CS-001

Chronic Nonhealing Abscess Wounds Revealing Underlying Sebaceous Cysts: A Case Series and Surgical Insight

Laurel Adams, BS; Jessica Reid, MS; Molly Gaffney, BS; Adam Shalek, DO; Seanna Yang, BS; Abigail Chaffin, MD, FACS, CWSP, MAPWCA

Introduction: Chronic nonhealing abscess wounds may persist due to underlying pathologies such as sebaceous cysts with retained epithelial lining or fibrotic cyst tracts. These wounds are often initially managed conservatively, but failure to heal despite adequate wound care should prompt further investigation. This case series presents two patients with chronic back wounds ultimately resolved through surgical excision and reconstruction.

Methods: Two patients presented with chronic, nonhealing back wounds that initially presented as abscesses and underwent incision and drainage. Each received 3–4 months of conservative management, including serial debridements and dressing changes, without significant improvement. As wound fibrosis progressed, surgical consultation was obtained. The first patient, a 59-year-old male with a smoking history, underwent excision of a sebaceous cyst and nonhealing back wound with layered complex closure. The second patient, a 41-year-old male with uncontrolled diabetes and a significant smoking history, underwent excision of the nonhealing wound, a local rotation advancement flap, and negative pressure incisional wound therapy. Both procedures aimed to excise chronic inflammatory and fibrotic tissue.

Results: Surgical excision confirmed sebaceous cysts in both cases. Patient 1 is healing well without complications and continues to improve with conservative care. Patient 2 is also progressing well, despite minor postoperative epidermolysis, and continues recovery following flap advancement and NPWT therapy.

Discussion: These cases underscore the importance of identifying the potential etiology of sebaceous cysts and retained cyst lining in chronic nonhealing wounds following abscess incision and drainage. Persistent fibrosis should prompt early surgical referral to improve healing and reduce morbidity.

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CS-002

A Novel Approach to Treating Severe Degloving Injury Nonoperatively: A Case Study

Laurel Adams, BS; Molly Gaffney, BS; Jessica Reid, MS; Adam Shalek, DO; Ross Jacobson, BS; Seanna Yang, BS; Abigail Chaffin, MD, FACS, CWSP, MAPWCA

Introduction: Degloving injuries are complex soft tissue traumas in which the skin and subcutaneous tissue are forcibly separated from underlying structures. When involving the hand, they present unique challenges due to its anatomical complexity and functional importance. Elderly or medically frail patients—who are more prone to degloving injuries due to skin fragility—may face significant risks with surgical intervention, making nonoperative wound management essential.

Methods: A 94-year-old woman presented with a dorsal hand degloving injury following a fall. Initial treatment with honey dressing and non-adherent Adaptic caused discomfort and failed to promote debridement. Two weeks later, the wound exhibited 60–70% slough with no signs of epithelialization. At that point, treatment was transitioned to a novel highly charged fiber dressing combined with pure hypochlorous acid wound soaks. The dressing was selected for its nonadherent properties, absorptive and debridement capacity, and ability to maintain a moist environment to facilitate autolytic debridement and healing.

Results: Within one week of initiating the new treatment, slough was significantly reduced and epithelialization had begun. By the second week, the wound bed was nearly fully epithelialized. Four weeks later, only a dime-sized wound remained, with full preservation of hand mobility. Complete healing was observed by week 5. The patient reported minimal pain and improved comfort with the novel dressing compared to prior treatments.

Discussion: The novel highly charged fiber dressing enabled rapid, atraumatic wound healing in an elderly patient without surgery. This case highlights its potential as a valuable nonoperative option for managing complex hand injuries in high-risk populations

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CS-003

Optimizing Wound Healing: A Case Series on the Use of Autologous Blood Products in Conjunction with DACC (dialkycarbamexIchloride)-Coated Wound Contact layer (WCL) for the treatment of diabetic ulcers.

Maria D. Aguinaga, MD

Introduction: Diabetic foot ulcers (DFUs) are a serious complication of diabetes mellitus and a leading cause of lower extremity amputations. They present significant challenges due to high infection risk, impaired perfusion, and the need for multifactorial management including offloading and infection control.

Methods: This case series explores the use of autologous blood products directly to the wound bed, followed by the coverage with (DACC-WCL). DACC technology offers a non-chemical antimicrobial approach by binding and removing bacteria via hydrophobic interaction.

Patients demonstrated increased granulation tissue formation and a reduction in wound surface area.

Results: Patients demonstrated increased granulation tissue formation and a reduction in wound surface area.

Most notably, no infections were observed throughout the treatment course. This outcome highlights the role of the DACC-coasted WCL in preventing bacterial colonization in high-risk wounds. Patient commitment and adherence to care protocols- including routine follow-ups and proper offloading-were critical in achieving these results.

Discussion: The combination of the autologous blood products and with a DACC coated WCL may enhance healing in chronic DFU's while significantly reducing infection risk. These preliminary findings underscore the importance of patient compliance and suggest that the dual therapy approach warrants further investigation through controlled clinical studies to validate its efficacy and infection prevention capacity in diabetic wound care.

CS-004

Scleroderma Skin Ulcers: Ovine Extracellular Matrix With Hyaluronic Acid Xenograft, A Promising Approach To An Orphan Disease

Burlingame Burlingame; Michelle Moore, RN; Katrina Palu, Podiatrist; Emily Welsh, BSN, RN; William Tettelbach, MD

Introduction: Systemic sclerosis (SSc), commonly referred to as scleroderma, is a chronic autoimmune rheumatic disease affecting multiple systems. Excessive fibrosis, blood vessel abnormalities, and immune system disruptions mark this rare condition. When SSc impacts only the skin, it is categorized as "localized" scleroderma.[1] Individuals with SSc may experience ischemic digital ulcers, leading to noticeable epithelial loss, contractures, and an increased risk of infections and potential amputation.[2]

Methods: The setting of this case report was a hospital-based outpatient diabetic wound care clinic at Vaiola Hospital, Nuku'alofa, the main hospital in the Kingdom of Tonga. The patient was provided standard wound care for a right fourth finger wound with a combination of topical therapies and selective debridement. After remaining refractory for three

months to standard wound care, a cellular, acellular, matrix-like product (CAMP) was added to the patient's wound care treatment regimen.

Results: The patient is a 54-year-old female with type 2 diabetes mellitus and scleroderma. She lives with her husband and seven children. Denies alcohol and tobacco use. In 2017, she underwent a left below-the-knee (BKA) amputation, followed by a right BKA in 2022. Secondary to her bilateral BKAs, the patient has been mobilizing via a wheelchair since 2014. On 03/01/2024, that patient presented to a satellite non-communicable diseases (NCD) clinic with an open wound on her right fourth finger that occurred due to crawling on the ground. She was referred to the diabetic wound clinic at Vaiola Hospital, where an NCD nurse prescribed oral Bactrim and topical silver sulfadiazine cream to be applied to the open ulcer daily. The right fourth digit, after 12 weeks, remained non-responsive to conservative standard-of-care techniques; NS moistened alginate dressings, along with selective debridement. A total of six applications of the OFM graft containing a layer of hyaluronic acid were applied until the closure of the scleroderma dermal ulcer was achieved. On average, the xenografts were placed every 5.3 days.

Discussion: This case report highlights the successful integration of an OFM xenograft into the wound care regimen for a complex scleroderma-related dermal ulcer. In a patient with type 2 diabetes and systemic sclerosis, whose right fourth digit wound had remained refractory to standard-of-care therapies, the addition of this novel CAMP led to marked improvement. These results suggest that even in resource-limited settings like the Kingdom of Tonga, such an advanced approach with an OFM xenograft can be a promising adjunct for managing hard-to-heal ulcers associated with orphan diseases.

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CS-005

A Novel Approach to Treating Lower Extremity Diabetic Ulcers Utilizing a Combination Of A TopicalDehydrating Chemical Agent & Ovine ECM Grafts Containing A Layer Of Hyaluronic Acid

Nya Akoteu, RN; Katrina-Anne Palu, Podiatrist; Blair Burlingame; Michelle Moore, RN; William Tettelbach, MD, FACP, FIDSA, FUMH, MAPWCA

Introduction: Lower extremity diabetic ulcers (LEDUs) are a common and highly morbid complication of diabetes.1Infections in LEDUs are a leading cause of hospitalizations and emergency department visits.[1,2] The aim of this case report was to observe the response of a hard-to-heal LEDU on the medial aspect of the left foot in a 57-year-old female with poorly-controlled diabetes after initiating wound bed preparation via chemical debridement with an active gel containing methane sulfonic acid, which has rapid desiccating (hygroscopic) properties (*DEBRICHEM, DEBx Medical, Amsterdam, Netherlands) followed by the routine application of a xenograft composed of a layer of glycosaminoglycans (hyaluronic acid) between sheets of ovine forestomach-derived extracellular matrix (OFM).; (*Symphony, Aroa Biosurgery, Auckland, New Zealand).

Methods: The setting of this case report was a hospital-based outpatient diabetic wound care clinic at Vaiola Hospital in the Kingdom of Tonga. Her A1c was 13%. The patient's left LEDU was treated with standard dressings, including alginate dressings and hypochlorous acid gel, along with selective sharp debridement for 38 days. However, there was no significant improvement. On 07/19, a topical dehydrating agent (TDA) was applied to prepare the wound bed (fig. 1 & 2). On 07/21, the patient developed a deep tissue injury after wearing tight-fitting shoes to church. An offloading boot was provided on 7/24. On 7/25, an OFM graft containing a layer of hyaluronic acid was added to her treatment regimen.

Results: On 7/19, the patients left LEDU was treated with more aggressive sharp surgical debridement followed by the application of a topical dehydrating agent to effectively reduce biofilm. The wound base had the expected caramelized appearance after removal of the dehydrating gel. The standard of care techniques were continued while on 7/25 an OFM xenograft was added to her treatment regimen. Ninety-six days after the initial chemical debridement using a topical dehydrating agent, the left foot LEDU reduced in area by 88%. From 07/25 to 09/21, a total of five applications of the ovine ECM graft containing a layer of hyaluronic acid were applied. On average, the xenografts were placed every 12 days. By 11/6 the LEDU had resolved

Discussion: This case report introduces the use of chemical debridement with a topical dehydrating agent, which effectively reduces bioburden and is subsequently followed by routine applications of an OFM xenograft containing hyaluronic acid to facilitate a trajectory toward closure. This approach resulted in a significant reduction in wound size, even in a patient with poorly controlled diabetes.

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CS-006

Initial Experience with Novel Negative Pressure Wound Therapy Peel and Place Seven-Day Dressing

Misael C. Alonso, MD, FACP, CWSP, FAPWCA

Introduction: While reticulated open cell foam (ROCF)* is a well-established dressing for negative pressure wound therapy (NPWT), granulation tissue ingrowth can occur if the dressing is left in place longer than 72 hours, potentially causing wound bed disruption, bleeding, and pain upon dressing removal. Additionally, dressing change frequency and sizing the foam to fit the wound can be time-consuming. A novel encapsulated peel-and-place dressing with a polyurethane foam manifolding core and hybrid silicone-acrylic adhesive drape has been developed to remain in place for longer wear time. We report our initial experience with NPWT and the peel and place dressing.

Methods: Excisional debridement was performed as appropriate to remove devitalized tissue. Antibiotics were prescribed as needed. Dressing release liners were removed, and the peel and place dressing† was applied with foam core portion extending ≥1 cm past the wound perimeter. The dressing was connected to the NPWT device via multi-lumen tubing, and -125 mmHg continuous pressure was applied. Peel and place dressings were changed at least once per 7 days.

Results: Four patients (2 female and 2 male; age range: 23-69) with 6 complex lower extremity wounds were treated. Compared to traditional ROCF dressings, peel and place dressings were easier and faster to apply and remove. The dressings remained sealed without leakage for the intended dressing duration. Patient satisfaction was higher with peel and place dressings due to fewer dressing changes. All wounds exhibited a positive wound healing progression during therapy, as evidenced by granulation tissue formation, reduction in wound dimensions, and epithelialization.

Discussion: The extended wear time of the peel and place dressing reduced cost and application time, compared to traditional ROCF dressings. The simplicity of peel and place dressing application also saved time. NPWT with the peel and place dressing was favored over NPWT with ROCF by patients due to quicker dressing changes and lower dressing change frequency. Use of peel and place dressings in appropriate wounds may improve patient and clinician experience with NPWT.

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CS-007

Management of Infected Dehisced Abdominal Wounds with Adjunctive Negative Pressure Wound Therapy and Instillation of a Topical Wound Solution

Christopher Gonzales, MD; Michael N. Desvigne, MD, FACS, CWS, FACCWS; Cyndie Burnett, MSN, RN, WCC; Christa Gilbert, BSN, RN; Alma I. Alonso, RN

Introduction: Complications following body-contouring procedures may include delayed wound healing, secondary wound dehiscence, postoperative hematoma, or seroma.[1,2] Full-thickness abdominal surgical wound dehiscence following abdominoplasty or liposuction is a severe postoperative complication that requires immediate treatment and can lead to prolonged hospital stay, high incidence of incisional hernia, and subsequent reoperations.[3] Negative pressure wound therapy with instillation and dwelling (NPWTi-d) of a topical wound solution has been shown to aid in automatic cleansing of the wound surface, solubilizing devitalized tissue, removing infectious exudate, and reducing bacterial load.[4,5] We report our experience with NPWTi-d to adjunctively manage three massive, infected dehisced abdominal wounds following abdominoplasty or liposuction.

Methods: NPWTi-d* was applied with hypochlorous acid solution via a reticulated open-cell foam dressing with through holes† (ROCF-CC) in 3 full-thickness surgically dehisced abdominal wounds of 3 patients following elective body-contouring surgery. Systemic antibiotics were administered, and sharp surgical debridement was performed prior to or in conjunction with NPWTi-d application. Infection was confirmed via non-contact real-time fluorescence imaging. NPWTi-d settings included instilling hypochlorous acid every 2.5 to 3.5 hours with a 10-15 minute dwell time between cycles of continuous negative pressure at -150 mmHg. Imaging technologies (non-contact real-time fluorescence wound imaging and non-contact near infrared spectroscopy studies) were used at each dressing change to guide clinical decision making. Dressings were changed 3 times/week. NPWTi-d was discontinued when the wound was clear of infection, at which time patient was transitioned to outpatient care with conventional NPWT.

Results: At admission, infection was confirmed for all wounds, and percent surface area slough coverage was 15%-50%. Following the initial surgical debridement, wound size volume ranged from 130.6 cm^3 to 1,186.1 cm^3. Average time to infection clearance/patient discharge was 8.7 days (range: 7-11 days), and wounds were healed in 7.9 to 12.8 weeks.

Discussion: Rapid conversion in each case to a non-infected wound with clean granulating wound base allowed for quick transition from hospital to outpatient care. NPWTi-d facilitated hydromechanical removal of devitalized tissue through the ROCF-CC dressing. Following NPWTi-d, all wounds progressed to closure without further sequelae.

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CS-008

Hydromechanical Removal of Nonviable Tissue with Negative Pressure Wound Therapy and Instillation to Assist Limb Salvage

Misael C. Alonso, MD, FACP, CWSP, FAPWCA; Justin Singh, DPM; Deborah Key, RN, BSN, WCC

Introduction: Tissue necrosis and infection stall wound healing and can lead to other complications, including disseminated infection and amputation. For wound care patients at risk of lower limb amputation, rapid conversion from infected nonhealing wounds to healing wounds is essential in avoiding amputation. Use of negative pressure wound therapy with instillation and dwelling (NPWTi-d) of a topical wound solution assists in diluting, solubilizing and removing nonviable tissue in infected wounds, which may help reverse a negative wound healing trajectory. We report our experience with NPWTi-d to adjunctively manage infected lower extremity ulcers of diabetic patients admitted under a limb salvage protocol.

Methods: NPWTi-d* was applied with hypochlorous acid via a reticulated open-cell foam dressing with through holes† (ROCF-CC) in 9 complex lower extremity ulcers of 3 patients. Systemic antibiotics were administered, and sharp surgical debridement was performed prior to or in conjunction with NPWTi-d application. In addition to NPWTi-d, limb salvage protocol included diabetic control, offloading, revascularization, nutritional support and smoking cessation. NPWTi-d settings included instilling hypochlorous acid every 2 to 3.5 hours with a 10-20 minute dwell time between cycles of continuous negative pressure at -125 mmHg. At each dressing change, non-contact real-time fluorescence wound imaging was used to determine the presence and location of pathogenic bacteria, and non-contact near infrared spectroscopy studies were performed to measure deoxyhemoglobin, oxyhemoglobin, and ratio of tissue oxygenation (StO2). Dressings were changed 3 times/week. NPWTi-d was discontinued when patient was discharged and/or wound bed was covered with clean granulation tissue.

Results: At presentation, wound size volume ranged from 4.6 to 49.2 cm3 and percent surface area coverage of nonviable tissue was between 15% and 100%. Wounds were converted to at least 90% coverage with clean granulating tissue in an average of 24.1 days during use of NPWTi-d. Amputation was avoided in all cases.

Discussion: Limbs previously at risk of amputation were salvaged following adjunctive use of NPWTi-d. NPWTi-d facilitated hydromechanical removal of devitalized tissue through the ROCF-CC dressing. A clean granulating wound base allowed for successful application of cellular, acellular or matrix-like products.

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CS-009 (RPT-002)

Intact Fish Skin Grafts for Treatment of Complex Wounds in Premature Neonates and Hospitalized Infants

Rene Amaya, MD; Emily Heisler, APRN, FNP-C

Introduction: A novel intact fish-skin graft (IFSG) product has been successfully used in chronic and acute wounds in the adult population. This product (Kerecis Omega3, Isafjordur, Iceland), is derived from the skin of Atlantic cod. While many studies support the use of IFSGs in adult wounds, similar studies on infants and premature neonates have been limited.

Methods: Patients underwent bedside application of IFSG after initial wound bed preparation. The IFSG was left in place for 7-14 days. During this period, the graft sites were assessed every 3-4 days for signs of infection or adverse effects from the IFSG. The two primary investigators performed all procedures. The primary endpoint was complete wound closure.

Results: Fourteen infants met the inclusion criteria. Their gestational age ranged from 21 weeks prematurity to term. Eleven patients received a single IFSG, and two required two IFSGs. Complete closure was seen in all but one patient, with an average closure time of 17.2 days. No adverse effects or complications were observed.

Discussion: This IFSG appears to be a safe and effective treatment for complex wounds in neonates.

CS-010

Evaluation for Safety of Pure Hypochlorous Acid Solution in Neonates and Preterm Infants with Wounds

Rene Amaya, MD; Emily Heisler, MSN, APRN

Introduction: The fragility of premature infant skin is well recognized. Application of various topical disinfectants, solutions and adhesive dressings can often lead to skin damage and irritation. Whereas the use of pure hypochlorous acid (pHA) wound cleanser solution has been shown to be both safe and effective in the adult population, the same has not been clearly shown in premature infants outside of small case series. The purpose of this retrospective case study was to report the outcomes of pHA utilized in 100 premature infants who suffered from hospital-acquired wounds. The goal was to determine if pHA could safely be applied to the skin and wounds in infants of varying prematurity without signs of contact dermatitis, chemical burns or other erosive skin injury.

Methods: Medical records from over 100 consecutive wound care patients in the neonatal ICU were reviewed and results collected. Age, sex, degree of prematurity, the number of applications per patient, and the type of wound present were reviewed. Information regarding the patient's environmental conditions were also gathered to include phototherapy, care in open crib or neonatal isolette. Records were reviewed to assess if the site of pHA application developed signs of contact dermatitis, chemical burns or other erosive skin injury.

Results: Data from over 100 infants was reviewed from 2024-2025. Infants ranged from 21 weeks prematurity to 40 weeks gestation. Identified wounds included IV extravasation injuries, pressure ulcers, surgical site complications, contact dermatitis from bodily fluids, skin tears, congenital skin disorder (EB, Ichthyosis) and vascular device related injuries. Wound documentation all came from the same primary investigator. In every case reviewed, no findings for pHA related skin injury were identified. The product was well tolerated regardless of degree of prematurity, the type of wound present, the patient's environment or the number of applications administered.

Discussion: The results of this large retrospective study reveal that application of pHA to the skin and wounds of premature infants is safe. The product was well tolerated even as young as 21 weeks gestation. It is currently a routine component of all wound care interventions in our NICU practice.

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CS-011

Novel Application of Fish Skin Grafts in Complex Calf Wound Post-Radiation Treatment of Basal Cell Carcinoma

Atif Baqai, MD, FACS, RPVI; Maria Gerona, PA-C

Introduction: Wounds in post-radiation skin cancer patients often poses a unique concern and challenge when considering options for treatment. Whereas such wounds are inherently acute in nature, wound management in this unique patient population must consider the long-term effects of treatment that will affect the future function of the limb and the aesthetic qualities of a residual scar. Identifying safe and effective dressings to treat these complex wounds in this fragile population is often a challenge for wound care specialists. In this case, a fish skin graft (FSG) was applied to a complex calf wound post-radiation treatment of basal cell cancer with high risk for limb loss in allowing for near-complete closure of her wound.

Methods: 93 y/o female with history of basal cell cancer of right posterior calf presented to the wound care center for evaluation of large right posterior calf wound. Patient had undergone external beam radiation treatment with electrons, receiving a dose of 5500 cGy in 20 fractions, completing treatment 5 months prior to presentation. Upon evaluation, her wound measured 8.0 x 7.0 cm with large dry eschar over the wound.

Results: Patient was treated with porcine urinary bladder grafts, amniotic grafts, and porcine small intestinal submucosal grafts with interval improvement in the wound but unable to get complete wound healing and closure. At this point, decision was made to use Fish Skin Graft which was used to assist with epithelization to achieve wound closure. Patient was not a candidate for STSG and complex plastic rotational flap given her advanced age She was also not a candidate for hyperbaric oxygen therapy since she had basal cell cancer in other areas. Subsequently, she underwent aggressive debridement with advanced wound therapy using Fish Skin Graft with near-complete closure of her wound.

Discussion: This case illustrates the complex nature of patients that have undergone radiation therapy for treatment of skin cancers. Limited non-surgical options exist for elderly patients to achieve wound closure on post-radiation wounds while paying careful attention to mobility and functional status. Patient presented with a complex situation, and given her advanced age and poor nutrition, this required a multidisciplinary approach to give her the best long-term outcome. She was unable to attain complete wound closure with multiple grafts. Using Fish Skin graft and aggressive debridement, the patient was able maintain her functional status with near-complete healing of her complex wound.

CS-012

Acellular Fish Skin as a Biologic Bridge to Split Thickness Skin Grafting in Staged Closure of Open Transmetatarsal Amputations

Ian Barron, DPM, FACFAS; Kimberly Barron, DPM, FACFAS

Introduction: Open transmetatarsal amputations (TMAs) are commonly performed in patients with diabetes, infection, or peripheral arterial disease. Healing these open surgical wounds can be prolonged and complicated by poor vascularity, local infection, and systemic comorbidities. Secondary closure procedures are not always possible and more proximal amputations are often required when healing fails. Piscine acellular dermal matrix derived from cod skin has demonstrated properties that promote granulation and epithelialization. This report evaluates the use of a fish skin graft in enhancing wound healing and reducing complications in patients undergoing open TMA.

Methods: This report includes patients who underwent open TMA due to severe soft tissue infection or ischemia. Following debridement and amputation, fish skin was applied to the open amputation site. After complete granulation, split thickness skin grafting was then performed. Patients received standard offloading and wound care.

Results: All patients experienced progressive granulation tissue formation and successful wound healing without requiring delayed primary closure or higher-level amputation. All patients maintained or improved their ambulatory function during recovery. No adverse events related to graft application were reported.

Discussion: Fish skin graft appears to be a promising adjunct in the management of open TMA sites, particularly in high-risk patients with impaired healing potential. The graft's structural integrity and bioactive properties may contribute to faster healing and lower complication rates. While these early results are encouraging, further prospective studies with larger cohorts are necessary to validate the efficacy in limb salvage surgery. Incorporating this product into clinical protocols may help reduce the need for secondary procedures and improve overall patient outcomes in complex limb salvage.

CS-013

Addressing Residual Tissue Voids in Lower Extremity Wounds with Acellular Piscine Skin Substitute Graft

Kimberly Barron, DPM, FACFAS

Introduction: Managing dead space in complex lower extremity wounds remains a significant challenge, particularly following extensive debridement. These voids can lead to delayed healing, persistent infection, and increased risk of reoperation or amputation. Traditional surgical techniques and bolster dressings often fall short in filling these spaces. Acellular fish skin graft derived from North Atlantic cod, offers a biologic scaffold that supports cellular infiltration and angiogenesis. Its unique structure and omega-3 content make it a promising tool for addressing dead space in complex wound settings. Fish skins use for dead space management in patients with high-risk lower extremity wounds will be evaluated.

Methods: Patients with complex lower extremity wounds and substantial dead space following aggressive debridement were treated using a skin graft substitute derived from fish skin. Each case involved varied etiologies, including infection, ischemia, and traumatic tissue loss. After thorough surgical debridement, fish skin graft was packed into the wound void and secured with standard secondary dressings. Patients were followed weekly for wound progression, granulation tissue formation, signs of infection, and time to wound closure.

Results: The grafts integrated well without signs of rejection or local adverse reaction. No infections or wound breakdown occurred during the follow-up period, and none of the patients required additional surgical procedures for wound closure. All wounds progressed to successful closure.

Discussion: Kerecis fish skin graft appears to be a valuable adjunct in the management of dead space in complex lower extremity wounds. Its biologically active matrix supports rapid granulation and reduces complications, helping to avoid prolonged healing and reintervention. These findings suggest fish skin grafts may be incorporated effectively into reconstructive limb salvage protocols, though larger studies are warranted to further define its role in clinical practice.

CS-014

Staged Reconstruction of Complex Foot Ulcers Using Acellular Fish Skin Graft Prior to Split-Thickness Skin Grafting

Ian Barron, DPM, FACFAS

Introduction: Diabetic foot ulcers (DFUs) present a significant clinical challenge due to impaired vascularity, neuropathy, and susceptibility to infection. Skin grafting, particularly split-thickness skin grafts (STSG), is often employed in wound closure but can have limited success in compromised wound beds. Skin graft substitutes have been shown to improve granulation tissue, allowing for improved STSG uptake. Piscine-derived acellular fish skin graft rich in omega-3 fatty acids, has been show to facilitate granulation tissue in diabetic ulcers. This study aims to evaluate the combined use of a fish skin graft and STSG in treating complex DFUs, assessing outcomes related to wound healing and graft incorporation.

Methods: This report includes diabetic patients with chronic, non-healing foot ulcers refractory to conservative wound care. Patients underwent a two-stage surgical approach. The first stage involved sharp debridement of devitalized tissue followed by application of fish skin to the wound base. Once the wound demonstrated healthy granulation tissue and incorporation of the fish skin graft, a second procedure was performed with application of STSG.

Results: Preliminary findings suggest that the use of a fish skin skin graft substitute prior to STSG results in improved graft take and rapid wound healing. Visible integration of the fish skin xenograft preceded application of STSG, and graft take was complete in each patient. No major postoperative infections or graft failures were observed.

Discussion: Fish skin graft may serve as an effective adjunct in preparing complex foot ulcers for successful STSG. Its ability to promote granulation tissue and provide a bioactive scaffold enhances graft incorporation and reduces healing time. These results support a staged biologic approach for difficult-to-treat foot ulcers and highlight the potential for improved long-term outcomes with fewer complications.

CS-015

Post Amputation Wound Management in Medically Complex and High Risk Patients: Application of a Bovine-Derived Collagen Matrix

Scott R. Boynton, DPM; Melina R. Butuci, PhD; Sara R. Shahbzi, PhD

Introduction: Post-amputation wounds in patients with diabetes and peripheral vascular disease present a high risk for delayed closure, infection, reoperation, and major limb amputation. Timely and effective wound closure is essential to reduce morbidity, avoid further surgical intervention, and preserve limb function. Bovine-derived collagen matrices have shown promise in supporting wound bed preparation, support granulation tissue formation, and accelerating closure in complex and chronic wounds.

Methods: This retrospective, single-center case series examined the management and outcomes of two medically complex patients with post-surgical lower extremity wounds and multiple risk factors for impaired wound closure, including diabetes, peripheral vascular disease, immunosuppression, neuropathy, and a history of substance use. Both patients were treated with a bovine-derived collagen matrix to promote wound bed preparation and closure, aiming to reduce the need for additional surgical intervention.

Results: As shown in Table 1, both patients presented with multiple comorbidities associated with impaired wound closure. Despite these risk factors, each case resulted in substantial wound size reduction and full closure without the need for reoperation. For Case 1, the wound reduced 91% from Day 0 to Day 14m with complete closure by day 56 following two collagen Matrix applications and adjunct NPWT. No further surgical intervention were needed following initial management. For case2, following matrix application, the dorsal foot eschar fully epithelialized by day 12. The lateral TMA reduced 90% by day 19. By day 59, complete closure was achieved without further surgical intervention. The patient experienced no complication.

Discussion: hese two cases demonstrate the clinical utility of a bovine-derived collagen matrix in managing complex post-amputation wound in patients with significant systematic and vascular comorbidities. Both patients had impaired wound closure potential due to conditions such as diabetes, PAD, neuropathy, and immunosuppression, factors known to delay wound closure and increase risk of wound complications. Case 1 achieved full closure in 56 days using two applications of collagen matrix and adjunct NPWT. Case 2 involved a single collagen matrix

application and the dorsal eschar fully epithelialized by day 12 and TMA wound achieved complete closure in 59 days, with 90% reduction by day19. These outcomes suggest that a bovine-derived collagen matrix can serve as a practical and effective wound management strategy following foot amputation, particularly in patients with limited surgical options. It may reduce the need for further surgical escalation and help preserve limb integrity in a high-risk population.

CS-016 (RPT-001)

Efficacy of Wound Healing and Decreasing Donor Site Morbidity using Autologous Skin Cell Suspension and Split Thickness Skin Grafting as a Dual Therapy

Mary Bridge, MD; Allegra Fierro, MD; John C. Lantis, MD

Introduction: Autologous skin cell suspension (ASCS) combined with split thickness skin grafting (STSG) provides an option for faster wound healing compared to STSG alone. ASCS promotes wound healing by providing maximal coverage to a wound while reducing the donor site size and morbidity associated with STSG. In this prospective study of 14 patients, we compared STSG+ASCS as a dual based therapy to both STSG and ASCS each as single therapies to evaluate healing in lower leg wounds.

Methods: Based on randomization, wounds < 50 cm2 received either ASCS (RECELL Autologous Cell Harvesting Device, AVITA Medical, Valencia, CA) Or STSG (meshed 1.5:1). Wounds >50 cm^2 underwent either STSG alone, or application of ASCS+STSG. Wound and donor site size as well as donor site pain scores (scale of 1-10) were evaluated weekly for 12 weeks.

Results: 14 patients were enrolled as follows: In the < 50 cm2 group, ASCS (n=4) and STSG (n=5). In the >50 cm2 group, STSG (n=1) and ASCS+STSG (n=4). In the < 50 cm2 arm, 50% of wounds closed by 12 weeks (n=3) with an average time to closure of 4.7 weeks. Of those not achieving closure in the STSG group (n=2), average wound area reduction (WAR) was 60.4% at 12 weeks. Complete closure was not achieved in any wounds < 50 cm2 treated with ASCS; however average WAR was 51.9% at 12 weeks, using less donor skin compared to the STSG group. For wounds >50 cm2 treated with ASCS+STSG, average WAR was 84.4% by 12 weeks and average WAR for STSG alone was 58.7%. Mean donor site healing time for STSG donor sites was 5.5 weeks. ASCS donor sites re-epithelialized in an average of 1 week.

Discussion: While our sample size was limited, ASCS therapy appears to be more effective when used in conjunction with STSG. We found that patients treated with ASCS+STSG had accelerated wound healing compared to those treated with solely ASCS or STSG. ASCS also decreases donor site morbidity due to faster healing time. While our findings were clinically significant, additional evaluation of ASCS+STSG will be beneficial to make definitive conclusions regarding this treatment modality.

CS-017

Novel Approaches to Limb Salvage Utilizing the BIOMES Framework: A Case Series

Trent Brookshier, DPM

Introduction: Delayed referral to wound or vascular specialists remains a major barrier to limb salvage. Takahara et al. found that patients with critical limb-threatening ischemia (CLTI) often go 1–3 months before specialist evaluation. Early identification of high-risk features is essential to reduce amputation risk. This case series illustrates how the BIOMES framework—a structured tool covering Blood Flow, Infection/Bioburden, Offloading/Overloading, Metabolic/Morbidities, Exudate/Edema, and Social/Economic factors— can prompt timely referral and intervention. Aligned with Wound Balance principles, BIOMES supports early, targeted care across biological, mechanical, and social domains. Early specialist involvement enables access to advanced dressings and surgical innovations not typically available in general care.

Methods: Three patients with chronic lower extremity wounds at risk of limb loss were assessed using the BIOMES framework at initial presentation. Clinical data, comorbid conditions, and social determinants were documented. Each patient's BIOMES domains were scored, and targeted interventions were implemented in real-time based on assessment findings. Cases were tracked longitudinally, including wound progression, referral timelines, interventions, and limb salvage outcomes.

Results: All three patients had complex comorbid profiles including diabetes or peripheral arterial disease. Each met ≥2 BIOMES criteria at initial evaluation. The tool supported continued recognition of underlying potentially threatening conditions and identified unmet needs. All achieved limb salvage at follow-up, with measurable wound improvement.

Discussion: This case series shows that applying the BIOMES framework at the initial wound care encounter helps identify complex healing barriers and prompts timely, targeted intervention. By facilitating early referral to a wound specialist, BIOMES enables access to advanced dressings and surgical innovations that are often unavailable in general care. These results support broader adoption of BIOMES as a frontline triage tool and reinforce its alignment with Wound Balance principles by addressing both intrinsic and extrinsic factors impeding healing.

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CS-018

ON101 Treatment of Polycythemia Vera Associated Chronic Heel Ulcer in a Diabetic Patient: A Case Report

Bin Cao, MD

Introduction: Polycythemia vera (PV) is a myeloproliferative neoplasm characterized by excessive erythrocytosis. A known but uncommon and debilitating adverse effect of hydroxyurea, the mainstay treatment for PV, is the development of chronic leg ulcers. When coexisting with diabetes mellitus (DM), wound healing is further impaired due to microvascular and metabolic complications. We present a case of a chronic heel ulcer associated with PV and diabetes, unresponsive to conventional wound care and growth factor therapy, but successfully treated with ON101, a novel topical cream.

Methods: A 67-year-old male with a 9-year history of type 2 DM and long-term hydroxyurea use for PV developed a shallow ulcer on the left heel that persisted for 9 months. Despite regular application of growth factor gel and petroleum-based dressings over 5 months, the ulcer showed no improvement. The patient's glycemic control was stable, with fasting glucose levels between 5–7 mmol/L. Vascular evaluations, including an ankle-brachial index (ABI) of 1.10 and lower extremity angiography, showed no evidence of significant arterial stenosis. Neurological examination was unremarkable. ON101 cream was applied daily, followed by dry gauze dressing.

Results: Before ON101 treatment, the ulcer had not shown any significant healing progress for more than five months. Following the initiation of ON101, rapid epithelialization was observed within 10 days, and near-complete healing occurred within approximately 14 days. The wound healed with less than one full tube of ON101 cream. No adverse events were reported during treatment. Long-term follow-up confirmed sustained wound closure.

Discussion: This case highlights the therapeutic potential of ON101 cream for chronic, non-healing ulcers in patients with complex comorbidities such as PV and DM. In PV, hydroxyurea-induced ulcers often

necessitate discontinuation of therapy, posing a treatment dilemma. A safe and effective topical agent like ON101, which promotes epithelial regeneration without systemic side effects, offers a valuable alternative. Further clinical studies are warranted to evaluate the broader applicability of ON101 in managing refractory ulcers associated with hematologic and metabolic disorders.

CS-019

Comparing SF-36 scores of a patient with dual diagnosis of Spinal Cord Injury and Traumatic Brain Injury before and after surgical intervention of Hidradenitis Suppurativa: A case study

Quyen Catania, PT, DPT, NCS, CWS, CLT; Marjorie Morgan, BS, PTA, CLT

Introduction: Patients with dual diagnosis of Spinal Cord Injury (SCI) and traumatic brain injury (TBI) have increased risk factors for wound-related complications due to reasons including impaired sensation, decreased mobility, and cognitive impairment. Periodically, a patient presents with more complex wounds, such as Hidradenitis Supparativa (HS). HS is a chronic inflammatory disorder that typically causes skin nodules and abscesses to develop in intertriginous skin areas. HS has been found to negatively affect a person's quality of life, self-esteem, and body-image.

Methods: A retrospective review was performed of a patient with dual diagnosis of SCI and TBI, around six years after injury, to compare quality of life, reports of pain, progress towards therapy goals, and self-reported satisfaction during bouts of care that took place before and after surgical management of HS.

Results: Patient showed improvements in 6 Minute Walk Test (6MWT) of 258 feet vs. 194 feet, both of which are considered above the Minimal Detectible Change (MDC). Patient's walking speeds decreased on the 10 Meter Walk test (10MWT), but it was comparing needing bracing and assistive device to without (0.9 m/s during the active bout of HS vs. 0.86 m/s after surgery). On the SF-36, patient showed MDC in physical function (10 to 40) and role limitation due to physical health (50 to 100). Although not within the range for MDC, patient did show improvements in reports of energy/fatigue, emotional well-being, pain, and social functioning stratifications. Functionally, the patient reports he has been spending more quality time with his son.

Discussion: HS negatively affected this patient's quality of life, as it led to painful tunneling wounds in his inguinal areas. During his rehabilitation bout with HS, he was not allowed to use harnessed walking, which affected meeting his rehabilitation goals. Patient was not able to continue working towards his therapy goals, despite his improved 6MTW and 10MWT during that bout of care, due to requiring surgical interventions related to the HS. However, after the HS surgery, his bout of care was extended due to making such great progress. Furthermore, due to active wounds and pain, he required more assistance with clothing management and ADLs, which meant he had to live at the nursing home. Treating these wounds was crucial to attaining his therapy goals, improving this patient's quality of life, and has allowed him hope to leave the nursing home and to move in with his son.

CS-020

Exploring the Efficacy of Continuous Topical Oxygen Therapy for Diverse Chronic Wound Types: Real-World Case Studies

Windy Cole, DPM, CWSP

Introduction: The 2017 Value in Health study utilizing the 5% Medicare dataset reveals that most chronic wounds among Medicare beneficiaries are not limited to diabetic foot ulcers (DFUs), venous leg ulcers (VLUs), or pressure ulcers. Instead, the most significant issues include surgical wounds that dehisce, traumatic wounds failing to heal, and chronic ulcers resulting from co-morbid conditions. There is a notable scarcity of clinical trials addressing these prevalent wound types, leading to limited effective treatment options.

Methods: This poster illustrates international case studies highlighting the efficacy of continuous topical oxygen therapy (cTOT) for various wound types beyond DFUs and VLUs.

Results: Results from five case studies demonstrate complete wound closure with cTOT. Case Study 1 involved a 39-year-old male in New York, US with a surgical wound dehiscence following a radical fasciotomy, showing complete closure in 77 days from an initial area of 72.0 cm^2. Case Study 2 featured a 41-year-old female in Pretoria, SA with full-thickness burns on the thigh, achieving closure in 84 days from a baseline wound area of 28 cm^2. Case Study 3 documented a 65-year-old male in Luton, UK with an osteoradionecrosis wound extending to the mandible, who healed completely in 35 days from a 5.25 cm^2 wound. Case Study 4 presented a 72-year-old male in Porto, Portugal with surgical wound dehiscence post-sternotomy, closing the 60 cm^2 wound in 26 days. Finally, Case Study 5 involved a 56-year-old female in Cleveland, US with a calciphylaxis wound of 7.92 cm^2, healed completely in 64 days.

Discussion: Conclusions of this case series emphasize the urgent need to establish effective treatments for wound types beyond DFUs and VLUs. To fill gaps in current randomized controlled trial (RCT) data, there is a pressing demand for real-world data (RWD) demonstrating treatment effectiveness in typical patients. Investigating interventions in individuals with varied wound etiologies and underlying health conditions is essential. cTOT has proven effective in promoting wound healing across diverse wound types in complex patients worldwide.

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CS-021

Use of Gentian Violet/Methylene Blue (GV/MB)-Impregnated Polyurethane (PU) Foam for Treating Peristomal Atopic Dermatitis: A Case-Based Approach

Linda Concepcion, BSN, RN, WCC

Introduction: Peristomal skin complications are common among ostomates. Atopic dermatitis in the peristomal region presents further challenges due to its recurrence and inflammatory nature. Skin breakdown to the peristomal skin compromises the adhesion of the pouch, leads to leakage, discomfort and increases risk of infection. This case study explores the innovative use of GV/MB-impregnated PU foams in the treatment of peristomal atopic dermatitis.

Methods: A single-patient case study was conducted in an inpatient setting to evaluate the effectiveness of GV/MB-impregnated PU foams in treating peristomal atopic dermatitis. An 84-year-old female with a colostomy presented with weeping skin, persistent erythema and pruritus; clinically diagnosed with atopic dermatitis. The patient had a history of recurrent and complicated peristomal skin issues since the creation of the colostomy in 2019, with multiple prior interventions yielding in limited success. GV/MB-impregnated PU foams were applied to the affected peristomal skin and secured with hypoallergenic tape. Dressings were changed every 24-72 hours, based on the amount of exudate and skin condition. The patient was monitored for 14 days for symptom relief, appliance adherence, and skin integrity. Clinical progress was documented through visual assessment and photography.

Results: Following the initiation of GV/MB-impregnated PU foam therapy, marked improvement was observed. Visual assessments revealed a decrease in erythema, exudate, and peristomal inflammation. Its non-cytotoxic antibacterial and atraumatic properties supported rapid improvement of skin integrity and appliance adherence. No adverse effects were reported. The patient tolerated the dressings well.

Discussion: GV/MB-impregnated PU foams proved to be a safe and effective adjunctive treatment for peristomal atopic dermatitis in this case. The potential role of GV/MB-impregnated PU foam in management of peristomal atopic dermatitis was significant in this study, especially when conventional therapies have failed. This case highlights the importance of individualized care and suggests that GV/MB-impregnated foam may be a valuable option.

CS-022

The Blue Magic: Innovative Use of Gentian Violet/Methylene Blue (GV/MB) Impregnated Polyvinyl Alcohol (PVA) and Polyurethane (PU) Foams in a Complex Wound Care Case

Linda Concepcion, BSN, RN, WCC

Introduction: Management of complex complex wounds is challenging enough-but becomes even more daunting following major abdominal surgery complicated by infection and fistula formation. Fistulas contribute to continuous drainage, increase risk of infections and delay wound healing. This case follows a patient post-Whipple procedure, whose recovery was hindered by intra-abdominal abscesses requiring multiple surgical washouts. The resulting wound was was further complicated by an enterocutaneous fistula with persistent drainage. This case study explores the use of GV/MB-impregnated PVA and PU foams; referred as "Blue Magic", in managing a complex wound with a fistula.

Methods: Initial goals of care included infection control, management of exudate, protection of the periwound skin and containment of the fistula effluent. A wound manager was applied to isolate the fistula and collect effluent. The wound base was managed using GV/MB impregnated PVA initially and covered with dry kerlix gauze. As the wound progressed, GB/MB with PU was used. Dressing changes were performed every 1-2 days, based on the amount of exudate. The wound manager was changed 1-2 times a week. Interventions included daily wound assessments, measurements, and photography to monitor progress.

Results: Over the course of 4 months, there was a significant reduction of wound size and increased granulation. The combination of using GV/MB impregnated PVA and PU dressings, in conjunction with a wound manager, effectively stabilized the wound environment, minimized risk of infection and supported ongoing wound closure. The choice to alternate the foams allowed flexibility based on wound depth, amount of exudate, and tissue type.

Discussion: This case underscores the complexity of managing surgical wounds complicated by fistula. The use of GV/MB-impregnated dressings offered multiple benefits: antimicrobial action, atraumatic wound contact, increased granulation tissue formation and exudate management. A key takeaway from this case was the importance of providing individualized wound care strategies by adapting to the evolving needs of the wound and the patient.

CS-023

Successful Conservative Management of a Chronic Plantar Ulcer in a Diabetic Patient with Foot Deformities Using a Combination of Amniotic and Adipose Tissue Allografts

Kristi Conway, DPM; HyunJu Lim, PhD; Alla Danilkovitch, PhD

Introduction: Chronic plantar ulcers present significant clinical, social and economic challenges. The plantar location makes ulcers not only challenging to manage but also leads to a high recurrency significantly increasing risks for amputations. An increased plantar pressure due to foot deformities or fat pad deficiencies plays a key role in plantar ulcer formation and recurrency. This clinical case describes a successful use of lyophilized full thickness human amniotic membrane (FT-AC) and cryopreserved human adipose tissue (hCAT) allografts for management of chronic plantar ulcer in a diabetic patient. The FT-AC is an advanced wound care modality that has been shown beneficial for chronic wound management. The hCAT is designed to address adipose defects including fat pad atrophy or displacement. The protective effect of hCAT has been shown in diabetic patients with plantar pre-ulcerative lesions.

Methods: A 73-year-old female patient with diabetes, high blood pressure, a gastroesophageal reflux disease, past breast cancer and both total knee replacements with recurring infections in the knee joints had a 2+ years history of a left foot non-healing metatarsal ulcer. The ulcer size was 1.1cm x 1.4cm x 0.3cm with a 1.5 cm tunnel beside. The patient has foot deformities but was not a candidate for a corrective surgery. The ulcer management included an implantation of 1.5 mL of hCAT in the periwound area of the ulcer on Week 0 and eight weekly FT-AC applications adjunct to the standard of care. Clinical outcomes included ulcer closure, time to closure, recurrency and treatment-related adverse events.

Results: The complete closure of the tunnel was achieved after two FT-AC applications. The complete closure of the plantar ulcer was achieved on Week 12 after eight applications of FT-AC. There were no ulcer recurrency for 4 months after the ulcer closure. There were no treatment-related complications. Longer term follow-up is ongoing.

Discussion: The combination of FT-AC and hCAT resulted in durable closure of the chronic diabetic plantar ulcer in a patient with foot deformities and multiple co-morbidities. The FT-AC and hCAT combination should be considered for ulcer management in patients who are not candidates for surgical repairs.

CS-024

Squamous Cell Carcinoma Arising from Pilonidal Disease: A Case Report and Lesson in Recognizing Wound Transformation

Paige A. Curcio, BS; Frank L. Ross, MD

Introduction: Introduction: If a wound is not healing, biopsy it! This case report explores a patient with a longstanding mass of the left upper buttock and history of pilonidal disease. The mass ruptured and eventually transformed into squamous cell carcinoma (SCC). This is a rare complication, with transformation of pilonidal sinus disease reported at a rate of 0.1%1. Thus, there is much to learn about the diagnosis and management of this unique phenomenon.

Methods: Methods: The patient is a 38-year-old female who first presented to an outside hospital for four months of continuous drainage from a non-healing, ruptured mass in the left upper buttock. The patient was referred to surgery clinic, but her family was unable to schedule the appointment. She re-presented four months later and was seen by surgery. The surgery note reported a history of pilonidal disease documented in outside hospital records and recommended follow-up with a wound care facility. The patient was seen a month later at our wound care facility and found to have a vertically aligned, fissure-like, full-thickness wound with a depth of at least three to four centimeters and possible penetration to the sacral bone. The wound edges were irregular and frond-like, and they bled easily. A biopsy was performed, and the family was advised to pack the wound with gauze soaked in dilute sodium hypochlorite solution and cover with a foam dressing.

Results: Results: The biopsy returned as SCC infiltrating the reticular dermis, and the patient was referred to surgical oncology. The current treatment plan is complete surgical excision. However, there is concern for expansive local disease and increased risk of regional spread given the wound depth. Thus, the patient may receive neoadjuvant therapy to shrink the lesion and avoid a highly morbid surgery.

Discussion: Discussion: There were five months between the patient's initial presentation and her visit to wound care, during which she presented twice to the ED. In that time, the wound grew from three to six centimeters in length. This case highlights the importance of early surgical biopsy of chronic, non-healing wounds and expands the limited literature on SCC arising from pilonidal disease2,3.

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CS-025

Outpatient Healing of Large Post-Excisional Defects in Hidradenitis Suppurativa Using Urinary Bladder Matrix

Paul Del Prado; Mark Shacker, None; Brittany Stansbury, MD

Introduction: Hidradenitis suppurativa (HS) is a chronic inflammatory skin disorder characterized by recurrent abscesses, sinus tract formation, and scarring. In moderate to severe cases (Hurley Stage II–III), wide local excision is often required, resulting in large soft tissue defects. These wounds can be difficult to manage, particularly in outpatient settings where complex reconstruction is not always feasible.

Methods: A retrospective review was performed on six patients between ages 16–31 with axillary and/or chest HS who underwent wide local excision. After partial primary closure where feasible, the remaining open wounds were managed with Urinary Bladder Matrix (UBM), an extracellular matrix (ECM)-based wound matrices*, used in both sheet and powder forms. Dressings included non-adherent layers and moistened gauze. Outcomes evaluated included time to granulation, need for skin grafting, functional recovery, and disease recurrence.

Results: All patients demonstrated complete wound granulation within 2–3 months postoperatively. Two patients required split-thickness skin grafts for final closure, while others healed via secondary intention. Functional outcomes were favorable, with full range of motion preserved in most cases. One patient required surgical release of a contracture. No HS recurrence was observed during the limited follow-up period.

Discussion: The use of ECM-based wound matrices* offers a viable solution for managing large post-excisional HS defects in outpatient settings. This approach supports effective wound healing, reduces the need for more invasive interventions like negative pressure therapy, and allows preservation of function with acceptable morbidity. These findings suggest that biologically active wound matrices may be an important adjunct in the treatment of complex HS wounds. Further prospective studies are recommended.

CS-026

Correlation of Reduction in Exudate, Pain and Wound Size of Refractory Wounds to Quality of Life; Emotional and Social Well-being; a Veterans Story

Virginia Delgado, RN

Introduction: Persistent non-healing wounds can significantly impact quality of life (QOL), particularly among veterans, contributing to anxiety, depression, and diminished physical and emotional well-being. These wounds are often malodorous and heavily exudative, causing substantial pain, limiting mobility, and leading to social isolation.[1] Veterans experience higher rates of chronic pain compared to non-veterans, further restricting their ability to engage in daily activities.[2] Emerging synthetic materials, such as boron-based bioactive glass fiber matrix (BBGFM), have gained attention for their role in supporting rapid granulation and epithelialization.[3,4] BBGFM supports a sustained wound environment conducive to healing while reducing exudate, discomfort, and pain.

Methods: Two veteran patients with a total of five chronic, heavily exudative, and painful venous leg ulcers—each persisting for more than 8–10 months—were treated with weekly applications of BBGFM. Both patients had previously failed multiple advanced treatment modalities and were unable to tolerate debridement or compression therapy due to severe pain. Their condition led to limited mobility and confinement to their homes, driven by pain, exudate, and social withdrawal.

Results: Both patients experienced a rapid reduction in exudate and odor within the first two weeks of BBGFM treatment, along with complete resolution of wound-associated pain.[4,5] These improvements enabled tolerance of compression therapy and increased ambulation, which in turn reduced feelings of social isolation. Four of the five wounds healed completely after six weekly applications of BBGFM. The fifth wound—measuring 10.8 × 9.0 × 0.3 cm—demonstrated a 60% reduction in wound area in the first few weeks. The patient remained pain-free and active, with continued weekly wound area reduction. In the resolved wounds, rapid granulation and epithelialization were observed, producing high-quality tissue. These outcomes may be attributed to the natural elements within BBGFM, which have been shown to support angiogenesis as well as fibroblast and keratinocyte proliferation.[6]

Discussion: These two cases provide real-world evidence supporting the early efficacy of BBGFM in the management of chronic, non-healing venous leg ulcers. The matrix supported a sustainable wound environment that facilitated rapid reduction in wound area and symptom burden. Importantly, both patients reported a marked improvement in QOL, including enhanced mobility, reduced pain, and decreased social isolation. These outcomes emphasize the potential of BBGFM not only as a wound-healing modality but also a means to improve the overall physical and emotional well-being of veteran populations struggling with complex chronic wounds.

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CS-027

Circumferential Lower Extremity Soft Tissue Reconstruction: Our Experience with Bilayer Matrix and Skin Grafting

Christopher J. Didzbalis, MD; Anish Raman, BA; Varoon Phondge, BA; Joseph Weisberger, MD; Edward Lee, MD

Introduction: Circumferential soft tissue injuries of the lower extremity may occur after significant trauma involving rollovers and industrial machine accidents. They may also occur as a result of morbid medical conditions. A circumferential complete loss of soft tissue may present a great challenge for the reconstructive surgeon, often requiring numerous debridement procedures with significant risk for infection throughout a staged approach. Open cell, synthetic, not-reticulated matrices allow for the production of granulation tissue in a cost effective manner with lower theoretical risk for infection. This institutional case series presents outcomes of patients with circumferential lower extremity wounds treated with synthetic tissue matrices.

Methods: A retrospective chart review was conducted in patients by a single surgeon between 2022 and 2025 for patients with circumferential lower extremity soft tissue injuries. Demographic information, wound size and location, and mechanism of injury were collected. The key endpoints were the presence of a healthy wound bed for grafting after tissue matrix application, skin grafting and wound closure. Patients were excluded if they were lost to follow up.

Results: Seven patients were included in this case series. The average patient was 36 years old with slight female predominance (57%). All

wounds were located on the lower extremity, as far proximal as the thigh and distal as the ankle, foot and toes. Average wound surface area was 2,063cm^2. The majority of wounds were traumatic in nature (71%) and all traumatic wounds were associated with open fractures. Two patients presented with known infection prior to initial plastic surgery debridement. All patients underwent eventual skin grafting with complete take and were deemed fully healed at subsequent outpatient follow up appointments.

Discussion: Circumferential lower extremity soft tissue wounds present a long, reconstructive challenge for both surgeon and patient. The results of this case series demonstrate excellent coverage can be achieved using circumferentially placed synthetic tissue matrix for production of granulation tissue, followed by skin grafting. Future, prospective research with greater sample size may be beneficial in fully demonstrating effectiveness of this reconstructive pathway.

CS-028

Soft Tissue Reconstruction with Acellular Dermal Matrix and Negative Pressure Wound Therapy: A Less invasive solution for open fractures

Christopher J. Didzbalis, MD; Anish Raman, BA; Varoon Phondge, BA; Joseph Weisberger, MD; Edward Lee, MD

Introduction: Open fractures of the extremities are challenging for the reconstructive surgeon. More severe injuries and other chronic wounds may result in significant soft tissue loss, periosteal stripping and often require some form of flap reconstruction. Unfortunately, many patients may be poor candidates for these procedures. Aseptically processed meshed human reticular acellular dermal matrix (HR-ADM) provides an open structure that can support host tissue ingrowth and revascularization to help rebuild extensive soft tissue loss. The goal of this study was to determine if meshed HR-ADM application with negative pressure wound therapy (NPWT) would provide adequate coverage over lost soft tissue. This institutional case series presents the outcomes of patients with extremity wounds with periosteal stripping treated with meshed HR-ADM.

Methods: A retrospective chart review was conducted in patients by a single surgeon between 2022 and 2025. Demographic information, wound size and location, and mechanism of injury were collected. The key endpoints were the presence of granulation tissue after meshed HR-ADM application, the receipt of skin grafting, and wound closure. Patients were excluded if they were lost to follow up.

Results: Seven patients were included in this case series. The average patient age was 57 years old with slight male predominance (57%). Most wounds were located in the lower extremity (86%) and ranged from 6cm2 to 700 cm2 in total surface area, with median surface area of 48cm2. They were traumatic in nature (86%) and infected (71%). Healthy granulation tissue was documented for all wounds and skin grafting was later performed in four patients (57%). Ultimately, wounds were deemed closed in 6 patients (86%), including two who did not undergo skin grafting. One patient recently underwent application of dermal matrix and is developing granulation tissue.

Discussion: Extremity wounds with exposed bone may be reconstructed in numerous ways. The results demonstrate adequate coverage was achieved with meshed HR-ADM allograft and NPWT in patients in a staged-reconstructive fashion. Future research with larger sample size, greater longitudinal follow-up and less attrition may be beneficial in further elucidating the effectiveness of this reconstructive approach.

CS-029

Accelerating Healing in Complex Pressure Ulcers: A Case Series Evaluating a Three-Dimensional Acellular Xenograft for Management of Wounds

Ryan Dirks, MS, PA; Zwelithini Tunyiswa, BA

Introduction: Pressure ulcers remain a major healthcare challenge, especially in patients with limited mobility and comorbidities. These wounds often exhibit depth, tunneling, and undermining, making healing difficult with standard treatments. This case series evaluates a three-dimensional acellular xenograft*, derived from porcine liver, in two patients with chronic, complex pressure ulcers with significant undermining. The study assesses whether this advanced wound care product can enhance wound management where conventional therapies have failed.

This study evaluates the effectiveness of a three-dimensional acellular xenograft in managing chronic, complex pressure ulcers by: (1) Assessing wound healing and closure in ulcers with significant undermining. (2) Tracking wound volume reduction and healing progress. (3) Evaluating the xenograft's role as an adjunct to standard wound care.

Methods: Two patients with chronic, complex pressure ulcers were treated with the acellular xenograft as part of their wound care regimen. Case 1: A 12-month-old Stage 4 coccyx ulcer with 2.1cm of undermining. Case 2: A 3-month-old Stage 4 sacral ulcer with 7cm of undermining. Both had received standard-of-care (SOC) treatments and additional therapies, including antimicrobial gels and different Cellular, Acellular, and Matrix-like Products (CAMPs), without success. The xenograft was applied, and wound dimensions, application frequency, and healing progress were monitored.

Results: Application of the xenograft led to substantial improvements in wound healing: Case 1: The ulcer achieved near-complete closure within 48 days after seven applications of the xenograft. By week 4, wound volume had decreased by 64%, and undermining had reduced by 40%. Case 2: The ulcer achieved 67% Percent Area Reduction (PAR) closure, and undermining decreased by 71% within 90 days after nine applications of the xenograft. These results suggest that the xenograft contributes to rapid tissue regeneration, wound contraction, and enhanced healing in complex pressure ulcers.

Discussion: Chronic pressure ulcers with significant undermining and depth present substantial treatment challenges. This case series demonstrates that a three-dimensional acellular xenograft may effectively enhance wound management, reduce wound volume, and address undermining in hard-to-heal pressure ulcers. Further studies are needed to explore its broader clinical applications.

CS-030

Wound Resolution via Excision of Massive Localized Lymphedema: A Case Series on the Surgical Management of Chronic Panniculus-Associated Wounds in Obese Patients

Augustine Ekpo, MS; Ameena Oyesile, BS; Cole Feuquay, MS; Abigail Chaffin, MD, FACS, CWSP, MAPWCA

Introduction: Massive localized lymphedema (MLL) is a rare, yet increasingly recognized sequela of morbid obesity, characterized by chronic lymphatic obstruction and the development of immense, pendulous soft tissue masses. These lesions frequently ulcerate, become infected, and profoundly impair mobility, yet many surgical teams decline intervention due to perceived perioperative risks and wound complexity. This case series details two patients with refractory MLL whose debilitating pannus masses were successfully managed through a multidisciplinary surgical and wound care protocol, ultimately restoring ambulatory function and independence.

Methods: Two morbidly obese female patients with function-limiting MLL presented with extensive, chronically draining panniculus masses unresponsive to prolonged conservative wound therapy. Case 1, a 32-year-old with an abdominal pannus measuring over 112 cm and weighing 194 lbs, was a full-time nursing home resident due to impaired mobility from the pannus as it hung to the ground with bilateral medial thigh traction wounds and impaired abductors. Case 2, a 60-year-old with a 12.5-lb right thigh pannus, suffered recurrent panniculitis, falls, and significant compromise of daily living activities. Both patients underwent panniculectomy with wide excision of devitalized tissue and complex local flap closure. Intraoperative adjuncts included irrigation with a pure hypochlorous acid solution, progressive tension sutures, incision negative pressure wound therapy (iNPWT), and closed-suction drainage. Postoperative care featured coordinated inpatient management by plastic surgery, hospitalist, infectious diseases, and wound care services, with structured outpatient follow-up at affiliated advanced wound centers.

Results: Case 1 achieved primary closure with minor groin dehiscence that resolved with conservative wound management; she was discharged home ambulatory and independent. Case 2 underwent flap-based closure of a 546 cm^2 defect and recovered without complication. The patient was ambulatory and was discharged home in stable condition. Both patients experienced dramatic functional recovery and resolution of chronic wounds.

Discussion: Surgical excision of MLL, when coupled with structured wound management and interdisciplinary planning, offers durable functional outcomes for patients often marginalized by traditional care pathways. These cases underscore the therapeutic potential of surgical intervention as definitive management for MLL when conservative modalities fail. Our findings reinforce prior literature supporting operative resolution in advanced-stage MLL.

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CS-031

Reviving Stalled Wounds: A Case Series on the Clinical Impact of a Boron-Based Bioactive Glass Fiber Matrix in Complex Patients

Diego Escobar, MD, CWSP

Introduction: Chronic and complex wounds present significant clinical challenges, particularly in medically fragile populations. Advanced wound care products are increasingly being used to stimulate healing in wounds that are refractory to standard interventions. A critical step in this process is wound bed preparation—removing nonviable tissue, managing exudate, and optimizing the local wound environment to promote granulation and epithelialization.[1-3] This case series evaluates the use of a Boron-Based Bioactive Glass Fiber Matrix (BBGFM) in three diverse patients with non-healing wounds, highlighting the skin substitute's role in potentially promoting proper wound bed preparation, formation and eventual wound closure.

Methods: Three patients with complex wounds were treated with BBGFM following periods of stalled healing. Clinical context, wound characteristics, and comorbidities were recorded. Wound progression was monitored through serial measurements and photographic documentation. The BBGFM was applied per manufacturer guidelines until closure or evidence of meaningful progression was observed.

Results: Case 1 involved a 93-year-old with a traumatic lower extremity laceration from a cardboard box. Treatment with the BBGFM began on 2/21/2025, and complete wound closure was achieved by 4/25/2025, representing a healing time of 9 weeks. Case 2 featured a 64-year-old with a right foot abscess complicated by alcohol-related systemic illness including portal hypertension, acute renal failure, and ascites. After multiple procedural interventions during a prolonged hospitalization and systemic support, the BBGFM was initiated on 5/31/2024, with complete closure achieved by 9/20/2024 (a 16-week course). Case 3 was a 52-year-old with a non-healing post-arthroplasty wound following a motor vehicle collision (MVC). After months of minimal improvement, the BBGFM was initiated on 11/1/2024. By 12/13/2024, a 47.74% reduction in wound percent area reduction (PAR) was documented, with wound bed granulation and epithelialization signaling readiness for subsequent wound closure intervention (6-week period).

Discussion: This case series demonstrates the utility of the BBGFM in promoting wound healing across diverse etiologies and patient populations. Notably, two cases achieved complete wound closure within 9 and 16 weeks, respectively, while the third showed marked improvement after prolonged stagnation. These results suggest that the BBGFM may potentially provide critical support in reinitiating wound healing cascades, even in medically complex or previously non-responsive wounds.

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CS-032

Cutaneous Squamous Cell Carcinoma in Patients with Epidermolysis Bullosa: A NovelApproach to Wound Closure Using a Decellularized Bovine Pericardium Scaffold

Yevheniia Fedorets, MD; Nataliia Shchotkina, PhD; Roman Zhezhera, PhD

Introduction: Epidermolysis bullosa (EB) is a rare, genetic condition characterized by fragile skin that leads to chronic wounds and scarring. A severe form, recessive dystrophic epidermolysis bullosa (RDEB), is associated with a high risk of aggressive mucocutaneous squamous cell carcinomas (SCCs). Surgical excision is the preferred treatment for SCCs in EB patients, but wound closure remains challenging. While various methods exist, they often prolong healing and increase the risk of infection. This case series presents the successful use of decellularized bovine pericardium scaffolds for wound closure after SCC excision in three EB patients.

Methods: Three RDEB patients, aged 25-30, were included in this case series. Each had chronic wounds (12 ± 0.75 cm^2) on the anterior-medial and posterior surfaces of the leg. Punch biopsies were taken from all wounds, and histopathological analysis confirmed recurrent SCC. Additional biopsies identified resection margins. Surgical excision involved removing the SCC-affected skin, retreating more than 1 cm from the wound edge, and excising the dermis and subcutaneous tissue down to the muscle fascia. To manage the large tissue defects, a decellularized bovine pericardium scaffold was applied for primary wound closure.The scaffold was chosen for its biointegrability, gradual absorption, and ability to support tissue regeneration as a temporary extracellular matrix. A secondary dressing with foam non-adhesive bandages and silicone mesh was applied, changing every two days to minimize trauma during healing.

Results: The decellularized bovine pericardium scaffold was applied twice weekly for three months. Over 10 days, the pericardium naturally degraded, integrating into the wound bed and supporting complete epithelialization without complications. All patients achieved full wound healing without the need for staged surgical reconstruction. The scaffold created a sterile environment, reducing infection risk, enhancing patient comfort, and minimizing dressing changes.

Discussion: Various wound closure techniques for EB-related SCC excision include healing by secondary intention, skin grafting, artificial dermal substitutes, and keratinocyte suspensions. However, these methods are often limited by the fragile nature of EB skin and the extensive wound burden. Using autodermoplasty could lead to additional wounds and increased infection risk due to flap rejection. This case series highlights the decellularized bovine pericardium scaffold as a novel, cost-effective solution, offering rapid coverage and reliable healing in complex clinical scenarios

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CS-034

Multidisciplinary Management of Refractory Pediatric Wounds Suspected to be Pyoderma Gangrenosum in a Medically Underserved Patient

Rebecca Flatt, RN; Erika Rodriguez; Apryl Birdwell; Teri Pay

Introduction: A 16-year-old female with documented Scleroderma presented with circumferential bilateral lower extremity wounds suspected

to be pyoderma gangrenosum (PG). Despite extensive prior care and systemic treatments, healing was not achieved. The patient (and family) was advised to pursue amputation. Social barriers, limited specialist access, and Oklahoma state funded insurance restrictions compounded clinical challenges.

Methods: Initial exam showed extensive ulceration, bioburden, pain, and slough. A regimen of high-dose corticosteroids, topical antimicrobials, wicking silver fabric and advanced dressing layers (including superabsorbents and silicone interfaces) was initiated. Dressing plans were frequently adjusted for efficacy and cost. Care was guided by the principles of "Wound Balance," emphasizing patient-centered decision-making and early intervention to reduce chronicity risks.

Results: Wound surface area improved (LLE: from 151.6 to 125.5 cm^2; RLE: from 161.0 to 123.0 cm^2). Pain decreased significantly, enabling discontinuation of narcotics. The patient regained some mobility, resumed social activities, and expressed aspirations to pursue nursing. Barriers such as formulary restrictions and lack of pediatric dermatology/rheumatology coverage remained persistent.

Discussion: This case highlights the need for creative, responsive wound care strategies within resource-limited systems. Using a Wound Balance approach—focusing on protease modulation with the use of a novel superabsorbent dressing and silicone interface, patient quality of life, and dressing adaptability—can foster meaningful healing even without ideal systemic supports. The case underscores the value of interdisciplinary coordination and policy reform to improve pediatric wound outcomes.

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CS-035

Adjunctive Dehydrated Human Amnion Chorion Membrane Usage for Pressure Injuries in the Post-Acute Care Setting

Allyn A. Forsyth, PhD; Martha Kelso, RN, LNC, HBOT

Introduction: In 2023 323,000 Medicare beneficiaries submitted 900,000 claims for treatment of a pressure injury. Many patients are discharged before durable wound closure or have a recurrence that requires treatment in the post-acute care setting. Patients with advanced age, multiple comorbidities, plegia or polypharma are especially vulnerable. Estimating how many patients suffer long-term pressure injuries is challenged by their movement from inpatient and hospital outpatient department (HOPD) settings to various post-acute care environments. Post-acute care, which encompasses long-term hospitals, inpatient rehab facilities, home-based care, and skilled nursing facilities is an often-underappreciated aspect of a patient's journey to recovery, and when poor mobility is also an issue, mobile wound care is an increasingly desirable post-acute care option. Here we describe 2 patients whose journey to wound closure shared the above complications resulting in pressure injuries open for over a year which were finally closed with advanced treatment by mobile wound care providers.

Methods: A mobile onsite service (1) provided wound care to two patients with hard-to-heal pressure injuries in their personal homes following care in the HOPD setting. Patient treatments, wound characteristics and wound size were tracked at each visit. The stalled wounds received standard care that included debridement and compression therapy when needed. When conservative therapy failed, DHACM (2) was appropriately applied at weekly to biweekly intervals until wound closure was observed.

Results: Two elderly subjects, each with multiple comorbidities were seen weekly for pressure injuries durations over 1 year. Patients were transferred to advanced treatment by mobile wound care providers and durable closure was obtained within 4 months.

Discussion: Advanced age, low mobility, and multiple comorbidities are common in the post-acute care settings. When such patients are discharged from the hospital after recently suffering a pressure injury, they are often at a greater risk for recurrence. Here we demonstrate how closure of long term pressure injuries can be achieved with post-acute care management that integrates the use of DHACM into the post-acute care treatment algorithm.

CS-036

Peptide Biomimetic Matrix Results in Rapid Healing Progression of Complex Pressure Ulcers with Exposed Structures

Robert Frykberg, DPM, MPH; Ryan P. Dirks, MS, PA-C, CWS

Introduction: With an underreported prevalence of 2.5 million in the United States, pressure ulcers are associated with pain, infection, and high mortality rates1. The estimated costs of hospital-acquired pressure ulcers are $26.8 billion per year, with over 50% attributed to managing Stage 3 and Stage 4 injuries1. The ideal treatment provides an environment conducive to healing while preventing infection, reducing pain, and preserving peri-wound skin quality. This case series evaluates the efficacy of a novel self-assembling peptide biomimetic matrix (BMM) in pressure ulcers with exposed structures. As a flowable extracellular matrix-like scaffold with antibacterial protection, BMM was engineered to facilitate healing of complex wounds, particularly with hard-to-access areas.

Methods: Four patients with multiple serious comorbidities presenting with chronic (> 2 months) stage 4 pressure ulcers (total of five ulcers), non-responsive to previous treatments, were selected to receive a novel FDA-approved flowable BMM*, in addition to standard of care. Four out of the five ulcers (80%) presented tunnels/undermined areas. Wound measurements, pain, and peri-wound skin appearance were assessed at baseline and monitored during following visits.

Results: All ulcers responded positively to BMM treatment, showing rapid wound healing progression and wound volume reduction. A meaningful reduction in wound depth / wound size was achieved and accompanied by healthy tissue granulation formation after a single BMM application. Easy access of BMM to hard-to-reach areas was also noted and resulted in rapid and significant progress towards resolution of tunneling / undermining. Within just 2 to 4 BMM applications, most wounds achieved over 50% surface area reduction and over 65% volume reduction. A substantial improvement in exudate was also noted, along with an overall improvement in the peri-wound skin appearance and integrity. No pain, signs of infection, or other adverse events were observed.

Discussion: This case series demonstrates the potential of BMM for treating hard-to-heal pressure ulcers with exposed structures and tunneling or undermining by intimately contacting all wound areas, creating an environment that promotes tissue regrowth and revascularization, and preventing re-infection. Larger clinical trials with longer follow-up period are required to expand on these findings.

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CS-037

Novel Approach in the Repair of Recurring Achilles Tendon Rupture: A Case Report

Molly Gaffney, BS; MJessica T. Reid, MS; Laurel E. Adams, BS; Adam Shalek, DO; Abigail E. Chaffin, MD, FACS, CWSP, MAPWCA

Introduction: Achilles tendon rupture (ATR) is a common, debilitating injury, often resulting in poor outcomes due to healing via scar tissue

formation. While management remains debated, surgical repair generally yields favorable results by reducing complications and preserving function. Chronic posterior ankle wounds, especially in patients with prior surgeries and tendon injuries, pose significant reconstructive challenges due to minimal surrounding soft tissue and vascularity. Successful reconstruction requires tension-free closure, vascular preservation, and protection of critical structures. This case report describes a complex reconstruction of a recurrent Achilles region wound after Achilles tendon rupture using a bipedicled fasciocutaneous advancement flap based on lateral calcaneal artery perforating blood vessels.

Methods: A 72-year-old male presented with a nonhealing posterior left ankle wound and a complex history of multiple ATRs, skin substitute grafts, and skin grafts. The wound was fibrotic with recurrent infections managed by infectious disease. Vascular evaluation showed a normal ankle-brachial index. The patient underwent excisional sharp debridement and bipedicled fasciocutaneous advancement flap reconstruction, based on lateral calcaneal artery perforators preserved to enhance flap viability. A skin graft was applied to the donor site, and medial undermining reduced closure tension. The wound was dressed with multilayer compression and immobilized in a CAM walker boot. Postoperative care included a three-day inpatient stay, culture-directed antibiotic therapy, and outpatient wound management. Due to venous congestion and partial necrosis of the skin medial to the flap, the patient underwent a second procedure for debridement and flap readvancement with complex closure and skin graft. Compression and immobilization were reinitiated, and multidisciplinary postoperative care was continued.

Results: Following the second procedure, the patient healed well with full healing of his flap and skin grafts without further signs of infection, venous congestion, necrosis, or wound dehiscence. At follow-up, the wound demonstrated complete healing with stable soft tissue coverage and no recurrence of ATR.

Discussion: This case highlights the effectiveness of a bipedicled fasciocutaneous advancement flap in managing complex Achilles tendon wounds in patients with compromised local tissue. Success was attributed to the preservation of perforators, meticulous technique, and prompt intervention for flap complications. Flap readvancement emphasized the need for close postoperative monitoring, especially in high-risk patients. Multidisciplinary care and limb immobilization further supported recovery. Tailored, vessel-preserving reconstructive approaches offer a reliable option for managing complex posterior ankle wounds in high-risk patients and optimizing long-term outcomes.

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CS-039

Effect of bioactive glass wound matrix on non-healing diabetic foot ulcers

Marcus Gitterle, MD; Marty Johnson, MD

Introduction: It is estimated that 18.6 million people worldwide and 1.6 million in the US are affected by diabetic foot ulcers annually.[1] Synthetic materials such as bioactive glass are becoming commercially relevant as the next generation of skin substitutes. A case series consisting of eight patients with non-healing diabetic foot wounds managed with bioactive glass wound matrix therapy is presented presently.

Methods: A case series of eight patients with non-healing diabetic foot ulcers were managed with weekly applications of bioactive glass wound matrix. All patients presented with non-healing diabetic ulcerations failed to heal by standard of care therapy. Patients saw rapid progress after starting the bioactive glass wound matrix applications. After the diabetic ulceration resolved, excellent tissue remodeling was observed in all patients.

Results: All eight non-healing diabetic wounds resolved after application of the bioactive glass wound matrix. Of these resolved wounds, tissue quality was noted as excellent and formally painful wounds were reported to have resolved after just the couple applications.

Discussion: Improvement in wound healing progressing was observed in each of the eight patients. These findings are consistent with a previously published RCT comparing bioactive glass wound matrix to standard of care in a 40-patient trial on diabetic foot ulcers.[2] Patients with painful wounds have also reported a significant reduction in pain after the application of bioactive glass wound matrix.[3,4] The improvement in these patients is significant due to the complicated nature of the patients and the severity of the wounds. While the number of wounds in this case series is small, it provides sufficient real-world data to suggest bioactive glass wound matrix has can have a significant impact on non-healing diabetic foot wounds.

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CS-040

Limb Salvage in a High-Risk Dialysis Patient: Healing a Trimalleolar Fracture with Chronic Wounds Using Borate-Based Bioactive Glass Fiber Matrix After Debridement and Arthrodesis External Fixation

Craig Glauser, MD, FAAOS

Introduction: Limb salvage in patients with end-stage renal disease (ESRD), immunosuppression, and chronic wounds presents a significant clinical challenge due to impaired perfusion, delayed healing, and elevated infection risk. These factors often lead to major amputation when orthopedic trauma or multisite wounds are present. Creating an optimal wound environment after surgical debridement is critical to promote angiogenesis, tissue regeneration, and durable healing. Borate-based bioactive glass fiber matrices (BBGFM) have emerged as regenerative adjuncts that modulate inflammation, stimulate angiogenesis, and support extracellular matrix remodeling.[1–3] This case highlights BBGFM's use in a multimodal limb salvage strategy for a dialysis-dependent transplant patient with a complex ankle fracture and chronic lower extremity wounds.

Methods: A 70-year-old male with ESRD on dialysis and prior liver transplant presented with a chronic medial venous leg ulcer. In December 2024, he sustained a trimalleolar ankle fracture complicated by fracture blisters and anterior foot eschar from dressing pressure. Vascular assessment showed non-palpable posterior tibial pulses with Doppler-detected dorsalis pedis signal. On Jan 10, 2025, he underwent left ankle arthrodesis with external fixation. Adjunctive wound care included: 02/26/2025: Initial surgical debridement and BBGFM application to large defect wounds; 03/19/2025: Subsequent debridement and BBGFM reapplication; 04/14/2025: External fixator removal, debridement, BBGFM reapplication, and NPWT initiation

Wound progression was monitored through clinical observation and photographic documentation with measurements.

Results: Over a three-month treatment period and following four applications of BBGFM, all wounds demonstrated substantial percentage area reduction, progressing to full closure. The matrix adapted well to complex wound topography, supporting robust granulation and enhanced wound bed vascularity. After removal of the external fixator and initiation of BBGFM-supported NPWT, the wounds remained stable with continued epithelialization and no signs of infection. This multimodal strategy resulted in complete wound resolution and successful limb salvage without further surgical intervention.

Discussion: This case demonstrates the effective use of BBGFM as an adjunct in a successful limb salvage strategy for a high-risk patient with ESRD, transplant history, and complex lower extremity wounds. BBGFM supported granulation, vascularization, and wound healing. Its bioactive properties—including ionic dissolution and stimulation of angiogenic and immunomodulatory pathways—have been described.[1,4,5] This case underscores BBGFM's role in limb salvage protocols where chronic wound healing is impaired. Further investigation is warranted to define its efficacy in similarly high-acuity populations.

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CS-041

Transforming Chronic Wound Healing: Efficacy of Vaporous Hyperoxia Therapy in Complex Cases

Jackie Glenn, MD, FACS; Donna Sage

Introduction: Vaporous Hyperoxia Therapy (VHT) represents a promising approach for the management of chronicwounds, particularly in cases such as diabetic foot ulcers, pressure ulcers, and venous insufficiency ulcers.This innovative treatment modality combines hydrating vapor with concentrated oxygen, which is believedto enhance wound healing through several biological mechanisms. Research indicates that hyperoxia canstimulate angiogenesis and promote collagen synthesis, both of which are critical for effective tissue repairand regeneration (Abedi et al. 2024; Crowley et al. 2017; Kawada, Ohtani, and Ishii 2010). Furthermore,hyperoxia has been shown to modulate inflammatory responses, thereby potentially reducing the chronicinflammation often associated with non-healing wounds (Abedi et al. 2024; Hatfield et al. 2015).

Methods: In a case-series study involving four patients with chronic lower extremity wounds, VHT* was integrated intoa multimodal treatment protocol that included standard wound care. Patients received 2-3 VHT sessionsweekly, and their progress was monitored using advanced imaging techniques such as Near-InfraredSpectroscopy (NIRS) and thermography imaging**. Clinical outcomes, such as wound size reduction andpain alleviation, were tracked, with follow-up durations extending up to 9 weeks.

Results: The results demonstrated significant clinical improvements, with all patients showing increased tissueoxygenation after each VHT session and a clear longitudinal trend, suggesting enhanced blood flow andangiogenesis. No signs of infection were detected via thermography. In one case, a patient with wounds onboth the medial and lateral posterior legs was showing early signs of healing. Although new woundsdeveloped, the initial site demonstrated notable healing progress.

Discussion: The findings from this case-series study underscore the potential of VHT as an adjunctive therapy in chronicwound management. The therapy not only addresses immediate concerns such as wound size reductionand pain alleviation but also facilitates long-term wound management by promoting a favorable healingenvironment. The use of NIRS and thermography for monitoring therapeutic effects allows for personalizedcare adjustments, enhancing the overall effectiveness of the treatment protocol. These results advocate forthe broader integration of VHT into clinical practices, particularly for complex wounds that are resistant toconventional therapies.

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CS-042

Diabetic foot wound heals with early detection, and care, a complicated case

Catharine Gray, BSc, PGCE, MHLthSc, DCh

Introduction: Obtaining a thorough and complete patient history is a cornerstone of effective medical care. It can never be overstated by those performing care. Excellent patient-practitioner communication skills are necessary to build a framework for healing that connects all the patient's health conditions. According to Statistics Canada, Canadians are living longer with an average life expectancy of 81.6 years of age.1 Mount Sinai Hospital in Toronto, defines a geriatric patient as anyone over age 65. 2 Those who were born in the 1930's may have been exposed to diseases during a time when vaccinations were not yet developed for them. As such, consideration must be given to these early conditions when obtaining a good health history. Combining the patient's current health status with the years of life experiences allows for a complete picture, and results in a better treatment regimen. Foot experts, such as chiropodists combine all the information gathered to put together complete patient management plans. When a foot wound presents, and a patient is diabetic, assumptions may be made about the cause of the wound. The patient in this case also had polio as a child, and other conditions that added to a complex care plan to heal the wound. The patient's foot biomechanics loaded pressure onto the area of the wound.3 Without addressing the biomechanical changes from post polio syndrome, and with diabetes combined, a different outcome may have prevailed.

Methods: Listening and building trust with our patients is vital. These two elements are the keys for quick successful outcomes when dealing with a diabetic patients foot ulcer.

Results: The link between diabetes and foot wounds is factual, and well documented with evidence to support this link. However, what about the link to other diseases such as post polio syndrome (PPS) in older geriatric patients prior to vaccinations as in this patients case.More research is needed with the intersection of PPS and diabetes being causative factors to foot wounds.

Discussion: Our older geriatric patients have a rich history that when explored can lead to other causative agents to foot wounds. Clinically, foot or wound experts can be quick to jump to conclusions for treatment regimes when diabetes is prevalent. Excellent communication skills are imperative with the patient and the care team for positive outcomes. Prevention is vital by performing diabetic foot screens, standardizing with the Inlows 60 second diabetic foot screen also aids in the best care for our patients.

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CS-043
Complex Wound Management With Negative Pressure Wound Therapy and All-In-One Dressing

Emily Greenstein, APRN, CNP, CWON, FACCWS

Introduction: Negative pressure wound therapy (NPWT) is widely utilized in wound management.[1-3] However, challenges exist with its use such as maintaining a seal in difficult anatomical locations, controlling exudate, periwound skin management, and pain upon dressing removal. A new, all-in-one, multilayer peel and place dressing (MPPD)* for NPWT has been developed that contains a foam dressing and a hybrid acrylic-silicone drape. Use of this new dressing was assessed in 3 cases with complex wounds.

Methods: Patients and wounds were assessed. The MPPD was applied to the wound followed by NPWT† initiation. Dressings changes occurred every 7 days. One patient required dressing changes every 3-4 days due to skin maceration and patient non-compliance with offloading. Wounds and periwound skin were reassessed at each dressing change.

Results: Three patients (age range 56-63) presented for care with a diabetic foot ulcer, a stage 3 pressure injury, and surgical wounds. Previous medical histories included diabetes, transmetatarsal amputation, hypertension, peripheral vascular disease, and Charcot foot. Dressing applications were easy and quick with each dressing application taking 2 minutes or less. Dressing removal was painless for all 3 patients. The negative pressure seal remained intact throughout the duration of therapy in all patients. Periwound skin remained healthy without any complications. The small diabetic foot ulcer was fully healed after 7 days of NPWT use. Wound size reduction and development of healthy granulation tissue were observed in the other 2 patients with larger, more complex wounds.

Discussion: Use of the new MPPD for NPWT helped reduce common challenges with dressing application, dressing removal, and periwound skin management and improved wound healing outcomes in these 3 patients.

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CS-044
Improving Skin Quality Through the Use of a Multilayer Compression System in Patients With Chronic Venous Insufficiency

Emily Greenstein, APRN, CNP, CWON, FACCWS

Introduction: Patients with long-standing venous insufficiency will often develop pathological changes to the skin due to chronic inflammation. Changes such as atrophie blanche, blanche plaques, epidermal lichenification, hemosiderin staining, lipodermatosclerosis, and venous eczema1. These changes can be painful to the patient and lead to ulceration.

Methods: The application of a novel multilayer venous compression wrap designed to reduce bandage slippage utilizing pressure indicators and a novel knitted base layer to improve patient outcomes. The compression wrap will be used on multiple patients with a history of skin changes as a result of chronic venous insufficiency. 10 patients were selected to receive treatment with a novel multilayer compression bandage. All patients had previously been treated with another form of compression.

Results: The use of a novel multilayer venous compression was able to improve skin quality in patients with chronic venous insufficiency. Each patient reported the dressings had stayed well, was comfortable to wear, and improved lower leg skin quality.

Discussion: The usage of a multilayer venous compression system may improve patient compliance, skin quality, and prevent the development of chronic venous ulcerations.

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CS-045
Management of Lower Extremity Wounds with Super-Absorbent Dressings and Compression Wraps

Emily Greenstein, APRN, CNP, CWON, FACCWS

Introduction: Up to 3/1000 people are estimated to have leg ulcers with prevalence increasing to 20/1000 for people >80 years old[1] These lower extremity wounds are often chronic, highly exudative, and associated with venous insufficiency. Management of these wounds involves advanced wound dressings designed to absorb large amounts of wound exudate and compression therapy. The use of advanced wound dressings, super-absorbent secondary dressings, and two-layer compression in 7 patients with lower extremity wounds is presented.

Methods: Wounds were assessed and managed with advanced wound dressings (oxidized regenerated cellulose [ORC]/collagen/silver-ORC* or

hydrofiber with silver dressings†) along with super-absorbent dressings‡ and two-layer compression wrap§. Dressing changes occurred 1-2 per week, depending on the level of exudate present. One patient received an advanced elastomeric skin protectant** prior to dressing and compression application.

Results: Seven patients presented for care (age range 41-88 years). Wound types included skin breakdown secondary to skin blistering from lymphedema (n=1), fluid overload ulcer (n=1), venous leg ulcers (VLUs, n=3), vasculitis (n=1), and traumatic ulcer (n=1). Previous medical history included VLU, lymphedema, obesity, diabetes, vascular insufficiency, and endovenous ablation. In all 4 patients, increased granulation tissue development along with reduction of wound area and exudate volume was observed after treatment for 14-28 days. Complete wound healing was noted in 4 patients within 46 days of presentation. Granulation tissue development and decreased slough were observed in the wound bed of the remaining patients. Hydrofiber with silver dressing and super-absorbent dressing use was continued.

Discussion: Use of advanced wound dressings, super-absorbent dressing, and two-layer compression wrap resulted in complete wound healing in 4 patients. This wound management plan contributed to increased granulation tissue development and reduced slough observed in the remaining patients.

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CS-046

Healing Without Disparity: Cellular and/or Tissue Products (CTPs) as the Great Equalizer in Diabetic Wound Care

Daniel Hallman, DPM, CWS, MS; Amena Babers, FNP-C; Lacey Bauer, MS; Jacqueline H. Brown, FNP-C; Melissa Cavazos, FNP-C, CWS; Ida Centineo, FNP-C, CWS; Robert Frykberg, DPM, MPH; Mary M. Kruse, RN, MAOL, CWOCN, CWS; Ashley Meusa, DPM; Judi Miller, FANP-C, APWH; Bill J. Releford, DPM; Hugh L. Richardson, DPM; Tanyikka Tinnon, MAOM; Kathryn Vatt, MS

Introduction: Chronic wounds, especially diabetic foot ulcers and pressure injuries, are often slow to heal under standard of care (SOC). Cellular tissue products (CTPs) are recommended if wounds do not reduce ≥50% by week 4. This study evaluated real-world healing outcomes with and without CTPs, and compared results across diabetic and non-diabetic populations.

Methods: Medical records of 138 patients within a mobile wound care company were retrospectively reviewed. Patients' wounds were categorized as SOC-only, SOC-to-CTP (delayed use), or CTP-only (early application). The wounds were further stratified by diabetic status (46 diabetic, 92 non-diabetic). Healing rates at 4, 8, and 12 weeks were analyzed along with time to closure and number of CTP applications. Kaplan-Meier curves visualized cumulative healing.

Results: By week 12, wounds treated with CTPs achieved 85.5% mean area reduction vs. 41.0% for SOC alone ($p < 0.001$). There is a clear advantage with initiating CTPs versus SOC alone as noted by the 44.5% mean area reduction of wound size in the same time frame. Median time to closure was 13.5 weeks (CTP-only) vs. 18 weeks (SOC-to-CTP). Once CTPs were initiated, 79% of wounds healed within 12 weeks. Healing rates between diabetics and non-diabetics were statistically equivalent at 8 and 12 weeks ($p > 0.3$). CTPs neutralized traditional disparities in healing trajectory related to diabetes. Only 7% of wounds healed with SOC alone by 16 weeks.

Discussion: Early biologic intervention significantly accelerated healing and closed the outcome gap between diabetic and non-diabetic patients. These results reinforce the clinical value of escalating to CTPs when wounds stagnate under SOC and support their broader use in chronic wounds regardless of comorbidity.

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CS-047

Healing complex surgical wounds with Icelandic Cod Fish Skin Grafts

Mary E. Hanley DO, MBA, FUHM, CWSP, FAPWCA, DO, MBA, CWSP, FUHM, FAPWCA

Introduction: Complex surgical wounds pose a significant challenge due to infection risk, poor vascularity, and delayed healing.'

Traditional grafts (autografts, allowgrafts) have limitations: donor site morbiditiy, availabilty and immune response

Acellular fish skin grafts (Kerecis (TM)) derived from North Atlantic cod (Gadus morhua), offer a unique extracellular matrix rich in Omega-3 fatty acids, as well as cellular porosity identical to human fibroblast size.

Methods: Study design: Prospective case seriesPopulation: patients with nonhealing or complex post surgical wounds.Intervention: weekly or biweekly application of Kerecis (TM) fish skin grafts. Endpoints: Time to healingPain scores (VAS)Wound size reductionInfection rates

Results: Kerecis (TM) fish skin grafts retain native collagen, elastin, glycosaminoglycans and Omega-3 Fatty acids. Fibroblasts can easily migrate into the fish skin promoting durable and timely healing. They promote neovascularization and reduce inflammation. Patients healed in under 12 weeks and had less pain.

Discussion: Fish skin grafts offer a promising alternative in management of complex surgical wounds. They accelerate healing, reduce pain and lower infection risk. This is most benefiticial in high risk patients.

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CS-049

Patient-Centered VLU Management: High Exudate Treatment with Superabsorbent Polymer Dressing and Two-Layer Compression to Self-Managed Therapy with Superabsorbent Polymer Silicone Border Dressing and Adjustable Compression

Sarah Hull, FNP, WCC, DWC; Erin Buchness, MHL, RN, CHWS; Zachary Naeger, RN, BSN, CWCN

Introduction: Venous leg ulcers (VLUs) are chronic wounds linked to venous hypertension, often producing highexudate and delayed healing. Effective care requires both moisture management and sustainedcompression. While systems like a two-layer compression system offer reliable compression they can becomplex and clinic-dependent. An adjustable compression system enhances ease of use and patientautonomy. This case series highlights a phased approach using a superabsorbent polymer dress-

ing andsuperabsorbent polymer dressing with a silicone border alongside a two-layer compression system andthen an adjustable compression system.

Methods: Patients with moderate-to-high exudating VLUs began treatment with superabsorbent polymer dressing,under a two-layer compression system. Dressings were changed on average every 3-7 days. Once exudatedecreased, patients transitioned to superabsorbent polymer dressing with silicone border with anadjustable compression system, an inelastic wrap with pressure indicators to support self-managedcompression. Education on use and daily pressure checks was provided.

Results: During their treatment course most patients showed significant exudate reduction and improvedperiwound skin, allowing extended dressing intervals. Ulcer area reduction, and increased granulationtissue where also assessed. Patients found the silicone border dressing more comfortable, especially infragile skin areas. Patients were able to self-manage or involve caregivers in applying an adjustablecompression system, reducing reliance on clinic or home visits. No cases of maceration or slippageoccurred. The longer wear time and improved independence led to greater adherence and potential costsavings.

Discussion: This staged therapeutic approach using a superabsorbent polymer dressing under a two-layer compressionand transitioning to a superabsorbent polymer dressing with a silicone border and an adjustablecompression system, provides a flexible treatment model for managing VLUs. It combines effectiveexudate management with flexible compression options that supports both patient empowerment andclinical outcomes.

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CS-050

Evaluating Early Efficacy of a Borate-Based Bioactive Glass Fiber Matrix in Chronic Full Thickness Pressure Injuries: First-Week Percentage Area Reduction (PAR) and Closure in a Case Series

Kayla Ingram-Smith, APRN, AGACNP-BC, WCS-C, EDS-C

Introduction: Chronic full-thickness pressure injuries are characterized by persistent inflammation, impaired angiogenesis, and disrupted extracellular matrix remodeling, all of which contribute to delayed wound healing.[1] These recalcitrant wounds often fail to respond to standard interventions, including advanced cellular and tissue-based products (CTPs).[2] Bioactive glass fiber matrices release therapeutic ions—boron, sodium, potassium, magnesium, calcium, and phosphate—that are known to support cellular proliferation, stimulate neovascularization, and demonstrate antimicrobial properties.[3-5] This case series presents early clinical outcomes, including first-week percentage area reduction (PAR), in patients with chronic non-healing wounds treated with a bioactive glass fiber matrix following failure of conventional therapies

Methods: Three patients (mean age: 70 years) with chronic wounds of ≥12 months' duration were treated. Wound etiologies included, one Stage 3 pressure injury, and two Stage 4 pressure injuries, All wounds had previously failed to close with standard wound care and other CTP applications. Following sharp debridement and standard wound bed preparation, borate-based bioactive glass fiber matrix was applied per manufacturer's guidelines and covered with appropriate secondary dressings. Wounds were assessed and treated weekly. The primary endpoint was the significant first-week percentage area reduction (PAR). Secondary endpoints included complete epithelialization and full wound closure, progressive surface area reduction over time, and monitoring for adverse events.

Results: All three wounds exhibited rapid and progressive closure following initiation of Bioactive Glass Fiber Matrix therapy. - The Stage 4 Pressure Injury of the 2nd toe, persisted for a couple of months, achieved full closure within 28 days and demonstrated a first-week PAR of 72%. - The Stage 3 Pressure Injury of the Right Hip, unresponsive to prior CTPs, healed within four months with a first-week PAR of 71%. - The Stage 4 Pressure Injury to the Sacrum, previously complicated by infection, achieved full closure in four months, with a first-week PAR of 84%. No adverse reactions or infections were observed during treatment. Accelerated (PAR) and healing may be attributed to the release of natural elements from the borate-based bioactive glass fiber matrix which supports angiogenesis, fibroblast proliferation, and the creation of a antimicrobial microenvironment.[3-5]

Discussion: Borate-Based Bioactive Glass Fiber Matrix demonstrated early and sustained healing efficacy in chronic recalcitrant wounds. Significant first-week PAR and full closure support its potential role as an adjunctive therapy in managing complex, non-healing wounds. Further prospective, controlled studies are warranted to validate these findings and optimize application protocols.

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CS-051

Case-Based Outcomes Using Boron-Based Bioactive Glass Fiber Matrix Skin Substitutes for Recalcitrant Wounds Following Trauma and Amputation

Fadi Isa, DPM; Syeda Mariam Qadri, DPM; Mehreen Rahim, DPM

Introduction: Chronic and post-surgical wounds, particularly in patients with comorbidities or a history of surgical complications, have the potential to stall, making healing difficult.[1] Bioengineered skin substitutes have emerged as promising adjuncts in wound care.[2,3] This case series describes the clinical course of three patients with complex lower extremity wounds treated using sequential applications of a Boron-Based Bioactive Glass Fiber Matrix (BBGFM) alongside standard wound care modalities.

Methods: Three patients with lower extremity wounds were followed over varying treatment timelines.Case-1: A 45-year-old female presented with a dehisced surgical wound following hardware removal from an ORIF of the left ankle. Early infection with Pseudomonas and Staph aureus stalled healing. Debridement, infection control, and staged grafting with a human placental tissue and a collagen based dermal layer were used prior to transitioning to serial BBGFM applications. Case-2: A 60-year-old male post-transmetatarsal amputation (TMA) with a non-healing wound with eschar and sloughing received BBGFM applications after initial management with a topical antiseptic and wound cleanser.Case-3: A 62-year-old male with a chronic necrotic wound post-midfoot amputation with a stalled wound after five xenograft skin substitute applications and use of collagen alginate wound dressings. Treatment protocols included surgical debridement, infection control,

absorbent and antimicrobial dressings, and application of various skin substitutes. Wound size, appearance, exudate characteristics, and healing percentage were recorded across the three cases.

Results: Case-1 progressed from 18cm³ with a negative healing trajectory to full closure over 8.5 months. Case-2 progressed a nonviable wound bed with negative healing trajectory to 100% closure in 12-weeks after seven BBGFM applications. Case-3 had nearly a year-long stalled wound, which began to contract and granulate following ten applications of BBGFM over 21-weeks, progressing from a peak wound volume of 4.9cm³ to complete epithelialization.

Discussion: Sequential applications of the BBGFM skin substitute played a pivotal role in accelerating healing in previously stalled wounds. In all three cases, graft use was associated with robust granulation, epithelialization, and volume reduction. These findings support the integration of bioengineered grafts as part of a multimodal wound care strategy for patients with complex or refractory wounds, particularly when combined with antimicrobial control and advanced dressings.

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CS-052

Successful treatment of nonuremic calciphylaxis with complex wound care and surgical debridement and excision

Maggie C. Jackson; Laura Vick, MD, FACS, CWSP

Introduction: Calciphylaxis is a disease characterized by calcification of arterioles within the dermis and subcutaneous fat, leading to subsequent tissue ischemia and necrosis. Calciphylaxis can be categorized as either uremic, due to its association with end-stage renal disease (ESRD), or nonuremic. Nonuremic calciphylaxis accounts for a small portion of calciphylaxis diagnoses; however, both uremic and nonuremic calciphylaxis are rare. Other risk factors associated with calciphylaxis include female sex, obesity, diabetes mellitus, liver disease, autoimmune conditions, and hypercoagulable states.[1] Currently, there is no standard approach to the treatment of calciphylaxis, but options include chemical and surgical debridement, sodium thiosulfate, bisphosphonates, and hyperbaric oxygen therapy. In this case report, we document a case of nonuremic calciphylaxis successfully treated with complex wound care, sodium thiosulfate, and surgical methods.

Methods: For this research project, we analyzed the case of a 62-year-old female who presented with new painful wounds on her bilateral lower abdomen. On admission, there was a high suspicion for calciphylaxis due to the location of the wounds and presence of several risk factors, including obesity, type II diabetes mellitus, and long-term use of prednisone for sarcoidosis. This diagnosis was later confirmed through tissue biopsy. Over the course of multiple hospitalizations in the following months, we utilized a variety of complex wound care methods, sodium thiosulfate, and operative treatments, including debridement with vacuum-assisted closure (VAC), excisional biopsies, and a partial panniculectomy with primary closure.

Results: As a result of these methods, the patient experienced relief of symptoms without the return of lesions. The improvement of her wounds is documented through consistent photographs taken on rounds and at wound care surgery clinic follow-up appointments.

Discussion: This case report highlights the utility of complex wound care and surgical methods in treating calciphylaxis. Data on the treatment of nonuremic calciphylaxis is limited; however, some literature indicates early surgical debridement is associated with improved mortality compared to patients who do not receive surgical debridement [2,3]. This case report contributes to the discussion of treatment options for calciphylaxis and emphasizes the importance of a multimodal approach to therapy.

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CS-053

Use of Borate-Based Bioactive Glass Fiber Matrix for a Chronic Non-Healing Dorsal Foot Ulcer with Exposed Tendon and Hardware: A Case Report

Brendan Johnson, DPM

Introduction: Chronic non-healing wounds, particularly those with exposed tendon or hardware, present a formidable clinical challenge. Surgical site dehiscence following joint fusion, especially in elderly patients, often results in prolonged wound care and risk of infection or hardware failure. Bioactive materials, such as borate-based bioactive glass, have shown promise in promoting angiogenesis and tissue regeneration.[1-3] We report a case of a 69-year-old female smoker with a chronic dorsal foot ulcer overlying a first metatarsophalangeal (MTP) joint fusion site that occurred after a fall, complicated by exposed tendon/hardware and removal, that demonstrated significant healing following application of borate-based bioactive glass fiber matrix (BBGFM).

Methods: The patient initially presented for a first metatarsal joint fusion on 9/20/2024. The surgical site dehisced following a fall which was later complicated by exposed tendon and hardware necessitating removal on 1/31/2025. Prior therapies included a synthetic bovine matrix, amniotic membrane, and wound vacuum assisted closure (VAC), with minimal sustained improvement complicated by poor compliance. The wound measured 9.0cm3 following surgical site dehiscence. On 02/12/2025, BBGFM was introduced following the hardware removal. The wound was evaluated at regular intervals through 4/14/2025, and wound area was recorded to assess healing progression.

Results: The wound area reduced to 0.75 cm3 from 9 cm3 and remained stable through early January. Intermittent setbacks occurred in March 2025 from a required hardware removal, but final wound size stabilized at 1.0 cm3 by 4/14/2025. Application of the BBGFM led to rapid granulation tissue formation, despite the presence of exposed tendon and hardware. The Percent Area Reduction (PAR) achieved from baseline to final measurement was 88.89% over the 18-week treatment period with three applications of the BBGFM over the course of 9-weeks.

Discussion: This case highlights the potential of BBGFM in managing complex post-surgical wounds with exposed deep structures. The bioactive properties may have contributed to both angiogenesis and fibroblast activation, facilitating tissue regeneration. While intermittent setbacks occurred, overall healing was substantial, supporting further use of BBGFM as an adjunctive treatment in wound care. This synthetic fiber may be especially useful in elderly patients where wound healing is compromised, and when exposed bone or hardware precludes the use of traditional dressings.

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CS-054

Borate-Based Wound Matrix Overcomes Medication-Induced Healing Impairment in Polycythemia Vera

Martin Johnson, MD

Introduction: Polycythemia vera (PV) is a myeloproliferative neoplasm requiring lifelong pharmacologic management, with hydroxyurea remaining a first-line cytoreductive therapy. However, 10–15% of patients develop hydroxyurea-associated cutaneous toxicity, including painful, non-healing ulcers that often resist conventional wound care.[1,2] These ulcers are particularly challenging in older PV patients, who frequently have comorbidities requiring multiple concurrent medications that further impair tissue repair. The resulting polypharmacy creates a multifactorial healing barrier, combining hydroxyurea's direct cytotoxic effects with systemic drug-induced suppression of inflammation, angiogenesis, and collagen synthesis. Hydroxyurea therapy for polycythemia vera can lead to severe cutaneous ulcers that often prove refractory to conventional treatments. We present a case where a borate-based glass fiber matrix (BBGFM) successfully overcame this barrier in three hydroxyurea cluster wounds on the right medial ankle in a 71-year-old male.

Methods: Weekly applications were performed under sterile conditions. After successful debridement the BBGFM was placed in the wound followed by a self-adaptive gauze and wrap. Wound dimensions (L×W×D), wound bed appearance, and quantity/type of exudate were carefully monitored throughout the treatment course.

Results: All three wounds demonstrated progressive reduction in size over the course of the treatment, culminating in near complete resolution by the final measurement. Wound-1 exhibited an initial increase from 1.80cm³ in Week-1 to a peak of 2.24cm³ in Week-2, followed by a consistent decline to 0cm³ by Week-6. Wound-2 followed a similar trajectory, increasing from 0.14cm³ to 1.60cm³ by Week-2, before steadily decreasing to 0cm³ by Week-5. Wound-3 showed the slowest resolution, beginning at 0.22cm³ and plateauing between Weeks-2 and 3 at 0.98cm³. It subsequently decreased more gradually, reaching near closure by the final time point.

Discussion: BBGFM achieved wound closure in seven weeks despite the patient's extensive medication burden. This suggests BBGFM's bioactive properties may overcome pharmacological barriers to healing. The bioactive properties of boron likely contributed to enhanced angiogenesis and tissue regeneration, while the matrix structure may provide optimal wound support.3 This inferred dual action, providing structural support while enhancing tissue regeneration, makes it a compelling option for hydroxyurea-resistant ulcers. The rapid healing trajectory observed underscores the potential of BBGFM as an advanced wound care modality for recalcitrant ulcers.

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CS-055

Efficacy of Broad-Focused Extracorporeal Shockwave Therapy for Wound Healing and Closure in Diabetic Foot Ulcers: A Case Study of 10 Patients

Richard Kaufman, DPM

Introduction: Diabetic foot ulcers (DFUs) remain a significant challenge in diabetes management, often progressing to chronic wounds with high amputation risk. Broad-focused extracorporeal shockwave therapy (ESWT), which delivers targeted yet wider-area shockwaves, has emerged as a potential non-invasive treatment to enhance wound healing. This case study assesses the efficacy of broad-focused ESWT in 10 patients with chronic DFUs treated between March 2024 and March 2025. Patients, aged 40–76 years, presented with Wagner grade 1–3 ulcers persisting for 10–24 weeks despite standard care. Each received 6–10 sessions of broad-focused ESWT (0.15–0.25 mJ/mm² energy flux density) over 8–12 weeks alongside conventional therapy. Outcomes included wound closure rates, healing time, and ulcer size reduction. Complete wound closure was achieved in 9 of 10 patients (90%) within 12 weeks, with a mean healing time of 9.6 weeks. The remaining patient showed a 90% reduction in ulcer area. Pain scores (VAS) dropped by 60%, and no adverse events were reported. These results suggest broad-focused ESWT promotes rapid wound healing and closure in DFUs, offering a promising modality for limb salvage. Despite the small sample, this case series supports further exploration of broad-focused ESWT in larger trials.

CS-056

The use of Copper-Iodine Complex Solution for Surgical irrigation during Breast Reconstructive Surgery: a Safety Study in 20 Patients with Bilateral Reconstructive Surgeries

Steven Kavros, DPM, FACCWS, MAPWCA

Introduction: Breast reconstructive surgery encompasses treatment of patients dealing with cancer and cosmetic goals, with reported infection risk of 2 – 2.5%. In an effort to reduce the risk of breast implant infection and capsular contractures, a variety of solutions to irrigate the implant and breast pocket have been championed. Copper-Iodine Complex Solution (CICS) is an FDA cleared medical device. CICS has demonstrated its capability to kill a broad number of pathogens such as bacteria, fungi, yeast, and viruses without evoking microorganism resistance. The CICS has been proven to be safe, non-cytotoxic, non-pyrogenic, and non-sensitizing to dermal tissue. The purpose of this study is to demonstrate safety of CICS in a 20 patient (40 breast) cohort.

Methods: There were 20 patients (40 breasts) in this study. Patients were consent included risk of infection, local and systemic allergic reactions, and capsular contraction. An incision was made in the infra mammary fold or around the nipple areola complex. The entire dissection was done with electrocautery in a sub muscular plane. The developed pocket was irrigated with CICS, and the implant was immersed in CICS prior to the placement in the pocket. The study was conducted from February 2022 through August 2022. Patients were followed for 6 months then on a yearly basis.

Results: Patients were typically seen 3 days, one week, one month, 6 months, and 1 year postoperatively. Local and systemic reactions were monitored included irritation of the skin incision, allergic reactions, blistering, burning, skin rash, redness, and swelling. Additionally, patients were evaluated for hematoma and seroma formation in the shorter timeframe and then capsular contraction longer term. There were reported no adverse reactions, A more detailed table describing patient demographics, PMH, technique, and results will be provided.

Discussion: Copper-Iodine Complex Solution is a novel, disruptive surgical and wound irrigant that was used in breast reconstruction surgery in 20 patients. There were no adverse reactions in the 20-patient study. CICS has a broad spectrum of antimicrobial killing of bacteria, fungi, yeast, and viruses. Furthermore, it is the only surgical/wound irrigation solution that has antimicrobial persistence for 72-hours. Additionally, CICS is non-cytotoxic and has an excellent safety profile. Further studies concentrating on antimicrobial science and wound healing parameters are forthcoming and warranted.

CS-057

The use of Biodegradable Bilayer Synthetic Matrix (BBSM) in treatment of pressor injuries

Paul Kim, DPM, MS; Tara L. Robertson, RN, MBA

Introduction: Pressor-induced necrosis can occur when high doses of vasopressors are used to raise blood pressure by vasoconstriction, causing tissue damage due to reduced blood flow in extremities, especially in the smaller vessels in the fingers and toes. The morbidity associated with vasopressor use is high, with 30-day amputation rates reportedly ranging from 10% to 30% and mortality rates near 15%.[1,2]

Methods: This patient experienced digital necrosis to all ten toes, as well as necrosis to plantar aspect of their feet, necessitating full or partial toe amputations to all their toes, as well as debridement of necrotic tissue of the plantar aspect of their feet. Biodegradable bilayer synthetic matrix (BBSM) was used on plantar aspect of their right foot and on the toes that were not able to be closed primarily.

Results: By three weeks post application, there was full integration of the BBSM and by nine weeks post application, the injuries had nearly healed and the foot had a smooth contour, retaining high functionality in both the patient's feet with the use of orthotics. This patient was able to heal by secondary intention and did not require a skin graft, saving additional exposure to anesthesia and donor site morbidity.

Discussion: The use of BBSM is of great value in patients with vascular deficiencies, such as this patient who experienced ischemia following the use of high dose pressors. These patients tend to have a slower healing process, and BBSM can be left in place longer than a biologic dermal matrix and is more robust in the presence of infection. The ability to leave BBSM in place longer than a biologic dermal matrix also allows the patient's medical needs to be prioritized over other advanced wound care, such as skin grafting. The BBSM requires only simple dressings and regular monitoring, making it a low maintenance option ideal for use in complex patients.

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CS-058

IRB-approved, retrospective, observational study assessing the effectiveness of a nylon, hook-array fabric device for diagnostic tangential shave biopsy.

Traci A. Kimball MD; Mervin Low, MD; Neal Lonky

Introduction: Tangential shave biopsy has a clinical utility in dermatopathology. By shaving skin lesions, a clinician can obtain a surgical tissue specimen, albeit accepting it will obtain the depth from surface to the base; however, sacrifice analyzing intact epidermal/dermal architecture. Skin ulcerations are commonly laden with necrotic tissue and slough. Visualization of potential pathology on the base requires removal of surface necrosis to properly shave and collect tangential biopsies for histopathology or for organism identification via culture or molecular means (Schultz). There are some pathologies where punch biopsy is preferred for needed architecture and tangential biopsy is deferred.

Methods: This study was reviewed and noted to be IRB review exempt. This was a retrospective observational study of nurses and physicians who were licensed to perform chronic wound and skin surgical biopsies. They used a novel hooked micro-curette biopsy brush that excavates and traps biopsy samples for lab transport (SoftBiopsy, Histologics LLC, Anaheim, CA). The clinicians had available the instructions for use and decided sites to biopsy. The investigators reviewed the reports and confirmed them as "diagnostic tissue" if epithelial, dermal, subcutaneous tissue, muscle, or bone was identified and a histopathologic diagnosis was rendered. We sought to evaluate the diagnostic capability of brush tangential biopsy in chronic wounds.

Results: We reviewed a series of redacted HIPAA compliant pathology reports from the two histopathology labs that received tangential biopsies carried by the hooked nylon fabric biopsy brush. Thirteen cases using the hooked brush for tangential biopsies were identified. One case had tissue in gross inspection on the brush but lost in processing and one case had ulcerated tissue with keratin. Four cases were devoid of viable tissue and showed exudate or fibrinopurulent material only. Seven cases met diagnostic criteria containing epithelial, dermal, subcutaneous tissue, muscle, or bone.

Discussion: To date over one million consistently diagnostic cases with hooked-brush biopsy of mucosal cervix tissue with similar methodology utilizing the devices under study have been documented and proven in a randomized clinical trial (Winter). Although capable of obtaining tangential shave biopsies for diagnosis in 7 of 13 cases, the remainder with a histopathologyreview appear to have been compromised by necrosis and slough captured instead. As per the instructions provided to clinicians (IFU), removal of non-viable substances, necrotic tissue, and slough to visualize the targeted tissue in the wound base is helpful to obtain diagnostic wound base biopsies. This may have been the cause of non-diagnostic cases.

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CS-059

Effective Use of Negative Pressure Wound Therapy with an All-in-One Peel and Place Dressing to Manage Lower Leg Wounds

Robert Klein, DPM, FACFAS, CWS

Introduction: Negative pressure wound therapy (NPWT) typically requires dressing changes every 2 to 3 days. A novel dressing has been developed that incorporates a fenestrated, non-adherent layer and negative pressure drape into the dressing design allowing for up to seven days of wear. Use of this peel and place dressing* in twelve patients with lower leg wounds is presented.

Methods: Systemic antibiotics were given as necessary. Patients underwent sharp debridement prior to application of the all-in-one dressing. Dressing changes occurred every 4 to 7 days. Upon dressing removal, all wounds were cleansed using a hypochlorous solution that was allowed to soak for 5 minutes, and gently patted dry.

Results: Twelve patients (average age 60.9 ± 15.7 years) presented for care. Wound types included surgical wounds (n=5), diabetic foot ulcers (n=4), surgical dehiscence (n=2), and diabetic foot infection (n=1). Patient comorbidities included diabetes, hypertension, obesity, and neuropathy. Prior treatment included traditional NPWT, advanced wound dressings, or petrolatum impregnated gauze. Wounds were present from 11 to 243 days. Dressing applications were simple, taking approximately two minutes to complete. None of the patients reported any pain at dressing application or dressing change. Granulation tissue development and wound size reduction was noted in all patients. Mild periwound maceration was observed in 3 patients due to patient non-compliance.

Discussion: Use of NPWT with the novel all-in-one dressing for wound management resulted in increased granulation tissue development and wound size reduction in all patients. The dressing design simplified dressing application, allowing for less time needed for dressing changes. Patients did not report any pain during dressing application or removal.

CS-061

Advancing Wound Reconstruction: Single-Stage Repair using Human Reticular Acellular Dermal Matrix (ADM)

Taylor Kreul, BS; Ritu Bhalerao, BS; Danielle Wenger, MD; Jimmy Chim, MD

Introduction: Biologic grafts, such as human reticular acellular dermal matrices (ADMs) and placental membrane allografts, have become essential tools in reconstructive plastic surgery, providing structural support and enhancing tissue integration in challenging wound environments. ADMs, in particular, promote the proliferative phase of wound healing,

making them valuable for reconstructing chronic wounds, extensive burns, and oncologic resection defects. This case series examines the clinical utility and diverse application of two ADMs* in single-stage wound reconstruction across various anatomical sites. By analyzing patient wound profiles and outcomes, this study aims to contribute to the growing evidence on the effectiveness of ADMs in complex wound management.

Methods: This retrospective case series includes five adult patients with complex wounds who underwent single-stage wound reconstruction with ADM between March 2024 and January 2025. Data on demographics, wound characteristics, treatment strategies, and outcomes were collected from medical records. Key variables included wound location, size, and classification. Primary outcomes analyzed were time to closure, complications, and need for unplanned reoperation. Descriptive statistics were used for data analysis.

Results: All patients (n = 5) sustained wounds due to motor vehicle accidents, with injuries located on the ankle, foot, forehead, and scalp. The average wound size was 37 cm2 (range = 30 cm^2 - 49 cm^2). Wound classifications included one class 2 (clean-contaminated), one class 3 (contaminated), and one class 4 (dirty and infected). The average time to closure was 2.5 months. None of the patients experienced postoperative complications or required an unplanned visit to the operating room for reoperation. Based on the study's one-year follow up data, all patients achieved satisfactory wound closure, even over previously exposed bone.

Discussion: This case series highlights the versatility and effectiveness of ADMs in reconstructive plastic surgery. ADMs provide a reliable tool to optimize wound management, particularly in patients with multiple comorbidities or in multisystem trauma patients where advanced flaps and reconstructions may not be an option. Despite challenges such as cost, ongoing advancements in ADM technology and growing clinical evidence are likely to enhance their role in wound reconstruction. Future research should focus on long-term outcomes, cost-effectiveness, and next-generation biologic matrices to further optimize reconstructive strategies.

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CS-062

Transforming Chronic Wound Healing Outcomes with Vaporous Hyperoxia Therapy (VHT): A Two-Wound Case Series

Dustin Kruse, DPM, MA, FACFAS

Introduction: Chronic wounds in diabetic patients present significant challenges, often leading to complications such as amputations. Vaporous Hyperoxia Therapy (VHT)*, an FDA-cleared, low-frequency ultrasonic mist therapy, combines hydration with concentrated oxygen to enhance wound healing. To evaluate VHT's efficacy in resolving chronic wounds in a high-risk diabetic patient through two distinct wound cases treated in 2019 and 2024.

Methods: A 51-year-old Caucasian female with type 1 diabetes (HbA1c 7.8, historically well-controlled) and a history of anemia presented with chronic wounds resistant to standard treatments. In 2019, she had a Wagner Grade 2 diabetic foot ulcer (DFU) on a forefoot stump. In 2024, the same patient developed a new DFU on the right foot, which worsened under initial treatment with collagen, Medi honey, and topical antibiotics. Healing progress was monitored using advanced imaging techniques such as Near-Infrared Spectroscopy (NIRS) and thermography imaging.

Results: Wound #1 (2019): At VHT initiation, the wound measured 1.4 x 1.6 x 0.3 cm with an area of 2.24 cm^2 and volume of 0.672 cm^3. After 4 weeks, the wound achieved a 45.98% reduction in area and a 64.88% reduction in volume. By 8 weeks, the wound showed a 64.29% reduction in area and a 76.19% reduction in volume, ultimately achieving 100% resolution after 46 treatments over 28 weeks.Wound #2 (2024): Initially measured 1.2 x 1.9 x 0.5 cm with bioburden and pale granulation tissue. After 4 weeks of VHT, the wound achieved a 56.6% reduction in area and a 74.0% reduction in volume. At 7 weeks, the wound showed an 89.5% reduction in volume, measuring 0.6 x 1.0 x 0.2 cm, and is on track to fully resolve with continued treatment. At baseline (day zero), a temperature gradient was observed between the wound and periwound areas, suggestive of a potential infection. The mean tissue oxygenation at the wound bed was 90% ± 14%, with a hypoxic area present (St2 < 39%). Following four weeks of treatment, the temperature gradient persisted, though wound bed oxygenation improved to 91% ± 11%, and the hypoxic area was no longer detectable. By six weeks, both the temperature gradient and hypoxic area had resolved, indicating positive healing trajectory.

Discussion: These cases highlight VHT's transformative potential in reversing chronic wound deterioration in complex diabetic cases. For this patient, VHT facilitated remarkable healing outcomes. Its ability to enhance granulation, reduce bioburden, and significantly reduce wound size supports its use as a vital adjunct to standard wound care.

References:

*Vaporous Hyperoxia Therapy (VHT), VAPOROX, Lone Tree, CO

**MIMOSA Pro, MIMOSA Diagnostics Inc., Toronto, ON

CS-063

Use of a Borate-Based Bioactive Glass Fibrous Matrix in the Treatment of Complex Lower Extremity Wounds: A Case Series

Anthony LaLama; DPM

Introduction: Chronic and complex wounds of the lower extremities are often refractory to standard care, particularly when complicated by infection, ischemia, or systemic comorbidities. Bioactive materials, such as borate-based bioactive glass, have gained interest for their ability to modulate the wound microenvironment, promote angiogenesis, and stimulate tissue regeneration.1-4 This case series evaluates the effectiveness of a borate-based bioactive glass fibrous matrix (BBGFM) in treating four complex wounds, using percent area reduction (PAR) as the primary outcome.

Methods: Four patients with distinct lower extremity wounds were treated using the BBGFM in conjunction with standard wound care practices. Wound dimensions were recorded (L x W x D) at baseline and monitored over time. Cases included: pyoderma gangrenosum (PG) of the right lower extremity, a venous leg ulcer (VLU) with hematoma of the left lower extremity, a surgically debrided necrotizing fasciitis wound on the left leg, and a Wagner Grade 3 diabetic foot ulcer (DFU) on the left heel. Dressing changes and follow-up intervals were based on clinical response

Results: All wounds demonstrated substantial improvement in wound area over the treatment period:PG: Chronic full-thickness wound unresponsive to treatment using ovine forestomach matrix and morsels underwent approximately 13 weeks of treatment using seven applications of BBGFM with a 70.96% PAR in wound size.VLU/Hematoma: Non ambulatory patient with end stage renal disease (ESRD) underwent approximately 11 weeks of treatment using one application of BBGFM with a 92.46% PAR in wound size.Necrotizing Fasciitis: Wound unresponsive to vacuum-assisted closure underwent approximately seven weeks of treatment using one application of BBGFM with a 90.16% PAR in wound size. DFU: Chronic wound present for about one year unresponsive to hyperbaric oxygen therapy (HBOT) underwent approximately five weeks of treatment using two

applications of BBGFM, 100% PAR with complete wound resolution.

Discussion: The BBGFM supported meaningful wound healing in a range of complex pathologies, including inflammatory, vascular, infectious, and diabetic wound types. Notably, the DFU achieved complete closure, underscoring the potential of this skin substitute to facilitate full resolution even in high-risk wounds. The high PAR values and favorable clinical trajectories suggest broad utility across a variety of complex wound etiologies.

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CS-065

Multimodal Treatment of a Chronic Lower Extremity Ulcer Associated with Polycythemia Vera

Hannah T. Leone, BSN, RN; Frederick J. Rothberg, DPM; Michael S. Rothberg, MD

Introduction: Polycythemia vera (PV) is a chronic myeloproliferative neoplasm characterized by increased red blood cell mass, microvascular dysfunction, and systemic inflammation, predisposing patients to non-healing ulcers. Management of PV-associated ulcers is complex, as cytoreductive therapies like hydroxyurea impair granulation tissue formation and delay wound healing. In this case, a 76-year-old female with a chronic, non-healing ulcer to her left lower extremity was diagnosed with PV following prolonged exposure to toxic chemicals from 9/11, raising the possibility of environmentally triggered disease onset. This case details the treatment progression and impact of JAK-inhibitor therapy and biofilm-targeted strategies on wound healing.

Methods: Diagnosed with PV in June 2014, the patient developed a lower extremity ulcer in March 2018, measuring 17×12.5×0.3 cm. Hyperbaric oxygen therapy improved healing but was discontinued due to pulmonary intolerance linked to 9/11-related lung disease. Low-frequency ultrasound therapy* reduced biofilm but plateaued despite serial use, alongside collagenase ointment* and calcium alginate dressings. Notably, biopsies and debridement worsened the wound, likely due to PV-related vascular fragility. A bilayered bioengineered skin substitute* was also tried but failed. In 2019, Ruxolitinib* 10 mg BID was initiated, leading to hydroxyurea discontinuation and significant wound improvement. In 2023, cadexomer iodine* was introduced, resulting in the most significant size reduction by further decreasing biofilm burden. By early 2025, the wound had reduced by 83.5%, now measuring 7.6×4.6×0.1 cm.

Results: Prolonged 9/11 toxic exposure may accelerate PV onset, increasing microvascular complications and impairing healing. Hyperbaric therapy aided healing but was limited by pulmonary intolerance. Low-frequency ultrasound therapy reduced biofilm but plateaued. JAK-inhibitor therapy improved PV-related dysfunction. Cadexomer iodine played a pivotal role in wound closure by shifting bacterial burden from systemic to localized, allowing immune control. Surgical debridement worsened the ulcer, emphasizing cautious intervention in PV-related wounds.

Discussion: This case underscores the importance of systemic disease control and biofilm management in PV-related ulcer healing. While JAK-inhibitors improved vascular function, cadexomer iodine was key in biofilm reduction, enabling immune-driven healing. These findings support further investigation into JAK-inhibitors and biofilm-targeted therapies for refractory PV-associated ulcers.

CS-066

Real-World Effectiveness of ON101 Topical Cream in Venous Leg Ulcer Management: A Multinational Retrospective Study

Brock A. Liden, DPM, FABWH, FAPWCA; Sanjay Sharma, MD, MS, FDFM, FFPM; Mohamed Sharkawy, MD

Introduction: Venous leg ulcers (VLUs) are a prevalent form of chronic wound characterized by slow healing and high recurrence rates, often requiring prolonged care. ON101 topical cream is formulated to support wound healing by maintaining a moist environment and promoting skin regeneration. This study assessed the real-world effectiveness and safety of ON101 in managing VLUs across multiple countries.

Methods: This retrospective, single-arm study included eight patients with chronic VLUs treated with ON101 twice daily for up to 16 weeks (after correction of the venous hypertension with different methods according to the venous hypertension severity & its etiology starting from grade 3 elastic stockings, venous surgery or ulcer bed perforators ligation) at clinical sites in the United States, India, and Egypt. Healing outcomes were compared with historical standard of care (SOC) data. Safety was monitored throughout the treatment.

Results: Healing Rate: 75% of patients (6/8) achieved complete healing within 16 weeks, compared to 39% with SOC (p=0.0667).

Healing Time: The median time to complete healing was 35.5 days, markedly shorter than the ~90–180 days typically reported with SOC.

Country-Specific Outcomes: USA: Healing completed within 3–13 weeks, requiring 3–13 visits.

India: Healing completed in 6 weeks with only 2 clinic visits. Egypt: Healing completed within 1–2 weeks with a single clinic visit. These results demonstrate rapid recovery with minimal outpatient burden. Safety: No adverse events were reported throughout the study.

Discussion: ON101 topical cream showed consistent and rapid healing performance with excellent safety in the treatment of VLUs after the correction of venous hypertension across diverse real-world settings. Its use was associated with reduced healing time and fewer clinical visits, supporting its role as an effective and practical option for VLU management in global wound care practice.

CS-068

Identifying and Managing Wound Complications with Combined Thermal and Bacterial Fluorescence Imaging: A Multicenter Case Series

Ron Linden, BSc, MD, CCF, DRCPSC, MSM; Danielle Dunham, MHSc; Hanna Varonina, MSc, CCRP; Rose Raizman, NP, RN-EC, PHCNP, NSWOC, MSc, MScN

Introduction: Wound healing can be affected by various factors, including compromised blood circulation, devitalized tissue with a high bioburden and other wound elements such as tunneling, undermining. In literature, ischemic areas are reported to have lower temperature values compared to unaffected areas1,2. This case series explores the utility of combined thermal and fluorescence imaging in providing additional point-of-care information to aid in the assessment of wounds, as it relates to cooler areas from ischemic or devitalized tissues, tunnels, undermining or hidden wound pockets and may offer insights into the patient's underlying vascular condition.

Methods: Ten patients with pressure injuries, venous leg ulcers, and diabetic foot ulcers at two out-patient clinics were assessed using a novel handheld device* that combines thermal and bacterial fluorescence imaging. Thermal images were taken approximately 5 minutes after the wounds were undressed (acclimatization period) but prior to cleansing or debridement. Fluorescence wound imaging was then performed in darkness including co-registered image capture of fluorescence and thermal. The results of both standard clinical assessment and wound imaging were recorded, along with any associated impact on treatment decision-making with the purpose of establishing their relationship.

Results: Across the 10 wounds, abnormally cool temperatures observed presented in two different scenarios. Hidden tunneling and undermining,

and deep unstageable pressure injury areas appeared as localized, well circumscribed areas of cooler temperature readings, in close proximity or in relation to the wound. Venous insufficiency was represented by an extensive, widespread cool temperature. Thermal imaging guided the clinician to these areas that were not immediately apparent in their clinical assessment. Fluorescence imaging further confirmed the presence of bioburden within devitalized tissues enabling targeted debridement.

Discussion: This case series highlights the advantages of combining thermal and fluorescence imaging modalities into a single handheld device. This combination, together with clinical assessment, revealed not always apparent wound complications such as tunneling or undermining, as well as underlying comorbidities like vascular insufficiency. By identifying these issues at the point of care, clinicians were able to adjust their treatment plans accordingly.

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CS-069

Use of ON101 Cream for Management of Stalled Atypical Wounds Including Hidradenitis Suppurativa: The Woundtech Experience

Minghsun Liu, MD, PhD; Cindy Alexander, NP; Mary Anderson, NP; Pennelope Dyals, NP; Monica Fierro, NP; Christina Houston, NP; Marie Desiree Lacandola, NP; Lashara Maea, NP; Tamayo Murayama, NP; Reynard Nivera, NP; Ikechukwu Nwabuobi, NP; Karen Pabalan, NP

Introduction: Hidradenitis Suppurativa (HS) is a chronic inflammatory skin condition characterized by painful nodules, abscesses, and sinus tracts, which can lead to significant morbidity. Traditional treatment modalities often provide limited relief, necessitating alternative therapeutic options. ON101 cream has been piloted for its potential benefits in managing atypical wounds, including HS.

Methods: This pilot study involved the application of ON101 cream on patients diagnosed with HS including those with Hurley Stage 3 and other atypical wounds. In one patient with HS, the cream was applied daily over a two-week period. Patients were concurrently receiving Secukinumab injections, and some had previously used other topical agents like Therahoney with minimal improvement.

Results: Preliminary observations indicate a significant reduction in pain and erythema, with patients reporting increased drainage and flatter abscess sites, allowing for improved quality of life. Continued application beyond the initial two weeks was deemed beneficial, with potential for longer-term use to sustain improvements.

Discussion: ON101 cream shows promise as an adjunctive treatment for HS, particularly in patients who are not surgical candidates due to comorbidities. The formulation's anti-inflammatory properties may contribute to its efficacy, supporting its use as a viable option in managing atypical wounds like HS. Further studies are warranted to confirm these findings and optimize treatment protocols.

CS-070

Fish Skin Graft as a Bridge to Qualify Patients as a Cantidate for Split Thickness Skin Graft: A Case Series

Peter F. Lovato, DPM, AAPWCA; Patrick McEneaney, DPM; Rimi Statkus, DPM

Introduction: Diabetic patients with wound infections and exposed tendon or bone were treated. Fish skin grafting was initiated to achieve granulation tissue over the area to allow for wound healing and bridge therapy for eventual STSG.

Methods: 4 total patients were included in the series. Infections were treated with admission, IV antibiotics, and when necessary incision and drainage. After Infection was stabilized, fish skin substitute (Kerecis MariGen & Particulate) was used to fill undermining if present and to achieve granulation tissue over exposed tendon structures or bone. Negative Pressure Wound Therapy was also utilized. Once 100% granulation was achieved over the tendon or bone a split-thickness skin graft of 0.18in thickness was used to completely heal the wound without complications. 100% acceptance of the STSG was achieved at 4 weeks after placement in all cases. All patients had a Hb A1C over 8.0.

Results: Initial I&D was performed and staged application of fish skin substitute. Fish skin substitute was used to fill undermining tissue and achieving complete granular coverage over the wound to facilitate the use of a split thickness skin graft. Patients eventually healed despite poor glucose control, obesity, and exposed tendon or bone. Post operative management after STSG application was mineral oil over the graft, adaptic white foam and negative pressure therapy set to 75mm/Hg. Tegaderm was placed over donor site. Time from initial I&D procedure to 100% acceptance of skin graft and healing of the wound was \an average of 95 days with no recurrence of infection. No recurrence of the wounds were appreciated at follow ups of 6 months and one year in all cases.

Discussion: Exposed tendon and bone after infection and/or abscess due to tissue loss is a frequent problem. These cases frequently result in non healing wounds, further infection and even loss of limb. Fish skin substitute can rapidly achieve granulation over exposed tendon or bone even in patients with significant barriers to healing. The barriers in this case were uncontrolled DM, obesity, decreased blood flow, and infection. Research has been shown to and was supported by patient experience to reduce pain scores, provide an antibacterial layer, as well as increase angiogenesis to help facilitate wound healing. The hypothesis is the properties of the graft prime the wound bed for better acceptance of a split thickness skin graft in patients that otherwise would not be a candidate.

CS-071

Case Series: Application of a Novel Thin, Porous Human Acellular Dermal Matrix for Deep Wound Management in Outpatient Procedures

Kenny Luong, DPM, FACFAS; Arnab Mondal, PhD; Bradley Wetzell, PhD; Julie McLean, PhD

Introduction: Deep wounds of the lower extremity, particularly those with exposed tendon or bone, present significant clinical challenges including high infection risk, delayed healing, and potential functional impairment.[1] These challenging wounds are often complicated by underlying comorbidities including diabetes, neuropathy and peripheral vascular disease. Current management strategies include debridement, negative pressure wound therapy (NPWT), and advanced dressings—which may require prolonged care and necessitate inpatient treatment.[2]

Human acellular dermal matrices (ADMs) derived from authorized deceased donors have been widely used for wound healing and soft tissue reconstruction and are indicated for soft tissue reconstruction including over deep exposed structures.[3,4] A novel porous ADM (pADM) may serve as an effective alternative treatment for deep wounds, providing a thin biological scaffold that facilitates faster cell infiltration and tissue vascularization.[5] In this case series, we utilized a pADM in an outpatient setting for management of chronic wounds with deep exposed structures.

Methods: This case series included authorized patients aged 60 to 99 years, presenting with deep lower extremity wounds with exposed tendon or bone, treated in an outpatient setting. All patients had previously failed conventional management, including debridement and/or NPWT. Wound etiologies were varied including complications from diabetes, pressure ulcers secondary to radiation-induced neuropathy or deformity and post-surgical complications, among others. Comorbidities included diabetes mellitus, end-stage renal disease, or

peripheral vascular disease, among others. Wound sizes ranged from 0.4 – 8.6 cm^2 in surface area and 0.1 – 1.4 cm depth. Following debridement, each wound was treated with a novel pADM*, which consists of thin, porous layers of reticular dermis, as an adjunct to standard of care. Wound progression was monitored at regular intervals to assess closure. Dressings were changed at each visit with non-adherent collagen alginate dressings.

Results: Complete wound closure was achieved in 2 to 17 weeks following single application of pADM, with closure time positively correlated with initial wound area.

Discussion: The use of a novel, thin pADM demonstrated efficacy as an alternative treatment for complex wounds with exposed deep structures in the outpatient setting, indicating that thin pADMs may be a viable option for treatment of challenging and chronic wounds.

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CS-072

When Conventional Treatment Fails: A Wearable Continuous Topical Oxygen Therapy System Reduces Wound Volume in Chronic Venous Leg Ulcers

Patricia C. Manavbasi, BSN, RN, CWON, CFCN; Lisa M. Foster, MSN, RN, PHN, CWON, CFCN, CFCS

Introduction: Venous leg ulcers (VLUs) account for nearly 80% of leg ulcers in the United States posing a significant challenge, especially among Veterans.[1] Despite standard of care (SOC) which, includes compression therapy, 20% of VLUs fail to heal within two years, leading to frequent clinic visits that burden both patients and healthcare systems.[2,3] Hypoxia is present in 97% of chronic wounds, including VLUs, further contributing to delayed healing.[4] Thus, adjunct therapies should be considered for VLUs demonstrating no improvement with SOC after four weeks.[5] Continuous topical oxygen therapy (cTOT) has proven effective in increasing oxygenation to the wound, decreasing pain and improving healing outcomes.[6,7]

Methods: Three patients with non-healing VLUs were assessed at our VA wound clinic, with an average wound duration of 2.5 years and a history of unresponsiveness to SOC. We initiated a wearable cTOT device alongside SOC dressings, which included peri-wound protectants, absorptive dressings, and self-adherent elastic wrap (SAEW). For patients unable to tolerate full toe-to-knee wrapping, SAEW bandages were applied locally along with a tubular elastic bandage extending from toes to knee. Each patient was instructed on self-management of the cTOT device and wound care. Patients were initially scheduled for follow-up visits every one to two weeks; later extending visits to two to five weeks as therapy progressed.

Results: Overall, patients achieved a mean wound volume reduction of 75% over 21 weeks, with specific reductions of 69.6 % for Patient 1, 66.5% for Patient 2, and 89.1% for Patient 3. All patients reported a reduction in pain, which facilitated improved tolerance for a broader application of SAEW. Edema and wound drainage decreased, requiring fewer dressing changes and clinic visits. Patients also reported easy self-management of the cTOT device and wound.

Discussion: Many standard treatments fail to heal long-term, persistent, chronic VLUs. However, cTOT delivers oxygen directly to the wound bed, reducing hypoxia and pain while enhancing healing and enabling better compression use. This method also decreases clinic visits, improving healthcare access for others. These findings highlight cTOT as an essential complement to SOC for non-healing VLUs.

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CS-073

Management of a Chronic Venous Leg Ulcer Using Botanical Hydrogel-Based Therapy and a Skin Substitute After Limited Success with Previous Treatments

Imaze Marian. Davis, DPM, MBA, DABPM, CWSP, DABMSP

Introduction: Chronic venous leg ulcers are a persistent challenge in wound care, especially in patients with complex medical histories and prior unsuccessful treatments. This case study explores the successful management of a longstanding venous leg ulcer using botanical hydrogel-based therapy in combination with a skin substitute to promote healing and prevent infection.

Methods: The patient, a 60-year-old African American male with a history of hypertension, prostate cancer, and high cholesterol, presented with a chronic venous leg ulcer that had persisted for over a year. The ulcer, measuring 14.5cm x 7.0cm x 0.2cm, showed signs of stagnation despite prior treatment with saline solution and an unidentified ointment. The patient reported a history of attempting to improve circulation using a leech while in Haiti, which resulted in a persistent wound. A treatment regimen involving botanical hydrogel-based therapy and a skin substitute was implemented. The wound was cleansed, the hydrogel was applied twice weekly, and the skin substitute was placed to support tissue regeneration. Dressings were changed regularly, and the wound was monitored for infection, drainage, and tissue response.

Results: Over four weeks, the wound demonstrated significant improvement. The wound size reduced from 14.5cm x 7.0cm x 0.2cm to 2.0cm x 2.0cm x 0.2cm. The wound maintained an infection-free state, displayed healthy granulation tissue, and demonstrated epithelialization. The patient reported no pain, and no malodor or periwound erythema was observed.

Discussion: This case highlights the potential of botanical hydro-

gel-based therapy combined with a skin substitute as an effective treatment for chronic venous leg ulcers. The observed reduction in wound size, absence of infection, and improved tissue regeneration demonstrate the benefits of combining botanical-based therapies with advanced wound care modalities. This approach may offer a valuable solution in managing complex wounds and improving outcomes in patients with challenging clinical histories.

CS-074

A Case Series Demonstrating the Clinical and Quality of Life Benefits of a Temporary Biosynthetic Wound Matrix in Partial and Mixed Depth Wounds

Neil Mashruwala, MD, FACS; Leah Hanson, APRN

Introduction: Partial and mixed depth wounds often require frequent dressing changes, which can be painful and burdensome for both patients and healthcare systems, especially in resource limited areas. A temporary biosynthetic wound matrix (BWM), composed of a bilayer silicone and micro-nylon structure, offers an advanced, low-maintenance dressing option that supports outpatient care while maintaining adherence to the wound bed.[1-3] This case series highlights three patients with varying wound etiologies who demonstrated favorable outcomes following treatment with BWM, including timely closure, simplified wound management, decreased pain and ability to maintain daily activities without disruption.

Methods: Three patients with partial or mixed depth wounds were treated with BWM in outpatient settings. A healthy 22-year-old female sustained a 2% TBSA burn and received BWM two days post-injury. A 31-year-old female with hidradenitis suppurativa had BWM applied to a donor site following surgery. An 88-year-old female with significant comorbidities and fragile skin was treated with BWM for full thickness skin avulsions from a fall. In all cases, BWM was secured with steri-strips or skin glue and covered with secondary dressings. Patients were followed for several weeks via in-person and/or telehealth visits, with data collected on healing, pain, and return to daily activities.

Results: All three patients experienced favorable outcomes. The average healing time was 15 days, with follow-up over an average of 4.7 weeks. All patients reported high satisfaction, minimal or no pain, and the ability to resume daily routines such as exercise, traveling, or caregiving immediately following application. Dressing changes were minimal, and BWM lifted naturally as healing progressed, as early as 5 days post-application, indicating re-epithelialization.

Discussion: BWM facilitated timely wound healing and supported patient independence across varied clinical cases. Its transparent, flexible design allowed for visual monitoring without disrupting the wound and required minimal maintenance, enabling patients to continue daily activities. All patients were managed locally, reducing travel and supporting continuity of care—especially valuable in rural and resource limited settings. These cases demonstrate BWM as an effective, patient-centered approach to acute wound management.

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CS-075

Management of a Wound Dehiscence with Fish Skin Graft after a Large Mass Exicision in the Foot

Patrick McEneaney, DPM; Peter F. Lovato, DPM; Rimvydas P. Statkus, DPM

Introduction: Larger soft tissue masses can leave a dead space after they are excised. Dead space management can be difficult in post operative patients. These often dehisce leaving a large wound.

Methods: A 60 year old female underwent an excision of a large ganglion on her lateral foot. Postoperatively, the patient developed a hematoma resulting in a wound dehiscence 2 weeks after surgery. At 4 weeks after the initial surgery, the wound measured 8.0 cm x 2.0cm x 0. 7cm in depth. The patient was treated at 2 weeks and 4 weeks with a fish skin graft. She was then switched to collagen therapy due to insurance coverage.

Results: The dehisced wound healed in 15 weeks with 2 fish skin graft applications followed by collagen application.

Discussion: This case is a demonstration how a fish skin graft can be utilized for a wound dehiscence following a mass excision.

CS-076

Collagen Matrix Containing Broad-Spectrum Polyhexamethylene Biguanide Antimicrobial Barrier for The Management of Complex Pressure Injuries

Eduardo Melendez, BA; Karla Chavez; Maribel Henao, DPM, MSPT; Cameron DeShazo, BS; Yeabsera Tamire, BS, MBA; Jeyantt S. Sankaran, PhD; Gabriel Arevalo, MD

Introduction: Pressure injuries substantially diminish the wellbeing and quality of life of the patient. Pressure injuries in vulnerable patient populations with significant comorbidities that extend into and beyond the dermis, with exposed muscle, tendon, and bone (stage 3 & 4) have been found to be susceptible to colonization by pathogens. Purified collagen matrix containing polyhexamethylene biguanide (PCMP(a)) has been shown to be an effective broad-spectrum antimicrobial barrier supporting the management of wounds of different etiologies. The objective of this study was to assess the clinical outcomes associated with the use of PCMP in the management of complex pressure injuries.

Methods: This single-surgeon, single-site retrospective case series includes patients with pressure injuries in the sacral region that were managed using PCMP. The sacral pressure injury wounds underwent sharp debridement in the operating room, followed by the application of PCMP on the wound bed as an adjunct to standard of care procedures. Demographic factors including age and comorbidities are reported. Change in wound dimensions, and the incidence of bioburden between index surgery (before PCMP application) and subsequent visits (after PCMP application) are reported.

Results: Nine patients, 6 male and 3 female with sacral pressure injuries were identified. All patients presented with exposed anatomical structures; 6 out of 9 patients had exposed tendons or ligaments, while 3 out of 9 had exposed subcutaneous fat. Bioburden was observed in the wounds of 8 out of 9 patients during index surgery. Following either one or two applications of PCMP as an antimicrobial barrier, no wounds exhibited exposed bone or tendon, bioburden persisted in only 1 out of 9 cases, and the median wound area was reduced by 46.7% when compared to baseline.

Discussion: This case series highlights the potential of PCMP as an effective adjunct in the management of pressure injuries by supporting healing and managing bioburden within the product. These findings strongly support the pursuit of larger studies to establish PCMP's role as a valuable adjunct in standard care protocols.

CS-077

To Compress or Not Compress: Diabetic Foot Ulcers with Concurrent Venous Dermatitis.

Yvette Mier, BSN, RN, CWON

Introduction: Diabetes affects an estimated 11.6% of the U.S. population, with up to one in four individuals developing a diabetic foot ulcer (DFU) during their lifetime. Within this DFU population, up to 24% will likely require an amputation at some level. Concurrently, roughly 35% of the U.S. population has some level venous and lymphatic dysfunction. While exact overlap is poorly quantified, shared risk factors such as age, obesity, and chronic disease duration, suggest a substantial subgroup at risk for both conditions.

Stasis dermatitis is an indicator of venous dysfunction. Evidence from the literature indicates that unaddressed venous or lymphatic dysfunction may delay DFU healing by up to 40%. Therefore, managing underlying vascular dysfunction is essential to preventing ulcer progression and improving outcomes.

Methods: All DFU patients underwent comprehensive vascular assessment to evaluate arterial perfusion, venous reflux, and lymphatic congestion. DFUs were treated with standard protocols, including debridement, offloading, and glycemic optimization. Stasis dermatitis was managed with a two-component, dual-layer compression system. Patients received education on nutrition, glucose control, offloading, and the role of compression therapy in wound healing.

Results: In all cases, stasis dermatitis resolved within two weeks of initiating compression therapy. All DFUs healed within six to eight weeks. No adverse effects from compression were noted, demonstrating its safety when applied correctly and preceded by appropriate vascular screening.

Discussion: Compression therapy remains underutilized in DFU management, largely due to concerns over peripheral arterial disease (PAD), which affects about 20% of diabetic patients. However, when guided by thorough vascular assessment, compression is safe and can significantly enhance healing outcomes. Failing to treat underlying venous or lymphatic dysfunction can lead to delayed healing, infection, and increased amputation risk. A multidisciplinary approach that integrates vascular evaluation and compression therapy where appropriate is critical for optimal limb preservation and wound resolution.

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CS-078
Rapid Resolution of Venous Dermatitis Using Dual Compression Therapy: A Case Series

Yvette Mier, BSN, RN, CWON

Introduction: Chronic venous disease (CVD) affects approximately 25% of the U.S. population and typically progresses from mild symptoms such as leg restlessness, itching and rash to chronic edema with ulceration. Timely diagnosis and intervention are crucial to preventing disease progression and infection. Unfortunately, many patients endure prolonged symptoms due to misdiagnosis in its early stage.This case series examines the diagnostic and therapeutic challenges associated with venous dermatitis and explores the role of compression therapy, specifically using a dual component compression system (DCS), which combines long and short stretch bandages.

Methods: Patients with venous dermatitis of 2 weeks to 18 months duration were included. Each underwent a comprehensive vascular assessment to rule out arterial insufficiency and assess for venous reflux. All were treated with a dual component compression system applied once or twice weekly.

Results: Complete resolution of venous dermatitis was observed in all cases within four weeks of initiating the dual compression system. Following resolution, patients were transitioned into long-term compression garments for maintenance.

Discussion: These findings underscore the importance of early recognition and treatment of CVD. Venous dermatitis, whether associated with reflux or not, often precedes more severe complications but can be effectively managed with targeted therapy. Compression therapy appears to resolve venous dermatitis through two principal mechanisms:

1. Improved Lymphatic Drainage Compression reduces lymphedema. When lymphatic flow is enhanced, it prevents the accumulation of inflammatory, protein-rich lymph fluid, thereby improving skin condition.
2. Enhanced Microcirculation: Although compression reduces venous and microvenous distention, it may also induce vasodilation in the microarteriolar circulation. This response is due to the adaptation of the calf musculature and surrounding tissues to the external compression, ultimately enhancing tissue perfusion and skin health.

Together, these mechanisms highlight the multifaceted role of compression therapy in managing venous dermatitis and preventing disease progression.

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CS-079
Have Skin in the Game? Case Series Using Axolotl Dermal Extracellular Matrix

Catherine Milne, MSN, APRN, WOCNF

Introduction: Introduction: The use of cellular, acellular, and matrix-like products (CAMPs) has expanded significantly over the past decade. While most are applied to diabetic foot ulcers (DFUs) or venous leg ulcers (VLUs), these products may also support healing in other complex wounds, including pressure injuries, surgical wounds, and atypical ulcerations. Given the principles of regenerative therapy, it is clinically compelling to use materials sourced from a species that retains regenerative abilities throughout its lifespan. The axolotl possesses unique capabilities to remodel, regrow, and restore tissue.[1,2] This case series examines the outcomes of three patients with hard-to-heal wounds treated with axolotl extracellular matrix.

Methods: Methods: Wounds of any etiology persisting for over one year, despite standard care and advanced interventions (e.g., HBO, NPWT, electrical stimulation, antibiotics, etc.) were managed with weekly applications of axolotl-derived extracellular matrix*. Prior to each application, all wounds were evaluated using fluorescence imaging to

detect bacterial presence and infrared thermography to evaluate signs of inflammation and potential infection. Patients received up to eight applications.

Results: Results: 3 patients with wounds, consisting of a fistula and 2 pressure ulcers, have received applications of axolotl ECM. The fistula closed after 1 application and has remained closed for 5 weeks. 1 pressure ulcer reduced in size by 47.8% after 3 applications over a 4 week period, and the 2nd pressure ulcer reduced in size by 53.6% after the second application. While closure is the ultimate endpoint, all patients showed significant reduction in the size of the wound and reduction in the signs of inflammatory response and drainage. Reduced wound pain, when present, was an unexpected finding in these cases. No adverse events were experienced.

Discussion: Discussion: Using extracellular matrix fabricated from the dermis of the axolotl in hard-to-heal wounds improved patient quality of life by decreasing drainage and reducing the inflammatory response3 and wound size. While further studies are warranted, the application of regenerative tissue sourced from a natural regenerative source is a clinically sound approach.

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CS-080

Use of a Synthetic Polyurethane Dermal Matrix for Limb Salvage in a Chronic Lower Extremity Wound Due to Idiopathic Calciphylaxis

Humza Mirza, MD, MS; Sam Girian, BS; Ellie Gschwendtner, MD; Patricia Pentiak, MD; Timothy Burton, MD; Alistair Chapman, MD; Amy Spencer, MD

Introduction: Calciphylaxis is a rare and life-threatening condition characterized by vascular calcification, thrombosis, and soft tissue necrosis. Although most commonly associated with end-stage renal disease and secondary hyperparathyroidism, idiopathic cases present unique challenges with limited treatment options. These wounds are notoriously difficult to manage and often lead to major amputation. This case explores the role of a synthetic polyurethane dermal matrix* in supporting wound healing and limb salvage in an elderly patient with a chronic lower extremity wound due to idiopathic calciphylaxis.

Methods: A 77-year-old female with iatrogenic calciphylaxis and multiple comorbidities presented with a chronic, non-healing wound of the right lower extremity. Prior interventions included serial surgical debridements, sodium thiosulfate infusions, and hyperbaric oxygen therapy. After failure of these interventions, a synthetic polyurethane dermal matrix* was applied to promote neodermis formation and prepare the wound bed for split-thickness skin grafting (STSG). Wound progression and pain levels were monitored over several months, with standardized photographs obtained every 7 to 14 days to document healing.

Results: Initial outcomes were favorable, with healthy granulation tissue observed at postoperative day (POD) 75 and subsequent STSG performed. By POD 110, the original wound had significantly improved—reduced in size and considered likely to heal without additional surgical intervention. However, new areas of necrosis developed outside the grafted zone, consistent with ongoing vascular calcification and ischemia. Despite the wound itself progressing toward closure, the patient experienced worsening, diffuse pain unresponsive to medical therapy. Ultimately, the decision for above-knee amputation (AKA) at POD 180 was driven not by wound failure, but by chronic, debilitating pain related to persistent calciphylaxis, following extensive multidisciplinary discussions.

Discussion: This case highlights that a synthetic polyurethane dermal matrix can effectively support wound bed preparation and graft uptake, even in the complex setting of idiopathic calciphylaxis. Although the wound itself demonstrated significant healing, progressive ischemia and debilitating pain developed in areas beyond the original wound margins due to ongoing systemic disease. This suggests that earlier and more aggressive initial debridement—guided by imaging—may help address subclinical calciphylaxis and prevent downstream complications. Importantly, this case reinforces that pain, even in the presence of a healing wound, can be a primary driver of treatment failure. Multidisciplinary collaboration, proactive pain management, and surgical strategies informed by disease extent are critical. When applied early, these approaches can not only promote wound healing but also increase the likelihood of successful limb salvage in patients with calciphylaxis.

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CS-081

Management of chronic wound with full thickness skin necrosis following sclerotherapy with absolute ethanol for treatment of arteriovenous malformation.

Frankie A. Mitchell, RN, MSN, AGNP-C, CWON-AP; Ursula Bingamon, MPH, BSN, RN, CWS, CTBS, DWC

Introduction: Chronic wounds impose substantial treatment and cost impacts on global healthcare amounting to an estimated 1 to 4% of healthcare costs.[2] Arteriovenous malformations (AVMs) are vascular anomalies with abnormal capillary networks which can lead to multiple complications if not corrected.[3] Embolization of the AVMs with absolute ethanol is a primary treatment but serious complications, like skin necrosis, can develop. Incidence of complications with absolute ethanol ranges from 1.8% to 7% that may require additional medical care, including 6-26% blistering and skin necrosis. Full-thickness defects, including deep tissue defects resulting from tissue necrosis, can include treatment with standard of care, hyperbaric oxygen therapy (HBO), and grafting.[3] A cellular partial thickness human dermal matrix* can facilitate healing these defects.

Methods: A 64-year-old male presented with a right thigh wound with full thickness skin necrosis, 2 to 3 months post absolute ethanol sclerotherapy of arteriovenous malformation, for consideration of HBO therapy. Initial wound measurements were 4 cm x 6.5 cm x 0.3 cm = 26 sq cm. The wound was clinically infected and painful. Initial treatments included selective and sharp debridement, at least two oral antibiotics and use of standard dressings prior to starting HBO. One month later, a silicone bilayer and autologous split-thickness skin graft (STSG) was applied with negative pressure wound therapy but became non-viable, which required debridement. HBO resumed along with cellular partial thickness human dermal matrix* with use of non-adherent and standard dressings.

Results: Patient presented with complete epithelialization following six applications of the cellular partial thickness human dermal matrix*. At this time, the patient reported no pain at the site and no complications.

Discussion: Utilizing cellular partial thickness dermal matrix* proved to be a successful treatment for challenging non-healing soft tissue defects. The cellular dermal matrix should be considered as a viable plan of care for chronic soft tissue defects. Further studies warranted.

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CS-082

Stabilizing the Wound Bed With Aseptically Processed Human Placental Allograft and Meshed Human Reticular Acellular Dermal Matrix Allograft in Pediatric Limb Salvage Reconstructions

Daniel Murariu, MD, MPH, MBA, FACS; Alisha Suri, BSc; Rachel Contopoulos, DO; Amy Liu, MD; Akash Liyanage, MBBS; Ruyan Zhang, MD; Christyn Mellor, BSc; Chloe McCreery, BSc; Peter Deptula, MD

Introduction: Pediatric lower extremity trauma poses multiple challenges in limb salvage including small blood vessel size, the need to accommodate continued growth,[1,2] and major healing complications including fractures and infection.[3-5] Additionally, small patient size severely limits donor sites.

Stabilizing the wound bed prior to final reconstruction may be key to improving outcomes. Aseptically processed dehydrated human placental amnion-chorion allograft (dHACA)* provides preserved extracellular matrix proteins, growth factors, and antimicrobial peptides. Aseptically processed meshed human reticular acellular dermal matrix (HR-ADM)** also provides an open network structure to support host tissue ingrowth and stabilizes the wound bed.

Methods: We present two cases where placental and dermal allograft were used to stabilize severe wounds prior to definitive reconstruction in pediatric limb salvage. Long-term outcomes and quality of life were assessed at follow-up. Case 1 is a 7 year old male with lawnmower injuries resulting in oblique amputation of the left heel and tangential soft and bony tissue loss of the right heel. The right heel was reconstructed with local tissue rearrangement, and the left with dHACA and a sensate medial plantar artery flap. Case 2 is a 7 year old male from the Marshall Islands who sustained Gustilo-Anderson Grade IIIB, tib-fib fractures initially treated with external fixator and wet-to-dry dressings over exposed bones. Following transfer a month later and orthopedic stabilization with antibiotic spacer, the wound was prepared with HR-ADM and negative pressure for one week prior to definitive coverage with free muscle transfer and skin grafting.

Results: Both patients achieved complete wound closure and ambulation. Case 1 was complicated by wound infection on the right side, requiring IV antibiotics and surgical intervention for infection control. Given the bony loss on the left, human allograft adipose matrix (AAM)*** was added 9 months later for added tissue volume to improve fitting of shoes.

Discussion: In complicated, traumatic and dirty wound injuries, allograft tissue can help stabilize the wound bed for final reconstruction. Placental tissues have preserved angiogenic, anti-inflammatory, and antimicrobial properties, while dermal tissues provide the open network structure to rebuild deep soft tissue loss. These allografts may be useful in wound bed preparation prior to final reconstruction in pediatric limb salvage.

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CS-083

Urethral Necrotizing Fasciitis: Use of Powdered Extracellular Matrix (ECM) with Negative Pressure Therapy

Beth Myers, MSN, A-GNP-C, APRN, CWOCN; Shabnam Hafiz, MD, FACS; Shawn M. Terry, MD, FACS

Introduction: 58-year-old Caucasian male admitted to the hospital with diagnosed soft tissue infection involving the perineum, mons pubis, and lower abdomen. The patient had a history uncontrolled diabetes mellitus (A1C 13.4), hypertension, and morbid obesity (BMI 54%). Surgery was required and debridement completed finding the source of infection to be necrosis of the urethra. The surgical case involved a general surgeon and urologist for intervention of large tissue defect with the loss of the entire urethra leaving a short remnant that required intubation with a red rubber catheter for urinary diversion in the base of the wound.

Methods: The Soft Tissue Service Wound NP was involved in the patient's care for wound management. Negative Pressure Wound Therapy (NPWT) was deferred until a permanent suprapubic catheter could be placed for urinary diversion. The placement of SP tube placed in Interventional Radiology related to the patient's body habitus. Once the SP tube was placed, the patient was seen in the operating room to place NPWT dressing after removal of urinary catheter and oversewing of urethral remanent. Powdered ECM used into the wound base and covered with a contact layer of non-adherent dressing and NPWT dressing applied.

Results: The perineal wound rapidly improved with the use of ECM and NPWT over the course of two weeks. Wound dimensions continued to rapidly improve over the course of two weeks with each dressing change using ECM and NPWT. The resulting wound base with 100% granulation tissue and over half the original size by the time of transfer to a hospital within the health system closer to the patient's home.

Discussion: This poster presentation reviews new, novel approaches to the management of wounds with large tissue defects from a soft tissue infection. The positive response of the wound in such a brief period of time with ECM and NPWT, the patient was able to transfer to another hospital with an easier wound care dressing.

CS-084

Managing Lower Extremity Wounds with a Peel and Place Negative Pressure Wound Therapy Dressing: Similar Performance with Time Savings

Ralph Napolitano, DPM, CWSP, FACFAS

Introduction: The application of negative pressure wound therapy to support the healing of lower extremity wounds is well-documented.1 A multilayer peel-and-place dressing (MPPD) incorporates a perforated non-adherent layer, reticulated open cell foam dressing, and a hybrid acrylic and silicone drape, which enable it to be placed over the wound and surrounding intact skin. We report the outcomes of applying NPWT with MPPD in 10 patients with lower extremity wounds.

Methods: Deidentified data were collected after obtaining informed patient consent and stored in accordance with federal regulations. Patients had injuries to the foot or lower leg and received NPWT with MPPD at -125 mmHg for 10 days, with dressing changes conducted on day 5.

Results: Five male and five female patients, aged 28 to 82 years old,

were included in the study. Wound etiologies included surgical wounds, a traumatic injury, and a decubitus ulcer. After 10 days of therapy, the wounds showed notable improvement and a significant reduction of periwound edema. We observed no periwound maceration in eight patients; in two, maceration was noted at the first dressing change and resolved after negative pressure was increased to 150 mmHg.

Discussion: The new NPWT dressing performed as expected, removing exudate and creating an environment conducive to wound healing. The application of the MPPD dressing was quick and easy, requiring only minimal trimming or shaping of the drape.

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CS-085

A Sustainable Wound Environment using Borate-Based Bioactive Glass Fiber Matrix (BBGFM) Contributes to the Efficacy in Healing Complex Lower Extremity Wounds

Ralph Napolitano, DPM, CWSP, FACFAS

Introduction: Treating lower extremity wounds presents significant challenges for both patients and clinicians. Many patients endure multiple unsuccessful treatment attempts, often resulting in poor outcomes and diminished quality of life. These individuals may spend months or even years cycling through therapies meant to promote healing, only to face persistent non-healing wounds and a looming risk of amputation. In response, clinicians increasingly turn to advanced modalities, including skin substitutes that show promise in improving patient outcomes. One such innovation is a borate-based bioactive glass fiber matrix (BBGFM)—a synthetic skin substitute comprised of natural elements in a fiber and microsphere form. The BBGFM conforms to wound surfaces and may support angiogenesis through VEGF upregulation, promoting rapid granulation and epithelialization, often within 1–2 weeks. It functions as a dissolvable scaffold, stabilizing the wound environment and facilitating key phases of healing.

Methods: Ten patients with lower extremity wounds were treated with BBGFM, each receiving one to three applications. The cohort included five males and five females, ages 49 to 71. Wound etiologies included delayed post-surgical wounds, diabetic foot ulcers, venous ulcers, a crush injury, and pressure injuries. Debridement was performed as clinically indicated, followed by secondary dressings to maintain a moist wound environment. Further debridement was conducted only when necessary to optimize healing.

Results: All ten wounds demonstrated progressive healing after BBGFM application. Evidence of angiogenesis and granulation was observed early, with significant wound area reduction noted within the first week. Epithelialization was seen in all cases. Patients reported increased optimism, decreased pain, improved exudate control, and visible size reduction. Ease of use was frequently cited by clinicians. Notably, no infections were observed in any of the treated wounds.

Discussion: Wounds of varied etiologies achieved favorable outcomes with BBGFM. These complex, chronic wounds mirror those described in other clinical reports involving BBGFM. Prior studies, including a 40-patient RCT and a newly published 100-patient RCT, support the consistent efficacy of BBGFM, including wounds refractory to other treatments. A key outcome across the literature has been the reduction of complications such as infection—reinforced by this case series, where no infections occurred. These findings further support BBGFM as a safe, effective, and reliable treatment option for difficult-to-heal wounds.

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CS-086

Complex Chronic Abdominal Morel-Lavallée Lesion Wounds: Management with Panniculectomy and Umbilical Transposition: A Complex Single Case Study

James Pai, MS; Abigail Chaffin, MD, FACS, CWSP, MAPWCA; Adam Shalek, MD

Introduction: Morel-Lavallée lesions (MLLs) are closed soft-tissue degloving injuries that occur when traumatic shear forces separate subcutaneous tissue from the underlying fascia. This separation creates potential space where blood, lymph, and necrotic fat can accumulate. If not resolved, these collections can lead to fibrous capsule formation, hindering fluid reabsorption and resulting in chronic lesions characterized by painful fibrosis and persistent seromas, which significantly complicate clinical management. While conservative measures may be attempted, they frequently prove insufficient for advanced or chronic MLLs, often necessitating aggressive surgical intervention. Although MLLs most commonly occur over the greater trochanter, thigh, buttock, and knee – abdominal occurrence is less frequent, though equally troublesome. MLLs are often underdiagnosed, particularly in acute trauma settings focused on more immediately life-threatening injuries, and delayed presentation is noted in up to one-third of cases. This case of a 68-year-old female describes the complex surgical management of a chronic abdominal MLL that developed after a high-velocity lower abdomen seatbelt injury. Initial presentation of a large left flank hematoma, progressed over six months to chronic pain, redness, and swelling. Initial conservative treatment at an outside center via incision and drainage failed to provide resolution, and Penrose drains resulted in persistent pain and non-healing wounds. Consequently, she developed deep, painful, fibrotic chronic seroma cavities extensively tethered to the underlying fascia, significant fat necrosis, necessitating extensive surgical intervention. Our report highlights the diagnostic and management complexities of a chronic abdominal MLL.

Methods: The patient underwent a panniculectomy-style MLL excision, resecting approximately 60x15 cm of diseased tissue, including >5 pounds of skin and subcutaneous fat, extensive deep fibrotic scar tissue forming large chronic seroma cavities (~15x10cm) filled with seropurulent fluid, adherent to the abdominal wall. Reconstruction of the resultant 900cm2 defect employed adjacent tissue advancement flaps totaling ~1500cm² with umbilical transposition. Incisions were closed with layered absorbable sutures, staples, and immediate compression dressings application.

Results: This procedure successfully addressed extensive fibrosis and fat necrosis, reducing post-op pain. Post-operative evaluation indicated excellent flap perfusion and viability by thermal imaging, without early complications, hernia defects, ischemia, or seroma recurrence.

Discussion: This case highlights progression to severe fibrosis and fat necrosis when MLLs are underdiagnosed post-trauma and emphasizes the importance of early recognition and intervention. Delayed diagnosis often leads to severe fibrosis, fat necrosis, and chronic complications – conservative treatment failure requiring aggressive surgical intervention. Our experience underscores the need for high suspicion and early intervention in the setting of acute MLL.

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CS-087

The Use of an Axolotl-derived ECM Wound Membranes* in Treatment of a Rural Population

Daniella Patel, BS; Tracy Winkley, PT, CWS, CLT, FACCWS, DAPWCA; Kerry Thibodeaux, MD, FACS, CWSP, FAPWCA

Introduction: This case series observes the use of donated axolotl-derived dermal membrane* in several patients presenting to a rural wound care clinic. The donated membrane is composed of 91% axolotl collagen and 9% other axolotl proteins. The patients observed in this study have conditions such as T2DM and chronic venous insufficiency, predisposing them to ulcerations and poor wound healing.

Methods: Patients were chosen based on failure of wound closure with four weeks of standard treatment measuring less than 20 millimeters in size. Patients received the membrane after debridement of the wound and standard dressing was placed for security. Membranes were replaced if they were no longer visualized or if there were circumstances requiring additional debridement of the wound. Wounds were checked on a weekly basis and measured at the time of initial membrane placement and every new membrane placement for data collection.

Results: Patients experienced anywhere from an 80-90% reduction in wound size in the span of 3-5 weeks of treatment. These patients required two to three membrane placements over the course of therapy and did not experience any adverse effects related to treatment application.

Discussion: The use of the axolotl-derived dermal membrane* resulted in significant improvement in small wounds in a reasonable amount of time. This membrane comes in sizes less than 20 millimeters, allowing for its use for treatment of small wounds. This study is ongoing but would benefit from a larger sample size or the use of a control group. Further research should be done to compare this dermal membrane to similar products on the market as well as to standard treatment. It would be beneficial to observe the time to complete healing and wound recurrence. A cost analysis for this method of treatment compared to others may also be done to determine if rural clinics with limited resources would benefit from its use.

CS-088

Endogenous Endophthalmitis Secondary to Diabetic Foot Osteomyelitis: A Rare Ocular Presentation of Sepsis

Jigar Patel, DPM; Jodi Walters, DPM

Introduction: Endogenous endophthalmitis is a rare but vision-threatening intraocular infection caused by hematogenous spread of pathogens from a distant site. It typically arises in association with systemic infections such as endocarditis, liver abscesses, or intravenous drug use. Diabetic foot infections are common in patients with poorly controlled diabetes, but they are an exceedingly rare source of bacteremia leading to ocular involvement. This case highlights the importance of recognizing atypical presentations of systemic infections in complex wound patients.

Methods: A 64-year-old male with poorly controlled type 2 diabetes mellitus and multiple chronic foot ulcerations presented with acute-onset left eye blurriness and ocular discomfort. He reported recent worsening of a foot ulcer, subjective fevers, and gastrointestinal symptoms. Examination revealed a purulent plantar ulcer without signs of surrounding cellulitis. Visual acuity in the left eye was limited to light perception, with signs of intraocular inflammation. Initial workup included wound, blood, and vitreous fluid cultures, inflammatory markers, and imaging. Local wound care, including offloading and dressing changes, was initiated alongside systemic infection control. Ophthalmology was consulted emergently.

Results: Blood and wound cultures both grew methicillin-sensitive Staphylococcus aureus (MSSA). CT imaging of the foot suggested possible early osteomyelitis. A vitreous fluid aspirate also grew MSSA, confirming endogenous endophthalmitis. The patient received intravitreal vancomycin and ceftazidime, along with intravenous cefepime and vancomycin. Despite prompt treatment, the patient suffered permanent vision loss in the affected eye.

Discussion: This case demonstrates a rare but devastating systemic complication of diabetic foot infection, with bacteremia leading to irreversible ocular damage. While advanced wound technologies were not employed, the patient required coordinated local wound care and systemic management. The case underscores the importance of multidisciplinary collaboration among wound care, infectious disease, and ophthalmology teams. Clinicians should maintain a high index of suspicion for systemic sequelae in diabetic patients with infected wounds, especially when ocular symptoms arise. Early recognition and intervention may preserve vision and prevent further systemic deterioration.

CS-089

Gentian Violet/Methylene Blue Polyurethane Foam (GV/MB PU) in the Longitudinal Management of a Large Abdominal Wound in a Preterm Neonate

Lisanne M. Pessini, BSN, RN, MSN, APRN; Matthew R. Tolliver, RN, BSN, CWOCN

Introduction: Neonatal abdominal wounds pose unique healing challenges, due to fragility of immature skin, susceptibility to infection, and limited treatment data. GV/MB PU, an antimicrobial foam dressing impregnated with gentian violet and methylene blue, supports wound healing through infection control and moisture balance.

Case: A single live female was born at 28 weeks gestation via C-section in the setting of Intrauterine Growth Restriction (IUGR) and maternal gestational hypertension. On Day 3 of life, she developed abdominal distension and pneumoperitoneum secondary to a 4 cm gastric perforation. After Penrose drainage failed, she underwent exploratory laparotomy and mesh closure. Immediate postoperative complications included local cellulitis with elevated inflammatory markers leading to recurrent sepsis, necessitating a second course of IV antibiotics.

Methods: The Wound Care team was then consulted and engaged two months after the initial surgery. Treatment with hypochlorous wound cleanser soaks, GV/MB PU foam, and an overlying occlusive dressing changed every 2–3 days was immediately initiated. Serial assessments were meticulously performed with each treatment, incorporating thorough documentation of wound characteristics, accurate measurements, and standardized photographic evidence.

Results: Throughout this inpatient admission, the wound demonstrated steadily evolving granulation tissue, reduction in size, and no recurrent infection. The patient was subsequently discharged on 10/28/24 with the wound in an excellent state of healing. After discharge, GV/MB PU foam was discontinued at home. At the first outpatient follow up on 11/7/24, the patient was readmitted for substantial wound deterioration and concern for new infection. After restarting GV/MB PU, the wound achieved a therapeutic healing state by 12/8/24.

Discussion: GV/MB PU proved to be a safe, well-tolerated, and valuable tool in promoting closure of a large abdominal wound in a preterm neonate. Rapid wound regression emphasized the importance of consistent advanced wound care in sustaining progress and preventing avoidable re-admissions. The patient's readmission after discontinuation of GV/MB PU therapy highlights the vital role of maintaining care continuity and addressing barriers to caregiver medical competency.

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CS-091

En Bloc MIS Floating Osteotomies for Recalcitrant Wounds Associated with Short Transmetatarsal Amputations

Hoa Q. Phan, DPM; Alexandria Armstrong, DPM; Nicole A. Ebalo, DO; Collin Pehde, DPM

Introduction: Patient with a chronic wound distal medial plantar secondary to a short TMA. Patient was total contact casted for 4 months prior to surgical intervention. Decision was then made to proceed with surgery. Patient with type 2 diabetes complicated by peripheral neuropathy.

Methods: CT was used to evaluate his deformity. Soft tissue was then superimposed on the skeletal anatomy. 3 portals for the osteotomy were made. Step cut osteotomy was then made. Fragment was confirmed to be mobile on intraoperative fluoroscopy. Patient was allowed to weightbear immediately after surgery in a short CAM boot.

Results: This type of osteotomy was stable and adequate for this patient's demands. This type of procedure is ideal for patients who are unable to stay immobilized or have a history of noncompliance. Given the minimal nature of the surgical wound low concern for wound healing complication. Wound has healed at 8 weeks and has not reulcerated. He has returned to diabetic shoes and inserts.

Discussion: This type of procedure may be ideal for patients who are unable to be be nonweightbearing example the sole caregiver, or have history of stroke. It utilizes 2-3 percutaneous incisions. Does not use large incisions such as the case of tendon transfers. Low concern for wound healing complications. It is durable in that the patient has not reulcerated.

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CS-092

Charcot event following transmetatarsal amputation Salvaged via Chopart Amputation

Hoa Q. Phan, DPM; Nicole A. Ebalo, DO; Alexandria Armstrong, DPM; Collin Pehde, DPM

Introduction: Patient with history of transmetatarsal amputation was seen with gas gangrene in the emergency department. patient was emergently taken for open chopart amputation. Patient had extensive history of CAD and T2DM complicated by peripheral neuropathy and refused a more proximal amputation.

Methods: After resolving Patient underwent numerous debridements until he was ready for closure. Patient with extensive history of T2DM and CAD. Patient was optimised and After 10 weeks of aggressive wound care he was fully healed.

Results: The road to recovery was long for this patient. We were unable to stop his brillinta in the setting of his CAD. Patient had septicemia as well on arrival. Despite long odds, the patient was persistent and was able to heal his surgical wound despite his past medical history and social determinants of health.

Discussion: If the patient has adequate perfusion, a primary below knee amputation can be avoided. By salvaging his foot, he was able to return to his ADLs without concern for reulcerating. A charcot event can occur even after amputaiton of the forefoot. Primary amputation can be avoided in patient's with charcot and infection if there is a high index of suspicion. We often find that a charcot event happens after a trauma in the insensate foot. Here we describe a case of a charcot event occurring following an amputation. After literature search, there is only two other papers that has been described that is similar.

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CS-093

Targeted Topical Antimicrobial Therapy in the Management of Recalcitrant Venous Leg Ulcers: A Multi-Case Review

Lisa Piercey, MD, MBA; Jeffery M. King, PharmD; Megan Yoder, RN, BSN, WCC

Introduction: Venous leg ulcers (VLUs) are a common chronic wound type, often resistant to conventional therapies, especially in patients with comorbidities such as diabetes and advanced age. Delayed healing contributes to morbidity and increased healthcare costs, as well as decreased quality of life. This poster presents outcomes from three cases in which patients with non-healing VLUs were treated with customized, culture guided topical antibiotic therapy in combination with standard wound care practices.

Methods: Three patients aged 60 to 84 with longstanding full thickness VLUs were treated, after standard of care (including debridement, compression, and systemic antibiotics) failed to produce healing. Each patient received a tailored topical antimicrobial spray formulated with a combination of generic antibiotics selected based on wound cultures or PCR sequencing. The medications were covered by patients' third party insurance plans and applied alongside conventional wound care treatments.

Results: All three patients experienced clinically significant wound improvement following initiation of the tailored topical antibiotic therapy. In the first case, a patient with polymicrobial infection and antibiotic resistant markers achieved complete closure five months after adding topical therapy. In the second case, an elderly patient with a history of non-compliance showed progressive healing with visible granulation and near total closure (98.8%) by 14 weeks. In the third case, a 75 year old diabetic patient demonstrated near-complete epithelialization of the nonhealing ulcer within four weeks. All patients experienced noticeable decreases in wound odor and drainage within the first week with no adverse reactions being reported.

Discussion: These cases support the integration of culture guided topical antibiotic therapy as an adjunct to standard of care in the management of nonhealing VLUs. Personalized topical antibiotics appear to accelerate healing and may reduce the need for prolonged systemic antibiotics and repeated debridement. These findings highlight the potential for a targeted topical localized approach to improve outcomes in patients with complex wounds.

CS-094

Use of Imaging Across Wound Types: A Case Series

Joanne Quevedo, PT, DPT, MS, CSCS; Edwin Monroy, PT, DPT, CWS, CLT; Stephanie Woelfel, PT, DPT, CWS

Introduction: Chronic wounds affect over 10 million U.S. Medicare beneficiaries, resulting in significant morbidity and healthcare costs.[1]

Accurate, objective assessment is essential for guiding treatment and optimizing outcomes.[2,3] Mobile multispectral near-infrared spectroscopy (NIRS) and thermography offer non-invasive methods to evaluate tissue oxygenation (StO_2) and surface temperature, respectively. These technologies may complement traditional wound measurements in tracking healing.[4–7] This case series explores the utility of NIRS and thermography across diverse wound types.

Methods: This case series included individuals with wounds of varying etiologies (e.g., diabetic foot ulcers, arterial insufficiency, pressure injuries). A pocket-sized multispectral imaging device* was used to measure tissue oxygenation and skin temperature. Data collected included demographics, wound characteristics, imaging metrics, and healing progression.

Results: Seven patients were followed using serial imaging methodology. NIRS demonstrated increasing StO_2 values over time, correlating with clinical signs of healing. Thermographic imaging identified temperature gradients suggestive of inflammation or infection. Pre- and post-debridement imaging revealed improved StO_2 values, supporting the effectiveness of intervention.

Discussion: Multispectral NIRS and thermography provide a multifaceted, objective assessment of wound healing. NIRS offers real-time insight into tissue oxygenation and thermography detects early signs of inflammation or infection. Together, these tools enhance clinical decision-making, support timely interventions, and can be readily integrated into patient care. Using these technologies can offer new diagnostic potential for clinicians, improving patient outcomes.

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CS-095

Bioabsorbable borate-based glass fiber matrix usage in diabetic foot wound closure post surgical intervention

Carmina Quiroga, DPM, CWSP, FACFAS; Rahul Pedagandham, DPM, MS

Introduction: 47 year old male presented to the ED, and our service was consulted to see the patient for a diabetic foot infection. He is Diabetic with peripheral neuropathy so he states he never noticed the wound or causing any pain. He stated he went to the ER when he noticed the wound became malodorous with increased drainage and increased swelling to the right foot and had presented with some chills. He had presented with a plantar aspect right forefoot full thickness ulceration measuring 3.5 cm x 4 cm x 4.5 cm which tunneled plantar to proximal with crepitus and gas gangrene was noted in the foot.

Methods: Patient was taken to the OR for an emergent washout for primary control of osteomyelitis infection and gas gangrene. X-rays were taken post-operatively and still there was some signs of crepitance noted and gas on film and MRI confirmed 4th and 5th rays consisting of osteomyelitis ,so he was taken again to the OR for debridement of all non-viable bone and soft tissue in which the second time 4th and 5th ray resections were performed. Then started NWPT post-operatively to optimize the physiology involved in wound healing by applying sub- atmospheric pressure to help reduce inflammatory exudate and promote granulation tissue. Patient has been on NWPT for about 7-8 weeks consisting of 3x weekly changes which were done with in house with our Podiatry service and wound care team.

Results: Skin substitutes were then discussed with patient to help achieve wound healing. Started to apply glass graft for our patient and patient agreed to proceed with the application of the graft. Each office visit, wound debridement was done and five applications of the graft were applied to the wound

Discussion: Mirragen Advanced Wound Matrix is intended for the management of acute and chronic wounds, including: partial- and full-thickness wounds, pressure ulcers, venous ulcers, diabetic ulcers, chronic vascular ulcers, tunneled/undermined wounds, surgical wounds (donor sites/grafts, post-Mohs surgery), post laser surgery, podiatric wounds, wound dehiscence, trauma wounds (abrasions, lacerations, first- and second-degree burns, skin tears), and draining wounds. With continued discussion of using this specific type of glass graft in healing complex diabetic lower extremity wounds in wound care and podiatry could lead to increased awareness and aid in potentially healing chronic non-healing wounds and surgical wounds the future.

CS-096

Empowering Patients and Enhancing Their Engagement in Wound Care Through Fluorescence and Thermal Imaging

Rose Raizman, RN-EC, PHCNP, NSWOC, MSc; Charles A. Andersen, MD, FACS, FSVS, MAPWCA; Danielle Dunham, MHSc; Micaela D. Gray, MSc; Laura Jones-Donaldson, PhD; Carly M. Knuth, PhD; Hanna Varonina, MSc

Introduction: Effective infection control in outpatient wound care critically relies on patient and/or caregiver adherence to treatment plans. By educating and actively engaging patients during clinic visits, clinicians can empower them to improve treatment adherence, achieve better outcomes, and reduce complication risk. This case series demonstrates how a multimodal fluorescence and thermal imaging system* can be easily integrated into the clinical workflow, enhancing patient understanding, promoting informed participation, and ultimately supporting improved wound healing outcomes.

Methods: We imaged 5 wounds with varying pathologies (callous, pilonidal sinus, surgical site, interdigital, and venous leg ulcer) using a point-of-care multimodal imaging system* across 2 wound care centers. Standard, fluorescence, and thermal images were captured simultaneously and immediately assessed by a clinician. These co-registered images were then shared with the patient and/or caregivers, serving as powerful visual aids. Clinicians utilized these images to educate patients on vital topics including wound hygiene and the rationale behind their treatment plans, with the goal of enhancing patient empowerment and adherence.

Results: Fluorescence imaging was used in three cases, thermal imaging in one, and multimodal imaging in another to enhance patient education and engagement during wound care visits. Fluorescence imaging effectively highlighted bacterial bioburden related to suboptimal self-hygiene, prompting behavioral changes that contributed to faster wound healing. In one case, thermal imaging demonstrated how tight clothing restricted local blood flow, significantly increasing the patient's understanding of factors impeding healing. Lastly, in a seemingly healthy patient, thermal imaging was pivotal in identifying blood flow impairment on a callous that was further revealed to have a high bacterial presence upon fluorescence imaging. Reviewing these combined imaging results with the clinician profoundly motivated the patient to significantly reduce tobacco use.

Discussion: Educating patients on the rationale behind their wound care treatments not only enhances their compliance but also empowers them to actively participate in their healing journey. Collectively, fluorescence and thermal imaging provide clinicians with a powerful visual communication tool to convey the importance of wound management strategies to patients and their caregivers. This directly supports faster healing, improved quality of life, and the prevention of serious complications.

CS-097

Next-generation sequencing as an effective solution for

pathogen identification in difficult to diagnose wounds

Kaitlyn Redford, PhD; Matthew Agsalud, MS4; Natalie Kahle, MSN, FNP-C, DAPWHc

Introduction: Traditional culture and PCR panels are widely used for pathogen identification in wounds, yet both methods have limitations that can lead to inconclusive results. Next-generation sequencing (NGS) offers a more comprehensive alternative when initial testing fails to yield actionable findings. Targeted NGS assays amplify and sequence the 16S rRNA gene in bacteria and the ITS gene in fungi, enabling precise identification of bacterial and fungal species. Additionally, these assays detect common antimicrobial resistance genes, aiding in effective antimicrobial stewardship.

Methods: This study presents three case reports from an industry leader in advanced wound care, demonstrating instances where NGS identified pathogens missed by standard culturing methods.

Results: The first case involved a 43-year-old male with a lower leg traumatic wound and suspected sporotrichosis. Multiple culture tests detected only coagulase-negative *Staphylococcus*, consistent with normal skin flora. However, NGS revealed a fungal infection caused by Alternaria species, allowing for targeted treatment.The second case featured a 75-year-old female with persistent, oozing abscesses on both legs for over a year. Culture results repeatedly showed no growth, leading to empirical treatment with clindamycin, ciprofloxacin, and azithromycin, all of which failed. NGS identified Mycobacteroides, enabling successful treatment with an antimicrobial wound cleanser and gel.The third case involved a 24-year-old female who developed an infection on her buttocks following cosmetic surgery. Culture results were inconclusive, but NGS identified Mycobacteroides species, guiding appropriate antimicrobial management.

Discussion: In all three cases, NGS provided definitive pathogen identification where culture-based methods fell short. Despite differences in patient demographics and wound types, NGS consistently clarified the infectious etiology, underscoring its potential as a valuable tool in wound care. By improving diagnostic accuracy, NGS may enhance treatment strategies and patient outcomes.

CS-098

Peptide Biomimetic Matrix Promotes Wound Closure in Lower Extremity Ulcers by Tissue Regrowth and Revascularization: Monitoring with Multispectral NIRS Imaging

Matthew Regulski, DPM, ABMSP, FASPM

Introduction: Chronic wounds, which affect millions globally, substantially reduce the patients' quality of life and place significant burdens on healthcare systems.1,2 Effective management of lower extremity ulcers requires strategies that enhance tissue regrowth and revascularization. This study evaluates the performance of a polypeptide biomimetic matrix (BMM) designed to support chronic wound healing via a 3D scaffold that resembles the dermal extracellular matrix (ECM) and provides antibacterial protection, using multispectral near-infrared spectroscopy (NIRS) imaging.

Methods: Five patients with multiple comorbidities presenting chronic (>2 months) wounds that failed to respond to previous treatments — diabetic foot ulcers, pressure ulcers, venous leg ulcers — were treated with an FDA-approved flowable BMM*. Multispectral NIRS, infrared (IR) thermal, and digital imaging were captured using a handheld mobile device**. Tissue oxygen saturation (StO_2) was assessed at baseline and continuously monitored during following visits.

Results: All patients responded positively to BMM treatment, showing ischemic area [defined as StO_2 < 39%] reduction and wound healing progression. Complete closure was achieved in all cases. In two cases, rapid ischemic area reduction (>65% reduction after 2-4 applications) was observed, achieving >99% ischemic area reduction within 3 to 5 applications and full wound closure within 7 to 8 applications. In two other cases, slower ischemic area reduction was noted (>65% reduction after up to 9 applications), achieving full wound closure within 10-16 weeks. In one case, while there was no marked reduction in wound surface area within the first 8 applications, a substantial wound depth reduction with granulation tissue formation was observed and accompanied by 86% reduction in ischemic area. In all five cases, an increase in tissue oxygenation was observed with BMM treatment and predicted healing, suggesting healthy tissue regrowth and revascularization, which ultimately resulted in complete wound closure.

Discussion: This case series highlights the potential of BMM in treating hard-to-heal, unresponsive lower extremity wounds by fostering an environment that promotes tissue regrowth and neovascularization. NIRS imaging provided an objective, non-invasive measure of oxygenation, helpful in predicting ulcer healing trajectory and treatment effectiveness. The reduction in ischemic area emerged as a potential marker for assessing tissue regeneration and revascularization.

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CS-099

Pressure Ulcer with Exposed Tendon Heals after Five Applications of a Peptide Biomimetic Matrix

Matthew Regulski, DPM, ABMSP, FASPM

Introduction: Wounds with exposed structures are challenging due to slow healing and high rates of infection and complications. Treatment of complex lower-extremity wounds requires a multifaceted approach including aggressive debridement, moist wound care, blood flow optimization, bioburden reduction, and often flap reconstruction1. Given that flap reconstruction is implausible in high-risk patients, it is critical to find alternative modalities that encourage rapid granulation over the exposed structures and achieve wound closure1. This case report describes the use of a novel biomimetic matrix (BMM) to treat a pressure ulcer with exposed tendon in a patient with numerous comorbidities. BMM is designed to support healing of complex wounds by providing an acellular 3D scaffold for tissue regrowth, with antibacterial protection, delivered via a syringe-based system for precise placement and dead space elimination.

Methods: The patient was an 82-year-old female with uncontrolled diabetes (HbA1c: 11%), vascular disease, severe rheumatoid arthritis, and reduced mobility. She developed a deep pressure ulcer with exposed tendon in the anterior ankle. BMM* was applied topically per the manufacturer's instructions. Wound measurements were recorded at baseline and each following visit. Tissue oxygen saturation (StO_2) was assessed using a multispectral near-infrared spectroscopy (NIRS) imaging device**. Adverse events were monitored throughout the study.

Results: BMM treatment resulted in rapid wound healing progression and ischemic area [defined as StO_2 < 39%] reduction. After a single application, there was substantial wound depth reduction with healthy granulation tissue covering the tendon, accompanied by 23% wound area reduction and 86% ischemic area reduction. Within 4 BMM applications, 82% wound surface area reduction and >99% ischemic area reduction was achieved, resulting in complete wound closure after 5 applications. No adverse events were observed during the study period.

Discussion: BMM successfully facilitated healing of a complex ulcer with exposed tendon in a patient with several risk factors, achieving complete wound closure with just five applications. These findings highlight BMM's potential for rapid healing progression in complex wounds with exposed structures, suggesting an advanced alternative modality. Further studies are necessary to confirm these results and evaluate BMM's performance in a larger patient population.

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CS-100

Peptide-Based Biomimetic Matrix Achieves Rapid Closure of Chronic Venous Leg Ulcers

Matthew Regulski, DPM, ABMSP, FASPM

Introduction: Venous Leg Ulcers (VLUs) are challenging wounds associated with healthcare costs estimated at >$32 billion annually[1], given the delayed healing and high recurrence rates, with only 60% closing by 12 weeks and 75% reappearing within 3 weeks[2]. Despite the severity of the issue and the recent advancements in wound care, VLUs remain an unmet clinical need requiring novel approaches. The objective of this study was to evaluate the safety and performance of an innovative Biomimetic Matrix (BMM) in chronic VLU management. Designed to promote tissue regrowth and prevent infection, BMM is a synthetic extracellular matrix (ECM)-like scaffold made of antibacterial self-assembling peptides that completely conforms to irregular, deep, and hard-to-access wounds.

Methods: Patients with multiple comorbidities [including peripheral vascular disease, diabetes, rheumatoid arthritis, limited mobility, lymphedema] presenting chronic VLUs were selected to receive an FDA-approved flowable BMM*. BMM was used after proper wound bed preparation per the manufacturer's instructions. Wound size measurements were captured at baseline and at each following visit using an artificial intelligence (AI) based imaging software. Clinical observations were recorded at each visit, including wound and peri-wound skin appearance.

Results: All VLUs in this case series responded positively to BMM treatment, showing fast healing progression with substantial wound size and wound depth reduction after 1 to 2 applications. In two cases, approximately 50% surface area reduction was observed after a single application, with full wound closure achieved within five applications of BMM. In three other cases, while the first application did not result in such a marked surface wound area reduction (percent area reduction ranging between 7% and 38%), full closure was still achieved within three to five BMM applications. Complete wound closure was achieved within the study period in all five ulcers. In all cases, early formation of healthy granulation tissue and an improvement in peri-wound skin appearance were noted with BMM treatment. No adverse events were observed.

Discussion: This case series establishes the potential of BMM in treating chronic VLUs by promoting early granulation tissue formation and rapid wound closure. Future studies in a larger population are needed to validate and expand these findings.

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CS-101

Autologous Recycled Skin Grafting for Reconstructive Management of Inflammatory Tetrad Disorders: A Case Series

Jessica T. Reid, Student; Laurel Adams, BS; Lilli Albucker, BS; Abigail Chaffin, MD, FACS, CWSP, MAPWCA; Molly Gaffney, BS; Tatjana Mortell, MD

Introduction: The inflammatory tetrad is comprised of hidradenitis suppurativa, acne conglobata, dissecting cellulitis of the scalp, and pilonidal disease. These diseases are chronic, relapsing dermatologic conditions characterized by follicular occlusion, rupture, and suppurative inflammation. These disorders often present in young adults and can significantly impair quality of life. Surgical excision is the mainstay of treatment in advanced cases but presents reconstructive challenges due to delayed wound healing, high recurrence rates, and limited availability of healthy donor skin.

Methods: We describe a case series involving three patients with severe manifestations of inflammatory tetrad disorders. Each patient underwent wide local excision of involved tissue followed by autologous recycled skin grafting. In this technique, excised skin was processed intraoperatively, removing diseased elements while preserving viable dermal and epidermal layers and reapplied to the wound bed as graft material. This approach aimed to minimize the need for traditional donor sites and reduce overall operative morbidity.

Results: All three patients demonstrated complete graft take without major complications such as infection, necrosis, or graft failure. Donor-site morbidity was effectively eliminated, and all wounds healed within an acceptable postoperative period. Patients reported minimal postoperative discomfort, and both functional and aesthetic outcomes were favorable. No clinical signs of recurrence were observed during follow-up ranging from 3 to 6 months.

Discussion: Autologous recycled skin grafting represents a promising reconstructive option for patients with extensive inflammatory skin disease, particularly when comorbidities or disease extent preclude conventional grafting. By reutilizing the patient's own skin, this technique conserves tissue, reduces operative time, and supports rapid healing while avoiding the complications associated with donor-site harvesting. Further study is warranted to evaluate long-term outcomes and broader applicability in similar high-risk populations.

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CS-102

The Use of Novel Formulation of a Known Wound Care Product: Pure Hypochlorous Acid Gel

Jessica T. Reid, Student; Laurel Adams, BS; Abigail Chaffin, MD, FACS, CWSP, MAPWCA; Joshua Dickerson, MD; Molly Gaffney, BS; James Pai, MS

Introduction: Hypochlorous acid (HOCl), a naturally occurring molecule produced by neutrophils during the oxidative burst, plays a critical role in innate immunity due to its potent antimicrobial and anti-inflammatory properties. Recent advancements in biotechnology have enabled the stable formulation of pure HOCl in topical gels, offering a promising therapeutic option in wound management and dermatologic care. Pure HOCl gel has demonstrated broad-spectrum efficacy against wound infection while exhibiting low cytotoxicity to human tissues. Its ability to reduce biofilm burden, modulate local inflammation, and support tissue healing makes it particularly advantageous in the treatment of chronic wounds, surgical incisions, burns, and inflammatory skin conditions. This introduction explores the clinical utility, mechanism of action, and emerging applications of pure HOCl gel in both acute and chronic wound care settings.

Methods: We present a case series involving multiple patients with varied wound etiologies, both operative and non-operative, managed with a pure hypochlorous acid (HOCl) gel formulation as part of their wound care regimen. These patients presented with a range of complex wounds requiring advanced wound care and the application of innovative treatment modalities

Results: Across cases, treatment with HOCl gel was associated with favorable outcomes, including reduced bioburden, accelerated wound healing, and improved wound skin integrity.

Discussion: Historically, pure hypochlorous acid solution has been utilized intraoperatively prior to wound closure and as a soak for graft sites, demonstrating favorable outcomes in infection control and healing. The development of a stable HOCl gel formulation represents a novel extension of this established antimicrobial agent. This formulation offers the potential for broader clinical application, particularly in wounds at increased risk for bacterial contamination, where sustained antimicrobial activity and biocompatibility are critical for optimal healing. Our findings

are overall positive and support the need for further study and application of treatment to a broader patient population.

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CS-103

The Innovative Use of Piscine Graft in Managing Atypical Wounds in Critical Preterm Neonates

Roxana Reyna, MSN, APRN, NP-C, CWON-AP; Vanessa Dimas, MD

Introduction: The management of atypical wounds in critically ill preterm neonates presents a significant challenge due to their fragile condition and the limitations of traditional surgical interventions. This study evaluated the use of fish skin grafts (FSG) on two critically ill preterm neonates who were unable to undergo surgical treatment for atypical wounds. One infant had a large abdominal wound from a fungal infection, and the other had a significant neck wound due to necrotizing fasciitis. Autologous skin grafts were not feasible for these patients.

Methods: A novel approach was employed where medical-grade honey served as a debriding agent for most of the wound bed preparation. Minor sharps debridement was done. Piscine skin graft particles were mixed with honey and applied to the wounds. The wounds were covered with white silicone foam as a bolster, secured with a silicone border dressing. Dressing changes were performed every 5 to 7 days until the wounds healed.

Results: The FSG was applied without a fully clean wound bed and incorporated during a period of suboptimal oxygenation, perfusion, and nutrition. Despite this, the wounds, which covered large areas, healed with minimal scarring.

Discussion: The successful application of FSG for the non-surgical management of atypical wounds in preterm neonates highlights its promising potential in clinical practice. The absence of adverse reactions and the avoidance of additional surgical interventions illustrate the method's safety and efficacy. Furthermore, the application at the bedside without the need for pain medication and the result of minimal scarring emphasize its advantages in care delivery in this vulnerable population.

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CS-104

Point-of-Care Multimodal Imaging in Mobile Wound Care: Insights from a Case Series

Alexxia Richmond, APRN, CWS, CWOCN, CFCN

Introduction: Chronic wounds—including pressure injuries, diabetic foot ulcers, and vascular ulcers—pose unique diagnostic challenges in mobile wound care settings, where access to advanced diagnostics such as vascular studies is limited.[1,2] Multimodal imaging, which combines digital photography, near-infrared spectroscopy (NIRS), and thermography, presents a portable, point-of-care solution. This case series explores the clinical utility of a pocket-sized multispectral imaging device* to support decision-making and optimize outcomes in mobile wound care practice.

Methods: A case series was conducted involving five patients with chronic wounds (including diabetic foot ulcers, arterial insufficiency, and pressure injuries) managed in mobile care settings. A multimodal imaging device* was used to capture tissue oxygenation (StO_2) and skin surface temperature at the point of care. The device was used to guide clinical assessment and treatment planning.

Results: Cases 1–2: Combined thermography and NIRS imaging supported differentiation between skin failure and hospital-acquired pressure injuries (HAPI) by identifying characteristic perfusion and temperature patterns in areas prone to pressure injury.[3] Case 3: Periwound tissue demonstrated low oximetry readings (17–30%), prompting referral for vascular assessment. Thermography revealed early signs of infection, with a temperature gradient between the wound bed (88°F), immediate periwound (86°F), and distal periwound (91°F). Case 4: In a diabetic patient, NIRS imaging confirmed adequate perfusion to proceed safely with debridement. Case 5: A patient with arterial disease post-fem-fem bypass and partial foot amputation (11/18/2024) was monitored. NIRS confirmed restored blood flow. Thermography provided early markers of infection, aiding timely intervention.

Discussion: Multimodal imaging facilitated early detection of perfusion deficits and infections, significantly enhancing clinical decision-making in mobile wound care. The portable device enabled comprehensive assessment, real-time documentation, and integration with a HIPAA-compliant portal—improving care coordination. This approach demonstrated potential to reduce complications and improve wound management in resource-limited settings.

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CS-106

Use of a Three-Dimensional Wound Matrix in Previously Radiated Tissue Wounds: A Case Series Analysis

Kelly M. Roberts, FNP, CWS

Introduction: Breast cancer treatment frequently involves radiation therapy, which, while effective in targeting cancer cells, can result in tissue damage and chronic, non-healing wounds. These complex wounds present significant challenges for patients and healthcare providers, often requiring multifaceted approaches to promote healing. Standard treatments include advanced wound matrices, negative pressure wound therapy (NPWT), and hyperbaric oxygen therapy (HBOT). Each modality plays a role in addressing the challenges of wound healing in radiated tissues. This case series evaluates the use of Miro3D (Reprise Biomedical, Inc., Plymouth, MN), a novel three-dimensional (3D) porcine-derived wound matrix, in patients with wounds resulting from breast cancer treatment involving radiation therapy.

Methods: A case series analysis was conducted on three patients with non-healing wounds caused by radiation therapy during breast cancer treatment. All patients received Miro3D applications as part of a tailored wound management protocol. Data collected included the number of applications, use of adjunctive therapies (e.g., HBOT, NPWT), and overall wound healing outcomes. The analysis aimed to identify trends in healing timelines and assess Miro3D's effectiveness in these challenging cases.

Results: Complete wound healing was achieved in all three cases with just two to three applications of Miro3D. The wounds, characterized by significant depth, tunneling, and/or undermining, had persisted for 103

to 345 days before treatment. Remarkably, complete healing was achieved in as little as 68 days following the initial application of Miro3D. Notably, one case healed without HBOT, demonstrating the matrix's efficacy without adjunctive oxygen therapy. Another case achieved complete resolution after prior unsuccessful treatment with another flat matrix, further underscoring Miro3D's potential.

Discussion: This case series highlights Miro3D's ability to support healing in complex wounds with minimal applications. Its use in previously radiated tissue wounds demonstrates promising outcomes, particularly in cases with significant challenges such as depth, tunneling, and undermining. Continued research and clinical application of Miro3D acrossdiverse wound types will be important for understanding its potential. By focusing on patient-centered care and leveraging innovative adjunctive solutions like Miro3D, healthcare providers may enhance healing outcomes, reduce recovery times, improve patients' quality of life, and reduce the overall burden of healthcare-associated costs. Faster wound healing not only translates to cost savings but also reduces the risk of infections and related complications, which is especially critical for this fragile patient population.

CS-107

Fish skin is a superior acellular dermal matrix for the treatment of Radiation Injury from cancer treatment

Michael Romberg, MD

Introduction: Radiation injury is tissue damage from exposure to ionizing radiation, especially during cancer treatment which can significantly impair wound healing due to cellular damage, microvascular changes, and altered cytokine levels, potentially leading to chronic wounds and infections as well as damaged blood vessels, causing reduced blood flow and oxygen supply to the wound affecting collagen production and strength.

Fish skin graft (FSG) is a unique biologic scaffold. FSG is rich in Omega3 anti-inflammatory, promotes cellular ingrowth, neovascularization and aids tissue infill and remodel. We hypothesize that FSG, can be used as part of the surgical intervention for radiation injury wound treatments aiding in tissue formation, vascularization and cellular ingrowth.

Methods: A pilot study of 2 patients with radiation injury wounds were treated. Wounds were debrided. Fenestrated FSG was placed at the base of the wound and sutured in place. Wounds were left open and packed. Dressings applied and wounds were followed to closure.

Results: Complete healing achieved. One time application of FSG led to successful healing time. Patients noticed significant scar reduction and experienced no pain immediately after application of FSG.

Discussion: FSG has shown to be an effective alternative to conventional surgical intervention of radiation injury wounds as opposed to standard of care or traditional gold standards. The use of FSG is safe, prevents seroma formation, induces decreased inflammation and scarring, rapid cell ingrowth and neovascularization, low immunogenicity and bacteriostatic properties. FSG is a promising option for treating radiation injury because of rapid healing with reduced infection rates.

CS-108

Fish skin is a Superior Acellular Dermal Matrix for the Treatment of Donor Site Management in Split Thickness Skin Grafts

Michael Romberg, MD

Introduction: For split-thickness skin grafting (STSG), common donor sites include the thigh (anterior or lateral), but other areas like the buttocks, upper arm, or scalp can also be used, depending on the location and size of the area needing grafting. In skin grafting, the donor site is the area of the body where healthy skin is taken to be transplanted to another area where skin is damaged or missing.

Fish skin graft (FSG) is a unique biologic scaffold. FSG is rich in Omega3 anti-inflammatory, promotes cellular ingrowth, neovascularization and aids tissue infill and remodel. We hypothesize that FSG, can be used as part of the surgical intervention for donor site management treatments aiding in tissue formation, vascularization and cellular ingrowth.

Methods: A pilot study of 2 patients. Fenestrated FSG was placed at the base of the donor site for STSG. and sutured in place. Gauze dressing applied and wounds were followed to closure.

Results: Complete healing achieved. One time application of FSG led to successful healing time. Patients noticed significant scar reduction and experienced no pain immediately after application of FSG.

Discussion: Conclusion Applying FSG to donor sites for STSG expedites healing time. Use of FSG is safe, induces decreased inflammation and scarring, rapid cell ingrowth and neovascularization, low immunogenicity and bacteriostatic properties. FSG is a promising option for donor site management treatments aiding in tissue formation, vascularization and cellular ingrowth.

CS-109

Management of full thickness lower extremity wound in patient suffering with drug and opioid addiction

Joseph Rudolph, MSN, RNFA, CWOCN, DWC; John Fernandez, MD, FACS; Kelsey Robins, MS, PA-C

Introduction: A 28-year-old male with a past medical history of chronic lower back pain secondary to a motor vehicle accident (MVA) was admitted to the ICU for altered mental status (AMS) due to a drug overdose, which was confirmed to include cocaine, fentanyl, and other opioids. Additionally, the patient tested positive for COVID-19 and was found to have a right lower extremity (RLE) non-traumatic compartment syndrome with acute rhabdomyolysis. This case report details the patient's complex hospital course, management, and outcomes, including wound care, surgical interventions, infectious disease (ID) management, and rehabilitation.

Methods: Upon admission, the patient required emergency intervention by Orthopedics for a right lower leg fasciotomy, followed by the application of a wound vacuum (VAC). The patient's hospital course was complicated by an unsuccessful extubation due to negative pressure pulmonary edema, fever, and right middle and lower lobe consolidations. Due to persistent hypoxemia, the ID team was consulted, leading to a regimen of vancomycin and Zosyn, later modified to ceftriaxone and metronidazole. The patient successfully extubated a week after admission and was subsequently downgraded to the general medical floor two days later. After completing COVID-19 treatment and quarantine, he was discharged from the ICU. Pre-discharge evaluations by Physical Medicine and Rehabilitation (PMR), Physical Therapy (PT), and Occupational Therapy (OT) were conducted to assess his readiness for acute rehabilitation. Two weeks after being admitted, the patient underwent successful soft tissue grafting using TheraSkin for the RLE fasciotomy.

Results: The soft tissue graft was successful without complications. During rehabilitation, the patient demonstrated improvement in functional mobility, progressing to a modified independent (Mod I) level with the use of assistive devices. The patient tolerated all sessions well, including wound care and VAC management

Discussion: This case highlights the challenges of managing a patient with multiple comorbidities, including drug overdose, opioid and drug addition, COVID-19, and acute compartment syndrome requiring surgical intervention. The interdisciplinary approach, involving critical care, infectious disease management, surgery, and rehabilitation, was pivotal in the patient's recovery. The patient's successful extubation, wound healing, and rehabilitation outcomes underscore the importance of timely surgical and medical interventions, as well as comprehensive rehabilitation planning. Utilizing TheraSkin graft compared to split thickness skin grafting allowed for better pain controlled, reduced need for IV and oral narcotics during and post hospitalization, enhanced focus on opioid & drug recovery, eliminated donor site morbidity, all while achieving full epithelialization with only one application.

CS-110

Vibrational Debridement with a Novel Thermo-reversible

Antimicrobial Wound Gel Turns a Non-healing Venous Leg Ulcer (VLU) to a Healing VLU

Miloslav Sailer, PhD; Robert Huizinga, PhD; Iris Noland, MD; Rohan Pointer, MD

Introduction: Debridement is critical for successful wound healing. The debrided wound then needs to be kept moist using a novel antimicrobial wound gel to treat bacteria and biofilm left in the wound. A vibrational debridement tool (VDT) followed with treatment with a novel thermo-reversible antimicrobial wound gel (TRG) was used on a 72-year-old female with a history of chronic obstructive pulmonary disease and multiple left ankle surgeries following a fracture in her youth. She presented with a venous ulcer located on the medial aspect of her left ankle. Despite maintaining a high level of physical activity (walking more than 5 km daily) the ulcer had remained unhealed for two years. Previous treatment with compression bandaging had not led to improvement. The chronic and non-responsive nature of the wound left the patient feeling discouraged and hopeless.

Methods: A new outpatient intervention was initiated, consisting of weekly mechanical debridement using VDT, followed by TRG to support autolytic debridement and healing. The TRG features a unique triple-action formulation for biofilm disruption and protease inhibition, PHMB for sustained antimicrobial protection, and a concentrated surfactant gel which promote tissue repair.

Results: Over the course of eight weeks, the patient achieved a greater than 60% reduction in wound surface area. The treatment was well tolerated, with no reported side effects. In addition to the physical healing observed, the patient reported improved morale and renewed optimism in the healing process.

Discussion: This case illustrates the potential benefits of combining a mild mechanical debridement tool (VDT), with the novel thermo-reversible antimicrobial wound gel in the management of chronic venous leg ulcers that have not responded to standard care. The outcome highlights a practical and effective strategy for outpatient wound care, offering both clinical and psychosocial benefits to patients with hard-to-heal ulcers.

CS-111

Clinical Use of a Novel Thermo-reversible Antimicrobial Wound Gel to Fill Deep Cavity Wounds and Reduce Pain and Exudate Levels

Miloslav Sailer, PhD; Robert Huizinga, PhD; Iris Noland, MD; Rohan Pointer, MD

Introduction: Deep cavity wounds are challenging to manage, especially when colonized by multidrug-resistant organisms and where in-hospital care is not an option. Pain and exudate control are crucial for improving patient quality of life. Topical treatments for deep cavity wounds typically suffer from lack of surface contact due to the inaccessible nature of the wound. A product that can change its physical form from a fluid state, that can be poured into the deep cavity, into a solid state for retention in the wound is needed for an effective treatment. Previous data with a novel thermo-reversible Antimicrobial Wound Gel (TRG) has demonstrated broad-spectrum antimicrobial action while promoting healing in wounds colonized by resistant bacteria. This case study demonstrates the effectiveness of TRG in treating a complex stage 4 pressure wound.

Methods: The TRG is cooled to < 15 °C prior to application, used on the cavity during every dressing change where it solidifies in place. Exudate levels, pain, wound size, and quality of life were monitored.

Results: In November 2023, a 77-year-old male with paraplegia and multiple comorbidities developed a stage 4 sacral pressure wound colonized with MRSA and ESBL Klebsiella. Upon admission to long-term care in May 2024, the patient was bedbound, with retained packing in the wound. By December 2024, his condition had worsened. Dressing changes caused severe pain, and significant purulent-serosanguineous drainage was present, contributing to psychological distress. TRG treatment began on January 17, 2025. Within 2 dressing changes, exudate levels noticeably decreased, and dressing changes became pain-free. Notably, the patient reported no pain during care sessions for the first time since the wound developed. After three weeks, wound measurements showed a reduction in size. The patient was able to sit and dine communally, significantly enhancing his quality of life.

Discussion: The novel TRG allows for painless application to deep cavity wounds improving patient tolerance and outcomes. Exudate levels and reported pain were reduced in a complex stage 4 wound. TRG offers a promising solution for managing chronic wounds in the outpatient setting, particularly in cases with limited treatment options, by reducing pain, controlling exudate, and enhancing quality of life. Further clinical studies are recommended to validate these results.

CS-112

Transformative Impact of Vaporous Hyperoxia Therapy on Complex Wound Healing

Anna Sanchez, DPM; Donna Sage

Introduction: Chronic wounds impact nearly 7 million Americans, including 2 million individuals suffering fromdiabetic foot ulcers. Without timely, effective intervention, these wounds often lead to infections,hospitalizations, and amputations, contributing to an estimated $50 billion annual burden on Medicare(Cho et al., 2022). The rising prevalence of obesity, diabetes, and cardiovascular disease furtherexacerbates the problem, underscoring the urgent need for innovative treatment solutions. VaporousHyperoxia Therapy (VHT) is a promising wound care modality that alternates cycles of hydrating vaporand concentrated oxygen to accelerate tissue healing. This adjunctive therapy presents a novelapproach to improving outcomes in chronic wound management

Methods: This case series assessed the outcomes of four patients with chronic lower extremity wounds treatedusing a multimodal protocol that incorporated VHT*. Patients received 2–3 VHT sessions per week.Near-Infrared Spectroscopy (NIRS) and thermography imaging** were utilized pre- and post- VHT anddebridement sessions to monitor changes in tissue oxygenation and temperature. Clinical outcomes,including wound size reduction, granulation tissue formation, and improvements in tissue oxygenation,were tracked over a follow-up period of up to 12 weeks.

Results: The integration of VHT into the treatment protocol resulted in significant clinical improvements. All fourpatients experienced pain reduction within 12 weeks. Wound surface areas decreased over the 12-week period too. Peri-wound tissue oxygenation showed marked improvement after each VHTsession, with an increase of over 10% after four sessions. Oxygenation within the wound bed improvedmore gradually but also exhibited positive healing trends, supporting favorable wound healingtrajectories.

Discussion: This study demonstrates the transformative potential of VHT as an adjunctive treatment for complexwounds. The combination of VHT with advanced imaging technologies enables precise, data-driventherapeutic adjustments, facilitating personalized care. These findings provide compelling evidence forthe broader clinical adoption of VHT and its integration into advanced wound care protocols.

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CS-113

Topical Botanical Hydrogel Use in Managing a Complex Leg Wound in a Ninety-Seven-Year-Old Patient

Dmitry Sandler, DPM, FACFAS, WCC

Introduction: Chronic non-healing wounds in elderly patients, especially those with hardware exposure, pose significant clinical challenges. This case study highlights the successful management of a complex low-

er extremity wound in a 97-year-old female patient with a decades-old orthopedic implant and recent chronic wound development. Prior conservative approaches failed to achieve wound closure, prompting a novel approach combining surgical and topical treatment strategies.

Methods: The patient presented with a large, chronic anterior tibial wound with exposed tendon and orthopedic hardware, unresponsive to previous care involving topical antimicrobials, debridement, and negative pressure wound therapy. Surgical excisional debridement and removal of the internal fixation hardware were performed, followed by partial closure of the wound edges. Post-operatively, Lavior Wound Gel* was applied weekly in-office, and the patient's family maintained twice-weekly dressing changes at home using the same gel and standard dressings (Adaptic, gauze, Kerlix, Medifix tape, and ACE wraps). Clinical progress was monitored for three months.

Results: Within one month of initiating Lavior Wound Gel* treatment post-surgery, the wound demonstrated substantial granulation tissue formation and reduction in depth. By the second month, wound closure was well underway, with robust epithelialization and absence of infection. At the three-month mark, the wound had nearly completely closed, with no exposed structures and healthy tissue growth. No signs of reinfection or adverse reactions were observed during the treatment period.

Discussion: This case demonstrates that elderly patients with chronic, complex wounds—particularly those complicated by orthopedic hardware exposure—may benefit significantly from a dual approach involving surgical intervention and consistent topical treatment. The integration of Lavior Wound Gel* into the post-operative wound care regimen appeared to support granulation and tissue regeneration, contributing to successful wound closure without infection. This case adds to the growing body of evidence supporting the role of botanical and bioactive topical agents in advanced wound care and offers a practical framework for treating similarly complex presentations in geriatric populations.

CS-114

Improvement in Healing of Stage 4 Pressure Injuries with Negative Pressure Wound Therapy: Case Study

Lisandra Santos del Castillo, APRN

Introduction: This case study highlights the diagnostic and therapeutic challenges in managing a bedbound patient with various chronic conditions, including multiple sclerosis (MS), functional quadriplegia, peripheral vascular disease (PVD), and recurrent pressure ulcers. This case underscores the need of a multidisciplinary approach to address complex clinical situations, such as multifactorial encephalopathy, systemic infections, and chronic wound treatment. It provides essential insights into the management of individuals at heightened risk for systemic repercussions due to substantial comorbidities and immobility.

Methods: Weekly follow up and wound vac changes by wound care expert.

Results: Significant improvement in healing and size of the wound.

Discussion: This case exemplifies the complex interaction of many chronic conditions in a bedbound patient suffering from multifactorial encephalopathy and systemic infections. Prompt diagnosis of the root causes, effective infection control protocols, and coordinated therapy among neurology, infectious disease, wound care, and vascular surgery teams were crucial for improving the patient's outcomes. This case underscores the need for meticulous supervision, tailored therapeutic approaches, and proactive wound management in patients with elevated risk factors. It emphasizes the need of addressing the social and functional factors that contribute to persistent problems in bedbound patients. Clinical Course: The patient was admitted with a preliminary diagnosis of multifactorial encephalopathy, perhaps associated with sepsis, osteomyelitis, and a chronic urinary tract infection, while the differential diagnosis included cerebrovascular accident (CVA). Imaging and diagnostic assessments were sought, including an MRI/MRA of the brain (preferably with IVC filter), 2D echocardiography, and arterial duplex studies. The first treatment was intensive intravenous hydration to control hypertension, so limiting ischemic damage, along with the administration of broad-spectrum antibiotics (Zosyn and vancomycin, later transitioned to daptomycin and ceftriaxone). The patient's critical pressure ulcers need urgent assistance from the wound care and surgical teams. Surgical debridement revealed unstageable pressure injuries on the sacrum and contralateral ischium, disclosing stage 4 lesions after the removal of necrotic tissue. A vacuum-assisted closure (VAC) system was used for sacral and bilateral ischial wounds. Infectious disease specialists were consulted for recommendations about prolonged antibiotic therapy for osteomyelitis and persistent MRSA infection. In the following months, the patient had extensive monitoring and multidisciplinary care. Upon readmission six months later, significant wound healing was seen, along with improved systemic infection control and stability in her overall health. The VAC treatment aided in the management of her chronic pressure injuries; nevertheless, anticoagulation medication continued because of her history of DVT and PVD.

CS-115

Living Skin Allograft for Pyoderma Gangrenosum (PG): A Case Study of Successful Wound Healing

Heather Schuster, MPAS, PA-C, CWS; Alyssa B. Cromer, BS, CMW

Introduction: Pyoderma gangrenosum (PG) is a rare and complex inflammatory skin condition characterized by ulcerative lesions that can be challenging to diagnose and treat. Given the lack of definitive diagnostic markers and a standardized treatment protocol, PG management often requires a multidisciplinary approach. Misdiagnosis and inappropriate interventions can lead to treatment delays and worsened outcomes.

Methods: This case study describes the treatment of a patient with chronic PG ulcers who had previously undergone multiple unsuccessful therapies. The patient received a cryopreserved, living split-thickness skin allograft in combination with wound debridement to support healing. The graft included preserved native living cells, growth factors, and native extracellular matrix, which may help support wound repair. Progression of healing was monitored over several months, assessing wound size reduction and symptom relief.

Results: The patient exhibited significant wound healing following the introduction of the cryopreserved split thickness skin allograft. Wound 1, which had remained relatively unresponsive to prior conventional treatments for 1 O years, achieved full closure within six months of graft application. Wound 2, a larger ulcer that was also present for 1 O years, demonstrated progressive improvement and was fully healed in 11 months. Additionally, the patient reported notable pain reduction for both wounds associated with wound closure.

Discussion: This case highlights the potential of cryopreserved skin allografts as a valuable treatment modality for PG, particularly in cases unresponsive to conventional therapies. While individual case studies cannot predict outcomes for all patients, the successful wound closure and symptom resolution observed here suggest that such grafts may serve as an effective component of PG management. Further research is warranted to evaluate their broader clinical applicability.

CS-116

Regenerative Healing of a Chronic Diabetic Foot Ulcer Using a Borate-Based Bioactive Glass Fiber Matrix in Conjunction with Offloading via Charcot Restraint Orthotic Walker: A Case Study

Natalie Scott, BSN, RN, CWOCN; Magen Bissell, AGNP-C, WCC, OMS

Introduction: Chronic diabetic foot ulcers (DFUs) are a leading cause of lower extremity amputation, contributing to >85% of diabetes-related limb loss globally.[1] Approximately 40% of DFUs fail to heal despite appropriate offloading and use of advanced wound care modalities. These

refractory wounds are characterized by dysregulated inflammation, cellular senescence, impaired angiogenesis, and disrupted extracellular matrix (ECM) remodeling.[2-4] Borate-based Bioactive Glass Fiber Matrix (BBGFM), have demonstrated regenerative potential via ionic dissolution products that modulate macrophage phenotype, enhance angiogenic signaling, and promote fibroblast-mediated ECM deposition.[5-7] This case study examines the use of a bioabsorbable BBGFM in conjunction with strict offloading using a Charcot Restraint Orthotic Walker (CROW) for a recalcitrant plantar DFU unresponsive to prior interventions.[8]

Methods: A 65-year-old male presented with a 3-year history of a recalcitrant plantar DFU, characterized by repeated cycles of reopening and delayed healing. The wound had failed to respond to standard of care and multiple cellular and tissue-based products (CTPs). A new protocol was initiated using a (BBGFM) applied weekly for five consecutive treatments. The patient was fitted with a (CROW) to provide offloading throughout the study period. Wound healing progression was assessed using measurements of wound, percentage granulation, and epithelialization. The matrix's biocompatibility, ease of application, and any adverse events were also recorded.

Results: The wound demonstrated robust granulation and progressive epithelial migration within the first 3 applications of the BBGFM. After the fifth treatment, the wound was fully epithelialized with complete resolution of drainage and no clinical signs of infection or local inflammation. Offloading with the CROW boot was maintained without interruption. The BBGFM was well-tolerated, conformed easily to the wound bed, and integrated seamlessly into outpatient wound care protocols. The temporal correlation between BBGFM application and accelerated healing supports its role in re-establishing a regenerative wound environment.

Discussion: This case provides clinical insight into the efficacy of Borate-based Bioactive Glass Fiber Matrix (BBGFM) therapy in the management of a chronic diabetic foot ulcer (DFU) complicated by underlying Charcot neuroarthropathy. The observed wound progression suggests that the matrix's ionic bioactivity—when combined with mechanical offloading via a Charcot Restraint Orthotic Walker (CROW)—may help restore a favorable healing trajectory in recalcitrant ulcers associated with structural deformity. These findings underscore the potential role of BBGFM as an adjunctive therapy in limb salvage protocols for high-risk patients. Further controlled studies are warranted to validate these outcomes and determine optimal integration into multidisciplinary wound care strategies.

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CS-117

Diabetic Foot Wounds Status Post Transmetatarsal Amputation With Healing Assisted by Use of Intact Fish Graft

Randy Semma, DPM

Introduction: Transmetatarsal Amputations have been a versatile procedure in the armamentariums of surgeons performing limb salvage procedures. In many cases involving large amounts of tissue loss secondary to infection, primary closure is not always achievable. In these instances, advanced wound care modalities must be employed in order to achieve closure in a successful and timely fashion. The mortality rates surrounding amputations continue to rise.[2] According to Armstrong et. Al. in 2020, The five- year mortality rate surrounding major amputation of the lower extremity was noted to be 56.6%. Minor amputations had a mortality rate of 46.2%.[1] As a comparison, the five year pooled mortality rate for all reported cancers during this time span is 31% according to the American cancer society and the National Cancer Institute.[3] Due to the graveness and cost of proximal amputations, providers work tirelessly to avoid amputations and heal wounds in both a timely and successful manner. One way this has been possible is with the use of split thickness skin grafts. Skin grafting is one of the most reliable and effective methods of wound closure in complex ulcers and amputations.[4] A meta-analysis performed by Yammine Et. Al. in 2019 reviewed the outcomes of STSG in 757 patients.[4] This study concluded that STSG was an ideal method of treating non-infected ulcers of the lower extremity.Our case series involves 2 patients with diabetic foot infections that ultimately required Transmetatarsal amputations. These amputations were unable to close via primary intention. A stepwise approach along with split thickness skin grafting was utilized to ultimately heal the Transmetatarsal sites.

Methods: 1. Infection Control: Remove all non-viable tissue and bone and treat with appropriate antibiotic therapy. 2. Application of wound vac with repeated allograft application allowing for promotion of granulation tissue. This should be continued until wound bed reaches level of surrounding epithelium. Once wound is at a level for grafting, a STSG should be utilized.

Results: The use of local wound care, Kermis skin graft and split thickness skin graft can provide excellent long-term results in healing transmetatarsal amputation with subsequent closure assistance.

Discussion: In conclusion, split thickness grafting has been a useful technique in amputations that are unable to be closed primarily.[4] In the two cases that have been presented, further proximal amputations were avoided with local wound care and with the aid of STSG.

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CS-118

Limb Salvage of DFUs Using ON101 Topical Cream: Real-World Evidence

Mohamed I. Sharkawy, MD

Introduction: Diabetic foot ulcers (DFUs) are a common major complication of diabetes, especially in patients with poor glycemic control, diabetic foot deformity and infection. Infected DFUs, particularly Wagner grade 1–3, often respond poorly to standard treatments and carry a high risk of amputation. This study assessed the real-world effectiveness of ON101 topical cream in treating infected DFUs.

Methods: A prospective study included 39 patients with DFUs (IDSA 2). Among them, 25 received ON101 as monotherapy, and 14 received ON101 in combination with other adjuvant measures (negative pressure

wound therapy (NPWT), Granulox spray or oxygen therapy) for 1–2 weeks due to complicating factors. All patients had poorly controlled diabetes (mean HbA1c: 9.8%). The average ulcer size was 24.2 cm^2 in the monotherapy group and 48.4 cm^2 in the combination group, with a mean ulcer duration of 8.2 months. Over 95% were Wagner grade ≥2, and 51.3% of ulcers were plantar. All patients were submitted to thorough investigations to detect etiological factors for wound retarded healing in each case, proper management concomitantly with ON101 cream application

Results: ON101 cream achieved rapid healing: 48.7% wound closure at 4 weeks; 71.8% at 6 weeks; 100% at 16 weeks. Mean time to closure was 5.2 weeks overall, and 4.3 weeks in monotherapy cases. On average, fewer than two tubes were used per patient. In complex wounds with tendon or bone exposure, the combination of ON101 with NPWT optimized the wound bed, enabling successful grafting or closure within 2–3 weeks and reducing hospitalization time.

Discussion: ON101 topical cream demonstrated significantly faster healing in high-risk, infected DFUs compared to published healing rates (27.5% at 6 months; 44.5% at 12 months). It proved effective as both a standalone and adjunctive therapy, enhancing granulation, reducing healing time, and potentially lowering amputation risk and medical burden. These findings support ON101 as a promising addition to the DFU treatment algorithm.

CS-119

Efficacy and Safety of ON101 Topical Cream for Diabetic Foot Ulcers: A Multinational Real-World Study to insure limb salvage, fast healing & Reduction of Hospital Re-admission

Mohamed I. Sharkawy, MD; Sanjay Sharma, MD., MS, FDFM, FFPM; Vadim Glukh, DPM, FACFAS, DABPM; Narendranadh Meda, MBBS, MS, DNB; Rajesh Kesavan, MBBS, MS., FPS; Brock A. Liden, DPM

Introduction: Diabetic foot ulcers (DFUs) are a serious complication of diabetes, often resulting in delayed healing, recurrent infections, frequent hospital re-admissions and high limb loss rate. ON101 topical cream is formulated to support wound healing by promoting fast tissue healing process in a moist environment. This multinational, real-world study assessed the efficacy, safety, and reduction of hospital re-admissions in patients with DFUs.

Methods: This retrospective, single-arm study enrolled 42 patients with chronic DFUs across six clinical sites in the United States, India, and Egypt. ON101 was applied twice daily for up to 16 weeks. Detection and correction of all etiological factors for retarded healing in each case was concomitant with the use of ON101 cream. Outcomes were compared with historical standard of care (SOC) data. Adverse events and re-admissions were recorded throughout treatment.

Results: Healing Efficacy: 83.3% (35/42) achieved complete healing within 16 weeks, significantly higher than the 32% SOC rate ($p < 0.0001$).

Healing Speed: Median healing time was 48.0 days versus ~78 days with SOC.

Subgroup Analysis: Patients with poor glycemic control (91.7%), large ulcers ≥5 cm^2 (88.2%), and plantar ulcers (87.5%) still show significantly better healing rate when using ON101.

Regional Efficiency: USA: Healing in 2–16 weeks with 2–16 clinic visits; India: Healing in 2–13 weeks with 1–4 visits; Egypt: Healing in 2–14 weeks with 1–7 visits. Safety & Re-admission: No treatment-related adverse events or hospital re-admissions were reported.

Discussion: ON101 demonstrated high healing rates, faster wound resolution, and excellent safety in the treatment of DFUs across varied healthcare settings. The reduced number of clinic visits and absence of re-admissions highlight ON101's clinical and economic value. These findings support ON101 as a promising global option for DFU management and re-admission prevention.

CS-120

Advanced Limb Salvage Techniques in an Acute Diabetic Necrotizing Soft Tissue Infection With Exposed Calcaneus. Utilizing an Icelandic Fish Skin Substitute and Adjunctive NPWT With Static External Circular Offloading

Greg Sheremeta, DPM

Introduction: A unique case of a 56-year-old male with severely uncontrolled diabetes who was being treated for a right lower extremity Charcot deformity with conservative total contact casting. He subsequently developed a decubitus wound to the left heel that advanced to a necrotizing deep tissue infection that required emergent surgery. Due to the significant tissue loss of the majority of the plantar left foot, as well as his current and unstable right lower extremity Charcot deformity, standard wound care therapies were not sufficient and more advanced techniques were required.

Methods: Patient underwent radical excisional debridement of the infected area that left a fully exposed calcaneus and a large deep tissue deficit. Limb salvage was initiated during the index procedure with an Icelandic Cod fish skin substitute and negative pressure wound vac therapy. Static circular external fixation was applied to the left lower extremity due to the inability of the patient to sufficiently offload the extremity based on the contralateral limb total contact cast. Circular offloading fixation was continued for 2 months, as well as negative pressure vac therapy. Split thickness skin graft was then harvested and applied. Patient subsequently broke down a portion of the planar heel and underwent a partial calcanectomy with additional Cod skin graft application and vac therapy

Results: Successful source control was achieved and limb salvage was initiated during the index procedure that resulted in complete coverage over the fully exposed calcaneus via two skin substitute applications in the OR and one in office. Additionally, depth restoration was achieved with full wound granulation resulting in a plantar grade foot without major amputation or limb loss.

Discussion: This case demonstrates that limb salvage is achievable in the setting an extensive necrotizing infection even with fully exposed calcaneus; utilizing an Icelandic scaffold type skin substitute in an economically reasonable fashion. This case provided a unique presentation that required more advanced wound care techniques due to the overall initial wound depth, uncontrolled diabetes and patient's ongoing contralateral Charcot casting treatment. Patient was able to avoid major lower extremity limb loss and excess morbidity, while achieving a plantar grade foot in 5 months' time without jeopardizing his contralateral limb.

CS-121

Effect of ON101 topical cream on Infected Diabetic Foot Ulcer: A Case Series in the US elderly patients.

Chia-Ding Shih, DPM, MPH, MA; Erianthe Ortega, BSN; Emily R. Rosario, PhD

Introduction: Diabetic foot ulcers (DFUs) are common and costly. Prior clinical trials have shown promising results with ON101 topical cream. However, the efficacy of such medication on infected DFUs is not well established. The presented case series aimed to demonstrate how the infected wound responds to the ON101 topical cream.

Methods: Potential subjects were recruited from the wound clinic at Casa Colina Hospital and Centers for Healthcare after informed consent. Inclusion criteria included the use of systemic antibiotics at the time of the enrollment for Wagner 2 DFU with mild infection (i.e. IDSA 2). Subjects were excluded if they were on dialysis or had inadequate perfusion as determined by arterial study and/or toe pressure. Subjects were monitored weekly for wound assessment. Additionally, a mid-week phone call was made to confirm adherence to the twice daily treatment regimen. Subjects were instructed to keep a journal to record the application day and time. The study was reviewed and approved by Casa Colina Hospital Institutional Review Board.

Results: Total of 4 subjects (2 females and 2 males) with four DFUs were recruited prospectively. The average age was 72. All subjects had a history of peripheral arterial disease while 3 of them had endovascular intervention. Subject 1 had an exposed extensor tendon while subject 2-4 had a concern of underlying bone infection which was debrided and were placed on oral antibiotics. The average HbA1c was 7.6. Duration of

the wounds prior to treatment range from 22 to 36 weeks. All subjects showed reduction in area size within 3 weeks for the first three participants with continuous application. No side effects were reported.

Discussion: To our knowledge, this is the first prospective trial using ON101 topical cream on infected DFUs. The small cohort in this case series demonstrated subjective improvement of pain as well as good wound healing process despite the risk factors for wound healing such as advanced age, peripheral arterial disease and underlying infection.

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CS-122

Use of Mirragen Advanced Wound Matrix in Two Cases of Chronic Venous Stasis Ulcers and Pyoderma Gangrenosum

Richard Simman, MD, FACS, FACCWS; Fatima Khan, BS; Madhulika Kastury, BS; Abigail Royfman, BS; Amber Edson, MS, BS

Introduction: Chronic venous stasis ulcers (CVSUs) and pyoderma gangrenosum (PG) are debilitating skin conditions characterized by chronic inflammation, tissue breakdown, and impaired healing. CVSUs result from venous insufficiency and sustained venous hypertension, while PG is an autoinflammatory neutrophilic dermatosis often associated with systemic disease. Both conditions are frequently refractory to conventional treatments, leading to prolonged discomfort and increased healthcare burden. Mirragen Advanced Wound Matrix is a completely bioabsorbable borate-based glass fiber matrix designed to support tissue regeneration by promoting angiogenesis, collagen deposition, and re-epithelialization. FDA-approved for various acute and chronic wounds, Mirragen presents a novel option for enhancing healing in difficult cases. This prospective case series describes our clinical experience using Mirragen as an adjunctive treatment in patients with non-healing CVSUs, with and without associated PG.

Methods: Two patients were managed in an outpatient wound care setting using Mirragen as an adjunct to standard care. One patient had isolated CVSUs, while the other presented with CVSUs complicated by PG. Weekly Mirragen applications were paired with absorptive dressings and compression therapy. Debridement was performed in the patient with CVSU alone, but was voided in the CVSU complicated by PG case due to pathergy risk. The patient with CVSUs received up to 10 treatments over 3 months, while the PG case underwent more than 10 applications based on clinical response and coverage limitations set by the Centers for Medicare & Medicaid Services.

Results: Both patients experienced favorable outcomes following treatment with Mirragen. One patient achieved complete wound closure, while the second demonstrated a substantial reduction in wound size with progressive epithelialization. Both reported notable pain relief after the initial application, with continued improvement throughout the treatment course. No adverse effects were observed.

Discussion: This prospective case series suggests that Mirragen is a safe and potentially effective adjunctive therapy for chronic wounds such as CVSUs and PG. Both patients showed clinical improvement and pain reduction, with one achieving complete closure. In the PG case, the ability to avoid debridement, due to exacerbation of pathergy, while still supporting epithelialization was clinically valuable. These observations suggest a potential role for Mirragen in minimizing discomfort and reducing clinical burden.

CS-123

Imaging-Informed Debridement: A Case Series on Multimodal Quality Measures in Chronic Wound Care

Robert Snyder, DPM, MSc, MBA, CWSP; Cuffy Cherison, Dr; Maria Swartz, MS; John Baptiste Shernell, BS

Introduction: Wound debridement is a cornerstone of chronic wound management, essential for removing necrotic tissue that impedes healing by obstructing granulation, re-epithelialization, and contraction, while also harboring bacteria that may lead to infection.[1-4] However, assessing the adequacy and effectiveness of debridement remains a clinical challenge. Multispectral near-infrared spectroscopy (NIRS) and thermography are non-invasive imaging technologies that allow real-time assessment of tissue oxygenation (StO_2) and skin surface temperature. This case series evaluates their utility in supporting structured debridement protocols and guiding clinical decision-making.

Methods: Five patients with plantar foot wounds of varying etiologies were monitored longitudinally. A pocket-sized tissue imaging device* was used to measure tissue oxygenation and skin temperature before and after serial debridements. Imaging sessions occurred weekly or biweekly, with clinical data including wound dimensions, visual assessments, and healing progress collected throughout. Wound preparation followed established debridement guidelines, and healing outcomes were correlated with NIRS and thermography findings.

Results: All wounds presented with non-viable tissue and pre-debridement StO_2 values below 40% at initial presence. Following debridement, an average increase of 15–20% in wound bed oxygenation was observed. In one case, the disappearance of thermal gradients over time potentially corresponded with reduced inflammation and progressive healing. Cases where ≥50% of the wound bed showed StO_2 < 40% were slower to heal. NIRS imaging aligned with the red-yellow-black tissue classification system[5] and supported identification of viable versus necrotic zones. Thermography provided additional insight into local inflammation or infection, particularly useful in early-stage detection.

Discussion: Multimodal imaging with NIRS and thermography offers objective, real-time data that enhance the assessment of debridement efficacy and tissue viability. These tools support the implementation of structured protocols by providing measurable indicators of healing potential. Their portability and ease of use make them well-suited for outpatient and bedside settings. Imaging-informed debridement may ultimately improve healing outcomes and patient engagement while supporting clinical confidence in decision-making.

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CS-124

The Use of an Autologous Multilayered Leukocyte, Platelet, and Fibrin Patch in Medically Complex Patients with Chronic Diabetic Wounds

Ashley Sonney, APRN, WCC; James Lin, DO

Introduction: Many individuals with chronic diabetic wounds also suffer from multiple comorbidities. A study by Doupis et al. found that patients with diabetic ulcers had significantly higher rates of coronary

artery disease, peripheral arterial disease, retinopathy, and nephropathy compared to those without ulcers. More than 50% of these patients have two or more coexisting conditions. These comorbidities can severely hinder the wound healing process and increase the risk of complications. The recent development of the autologous multilayered leukocyte, platelet, and fibrin (MLPF) patch has introduced a promising new option for these patients. This advanced therapy has shown potential in promoting the healing of chronic, non-healing wounds—helping prevent serious outcomes such as infection, amputation, and even death.

Methods: In our clinic, we observed that patients with chronic diabetic wounds and multiple comorbidities—such as peripheral vascular disease and poor glycemic control—often faced prolonged healing times and limited success with advanced therapies. However, the introduction of the autologous multilayered leukocyte, platelet, and fibrin (MLPF) patch significantly enhanced wound healing in this population, even among those who had failed multiple other advanced wound care modalities.

Results: We conducted a case series involving seven patients, with diabetic ulcers and at least two additional comorbidities. Remarkably, 100% of these patients achieved complete wound closure with 12 or fewer applications of the MLPF patch. Case 1: A 65-year-old female with type 2 diabetes, hypertension, hyperlipidemia, and peripheral neuropathy presented with a Wagner Grade 4 ulcer on the right second toe, resulting from frostbite. After four weeks of unsuccessful conservative treatment, the MLPF patch was applied twice, leading to complete wound closure. Case 2: A 73-year-old female with type 2 diabetes and chronic deep vein thrombosis (DVT) of the right lower extremity presented with a mixed-etiology ulcer on the right lateral ankle. Her ankle-brachial index (ABI) was 0.7, and she exhibited venous reflux even with a recent venous intervention. Despite adherence to medical-grade compression therapy, the wound recurred. After 10 applications of the MLPF patch, the wound fully closed and remained healed with no recurrence for over six months.

Discussion: Treating chronic diabetic wounds in patients with multiple comorbidities remains a significant clinical challenge. These individuals often fail to respond to conventional and advanced wound care therapies, leading to prolonged healing, infections, or even limb loss. The MLPF patch represents a promising and innovative therapy, demonstrating efficacy in promoting full wound closure in medically complex cases.

CS-125

Polymicrobial Bacterial Contamination of Complex Wounds Successfully Healed with Chlorhexidine Gluconate and Fish Skin Graft: Multiple Case Series.

Peter Lovato, DPM, FACFAS; Patrick McEneaney, DPM, FACFAS

Introduction: Infected ulcers in the lower extremity can pose many challenges in treatment. After stabilization of infection with antibiotics, treatment is often focused on debridement of devitalized tissue for further reduction in bioburden. Re-infection is an ongoing concern, especially when large surface areas are involved. The multiple case series presented highlights successful wound treatment in patients with complicated past medical history deterrents to healing managed with debridement, application of skin substitute and frequent wound irrigation using Chlorhexidine Gluconate (CHG).

Methods: 8 patients with complex lower extremity wounds were included in this case series. Following wound debridement, the patient would undergo wound irrigation utilizing 0.05% CHG in sterile saline via handheld jet lavage followed by application of skin substitute.

Results: Advanced adjunct therapies – such as the use of a wound disinfectant – may need to be considered in patients with significant co-morbidities and other deterrents to healing. Complete closure of the complex wounds was achieved within 2-3 months from initiation of CHG irrigation with wound debridement and application of skin substitute. The patients remained epithelialized and was carefully monitored in the year following treatment.

Discussion: A combination of surgical intervention, wound debridement, application of skin substitute, offloading, wound disinfectants and other advanced modalities are often required for patients with complex medical conditions for successful limb salvage. This case report exemplifies that a complete clinical picture needs to be considered with aggressive treatment in the setting of surgical site dehiscence and wound contamination.

CS-126

The Use of Micronized Fish Skin Graft in Various Anatomical Wounds for Successful Limb Salvage: Multiple Case Series

Rimi Statkus, DPM, FACFAS; Peter Lovato, DPM, FACFAS; Patrick McEneaney, DPM, FACFAS

Introduction: A collection of multiple case reports was compiled on select patients with significant co-morbidities and complex wounds who were at high risk for proximal amputation of the affected limbs. Patients are often faced with complications including long hospital stays, wound infection, osteomyelitis and limb loss due to challenges associated with healing full- thickness wounds. In this multiple case report, micronized fish skin graft was used in multiple cases and various anatomical areas are assessed and utilized for limb salvage.

Methods: 10 cases with complex wounds at challenging anatomical sites in the lower extremity (including fasciotomies, previous abscess sites, amputations, structural deformities with significant bone or soft tissue loss) were included and surgically treated.

Results: All wounds were successful healed within several weeks. Limb salvage has evolved significantly in recent years due to the progress and innovation of advanced modalities. Unique anatomical challenges of wounds coupled with the need to optimize patient co-morbidities make it challenging for the surgeon to develop a clear consensus when determining the most appropriate treatment modalities to utilize.

Discussion: In this multiple case report, a combination of aggressive surgical debridement; application of skin substitutes; application of NPWT; and offloading with application of external fixator were utilized to assist with rapid wound closure. In patients with PAD and extensive bone and soft tissue loss, successful outcomes were observe in preventing additional proximal amputation, resulting in a functional limb that the patient could ambulate on after wound closure.

CS-127

Reconstruction of Scalp Wound With Exposed Calvarium - Staged Repair With Dermal Matrix* And Skin Grafts

Daniel E. Suarez, MD; Lindsay Blank, MS; Wendy-Ann Olivier, MD; Tim Schwartz, DO; Marjorie Wilson, NP; Sydney C. Butts, MD

Introduction: Large scalp wounds with exposed calvarium, particularly those lacking periosteal coverage, pose a complex reconstructive challenge due to poor vascularity of the cortical bone surface and lack of local remaining scalp tissue for coverage of the defect. Immediate skin grafting over denuded calvarium often fails, necessitating techniques to promote a viable wound bed.1 Dermal regeneration templates offer a staged approach that encourages neodermis formation, facilitating subsequent skin grafting.2 We present a case of a 60 year old female with a near total scalp defect (18x16 cm) secondary to chronic necrotizing soft tissue infection, resulting in large sections of exposed calvarium without periosteum.

Methods: The patient first underwent multiple debridements for removal of eschar and necrotic tissue by the Acute Care Surgery service. Reconstruction began with drilling of the outer cortex of calvarium using a 4 cutting otologic burr until bleeding bone of the diploic space was reached, followed by application of a bilayer dermal regeneration template*. After three weeks, the silicone layer was removed and adequate neodermis formation was confirmed. Split-thickness skin grafts (STSGs) were harvested from the thighs bilaterally and secured to the wound bed with placement of a negative pressure wound vac.

Results: The bilayer dermal regeneration template* integrated well, and a healthy bed of granulation tissue was evident upon inspection at the three-week interval. There was 100% take of the STSGs. At eight months post-op, skin graft coverage was intact with no bone exposure.

Discussion: Large scalp defects, especially those lacking viable periosteum, may require microvascular free flaps for adequate tissue coverage.1,3 This case illustrates the utility of a staged approach with bilayered dermal matrix and STSGs in the setting of a near total scalp defect with exposed calvarium. This technique can be performed in the acute setting to create a safe wound and avoids the morbidity of local flap or free tissue transfer especially in patients unsuitable for complex reconstructions.4 This demonstrates the important techniques needed to allow adequate granulation tissue formation that will support STSGs as a viable option in managing large scalp defects with exposed calvarium.

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CS-128 (RPT-003)

Successful Salvage of a Ventriculoperitoneal Shunt Utilizing Fish Skin Xenograft: A Unique Case Report

Mark D. Suski, MD

Introduction: Placement of ventriculoperitoneal shunts (VPS) is the most frequent surgical treatment for patients with hydrocephalus. In the United States, over 30,000 procedures are performed yearly. Complications occur in 23.8 % of patients with infection and shunt malfunction being the most common.[1] In addition, shunt revision is required in 39.1% of patients.[2] Fish skin xenografts have been shown to expedite healing in chronic and acute wounds. This case report investigates the utilization of fish skin xenograft for salvage of a VPS following soft tissue erosion and hardware exposure with impending failure of the shunt system.

Methods: The patient is a 67 year old diabetic male with paraplegia secondary to tethered spinal cord syndrome. In 1985, he developed coccidioidal meningitis with hydrocephalus necessitating VPS placement. He subsequently underwent a replacement of the shunt in 1994 secondary to infection. At that time, hardware was utilized to secure the shunt to the cranium. He did well until two years ago when he experienced erythema associated with soft tissue loss which exposed the underlying hardware adjacent to the VPS. Secondary to the previous revision, neurosurgery determined an attempt at shunt salvage was warranted. The patient was taken to the operating room and the hardware was explanted revealing a 2 by 2cm area of exposed bone devoid of periosteum. Secondary to the prior shunt revision, the adjacent soft tissue was very atrophic and no local flap reconstruction was feasible. The exposed bone was burred and the fish skin xenograft was placed and secured with a nonadherent compressive dressing. Pathology revealed no evidence of osteomyelitis.

Results: Despite operative cultures positive for Propionibacterium acnes for which he received one month of doxycycline, the surgical wound fully healed in 8 weeks with only one application of fish xenograft. The wound has remained healed with a stable pliable scar and the VPS continues to function well.

Discussion: Revision VPS surgery is common and can incur 50 million dollars of health care expenditure per year.[3] Fish skin xenografts are an acellular dermal matrix harvested from Icelandic cod with a porous microstructure similar to human skin. Characteristics of the xenograft include bacterial resistance, angiogenesis and inflammatory cytokine mitigation.[4] This case highlights their suitability for functional complex reconstruction even in prior surgical fields adjacent to prosthetic devices. Further research and long-term follow-up is recommended to clarify their clinical outcomes and economic benefits in these unique reconstructive clinical scenarios.

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CS-129

Complex Soft Tissue Reconstruction with Ovine Graft Following Surgical Resection of Invasive Recurrent Facial Basal Cell Carcinoma: A Case Report

Mark D. Suski, MD

Introduction: Soft tissue reconstruction following extensive excision of invasive malignant tumors are a clinical challenge, especially when considering major flap reconstruction in the face.[1] For patients who are poor candidates for autologous free flap or local tissue rearrangement, there is a need for an adaptive surgical tool that supports rapid soft tissue coverage while simultaneously minimizing the risk of surgical site complications and optimizing long-term functional outcomes. Ovine forestomach matrix (OVM) has previously shown success in soft tissue regeneration following resections of skin cancers of the head[2] as well as traumatic lesions of the face involving a parotid fistula.[3] This case report investigates the utilization of ovine forestomach matrix for volumetric fill and aesthetic repair following the resection of a large recurrent invasive basal cell carcinoma of the face requiring multiple surgical interventions.

Methods: The patient presented with a history of recurrent infiltrating basal cell carcinoma of the left cheek. Despite prior Moh's procedures, the deep and peripheral margins remained positive with extensive perineural invasion into branches of the facial nerve. He ultimately underwent a wide local excision by surgical oncology resulting in a wound of 6.5 by 6.5 cm with extension into the superficial lobe of the parotid gland. Despite this aggressive resection, the deep margin was still unable to be cleared. The patient had no local flap options for reconstruction; therefore, he underwent application of morselized and sheet OFM graft to provide coverage and volumetric soft tissue infill for this complex surgical wound.

Results: Despite the presence of a postoperative parotid fistula, the patient required only one surgical application of OFM graft. He achieved enough soft tissue volume regeneration and closure of the fistula to undergo successful staged full-thickness skin graft within 6 weeks. The rapid closure allowed the patient to undergo successful radiation therapy to treat his deep positive margins. He remains tumor free with a pliable skin graft.

Discussion: This case highlights the safety and efficacy of OFM graft in complex soft tissue defects following surgical resection of invasive malignant tumors in a cosmetically sensitive location. The case emphasizes the potential of OFM as a promising alternative to complex flap coverage in challenging resections of cancerous lesions. Further research and long-term follow-ups are ongoing in a prospective registry and essential to validate these results in a broader population.

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CS-130

Robust Closure of Complex Lower Extremity Wounds with the Use of Split-Thickness Skin Grafting and Autologous Skin Cell Suspension: A Case Series

Kazu Suzuki, DPM; Alexander C. Kashani, DPM; Ala Morshedian, PhD

Introduction: While split-thickness skin grafts (STSGs) are a well-established treatment for the closure of lower extremity wounds, the need for a large donor site may pose significant risks in patients with comorbidities that impair wound healing. The addition of Autologous Skin Cell Suspension (ASCS) can support robust wound closure with minimal donor skin, which is crucial for vulnerable patient populations at risk for delayed healing and extensive donor site morbidities.[1]

Methods: We conducted a retrospective review of 21 patients with complex lower extremity wounds treated with STSG + ASCS at a single institution from January 2024 to January 2025. Wound types included diabetic foot ulcers, venous leg ulcers, and ischemic wounds. Following standard wound bed preparation and debridement, STSGs were harvested and meshed 2:1. A small donor site (1–2 cm^2) was used to prepare ASCS, which was sprayed over the meshed graft.[2] Patients received perioperative antibiotics, were appropriately offloaded, and monitored through weekly follow-ups until definitive closure was achieved. Wound closure was defined as complete epithelialization without drainage.

Results: Mean wound size was 121.5 cm^2 (range: 6–704 cm^2), with an average chronicity of 284 days. All 21 wounds achieved complete closure, with a mean time to closure of 38.7 days. Two patients required a second ASCS application, and one wound dehisced due to thalassemia-related systemic impairment unrelated to surgical treatment. Mean hospitalization duration was 11 days.

Discussion: In this case series, treatment with ASCS over meshed autograft achieved robust wound closure. This technique may improve outcomes in challenging wounds and vulnerable patient populations, representing a promising advancement in wound reconstruction.

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CS-131

A Two Stage Surgical Approach Using Novel Biodegradable Synthetic Matrices Treating Hidradenitis Suppurativa in a Difficult Anatomical Region

Phu C. Tran, MD; Marvin Mendez, RN

Introduction: Hidradenitis Suppurativa (HS) is a chronic inflammatory condition with a prevalence up to 4% globally.[1] This disease affects apocrine gland bearing skin regions and is characterized by various lesions. Treatment includes lifestyle modifications, medication management and excision with grafting.[2] The goal of surgery is to decrease disease burden and improve quality of life (QOL) in patients with the worst severity.[3] This case study demonstrates the efficacy of a two-stage surgical approach using biodegradable synthetic matrices (BSM) to tolerate a region with high bacterial burden and create a vascularized wound bed suitable for split thickness skin grafting (STSG).

Methods: The patient presented with HS Hurley stage III affecting the buttocks and perianal region, causing pain, malodorous drainage, and inability to sit. A wide excision was performed to most of the diseased tissue without risking injury to the anal sphincters resulting in a 27 cm by 21 cm defect and depth extending to gluteal muscle and fascia. Monolayer BSM was applied for volumetric fill, followed by bilayer BSM for wound coverage, and secured with staples and sutures.

Results: The patient was discharged post operative day (POD) 2 and readmitted POD 4 with signs of wound infection. Patient was treated with intravenous antibiotics, pain medications and wound care. On POD 16, patient was discharged with oral antibiotics and outpatient management. By POD 54, a portion of the wound healed secondarily, and the remaining open wound received a STSG. At 2 months post STSG, the graft was healed with minor wounds present that were treated with silver nitrate. The patient was able to sit without pain and was able to return to work.

Discussion: HS is a difficult disease to manage requiring a multidisciplinary approach. In this case study, the patient had limited surgical options but had previous success with a similar staged approach in HS of the chest. Despite the bacterial bioburden presented in the perianal region, BSM was durable against infection and continued to create a wound bed suitable for grafting without re-debridement or re-application of the product. Post reconstruction, the goals of decreasing HS disease burden and improving QOL were achieved.

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CS-132

Management of a Traumatic, Bilateral Above-Knee Amputations with a Biodegradable Temporizing Matrix and Autologous Skin Cell Suspension: A Case Report

Justin Van Hoorebeke, MD, MS; Seiji Shinkawa, BS; Phuong Vu, MD; Ala Morshedian, MS, PhD; Erich Lemker, MD

Introduction: Traumatic injuries from train accidents are often fatal. Survivors typically suffer severe morbidity, with injuries necessitating extremity amputations, complex soft tissue reconstruction, and prolonged hospitalization. Autologous skin cell suspension (ASCS) reduces donor site needs and promotes healing in such challenging wounds.[1-3] Prepared intraoperatively from a small split-thickness skin sample, ASCS contains keratinocytes, melanocytes, and fibroblasts vital for epidermal regeneration, pigment restoration, and dermal remodeling.[4] We report a case of traumatic bilateral above-knee amputation managed with ASCS, a biodegradable temporizing matrix, and widely meshed autograft, resulting in early graft take and good cosmetic and functional outcomes.

Methods: A 26-year-old male presented with traumatic bilateral lower extremity amputation from a train accident. On admission, he underwent emergency surgery for hemorrhage control, necrotic tissue debridement, and completion amputations. After stabilization, staged wound management achieved stump closure. Early procedures included femoral artery coverage with muscle flaps, diverting colostomy, and bilateral hip disarticulations. Negative pressure wound therapy (NPWT) managed exudate and promoted granulation, along with serial debridements to control infection. On hospital day (HD) 41, a biodegradable temporizing matrix was applied. On HD 62, a 3:1 mSTSG (864 cm^2) was harvested from the posterior torso; a portion was used to prepare ASCS, applied post-graft with fibrin sealant. The graft was stapled and covered with NPWT over clear dressings. The donor site was treated with a silver-containing antimicrobial dressing. On HD 69, graft take and donor site healing were assessed.

Results: Seven days post-ASCS application, grafted areas showed 100% take with no sloughing, necrosis, or infection, indicating excellent healing. The donor site also showed healthy granulation tissue and early healing. Dressing changes were tolerated without complication. No further issues were reported. Follow-up visits revealed excellent wound pliability with minimal edge breakdown. These results, aided by ASCS, enabled early mobility and full physical therapy participation.

Discussion: Despite extensive injuries requiring multiple staged procedures and resulting in grave morbidity, we achieved excellent functional and aesthetic outcomes. The biodegradable matrix provided a stable scaffold, while ASCS promoted early graft take, epithelization, and faster healing. These factors produced pliable, healthy wound coverage, enabling early mobilization and recovery. This case underscores the value of multidisciplinary care and advanced reconstructive techniques in managing complex traumatic amputations.

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CS-133

Revolutionizing Fecal Care with Automation

Deanna Vargo, RN, BSN, CWS, FACCWS, DAPWCA, CWOCN

Introduction: This study introduces the Automated Stool Management Kit, an innovative technology designed to enhance fecal containment in critical care units. Traditional methods often fail to manage fecal incontinence, leading to pressure injuries and infections. They have leakage rates of 40-78% which is reduced to 1.8% with automation. Kit represents a breakthrough in patient care, offering a more reliable, efficient solution.

Methods: Patient Eligibility: Bedridden adults with at least one liquid stool incontinence within 24 hours before device use. Patients on oral anti-coagulation therapy or with recent cardiac arrest were included at care provider's discretion. Patients with suspected or confirmed rectal abnormalities were excluded. Interventions and Assessments: Patients used absorbent pads with the device in place, monitored every 8 hours. The perineal area was checked for complications. Assessments focused on successful fecal diversion, leakage rates, duration of use, nursing time, caregiver strain reduction, patient comfort, accidental expulsion, device removal due to inefficacy. Statistical Analysis: Data were analyzed using Microsoft Excel, presenting results as absolute values, percentages, with mean ± standard deviation.

Results: 20 patients were evaluated. At device insertion, 40% had stool consistency at Bristol Scale 7. Devices were successfully deployed, with 95% of care providers reporting ease of insertion. Among 341 assessments, no leakage was observed in 323 instances (94.72%), minor leakage in 12 (3.5%), major leakage in 6 (1.8%). Only 6 under pads were changed due to soiling. In 87 days of collective use, the device accidentally expelled twice but was reinserted. Nurses spent an average of 6.8 minutes daily and 0.4 minutes per follow-up. The device remained in place for an average of 4.4 days. No anorectal bleeding observed.

Discussion: 20 patients were evaluated. At device insertion, 40% had stool consistency at Bristol Scale 7. Devices were successfully deployed, with 95% of care providers reporting ease of insertion. Among 341 assessments, no leakage was observed in 323 instances (94.72%), minor leakage in 12 (3.5%), major leakage in 6 (1.8%). Only 6 under pads were changed due to soiling. In 87 days of collective use, the device accidentally expelled twice but was reinserted. Nurses spent an average of 6.8 minutes daily and 0.4 minutes per follow-up. The device remained in place for an average of 4.4 days. No anorectal bleeding observed.

CS-135

Evaluating the Utility and Application of an All-in-One, Peel and Place Dressing for Negative Pressure Wound Therapy: Initial Experience in Lower Extremity Wounds

Dot M. Weir, RN, CWON, CWS

Introduction: Negative pressure wound therapy (NPWT) using reticulated open-cell foam (ROCF) dressings has demonstrated versatility in various wound types.[1,2] However, ROCF dressing changes can be painful, and prolonged use of ROCF dressings is subject to tissue ingrowth. Additionally, the required ROCF dressing change frequency (at least 3x weekly) can be burdensome in terms of outpatient and home care visits, cost, and quality of life. A novel all-in-one dressing[3] composed of encapsulated ROCF, a perforated nonadherent layer, and hybrid acrylic-silicone drape is available with an extended wear time.

Methods: Patients with lower extremity wounds were assessed. Wounds were appropriately debrided, and antibiotics prescribed as needed. Wound area was measured at each dressing change, including undermining. An all-in-one wound dressing with drape* was applied over the wound and connected via tubing to an NPWT unit†. Negative pressure was adjusted up to -150 mmHg as appropriate. All-in-one dressings were changed at least once per 7 days.

Results: Four patients (2 female and 2 male; age range: 42-82) with 4 lower extremity wounds (traumatic wounds (n=3) and residual limb wound (n=1)) were treated. Patients' prior treatments included gelling fiber and foam dressing, NPWT† using reticulated open cell foam (ROCF)‡, collagenase, and non-adherent dressings. Duration of NPWT and all-in-one dressing therapy ranged from 32-100 days. All wounds exhibited a positive wound healing progression during therapy, as evidenced by increased granulation tissue formation, reduction in wound dimensions, and epithelialization.

Discussion: All hard-to-heal wounds in this series progressed in a positive wound healing trajectory during use of NPWT and all-in-one dressings. Minimal to no pain was noted during dressing application and removal. The all-in-one dressing was well tolerated by patients. 7-day extended wear and ease of dressing placement also addressed other challenges in using NPWT, such as patient transportation and clinic scheduling.

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CS-136

Textile Technology: A New Era in Positive Pressure Wound Therapy (PPWT**): A Case Series

Martin J. Winkler, Sr., MD, FACS; Suzie Ehmann, DPT, PhD, CWS, CLT-LANA

Introduction: This case series suggests that elastic textile compression delivers mechano transduction effective to heal wounds. Caroline

Fife published polaroids of her first Negative Pressure Wound Therapy (NPWT) case, a large abdominal dehiscence treated in 1997 with dramatic results. Fife reminisces "... the entire field of wound care had changed ... had been running wound center for 7 years ... could do little more than Ambroise Paré, 'I dress the wounds and God heals them.'" (Fife 2019). Louis Argenta published dramatic NPWT results, like Pare, he could only speculate on the physiology at work. (Argenta. L, 1997). In our reading of Orgill's seminal work on the cell physiology of NPWT, open cell polymer foam acts as a physiologic mandril to deliver sub atmospheric pressure, aka static mechanical force, to wound tissue creating tissue mechano transduction signals that upregulate gene expression, dramatically increasing protein synthesis and healing. (Orgill, D 2013).

Fuzzy Wale Elastic Compression Stockinet (FWEC)*, (Sibbald 2022) delivers Wound Bed Preparation that rivals NPWT - what's going on?

Methods: Wound photos document details of wound bed preparation in 3 patients with refractory lower extremity wounds, using fuzzy wale elastic compression stockinet (FWEC)* as the wound contact layer.***

Results: Clear photos document: (1) Early resolution of peri wound edema, lymphorrhea, stasis dermatitis. (2) Early clearing of wound edge epiboly. (3) Robust wound bed progression to complete healing.

Discussion: Fuzzy longitudinal wales of FWEC* stockinet as a wound contact layer delivers robust 'wound bed preparation' (Schultz G 2003) similar to that seen with NPWT. Wales may act as an effective mandril to deliver static physiologic force, mechano transduction signals sent to cell nuclei upregulate protein synthesis. (Winkler 2023) Ehmann has coined the term Positive Pressure Wound Therapy (PPWT)** to describe the findings we are reporting--future research has exciting implications.*** (Ehmann S., Ostler M. 2022)

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   Does Tissue Response to Fuzzy Wale Elastic Compression Therapy include Cell Micro Deformation, Optimizing Cell Mechano Transduction Signaling to Nuclear DNA to Upregulate Gene Expression & Synthesis of Proteins Required for Healing?

* Fuzzy Wale Elastic Compression Stockinet (FWEC), EdemaWear, Compression Dynamics LLC, Omaha, Nebraska 68102

** Positive Pressure Wound Therapy (PPWT), Suzie Ehmann DPT, PhD, CWS, CLWT, CLT-LANA, South Carolina

*** Nota Bene (This report includes off label use of compression textiles.)

CS-137

Effective Closure of Refractory Wounds Utilizing Bioactive Glass Fiber Matrix: A Case Series

Lindsay Wolf, APRN, AGACNP-BC, WCS-C, EDS-C

Introduction: Refractory wounds, characterized by resistance to standard therapies,lead to increased morbidity, diminished quality of life, and limb loss.Borate-based Bioactive glass fiber matrices (BBGFM) have emerged as innovativesolutions, supporting angiogenesis, granulation tissue formation, andepithelialization.[1,2] This case series evaluates the effectiveness of BBGFM intreating three refractory wounds across three patients

Methods: Three patients (average age 68) presented with three refractory wounds:one postsurgical wound, one trauma wound, and one venous leg ulcer. Theaverage wound size was 9.0 cm x 2.5 cm x 0.2 cm. All wounds had failedstandard treatments, moist wound healing, debridement, negative pressurewound therapy (NPWT), and compression therapy. BBGFM was applied asthe primary dressing, secured with a non-adherent dressing, fixated andcovered with a secondary dressing to manage wound exudate. Weeklyassessments measured wound dimensions, tissue quality, and exudatelevels.[3]

Results: All three wounds achieved complete closure. Slough reduction andgranulation tissue formation were evident early in treatment. Woundsize decreased significantly over the course of treatment, with vascular-granulation tissue and re-epithelization noted in all cases. No adverseeffects or infections occurred.[4]

Discussion: BBGFM effectively treated and closed wounds of diverse etiologies,including surgical wounds, trauma wounds, and venous leg ulcers.It facilitated angiogenesis, well vascularized granulation tissue, andepithelial migration, creating an optimal healing environment.[1] These results align with existing evidence supporting the efficacy ofbioactive glass in refractory wound management, offering a versatile andeffective solution for challenging wound care cases.[2,4]

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CS-138

Treatment of Morganella morganii-Associated Non-healing Diabetic Foot Ulcer With Vaporox: A Case Report

Zhi Yu, MD, PhD

Introduction: Diabetic foot ulcers represent a significant complication of diabetes mellitus, characterized by mechanical changes of bony architecture often leading to chronic wounds with increased risk of infection and impaired healing. Morganella morganii, a Gram-negative bacterium, is one of the pathogens found in infected diabetic foot ulcers. It is a human gastrointestinal commensal organism that may cause widespread deadly infections. This report discusses the case of a 76-year-old male with diabetes mellitus who presented with M. morganii diabetic foot ulcer to an in-patient rehabilitation facility. Despite conventional wound care and antibiotic therapy, the ulcer failed to improve. The management approach for this patient consisted of a rehabilitation modality called Vaporox, a machine that utilizes vaporous hyperoxia therapy (VHT), as it combines ultrasonic mist and high concentration of oxygen to fasten revascularization and healing.

Methods: Vaporox therapy administered 3 times per week. Continuation of glycemic control and antihypertensive therapy. Debridement every two weeks as needed. Offloading with total contact cast.

Results: The graph below illustrates wound size reduction over time: Baseline wound size: 10 cm^2; Week 2: 8 cm^2; Week 4: 6.5 cm^2; Week 6: 5 cm^2; Week 8: 2.5 cm^2; Week 10: Wound closure. Granulation over exposed tendon observed by Week 4. Significant reduction in wound size by Week

6. Complete wound closure achieved within 10 weeks. No signs of infection or recurrence at follow-up.

Discussion: Vaporox therapy proved highly effective in accelerating wound healing in a complex patient with multiple comorbidities. The therapy enhanced wound hygiene, promoted granulation tissue formation, and facilitated complete wound closure, demonstrating its potential as a valuable adjunct in chronic wound management.

CR-001

Not Every Patient is the Same: Comparing Energy Needs for Wound Healing Using Predictive Equations vs. Measured Using Indirect Calorimetry

Kristen Alario, BSN, RN, CWON; Annalisa Tsai, MS, RDN

Introduction: The purpose of this study was to validate the use of an Indirect Calorimetry (IC) reading to determine a more accurate picture of the caloric need per individual patient with a goal of wound healing. We hypothesized that the "one-size-fits-all" predictive equation of 30-35 kcal/kg wound not match the patient's measured resting energy and total energy expenditures (REE/TEE).

Methods: Participants needed to have a chronic wound. After a 5 hour fast, they completed an IC reading monthly for a minimum of 2 measurements and up to healing. The machine would analyze the carbon dioxide and oxygen exchange rate to determine the resting energy expenditure. The reading would take 10-20 minutes. REE was then multiplied by an activity factor based on individual lifestyle (0.1 for normal daily activity - 0.2 for moderate exercise) to provide a measured TEE.

Results: The resulting data shoed that there was a significant difference in the measured TEE vs. the predictive equation. The predictive equation in every case either over- or under-estimated the patient's caloric needs; in most cases it grossly over-estimated the patient's need. The predictive equation of 30 kcal/kg was the closest to the measured TEE, however it was still more than the patient actually needed.

Discussion: We concluded from our study that the IC should be a tool utilized in the outpatient setting to give our patients a more individualized plan of care. Additionally, through the process we discovered that most patients had no understanding of how nutrition played a role in healing. This ultimately lead to our Wound Clinic to hiring a dietitian as part of the staff who is now part of every patient's plan of care.

CR-002

Efficacy of Carboxymethylcellulose Fiber Dressing in Promoting Reepithelialization of Split-Thickness Skin Graft Donor Sites.

Viviane F.C. Belizário, PhD, CWOC, RN; CWOC, RN; Rolf Gemperli, PhD, MD; Vivian G. Mantellatto, RN; André O. Paggiaro, PhD, MD

Introduction: Split-thickness skin grafting (STSG) is a cornerstone technique in reconstructive surgery, particularly when managing extensive areas of skin loss. However, the optimal management of the donor site remains a topic of ongoing debate among surgical and clinical specialties. The ideal dressing for this surgically created wound should support reepithelialization while minimizing adverse events and complications such as pain and infection.This study aimed to compare the healing time (reepithelialization), postoperative pain levels, and potential complications in burn patients undergoing STSG, using two different donor site dressings: one composed of 100% carboxymethylcellulose (CMC) fibers and the other consisting of traditional cotton gauze moistened with 0.9% saline solution.

Methods: From October 2024 to March 2025, thirty-two patients with deep second- and third-degree burns were included. The donor site, located on the anterolateral thigh, measured approximately 22 × 8 cm and was harvested at a depth of 0.3 mm using an electric dermatome. Each site was divided into two equal areas separated by an intact skin bridge. One area was dressed with CMC, and the other with saline-soaked rayon gauze. Both areas were covered with surgical gauze and elastic bandage. Dressings were first opened on postoperative day five. The study adhered to the ethical principles outlined in the Declaration of Helsinki, which governs clinical research involving human subjects.

Results: Patients reported significantly lower pain levels in areas treated with the CMC dressing. Additionally, reepithelialization was achieved more rapidly in the CMC group compared to the traditional gauze group—8 days versus 14 days, respectively ($p < 0.05$).

Discussion: The CMC fiber dressing demonstrated superior outcomes in terms of pain relief and accelerated epithelial healing, with no observed complications. These findings support its use as an effective and safe option for donor site management following STSG in burn patients.

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CR-003 (RPT-009)

Comparative Study of Two Negative Pressure Wound Therapy Systems for Wound Bed Preparation in Individuals with Diabetes: A Prospective Cohort Study

Viviane F.C. Belizário, PhD, CWOC, RN; Rolf Gemperli, PhD, MD; Marcelo H. Machado, MD; André O. Paggiaro, PhD, MD

Introduction: Complex wound treatment in diabetic patients is a worldwide challenge since Diabetes Mellitus causes cellular and molecular changes that hinder the healing process. Treating these injuries requires specialized care through clinical and/or surgical techniques, including sub atmospheric pressure therapy, which has shown promise in optimizing healing in hard-to-heal injuries. The aim of this investigation was to compare, using clinical variables, the ability of two negative pressure wound therapy delivery systems [Commercial Vacuum System (CVS) and Hospital Vacuum System (HVS)] to prepare the wound bed in diabetic patients for subsequent surgical closure with skin grafts.

Methods: This study was a comparative interventional case series evaluating different wound treatment approaches for lower limb injuries in diabetic patients. The sample included performing the presented data consisting of ninety-nine (n = 99) diabetic patients, coming from spontaneous demand or those referred from health services of primary and secondary care of the public health system. Each participant underwent a structured clinical assessment and interview at three distinct time points: preoperative Phase 1: conducted prior to the initial wound bed debridement surgery, this phase confirmed eligibility criteria, collected sociodemographic and lifestyle data. Phase 2: At this stage, wound characteristics were documented using the Pressure Ulcer Scale for Healing (PUSH) tool prior to the initiation of negative pressure wound therapy (NPWT). Postoperative Phase 3: this final phase took place after wound bed preparation using NPWT and subsequent surgical intervention for definitive wound closure.

Results: Sociodemographic variables, health history, and wound bed characteristics (as measured by the PUSH tool) showed no statistically significant differences between the CVS and HVS groups. By comparing the difference between the pre- and post-intervention values of the CVS and HVS groups, we demonstrated that the CVS had a more efficient performance when preparing the bed to receive the graft or flap. This enhanced performance directly affected the results of our study since we observed a decrease in the lesion area, modifications in the tissue type and a reduction in wound bed exudate volume, resulting in fewer dressing changes and less time for wound bed preparation.

Discussion: When comparing the commercial and hospital vacuum systems, we found that patients in the CVS group required less wound

bed preparation time and fewer dressing changes without affecting the incidence of complications.

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CR-004

Ionic Silver-Impregnated Carboxymethylcellulose Dressing in the Treatment of Venous Ulcers: A Randomized Clinical Trial

Viviane F.C. Belizário, PhD, CWOC, RN; Gisele F. Chicone, Ph.D., CWOCN, RN; Luiz F. Fogaça, PhD, RN; André O. Paggiaro, PhD, MD

Introduction: Innovative primary dressings have been developed to modulate the microenvironment of chronic venous leg ulcers (VLU) and support the natural wound healing process. Among these, dressings composed of carboxymethylcellulose (hydrofiber) impregnated with ionic silver represent a promising alternative. To compare the effectiveness of a ionic silver-impregnated carboxymethylcellulose dressing to a calcium alginate hydrogel dressing in the treatment of venous leg ulcers.

Methods: This was a randomized, blinded clinical trial involving 40 participants with lower limb VLU, allocated into two groups: Group IG (elastic compression bandage + ionic silver-impregnated carboxymethylcellulose dressing) and Group HD (elastic compression bandage + calcium alginate hydrogel dressing). Patients were followed for 12 weeks. Data collection included digital photography, wound planimetry, and validated instruments assessing pain (Brief Pain Inventory), self-image (BIQLI), self-esteem (EARG), and functional independence (MIF). Assessments occurred at baseline and at 4-week intervals. Two independent, blinded evaluators analyzed the wound images using the Pressure Ulcer Scale for Healing (PUSH).

Results: Nineteen participants in each group completed the 12-week follow-up. Complete wound closure was achieved in 11 patients from the HD group and 10 from the IG group. Both groups showed a significant reduction in PUSH scores over time ($p < 0.001$), including wound area, exudate amount, and tissue type (all $p < 0.001$). Pain scores significantly decreased from baseline to week 12, and improvements were observed in self-image and self-esteem ($p < 0.001$ for all comparisons).

Discussion: Both dressing types, when used in conjunction with compression therapy, contributed to significant improvements in wound healing, pain reduction, and psychosocial well-being among individuals with venous leg ulcers.

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CR-009

Behavior of a Multicomponent Bandage in a Hot Environment Results in Hospital Staff Volunteers With a Pitting Edema

Debashish Chakravarthy, PhD

Introduction: There is a very scarce literature about the consequences of using multicomponent bandages in a very hot environment. The materials used in these multi-components are theoretically designed to withstand higher temperatures without losing their compression properties. The objective of this study was to evaluate the effects of the Dual Compression System (DCS), a compression therapy system, after 4 hours of wear and a treadmill test on leg volume, interface pressures, static stiffness index, comfort and slippage in a hot environment. The compression system consists of a short stretch and a long stretch bandage, with visual indicators to allow for accurate compression pressure application.

Methods: Twenty volunteers presenting pitting oedema, from hospital staff working standing in the Diabetic Foot Center, Cairo, participated in this study. At baseline, the leg volume was assessed using a laser based volume measurement device and the bandage was applied with an interface pressure of 45 ± 3mmHg.

Results: After only 4 hours of wearing the compression system, a significant reduction of the mean volume of 81 ml (2.9% of the total leg volume) was documented by the investigators.

The SSI calculated at baseline after bandage application (13+/-4.8 mmHg) increased significantly at T+ 4h (15.9 +/- 4.9 mmHg) in addition to a decrease in resting pressure to 30 mmHg, without any slippage.

Discussion: This clinical trial shows that the Dual Compression System (DCS) helps reducing edema in a very hot environment after four hours of wearing. SSI, which increased over the course of the trial, is an essential factor in reinforcing venous hemodynamics of the calf muscle pump. Despite this hot environment, comfort at the end of the study remained very good.

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CR-010

Rapid Reduction of Edema in a Clinical Trial With Venous Ulcers With a Novel Bandaging System That Contains Both a Short and a Long Stretch Bandage (Dual Compression System, DCS).

Debashish Chakravarthy, PhD

Introduction: Compression bandages are effective only when their application results in the application of correct therapeutic pressure. This can allow for rapid reduction of edema. This can explain why for some effective bandages, there is some degree of bandage slippage. This empirical observation led us to examine the primary data set from an earlier clinical trial where the continuity of bandage pressure was studied on human limbs with venous ulcers. We wanted to see if the rate of edema reduction was high at initial application followed by a flattening of the edema reduction rate curve.

Methods: A human clinical study has previously shown consistent application of 40 mm Hg therapeutic pressure on human patients with intervening bandage changes over a four week period. The ankle diameter, which was not analyzed in the previous data analysis, was now analyzed as a function of time post application.

Results: We find that when the edema reduction/ankle diameter is plotted against time, there is a discontinuity effect. There is very rapid ankle diameter reduction in the first week with a sharp flattening of the edema reduction curve soon thereafter.

Discussion: This study (the discontinuity effect, of the rapid and visible step change in the edema reduction curve) shows that the empirical observation that the highly effective dual compression system will tend to slip in highly edematous patients in the first week (approximately) is explained by the very rapid and effective edema reduction in the first weeks. Following more frequent changes during the first weeks, the bandages can be likely applied effectively on a weekly basis, this study implies. This parallels clinical experience with the DCS bandage.

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CR-011

Evaluation of an All-in-One Extended-Wear Dressing with Negative Pressure Wound Therapy for Wound Bed Preparation in the Treatment of Pressure Ulcers

Jody Wolfe, BSN, MBA, RN, CWOCN

Introduction: Negative pressure wound therapy (NPWT) with polyurethane dressings is used to help manage complex wounds, including pressure ulcers (PU), because it creates an environment that promotes healing and helps prepare the wound bed for closure.[1] Reticulated open cell foam (ROCF) dressings utilized in NPWT require a multi-step application process of measuring and cutting foam and adhesive components. ROCF dressing changes must occur at least 3 times/week to minimize tissue ingrowth and potential for pain during removal.[2-3] An all-in-one dressing* available for use with NPWT minimizes application time. It includes an integrated ROCF dressing and drape with perforated non-adherent layer that reduces tissue ingrowth and allows for extended-wear of up to 7 days.[4] Here, we describe our experiences using NPWT with all-in-one dressing to prepare PU for closure.

Methods: Antibiotics were initiated as needed. Following a thorough evaluation, NPWT with all-in-one extended-wear dressing was selected to facilitate wound bed preparation for surgical closure. The size of the all-in-one dressing was selected to ensure that the foam and non-adherent layer extended over the periwound skin. NPWT† was applied with continuous subatmospheric pressure of -125 mmHg. All-in-one dressing changes were conducted at least every 7 days.

Results: Five patients presented for evaluation and management of PU located on the sacrum (n=3), hip (n=1), and thigh (n=1). Notable results included a reduced dressing application time, ease of application and removal, and effective wound bed preparation for closure. Treatment outcomes encompassed primary closure (n=1), modified flap closure (n=2), healing by secondary intention (n=1), and discontinuation of treatment due to non-compliance (n=1). PU managed with NPWT using the all-in-one dressing showed reduced dimensions and decreased severity, demonstrating effective preparation for closure.

Discussion: In these patients, the management of PU with NPWT using the all-in-one dressing resulted in smaller and less complex wounds that were effectively prepared for closure. Compared to NPWT with ROCF dressings, the application and changing of the all-in-one NPWT dressing were quicker, simpler to perform, and required fewer dressing changes.

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CR-012

Acceptability and Effectiveness of a Pressure Injury Prevention Protocol Incorporating a Silicone Border Sap Dressing in Long-term Acute Care Setting: Results From a Prospective Non-comparative Clinical Investigation

Jennifer Godfrey, MSN, RN, CWON; Chrystalbelle Rogers, MSN, RN, CWCN, CENP; Syed Naqvi, B.S.; Anthony Nunes, PhD

Introduction: Patients in Long-Term Acute Care (LTAC) hospitals are vulnerable to developing sacral pressure injuries due to extended periods of immobility during care. This study evaluated the acceptability of a sacrum-shaped, multi-layer dressing composed of silicone and super-absorbent polymer as reported by patients and clinical staff.

Methods: We conducted a prospective, non-comparative clinical investigation of a sacrum-shaped, multi-layer, silicone super-absorbent polymer dressing. Patients receiving the dressing were evaluated and designated as high risk of sacral pressure injuries according to the Braden Scale and clinical judgment as per the LTAC's standard of care. Dressing replacement was performed at the discretion of the clinical staff but no less than once every 7 days. Patient and nursing staff impressions and clinical observations were documented through structured questionnaires at each dressing change and upon exit from the study. Primary endpoints included acceptability of the dressing within domains of comfort, ease of use, and performance. Secondary endpoints included pressure injuries, adverse events, and dressing usage.

Results: From 1/2024 to 4/2025, 51 patients consented to participate in the study. The median age of participants was 63 (IQR: 43 – 71) and the median Braden Score was 15 (IQR: 14 – 17). Patients had limited mobility, with 57% unable to walk at all and 24% able to walk but not more than 150 feet. Of 34 patients who completed the exit surveys, 94% said their overall impression was good to excellent. Of 28 surveyed nursing staff, 93% reported that their overall impression using the dressings was good to excellent. Mild discomfort or itchiness was reported by 4 patients, and 1 patient reported moderate discomfort. No pressure injuries or adverse events related to the dressing were reported.

Discussion: With high ratings of acceptability from patients and nurses, we conclude that the sacral dressings may be integrated into pressure injury prevention protocols in high-risk populations of patients admitted to LTAC hospitals. Minimal reports of discomfort, along with the absence of pressure injuries or serious adverse events during the follow-up period, support a substantially favorable benefit–risk profile in this context. Future work will address the comparative effectiveness of the dressings relative to the standard of care.

CR-013

Superior Healing Outcomes With an Advanced Wound Care Dressing vs Standard of Care in Hard-to-Heal Venous Leg Ulcers: Results from a Multinational Randomized Controlled Trial

Beate Hanson, MD; Stefania Beraldo, MD; Simona Drews, MD; Matthias Schneider, MD; Cristin Taylor, MSHS

Introduction: Venous leg ulcers (VLUs) represent one of the most prevalent types of hard-to-heal wounds and currently affect a global population of over 143 million patients, posing a significant burden on healthcare systems worldwide. The aim of this study was to evaluate the performance of a carboxymethylcellulose dressing containing ionic silver, ethylenediaminetetraacetic acid and benzethonium chloride* ('CISEB') versus a dialkylcarbamoyl chloride-coated dressing ('DACC')† in VLUs.

Methods: This study was conducted in 2022–2024 across Germany, the United Kingdom, and Columbia. Subjects were randomized to the CISEB or DACC arm. Therapeutic compression and routine wound care were standardized management in both arms. Subjects returned to clinic for weekly follow-up. The primary endpoint was complete wound closure at 12 weeks. Additional endpoints included time to complete wound closure and incidence of adverse events (AEs).

Results: 203 subjects were randomized to CISEB (n=100) or DACC (n=103). Final analysis included 109 wounds in the interventional arm and 110 wounds in the control arm. Wounds treated with CISEB displayed significantly higher healing rates at 12 weeks than those treated with DACC (74.8% and 55.6%, respectively, superiority p-value < 0.0031). CISEB-treated wounds were 35% more likely to heal completely by 12 weeks than those treated by DACC [Relative Risk 1.35 (95% CI, 1.10-1.65, non-inferiority p< 0.0001)]. Time to complete wound closure was shorter in CISEB-treated wounds compared to DACC (median 56 and 70 days, respectively, p< 0.0272). 11 AEs in 5/101 (4.95%) subjects from CISEB arm were recorded with 27 AEs in 18/102 (17.65%) subjects from the DACC arm.

Discussion: Hard-to-heal VLUs treated with CISEB were found to achieve superior clinical outcomes with significantly higher healing rates, shorter time to wound closure, and fewer AEs compared to those treated with DACC.

CR-014

Impact of a Nitric Oxide-Generating Wound Dressing in Diabetic Foot Ulcers Segmented by Infection Status and Wound Duration: Post-hoc Analyses

Alan M. Horner, PhD; Chris Manu, MD; Michael Edmonds, MD; Daniel G. Metcalf, PhD

Introduction: Diabetic foot ulcers (DFUs) are a frequent and serious complication for patients with diabetes, which significantly impact patient quality of life and pose a substantial burden on healthcare systems. Nitric oxide (NO) represents a promising therapeutic agent for the management of DFUs, due to its antimicrobial properties and ability to target mechanisms integral to biofilm survival. The aim of this post-hoc analysis was to evaluate the effectiveness of a novel NO-generating wound dressing*, on the healing rates of infected DFUs segmented by infection status and wound duration.

Methods: A post-hoc analysis of the ProNOx1 randomized controlled trial [1]. The study involved treatment with either the NO-generating wound dressing or Standard of Care (SoC), for 12 weeks or until the DFU had healed, and a further 12-week follow-up period. The impact of local infection status and wound duration on the number of DFUs healed in the intention to treat (ITT) cohort were assessed.

Results: Of the 149 DFUs in the ITT cohort, 38/74 (51%) in the NO-generating dressing arm and 39/75 (52%) in the SoC arm were complicated by signs of infection at baseline. At week 12, healing rates in the infected DFUs were 36% vs 21% (NO-generating dressing arm vs SoC) and 35% vs 30% in those without infection. The healing trajectory continued in the NO-generating dressing arm, with 43.6% of DFUs healed by week 14, but no further improvement was seen in the SoC arm beyond week 12. In wounds ≤12 weeks in duration, the healing rate in the treatment period was 52% for the NO-generating dressing arm and 22% for SoC. The healing rates increased in the follow-up period in both groups with 57% (NO-generating dressing arm) and 30% (SoC arm) of DFUs healed. In DFUs >12 weeks of duration, the healing rates were the same for both arms: 25% in the study period and 30% at final follow-up. When segmented by the presence of local infection, the healing rate for the NO-generating dressing arm was 35% at final follow-up compared with 18% for SoC.

Discussion: This sub-analysis of the ProNOx1 study data demonstrated the ability of the NO-generating wound dressing to improve the DFU healing rate in wounds of ≤12 weeks of duration and of infected wounds, compared with SoC.

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CR-015

Dual vs Single Layer Amniotic Membrane Treatment in Venous Leg Ulcers: Is Dual Layer Really Better?

Alton R. Johnson, DPM, CWSP; Ryan Huang, DO; Yiheng Welch, MS-III; Shenlone Wu, MS

Introduction: In our previous study, we established that five weeks of treatment with single-layer amnioticmembrane (AM) was more effective for venous leg ulcers (VLUs) than standard care [1].Recently, dual-layer AM has largely replaced single-layer AM in VLU treatment. This studyaimed to evaluate whether dual-layer AM is more effective than single-layer AM in promotingVLU wound healing.

Methods: This retrospective study included patients treated between 2019 and 2024 by providers from large wound care group. A total of 42 patients met the inclusion criteria. Of these, 21 patients with chronic wounds that had not healed with standard of care (SOC) receivedsingle-layer amniotic membrane (AM) treatment between 2019 and 2022, while another 21patients received dual-layer AM treatment between 2023 and 2024.

Results: Our study demonstrates that single-layer amniotic membrane (AM) achieved an average woundsize reduction of 47.5% after five weeks of application in patients with VLUs. This finding isconsistent with previous studies that also show favorable wound reduction outcomes usingsingle-layer AM. In comparison, the dual-layer AM resulted in an average 61.4% reduction in wound size.

Discussion: Based on these findings, we concluded that dual-layer AM is 33% more effective than single-layer AM in reducing wound size. This retrospective study demonstrates that both single-layer and dual-layer amnioticmembranes are both effective in promoting wound healing in patients with chronic venous legulcers. However, dual-layer amniotic membrane treatment resulted in significantly greaterwound size reduction after five weeks, suggesting enhanced clinical efficacy. The superiorperformance of dual-layer AM may be attributed to its higher concentration of growth factors,improved structural integrity, and ability to support a more robust regenerative response.

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CR-017

Assessing Pathogen Detection in Pediatric Osteomyelitis: A Systematic Review and Meta-Analysis

Catherine; Kennedy, BHSc

Introduction: Osteomyelitis is a biofilm mediated infection of the bone with an estimated annual prevalence of 8 per 100,000. Early detection and targeted therapy are imperative to minimize the risk of adverse outcomes. However, the role of intraoperative or image-guided biopsy to enhance diagnostic accuracy in the pediatric population remains elusive. Herein, we evaluate the diagnostic accuracy of image-guided and open surgical bone biopsies and their influence on clinical management in pediatric osteomyelitis.

Methods: A comprehensive systematic search of Cochrane, ClinicalTrials.gov, Embase, PubMed, and Web of Science was performed. Qualifying studies provided data on patients < 18 years and reported the biopsy diagnostic yield, pathogen-identification rate, and consequent changes in management. Pooled proportions were evaluated using a random-effects model for image-guided biopsy and change in management, and fixed-effects model was used due to a low number of studies and non-significant heterogeneity for intraoperative biopsy.

Results: Of the 815 studies initially identified, eight articles (n=1599 patients) met eligibility criteria after duplicate removal and all screening stages. For patients undergoing open surgical biopsy, the pooled diagnostic rate of identifying a pathogen was 81.6% (95% CI: 13.1, 150, I2 = 0%) in comparison to the image-guided positive diagnostic rate of 50.2% (95% CI: 19.9, 80.5, I2 = 71.5%). Of the studies reporting a change in antibiotic choice based on biopsy, regardless of type, had a pooled effect of 60.6% (95% CI: 51.0, 70.1, I2 = 93.9%).

Discussion: With the emergence of drug resistant organisms, there is a critical need for improved diagnostic accuracy. However, there is a notable lack of evidence on the influence of biopsy technique on the transition from empiric to targeted antibiotic therapy in pediatric patients in comparison to adults. Therefore, there is an unmet need to determine which technique optimally balances diagnostic accuracy and economics, to support more responsible antibiotic stewardship.

CR-019

Comparative effectiveness of Porcine Placental Extracellular Matrix (PPECM) against other Cellular, Acellular, and Matrix-

like Products (CAMPs) in Diabetic Foot and Venous Leg Ulcers from the Medicare Database

Brad Marcinek, PA; Jenny Levinson, MPH; Irene Varghese, MS; Caitlin Sheetz, MPH; Peter Kardel, MA; Cristin Taylor, PA

Introduction: Diabetic foot ulcers (DFU) and venous leg ulcers (VLU) are often hard-to-heal, and may require advanced treatment with cellular, acellular, and matrix-like products (CAMPs). In 2024, the seven Medicare Administrative Contractors published a Local Coverage Determination (LCD), which significantly restricts coverage of these products. This retrospective cohort study examines the Medicare Fee-for-service (FFS) population to compare clinical outcomes and health resources utilization in patients receiving Porcine Placental Extracellular Matrix (PPECM*) against other CAMPs with LCD-coverage.

Methods: This study analyzed 100% Medicare Research Identifiable Files (January 2020 - June 2024) for patients receiving a CAMP treatment. Eligible patients were categorized into groups according to treatment received: (1) PPECM*, (2) PPECM's 510(k) predicate†, (3) all other LCD-covered CAMPs (LCC)‡. Patient demographics, comorbidities, and ulcer location were assessed for cohort homogeneity via inverse probability of treatment weighting (IPTW), allowing for balanced comparison of health outcomes.

Results: A total of 34,664 patients with DFU (3.6% of DFU total patients) and 16,771 patients with VLU (3.4% of VLU total patients) received a CAMP treatment. For the DFU cohort, patients receiving LCC were 1.309 times more likely to undergo outpatient amputation than PPECM* (95% CI 1.251 – 1.371, p< .0001), and bacteremia was 2.75 times more likely in LCC (95% CI 2.471 – 3.053, p< .0001). In the VLU cohort, risk of amputation did not differ across treatment groups (p=.65). Across both wound types, PPECM* demonstrated significantly fewer outpatient hospital visits compared to LCC and the 510(k)-predicate (DFU: 5.84, 8.79, 10.24 respectively, p< .0001; VLU: 5.98, 9.07, 11.63, p< .0001). There were no differences in physician office visits, hospital admissions, and emergency room (ER) visits.

Discussion: The findings suggest that PPECM* performed clinically as well as or better than other covered CAMPs. Notably, PPECM* showed significantly less risk for outpatient amputations and wound complications in DFU patients. While PPECM* patients had longer treatment durations and higher unique days of CAMP applications, these patients showed fewer outpatient hospital visits and costs for both disease cohorts suggesting a more cost-effective treatment strategy and improved long-term care management.

CR-020

A Simple Comparison of Real-World Retrospective Pressure Ulcer Data

Toni-Ann M. Martorano, MS; Ian S. Perpetuo, MS; Wendy W. Weston, PhD, CTBS

Introduction: Pressure ulcers are chronic injuries that occur from exposure to prolonged pressure and are often seen in bony areas, such as the heels, hips, and sacrum. These types of injuries are a serious problem for the healthcare system, as patients have these injuries for an extended period of time. This also leads to a decrease in quality of life and an increase in medical costs and morbidity. Wound management for pressure ulcers includes redistribution of pressure, debridement, and dressing applications. It is imperative for the proper treatment modality to be used for these wounds to achieve size reduction and eventually closure. The use of a retention processed placental graft (RE-AC) can be an ideal option for these patients.

Methods: This study was a simple comparison of collected retrospective data from electronic health records (EHRs) of patients treated with RE-AC or SOC at multiple outpatient wound care centers. Wound locations were matched. Data was compared for wound area, wound volume, number of visits/applications and percent reduction in area and volume. The patients included in this study included those who fall outside of normal RCT criteria, reflecting a real-world perspective of wound response.

Results: Results indicated that patients who received RE-AC had a significant percent reduction in wound area and volume (p< 0.05), compared to those who received SOC. The results also show that patients who received RE-AC had a decrease in doctor visits.

Discussion: Pressure ulcers are long-term, chronic wounds that can lead to high medical costs and a diminished quality of life. According to this study, use of RE-AC imparts greater percent reduction in wound size compared to standard of care and reduces the number of required doctor visits. Since these wounds are larger with more diverse complications, these results are impactful for the real-world patient. Additionally, the decrease in required doctor visits speaks to the improvement of quality of life and decrease in medical cost.

CR-021

Impact of a Nitric Oxide-Generating Wound Dressing in Diabetic Foot Ulcers in Patients Receiving Antibiotics: Post-hoc Analysis

Daniel Metcalf, PhD; Chris Manu, MD; Michael Edmonds, MD; Alan M. Horner, PhD

Introduction: Diabetic foot ulcers (DFUs) are a prevalent and serious complication of diabetes, which result in poor patient quality of life and substantial economic burden. Nitric oxide (NO) within a wound dressing represents a promising treatment for the management of DFUs, due to NO's inherent antimicrobial properties. The purpose of this study was to evaluate the impact of a novel prototype NO-generating wound dressing*, compared with standard of care (SoC), on DFU wound healing in patients that received antibiotics during a clinical study.

Methods: A post-hoc analysis of the ProNOx 1 randomized controlled trial of a NO-generating wound dressing compared to SoC was performed to determine the impact of NO-generating wound dressing on DFU healing outcomes in patients receiving antibiotics at commencement and/or during the study. The study was conducted in 10 UK wound care centres, and primary endpoint analysis has been reported (Edmonds et al, 2018)1. The primary efficacy measure of this post-hoc analysis was DFU percent area reduction (PAR) at 12 weeks. A secondary efficacy measure was number of DFUs completely healed at 12 weeks.

Results: Of the 124 patients that were treated per protocol, 63 (33 in the SoC population; 30 in the NO-generating wound dressing population) were treated with antibiotics. At 12 weeks, mean PAR was 13.6% and median PAR was 44.3% in the SoC population, compared to mean PAR of 61.5% and median PAR of 87.1% in the NOGD population. At 12 weeks, the number of healed DFUs was 5/33 (15%) in the SoC population and 11/30 (37%) in the NOGD population.

Discussion: This post-hoc analysis of DFUs in patients receiving antibiotics, which can be assumed to be infected or at-risk of infection, demonstrates the ability of the NO-generating wound dressing to improve healing outcomes compared with SoC.

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CR-022

Impact of the Wound Hygiene Protocol, Incorporating an Advanced Antimicrobial Silver-Containing Gelling Fiber Dressing, on Hard-To-Heal Leg Ulcers: Real-World Evidence

Daniel Metcalf, PhD; Rachel M. Torkington-Stokes, MSc

Introduction: Hard-to-heal wounds compromised by bioburden are often managed with antimicrobial wound dressings. We evaluated the impact of a 4-step biofilm-based wound care protocol, Wound Hygiene (cleanse, debride, refashion, dress with advanced antimicrobial silver-containing gelling fiber dressing [AAA]*), on hard-to-heal leg ulcers (venous, arterial, mixed, and unknown origin), including infected leg ulcers.

Methods: A subgroup analysis of a prospective, real-world evaluation

of hard-to-heal leg ulcers managed with the Wound Hygiene protocol incorporating AAA* dressings. Primary endpoints were quantitative changes in leg ulcer volume and area from baseline to final assessment. Secondary endpoints were qualitative changes in overall leg ulcer status, local wound infection status, suspected biofilm, and exudate levels. Where clinically indicated, compression therapy (bandaging or hosiery) was applied.

Results: 271 leg ulcers from 259 patients were included in the analysis. Venous leg ulcers (67%) and mixed leg ulcers (18%) were the most common leg ulcer types. 37% of all leg ulcers were locally infected at baseline, and 52% of patients were receiving systemic antibiotics. Leg ulcer duration was >12 months in 37% of cases. At baseline, the mean leg ulcer volume was 28.1 cm3 and mean area was 40.5 cm2. At final assessment, after a median 31 days of Wound Hygiene, mean leg ulcer volume was 3.8 cm3, and mean leg ulcer area was 17.6 cm2, corresponding to 87% and 56% reductions from baseline respectively. At baseline, 49% of leg ulcers were static and 25% were deteriorating; at final assessment, 73% had improved and 22% had healed. Local infection reduced from 37% to 3.3% at final assessment. Of the leg ulcers infected at baseline, 85% of infections were resolved, and only 7.0% remained infected at final assessment. Suspected biofilm decreased from 86% at baseline to 25% at final assessment. Exudate levels reduced from largely moderate (42%) and high (28%) to largely low (43%) or none (27%). Subgroup analyses of venous leg ulcers and infected leg ulcers gave similar results.

Discussion: Wound Hygiene is a new proposed biofilm-based standard of care that successfully treats hard-to-heal leg ulcers by addressing key local barriers to wound healing.

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CR-023

Comparison of Hypochlorous Acid versus Surfactant Wound Cleanser for Venous Leg Ulcers

Catherine Oliver, MD; Brianne Childs, PT, DPT

Introduction: Introduction: Wounds benefit from cleansing but there is debate over which cleanser to use. Hypochlorous acid is an antiseptic with low cytotoxicity and demonstrated healing benefits for venous leg ulcers . Our wound clinics use a surfactant-based cleanser. Clinical question: would patients benefit from hypochlorous acid over surfactant-based wound cleanser? Study compared wound healing rates, volume reduction, antibiotic use, emergency department visits and hospitalizations in patients with venous leg ulcers that received either hypochlorous acid or surfactant-based wound cleanser.

Methods: Methods: Inclusion criteria: wound on lower extremity. Exclusion criteria: untreated peripheral arterial disease, pressure wound, malignancy, pyoderma and calciphylaxis, psoriasis or ezcema. 162 patients eligible. 32 received hypocholorous acid, 129 surfactant-based wound cleanser for all dressings changes. Mean age, number of wounds, onset wound volume and diabetes were similar between groups. Study duration 10 weeks. Chart review performed week 22 for healing rates, wound size reduction, both at week 10 when hypochlorous acid was stopped and week 22. Rate of oral/intravenous antibiotic, emergency visits for wound(s) and hospitalizations also determined.

Results: Results: At 10 weeks 31.25% of HOCl patient healed compared to 24.80% of surfactant patients. At week 22, 59% of HOCl healed versus 33% of surfactant. HOCl patients that did not heal had 84% reduction in wound volume compared to 62% reduction. Oral antibiotics prescribed in 37.5% of HOCl patient and 58% of surfactant. IV antibiotic use 9.4% for HOCl and 22% for surfactant. Emergency room visits 6.3% for HOCl and 22.5% for surfactant. Hospitalization in HOCl group 9.4% and 14% for surfactant group.

Discussion: Discussion: Findings suggest hypochlorous acid may be a more effective wound cleanser for healing and reducing infection in patients with venous leg ulcers. Interestingly wound healing results at week 22 suggest benefit of hypochlorous acid use continues beyond initial treatment period. Findings also suggest hypochlorous acid decreases use of both oral and intravenous antibiotics in addition to decreasing outpatient treatment failures that result in increased emergency room use and hospitalization. The limitations of this study are small sample size, not blinded and short study duration. Despite these limitations results suggest that hypochlorous acid warrants further study as it may improve wound healing and reduce wound infection.

CR-024

Bridging the Gap: Correlating Multispectral Near-Infrared Imaging with Standard Vascular Diagnostics in Chronic Wound Care

Alisha Oropallo, MD, FACS, FSVS, FAPWCA, FABWMS; Christina Del Pin, MD; Marisa Ranire-Maguire, MD; Natasjia Pinnock, MD; Amit Rao, MD

Introduction: Chronic wounds — including diabetic foot ulcers and venous leg ulcers—impact up to 10.5 million of Medicare beneficiaries - 2.5% of the total population of the United States.1 Adequate tissue perfusion is critical for healing.2,3 Yet standard vascular diagnostics (ABI, TBI, $TcPO_2$, and Doppler) often fall short in assessing real-time, microvascular status at the wound wound bed. Multispectral near-infrared spectroscopy (NIRS) imaging non-invasively measures tissue oxygen saturation (StO_2) in real time at and around the wound bed. While promising, its correlation with conventional diagnostics remains underexplored. The purpose of this REB-approved prospective observational study is to evaluate the correlation between NIRS-derived StO_2 and standard vascular diagnostic tests.

Methods: A single-center, prospective, observational study enrolled 40 adults (≥18 years) with lower extremity wounds. Each participant underwent NIRS imaging*,4 capturing StO_2 across multiple foot planes (plantar, dorsal, lateral), alongside standard assessments: ABI, TBI, $TcPO_2$, and Doppler waveforms. Primary analysis used Spearman correlation to assess StO_2 relationships with vascular parameters ($p< 0.05$). Secondary endpoints included stratification by PAD (Rutherford, Fontaine, WIfI), venous disease (CEAP), and wound severity (Texas classification), with ANOVA comparisons. Exploratory analyses examined StO_2 variability by age, sex, diabetes status, and Fitzpatrick skin type. Examination success rates and barriers (e.g., pain, dressings, anatomy) were also recorded.

Results: This ongoing research, currently pending final analysis, shows promising interim results. Preliminary data demonstrates a strong correlation between NIRS-derived StO_2 and $TcPO_2$, with moderate correlations to ABI and TBI. StO_2 trends aligned with Doppler waveform patterns, suggesting physiological consistency. Importantly, NIRS achieved high imaging success rates due to its non-contact, non-invasive nature.

Discussion: These early results support NIRS imaging as a clinically relevant adjunct to standard vascular assessments. By delivering point-of-care perfusion insights directly at the wound bed, NIRS may help overcome limitations of traditional tools—particularly in patients with non-compressible vessels. Integration of NIRS into routine wound care could streamline diagnostics, support earlier intervention, and reduce reliance on time- and resource-intensive vascular labs. While limited by single-site enrollment, this study highlights NIRS's promise as a scalable, accessible technology with potential to enhance decision-making and equity in wound care delivery.

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CR-025

Integrating Foot Risk Assessments and Education into Hemodialysis Care: A Pathway to Preventing Ulceration

Erianthe Ortega, BSN; Emily Rosario, PhD

Introduction: Foot ulceration is a costly complication of diabetes, and has a high rate of recurrence. Diabetic individuals with end stage renal disease are at a higher risk of developing a diabetic foot ulcer.

Methods: Nurses implemented Miller et al. (2014) standardized 3 minute foot screening protocol for dialysis patients who provided informed consent. This was done at 8 dialysis clinics in east Los Angeles County. The screening involved three components. Patient history and risks factor assessment: Nurses collected patient demographic information, and detailed medical histories including hypertension, congestive heart failure, transient ischemic attack, cerebrovascular accident , peripheral arterial disease, type 1 or 2 diabetes mellitus, inability to walk without assistance, and recent hospitalization within the past 12 month. Comprehensive physical exam: a thorough foot exam was conducted including dermatological, neurological, musculoskeletal, and vascular assessment. Assessing skin integrity, sensation,circulation etc. Patient education and Podiatry Inquiry: Nurses tailored foot care education to each participant and inquired about their podiatry care.

Results: Results from approximately 248 participants showed that a majority of the hemodialysis patients identified as Hispanic. During the podiatry inquiry, most participants reported not having a podiatrist. In terms of medical history, high blood pressure and Type 2 diabetes were common among the patients. The physical foot exams revealed that nearly half had issues such as discolored, ingrown, or elongated nails. A smaller group showed signs of fungal infection. A minority of participants did not respond to light touch, and a similar portion exhibited clear foot deformities. Limited joint mobility was observed in some individuals, while a notable portion required assistance with walking. Reduced hair growth on the top of the foot and lower leg was also observed in a significant number of patients. About half of the participants lacked detectable tibial pulses, and more than a third were without palpable dorsalis pedis pulses.

Discussion: The study demonstrated a high prevalence of foot complications concerning nail issues, fungal infections,loss of sensation and a lack of palpable pulses. We also found a significant percent of this population lack of podiatry care. Routine screening and early intervention may help prevent patients from developing further complications. Providing education to both patients and providers is an initial and crucial step in amputation prevention.

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CR-026

Effect of Insulin versus Metformin on Trans Metatarsal Amputation

Hau Pham, DPM; Alyssa Miyasato, DPM; Daniel Roh; Subin Siby, DPM

Introduction: Impairment of wound healing is a common pathological condition in diabetes, and 20% to 40% of all patients with diabetes develop ulcers (DFU) (1). Over half of the patients with Diabetes will develop an ulcer in their lifetime, while 17% of them will require amputation. (2) DFUs are challenging to heal. Wilkinson et al. reported on the contribution of senescent cells to chronic wounds and diabetic ulcers. (3) Studies showed that Metformin had senolytic properties. (4) Faster wound healing and increased angiogenesis were observed in animal studies (5). This review compares the outcomes of Trans Metatarsal Amputation (TMA) in patients who received insulin versus Those Who Received Metformin.

Methods: We reviewed 258 patients who had TMA at our institution between January 1, 2014, and December 31, 2023. Sixty patients were taking Metformin for glucose control; we matched this group with patients who only took Insulin for age, gender, and surgery date. Each group has 14 females and 46 males, with an average age of 62. The glycated hemoglobin levels for the Insulin group were 8.2 and 8.5 for the Metformin Group. The Institutional Review Board approved this TMA study with exempt status.

Results: In the Metformin group, 42 (70%) healed in 89 days, and 18 required leg amputation. In the Insulin group, 36 (60%) healed, three converted to CPA, one to LSF, and 20 required leg amputation; the TMA, LSF, and CPA healed in 126 days.

Discussion: Our review of digit amputation showed that patients taking Metformin had better outcomes than those taking Insulin. This study showed that those who took Metformin healed more and in less time than those who took Insulin. Metformin is an anti-hyperglycemic medication, but it also has senolytic properties and appears to improve healing in patients who need amputation because of ischemia and infection.

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CR-028

Risk-Based Safety and Quality Management Strategies in Wound Care Clinical Trials Conducted at a Tertiary, Safety Net Hospital

Connor A. Roddy, MS; Vitaliy Volansky, DPM; Marina Malikova, PhD, MACI, MBA, RAC

Introduction: An analysis of risk factors affecting wound care clinical trials was performed to develop proactive risk mitigation strategies,and improve the safety and quality of trials conducted. Adherence to study protocol and compliance with regulatory requirements wasexamined, based on the rate of protocol deviations.

Methods: Prospective, randomized clinical trials for diabetic foot ulcers (DFUs) and venous leg ulcers (VLUs) were compared forrates/types of deviations from study protocols. Adverse events were analyzed in enrolled participants. The rate and patterns of seriousadverse events (SAEs) and non-serious adverse events (AEs) were compared between the two wound indications.

Results: In all, 15 trials with a total of 261 participants and 223 adverse events were included in the analysis. The DFU group was noted to have a 10.4% higher incidence of SAEs and a 7.3% higher incidence of having any AEs compared with the VLU group. Analysis showed a higher number of deviations (n=325) in VLU trials compared with DFU trials (n=128). Overall, VLUs and DFUs had rates of deviation of 1.9 and 1.4 per enrolled patient, respectively.

Discussion: An understanding of the frequency/types of adverse events can contribute to the development of safety monitoring plansand risk mitigation strategies for wound care trials. Effective training and retention of research coordinators can reduce the number ofdeviations, and an understanding of the frequency and types of adverse events can inform safety management/risk mitigation plans.

CR-031

Cold Plasma Therapy in Chronic Wounds—A Multicenter, Randomized Controlled Clinical Trial (Plasma on Chronic Wounds for Epidermal Regeneration Study): Preliminary Results

Martin Storck, MD; Susanne Kley, MD; Carsten Mahrenholz, PhD; Thomas Meyer, MD; Nessr Rached, MD; Markus Stücker, MD

Introduction: Chronic wounds (CWs), defined as wounds unhealed after 8 weeks, are driven by persistent inflammation and often colonized by bacteria, which impairs healing and promotes excessive cytokine release. Antibiotics are frequently overused in CWs, contributing to rising resistance. Cold plasma therapy (CPT) is a novel treatment that targets both inflammation and bacterial burden. Previous studies have shown its antibacterial, anti-inflammatory, and wound healing effects, but real-world data, particularly in larger wounds, remain limited.

Methods: This randomized controlled trial (RCT) compared CPT to standard wound therapy (SWT) in patients with CWs. A total of 48 patients were included in this interim analysis, using the intention-to-treat principle. The CPT device used delivers plasma automatically through a patch system, ensuring consistent application regardless of user technique. Outcomes included wound closure factor, antibiotic use, pain reduction, and quality of life (QoL), assessed with the SF-12 questionnaire.

Results: CPT significantly increased wound closure by 214% compared to SWT ($p = 0.049$) and led to a higher wound closure factor at day 25 (difference: 1.69, 95% CI 0.01–3.38). Antibiotic use was significantly lower in the CPT group ($p = 0.049$). Although the CPT group included older patients and a higher rate of diabetes (72.2 years, 40%) versus SWT (65.5 years, 14%), these differences were not statistically significant. Pain scores decreased to zero in many CPT-treated patients, suggesting a reduction in analgesic need. No adverse events were reported. QoL improved significantly with CPT, particularly in the Mental Component Summary (MCS) score ($p = 0.0001$), possibly linked to faster healing and reduced passive pain.

Discussion: Our results demonstrate CPT's potential to accelerate healing, reduce antibiotic usage, and improve QoL, especially in larger wounds. This is the first RCT to show antibiotic reduction with CPT. The device's automated, patch-based design ensures reproducibility and may explain better outcomes compared to previous studies with handheld systems. Although a recent meta-analysis questioned CPT's benefit, differences in devices and protocols limit comparability. While blinding was not possible, our design closely reflects clinical practice and included a range of wound sizes. Further results from the full cohort ($n = 134$) will clarify CPT's efficacy across wound etiologies and its medico-economic impact.

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CR-032

Save a Leg, Save a Life: Community Amputation Prevention Screenings

Laura; Swoboda; DNP, APNP, FNP-C, FNP-BC, CWOCN-AP, WOCNF, CWCP

Introduction: Peripheral artery disease (PAD) significantly contributes to the 150,000 annual non-traumatic lower extremity amputations in the US. A substantial number of these procedures occur without prior vascular assessment, highlighting a systemic failure in early detection. Community-based screening programs offer a promising strategy to identify at-risk individuals, facilitating timely referral and intervention, thus shifting care from reactive amputation to proactive limb preservation.

Methods: The efficacy of community screening programs for PAD, drawing on data from past successful limb screening events conducted by the Save a Leg, Save a Life (SALSAL) Foundation and examining them to validate a community screening playbook or schedule of events for the September 2025 screening event in Milwaukee, Wisconsin. SALSAL's historical screening events have primarily utilized non-invasive Ankle-Brachial Index (ABI) measurements in addition to advanced modalities available on a per site basis. The screenings targeted at-risk populations (e.g., diabetics, smokers, individuals with hypertension). These events were typically held in accessible community settings and staffed by trained healthcare professionals. The pre-screening preparation process for successful community participation in SALSAL's previous events involved extensive local outreach, partnerships with community organizations, targeted advertising, and clear communication of the screening's benefits. For the Milwaukee 2025 screening, similar preparatory strategies were being employed, including collaborations with local health systems, grass roots community leaders, and media outlets. Data collection for events includes the number of individuals screened, prevalence of undiagnosed PAD, rates of referral to vascular specialists, and assessment of participant demographics.

Results: SALSAL's historical community screenings consistently identified undiagnosed PAD; a significant proportion of participants showed abnormal ABI readings. High referral rates to vascular specialists underscore the direct impact of screening on access to specialized care. Analysis of successful pre-screening preparations consistently showed that direct community engagement via local health fairs and trusted leaders yielded the highest participation, reinforced by word-of-mouth referrals. Post-event analysis for Milwaukee will detail diagnostic findings for direct comparison with past successful events.

Discussion: Community-based PAD screening programs hold immense potential in amputation prevention by identifying at-risk individuals before they present with advanced limb ischemia. By proactively detecting PAD, these programs can facilitate early referral to vascular specialists, enabling timely interventions that can prevent or delay amputation.

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CR-033

Time Out Before Amputation' – A Novel Strategy for Limb Salvage

Laura Swoboda, DNP, APNP, FNP-C, FNP-BC, WOCNF, CWCP; Frank Aviles, PT; Elizabeth Faust, PhD

Introduction: Non-traumatic lower extremity amputations represent a significant public health burden, with approximately 150,000 occurring annually in the United States. Disturbingly, between 31.6% and 51% of these patients (48,000-74,000 people) undergo amputation without prior vascular assessment. It is estimated that 85% of amputations are avoidable. This highlights a critical gap in care that leads to unnecessary limb loss. Drawing inspiration from the highly successful surgical "Time Out" protocol, the proposed "Time Out Before Amputation" (TOBA) is a novel intervention to ensure comprehensive vascular assessment prior to amputation, aiming to reduce the incidence of preventable amputations.

Methods: The "Time Out Before Amputation" initiative implemented a standardized protocol for pre-amputation assessment mirroring the Joint Commission's Universal Protocol for surgical safety. It mandates a brief, pre-procedural pause for any patient with amputation on their differential, involving the healthcare team in verifying critical details. Key components include confirming patient identification, procedure, site, and crucially, the availability and review of all relevant vascular assessment findings. This includes ensuring proper display and access to diagnostic and radiology test results, facilitating immediate identification of cases where vascular testing has not been performed or indicates potential for limb salvage through revascularization. This standardized checklist approach, similar to those proven effective in complex cardiac surgeries, is designed to enhance patient safety and reduce adverse events.

Results: Current data reveal that only 49-68.4% of non-traumatic lower extremity amputations are preceded by any arterial testing. Even when testing occurs, utilization varies by amputation site, with foot amputations having the lowest rates (62.5%). Studies have shown that when vascular surgeons are involved in tertiary care settings, pre-amputation vascular evaluation is achieved in nearly 100% of patients. TOBA protocol preliminary results from a single acute care medical center pilot site demonstrated both successful implementation of a time-out before amputation and successful amputation severity reductions.

Discussion: "Time Out Before Amputation" holds significant potential to decrease the staggering number of lower extremity amputations performed without appropriate vascular assessment. By mandating a structured pause and verification of vascular status, TOBA aims to ensure

that every patient is considered for limb salvage through revascularization. This initiative could bridge the current gap in care, transforming the care pathway from "no-screen-no intervention-limb loss" to "screen-referral-intervention-limb salvage," ultimately improving patient outcomes and quality of life. Further research is needed to quantify the direct impact of TOBA on amputation rates and the proportion of patients receiving subsequent vascular interventions.

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CR-034

Results of an Educational Campaign to Improve the Knowledge of Referring Providers Related to the Benefits of Hyperbaric Oxygen Therapy on Late Radiation Tissue Injuries

William Tettelbach, MD, FACP, FIDSA, FUHM, MAPWCA; Daniel Christopher, MSN, RN, ACHRN

Introduction: Radiation therapy is a modality used to treat many forms of cancer, and about 50% of individuals receiving radiotherapy will be long-term survivors. A 2023 review of eighteen studies using Cochrane methodology with publications ranging from 1985-2022 suggested hyperbaric oxygen (HBO2) therapy may be associated with improved outcomes in patients with late radiation tissue injuries (LRTIs) affecting areas of the head, neck, bladder, and rectum.1 Despite supporting medical evidence, patients experiencing symptoms of LRTI appear to be under-treated with HBO2 therapy secondary to a lack of understanding of HBO2 medicine by potential referring providers. This analysis aims to determine whether a nationwide educational campaign targeting LRTIs could favorably impact patients' access to HBO2 therapy.

Methods: A twelve-month LRTI education campaign was initiated on October 1, 2023, and led by over 25 directors targeting local and regional oncology and primary care practitioners across North America. Data collected from 235 RestorixHealth sites utilizing the WoundDocselectronic medical record (EMR) From October 2023 through September 2024, the total number of HBO2 therapy treatment sessions organized by ICD 10 codes specifically correlating with patients treated for *LRTIs was collected. The comparator group was collected prior to the education campaign from October 2022 through September 2023. Statistical significance was calculated using Chi-Square.

Results: During the twelve months of the LRTI educational campaign, monitored at 235 sites (95% CI:0.823,0.905), there was a statistically significant 12.2% increase in the number of HBO2therapy treatments targeting LRTIs when compared to the baseline twelve months before the start of the LRTI campaign through the educational intervention period.

–>The percent increase between the baseline and intervention periods was 12.2%.

–>Intervention period - For all indications treated with adjunct HBO2 therapy 26.7% were for LRTIs.

–>Baseline period - For all indications treated with adjunct HBO2 therapy 23.8% were for LRTIs.

Discussion: This real-world retrospective analysis was statistically significant and suggests that patients suffering from LRTIs may never be offered HBO2therapy as a treatment option to alleviate their pain and suffering secondary due to a lack of familiarity of referring provider(s) with the benefits of Hyperbaric Medicine. Further studies are warranted to corroborate these findings.

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CR-035

Show Me The Light: Clinical Application of Fluorescence Imaging and The Impact on Provider Decision Making

Christin Tomlinson, DNP, APRN, FNP-C, CWS; Blake Johnson, PA-C

Introduction: Clinicians face many challenges while treating chronic wounds. Increased bacterial burden is a common finding in chronic wounds that can increase the patient's risk of infection and ultimately prolong wound healing. Researchers have found that an increased bacterial burden of 104 CFU/g is present in over 80% of chronic wounds, and these wounds often did not show clinical symptoms of infection1. Chronic wounds often stagnate in their healing progression, which can cause providers to question their treatment plans.

Fluorescence (FL) imaging uses safe violet light to fluoresce areas of increased bacterial burden with loads >104 CFU/g. FL imaging is available in handheld devices that provide real-time feedback that can impact a provider's treatment plan. Incorporating FL imaging into standard wound care has led to increased healing rates in chronic wounds2.

Methods: FL imaging was incorporated into in-home wound care visits after initial wound cleaning. Three patient cases were reviewed and the providers reported how the FL imaging impacted the patient's treatment plan. FL imaging was used on new patients, stalled or regressed patients and patients receiving cellular tissue product (CTP).

Results: Three patient case studies were found to demonstrate elevated levels of bacteria by FL imaging, resulting in adjustment of treatment plan. Adjustments included conservative sharps debridement, change of wound dressing, prompting of wound culture and holding CTP. Of the three cases there was greater than 30% decrease in wound size in 30 days or closure of wound and one patient had wound closure in 5 weeks.

Discussion: A five-question survey was completed by providers using FL imaging to assess the impact this device has with treating chronic wounds. There was a 76% response rate with 94.7% of responding providers reported that FL imaging changed their management of a patient wound. 80% of chronic wounds have biofilm, evaluating increased bioburden benefits of decreasing infections and complications, which have a direct correlation to wound healing. Overall, FL imaging provided clinicians with real-time evidence that impacted treatment plans and led to improved patient outcomes.

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CR-036

Impact of the Wound Hygiene Protocol, Incorporating an Advanced Antimicrobial Silver-Containing Gelling Fiber Dressing, on Hard-To-Heal Pressure Ulcers/Injuries: Real-World Evidence

Rachel Torkington-Stokes, MSc; Daniel G. Metcalf, PhD

Introduction: Hard-to-heal wounds such as pressure ulcers/injuries

that are compromised by bioburden are often managed with antimicrobial wound dressings. We evaluated the impact of the Wound Hygiene protocol, a 4-step wound care protocol (cleanse, debride, refashion, and dress with advanced antimicrobial silver-containing gelling fiber dressing [AAA]*), on hard-to-heal pressure ulcers/injuries.

Methods: A subgroup analysis of patients with pressure ulcers/injuries in a prospective, real-world study of hard-to-heal wounds managed with the Wound Hygiene protocol incorporating AAA* dressings, for approximately 4 weeks, or as clinically appropriate, was performed. The primary endpoint was change in wound volume from baseline to the final assessment.

Results: 110 patients had pressure ulcers/injuries (38% were static, 24% were deteriorating) that were included in this analysis. Of 88 patients with baseline and final wound volume assessments, 30 (34%) had complete wound closure (100% volume reduction) after a median of 32 days of the Wound Hygiene protocol. Mean wound volume reduced from 143.1 cm3 at baseline to 37.4 cm3 (73% reduction) at final assessment. Exudate levels changed from predominantly moderate (50%) at baseline to predominantly low (36%) at the final assessment. Signs of clinical infection were present in 51% of pressure ulcers/injuries at baseline, which had reduced to 5% at final assessment. Suspected biofilm was 78% at baseline and 15% at final assessment. At final assessment, 20% of pressure ulcers/injuries had healed and 75% had improved.

Discussion: Management with the Wound Hygiene protocol resulted in healing or improvement in nearly all hard-to-heal pressure ulcers/injuries (95%), and notable decreases in wound volume, exudate level, suspected biofilm, and local infection. Our findings suggest that the Wound Hygiene protocol incorporating AAA* dressing is an effective treatment strategy for pressure ulcers/injuries.

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CR-037

Evaluating the Effectiveness of CAMPS Products on Pressure Ulcer Healing: A Real-World Comparative Effectiveness Study

Zwelithini Tunyiswa, BA; Jessica Hoge, MD; Ryan Dirks, MS, PA

Introduction: Pressure ulcers represent a significant clinical and economic burden in wound care. Despite growing interest in advanced wound technologies, real-world evidence on their effectiveness remains limited. This study investigates the impact of Cellular, Acellular, and Matrix-like Products (CAMPS) on pressure ulcer healing, using a large-scale wound registry and robust causal inference methods to estimate the average treatment effect (ATE) of CAMPS relative to standard of care (SOC).

Methods: This observational study analyzes de-identified data from a national wound registry. The cohort includes 150 subjects treated with CAMPS and approximately 10,000 matched controls receiving SOC. To address confounding in this real world non-randomized setting, two complementary statistical approaches were applied: propensity score matching (PSM) and inverse probability weighting (IPW). Baseline covariates included wound size, location, stage, duration at baseline, and comorbidity indicators. The primary outcome was defined as complete wound closure within a fixed observation window.

Results: Interim analyses indicate that after covariate adjustment via PSM, the CAMPS-treated group demonstrated a higher probability of healing compared to SOC. IPW analyses are currently underway and may be extended to support marginal structural modeling (MSM) to further evaluate time-varying treatment effects. Sensitivity analyses will assess robustness to unmeasured confounding and covariate balance.

Discussion: Preliminary findings suggest that CAMPS products may offer a clinically meaningful benefit over SOC in promoting pressure ulcer healing. The use of real-world data combined with causal inference methods allows for timely, practice-relevant insights while accounting for treatment selection bias. Planned extensions of the analysis using MSM will support a more nuanced understanding of treatment dynamics. These results may inform future clinical decision-making and prospective trial design.

CR-040

Comparison of Mean Healing and Graft Application Rates for Cellular and Tissue-based Products Commonly Utilized in the Treatment of Chronic Wounds: A Literature Review

Bradley Wetzell, PhD; Julie B. McLean, PhD

Introduction: Increasing treatment and costs associated with chronic wounds such as diabetic foot ulcers (DFUs) and venous leg ulcers (VLUs) burden global healthcare systems.[1,2] Proposed changes to the US Centers for Medicare and Medicaid Services (CMS) Local Coverage Determination (LCD) for treatment of such wounds with Cellular and Tissue-based Products (CTPs)[3] highlight a growing urgency to identify efficacious and cost-effective treatments. This study compared published mean healing and application rates for several CTPs commonly utilized to treat chronic wounds as representing simple hypothetical indicators of their relative clinical efficacy and cost effectiveness.

Methods: A literature review via PubMed and Google Scholar identified multi-patient studies reporting on the use of several commonly utilized CTPs (denoted A through E) without adjunctive therapies to treat DFUs or VLUs. Level III studies or better with primary endpoints of Mean Healing Rates and/or Mean Number of Graft Applications were included. When available, Mean Baseline Wound Sizes were also extracted as a secondary endpoint to evaluate the robustness of reported results. Overall means for each endpoint within each CTP were calculated and reported.

Results: A total of 14 studies were identified.[4-17] Mean wound sizes studied for CTPs A through E were 13.5, 9.0, 3.9, 8.8, and 4.3 cm2, respectively. Mean healing rates for each were 57.1%, 73.5%, 62.8%, 58.4%, and 84.0%, respectively. The mean number of applications to achieve healing for each was 1.2, 2.4, 4.2, 6.3, and 3.9, respectively.

Discussion: The mean wound sizes were largest in CTPs A and B, which also demonstrated the lowest numbers of applications. CTP B achieved the second-highest healing rates. While CTP A healing rates were among the lowest, the wound sizes studied were nearly three times larger than those of CTP E, which had the highest healing rates. CTP D had the second lowest healing rates but was studied in relatively robust wounds and required the highest number of applications.When choosing a CTP for the treatment of complex wounds, it is important for clinicians to consider published data reflecting not only their clinical efficacy, but also their number of applications, which may reflect cost-effectiveness.

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EBP-001

The Wound That Whispers: Recognizing End-of-Life Skin Failure in Kennedy Terminal Ulcers

Lacey Bauer, MS; Amena Babers, FNP-C; Jacqueline H. Brown, FNP-C; Melissa Cavazos, FNP-C, CWS; Ida Centineo, FNP-C, CWS; Robert Frykberg, DPM, MPH; Daniel Hallman, DPM, MS, CWS; Mary M. Kruse, RN, MAOL, CWOCN, CWS; Ashley Meusa, DPM; Judi Miller, FANP-C, APWH; Bill J. Releford, DPM; Hugh L. Richardson, DPM; Tanyikka Tinnon, MAOM; Kathryn Vatt, MS

Introduction: Kennedy Terminal Ulcers (KTUs) are skin manifestations that emerge in the final days or hours of life. They typically signal a rapid decline in systemic function and multi-organ failure. These ulcers are often mistaken for pressure injuries, leading to misdiagnosis, distress for families and caregivers, and avoidable legal concerns. Recognizing organ impairment or skin failure as contributing to deterioration is not currently prioritized in the assessment processes used in our care settings. Raising awareness of KTUs is critical for healthcare professionals in wound care, palliative care, and long-term care settings.

This poster aims to equip healthcare professionals with a practical approach to identifying underlying pathophysiology and appropriately managing KTUs. By clearly outlining their clinical presentation and context within a structured protocol, we seek to facilitate accurate diagnosis, enhance the quality of end-of-life care, and support communication strategies consistent with comfort-focused goals.

Methods: A review of the current literature, clinical case reports, and expert consensus statements was conducted to identify hallmark features of KTUs, including their classic appearance, sudden onset, and progression despite appropriate care. Comparisons between KTUs and complex pressure injuries were drawn to highlight differences in etiology, timing, and management. Best practices in documentation and family communication were also examined.

Results: KTUs typically present as rapidly developing skin failure on the sacrum or coccyx, with irregular borders and varying coloration (e.g., reddish, purplish, or blackened areas). Unlike pressure injuries, KTUs are unavoidable and associated with the natural dying process. A protocol including clinical assessment, risk factor review, comfort treatment, clinician education on documentation, and interdisciplinary communication are key to avoiding mislabeling and ensuring care remains aligned with palliative goals.

Discussion: KTUs challenge the traditional paradigm of wound care by underscoring that not all skin breakdowns are preventable. Recognizing KTUs as a distinct phenomenon of skin failure at the end of life helps clinicians provide compassionate and appropriate care. Proper documentation and family education reduce the risk of confusion and blame. Continued training and institutional awareness are essential to support best practices in terminal wound care.

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EBP-002

Virtual Technologies in Pressure Ulcer/Injury Assessment

Abdulaziz Binkanan, RN, MSc, IIWCC, TOT

Introduction: Pressure ulcers (PUs) are a major healthcare burden, causing significant morbidity and mortality. Accurate assessment is crucial for timely diagnosis and intervention. Virtual technologies offer promising avenues for improving PU assessment, but their effectiveness and impact need further exploration. This narrative review aims to synthesize current research on virtual.

Methods: We searched PubMed, EMBASE, CINAHL, and Cochrane Library from January 2010 to January 2024 using relevant keywords. Studies investigating virtual technologies for PU assessment in adult populations were included. We excluded studies with specific technology limitations or not published in English. We identified studies exploring various virtual technologies, including telemedicine consultations, image analysis tools, and sensor-based monitoring systems.

Results: remote settings. Image analysis tools offered potential for objectivity and reduced inter-rater variability in wound characterization and staging. Sensor-based monitoring systems held potential for early detection of pressure complications, but further validation and research are needed. These findings suggest that virtual technologies have the potential to enhance PU assessment across diverse settings. However, challenges regarding technology acceptance, data security, and cost-effectiveness require further consideration. Future research should focus on long-term outcomes, cost-effectiveness evaluation, ethical considerations, and integration into clinical workflows. These findings suggest that virtual technologies have the potential to enhance PU/PI assessment across diverse settings.

Discussion: Virtual technologies hold promises for revolutionizing PU assessment, potentially leading to improved access, earlier interventions, and better patient outcomes. Further research is crucial to optimize their clinical integration and ensure ethical and effective implementation in routine practice.

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EBP-003 (**RPT-010**)

Enhancing Deep Tissue Injury Detection: The Role of Near-Infrared Spectroscopy in Early Diagnosis Across Skin Tones

Hailey Caprara, RN, BSN, CWS, DAPWCA; Mary Rose B. Marcaida; Nirman Tulsyan

Introduction: Introduction: Deep tissue injuries (DTIs) are severe pressure-induced damages to subdermal tissues, such as muscle and connective tissue, affecting approximately 0.4% of hospital patients and costing the U.S. healthcare system an estimated $1.3–2.7 billion annually for pressure injury management.[1–3] Early detection is critical to prevent progression to full-thickness wounds, yet current methods rely on subjective visual skin assessment (VSA), which is less effective in darker skin tones.[4] Thermography has been investigated as a potential alternative to VSA for DTI detection.[5] Near-infrared spectroscopy (NIRS) provides a non-invasive method to measure tissue oxygenation, offering a robust solution to overcome VSA's limitations too. This study evaluates NIRS imaging for early DTI detection across Fitzpatrick skin types I–V, aiming to enhance diagnostic equity in clinical practice.

Methods: Methods: A prospective observational study was conducted across 15 long-term care facilities, enrolling 17 patients with 20 confirmed DTIs. Patients represented Fitzpatrick skin types I–V, with DTI locations including sacral, heel, hip, and buttock regions. Exclusion criteria included active dying or unstable medical conditions. DTI detection was compared using three **methods:** VSA, NIRS and thermography imaging. The FDA 510(k)-cleared handheld device* collected NIRS, thermal, and digital images. Tissue oxygenation deficits (ΔStO2) were measured as the percentage difference between affected and adjacent healthy tissue. Descriptive statistics summarized ΔStO2 across Fitzpatrick types, and Pearson correlation assessed the relationship between Fitzpatrick score and NIRS-detected ΔStO2. A p-value < 0.05 was considered significant.

Results: Results: Preliminary data showed NIRS-detected tissue oxygenation deficits ranging from -27% to -79% (mean ΔStO2 = -56.8%, SD = 19.7%). No significant correlation was observed between Fitzpatrick score and ΔStO2 ($r = 0.14$, $p = 0.4547$), suggesting NIRS's consistent performance across skin tones. Thermography showed variable performance, with reduced reliability in early-stage DTIs.

Discussion: Discussion: This study highlights NIRS's promise as a tool for early DTI detection. The lack of correlation between Fitzpatrick score and NIRS performance underscores its robustness across diverse populations, addressing a critical gap in equitable healthcare. This is significant because some medical technologies show reduced effectiveness on darker skin tones due to differences in light absorption. NIRS's ability to detect tissue oxygenation deficits may enable earlier interventions, reducing the risk of severe complications. Compared to thermography, NIRS offers greater consistency in early-stage DTI detection. Future research should explore NIRS's integration into clinical workflows and its cost-effectiveness in reducing DTI-related healthcare burdens.

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EBP-004

Screw It: An Analysis of Hardware-Related Wounds

Elizabeth Carradini, DNP, CWS

Introduction: Hardware related wounds are somewhat common, though may be difficult to diagnose in some cases in the wild world of wound care. Hardware is placed for osseous stability following injury or surgical repair. Hardware related wounds may occur acutely following surgical placement, or months to years afterwards.As wound care clinicians it is important to understand the mechanism behind hardware related wounds, how to confirm or suspect hardware relation, when to begin necessary intervention, and collaborate with orthopedics for best patient outcomes.Orthopedic hardware may become covered with bacteria, most commonly Staphylococcus aureus and epidermis, which can cause secondary bone infection. Bacteria produce glycocalyx, or biofilm, which protects the organism from the immune system as well as antibiotics. This allows the hardware to renew infection if not removed or treated[1,2].

Methods: Patient A presented with sudden ulceration to the great toe. Within a week, communication with hardware was made, thus meeting confirmatory criteria of hardware infection. After several treatment modalities failed, X ray was preformed to indicate screw in great toe. After removal of screw, patient healed within 2 weeks.Patient B presented with chronic medial and lateral malleoli ulcerations related to hardware with hardware communication, increased ESR, CRP, and WBC. Patient was in the acute phase of osseous union, and therefore hardware was unable to be removed. Through antibiotics, HBO treatments and close coordination with orthopedics, patient remained infection free. After osseous unionization, hardware was removed and ulceration healed within a month.

Results: Utilizing suggestive and confirmatory criteria, collaboration, appropriate wound care, imaging, labs, and surgical intervention, healing of both acute and chronic hardware related wounds was successful as well as osseous stability and function.

Discussion: Hardware may become infected either hematogenously or directly through soft tissue disruption, allowing the bacteria to enter the immune system, leading to seeding of the hardware. Immunocompromised individuals are also susceptible to hardware related complications[1,2].Removal occurs in the setting of risk versus benefit, and if the hardware has been affected acutely or chronically following placement. If it is chronic, it is likely that the osseous structure has unionized, allowing for safe removal. If osseous unionization has not occurred, it is possible to epithelialize tissue over the hardware in the setting of antibiotics and or washouts. ESR and CRP will show a decrease and thus, success in treatment[1].

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EBP-005

Recommendations for Chronic Wounds: FDA Guidance Update on Clinical Trial Design

Marissa Carter, PhD; Peggy Dotson; Vickie Driver, DPM; Caroline Fife, MD; Sarah Griffiths, PhD; Maribel Henao, DPM; Francis James, Other; Holly Korznendorfor, Other; Katie Mowry, PhD; Alisha Oropallo, MD; Joseph Rolley, Other; Mitch Sanders, PhD; Robert Snyder, DPM; Marjana Tomic-Canic, PhD; Zweli Tunyiswa, PhD; Howard Walthall, PhD

Introduction: The FDA Guidance Document on Chronic Cutaneous Ulcers and Burn Trials has not been revised in nearly two decades, highlighting a pressing need for an update to reflect advancements in our understanding of chronic wound pathogenesis and the development of innovative diagnostic techniques. In response to this gap, the Wound Care Collaborative Community (WCCC) convened a dedicated work group with the objective of revising and enhancing existing guidelines.

Methods: This initiative aimed to formulate comprehensive recommendations for updating the FDA guidance document. Central to this effort was the incorporation of the latest evidence and best practices, supported by thirty-five newly reviewed references that capture the current state of knowledge. The project addressed both preclinical and clinical trial considerations. From a preclinical standpoint, it underscored the necessity for standardized testing protocols, as advocated by the Wound Reporting in Animal and Human Preclinical Studies (WRAHPS) guidelines. There was also a significant focus on bridging preclinical efficacy data with human outcomes, recognizing the variability influenced by factors such as species, sex, and age. On the clinical front, we explored the distinct regulatory pathways for devices versus drugs and biologics, emphasizing the importance of utilizing objective wound assessment techniques, including advanced digital imaging technologies for precise wound measurements. Additionally, the statistical analysis section was substantially enhanced to incorporate contemporary methodologies, such as Maximum Likelihood Estimation (MLE) and Bayesian Estimation (BE).

Results: Two pivotal documents emerged from this process. The first comprised official docket comments submitted to the FDA, equipped with insightful recommendations for their consideration. The second document is a comprehensive manuscript authored by WCCC members, detailing these recommendations and slated for publication.

Discussion: These updated guidelines present consensus findings on standard care practices related to study endpoints for assessing treatment efficacy. They delineate parameters for evaluating wound healing rate, percentage area reduction, healing time, and pain assessment, thereby providing robust frameworks for current and future clinical trials. Ultimately, through these evidence-based recommendations, the WCCC aims to drive progress in chronic wound management and enhance patient outcomes.

EBP-006

Have You Unzipped Lately? Elevate Hospital Safety with Validated Support Surface Materials

Neil S. Craney, BSN, RN; Agiliti; Kristen Thurman, PT, MPT, CWS; Estelle Zanotti, MSN, RN, CWON; Megan Hermann, PT, DPT

Introduction: Hospital support surfaces with fluid ingress have a 5.83 times greater risk for cross-contamination.[1] Fifty percent of acute care support surfaces are compromised within 3.8 years with an increase in failure odds of 67.6% with each additional year of age.[2] The FDA recommends regular support surface inspection for fluid ingress and damage and replacing damaged covers and surfaces to reduce the risk of infection to patients.[3] Replacing surfaces is costly - preserving their integrity prevents not only infections but also unnecessary spend. Innovative surface materials and construction were assessed to understand the impact on fluid ingress and improved lifespan.

Methods: Surfaces considered patient-ready were thoroughly inspected to observe fluid ingress and damage. Top covers were inspected for holes, tears or internal staining. The top cover was then removed to inspect internal components for damage and staining. With evidence of fluid ingress, full surface replacement was recommended to prevent cross-contamination risk. Surfaces from various manufacturers were inspected to understand how different constructions impacted fluid ingress and surface longevity.

Results: Across 89 facilities, 1022 surfaces with an average age of 5.7 years were inspected. One hundred and twenty-three (123) surfaces contained a welded-shield to prevent fluid ingress to the internal components if the top cover was damaged. None of these surfaces required full replacement and only 17% had top cover damage. Of the remaining 899 without a welded-shield, 74% (667) sustained internal damage requiring full surface replacement.

Discussion: Innovative materials and construction prevented fluid ingress and damage increasing longevity of costly assets.4 Non-innovative

surfaces had a higher occurrence of fluid ingress and damage, shortening their life-span and requiring replacement in less than five years, consistent with previous studies.[1] The cost of replacing the 667 surfaces with internal damage (~$1500 per surface) totals $1,000,500. Replacing the top cover (~$200) of 17% would save $996,300. Surfaces with a welded-shield construction yield significant cost savings. Considering welded-shield surfaces did not require replacement, inspection of these surfaces beyond 6 years is warranted to understand total useful life.

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EBP-007

Negative Pressure Wound Therapy With Instillation Use in the Acute Care Setting: Patient Outcomes and Hospital Reimbursement

Mary Creger, MSN, ACNS, WCC; Stephanie Risner, MHI, RHIA, FACHDM; Yesenia Banks, CPC

Introduction: Early initiation of negative pressure wound therapy with instillation and dwell (NPWTi-d*) has been associated with statistically significant improvements in patient outcomes and cost reduction.1 Recently, specific reticulated open-cell foam dressings (ROCF-CC† and ROCF-CCC‡) used with NPWTi-d attained an expanded indication statement for the hydromechanical removal of infectious materials, non-viable tissue, and wound debris. The impact of NPWTi-d use on patient outcomes and hospital reimbursement were examined.

Methods: All patients received systematic antibiotics and sharp debridement, as necessary. NPWTi-d was applied, and normal saline, 0.25% Dakins solution, or hypochlorous acid solution were instilled into the wound bed. These solutions were allowed to remain in the wound bed for 10 minutes followed by a 1 hour 50-minute negative pressure cycle at -125 mmHg. Dressing changes occurred every 3 days. Diagnosis related group (DRG) before and after use of ICD-10-PCS codes were recorded. Documentation supporting the use of the ICD-10-PCS code that aligns with the FDA expanded indication for NPWTi-d use with ROCF-CC or ROCF-CCC dressing was recorded for each patient.

Results: A total of 25 patients received NPWTi-d with ROCF-CC or ROCF-CCC dressings. The most common wound types included pressure injury (n=13) and soft tissue infection (n=4). NPWTi-d therapy use ranged from 4 to 31 days. Removal of infectious materials, non-viable tissue, and slough was observed. Wound area reduction was observed in 19 patients. Reduced amounts of non-viable tissue were observed in the remaining 6 patients. Patients were discharged to home, a skilled nursing facility, a short-term acute care hospital, or inpatient rehabilitation care (n=25). One patient expired, though this was not related to NPWTi-d use. The ICD-10-PCS code aligned with the expanded indication increased DRG reimbursement by an average of $17,239.52 per patient.

Discussion: The expanded indication of hydromechanical removal by NPWTi-d with ROCF-CC or ROCF-CCC dressings may help to reduce the number of surgical debridements required, while promoting granulation tissue development, and creating an environment that promotes wound healing. ICD-10-PCS coding for NPWTi-d use with ROCF-CC or ROCF-CCC dressings as a tissue management option should be further assessed along with potential impacts to DRG reimbursement.

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EBP-008

Effect of a Team Approach to Pressure Injury Management over 5 Years in a Tertiary Hospital

Hyung Min Hahn, MD; Hyoseob Lim, MD, PhD; Il Jae Lee, MD, PhD

Introduction: The authors' facility established a novel integrated wound care team (IWCT), which included the implementation of a strict treatment algorithm by the patients' attending providers and a specialized wound care team led by a plastic surgeon. Investigators then retrospectively analyzed clinical outcomes of pressure injury (PI) management by the IWCT over 5 years.

Methods: The authors performed a retrospective chart review and periodic statistical analysis of the data for all patients with PI referred to the IWCT in the authors' center from May 2015 to April 2019. Data including patients' demographic information, first and last consultation dates, referring department, PI stage, site of PI, and Braden Scale scores were collected and analyzed.

Results: Patients (N = 15,556) did not differ significantly in age, sex, or Braden Scale score. A preimplementation/postimplementation analysis of PI data before and after establishing the IWCT showed that the incidence of stage 3 or 4 PIs had significantly decreased during the study period (19.1% vs 15.2%, $P < .05$). Conversely, the incidence of stage 1 PIs significantly increased in the same period (38.0% vs 57.4%, $P < .05$). The proportion of completely healed PIs also increased, and the median treatment period was significantly shortened ($P < .05$).

Discussion: Implementation of the IWCT in a tertiary hospital setting led to a significant increase in early-stage PI detection and a decrease in severe PIs.

EBP-009

Optimizing Hard-to-Heal Wound Healing: Integrating Near-Infrared Spectroscopy and Thermographic Imaging into the 7-Step Wound Management

Christine Handley, MBA, BSN, RN

Introduction: Chronic wounds affected approximately 10.5 million U.S. Medicare beneficiaries in 2023, up from 2.3 million in 2014.[1] The "7-Steps of Wound Management" is an evidence-based framework designed to enhance outcomes in the treatment of hard-to-heal wounds. It includes assessing circulation, infection management, debridement, offloading, nutritional support, moisture balance, and advanced therapies like Cellular and/or Tissue-Based Products (CAMPs) and hyperbaric oxygen (HBO_2) therapy. This approach aims to accelerate healing, reduce complications, optimize resource utilization, and improve quality of life. This study evaluates the integration of Near-Infrared Spectroscopy (NIRS), thermography, and digital imaging, and automated wound measurements into the 7-Step Wound Management Framework, highlighting their role in improving clinical decision-making and health resource utilization (HRU).

Methods: An FDA-cleared imaging device2 measuring tissue oxygenation (StO_2) via NIRS, skin surface temperature, and wound surface area was incorporated into the 7-Step Wound Management Framework. Patients with hard-to-heal wounds were assessed for wound size, StO_2, and skin surface temperature during key clinical phases. These included vascular assessment (comparing NIRS to ABI or Doppler ultrasound), infection monitoring (comparing thermography to wound cultures), debridement (evaluating NIRS to determine if further intervention was needed), and the application of advanced therapies. The added value of tissue StO_2, skin surface temperature, and wound surface area was demonstrated throughout each step, from monitoring standard care

(SOC) progress to qualifying patients for advanced treatments and tracking their responses.

Results: NIRS imaging identified poor perfusion (StO_2 < 40%), enabling timely interventions. Thermography detected infection, reducing unnecessary biopsy orders. NIRS-guided debridement led to a 15-20% increase in tissue oxygenation, accelerating wound closure. Thermography optimized offloading strategies, ensuring better pressure distribution. Additionally, incorporating imaging results into patient discussions increased compliance with advanced therapies, reducing missed appointments.

Discussion: The integration of advanced imaging techniques, such as NIRS and thermography, into the 7-Step Wound Management Framework improves clinical outcomes, reduces complications, and enhances HRU. These findings support the broader adoption of these technologies in wound care.

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EBP-010

An Evidence-Based Guide for Initiating Compression Therapy: Building Confidence in the Non-Expert Provider

Matthew Hardy, M.D., CWSP; Caroline Hardy, DNP, APRN, FNP-C

Introduction: With experience in numerous healthcare systems throughout the nation, the authors noted a general reluctance of outpatient, primary care providers, urgent care providers, and other non-expert providers to initiate lower extremity compression therapy for several common disease processes. This delay can have a negative impact on patient outcomes including infection, delayed healing, non-healing, chronic pain, amputation, and death.

Methods: An extensive literature review was performed aimed to identify 1) the most common reasons for non-expert provider reluctance to initiate compression therapy, 2) best evidence-based practices for compression therapy in venous, lymphatic and other lower extremity disease processes, and 3) what resources exist to help guide the non-expert provider and build confidence in early and appropriate initiation of compression therapy.

Results: There is an ever-growing body of vigorous research to support the best practices identified for the early and appropriate initiation of compression therapy. The authors note the evidence for non-expert reluctance to initiate therapy is less robust, however, local experience and informal primary care provider surveyance demonstrated that perceived risk, lack of experience, unclear treatment algorithms, and overwhelming product options were among the most common barriers to initiating therapy. Lastly, the literature review revealed that while much of the research established and supported best practices, it did not translate to wider adoption by primary care or other non-expert provider groups.

Discussion: Given the relative lack of available evidence in the literature, the authors aim to gain further insight into the various reasons for non-expert reluctance to initiate compression therapy through a formal survey of primary care providers. A better understanding of these reasons will be used to create a streamlined, evidence-based guide for initiating compression therapy and thereby assist in building confidence in the non-expert provider. The goal being more patients receiving appropriate compression therapy either as potentially definitive therapy or as "compression therapy triage" while awaiting specialist evaluation.

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EBP-012

Defining Skin Failure in the Clinical Setting

Lauren Morata, DNP, APRN, CCNS, CCRN, CPHQ; Diana Burgueno-Vega, MD; Jena Brandt, BSN, RN, CCRN; Daisy Gonzalez, MSN, APRN

Introduction: When reviewing data from 2023, the team identified that approximately 46% of the wounds labeled as pressure injuries had an etiology of skin failure. This was determined based on evidence published regarding the diagnosis of skin failure and chart review of the patient's clinical condition and pressure injury prevention interventions implemented.

Methods: After an extensive literature review, the Quality and Wound Care teams developed a definition for skin failure which was approved by legal, medical staff office, and nursing leadership. The definition is as follows: A skin disorder in which the skin and underlying tissue fail from hypoperfusion due to multisystem organ failure, end of life, or a hypoperfused state (i.e., severe septic shock/shock on vasopressors). Often these patients have multiple comorbidities. Skin failure occurs even when attempting/able to perform preventative interventions tailored to the patient and their acuity (e.g., turning q2/mobilizing, optimizing nutrition). Presentation can occur anywhere on the body and is typically yellow, purple or black, often in a pear- or butterfly-shape. The team collaborated with Informatics to develop an easy to use documentation template to ensure consistency in the definition. In order to meet the diagnosis, the key is to ensure all preventative interventions were implemented.

Results: Our criteria for diagnosing skin failure is stringent requiring the documentation of appropriate pressure injury prevention interventions and agreeance between the Wound Care and Attending teams on the etiology; therefore, only approximately 25 patients have met the diagnosis. We were hopeful this would decrease the overall pressure injury rate, but have not observed this outcome. Fortunately, in these instances the wound etiology can be appropriately diagnosed.

Discussion: Creating criteria to effectively diagnose skin failure through multidisciplinary collaboration can lead to an improved diagnosis of wounds. While skin failure should not be implemented as a method to avoid appropriately diagnosing pressure injuries, there is value in correctly identifying wounds.

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EBP-013

Patient Survey Results: Key Insights for Advancing Wound Care Success using Fluorescence Imaging

Rose Raizman, RN-EC, PHCNP, NSWOC, MSc; Katherine N. McLeod, CRNP, BSN, RN, CWCN; Alisha Oropallo, MD; Amit Rao, MD; Carly M. Knuth, PhD; Micaela D. Gray, MSc; Laura Jones-Donaldson, PhD

Introduction: Several studies have demonstrated the clinical value of fluorescence (FL) imaging in detecting bacterial burden, guiding wound therapy, and improving healing outcomes a-c. However, few studies have objectively measured its impact from the patients' perspective, including on treatment adherence, or their emotional/behavioral responses to

repeated FL imaging. This study aims to quantify patients' perceptions of the influence of FL imaging on their wound care experience, building on clinical observations that it enhances patient engagement.

Methods: We surveyed 27 patients receiving long-term treatment (≥6 months) with various wound pathologies across two outpatient wound care centers. A 10-item questionnaire, adapted from validated quality-of-care toolsd, assessed patients' emotional and behavioral responses to repeated FL imaging use (≥10 visits). We focused on key domains including education, empowerment, and treatment adherence, with responses captured on a 5-point scale (strongly disagree to strongly agree). A case example of a 72-year-old male with venous insufficiency and bilateral venous leg ulcers is described here.

Results: Our findings consistently demonstrated the positive impact of FL imaging across multiple patient-centered domains. All respondents (100%) agreed or strongly agreed that FL imaging significantly improved their understanding of their wound's status and the rationale behind their prescribed treatments. This enhanced comprehension directly translated into improved adherence, with most respondents indicating they were more likely to follow at-home care plans (89%) and return for future appointments (78%) when FL imaging was incorporated into their wound care visits. Furthermore, FL imaging played a crucial role in patient empowerment. All respondents (100%) believed that FL imaging deepened their understanding of their condition. Moreover, most patients reported a greater sense of hope and reduced anxiety (89%), alongside a heightened trust in their wound care provider (96%) as a direct result of the visual clarity provided by FL imaging. In the case example, the patient was initially non-compliant with treatment and his wound became chronic; however, he demonstrated improved adherence and wound size reduction after FL imaging enhanced his understanding of the correlation between his poor compliance and increased bacterial presence.

Discussion: We found that FL imaging was positively perceived by patients and enhanced their engagement and treatment adherence, confirming anecdotal reports and our own clinical observations. Our findings underscore its role as a crucial tool for diagnosing bacterial burden and as a powerful catalyst for patient education and empowerment. Integrating FL imaging into routine wound care holds substantial promise for improving clinical outcomes and the overall patient experience.

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EBP-014

Bedside Nursing Accuracy of Determining Etiology and Staging of Pressure Injuries vs Wound Care "Experts"

Heather Redman, BSN; Shannon Thomas, BSN; Gian Aguiluz, BSN

Introduction: Bedside nursing accuracy of determining etiology and staging of pressure injuries were found to be exceedingly inaccuracy during a retrospective closed chart audit.

Methods: A review of literature determine best practice to shift the responsibility away from bedside to wound care "experts" greatly reduced the incidence of hospital acquired pressure injuries at Redlands Community Hospital. A new workflow for staging pressure injuries was implemented to reflect current best practices. Wound Care "experts" include healthcare professionals with addition training/certification in wound care.

Results: A year post implementation, incidence rate of hospital acquired reduced over 60%. Confirmed etiology and staging is more accuracy if determined by wound care "experts"

Discussion: Determination of etiology and stage is more accurate if determined by wound care "experts" when compared to bedside nursing.

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EBP-015

A Multi-National Survey of Healthcare Professionals' Experiences of Gelling Fiber Wound Dressings for Different Wound Types

Monique Y. Rennie, PhD; Sinead Fahy, MA

Introduction: Gelling fiber dressings are widely used to absorb and retain excess exudate. Real-world usage characteristics, product performance, and strengths/weaknesses (e.g., one piece removal) vary across products. We, therefore, aimed to assess real-world healthcare professional (HCP) clinical experiences in terms of usability and product performance of a gelling fiber dressing* made from highly absorbent polyvinyl alcohol fibers, as well as its silver-containing form.

Methods: Between April and July 2024, HCPs were provided with a QR code to access the survey questionnaire on a secure survey platform. Only HCPs with a minimum of 3 months' experience of using the dressings were eligible. Survey translations were provided in several languages. HCPs were asked to answer 12 questions for each dressing: 10 focused on dressing usage in different clinical scenarios, one focused on overall dressing rating, and one asked participants if they would recommend the dressings to colleagues. At survey closure, data were extracted by a blinded statistician for analysis.

Results: 572 HCPs across >10 countries provided responses relating to the gelling fiber dressing and 243 relating to its silver-containing form. HCPs indicated their use of these products was highest for leg and foot ulcers, closely followed by pressure injuries, with additional use on surgical wounds, partial thickness burns, donor sites, and malignant wounds. 82% of HCPs indicated that the dressings are extremely effective in terms of one piece removal, 70-78% indicated that they are extremely effective at absorbing, retaining, and transferring exudate; and 70-75% indicated that they are extremely effective at facilitating patient comfort during wear. 76% of HCPs rated their overall impression of the dressings as being extremely effective.

Discussion: The findings demonstrate the clinical utility and performance of the evaluated gelling fiber dressings in the management of chronic wounds.

EBP-016

A Multinational Survey of Healthcare Professionals' Experience on Using a New and Innovative Non-bordered Foam Dressing in the Management of Different Wound Types

Monique Y. Rennie, PhD; Joran Chancrin, RGN; Ana Martins, RN; Leonora Oberendorf, PhD

Introduction: Wound exudate will flow in the direction of gravity, especially in the case of venous leg ulcers (VLUs) and, if mis-managed, lead to leakage and increased risk of maceration. Dressings that can handle large quantities of exudate, while maintaining a moist wound environment, can help minimise the risk of moisture-related damage. A survey of healthcare professionals (HCP) was conducted to capture feedback on the usability and performance of a new and innovative double-layer, non-bordered foam dressing with a soft silicone wound contact layer* developed for managing low-to-high exudation (low-to-high viscosity).

Methods: HCPs were provided with a QR code to access a survey questionnaire (Qualtrics platform) over a 2-month period. Translations of the survey were provided in eleven languages. HCPs who had used the non-bordered foam dressing on at least two patients for a minimum of two weeks were eligible. They were asked 8 questions relating to the clinical performance of the dressing.

Results: 209 HCPs across 13 countries provided responses. Respon-

dents indicated that they had used the dressing on 889 wounds, mostly commonly venous leg ulcers (62.1%). Respondents indicated that the dressing had been used on wounds with high (44.4%), moderate (42.3%) and low (13.2%) exudate levels. The dressing was rated highly in terms of: Ease of handling and application (99% effective); Facilitating patient comfort during wear (99% effective); Managing exudate (96% effective); Minimizing leakage (94% effective); Minimizing maceration (94% effective); Minimizing pain during dressing changes (97% effective); Meeting the clinical needs when used under compression therapy (95% effective); Wear time (96% effective).

Discussion: These results demonstrate positive trends in the clinical utility and performance of a new and innovative non-bordered foam dressing. These trends are further encouraging given that just under half of the wounds were categorized as having high exudate levels.

EBP-017

Surgical Management of Large Mass Excisions with Novel Fish Skin Graft for Prevention of Seroma Formation & Successful Healing Time

Michael Romberg, MD

Introduction: Seromas form when clear fluid, called serum, accumulates in a "dead space" – a space where tissue has been removed or disturbed during surgery. This can happen due to fluid leaking from damaged blood or lymph vessels during surgery. Seromas can cause swelling, discomfort, and in some cases, delay further treatment or increase the risk of infection.

Fish skin graft (FSG) is a unique biologic scaffold. FSG is rich in Omega3 anti-inflammatory, promotes cellular ingrowth, neovascularization and aids tissue infill and remodel. We hypothesize that FSG, can be used as part of the surgical intervention for various surgical procedures to provide support for tissue regeneration and reduce seroma formation.

Methods: Pilot study of 2 patients. Fenestrated FSG sutured at the base of the cavity where mass was excised. Staples for wound closure and pressure dressing applied.

Results: One time application of FSG led to successful healing time preventing seroma formation/infection thus improving surgical wound outcome. Patients noticed significant scar reduction and experienced no pain immediately after application of FSG.

Discussion: Applying FSG to cavity site after large mass excision expedites healing time. Use of FSG is safe, induces decreased inflammation and scarring, rapid cell ingrowth and neovascularization, low immunogenicity and bacteriostatic properties. FSG is a promising option for treating & managing excisions of large masses-- preventing seroma formation while aiding in tissue formation, vascularization and cellular ingrowth. Continued research into the efficacy and safety of using fish skin in surgical applications is essential to establish protocols and guidelines for its use in clinical settings.

EBP-018

Reframing the Narrative: Improving Diagnostic Precision in the Identification of Ulcerations Caused by Skin Failure

Ronald N. Rosen, MD, CMD

Introduction: There is no consensus on the use or coding of the terminology for skin ulcers caused by skin failure rather than solely by pressure. The failure to accurately describe skin ulcerations can cause medical, legal, ethical, social and psychological issues especially when the term "pressure ulcer" is used and the predominant underlying cause is not pressure.

Methods: Literature search

Results: Lack of consistent classification of skin changes at life's end could by improved by terminology used to describe failure in other organ systems.

Discussion: The term "pressure ulcer" has negative connotations, indicating a probable deviation from standards of care. Not only does this raise legal and regulatory concerns, it can cause severe emotional distress for patients, their families and caregivers. Accurately describing skin ulcers as skin failure indicates the likelihood these ulcers were unavoidable. Various terms such as Kennedy terminal ulcer (KTU), Trombley-Brennan terminal tissue injuries (TB-TTIs), "3:30 syndrome" ulcers and skin failure at life's end (SCALE) are being used to describe skin failure. None of these terms are currently present ICD-10 or the next version ICD-11. Failure of other organ systems such as cardiac, pulmonary and renal are described by terms such as acute, semiacute and chronic. Use of this descriptive terminology in relation to skin failure would more accurately describe the causation, treatment options and prognosis of this form of skin breakdown. Standardizing the terminology of ulcers caused by skin failure would allow a more accurate way to describe and treat these conditions.

EBP-019

Itchy Burns: Debilitating Effects of Pruritus on Daily Activity in Follow-Up Care

Elizabeth Shrader, BSN, RN; Alexander C. Eischeid, Student; Esther Rathjen, MSN, RN, APRN-CCNS, CBRN

Introduction: Current practices in the long term treatment of burn wounds often ignore or only minimally respond to prolonged pruritus, or itching. In truth, the presence of pruritus in patients receiving follow-up care which negatively impacts patient lifestyles is likely under documented and not effectively treated. Quantifying and treating pruritus in a similar fashion to pain management is thus the next logical progression of burn care in an outpatient setting.

In this study, we hypothesize that the presence of pruritus positively correlates to daily activity disability and warrants investigation into further intervention.

Methods: All patients presenting for an outpatient appointment for treatment of burn injuries at a wound care center were provided a 5-D Pruritus Scale questionnaire at the time of their arrival with other clinic paperwork prior to being seen by a provider. Interpreter services for non-English speaking patients and writing assistance for patients with hand injuries were provided, when necessary. The survey collected patient ratings on pruritus duration, degree, direction, disability, and distribution. Responses were de-identified and recorded in numerical form. Of the 127 submitted surveys, blank responses (n=13) and responses which struck/altered the word "itch" and replaced it with "pain" (n=2) were omitted.

Results: Surveys were collected for a 6 week period with a total of 112 valid responses obtained. Of the valid surveys, 44 (39%) reported moderate (level 3/5) itching or higher with 47 patients (41%) indicating at least occasional sleep disruption/challenges resulting from pruritus. Under daily activity disability categories (leisure/social, housework/errands, and work/school), 44 (39%) reported at least occasional inability to complete at least one of the activities with 39 (35%) and 29 (26%) indicating at least occasional disability in two or three of the activities, respectively. It was determined patients reporting moderate pruritus were significantly more likely ($p < 0.001$) than patients only reporting minimal or mild pruritus to report daily activity disabilities (61% versus 25%, respectively) and sleep disruptions (68% versus 25%, respectively).

Discussion: This study revealed a higher than expected proportion of patients reporting pruritus leading to daily activity disability during follow-up care for burn wounds. Further, there exists a correlation of patients indicating moderate or worse pruritus with sleep and activity disruptions. The relationship between increased rates of daily activity disability and degree of pruritus indicates providers should be vigilant in screening for pruritus-related disability. This study further supports continued investigation into novel pruritus treatment modalities and enhanced nursing education to improve outcomes for burn survivors.

EBP-021

Preoperative Optimization in Pressure Injury Patients Undergoing Surgical Reconstruction: A Systematic Review

and Proposed Protocol

Robert Unger, MS; Natalya Foreman, BA; Taylor Kreul, BS; Ritu Bhalerao, MS; Danielle Wenger, MD; Jimmy Chim, MD

Introduction: Pressure injuries are a persistent surgical challenge, with high recurrence rates despite technical advances in reconstruction. Emerging evidence suggests that preoperative patient optimization—rather than operative technique—plays a central role in improving outcomes. However, a standardized protocol guiding preoperative workup and optimization is lacking. This study aims to systematically review evidence-based strategies for medical, nutritional, infectious, mechanical, and psychosocial optimization in patients undergoing surgical management of pressure injuries, culminating in a proposed comprehensive optimization protocol.

Methods: A systematic review of PubMed, Embase, and Scopus databases was conducted to identify studies from 2000 to 2024 examining preoperative management factors associated with outcomes following surgical intervention for pressure injuries. Inclusion criteria encompassed adult patients with stage III–IV pressure injuries undergoing reconstructive surgery. Key domains assessed included glycemic control, anemia management, nutritional repletion, infection control, mechanical offloading, and psychosocial support. Study characteristics, optimization strategies, and outcome measures were extracted and synthesized narratively.

Results: Forty-eight studies met inclusion criteria. Poor glycemic control (HbA1c >7.5%), hypoalbuminemia (< 3.5 g/dL), active infection, inadequate pressure offloading, and lack of psychosocial support were consistently associated with increased postoperative complications and recurrence. Targeted interventions—including nutritional supplementation, aggressive infection management, mechanical pressure offloading, and multidisciplinary team involvement—were linked to improved healing and reduced recurrence rates. Based on these findings, a standardized preoperative optimization protocol was developed encompassing medical clearance, nutritional goals, infection eradication, strict mechanical offloading, and psychosocial evaluation (Table 1).

Discussion: This review highlights the critical role of multidisciplinary, evidence-based preoperative optimization in the successful surgical management of pressure injuries. Adherence to standardized optimization protocols may significantly reduce recurrence rates and improve overall outcomes. Future prospective studies are warranted to validate and refine the proposed protocol across diverse patient populations.

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EBP-022

Reduction of Endotracheal Tube and Endotracheal Tube Securement Device Related Pressure Injuries in the Surgical Trauma Intensive Care Unit: A Quality Improvement Project

Elisa Winn, DNP, RN, AMB-RN, CWON

Introduction: The endotracheal tube (ETT) and ETT securement device caused a significant number of medical device-related pressure injuries between 2020 and 2023, leading to poor patient outcomes, decreased patient satisfaction, and the need for additional care. This quality improvement project aimed to reduce the prevalence of ETT and ETT securement device-related pressure injuries in intubated adult patients in the Surgical Trauma Intensive Care Unit (STICU).

Methods: The project team used John Kotter's Eight Step Change Model to promote practice transformation. Data was collected over 13 weeks through weekly rounding on intubated adult patients. Collected data points included age, gender, medical record number, ETT securement method, date/time of intubation, presence of date changed on ETT securement device, description of commercial ETT securement device fit, presence of pressure injury from ETT and/or ETT securement device, condition of upper teeth, presence of facial edema and/or facial hair. Bedside huddles were conducted when a pressure injury was discovered or when patients at risk of pressure injury development were identified. Manual chart audits were performed to determine documentation compliance with every two-hour ETT rotation.

Results: Among the 41 patients assessed, one (2.4%) sustained a mucosal pressure injury from the commercial ETT securement device. Of the 39 patients with the commercial ETT securement device, four devices (10.3%) were not dated, and 11 patients (28.2%) had the device applied when contraindicated by practice guideline. Nursing and Respiratory Therapy documented every two-hour ETT rotation at 61% compliance.

Discussion: The prevalence of ETT and ETT securement device-related pressure injuries decreased from 55.6% (5 injuries) in 2023 to 20% (1 injury) in 2024. Standardized practice and improved collaboration between disciplines effectively prevented injuries. The impact of this project includes improved patient outcomes, improved patient satisfaction, reduced health care costs, enhanced multidisciplinary collaboration, data driven insights, and leadership support for other projects.

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HE-001

Evaluation of an All-in-One Dressing with Negative Pressure Wound Therapy in Complex Wounds

Jody Wolfe, BSN, MBA, RN, CWOCN

Introduction: INTRODUCTION: Negative pressure wound therapy (NPWT) using a polyurethane, reticulated open-cell foam (ROCF) dressing is utilized for managing diverse wound types. While NPWT's therapeutic benefits are well established, ROCF dressing application can create obstacles for therapy. Additionally, patient discomfort during ROCF dressing removal due to tissue ingrowth may also make effective NPWT prohibitive.[1-3] Dressing change frequency of every 48-72 hours may require increased visits to the clinic or additional assistance by home health care services. Here, we report our evaluation of an extended wear, up to 7 days, all-in-one dressing* with an integrated perforated non-adherent contact layer designed to help mitigate tissue ingrowth and a hybrid silicone/acrylic adhesive drape.[4]

Methods: Antibiotics were initiated if necessary. Each patient had previously been treated with NPWT using ROCF dressings. An all-in-one dressing of appropriate size was applied over the defect, with the foam and non-adherent layer also extending over the periwound skin. NPWT† applied continuous subatmospheric pressure (-125 mmHg). All-in-one dressing changes were performed every 72 hours to 7 days.

Results: Eleven patients presented for care. Wound types included pressure ulcers (n=3), non-healing surgical sites on the lower back (n=1) and abdomen (n=1), a complex wound on the thigh (n=1), venous leg ulcers (n=3), a lower extremity wound from trauma, and complex bilateral lower extremity wound due to an autoimmune condition (n=1). Notable outcomes included a reduced dressing placement time of less than 5 minutes, ease of dressing application and removal, and protection of the periwound skin as observed by patients and staff. All patient wounds exhibited improvement, evidenced by reduced dimensions and re-epithelialization. Interestingly, wounds managed with NPWT using the all-in-one dressing appeared smoother, less granulated, and showed more epithelialization compared to the characteristic appearance of wounds treated with NPWT and ROCF dressings.

Discussion: In these 11 patients, NPWT with the all-in-one dressing served as an attractive alternative to NPWT with ROCF dressings. In these patients, use of the all-in-one dressing supported wound area reduction and helped reduce home health visits for dressing changes.

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HE-002

Reconstruction Following Mohs Surgery with a Placental Allograft: A Cost-Effectiveness Analysis

Allyn A. Forsyth, PhD; Gary Rogers, MD

Introduction: The purpose of this study was to examine the cost-effectiveness of placental allograft as a nonoperative surrogate to autologous tissue-based methods of defect reconstruction on the face, head, and dorsal hand following Mohs micrographic surgery (MMS).

Methods: This study was a 5-year retrospective, analysis comparing propensity-matched cohorts of eligible Mohs surgery patients treated with a placental allograft (DHACM, dehydrated human amnion/chorion membrane) vs. autologous tissue-based repairs (SOC). Four-hundred-twenty-nine propensity-matched patients were divided into treatment (DHACM) and SOC cohorts in a 1:2 match (143 DHACM, 286 SOC). Costs on day 0 through discharge were used for a cost-effectiveness analysis and an incremental cost-effectiveness ratio (ICER).

Results: High risk reconstructions had favorable results with DHACM (see Figures on pg 1). MMS defects treated with DHACM had significantly lower rates of adverse post-repair sequelae; dehiscence ($p=0.0189$), hematoma ($p=0.0066$) and surgical revisions ($p=0.0044$), resulting in an average savings of $409.55 for high-risk post-MMS defects and a dominant ICER. The primary reconstruction cost increased with DHACM ($p < 0.0001$), while the cumulative cost of care was similar between groups ($p > 0.05$).

Discussion: Closure of post-MMS defects with DHACM resulted in significantly lower rates of adverse post-repair sequelae (2.8% vs. 21.3%, $p < 0.0001$), which offset the upfront cost of DHACM, resulting in equivalent cost per episode of care and equally favorable cosmetic outcomes. DHACM was an effective repair approach for surgical wounds that were not amenable to primary closure or second-intent healing or in patients at higher risk for adverse events from complex closures.

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HE-003

Evaluating the Health Economics Impact of Integrating Multispectral Near-Infrared Spectroscopy and Thermography Imaging in the Management of Ulcers with Cellular, Acellular, and Matrix-Like Products

Christine A. Handley, MBA, BSN, RN

Introduction: Diabetic Foot Ulcers (DFUs) and Venous Leg Ulcers (VLUs) pose significant healthcare challenges globally.[1,2] Cellular, Acellular, and Matrix-Like Products (CAMPs) have emerged as vital components in the treatment of these wounds, supported by growing evidence of their efficacy.[3,4] The Medicare Administrative Contractors (MACs) recently proposed Local Coverage Determinations (LCDs) focusing on CAMPs have expanded accepted vascular assessment methods to include tissue oxygenation measurements, complementing traditional techniques.[5] This study explores the integration of multispectral near-infrared spectroscopy (NIRS) for assessing tissue oxygenation as part of a comprehensive wound care strategy utilizing CAMPs.

Methods: Building on our previous single-site study,[6] this research was expanded to two hospitals to enable comparative analysis. A handheld, FDA 510(k)-cleared device*[7] equipped with NIRS, thermography, and automated wound measurement capabilities. Wound imaging was performed at multiple clinical milestones, including pre- and post-debridement during the standard four-week care period, before the initial application of CAMPs, and following each subsequent application. Key metrics centered on healthcare resource utilization, specifically the total number of appointments booked for CAMP placement and patient compliance (attended versus missed appointments). Data from three quarters before and after imaging integration were compared. Three patient case

examples are presented to illustrate the clinical utility of imaging across multiple steps in the wound management process.

Results: The integration of NIRS and thermography imaging, along with wound size measurements, provided comprehensive, objective documentation of wound progression. Tissue oxygenation confirmed adequate perfusion for healing, while thermography validated the absence of infection before skin substitute application. These technologies streamlined clinical workflows, supplying the objective data needed to meet medical necessity criteria for CAMPs. Preliminary results from one hospital showed a 3% increase in the number of appointments booked for skin substitute placement and a 17% improvement in patient compliance. Data analysis from the second hospital is ongoing.

Discussion: Non-invasive measurements of tissue oxygenation, combined with skin surface temperature assessments, provide real-time insights that guide clinical decisions and predict treatment outcomes. The integration of NIRS imaging into wound care protocols not only improves patient outcomes but also accelerates treatment access and reduces administrative burdens on healthcare providers. Ultimately, the combination of NIRS and thermography imaging with automated wound measurement enhances patient outcomes, streamlines treatment access, and fosters personalized care.

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HE-004

Biomarker and Economic Advantages of Superabsorbent Dressings in Chronic Venous Leg Ulcers: A Case Series

Alton R. Johnson, DPM, CWSP

Introduction: Venous leg ulcers (VLUs) are notoriously chronic and costly to manage. Conventionaldressings often require frequent changes, increasing patient burden. This case seriesevaluates outcomes in three patients with long-standing VLUs treated with superabsorbentdressings designed to promote Wound Balance.

Methods: Three patients with VLUs >1 year (one >9 years) were transitioned from daily ABD padchanges to a regimen utilizing a novel superabsorbent dressings. Dressing frequency wasreduced to twice weekly. All patients also received compression therapy and tailoredtopical regimens.

Results: All patients exhibited wound area reduction, improved periwound skin, and enhancedcomfort. One long-term wound (10 years) nearly closed within months. Dressing changefrequency dropped from daily to biweekly, lowering caregiver workload and supply use. These outcomes align with biomarker-guided strategies that support wound bednormalization and protease reduction.

Discussion: SAP dressings help improve healing outcomes in chronic VLUs by managing exudate,reducing inflammation, and minimizing protease activity. Transitioning from daily tobiweekly dressing changes reduced caregiver burden and supply use while enhancingpatient comfort and adherence. This cost-conscious approach aligns with evidence showingthat dressing effectiveness and wear time, not just unit cost, drive wound care value(WUWHS, 2019). SAPs also support early biomarker modulation; within 14 days, shifts inMMPs and elastase levels help transition wounds toward a healing state (Mikosiński et al.,2022). These combined clinical and economic benefits support their use in long-standingVLUs.

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HE-005

Negative Pressure Wound Therapy: Working Smarter to Improve Patient Outcomes and Reduce Cost

Julie E. Ross, MSN, RN, CWOCN; Diane Whitworth, MSN, RN, CWOCN, CSS; Karin Crookes, BSN, RN, CWON; Kelley Fite, BSN, RN, CWON; Lisa Stewart, MSN, RN, CWON; Cynthia Miller, BSN, RN, CWOCN; Anthony Gentry, BSN, RN, CWON; Carrie Bloom, BSN, RN, CWON; Glenda Brunette, MSN, RN, CWON

Introduction: Our academic acute care facility lacked standardized negative pressure wound therapy ordering process. Specifically, it lacked consistent orders in patient medical records, a process for obtaining and discontinuing equipment, and documentation to support the use in progress notes. The lack of process and documentation made it challenging to verify proper frequency of dressing changes, the location of equipment, and accurate billing dates. All those deficits then led to missing or lost equipment.

Methods: Key stakeholders involved in the day-to-day operation of this equipment were gathered and placed on an improvement project team. Some of those stakeholders were our asset management company, nurses, doctors, OR managers, and representatives of our negative pressure wound therapy company. We updated and pulled out our current negative pressure wound therapy panel as a stand-alone order. We reached out to our negative pressure wound therapy representatives regarding the changes and new processes. We created a plan to improve communication with all care team members through education with our nurses, doctors, APPs, interoperative managers, and directors.

Results: Chart reviews demonstrated an increase in negative pressure wound therapy panel orders in the electronic medical record as well as an improvement in documentation in progress notes. This documentation improved patient outcomes as it clarified when dressing changes were occurring, wound assessments, and next steps for the patients. We compared pre and post 6 months of the new process implementation and identified cost savings of $98,781 and a reduction of equipment use by 14.3 rental days.

Discussion: There were challenges in identifying the correct stakeholders to invite to the project. Another challenge was creating and implementing education for all our care team members. Our vendor representatives were integral in assisting with education across the facility. First, we targeted high usage areas and provided education on day and night shift. We then shifted to all other units. Ongoing education will be required to continue providing optimum patient care and reduce the facility's financial burden.

HE-006

Estimating the Evidence Threshold: Sample Size and Effect Size Benchmarks from Medicare's Diabetic Foot Ulcer Skin

Substitute Grafts/Cellular and Tissue-Based Products LCD's

Zwelithini Tunyiswa, BA

Introduction: Cellular and Matrix-Based Products (CAMPS) are widely used to treat diabetic foot ulcers (DFUs). Medicare coverage decisions for these products are based on clinical trials reviewed by Medicare Administrative Contractors (MACs) under the GRADE framework. However, the actual thresholds for effectiveness and study size have not been clearly defined - leaving researchers and sponsors uncertain about what is required. This study reviews all the clinical trials that have supported Medicare coverage for DFU-related CAMPS and uses a Bayesian analysis to quantify the effect sizes and study sizes that have historically met Medicare's evidentiary expectations.

Methods: We analyzed 27 randomized controlled trials cited in LCDs (Local Coverage Determinations) across more than 15 CAMPS products. Healing rates were extracted from both CAMPS and standard care (SOC) groups. A Bayesian hierarchical model was used to estimate the overall and product-specific treatment effects (as risk ratios). We also used a Bayesian negative binomial model to estimate the range of sample sizes observed across studies that resulted in coverage decisions.

Results: The average risk ratio for CAMPS products versus SOC was approximately 1.45, indicating a 45% improvement in healing rates. Several products showed even larger effects. The typical total sample size among studies that supported coverage was approximately 104 patients. Our model confirmed this, showing a central estimate of 104, with a common range from 70 to 160 patients across all covered products. These findings align closely with the real-world evidence base Medicare has accepted.

Discussion: his analysis provides an evidence-based summary of what the Medicare MACs accepted as sufficient for DFU CAMPS coverage. It shows that studies with clear, reproducible healing benefits and total sample sizes at or above 70 patients met the bar. This helps researchers and sponsors align new study designs with past precedents and prevents retrospective "goalpost shifting" in the evaluation of evidence. By quantifying historical expectations, this study offers transparency and consistency for future product development and reimbursement strategy.

LR-001

Characterization of a Bi-layered Living Cellular Construct and Genetic Regulation of Re-epithelialization

Justin T. Avery, PhD; Katrina A. Harmon, PhD; Steven Zabroski, HS; Kelly A. Kimmerling, PhD; Katie C. Mowry, PhD

Introduction: Bi-layered living cellular construct (BLCC†) consists of an epidermal layer containing keratinocytes and dermal layer consisting of fibroblasts. Much like human skin, these layers express varying levels of extracellular matrix (ECM) components as well as cytokines, chemokines, and growth factors. Wounding of the construct has been shown to promote a wound healing response, allowing for self-repair in vitro. To further evaluate regenerative responses, an extensive IHC panel and an in vitro outgrowth model were performed.

Methods: BLCC units were assessed by IHC for ECM markers and growth factors/cytokines. For wound assays, 4mm biopsy punches of BLCC were placed onto a tissue engineered dermal layer and assessed at days 3, 6, and 9. Genetic assessments of the punches and outgrowth were performed.

Results: IHC determined that growth factors like HGF and IGF-1 appear to be localized predominantly in the epithelial layer of the product, whereas TGF-β and ECM components were found primarily in the dermal layer. Genetic assessment found Col3A1 was preferentially expressed compared to Col1 genes and elevated MMP1 levels were observed, indicative of an early phase wound healing response.[1] Additionally, HGF, ITGB1, IL6, PTGS2, and chemokines (CXCL-1, -2, and -5) were upregulated, which are reported to drive cell differentiation, proliferation, and migration as the neoepidermis extends across the wound.[2,3]

Discussion: Understanding outgrowth and the mechanisms by which BLCCs heal themselves in vitro can provide better understanding of the mechanism by which they promote patient healing. Additional studies looking at the localization of gene expression, protein expression, as well as other wound models is critical for further characterization.

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LR-002

In Vitro Assessment of Methylene Blue and Gentian Violet-Containing Foam Dressings and an Advanced Silver-Containing Gelling Fiber Dressing: Physical Test Methods

Sophie Ballamy, BA; Daniel G. Metcalf, PhD

Introduction: Hard-to-heal wounds compromised by bioburden are often managed with antimicrobial wound dressings. Physical characteristics are an important factor in overall dressing performance. In vitro physical test data provides an insight into the functionality of dressings, upon which antimicrobial technologies are platformed.

Methods: A carboxymethylcellulose fiber dressing containing ionic silver, ethylenediaminetetraacetic acid, and benzethonium chloride (AAA)*, a polyvinyl alcohol foam dressing containing methylene blue and gentian violet (PVA-MBGV)†, and a polyurethane foam dressing containing methylene blue and gentian violet (PU-MBGV)$ were evaluated. Key performance characteristics of fluid absorbency and retention, shrinkage, fluid movement, and tensile strength, were assessed using the appropriate standard or validated test method.

Results: AAA (80%) and PU-MBGV (78%) demonstrated higher free swell retention compared to PVA-MBGV (66%). AAA (90%) and PVA-MBGV (94%) had higher retention under compression compared to PU-MBGV (69%). PVA-MBGV (15% increase) and PU-MBGV (49% increase) exhibited swelling during hydration, whereas AAA exhibited shrinkage (19%). Fluid wicked 15-25 mm for AAA and 10-23 mm for PU-MBGV, while for PVA-MBGV, fluid wicked along the full 100 mm sample length. PVA-MBGV exhibited a higher wet tensile strength (13.98/15.51 N/cm) than PU-MBGV (4.90/6.73 N/cm) but was less elastic. AAA (8.16/3.28 N/cm) was closer in wet tensile strength to PU-MBGV but was less elastic due to its fibrous nature. All dressings remained integral throughout testing and exhibited wet tensile strength data characteristic of their primary material.

Discussion: AAA (fiber) and PVA-MBGV/PU-MBGV (foams) are comprised of materials with inherently different physical characteristics, therefore any comparisons must be considered within the wider context of clinical use. A notable difference is the mode of absorption and retention: AAA's fibers gel irreversibly upon hydration, locking fluid within fibers, whereas PVA-MBGV/PU-MBGV hold fluid within foam pores via capillary action. While the capacity to expand to accommodate fluid may be an advantage for foams, fluid retention is not as effective, and in conjunction with swelling may result in leakage and/or periwound maceration.

LR-003

The Chemical and Antimicrobial Activity Within a Nitric Oxide-Generating Wound Dressing

Nicholas M. Boote, PhD; Matilda M. Coleborn, PhD; Emma Griffiths, PhD; Lucy G. Forbes, MSc; Michael M. Busby, PhD; Daniel G. Metcalf, PhD

Introduction: Hard-to-heal wounds, such as diabetic foot ulcers, are highly prevalent and place a significant burden on patients and healthcare systems. The aim of these studies was to demonstrate the novel chemical properties (defined water activity, osmolarity, and pH), and antimicrobial activity from the supplemental generation of nitric oxide (NO), within a novel prototype NO-generating wound dressing*.

Methods: Water activity (relative humidity) of the entire dressing, and for each of the two dressing layers, was measured using a tunable diode laser water activity meter. Osmolarity was calculated from solute concentrations in dressing components. The pH of the dressing was measured using a pH surface probe by challenging dressings with a pH 7.4 buffered solution at 0.4 mL/hour over 48 hours. The antimicrobial activity of the dressing over 48 hours was measured using a direct inoculation method, including a 48-hour preconditioning period, with six bacteria, one yeast, and one mold.

Results: The NO-generating dressing had a water activity of 0.71 ± 0.014, with 90% of the water activity attributable to the upper absorbent layer. The dressing had an osmolarity of approximately 6,400 mOsmols. The NO-generating dressing buffered the alkaline challenge solution immediately and then consistently to pH 5-6 over 48 hours. All challenge microorganisms were rapidly killed by >4 log10 within the NO-generating dressing.

Discussion: The water activity of the prototype NO-generating dressing provides high fluid absorption, is inhospitable to absorbed challenge microorganisms, and has high osmolarity. The dressing immediately buffered the alkaline solution back to acidic pH, creating an acidic state that is inhibitory towards microorganisms and conducive to wound healing. This acidic pH also activates the production of NO within the dressing. NO provides additional antimicrobial activity over a minimum of 48 hours, as shown by the eradication of 8 challenge microorganisms. The chemical and antimicrobial activity of the prototype NO-generating dressing provides a potent antimicrobial environment to potentially support wound healing.

LR-004

Pressure Management Performance of Commercial Negative Pressure Wound Therapy Systems Under Difficult Wound Conditions and Pressure Settings

Jonathan M. Cayce, PhD, MS; Caroline Hibbett, B.S.; Stone Isaacs, MS, BS; Dan Marzahl, BS; Ethan Valentine, BS; Timothy Oetter, MS, BS; Casey Y. Carter, MS, BS; Dhanvin Desai, MS, BS; Thomas Lawhorn, MS, BS

Introduction: Negative pressure wound therapy (NPWT) represents a dynamic environment in which changes at the wound bed and dressing site may impact performance. Factors impacting performance include air flow through the dressing, exudate rate and viscosity, wound volume, and pressure settings of the NPWT device. Negative pressure wound therapy systems must adapt to real-time changes in these factors to deliver the prescribed therapy to the wound bed.1 Previously, our group demonstrated the importance of air flow through a dressing and how exudate rate and viscosity may impact the performance of NPWT delivered in single lumen and multi-lumen systems, with and without controlled airleaks.2,3 This research led to the development of a new NPWT system for inpatient and outpatient use that employs a steady, controlled air leak combined with a multi-lumen NPWT system to maximize the accuracy of the pressure delivered to the wound bed. This study compares the new system to other commercial systems regarding pressure management and accuracy at the wound bed under a variety of simulated conditions.

Methods: The study evaluates the novel NPWT system that combines multi-lumen with controlled air-leak or (MLCA) system to NPWT systems from other manufactures that use either controlled air-leaks or multi-lumen technology for inpatient and outpatient settings. Simulated wound conditions include exudate rate (4 and 50 cc/hr) dressing leaks (0 cc/hr, and 150 cc/hr), and exudate viscosities (1.158 cP (normal) and 35.5 cP (heavy)).4,5 Device settings tested include continuous pressures between 25 mmHg and 200 mmHg and variable pressure set at 25 mmHg to 125 mmHg. Each condition was tested in triplicate.

Air pressure sensors, connected below the foam and centered under the dome, monitored pressure at 0.1 Hz. Descriptive statistics and 99.7% (3σ) confidence intervals (CI) were used to compare pressure management between systems.

Results: The MLCA system achieves the highest degree of accuracy for managing pressure in a wound bed under a variety of simulated conditions as compared to other tested NPWT systems.

Discussion: This study characterizes the performance characteristics of a novel NPWT system compared to other commercial systems. Results show how combining multi-lumen NPWT with a controlled air leak delivers the highest accuracy of pressure to the wound bed and highlights how simulated wound conditions and pressure settings impact NPWT device performance.

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LR-005

Comparative Breathability of Various Two Layer Compression Bandages Available in the United States: Does Breathability Differences Exist, and Does It Matter?

Debashish Chakravarthy, PhD

Introduction: The definitive treatment of venous ulceration is the use of compression bandages. Predominantly, the use of four layer bandages of the past are being replaced by the use of two layer bandages for the reasons of convenience. Particularly in hot climates, the bandages are worn with low compliance due to patient discomfort and a feeling of occlusiveness/constriction. Quite possibly, breathability of the construct is an important patient compliance factor, impacting healing. We measured breathability under standard conditions of four bandages commercially available in the US, including a Dual Compression System (DCS)* which combines two engineered fabrics, one with printed visual stretch indicators, that is highly evidence based (clinical).

Methods: We included four bandages in our study. We used the method ISO 9237:1995 (Textiles — Determination of the permeability of fabrics to air). It describes a method for measuring the permeability of fabrics to air.

Results: The bandages were tested according to instructions of each product. The results showed wide differences in breathabilities in the units liter/square meter/second. The breathability values ranged from 272 for a popular short stretch bandage product** to 822 for the DCS, an almost threefold difference.

Discussion: Recent launch of the DCS in the US has shown high patient/clinician preference for it within users of other compression systems long established in the USA, such as the one we found possessing the least value of breathability **. The reasons for this preference are not completely understood, though patient comfort and the resulting wear compliance has been stated by clinicians choosing the DCS in favor of other more established bandages. It is possible that this high degree of breathability leads to higher patient comfort, and thus compliance, and therefore clinician adoption. The visual indicators also make application easier and the clinician more confident in application.

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LR-006

The Measurement of Negative Charges in a Highly Charged Fiber Dressing That Supports Debridement of Slough

Debashish Chakravarthy, PhD

Introduction: Fiber dressings are currently used materials for wound contact in the desloughing of chronic wounds, an important step in healing, and are made of different chemical composition fibers, such as carboxymethyl cellulose (CMC, a highly gelling fiber), alginate, polyvinyl alcohol and cellulose ethyl sulfonate. A new category of fiber dressings based on highly charged (negatively) unique polyacrylate technology has been launched. When contacting the wound, electrostatic interactions between the negative charges in these Highly Negatively Charged (HCF) dressings and slough components allowing slough removal via physical forces. Carboxyl and carboxylate groups which are negatively charged, are the source of negative charges in the unique HCF dressing. Negative charges are also also present in some others such as alginates and CMC based dressings. In this work, we measure the carboxyl and carboxylate density of different dressings as that will highly impact desloughing properties.

Methods: The content of carboxylic and carboxylate groups is determined by titrimetric analysis. The dressings are either ground or cut into small pieces before being immersed, under magnetic stirring, in an aqueous sodium chloride solution at 5g/liter. The titration with NaOH begins when the pH is stable. This protocol is repeated on a new sample, but the titration is carried out with HCl. The results of the two titrations are combined to create a titration curve that quantifies the carboxylic and/or carboxylate groups present in the different dressings. The result is expressed in milliequivalent per gram of dressing.

Results: We show a much higher density of negative charges in the unique Highly Charged Fiber dressing based on polyacrylate technology compared to others, including the highly gelling CMC dressing and alginates.

Discussion: The HCF dressing is supported by clinical data in comparative desloughing studies. This probing study explains the most likely reason why it is such a superior product with respect to desloughing compared to other dressings that possess much lower charge levels. Our method clearly allows discrimination between different dressings in terms of the potential of electrostatic interactions of different fibrous materials with the slough which leads to effective desloughing

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LR-007

Innovative Lucifer Yellow Dye Penetration Method Reveals Efficacy Differences in Skin Protectant Barrier Films

Brenda Curtis, PhD; Anthony Frei, PhD; Jessica Campbell, BS

Introduction: Effective skin protectant barrier films provide resilient yet flexible protection against bodily fluids and friction from garments, incontinence pads, and wiping, while maintaining moisture homeostasis and breathability. Despite their known benefits, reliable techniques to evaluate their efficacy in preserving stratum corneum integrity under conditions mimicking urinary incontinence are needed. This study aimed to: 1) develop a dye penetration method to assess the effectiveness of skin protectant barrier films, and 2) compare two types of skin protectant barrier films—100% (neat) cyanoacrylate polymer (NC)∗ and solvent-containing polymer-cyanoacrylate (SC)º.

Methods: We developed a novel method employing Lucifer Yellow (LY) dye, which is typically retained by intact stratum corneum, to evaluate barrier effectiveness under simulated urinary incontinence conditions. Test sites on excised porcine skin were treated with or without skin protectant. Sites were either unchallenged (controls) or subjected to one or four cycles of moisture exposure (15-minute soak in simulated urine) followed by 500 wipes with a damp sponge. LY was applied topically for one hour, then samples were fixed, cryosectioned, mounted with media containing DAPI (4′, 6-diamidino-2-phenylindole) as a counterstain, and examined using confocal microscopy.

Results: After one challenge cycle, LY penetrated the stratum corneum at multiple locations in all untreated sites and two out of three SCº-treated sites, while it was retained in all NC∗-treated samples. After four cycles, untreated and SCº-treated sites showed broken or missing epidermis and significant LY barrier breach. In contrast, NC∗-treated sites retained LY in the stratum corneum, with only one minor area of LY penetration below the surface in one test site.

Discussion: This study utilized a novel method combining LY penetration with a urinary incontinence model to assess skin protectant barrier films. The data demonstrate that NC∗ provides a superior barrier compared to SCº, with dramatically less LY staining below the stratum corneum in NC∗-treated test sites. This suggests that NC∗ is more effective in preserving the integrity of the stratum corneum under harsh conditions of repeated moisture and abrasion challenges.

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LR-008

Preliminary Evaluations of Nitric Oxide Formulations on Third-Degree Burns Using a Porcine Wound Model

Stephen Davis, BS; Ivan Jozic, PhD; Joel Gil, BS; Michael Solis, MBA; Ryan Strong, BS; Beatriz A. Abujamra, PhD; Roger Cassagnol, BS; Lex Schindler, MS; Michael Miller, MS; Sarah G. Langbord, BS

Introduction: The effects of nitric oxide (NO) have been evaluated in many areas of medicine including cardiology and inflammation. NO has been shown to exhibit broad-spectrum antimicrobial activity against bacteria, viruses, and parasites as well as having a vital role in normal wound repair. The objective of this study was to assess the efficacy of two topical nitric oxide-delivering foam (NODF) formulations on third-degree burn wounds.

Methods: Swine were used as an experimental animal due to the similarities to human skin. Twenty-eight third-degree burns (27 mm in diameter) were created and divided into 7 treatment groups with 4 wounds each. Wounds were treated within the first half hour (0.5) or 24 hours after injury (24). Treatments included A. NODF-A (0.5), B. NODF-A (24), C. NODF-B (0.5), D. NODF-B (24), E. Vehicle (0.5), F. Vehicle (24) and G. Untreated control. Treatments were applied daily for only 5 minutes and covered with polyurethane film dressing to avoid cross contamination. Wounds were assessed on days 2 and 9 post injury; two wounds were assessed for total bacterial counts and histological analysis in each assessment time.

Results: Untreated Control showed the highest bacterial counts on both assessment days (7.21 and 6.62 Log CFU/g, respectively). Wounds treated with A. NODF-A (0.5) and C. NODF-B (0.5) had the lowest bacterial counts on Day 9, 4.62 and 4.96 Log CFU/g, respectively. These values represent a more than 99.0% and 97.8% bacterial reduction compared to those wounds left untreated for NODF A and NODF B respectively. No erythema was noted with any of the wounds treated and histological analysis is currently being evaluated.

Discussion: Overall, the NO formulations that were applied within the first half hour in this third-degree burn model appeared to be the most effective treatment groups to reduce natural total bacterial counts. These results may have significant clinical implications when treating patients with acute or chronic wounds. Additional animals are currently planned to substantiate and provide statistical significance to these pilot study findings.

LR-009

Characterization of PURION Processed Dual Layer Chorion Allograft

Isioma Enwerem-Lackland, PhD; Sarah Moreno, MS; Michelle Massee, BS; John R. Harper, PhD

Introduction: Amniotic membrane allografts have demonstrated the potential to support multiple stages of the wound healing cascade, primarily by modulating the behavior of cells such as human dermal fibroblasts (HDFs) and keratinocytes to promote closure of hard-to-heal wounds. This study characterizes a novel PURION processed lyophilized dual layer chorion allograft (DC). Structural features were characterized histologically, and the effects on HDFs proliferation and migration were assessed in vitro. To further characterize allografts, barrier function and growth factor content were analyzed. In vivo effects were evaluated using a nude mouse model.

Methods: Allografts were prepared using the PURION process, which includes gentle cleansing, lyophilization, and terminal sterilization. Histological analyses were performed using hematoxylin and eosin (H&E) staining and immunofluorescence (IF) to assess structure and composition. Growth factor content was assessed using SomaScan platform (SomaLogic, CO). Functional assays evaluated the impact of these extracts on HDF migration and proliferation, using eluates standardized by surface area-to-volume ratios. Barrier function was assessed by analyzing protein diffusion through the membrane using an equilibrium dialysis cell system. For in vivo evaluation, DC allografts were implanted subcutaneously in athymic nude mice and harvested after 1, 2, and 4 weeks for histological analysis of the allografts and host cell response.

Results: H&E staining and immunofluorescence revealed distinct structural components of the DC. Proteomics analysis identified the growth factors contained in DC. In vitro, DC promoted significant cell migration and enhanced proliferation of HDFs. DC allografts served as an adequate barrier for proteins exceeding 14 kDA. Following subcutaneous implantation of DC in nude mice, early infiltration of host cells within the implant was evident, and as time elapsed matrix remodeling was apparent and associated with the presence of migrating fibroblasts and new collagen deposition.

Discussion: These findings indicate that the dual-layer chorion allograft supports key cellular activities essential for wound healing. The DC allograft promoted fibroblast proliferation and migration in vitro and supported tissue integration and remodeling in vivo. This study provides important evidence for the clinical potential of a PURION-processed dual-layer chorion membrane in promoting optimal wound healing environments.

LR-010

Amniotic Membrane Allografts Promote Re-epithelialization in vitro via cJUN Mediated Mechanism

Isioma Enwerem-Lackland, PhD; Sarah Moreno, MS; Michelle Massee, BS; John R. Harper, PhD

Introduction: Re-epithelialization, the restoration of a protective epithelial barrier over a wound, relies on regulatory proteins, such as cJUN, to drive keratinocyte migration and proliferation.[1,2] In chronic wounds, this process often requires advanced interventions such as placental-based allografts. This study investigates how different placental allograft configurations promote re-epithelialization in vitro. The products evaluated included two multilayer allografts—lyophilized human amnion chorion membrane (LHACM*) and lyophilized dual chorion membrane (DC)—and two single-layer allografts: lyophilized single-layer amnion (SA) and lyophilized single-layer chorion (SC).

Methods: Allografts were processed using the PURION method (gentle cleansing, lyophilization or dehydration, and terminal sterilization). Soluble factors were extracted from each product into basal media and analyzed using Multiplex Luminex assays to quantify proteins involved in re-epithelialization. Functional activity of the extracts was assessed in HaCaT cell migration assays. All treatments were normalized by surface area-to-volume ratio. Expression levels of cJUN and phospho-cJUN were evaluated. Gene expression of cJUN target genes was measured via qPCR. Additionally, Luminex assays were used to detect matrix metalloproteinases (MMPs) secreted into the conditioned media of treated cells.

Results: Luminex assays confirmed that allograft extracts contained re-epithelialization associated factors. All products promoted HaCaT cell migration at the highest concentration tested. At the intermediate concentration, only the multilayer products, LHACM and DC, significantly enhanced scratch wound closure. No products promoted migration at the lowest concentration. LHACM, DC and SC showed significant increased expression of total and phospho-cJUN above basal control. MMP1 gene expression was elevated 24 hours post-treatment, with LHACM and DC showing significantly higher levels compared to control.

Discussion: These findings highlight the importance of allograft structure in regulating cellular responses essential to wound healing, particularly re-epithelialization. Mechanistically, the multilayer products more effectively promote re-epithelialization by inducing cJUN and phospho-cJUN expression, leading to upregulation of MMP1. We propose that elevated MMP1 facilitates keratinocyte migration by degrading the provisional matrix at the wound edge. By engaging these molecular pathways, amniotic allografts, especially multilayer configurations, may enhance re-epithelialization and support epithelial barrier restoration.

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LR-011

Avoiding Microclimate Moistakes – Addressing patient microclimate needs

Carroll Gillespie, MS, BSN, RN, CWOCN; David Newton, MEng, CEng, MIET, MIEEE; Sara Tackson, PT, MPT, CWS; Amanda Roguljic, RN, MS, APN, CWCN

Introduction: Pressure injuries (PIs) remain at a high level affecting approximately 2.5 million individuals in acute care facilities in the US, creating a $22 billion financial burden on health care.[1] Microclimate is a clinically relevant risk factor for PI development.[2] Most support surfaces in clinical use do not prioritize microclimate as a primary feature. Management of microclimate can be accomplished through positive air flow technology surfaces or a microclimate coverlet used in conjunction with support surfaces to address multiple risk factors in PI management. If a facility's in-house support surfaces adequately meet patients' pressure redistribution needs, the microclimate coverlet can enhance surface performance by addressing additional PI risk factors such as microclimate, shear, and friction. Combining a microclimate coverlet with an existing pressure redistribution surface can improve overall surface performance and reduce the need for additional specialty products. This approach can be financially advantageous by utilizing existing hospital support surfaces.

Methods: The study's aim was to test and demonstrate that the application of a microclimate coverlet to various support surfaces does not interfere with their pressure redistribution properties while enhancing heat and moisture management at the skin/surface interface. Multiple support surfaces were tested according to the ANSI/RESNA/NPIAP SS-1 standard[3], using Part 2 and 4, with tests conducted by independent laboratories.[4,5] A comparison of immersion and microclimate properties, both with and without a microclimate coverlet, was performed in line with the evolving test approach of S3I's "interface" task group, which assesses the impact of multiple devices layered on a support surface.

Results: (% Immersion changes with and without coverlet); Active_Alternating_MRS = 10.2%; Integrated_(Reactive-Pulsation-Reactive) = 8.3%; Hybrid Active = 1.8%; Hybrid_Reactive: 1.6%; Foam: 1.2%; (Microclimate SGHP Evaporative Capacity); Evaporative Capacity=243-290g/m2/hr with coverlet.

Discussion: The tested support surfaces retained their immersion characteristics while incorporating the therapeutic advantages of enhanced moisture removal and thermal dissipation offered by the microclimate coverlet. This coverlet has demonstrated compatibility with various surfaces, types, and technologies, while improving the microclimate at the skin/surface interface.[4] Additionally, it allows for the upgrading of standard surfaces by selectively applying the microclimate coverlet to mitigate PI risk factors.

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LR-012

An Evaluation of the Mechanical Properties of Sacral Dressings for the Prevention of Pressure Injury

Anna Grou, MSc; Camilla Johansson, MSc; Gustav Juhlin Onbeck, MSc; Michael Öberg, MSc; Charlotta Fredriksson, MSc; Alit Putra, PhD

Introduction: Sacral pressure injury (PI) develops from sustained pressure on soft tissue. Some dressings are designed to help prevent PI by redistributing pressure and minimizing shear forces. Conformability (fit to body contours), anisotropy (directional characteristics), tensile properties (strength and elongation) and response to compressive forces are crucial for sacral dressing performance. The study described aimed to investigate how these properties contribute to the effectiveness of sacral dressings in preventing PI.

Methods: Three commercially available dressings were evaluated through physical testing and geometrical scans to determine their mechanical properties and shapes. The data were then used to develop finite element (FE) models, simulating the interaction between dressings and soft tissues in the clinical setting. The study assessed Von Mises stress (overall mechanical stress), shear stress (sliding forces causing tissue distortion) and strain energy density (mechanical energy stored in tissue, signaling potential damage if above tissue thresholds).

Results: Dressing A had the best conformability, highest anisotropic ratio, and was softest in one of the tensile loading directions. Dressing B had the poorest conformability, was the least anisotropic, and was the stiffest. Dressing C showed moderate conformability and anisotropy, with the stiffest response under compression. FE simulations showed that Dressing A provided the greatest protective effect, reducing Von Mises stress by up to 95%, shear stress by up to 97%, and strain energy density by up to 94%. Dressing B showed moderate reductions in Von Mises stress (up to 59%) and strain energy density (up to 53%). Dressing C showed more modest reductions in Von Mises stress (51%) and strain energy density (up to 85%). Overall, Dressing A consistently provided the highest biomechanical offloading.

Discussion: The study emphasizes the importance of mechanical properties to sacral dressings' performance. Dressings with better conformability and higher anisotropic ratios fit body contours and adapt to directional mechanical loads, offering better protection. Reducing strain energy density is crucial for preventing soft tissue damage, as lower strain energy density means less mechanical energy stored in the tissue, reducing the risk of damage. These results underscore the need to select dressings with effective mechanical properties to ensure effective PI prevention.

LR-013

Evaluation of a Novel Antimicrobial Barrier Assay for an ROS-Producing Wound Management Technology

Thomas J. Hall, PhD; Eleanor C. Hill, MSc; Neil Johnson, BSc

Introduction: Antimicrobial resistance significantly contributes to the challenges faced in managing chronic wounds, requiring the rapid development of new, potent antimicrobial systems1. Reactive oxygen species (ROS) have a broad-spectrum of activity, capable of disrupting critical pathways within a pathogenic organism2. A novel matrix has been developed to maintain an optimal moisture balance and act as a barrier across a lesion: killing pathogens, disrupting biofilm and protecting the wound from further contamination. Existing test methods for ascertaining barrier functionality focus on solid dressings, not suitable for semi-solid devices3. This study evaluates a novel in-vitro antimicrobial barrier assay to assess the functionality of an amorphous, semi-solid, ROS-producing matrix technology.

Methods: ROS-producing matrix was added at a clinically relevant thickness to a microbially permeable PET Transwell insert. The insert was placed in contact with nutrient agar in a well plate with 1×106 CFU/mL of test organism inoculated at the surface of the matrix. Test organisms included, ESKAPE and fungal wound pathogens. The well plates were incubated at skin temperature (32°C) for 96 hours. Negative controls verified the ability of pathogens to traverse from the insert onto the agar. Microbial growth was validated by neutralisation of swabbed agar in extraction buffer and a growth promotion tests in nutrient broth. Growth promotion tests were conducted at 37°C over 3 and 5 days for bacteria and fungi respectively. Plating of growth promotion broth further confirmed barrier functionality.

Results: The ROS-producing matrix prevented all microbial species

from colonising the nutrient agar. This reproducible assay assesses the barrier efficacy of matrix-based devices. The absence of visual microbial growth in the well and no microbial recovery in either nutrient broth or solid agar after neutralisation confirmed its antimicrobial barrier properties.

Discussion: The formation of an impenetrable barrier by the ROS-producing matrix highlights its potential use in chronic wound management. This assay offers a standardised testing method for similar semi-solid devices, aiding advancements in wound management technologies. The reproducible results suggest this method is suitable for adoption in research and clinical settings to evaluate other antimicrobial and barrier technologies. Future studies should explore efficacy against more microbial species and correlation with clinical data sets.

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LR-014

Evaluating Bromelain Effects on Vitro Cytotoxicity

Richard Harkrider; Ty Gregory; Julianne Guercio; John Carleton; Mathew Scott, PhD; Jessica Rivera, MD, PhD

Introduction: Bromelain, a proteolytic enzyme extracted from pineapple stems, has garnered attention for its potential to facilitate enzymatic wound debridement (Schulz et al., 2017). However, its potential cytotoxic effects on cells within the wound milieu remain underexplored. Our study investigates the potential cytotoxic effects of increasing bromelain concentration on fibroblast-like cells and macrophages in vitro.

Methods: Fibroblast-like cells (C2C12 myoblasts, NIH/3T3 fibroblasts, MC3T3-E1 pre-osteoblasts) and RAW 264.7 macrophages were suspended in standard growth medium, plated in 96-well plates (5-15*103 cells/well), and allowed to adhere for 24hrs. The growth medium was then replaced with increasing concentrations of bromelain-treated medium (0-1mg/ml). MTT assays were performed, as previously described, at 24, 48, and 72hrs post-treatment to estimate cytotoxicity by measuring relative absorbance at 570nm compared to untreated cells (López-García et al., 2014). One-way ANOVA followed by Dunnett's post-hoc test was used to determine significant effects and specific differences compared to control, respectively (α=0.05).

Results: In RAW 264.7 macrophages, no significant cytotoxicity was observed as an effect of bromelain treatment, with cytotoxicity only being noted after 72hrs exposure to 1000µg/ml bromelain. Interestingly, macrophages showed an increase in relative absorbance at 24 and 48 hours, particularly at bromelain concentrations below 1000µg/ml. In contrast, NIH/3T3 fibroblasts, MC3T3-E1 pre-osteoblasts, and C2C12 myoblasts showed a dose-dependent decrease in relative absorbance, starting at 100µg/ml. By 72 hours, these cell lines exhibited significant and meaningful reductions in relative absorbance (< 50%) at concentrations above 300µg/ml.

Discussion: Bromelain treatment generally demonstrated cytotoxic effects on fibroblast-like cells at concentrations above 100µg/ml. Macrophages showed an increase in absorbance relative to controls at concentrations less than 1000µg/ml, suggesting increased proliferation compared to untreated cells. Considering 1mg/ml bromelain solutions are commonly proposed and studied for debridement, these findings suggest bromelain may harm healthy fibroblasts in the wound milieu but preserve, or perhaps promote, macrophage activity and proliferation. Limitations include the in vitro design and unexplored molecular mechanisms and long-term effects of bromelain treatment.

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LR-015

Hypothermic Storage of Placental Membranes Maintains Key Characteristics of Fresh, Unprocessed Placental Tissues

Katrina A. Harmon, PhD; Kelly A. Kimmerling, PhD; Katie C. Mowry, PhD

Introduction: Placental allografts have been used since the early 1900s for a variety of applications, including wounds and burns. Processing methods used to preserve placental membranes are known to impact the native characteristics, including structure, composition, and functionality. A gentle processing and preservation technique was developed to maintain all key characteristics of placental membranes. Here, hypothermically stored amnion (HSAM*) and chorion (HSCM^0) membranes were compared to fresh, unprocessed amnion (uAM) and chorion (uCM) membranes and evaluated for biophysical properties, structural integrity, degradation profiles, and scaffold functionality.

Methods: Donor-matched placental membranes were processed into either HSAM and HSCM, which were stored at 1-10°C for up to 42 days before use, or uAM and uCM, which were used within 24 hours. The impact of hypothermic preservation on extracellular matrix (ECM) structure was assessed via scanning electron microscopy (SEM), histological staining, and tensile testing. Membranes were subjected to simulated wound fluid (SWF) for 17 days and degradation was assessed through imaging and mass retention. Functionality of scaffolds was evaluated via fibroblast attachment and proliferation for up to 7 days.

Results: Hypothermically stored membranes retained similar structural characteristics compared to unprocessed tissues. Both HSAM and HSCM maintained expression of ECM components and key proteins seen in unprocessed membranes. In response to hypothermic storage, there were no significant differences in tensile testing as measured by maximum force or displacement compared to unprocessed placental tissues. When subjected to SWF, HSAM and HSCM had comparable degradation kinetics over 17 days to unprocessed membranes, and imaging revealed similar ECM changes. Both HSAM and HSCM functioned as scaffolds and supported the attachment and proliferation of fibroblasts, with significant growth out to 7 days.

Discussion: These results highlight that this gentle hypothermic process is an effective method for processing and preserving placental membranes by maintaining key characteristics and functionality in vitro.

LR-016

Assessment of Foam Vs Hydrogel Prophylactic Heel Dressings: Effectiveness and Durability of Pressure Redistribution Properties Under Cyclic Loading Conditions

Matthew Henry, MS, MBA; Patrick Lamb, MS

Introduction: Pressure injuries/pressure ulcers(PIs/PUs) remain a significant healthcare concern due to links with increased morbidity, prolonged hospital stays, and higher treatment costs. These injuries typically result from prolonged pressure over bony prominences, leading to tissue ischemia and damage.[1] Prophylactic dressings are commonly used to reduce/redistribute pressure and protect vulnerable areas, such as the heel. Although conventional foam-based prophylactic dressings have

been extensively evaluated for their pressure redistribution capabilities, these studies typically only assess reductions in peak pressure(PP) during a single loading event.[2] This overlooks the repeated loading and unloading cycles that dressings experience in clinical settings, where patients are routinely repositioned to prevent PIs/PUs. This study assessed the durability of pressure redistribution properties of both foam-based and hydrogel-based prophylactic heel dressings over multiple loading/unloading cycles.

Methods: This study evaluated three commercially available prophylactic heel dressings: two foam-based (Dressing A and B) and one hydrogel-based (Dressing C). During testing, dressings were placed on a high-resolution pressure mapping system and a 1.5-kg spherical weight was used to mimic the calcaneal tuberosity(heel). Peak pressure measurements were recorded after applying the weight to the dressing, and again after a 30-min exposure period. The weight was then removed, and the dressing remained "unloaded" for 30-min. This load/unload cycle was repeated nine additional times, with PP measurements taken at the end of each loading phase. These cycles simulate a clinical setting where patients are repositioned at regular intervals to reduce the incidence of PIs/PUs.

Results: Dressing C performed best at reducing PP(≈74–76% reduction), followed by Dressing B(≈69–76% reduction), and A(≈48–61% reduction). Only the foam-based dressings exhibited a loss in their ability to redistribute PP due to the cyclic loading conditions, illustrated by a significant, linear increase in PP for Dressing A and B at a rate that was 53.8-fold and 28.7-fold greater than Dressing C, respectively.

Discussion: This study demonstrated that foam-based, prophylactic heel dressings are substantially more susceptible to mechanical degradation from repeated loading/unloading cycles than hydrogel-based dressings. As such, hydrogel-based dressings may offer a more effective and durable alternative for mitigating localized tissue pressure and could consequently help reduce the incidence of PIs/PUs for patients.

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LR-017

Assessment of Cell Responses and Biocompatibility of an Allograft Membrane: Viability and Migration of Distinct Cell Types

Alison Ingraldi; Aaron J. Tabor, PhD, CTBS, CWCA

Introduction: An amniotic membrane allograft is a biological product derived from the innermost layers of the placenta, specifically the amnion and chorion. These tissues are collected from healthy donors following deliveries and are processed according to strict safety and regulatory guidelines. The unique properties of the amniotic membrane make it suitable for a variety of medical applications, both in clinical settings and surgical procedures. Amniotic membrane allografts not only contain growth factors that may support healing, but their extracellular matrix also creates a framework that encourages cell migration and proliferation, assisting in wound healing phases. The Axolotl Biologix DualGraft is a dehydrated dual-layer amniotic membrane (dHAAM) product that has been tested for its ability to promote the adherence and cellular compatibility of different cell types commonly encountered in its applications.

Methods: The cellular viability and adhesion for skin, muscle, and bone tissue types were evaluated by culturing the following cell types: fibroblasts, myoblasts, and osteoblasts on samples of dHAAM. To assess cell viability, cytotoxicity, and proliferation, the WST-1 assay was utilized. This non-radioactive colorimetric-based viability assay measures cell activity by tracking the conversion of tetrazolium salt reagent into a formazan dye by metabolically active cells. This conversion is facilitated by mitochondrial succinate-tetrazolium reductase, an enzyme that is primarily active in viable cells. To further track the attachment of the different cell types, a CellTracker fluorescent (CMAC 2111) probe was utilized to monitor cells' movement, location, migration, chemotaxis, and invasion of the membrane sample.

Results: Data collection is currently underway, and we expect the results to clarify the biocompatibility of dHAM with cell viability and visual attachment. Preliminary testing with fibroblasts cultured on the membrane showed comparable ATP production, whether dHAM was present or not. Microscopy images clearly distinguished between live and dead cells found on the membrane after 48 hours of incubation. We will present further results upon the completion of the full study with additional cell lines.

Discussion: By further exploring the biological properties, researchers and clinicians can study the underlying principle of the amniotic membrane allografts and discover unique future applications. Further tissue type support will be explored using more in-depth methods, assays, and data analysis.

LR-018

Cytotoxicity and Cell Proliferation in Amniotic Skin Graft: A Multi-Donor Study

Sadhana Joshi, MS; Babak Safavieh, PhD; Isabella Sledge, MD; Mora Melican, PhD

Introduction: Chronic wounds are characterized by their inability to progress through the normal stages of healing within an expected timeframe, posing significant risks—especially in patients with diabetes and other comorbidities.[1] These wounds often remain in the inflammatory phase longer than normal, where the release of cytokines and growth factors essential for healing becomes dysregulated. This disruption impairs tissue repair and maintains the wound in a non-healing state.[2] With the rising prevalence of chronic wounds and diabetes, research and treatment options in the wound care industry have expanded considerably. One of the more prominent advancements includes the use of placental membrane grafts.[3] These grafts, derived from the amniotic membrane, are rich in cytokines, growth factors, and other bioactive proteins that promote an effective and accelerated wound healing process.[4] This study focuses on assessing the characteristics of amnion grafts in supporting cell migration, evaluating the cellular composition of isolated cells, determining their proliferation capabilities, and analyzing gene expression profiles.

Methods: Amniotic membranes from 5 donors were assessed in 3 manufacturing conditions: Fresh (unprocessed), Stage 1(single freeze/thaw cycle), Stage 2 (representative of final product, without irradiation). Cell enumeration was performed after enzymatic digestion of amnion membrane and the isolated cells were counted. The composition of the isolated cells were assessed using Flow cytometry and Cell proliferation was determined using cell- based assays. Cell migration was assessed using transwell migration assay.

Results: The amnion products showed characteristics essential for a faster wound-healing process. Amnion products showed a significant level of Cell Viability in all the differently processed samples. The Cell Based Assays revealed that the cells maintained their proliferation capabilities. PCR Array revealed the presence of key wound healing genes in the Amnion membranes. The presence of exosomes was confirmed in the final amniotic graft product.

Discussion: The amnion membrane shows significant promise in promoting the healing of chronic wounds. The findings of this study further demonstrate its wound-healing capabilities. Specifically, this work successfully compares different stages of amnion membrane processing and their effects on cell composition, gene expression, and cellular proliferation. Amnion membranes create a favorable environment for cell growth and accelerate the healing process by releasing cytokines and growth factors. This not only promotes tissue regeneration but also reduces the risk of infection and minimizes the duration of the inflammatory phase. These properties position amnion membranes as a promising treatment option within the wound care industry.

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LR-019

The Effect of Copper-Iodine Complex Solution on the Killing and Antimicrobial Persistence of two Candida Species (Calbicans and C. auris): an in vitro model

Steven Kavros, DPM, FACCWS, MAPWCA

Introduction: Yeast infections, such as that produced by *Candida spp*., are common in chronic wounds and burns. *C. albicans*-relatedinfection has multiple treatment options, both topical and pharmacological. However, *C. auris* is an emerging WorldHealth Organization threat with no known pharmacologic treatment course and can lead to morbidity and mortality. Thepurpose of this in vitro study is to demonstrate the killing effect and antimicrobial persistence of copper iodine irrigationsolution (CICS) on two yeast species.

Methods: Each test article (CICS or 1 ppm Lugol's iodine) was inoculated with ~105 CFU/mL of *C. albicans* or *C. auris*. After a 10-minute exposure time (sample 0 mins), samples were neutralized, diluted, and plated. To assess theantimicrobial persistence, the same samples were rechallenged by renoculating~105 CFU/mL of each organismat 10 mins, 2 hours, 5 hours, and 24 hours and neutralized after a 10-minute exposure time.

Results: A full table of results will be provided on the log reduction and kill times.High antimicrobial efficacy (>99.999% or 5 log reduction) of CICS was demonstratedwhen rechallenged by reinoculations over 24 hours for both *C. albicans* and *C. auris*. Lugol's iodine showed loss of activity in 2 hours of exposure.

Discussion: Copper-Iodine Complex Solution demonstrated an effective kill rate and antifungalpersistence in vitro with both *C. albicans* and *C. auris*. This has significant implicationsfor acute and chronic wounds, trauma and burns, especially when there is no presentmedicinal treatment for *C. auris*. Further studies are warranted to support thesefindings.

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LR-020

Development and Preliminary Evaluation of a 3D-Printed Implantable Medical Device Using Antibiotic-Loaded Porcine-Derived ECM

Min Ji Kim; Hyung Min Hahn, M.D., Ph.D; Hyoseob Lim, MD, PhD; Eun Hee Han, Master; Seung Hee Hong, PhD; Il Jae Lee, M.D., PhD

Introduction: Porcine-derived extracellular matrix (ECM) collagen demonstrates excellent biocompatibility, hemostatic activity, and the promotion of angiogenesis, making it an attractive biomaterial for wound healing applications. Utilizing collagen-based 3D printing technologies, we sought to fabricate a biocompatible implantable device. Given the critical importance of infection prevention for successful graft integration, we developed a 3D-printed scaffold coated with gentamicin to enhance antimicrobial protection.

Methods: Six experimental groups were established: (Control) non-printed collagen sponge; (C+G) non-printed collagen sponge with gentamicin coating; (1) chemically crosslinked 3D-printed scaffold; (2) chemically crosslinked 3D-printed scaffold with gentamicin; (3) physically crosslinked 3D-printed scaffold; and (4) physically crosslinked 3D-printed scaffold with gentamicin. Mouse fibroblast L929 cells were seeded onto each scaffold. Four parameters—cell adhesion, proliferation, viability, and infiltration—were evaluated. Cell adhesion was assessed using Calcein-AM staining and CCK assay; infiltration was measured via Phalloidin staining and H&E staining; proliferation and viability were evaluated by CCK assay at day 7.

Results: Compared to the control, 3D-printed scaffolds demonstrated significantly enhanced cell adhesion (1.29–1.46-fold increase, $p< 0.05$) and cell infiltration (2.62–3.37-fold increase, $p< 0.05$). Chemically crosslinked scaffolds showed superior cell proliferation (1.38–1.84-fold increase, $p< 0.05$) and viability compared to the control group. Even with antibiotic loading, physically crosslinked scaffolds maintained stable cell adhesion, while chemically crosslinked scaffolds exhibited significantly better overall cell viability than physically crosslinked scaffolds ($p< 0.05$).

Discussion: Our 3D-printed, gentamicin-coated porcine ECM scaffolds demonstrated improved biocompatibility and cellular performance compared to conventional collagen sponges. Chemical crosslinking strategies further enhanced scaffold functionality. These findings suggest that this technology holds promise as an implantable biomaterial capable of supporting tissue integration while simultaneously providing localized infection control.

LR-021

Optimizing Bioactive Scaffolds: Effects of Calcium Integration

Brian Kratt, BS; Miguel A. Fuentes, PhD; Franco Kraiselburd, BSE; Ixchel Robles, BSE; Rodrigo A. Somoza, PhD

Introduction: Scaffolds consisting of gelatin (Ge) and chitosan (Ch) are commonly used biomaterials to promote skin wound healing because of their ability to mimic the tissue microenvironment, promote cell adhesion and initiate release of restorative growth factors.[1] Specifically,

scaffold interaction with mesenchymal stem cells (MSCs) are of interest when determining therapeutic efficacy as the MSC secretome releases factors to promote angiogenesis, suppress immunoreactivity, and accelerate wound closure[2]. Incorporating calcium-based additives has been explored to improve coagulation, but this may come at the expense of other regenerative properties. Calcium interactions with gelatin and chitosan may decrease pore size of the polymer, which has been shown to decrease cell adhesion. Moreover, increased extracellular calcium has shown to improve keratinocyte proliferation and differentiation, but the speed of proliferation may be decreased at higher calcium concentrations.[3] MSCs have also been shown to exhibit an osteogenic profile at higher calcium concentrations, which may decrease their secretion of wound healing factors like PDGF, EGF, and VEGF.

Methods: Scanning electron microscopy (SEM) was performed to determine the porosity and average pore size of the scaffolds. Coagulation time was determined by applying whole human blood to the scaffold surface and quantifying clot formation via absorbance based measurements. WST-1 assays quantified cell adhesion to the scaffold surface, and subsequent ELISA assays quantified expression of PDGF, EGF, VEGF, and TGF-β1 from the collected cell media.

Results: Preliminary results showed a decrease in pore size with increased concentration of calcium *(Control = 83.7 µm ; [x] Ca = 71.5 µm ; [3.5x] Ca = 55.1 µm). Coagulation assays showed a significant increase in coagulation time with increased concentration of calcium. The significant reduction in pore size is predictive of a correlational difference in cell adhesion and attachment.

* Due to proprietary considerations, some specific concentrations may be omitted

Discussion: This study seeks to determine optimal concentrations of calcium-based additives for incorporation into a Ge/Ch scaffold to promote the wound healing response. Assessing the scaffold's porosity, coagulation, cell adhesion and subsequent growth factor release demonstrates the tradeoffs calcium incorporation has on biological performance, and provides insight into the optimal concentration levels to promote the strongest wound healing response.

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LR-022

Bovine Extracellular Matrix Particulate Modulates Fibroblast Cellular Activities Supportive of Wound Management

Jimmie Lang, MS; Sarah Moreno, MS; Michelle Massee, BS; John Harper, PhD

Introduction: Biological scaffolds derived from the ECM are crucial for wound healing as they provide the necessary biochemical cues that enhance tissue repair and remodeling. Human dermal fibroblasts (HDFs) play a critical role in wound repair by synthesizing collagen and secreting proteins necessary for tissue remodeling. This study investigates the potential of a bovine ECM particulate* composed of type I and type III collagen to support human cell viability and function, with a focus on how its structure influences regenerative outcomes in both in vitro and in vivo.

Methods: Pre-hydrated bovine ECM was seeded with HDFs. Cell viability and metabolic activity were assessed after 3, 7, 10, and 17 days. Calcein staining was used to observe live cells seeded onto the scaffold. Metabolic activity was determined by Cell Titer-Glo Assay. The impact of the scaffold on the secretome of the cells was evaluated utilizing Multiplex Luminex assays. Athymic mice received a subcutaneous implant of bovine ECM and were evaluated at 1, 2, and 4 week endpoints. Histopathological assessment was completed to evaluate cellular infiltration and implant bioresorption/reorganization.

Results: Assessment of cell viability utilizing calcein staining, shows that the bovine ECM scaffold supports HDF cell viability. Cells grown on the bovine scaffold remain metabolically active at all time points evaluated. Luminex results show HDFs increase secretion of proteins that play a role in tissue remodeling compared to cells grown on tissue culture plate. Histological analysis shows that HDFs actively interact and infiltrate the bovine scaffold in vitro. Additionally, in vivo, host cell infiltration of the implant was observed.

Discussion: In vitro and in vivo data highlight the supportive role of a bovine ECM particulate scaffold to facilitate fibroblast activity that is essential for wound healing, including tissue remodeling and cellular infiltration. Both in vitro and in vivo data demonstrate that the structure of the scaffold allows for infiltration by host cells. This study provides insights into the therapeutic application of a bovine ECM particulate for facilitating healing outcomes particularly in deep wounds where the scaffold can conform to the surface of the wound.

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LR-023

Therapeutic Potential of Amniotic Tissue in Promoting Pigment Restoration During Wound Healing

Jimmie Lang, MS; Sarah Moreno, MS; Michelle Massee, BS; John Harper, PhD

Introduction: Impairments during wound healing can lead to hypopigmentation that results in patches of skin that are lighter in color than the surrounding areas. The mechanism by which the discoloration occurs is through inadequate melanocyte proliferation, defects in melanin synthesis, melanin secretion to keratinocytes, or alterations in dendritic morphology. In this study, a dehydrated human amniotic membrane (DHACM)* composed of the amnion and chorion layers was utilized to evaluate the potential of amniotic tissue-derived therapies to support melanogenesis and pigment restoration during the healing cascade.

Methods: DHACM was prepared using the PURION process, consisting of gentle cleansing, followed by dehydration and terminal sterilization. Murine melanocyte cell line, B16F10, was treated with DHACM and effects on proliferation were assessed using the CyQuant assay. Melanin synthesis was evaluated by measuring intracellular melanin content and by measuring tyrosinase activity. Cellular morphology and intracellular melanin accumulation were visualized using Fontana-Masson staining. Melanin secretion was determined by quantifying melanin accumulated into the culture media.

Results: DHACM significantly increases cellular proliferation of melanocytes over 3 days. Analysis of tyrosinase activity and intracellular melanin content both show that DHACM increases melanin production. Dendritic morphology was visualized at all concentrations using Fontana-Masson staining. Quantification of melanin accumulation in cell culture media indicates that DHACM increases the amount of melanin secreted in the culture media.

Discussion: Social stigma surrounding hypopigmentation can impact a patient's self-esteem, often negatively affecting their quality of life. This in vitro study demonstrates that amniotic tissue impacts melanocyte activities such as cellular proliferation and melanin synthesis and secretion that may become impaired during wound healing, such as increased cellular proliferation and increased melanin synthesis. Improving the quality of life drives the need to explore the therapeutic usage of amniotic tissue for treatment of hypopigmentation as complications following impaired wound healing.

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LR-024

A Comparison of Sterilization Methods for Dehydrated Birth Tissue

Wendy W. Weston, PhD, CTBS

Introduction: Sterilization of tissue is a crucial part of ensuring that the allograft is safe for the recipient. Sterility Assurance Level (SAL) is the probability that a single unit that has been subjected to sterilization nevertheless remains nonsterile. Medical device manufacturers design their sterilization processes for an SAL of 10–6. Gamma irradiation (γ-IR) is used by many allograft processers, but this method has no dose flexibility, and at the industry standard of 25 kGy, has been shown to affect tensile strength, elongation, and water absorption of collagen membranes. E-beam irradiation is very similar to γ-IR in being an ionizing energy. E-beam utilizes higher doses with less time of exposure and lower penetration, hence the effect of the sterilization process on tissue structure and endogenous factors should be reduced. With this in mind, we hypothesized that e-beam sterilization at increasing doses and γ-IR at 25 kGy would have differing effects on absorption capacity and growth factor availability.

Methods: Amnion/chorion (AC) and Umbilical cord (UC) were processed for dehydrated product. The packaged samples were sent out for E-beam sterilization at 0, 10, 20, 40, 60 and 80 kGy and γ-IR. Following sterilization, 10mm punches were taken from each lot and dose. For absorption capacity, punches were photographed, weighed, and rehydrated in DPBS. Punches were removed from the liquid, blotted, weighed and re-photographed. Absorption was calculated as % weight difference between dry and wet conditions. For molecular assays, punches were incubated with DPBS for 72 hours. The supernatant was used for collagen 1A1, hyaluronic acid, IL-1ra and HGF assays. All assays were compared Student's t-test with significance set at $p< 0.05$.

Results: In UC, 80 kGy e-beam had significantly less IL-1ra than 10 kGy. HA did not show significant differences between the sterilization treatments, but there is an obvious downward trend in elution with increasing doses. Absorption results showed a clear downtrend in absorption capacity as irradiation dose increased, with γ-IR results being close to or equal to higher e-beam doses.

Discussion: Based on these results, e-beam sterilization at increasing doses and γ-IR have differing effects on absorption capacity and growth factor availability. Hence, ideal sterilization technique should be based on the desired product and application (e.g. softer, absorptive membrane with available growth factors vs. stiffer membrane with less/no factors). Based on these results, clinical studies are warranted to elucidate the functional differences in a wound environment.

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LR-025

Direct Comparison of Processing Methods for Placental Tissue Allografts

Toni-Ann M. Martorano, MS; Ian S. Perpetuo, MS; Wendy W. Weston, PhD

Introduction: Placental membrane allografts have emerged as valuable treatment modalities in wound care, particularly for wound covering and protection. These membranes are naturally rich in growth factors, cytokines, and chemokines. However, techniques originally used to produce grafts from placental membranes often resulted in the loss of these beneficial properties. To address this, a new gentle processing technique, BioREtain, was developed to retain and preserve the native characteristics of the placental membrane. A comparative analysis was conducted between our BioREtain product (RE-AC) and two leading amnion/chorion (AC) competitor products.

Methods: Five independent lots were selected for each product. Samples were assessed for key biological components and molecular factors using histology and cytokine analysis via enzyme-linked immunosorbent assay (ELISA). Results were reported as the amount of each factor per cm^2.

Results: Across all assays, the retention processed placental membrane allograft (RE-AC) demonstrated superior structural and biological integrity compared to the leading AC competitors. These findings suggest that RE-AC products effectively preserve the native properties of the placental membrane.

Discussion: Our results show that the BioREtain placental membrane allografts maintained their natural structure better and exhibited higher growth factor retention compared to the leading AC competitors. Additionally, our product showed consistency across multiple lots, indicating reliability in manufacturing and performance.

LR-026

Biophysical Characterization of COMPLETETM AA: Biophysical Characterization of Completetm AA: A Novel Dehydrated Dual-Layer Amnion Allograft

Jeremy Mercuri, PhD; Emily DiNicola, PhD; Jerry Chang, BS

Introduction: Human amnion-derived allografts are used as skin substitutes for difficult-to-heal wounds. These placental tissues are manufactured using a variety of processing techniques that can impact/alter their biophysical characteristics. As such, resultant allografts should be thoroughly characterized. Thus, the objective of this work was to characterize a novel dehydrated dual-layer amnion wound care allograft (*) via histological, biochemical and in vitro cellular bioactivity evaluations.

Methods: Dehydrated dual layer amnion allografts* were produced from placentas that were donated via informed consent following cesarean section deliveries. Tissue processing was performed in accordance with Food and Drug Administration's Good Tissue Practices and the American Association of Tissue Banks (AATB) guidelines prior to dehydration and terminal sterilization to a sterility assurance level of 10-6. To evaluate the histological microarchitecture and extracellular matrix (ECM) composition of the resultant allografts, samples underwent routine processing, staining and microscopic imaging. To biochemically characterize the allografts, glycosaminoglycan (GAG) and growth factor content was quantified via a dimethylmethylene blue assay and a multiplex cytokine array, respectively. To evaluate allograft bioactivity, soluble extracts (1mg/ml) prepared from the grafts were added to basal cell culture media and incubated with human dermal fibroblasts (HDF's). HDF metabolic activity, proliferation and migration were evaluated. Of note, all analyses were performed by independent, third-party vendors.

Results: Allograft* histology demonstrated a dual-layer amnion allograft with a dense, intact ECM containing all zones of the native amnion and comprised of collagen, glycosaminoglycan, and elastin. Average GAG content of the allograft* was 12.7±2.4 µg GAG/mg dry weight (14.6±3.0 µg GAG / cm2). The allografts contained physiologically relevant concentrations of growth factors, including those involved in ECM remodeling, angiogenesis and immunomodulation. Furthermore, extracts

from the allografts supported fibroblast metabolism, proliferation and migration.

Discussion: Upon comparison to peer-reviewed literature characterizing both native amnion and other amnion-derived allografts, the results herein demonstrate retention of the biophysical properties of this dehydrated, dual-layer amnion allograft (*). These results also demonstrate preservation of the original relevant characteristics of the amniotic membrane relating to its utility to serve as a covering and offer protection from the surrounding environment.

LR-027

The Role of Nitric Oxide in the Killing and Prevention of Surface-Associated Bacterial Communities by a Nitric Oxide-Generating Wound Dressing

Daniel Metcalf, PhD; Nicholas G. Boote, PhD; Alan M. Horner, PhD

Introduction: Hard-to-heal wounds, such as diabetic foot ulcers, pose a significant clinical challenge, resulting in poor patient quality of life and substantial economic burden. The aim of these in vitro studies was to demonstrate the activity of nitric oxide (NO), based on acidified sodium nitrite ($NaNO_2$), within a novel prototype NO-generating wound dressing technology*, against surface-associated bacterial communities.

Methods: Initial prototype test dressings comprised upper absorbent layers plus lower carrier layers (CL) containing varying concentrations of $NaNO_2$. To examine killing effects, surface-associated communities of methicillin-resistant Staphylococcus aureus (MRSA) were grown on nitrocellulose filters for 24 hours, before prototype/control dressings were applied. To assess the prevention of development of surface-associated communities, planktonic MRSA-inoculated filters were immediately covered with prototype/control dressings for 24 hours. The effect of treatment time with a final dressing design containing a 1M $NaNO_2$ CL was assessed regularly over a 24-hour period to evaluate killing and prevention of surface-associated bacterial communities.

Results: Surface-associated MRSA was reduced by 3 log10 in 24 hours by prototypes with CL containing 0.2M $NaNO_2$, and was eradicated by dressings with CL containing 0.5M $NaNO_2$. Development of surface-associated MRSA communities was not prevented by dressings with CL containing 0.1M $NaNO_2$, but was completely prevented by dressings with CL containing 0.2M $NaNO_2$, after 24 hours. Using final design NO-generating wound dressings with CL containing 1M $NaNO_2$, surface-associated MRSA was reduced by 3 log10 after 2 hours, by >7 log10 after 4 hours, and completely eradicated after 6 hours. Development of surface-associated MRSA communities was completely prevented after 6 hours by the NO-generating wound dressing.

Discussion: In vitro models of kill and prevention of surface-associated MRSA communities showed that varying the concentration of $NaNO_2$ used to generate NO, and varying the duration of treatment with the final design dressing, resulted in a dose-response effect on the kill and prevention of surface-associated MRSA communities. The NO-generating dressing can effectively kill and prevent development of surface-associated bacteria in vitro.

LR-028

In Vitro Assessment of a Methylene Blue and Gentian Violet-Containing Foam Dressing and an Advanced Silver-Containing Gelling Fiber Dressing Against Surface-Associated Antibiotic-Resistant Bacteria

Matilda M. Coleborn, PhD; Kate Meredith, PhD

Introduction: Microorganisms in surface-associated/aggregated form are implicated in hard-to-heal wounds and comprise communities embedded in extracellular polymeric substance (EPS) matrices. In vitro studies have assessed the antimicrobial efficacy of wound dressings against this phenotype; however, methods vary in robustness and validity. We evaluated two antimicrobial dressings with distinct mechanisms against antibiotic-resistant bacteria using a stringent, challenging in vitro model.

Methods: A carboxymethylcellulose fiber dressing* containing ionic silver, ethylenediaminetetraacetic acid (EDTA) and benzethonium chloride (BEC; 'CISEB') and a polyvinyl alcohol foam dressing† containing methylene blue and gentian violet ('PVA-MBGV') were evaluated. Challenge bacteria (antibiotic-resistant Pseudomonas aeruginosa [RPA] and community-associated methicillin-resistant Staphylococcus aureus [CA-MRSA]) were separately grown on gauze (simulating surface-associated/aggregated phenotype) and transferred to simulated wound assemblies. Test dressings were applied to the colonized gauzes and covered with a transparent film dressing before incubation for ≤120 hours at 35±3°C. A no-dressing control was included. Enumeration of surviving bacteria was performed for each test dressing (n=3).

Results: PVA-MBGV produced an initial ~0.5 log10 reduction in RPA population at 6 hours, which was sustained throughout the 96-hour challenge period. CISEB reduced the RPA population by ~1.5 log10 at 6 hours and by ~6 log10 at 48 hours (million-fold reduction from initial challenge of ~1×1010 colony-forming units [CFU]/gauze). The kill rate was sustained with the population reaching non-detectable levels (< 30 CFU/gauze) by 96 hours (~8.8 log10 reduction). No reduction in CA-MRSA was observed with PVA-MBGV and population levels remained high throughout the 120-hour challenge period. The initial bacterial challenge (~3×109 CFU/gauze) was sustained at 48 hours with levels comparable to the no-dressing control at the remaining timepoints. CISEB reduced the CA-MRSA population by 1 log10 at 6 hours and >5 log10 at 48 hours. The kill rate was sustained and the population reached non-detectable levels by 96 hours (~8.4 log10 reduction) and 120 hours. The no-dressing controls demonstrated challenge organism viability throughout the test periods.

Discussion: CISEB demonstrated superior antimicrobial activity against surface-associated RPA and CA-MRSA compared with PVA-MBGV, reducing populations to non-detectable levels. The observed activity of CISEB may be attributed to EDTA and BEC that can disrupt EPS matrices, potentiating the antimicrobial activity of ionic silver.

LR-031

Structural, Compositional, and In Vitro Functional Characterization of a Micronized Native Collagen Wound Matrix

Suzie Riley, PhD; Vivek P. Raut, PhD; Rami A. Nasrallah, BS; Jumana R. Alhamdi, PhD; Thuan-Ethan Ngo, MS; Katie C. Mowry, PhD

Introduction: Extracellular matrix (ECM) -based wound matrices are widely used to support wound healing. Characteristics such as structure, composition, and functionality are impacted by both the source tissue and processing methodology. Collagen Wound Matrix-Micronized (CWM-MZ*) is a biocompatible, acellular native ECM powder intended for the management of a variety of wounds, including deep irregular shaped wounds. In this study, we evaluated CWM-MZ using in vitro models to fully characterize key properties.

Methods: Structural properties of CWM-MZ were assessed with scanning electron microscopy and light scattering particle sizing analysis. Native collagen composition was quantified by Sircol and hydroxyproline assays. Absorption capacity was determined gravimetrically, and protease inhibition was measured using a gelatin or casein-fluorescein-labeled substrate assay. Cell responses were evaluated using primary human fibroblasts. Fibroblasts were cultured on surfaces coated with CWM-MZ and proliferation and morphology assessed by DAPI staining, NucleoCounter counting, and phase contrast microscopy. Cell viability and ECM deposition in response to CWM-MZ were evaluated by culturing fibroblasts in simulated wound fluid (SWF) ± collagenase and assessed with CellTiter-Glo and immunofluorescence staining. Angiogenic responses were assessed by exposing human umbilical vein endothelial cells (HUVECs) to fibroblast-CMW-MZ and imaging tube formation.

Results: CWM-MZ is composed of 80.5% native collagen/mg of protein with average particle sizes of 286 and 334 mm for wet and dry analysis, respectively. CWM-MZ absorption capacity was 7 mL/g, which is significantly higher than comparable sheet materials. CWM-MZ inhibited protease activity by 24-66%, collagenases/gelatinases by 50-80%, and elas-

tase by 43-80%, at concentrations increasing from 5-25 mg/mL, respectively. Fibroblasts adhered, proliferated, and migrated at a higher capacity when cultured on CWM-MZ compared to purified collagen controls. An environment enriched with CWM-MZ resulted in preserved cell viability by 75% when exposed to collagenase II, more robust collagen I deposition and vimentin expression by fibroblasts, and enhanced tube and branch formation of HUVECs compared to SWF alone.

Discussion: This study demonstrates that CWM-MZ inhibits proteases, supports fibroblast attachment and proliferation, and an environment enriched with CWM-MZ results in improved cell responses. Together, these in vitro results support the utilization of CWM-MZ to support the management of wounds.

LR-032

In-Vitro Antibacterial Testing of APLICOR 3D Printed Adipose Wound Grafts

Laura Rivera Tarazona, PhD; Babak Safavieh, PhD; Mora Melican, PhD

Introduction: Chronic wounds present a major health issue, impairing healing and quality of life. Adipose tissue, rich in growth factors, cytokines, and adipose stem cells (ASCs), offers therapeutic benefits for wound regeneration by promoting angiogenesis, cell proliferation, and immunomodulation. While 3D printing allows for patient-specific adipose grafts, the risk of wound infection remains a critical challenge. This study introduces an in-vitro method to assess the antibacterial properties of 3D printed adipose wound grafts integrated with antibacterial agents to combat infections and promote healing.

Methods: Human lipoaspirate was processed with additional ingredients for use with the APLICOR 3D system to fabricate wound grafts. A proprietary antibacterial agent (Agent Y) was incorporated into the bioink before 3D printing. To evaluate antibacterial efficacy, Staphylococcus epidermidis (ATCC 12228) and Escherichia coli (ATCC 25922) were cultured and diluted to an optical density (OD600nm) of 0.05. The 3D printed adipose grafts containing Agent Y (experimental group) were exposed to these bacterial suspensions. Control groups included Agent Y alone with bacteria (positive control) and bacteria cultured without antibacterial intervention (negative control). Bacterial viability was assessed by serial dilution and colony-forming unit (CFU) counting at 0, 3, 6, 24 hours, and 7 days. The culture media was not changed to evaluate the grafts' sustained antibacterial effect and cell-killing potential.

Results: The 3D printed adipose grafts incorporating Agent Y are anticipated to show significant antibacterial activity against both S. epidermidis and E. coli. A marked reduction in CFU counts is expected in the experimental grafts compared to the negative control at all time points. Furthermore, results are projected to demonstrate sustained bacteriostatic and/or bactericidal activity over the 7-day period, indicating the long-lasting efficacy of the incorporated agent. The grafts' antibacterial performance is expected to be comparable to the positive control, confirming Agent Y's successful integration and activity.

Discussion: This study aims to demonstrate that incorporating an antibacterial agent into 3D printed adipose wound grafts yields constructs with potent and sustained antibacterial properties. Such functionalized grafts could potentially reduce bacterial colonization and infection in chronic wounds, supporting natural healing. Developing inherently antibacterial adipose-derived grafts is a promising advancement for chronic wound care, potentially improving healing and reducing patient morbidity. Future work will optimize agent concentrations and evaluate efficacy in more complex wound models.

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LR-033

The Medical Potential of 3D Bioprinting Shaping Tissue, Healing Chronic Wounds

Babak Safavieh, PhD

Introduction: Chronic wounds remain one of the most challenging skin conditions due to multiple contributing factors, including diminished vascularization and persistent hypoxic conditions that sustain and aggravate inflammation.[1] Additionally, the prolonged overexpression of various inflammatory cytokines, such as TNF-α and interleukins, delays the wound repair process from progressing into the proliferative phase. Consequently, there is a critical need for advanced, versatile, and easy-to-use regenerative treatments that provide appropriate biological cues and cytokines to promote angiogenesis, modulate inflammation, and ultimately accelerate wound healing.

Methods: 3D bioprinting has emerged as a promising technology for precisely fabricating medical constructs by incorporating live cells and bioactive materials. In skin regeneration, it enables the development of adaptable bioinks that meet multiple therapeutic needs, offering personalized grafts with tailored dimensions to match the unique geometry of each wound.[2]

Results: These capabilities allow for individualized approaches to treating chronic wounds that are otherwise resistant to conventional therapies.[3]

Discussion: This talk will overview current combinational biomaterial-based 3D bioprinting strategies and highlight the unique advantages of each approach. It will also explore how emerging bio-ink formulations are positioned to transform the landscape of wound care through targeted, patient-specific regenerative solutions.

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LR-034

Processing of Placental Components for Extrusion 3D Printing

Larry Stevens, BS; Lisa Shirreff, MS; Laura Rivera Tarazona, PhD; Babak Safavieh, PhD; Mora Melican, PhD

Introduction: The development of bioinks incorporating placental-derived extracellular matrix (ECM) components offers a promising avenue for enhancing the bioactivity and mechanical properties of 3D-printed tissue constructs. This study focuses on isolating blood-free particulates from different regions of the human placenta, processing them to achieve particle sizes compatible with extrusion through a 25-gauge (25G) needle, and evaluating their suitability for bioprinting applications.

Methods: The human placental tissues were decellularized, lyophilized, and milled to obtain fine ECM powders, which were then characterized for particle size distribution, ensuring compatibility with 25G needle extrusion. These ECM powders were subsequently incorporated into bioinks, and their rheological properties were assessed to determine printability.

Results: The incorporation of placental ECM components into bioinks resulted in enhanced bioactivity, as shown both in vitro and in vivo.

Discussion: This study underscores the potential of utilizing placental-derived ECM components in the formulation of bioinks for 3D bioprinting. The successful processing of placental tissues into fine particulates suitable for extrusion through a 25G needle expands the toolkit for fabricating intricate tissue constructs with enhanced bioactivity. Future research should explore the in vivo biocompatibility and functional integration of these bioinks in tissue regeneration models, building upon the foundational work presented here and in related studies.

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PI-001

Enhancing Complex Wound Healing: A Case-Based Application of the 7-Steps of Wound Management Framework

Nya Akoteu, RN; Kevin Nolan, MD; William Tettelbach, MD

Introduction: The "7-Steps of Wound Management" is an evidence-based framework designed to enhance outcomes in managing hard-to-heal wounds. These steps involve assessing circulation, infection, debridement, offloading, nutritional support, moisture management, and advanced therapies such as cellular, acellular, and matrix-like products (CAMPs) or hyperbaric oxygen (HBO2) therapy. This framework aims to promote healing, reduce complications, conserve medical resources, and improve quality of life.

Methods: Patients were treated using the 7-step framework, which included evaluating circulation with ABIs or Doppler, wound cultures as needed, and regular sharp debridement. Nutritional needs were addressed, off-loading was implemented when necessary, and dressing choices were tailored to wound characteristics.[1,2] For wounds not reducing by 50% after four-weeks of standard care, advanced therapies like CAMPs or HBO2 were deployed. Treatment protocols emphasized adaptability based on individual patient needs. Aims: Evaluate the application of the 7-Steps of Wound Management framework in treating complex wounds through case studies. Highlight the usefulness of advanced therapies, like CAMPs, when standard care fails in chronic wound healing. Demonstrate the impact of individualized, patient-centered care in improving healing outcomes and quality of life.

Results: Cases: Patient 1: A 58-year-old diabetic male with amputations and peripheral neuropathy developed diabetic foot ulcers (DFUs). After stagnation with silver dressings, advanced therapy with PuraPly AM (Organogenesis, Canton, MA, USA) was implemented, achieving complete epithelialization in 33 days despite a 28-day gap in follow-up.Patient 2: An 80-y/o male with PAD underwent revascularization and TMA for ischemia and necrosis. In addition to standard care and dietary counseling, negative pressure wound therapy (NPWT), PuraPlyAM, and Apligraf(Organogenesis, Canton, MA, USA) CAMPs were utilized. Complete closure occurred within four months.

Discussion: These cases illustrate the importance of the 7-Steps framework in overcoming challenges like missed follow-ups and chronic wounds. Advanced therapies, such as CAMPs, proved critical when standard care alone failed to achieve closure. The approach aligns with literature advocating systematic wound management and individualized care.[3-4,5] The "7-Steps of Wound Management" offers a comprehensive foundation for optimizing the process of caring for both complicated and hard-to-heal wounds. Consistent, patient-centered applications lead to improved healing, reduced complications, and enhanced quality of life.

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PI-002 (RPT-008)

Intraoperative Benefits of Integrating Fluorescence Imaging into the Management of Complex Wounds: A Suggested Workflow Algorithm

Michael N. Desvigne, DO; Arti Karmur, DPM; Prabhakar Pandey, MD; Justin Singh, DPM; Genaro Valladolid, MD

Introduction: Bacterial fluorescence imaging* is an innovative, non-invasive technology designed to enhance the assessment of wounds by detecting bacterial contamination in real-time. This imaging system uses fluorescence to identify bacterial presence, helping clinicians locate bacteria linked to poor outcomes in complex wound procedures like amputation and reconstruction. It aids in targeted debridement and post-debridement assessment, improving outcomes across various wound types and care settings.[1,2,3]

Methods: A 10-patient case series presents examples of the utilization of fluorescence imaging in the guidance of intraoperative debridement across multiple specialties. Wound types and pathologies include non-healing, dehiscent post-amputation wounds, surgical site infections, and diabetic foot and pressure ulcers. An algorithm for a suggested workflow that can be adapted to different surgical cases is provided.

Results: In surgical debridement, the fluorescence Imaging device* enabled real-time detection of bacterial presence, increasing its efficacy. In amputation, it helped identify bacterial presence in the residual limb, optimizing amputation level and wound management. During reconstruction, it optimized bacterial hotspot removal on graft sites prior to application. For all cases post-debridement verification of sufficient bacterial removal is encouraged. In the case of skin substitutes and grafts, documentation is particularly relevant in recording that optimal wound bed preparation was achieved for the graft to thrive.

Discussion: Integrating bacterial fluorescence imaging into the intraoperative workflow offers significant advantages in the management of complex wounds. The technology improves the detection of bacteria (including in biofilm form), enhancing surgical debridement precision, and reducing the risk of postoperative infections and/or graft failure. Its real-time, its non-invasive capabilities make it safe and efficient, and its documentation capabilities help document the need for and optimal use of skin substitutes. As its use expands, this system may become standard practice in managing complex wounds during surgery. This case series is meant to describe its benefit but also its ease of integration into a surgical workflow.

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PI-003

Preoperative Wound Bed Preparation Using Fluorescence Imaging to Optimize Outcomes in Chronic Wound Reconstruction

Arti Karmur, DPM; Justin Singh, DPM; Baljeet Uppal, MD; Michael N. Desvigne

Introduction: Preoperative infection management is crucial for reducing complications in chronic wound reconstruction. Traditional infection assessment methods can delay intervention (e.g., microbiology). Fluorescence wound imaging* enables real-time, objective bacterial detection for faster and targeted infection control, potentially enhancing presurgical preparation, improving outcomes and shortening time to reconstruction. This study aims to evaluate the impact of preoperative fluorescence imaging in optimizing wound bed preparation ahead of complex reconstructions via grafts and flaps.

Methods: Ten candidates for chronic wound surgical reconstruction via grafting (autologous or skin substitutes) (pressure injuries, diabetic foot ulcers, venous leg ulcers, and non-healing surgical wounds) were evaluated using fluorescence imaging during their preoperative hospital stay. The imaging assessed the location and presence of bacteria at pathologic loads ($\geq 10^4$ CFU/gr) in both the wound and surrounding tissue. Based on the fluorescence imaging findings, targeted wound debridement, cleansing, and antibiotic therapy were employed to manage infection and reduce bacterial load prior to surgery, with the goal of eliminating or significantly reducing fluorescence signals. Postoperative outcomes, including healing time, infection rates, and complications, are described.

Results: Fluorescence imaging revealed bacterial contamination and biofilm in all 10 cases, guiding additional debridement and more precise antibiotic therapy prior to reconstructive surgery. The treatment algorithm, as guided by fluorescence, included mechanical debridement, surgical debridement, and negative pressure wound therapy (NPWT) with or without installation. Antibiotic therapy was initiated for any patient showing evidence of acute infection. Fluorescence imaging was involved in key decision points, including: 1) preoperative infection control, 2) urgent surgical debridement, 3) timing of surgical closure.

Discussion: Preoperative fluorescence imaging optimized wound bed preparation in the hospital inpatient setting, expediting surgical readiness and improving outcomes in complex autologous skin or biologic skin substitute placement. It provided real-time, objective insights into bacterial load, enabling targeted infection control, faster healing, and fewer complications.

PI-004

Enhancing the Surgical Management and Infection Control of Necrotizing Fasciitis with Real-Time Fluorescence Imaging

Misael C. Alonso, MD, FACP, CWSP, FAPWCA; Jose Diaz, MD; Christopher J. Gonzalez, MD; Prabhakar Pandey, MD; Michael N. Desvigne

Introduction: Necrotizing fasciitis (NF) is a rapidly progressing soft tissue infection requiring immediate and aggressive intervention. Gold-standard treatment involves multiple rounds of extensive surgical debridement with the goal of removing all infected and necrotic tissues to mitigate the spread of infection, prevent amputation, and decrease the risk of mortality. However, complete intraoperative removal is challenging, even for experienced surgeons, since the borders between healthy and infected tissues are difficult to discern by eye. This case series aims to demonstrate how fluorescence imaging* enhances intraoperative infection control during surgical debridement in complex cases of NF.

Methods: We present case examples demonstrating the utility of fluorescence imaging in patients with NF. Intraoperative fluorescence imaging precisely identified the location and presence of bacteria at pathologic loads (>104 CFU/g). Surgical debridement was targeted to fluorescence-positive areas with the goal of eliminating or significantly reducing bacterial loads for optimal wound bed preparation prior to reconstruction. Post-operative outcomes, including healing time and complications, are described.

Results: In all cases, initial surgical debridements without the use of fluorescence imaging led to unsuccessful infection control, and in some cases, worsened complications. Intraoperative fluorescence imaging maintained surgical efficiency and enabled clinicians to identify and remove bioburden more precisely while sparing healthy tissue. This optimized infection management and wound bed preparation for reconstructive surgery. Following reconstruction, all wounds continued on a healing trajectory.

Discussion: Fluorescence imaging improves the surgical management of NF by providing real-time, objective detection of bacterial-laden tissues. This allows surgeons to make dynamic adjustments to ensure all infected tissues are removed while sparing healthy tissues for better outcomes. As its use expands, this technology has the potential to significantly improve the standard-of-care in NF, ultimately leading to better patient outcomes and reduced complications.

PI-005

Single Stage Excision and Reconstruction with an Intercostal Artery Perforator Flap for the Management of Adolescent Bilateral Axillary Hidradenitis Suppurativa

Jenny Barker, MD, PhD; Jason Newland, MD

Introduction: Axillary hidradenitis suppurative (HS) is a common problem in the adolescent patient population. While significant advances have been made with the medical management including biologic therapy for HS, a subpopulation remain with refractory disease requiring surgical management. The most common strategies for surgical management include excision with secondary healing including wound vac therapy, excision and primary repair, or excision with autologous skin grafting for larger defects. Each of these carries limitations that include prolonged time to healing, secondary or re-infection, graft loss, and in the axilla in particular, pathologic scar contracture of the skin graft. This report includes the description of an alternative single-stage reconstruction technique aimed at reducing these complications in a 19 year old female with bilateral Hurley stage III axillary hidradenitis.

Methods: Because of the risk of surgical site infection, single stage reconstruction of HS is challenging owing to the contaminated nature of the axilla when there is significant HS burden. In collaboration with the infectious diseases team, this patient underwent clinic bedside I&D of an HS tract which was then sent for culture 2 weeks preoperatively. Dominant bacteria were identified and the patient was pre-treated with an appropriate antibiotic regimen pre-operatively. Intraoperatively, the area of disease was excised and then reconstructed with an intercostal artery perforator-based fasciocutaneous flap. The postoperative antibiotic plan, splinting regimen and activity management are described.

Results: This patient underwent successful bilateral axillary excision and reconstruction with two unilateral procedures spaced 2 months apart. She avoided post-operative SSI, has minimized scar burden without the need for an autologous skin graft and has no axillary scar contracture.

Discussion: By pre-treating with a targeted antibiotic plan for an infected area, single stage flap reconstruction of advanced HS can be accomplished. Local fasciocutaneous flap reconstruction has the benefit of decreased scar burden and the delivery of pliable soft tissue to the axilla to avoid pathologic graft contracture.

PI-006

Simplified Approach to Managing Complex Surgical Neck Wounds Using Transforming Powder Dressing

Nancy Bernard, RN, BSN, CWON; Rosemarie Machan, BSChE, RN, CWON

Introduction: Managing neck wounds presents unique challenges due to the need to protect the airway, vital blood vessels, and spinal cord in a small, highly mobile area. The presence of several major anatomical structures in the neck complicates wound management. Conventional wound dressings, such as negative pressure wound therapy or packing, are difficult to secure in this location and often require time-intensive, frequent, and painful dressing changes. Novel wound management approaches are required to improve patient comfort and reduce nursing time associated with frequent dressing changes without increasing infection risk. This case study evaluates the use of an extended wear transforming powder dressing (TPD) on a 50-year-old diabetic male who underwent surgical resection of a large benign neck mass, resulting in a 7 x 8 x 1.5 cm wound on the anterolateral lower neck.

Methods: Following surgical excision, the patient's wound was treated with TPD, primarily composed of polymers similar to those used in contact lenses. TPD was applied by sprinkling it over the wound, hydrating it with saline, and allowing it to form a moist, oxygen-permeable matrix that protected the wound. TPD conforms and adheres to the wound surface and can remain in place for up to 30 days and may be "topped off" with additional powder or reapplied as necessary.

Initially, the TPD dressing was applied twice during the first week while the patient was hospitalized. After discharge, his family managed wound care at home, topping off the TPD once weekly until the wound was fully healed.

Results: The patient underwent one initial TPD application and six additional top-offs. A contact layer and bordered dressing were applied over the TPD once weekly by a family member. The wound fully healed in 35 days with no complications or readmissions. The patient reported no pain following TPD application and did not require pain medications.

Discussion: The wound healed completely within five weeks. Weekly applications were easily managed by the patient's family. The use of TPD eliminated the need for pain medications and facilitated a straightforward, low-maintenance wound care regimen.

PI-007

Standardization of Pressure Injury Treatment through Nurse Driven Wound Care Protocol

Jena Brandt, BSN, RN, CCRN; Lauren Morata, DNP, APRN-CNS, CCNS, CPHQ

Introduction: Our facility identified an opportunity to improve our rate of Patient Safety Indicator 3 (PSI 3) and lower the incidence of hospital acquired pressure injuries. The initiative sought to standardize pressure injury treatment plans and consultation to our wound care team by revising our existing Nurse Driven Wound Care (NDWC) protocol.

Methods: The NDWC protocol was developed to create standard, initial management of all stages of pressure injuries, skin tears, and incontinence related moisture associated skin damage (MASD). The protocol was reviewed and approved through our Nursing Governance process, physician steering, and the Medical Executive committee. Our Clinical Informatics team aided to develop the protocol within our EHR and create clinical triggers to prompt the RN to order the protocol. We worked with our Nursing Practice and Professional Development and Clinical Informatics teams to provide education to our RNs providing bedside patient care. The wound care team was later expanded to allow for automatic consults to be placed through the NDWC protocol for wound care RNs to assess Stage 2 pressure injuries. We received feedback through our Nursing Governance process to include a treatment plan for MASD not related to incontinence; this was added to the protocol.

Results: After initiation of protocol in February 2022, we saw a 92% increase in ordering of the NDWC protocol when comparing orders placed in February 2022 to orders placed in February 2021. An increase in orders of 271% was observed from 2021 to 2022. The compliance in ordering of the NDWC protocol has increased and sustained since its initiation. A decrease in the rate of PSI 3 has not been demonstrated.

Discussion: The development of the NDWC protocol has empowered our bedside RNs to initiate treatment plans for pressure injuries, MASD, and skin tears, while standardizing treatment and consultation to our wound care team. The protocol's initiation and sustainment provided data to demonstrate the value of our wound care team leading to expansion of the team to see patients with Stage 2 pressure injuries. Unfortunately, the protocol has not led to a decrease in PSI 3, which is largely attributed to opportunities in appropriate identification and staging by the bedside RN. This gap is currently being addressed though ongoing education initiatives. We aim to further develop and expand our wound care team to allow for consultation, review, and confirmation by wound care of all suspected pressure injuries.

PI-008

Clinical Validation of the BIOMES Tool for Guiding Specialist Referral in Wound Care: A Pilot Study

Trent Brookshier, DPM; Laura Swoboda, DNP, APRN, FNP-C, FNP-BC, WOCNF; Chrystalbelle Rogers, MSN, RN, CWCN, CENP

Introduction: The BIOMES tool was developed to help wound care providers identify patients who may benefit from specialist referral based on six domains: Blood flow, Infection/Bioburden, Offloading/Overloading, Metabolic/Morbidities, Exudate/Edema, and Social/Economic factors. This pilot study aimed to validate the BIOMES tool in clinical practice by assessing its reliability and content validity in real-world wound care settings.

Methods: A small-scale field test was conducted across multiple wound care sites. Wound specialists completed a structured survey in paper or electronic form for each patient encounter. Survey items captured demographic data, comorbidities, wound etiology, and presence or absence of each BIOMES domain. The survey also included an open-ended section for provider feedback. Quantitative data were stored in Microsoft Excel and analyzed by a biostatistician. Qualitative responses were thematically grouped to identify potential tool limitations or bias. BIOMES scores ranged from 0–6 based on the number of domains selected.

Results: Preliminary data from the pilot included responses across a range of wound types including diabetic foot ulcers, venous leg ulcers, and atypical wounds. The tool demonstrated face validity, with wound specialists indicating that the selected BIOMES components reflected clinical factors contributing to poor healing. Providers consistently identified the same domains in similar patient scenarios, supporting inter-user reliability. The number of patients meeting criteria in at least three BIOMES categories was significant, suggesting the tool may help standardize referral thresholds. Feedback also highlighted the need for brief training and clarification of certain terms, which will be incorporated into future iterations.

Discussion: Initial findings support the BIOMES tool as a valid and reliable screening aid for identifying complex wound patients who may benefit from specialist care. Its structured format and applicability across wound types may improve consistency in clinical referral decision-making. Ongoing data collection and refinement will strengthen its utility and generalizability across care settings.

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PI-009

Evaluation of a Rapid Set Immersion Support Surface for Pressure Injury Prevention and Treatment

Neil S. Craney, BSN, RN; Wesley S. Fell, LPN, WTN; Megan Hermann, PT, DPT; Kristen Thurman, PT, MPT, CWS

Introduction: An estimated 3 million patients per year are treated for pressure injuries (PIs) in the United States with cost approaching $17.8 billion.[1] Long-term acute care has the highest overall PI prevalence resulting in increased length of stay, higher mortality rates, and increased financial burden.[2,3] With PIs considered never events, prevention is a primary objective. Support surface selection plays an important role in prevention and treatment due to the impact they have on soft-tissue perfusion for PI prevention.[4]

Methods: A long-term acute care unit utilized a convenience sample of 20 consecutive patients with high-risk for pressure injuries to evaluate a new immersive support surface. The rapid set immersion (RSI) surface contains a patented algorithm to quickly set and maintain therapeutic air pressure and provide targeted microclimate management at the patient-surface interface. Each patient was placed on a RSI support surface as they were admitted to the unit. Initial patient assessments included skin, existing PIs, and risk factors for PIs. Data – including newly acquired pressure injuries - were collected on patients utilizing the surface for 7 days or greater. Data were collected until patients were discharged from the unit. PIs present on admission were monitored for surface area changes if the patient utilized the RSI surface for 14 days or greater. Patients receiving hospice care were excluded from the data set.

Results: No patient (n=20) developed a new pressure injury while on the RSI support surface. The average length of stay for patients on the RSI surface was 31.55 days (7-84 days). Six patients, utilizing the surface for 14 days or greater, had PIs present on admission. Average surface area reduction of those PIs - indicating healing - was 59%, with two patients' pressure injuries healed to closure.

Discussion: High-risk patients placed on the RSI support surface did not develop PIs, while existing PIs progressed in healing. The RSI support surface prevented high-risk patients from developing PIs and supported PI healing in the long-term acute care setting. Based on these findings a larger study comparing the performance of the rapid set immersion surface to current market surfaces is warranted.

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PI-010 (RPT-005)

A Backup Plan for Plastic Surgical Reconstruction when Plan A Fails: Use of Aseptically Processed Meshed Reticular Acellular Dermal Matrix in Soft Tissue Reconstruction

Jody Wolfe, BSN, MBA, RN, CWOCN

Introduction: Flap mobilization and closure is the mainstay of treatment in soft tissue reconstruction. Successful outcomes are only achieved when there is adequate tissue for transfer. When there is a relative tissue deficiency, needed procedures may become more challenging and complex such as free tissue transfer, and outcomes may be compromised, resulting in flap failure.

Aseptically processed meshed human reticular acellular dermal matrix (HR-ADM) is unique in that it comes from the reticular dermal layer that provides an open network structure to support tissue ingrowth and serve as a scaffolding. While these tissue forms are known to assist with soft tissue support for secondary healing or split thickness grafting, this dermal matrix may also be used as an adjunct to flap transfer which may then allow for coverage of vital structures if flap failure occurs, perhaps reducing the need for additional surgery and or more complex procedures.

Methods: We present 5 cases of soft tissue reconstruction where there was a paucity of tissue and or concern for flap failure resulting in exposure of vital structures such as bone, tendon or vascular graft. Wound etiologies included Pressure ulcerations n=3, Full thickness necrosis of the groin n=1, and a Diabetic foot ulcer (DFU) in a poorly perfused lower extremity n=1). Aseptically processed meshed HR-ADM was placed prior to flap inset to serve as a scaffolding to support tissue ingrowth following flap transfer.

Results: Postoperative complications occurred including dehiscence n=4 and flap failure. Despite the complications, incorporation of the meshed HR-ADM allowed delayed primary closure n=2, secondary healing n=3. The DFU case was noteworthy as a failed tarsometatarsal amputation (TMA) that occurred in a poorly perfused lower extremity after the meshed HR-ADM had been placed prior to the TMA. Following flap failure, secondary healing was successful without need for more proximal amputation.

Discussion: Meshed HR-ADM has properties that allow tissue integration and incorporation. Patients with soft tissue deficits requiring flap reconstruction may benefit from meshed HR-ADM for additional support and may serve as a backup to allow for coverage of vital structures. While distant flaps are still considered the standard of care, these procedures may carry a higher risk of complications. The use of meshed HR-ADM in these patients may help create a scaffolding for tissue incorporation to allow for coverage of vital structures, reducing the need for more complex surgical intervention.

PI-011

Preoperative Wound Bed Preparation Using Fluorescence Imaging to Optimize Outcomes in Complex Wound Management and Reconstruction

Misael Alonso, MD, FACP, CWSP, FAPWCA; Jody Wolfe, BSN, MBA, RN, CWOCN

Background: Preoperative infection management and wound bed preparation is a critical step in reducing postoperative complications and improving outcomes in reconstructive surgery for chronic wounds. Methods of assessing bacterial infection and biofilm presence such as clinical evaluation and microbial cultures are often subjective, inaccurate and can delay necessary interventions. Fluorescence imaging technology (MolecuLight), provides real-time, objective detection of bacterial presence in wounds, enabling targeted management of infection and biofilm. This study aims to evaluate the impact of preoperative fluorescence imaging in assessing and optimizing wound bed preparation prior to complex reconstruction.

Methods: A total of seventeen (n=17) patients with chronic, non-healing wounds (pressure ulcers, DFUs, VLUs, and non-healing surgical wounds) were evaluated preoperatively using fluorescence imaging to assess location and presence of bacteria at pathologic loads (104 CFU/gr) in the wound and surrounding tissue. Based on fluorescence imaging findings, targeted wound debridement, cleansing, and antibiotic therapy were initiated to reduce bacterial load prior to surgery until fluorescence signals were eradicated or significantly reduced. In some cases, the need for operative debridement was in part determined by the imaging results. Postoperative outcomes, including healing time, infection rates, and complications, were compared to historical data from similar cases managed with standard care methods. In addition, objective imaging served as a tool to assist with management decisions.

Results: Fluorescence imaging revealed bacterial contamination and biofilm in 17 of the 17 cases, guiding additional debridement and more precise antibiotic therapy prior to surgery. The treatment algorithm as guided by fluorescence included: office and bed side debridement, surgical debridement, negative pressure wound therapy (NPWT) with and without instillation. Antibiotic therapy was initiated in any patient revealing evidence of acute infection. Segments of the management protocol where fluorescence imaging was involved in the decision-making

process typically involved:

1) Preoperative infection control,
2) Urgent surgical debridement,
3) Timing of surgical closure, and
4) Postoperative infection control. Postoperative healing occurred without infection-related complications in all surgical cases. No patients experienced infection recurrence or surgical site infections (SSIs).

Discussion: Conclusion: The preoperative use of fluorescence imaging for wound bed preparation significantly enhanced surgical outcomes in complex skin reconstruction. Additionally, fluorescence imaging proved valuable in guiding management decisions. By offering real-time, objective insights into bacterial load and biofilm presence, it enables more targeted and effective infection control, ultimately leading to faster healing and fewer postoperative complications.

PI-012

Improved Outcomes in Surgical Reconstruction of Skin Defects: A Case Series Utilizing Fluorescence Imaging for Infection Management and Wound Bed Preparation

Misael a, MD, FACP, CWSP, FAPWCA; Jody Wolfe, BSN, MBA, RN, CWOCN

Background/Introduction: Surgical reconstruction for chronic wounds requires meticulous wound bed preparation to minimize post-operative complications. Non-viable tissues, bacteria, and biofilms must be removed to prevent post-operative infections. Traditional methods of wound assessment frequently fail to identify bacteria and biofilms[1,2], and historically post-operative infection rates can reach up to 50%3, often leading to prolonged healing times. Point-of-care fluorescence imaging (MolecuLight) has emerged as a promising tool for real-time infection detection and management, potentially improving outcomes in skin and soft tissue reconstruction. This technology detects and highlights bacterial presence above 104 CFU/gr in biofilm or planktonic form. This case series aims to evaluate the impact of intraoperative fluorescence imaging-guided wound bed assessment and preparation in surgical reconstruction with a focus on minimizing postoperative complications and improving healing rates.

Methods: We present 5 challenging cases of chronic complex, wound candidates for that presented for surgical reconstruction. These included: Pressure ulcer on trunk n=2, VLU n=1, DFU n=1, Non-healing surgical wound on abdomen n=1. Intraoperative fluorescence imaging was performed in all 5 cases pre and post excisional debridement to monitor bacterial presence and location. The time to heal and incidence of postoperative complications, including post-operative infections, were measured.

Results: The intraoperative use of fluorescence imaging helped confirm the adequacy of surgical debridement regarding the presence of bacteria and prompted additional intraoperative excision in 3 of the 5 cases. In all 5 cases surgical healing progressed with no post operative infection. The pressure ulcer surgical reconstructions (n=2) healed without incident. The VLU, DFU, and non-healing surgical wound of the abdomen healed by secondary intention without further surgical intervention. Postoperative complications, particularly infection-related issues such as dehiscence, wound breakdown or surgical site infections, were 0%.

Discussion: Intraoperative use of fluorescence imaging using MolecuLight is a valuable adjunct in the surgical management of skin defects to help reduce postoperative complications. By objectively assessing the wound bed and confirming the adequacy of wound bed preparation, fluorescence imaging enables more complete bacterial removal and may lead to more successful surgical intervention. Further investigation in larger, controlled studies is needed.

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PI-013

Reducing Bioburden and Disrupting Hard to Remove Microbial Colonies with The Use of Pure Hypochlorous Acid (pHA)* to Reduce Bioburden in all Plastic Surgical Reconstruction

Jody Wolfe, BSN, MBA, RN, CWOCN

Introduction: The presence of bacterial colonies that are adherent to the tissue surface are recognized as deterrents to wound healing. The success of surgical reconstruction often relies on the ability to reduce the risk of postoperative infection. Evidence shows that pure Hypochlorous Acid (pHA) based cleanser*, is able to remove bacteria, associated slime like materials, and necrotic tissue that are all usually associated with problem wounds. Hypochlorous acid is also commonly known by its simple chemical formula, HOCl.

Methods: We present a retrospective review of a series of 95 patients undergoing surgical reconstructive procedures over a 20 month period. All but 2 patients received pure Hypochlorous Acid (pHA) based cleanser that has a pH of 3.5 to 5.5, to help reduce the bacterial burden prior to closure. The two patients who did not were being treated for localized skin cancers that underwent resection and local flap closure as an outpatient procedure. The remaining 93 patients included 60 patients with pressure injury, 6 lower extremity wounds, 6 cancer resections, 6 abdominal wall reconstructions, 6 Hidradenitis and or pilonidal disease and 5 miscellaneous procedures (autoimmune disease, TMA neuroma, and 1 Morel-Lavallee lesion).

Results: All patients receive pHA soak and or irrigation intraoperatively. The HOCl was placed in a sterile container on the operative table. Following excisional debridement and pulse vac irrigation in those cases with significant debris, pHA was poured onto a lap sponge, with the pHA soak intraoperatively for 10 min. We report no postoperative infections in all cases presented here.

Discussion: Pure pHA or HOCl is a useful adjunct to address bioburden in reconstructive surgery. Wounds which are chronic and contaminated and or those with evidence of acute infection certainly benefit from this cleansing step. Additionally, the use of pHA/HOCL in general may be useful to any reconstructive procedure to reduce the risk of postoperative infection. Specifically, pHA/HOCL soak prior to closure, graft or flap may add an additional benefit with minimal additional operative time and or cost. Additionally, pHA/HOCl appears to be compatible with the biological matrices (CAMPS) used to promote surgical healing or as an adjunct to flap reconstruction.

PI-014

Use of Negative Pressure Wound Therapy with an All-in-One Dressing to Manage Split Thickness Skin Grafts in Three Patients with Venous Leg Ulcers

Michael N. Desvigne, MD, FACS, CWS; Jody Wolfe, BSN, MBA, RN, CWOCN

Introduction: Split-thickness skin grafts (STSGs) are a valuable tool in the management of Venous Leg Ulcers (VLUs). An all-in-one dressing has recently become available for use with negative pressure wound therapy (NPWT). This dressing is designed with an incorporated silicone-acrylic adhesive drape and perforated non-adherent layer to be worn for up to 7 days and facilitate fast and simple dressing application and removal. This study evaluated the use of NPWT with the all-in-one dressing to manage STSGs in 3 patients with VLUs.

Methods: Prior to STSG, the wound bed was prepared using surgical debridement and NPWTi-d* with ROCF dressings†. NPWT‡ with all-in-

one dressing§ were applied to bolster the STSG. A negative pressure of -125 mmHg was utilized with dressing changes every 7 days. Placental allograft was placed over the STSG to optimize healing. STSGs and peri-wound skin were assessed at each dressing change.

Results: Three female patients between the ages of 63-86 years with a history of venous insufficiency (n=3), hypertension (n=3), lupus (n=2), diabetes mellitus (n=1), cirrhosis (n=1), and breast cancer (n=1) presented for care. STSGs were managed with NPWT and all-in-one dressing, treatment duration ranged from 1 to 5 weeks. Two patients had 100% graft take and 1 patient had 75%-80% graft take due to non-compliance.

Discussion: Wound bed preparation and use of the all-in-one dressing with NPWT over the STSG was well tolerated by all patients. Application of the all-in-one dressing with NPWT over the STSGs resulted in granulation tissue formation and improved graft take in these patients. The dressing application was simple and fewer dressing changes were required.

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PI-018

Xylazine-Associated Wounds: Emerging Surgical Challenges and Opportunities for Harm-Reduction Care

Madhulika Kastury; Efia Nuako; Naveen Viswanath, MD

Introduction: Xylazine, a veterinary alpha-2 adrenergic agonist increasingly found as an adulterant in illicit opioids, has emerged as a driver of severe, chronic wounds among people who use drugs (PWUD). These lesions, often appearing at non-injection sites, present distinctive challenges in diagnosis, debridement, and reconstruction. Bone and tendon exposure, necrosis, and delayed presentation increase surgical complexity, while housing instability and healthcare distrust hinder follow-up. This review aims to systematically review the literature on xylazine-associated wounds, emphasizing wound characteristics, surgical management, and the influence of social determinants of health on outcomes.

Methods: A systematic review was conducted per PRISMA guidelines and registered with PROSPERO (CRD420251000303). Searches were performed in PubMed, Embase, and Web of Science using terms related to "xylazine," "wound," "ulcer," "necrosis," and "soft tissue infection." After removing 176 duplicates in Rayyan, 89 records were screened by three independent reviewers. Of these, 21 studies met inclusion criteria and were synthesized. Data were extracted on wound characteristics, treatment modalities, and outcomes. Descriptive statistics and Fisher's exact tests were used to explore associations.

Results: Across 21 studies comprising 102 patients, extremity involvement was most common (78%), with bone or tendon exposure in 69% and osteomyelitis in 42%. Surgical interventions included grafting (29%), flap reconstruction (14%), and amputation (19%). Negative pressure wound therapy (NPWT) was used in 14% of cases and was associated with graft use ($p = 0.015$) and osteomyelitis ($p = 0.042$). Surgical treatment correlated with higher amputation rates ($p = 0.012$), more frequent grafting ($p = 0.001$), and osteomyelitis ($p < 0.001$), suggesting use in more advanced wounds. Clinical algorithm use was associated with bone/tendon exposure ($p = 0.004$) and amputation ($p = 0.026$). Osteomyelitis trended toward predicting amputation ($p = 0.058$). Despite the severity of presentation, recovery was uncommon and inconsistently reported. These findings highlight the complexity of xylazine-associated wounds and the challenges of surgical management in medically and socially vulnerable populations.

Discussion: Xylazine-associated wounds present with deep tissue necrosis, frequent infection, and surgical complexity. Intensive interventions were linked to delayed or advanced disease. Associations with clinical algorithm use likely reflect appropriate triage. These findings support the need for early risk stratification and multidisciplinary care. A preliminary clinical pathway was developed to support surgical decision-making and integrate harm-reduction strategies. Further research is needed to evaluate structured care models for this high-risk population.

PI-019

A Model for Industry-Sponsored PRCT's to Advance CAMPs-Based Innovation Through Academic Collaboration

John P. Kirby, MD, MS, FCCWS, FACS; Walaya Methodius-Rayford, MD, MBA, CWSP; Ricardo P. Fonseca, MD; Jennifer P. Yu, MD; Mohamed P. Zayed, MD; Michael Alchaer, MD; Amy P. Couch, MD; Abdo Raymond, DPM; Stacey P. Reese, RN, BSN; Paula P. Vaughn, APP; Teressa P. Swinton, APP; Grant V. Bochicchio, MD

Introduction: Hard-to-heal wounds remain a challenge in healthcare due to their complex, multifactorial pathophysiology. While contemporary Cellular and/or Acellular Matrix Products (CAMPs) show promise, they are costly and lack the robust evidence base of prospective, randomized controlled trials (PRCT) needed for widespread adoption. We propose that industry should collaborate meaningfully with clinicians, particularly those in academic medicine, to design and execute these trials. This abstract outlines an iterative partnership between Reprise Biomedical and Barnes-Jewish Hospital/Washington University School of Medicine (WUSM) to jointly invest in the launch of a PRCT evaluating Miro3D Wound Matrix, a porcine liver-derived acellular scaffold, for deep, tunneling, hard-to-heal wounds.

Methods: Following FDA clearances, Reprise Biomedical engaged clinicians experienced in managing complex wounds. Funding supported a structured learning initiative under a WUSM IRB-approved protocol to evaluate optimal use cases for Miro3D. Local and national clinical experience, along with preliminary outcomes, informed the PRCT design, focusing on two wound categories with clinical equipoise: (1) deep pelvic/lower extremity wounds and (2) post-fasciotomy wounds. These categories were selected to assess Miro3D's potential therapeutic benefit.

Results: Sustained financial, clinical, and academic investment enabled valuable insights, shared at professional meetings such as SAWC and CAMPs Wound Care Summit. We have learned that patients consistently reported improved quality of life on Likert scales, even when clinical responses varied. Responses generally fell into three groups: non-responders, partial responders, and complete responders—although no reliable predictors of outcome have yet been identified. Miro3D demonstrated a strong safety profile in both inpatient and outpatient settings. Most critically, this early-phase work confirmed both the need and feasibility of a formal PRCT.

Discussion: A structured PRCT has been initiated to study two archetypal hard-to-heal wound types: complex lower extremity and post-fasciotomy wounds. Future analyses, including tissue sampling, aim to identify predictors of response and refine strategies for repeat application. Broader clinical site inclusion and robust data collection will be essential for generating generalizable, evidence-based, and cost-effective wound care strategies using Miro3D, including strategies that are also attractive to payors. This collaborative model of industry-academic collaboration may serve as a blueprint for future CAMPs evaluations in the U.S.

PI-020

Reconstruction of a Malignant Melanoma Defect with Kerecis Marigen: A Case Report

Daniel Krazeise, BS; Michael McPhee, MD

Introduction: Malignant melanoma, particularly with a Breslow thickness of 3.8mm and a pT3b stage, presents significant challenges in both treatment and reconstruction. Given the location of the tumor on the left cheek and the patient's use of Xarelto, which complicates surgical options, careful consideration was necessary for the reconstruction approach. This case explores the use of Kerecis Marigen, a fish-skin-derived skin graft substitute, as a viable option for reconstructing a complex surgical defect following wide local excision.

Methods: A 67-year-old patient with a pT3b 3.8mm Breslow thickness malignant melanoma on the left cheek underwent wide local excision and sentinel lymph node biopsy. The defect was 5 x 5 x 1 cm post-excision. The patient's anticoagulation therapy with Xarelto contraindicated the use of certain reconstructive methods, including cervicofacial flaps and full-thickness skin grafts, due to the risk of failure and prolonged anesthesia. After considering all options, Kerecis Marigen skin substitute was selected for wound closure. The patient received a second application of Kerecis after one week, with the wound size reducing to 5 x 5 x 0.8 cm and healthy granulation tissue present. Follow-up treatment included home wound care, and after two months, the wound size had decreased to 2 x 2 x 0 cm. Additional debridement and scar revision were performed in the office under local anesthetics, and a successful cosmetic outcome was achieved.

Results: The patient tolerated the reconstruction well, with the Kerecis Marigen graft successfully adhering to the wound site. At two months, the defect had significantly reduced in size, from 5 x 5 x 1 cm to 2 x 2 x 0 cm. The patient's facial nerve remained intact throughout the process. After two weeks of additional care and suture removal, the patient showed excellent cosmetic results.

Discussion: This case highlights the potential for Kerecis Marigen skin substitute as an effective reconstruction method for large, complex defects, particularly in patients with contraindications for rotational flaps and other grafting techniques. The successful outcome underscores the importance of selecting a tailored approach based on patient-specific factors such as anticoagulation therapy and the size and location of the tumor. Kerecis Marigen offers a promising alternative, especially in cases where traditional methods may pose significant risks. Kerecis also offers de-escalation in surgery by avoiding complex skin flap reconstruction through decreasing the size of skin defects. Further research and case studies will be important in evaluating the long-term efficacy of skin substitutes in oncological reconstructive surgery.

PI-021

A Novel 3D Bioprinting Tool* for Advanced Wound Grafting and Healing: A Snapshot of a Wound Care Surgeon's Practice

Sibi Krishna Thiyagarajan, MD; Sydney M. Garner, MD; Kacper Kubiszewski, MD; Thea Price, MD

Introduction: We have been frontiers in utilising a novel customised 3D bioprinting tool* using a patient's own adipose tissue to print personalized skin grafts that fit the exact contour of their wounds. We have performed > half of the total number of cases in the United States (US). Through this study we aim to pave a path for future clinical applications, outcomes, and pitfalls to determine the optimal uses for our patients.

Methods: We conducted a retrospective single center, single surgeon study between January 2025 and May 2025 involving 11 patients who underwent autologous fat grafting using this bioprinting tool*. Image capture software was used to determine the required adipose volume to print a customised 3D graft. Adipose tissue was extracted using a lipectomy procedure (10-15 ml for a ≤ 35 cm^2 wound) then filtered and washed with only saline to isolate the 3% mesenchymal stem cells (MSCs) present. Grafts were printed with the bioink at a selected depth of 2-4 mm utilizing a freezing method ("fatsicle") or intermixing with fibrin to reinforce mechanical integrity and malleability for enhanced wound cohesion.

Results: Fourteen procedures in 11 patients were performed. Three patients had two applications due to high risk wounds: chronic ischial wounds and acute burns, chronic osteomyelitis, and a partially failed free flap with exposed radiated tibia. Patient wounds were varied including a post-thoracotomy persistent pleural fistula, an unclosable melanoma excision and an IV infiltration of the hand with exposed tendon in a immunosuppressed double lung transplant patient. Two procedures were performed in the OR and the rest in clinic under local anesthetic with great tolerance. Lipectomy was taken from the abdomen, posterior calf, and posterior thigh. There was no infection, and all grafts were incorporated within 2-7 days. No patients reported adverse effects except a failed graft in the patient with chronic osteomyelitis. All patients progressed to greater than anticipated wound healing.

Discussion: We believe this bioprinting tool is scalable as it can print up to 90 cm^2 at once and seems promising for prospective clinical applications wherever rapid coverage of a wound or operative site is indicated, and to replace typical fat grafting.

PI-022

Comparative Analysis of Inflammatory, Granulation, and Epithelialization Proteins in Porcine Wounds Treated with Novel All-in-One NPWT Dressing versus Reticulated Open Cell Foam

Samantha Mann, BS; Diwi Allen, MS; Kris Kieswetter, PhD, MBA, FAIMBE

Introduction: Reticulated open cell foam (ROCF‡) is widely used in negative pressure wound therapy (NPWT*), but its tendency for tissue in-growth poses challenges during removal, potentially leading to adverse reactions, including bleeding. This study aimed to evaluate a novel all-in-one NPWT dressing† in comparison to ROCF in porcine full-thickness excisional wounds to determine the presence of inflammatory, granulation, and epithelialization-associated proteins presence.

Methods: All animal work was approved by the relevant Institutional Animal Care and Use Committee and complied with all applicable national and local regulations. A preclinical study was conducted with three groups of 11 animals, 33 animals total, each group assessing 3 different dressing intervals: a 4-Day Dressing Group, a 7-Day Dressing Group, and a 13-Day Epithelialization Group. Proteomic analysis was performed on wound biopsy specimens using a custom magnetic bead panel and multi-analyte profiling. Inflammation levels were assessed by quantifying granulation and epithelialization-related proteins, including angiopoietin-2 (ANGPTL2), transforming growth factor-beta 2 (TGF-b2), TGF-b3, tissue inhibitor of metalloproteinase-1 (TIMP-1), vascular endothelial growth factor (VEGF), and platelet and endothelial cell adhesion molecule (PECAM).

Results: The study demonstrated that wounds treated with ROCF in the 4-Day Dressing Group showed significantly lower levels of granulation-associated proteins compared to the all-in-one dressing in the 4-Day Dressing Group. Specifically, wounds treated with the all-in-one dressing showed higher levels of ANGPTL2 (289.65 ng/g total protein) and VEGF (6.65 ng/g total protein) compared to those treated with ROCF dressings, which had levels of 124.73 ng/g total protein and 3.23 ng/g total protein, respectively.

Wounds treated with the all-in-one dressing exhibited significantly reduced levels of granulation and epithelialization markers on day 13 compared to day 7. Specifically, TIMP-1 levels were 1.47 ng/g total protein on day 13 versus 24.56 ng/g total protein on day 7. PECAM levels were 11.72 ng/g total protein on day 13 compared to 16.53 ng/g total protein on day 7.

Discussion: These proteomic findings correlate with the faster wound fill response observed in all-in-one dressing treated wounds compared to ROCF in the preclinical study.[1]

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PI-023 (RPT-006)

Autologous Skin Micrografting: A Modified Technique Adopted to the Wound Clinic Setting

Igor Melnychuk, MD; Cat Graham, PA; Sayed Hashemy, MD

Introduction: In this study we addressed the limited accessibility of traditional skin grafting techniques in outpatient wound care clinics due to the need for specialized equipment, surgical expertise, and operating room (OR) facilities. Additionally, while commercial micrografting kits exist, their high cost and patented technology restrict widespread adoption.

Methods: To overcome these barriers, twe developed a simplified, cost-effective autologous skin micrografting technique using basic instruments, such as a razor blade and scissors, eliminating the need for advanced surgical skills or expensive tools. The solution involved harvesting small split-thickness skin grafts from a donor site, mincing them into 1–3 mm^2 islands, and applying them to the wound without concern for epidermal orientation. This method, inspired by Meek's micrografting principles but significantly simplified, achieved an expansion ratio of 1:4 to 1:5—comparable to traditional meshed grafts.

Results: The technique proved highly effective, with wounds healing within weeks and donor sites recovering rapidly. We observed that autologous micrografts often outperformed commercial placental grafts in promoting granulation tissue formation.

Discussion: Key learning points include the technique's practicality, affordability, and adaptability to outpatient settings, along with its potential to reduce reliance on costly biologics. Our study also highlighted that epidermal orientation may not critically impact graft survival, as randomly placed micrografts incorporated successfully. Lessons from this experience emphasize that simplified, low-cost innovations can enhance wound care accessibility while maintaining efficacy. The method's success suggests broader applicability in chronic wound management, warranting further research to optimize expansion ratios and identify ideal candidate wounds. Ultimately, this approach democratizes skin grafting, making it a viable option for routine wound care practice.

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PI-024

Approaches to Treatment of Wounds after Below and Above-The Knee Amputations. A Case Series

Sayed Hashemy, MD

Introduction: In this case series study we address the high incidence of post-amputation wound complications following below-the-knee (BKA) and above-the-knee amputations (AKA), particularly in patients with peripheral arterial disease, diabetes, or war-related injuries. Despite the prevalence of these complications, there are no established treatment algorithms for managing such wounds, which often exhibit unique characteristics like dehiscence, tunneling, and hypergranulation. These wounds delay prosthetic fitting, increase the risk of revision surgeries, and significantly impact patient mobility and quality of life.

Methods: To address this issue, we present a case series of nine patients with post-amputation wound complications treated at the Charles George VA Medical Center between 2019 and 2023. We employed various wound closure techniques, including sharp debridement, silver nitrate cauterization, collagen scaffolds, negative pressure wound therapy (NPWT), and two innovative **methods:** a modified Unna boot for compression and the "soap scrap" technique for collapsing tunneled wounds. These approaches were tailored based on wound type—hypergranular, tissue defect, or dehisced incisional wounds—with an emphasis on compression and immobilization where necessary.

Results: Key findings from the study included the effectiveness of the modified Unna boot in managing edema and promoting healing in BKA wounds, as well as the utility of the soap scrap technique in collapsing deep cavities without requiring unroofing. Our case series also highlighted the prolonged healing times in ischemic wounds and the high mortality risk among amputees with comorbidities. Notably, some wounds required up to 14 months to heal, underscoring the challenges in managing these complex cases.

Discussion: Our findings emphasizes the need for standardized treatment protocols for post-amputation wounds, particularly given their unique pathophysiology. Key lessons include the importance of compression therapy, early debridement, and innovative techniques like the soap scrap method to avoid surgical revisions. Additionally, the findings advocate for further research into optimal treatment strategies, especially for high-risk populations, to improve outcomes and reduce the need for re-amputations. Our experience demonstrates that tailored, multimodal approaches can successfully manage these challenging wounds in outpatient settings.

PI-025

The Evolution of Wound Dressings: Past, Present, and Future Approaches to Address Local Barriers to Wound Healing

Daniel Metcalf, PhD; Scarlet M. Milo, PhD

Introduction: Hard-to-heal wounds, such as leg ulcers and diabetic foot ulcers, are highly prevalent and place a significant burden on patients and healthcare systems. The aim of this review was to describe a next stage of the evolution of advanced dressings for the treatment of hard-to-heal wounds.

Methods: Narrative review.

Results: Major developments in dressing technologies in the last three or four decades have focused on key local barriers to wound healing: (1) exudate management, (2) infection management, and most recently, (3) management of biofilm (surface-associated and aggregated microbial communities). Past approaches have focused on dressing physical and chemical characteristics designed to manage exudate and infection. For example, material advances in alginates, hydrocolloids and advanced gelling fibers have provided clinically useful material properties for the management of moderately to highly exuding wounds. Furthermore, the addition of, for example, ionic silver to such dressings provided a safe and effective method for management of microbial colonization and local infection. More recently, biofilm has been inexorably linked to hard-to-heal wounds. A present 'state of the art' dressing is the first of its kind designed to manage, in addition to exudate and local infection risk, surface-associated and aggregated microbial communities within the dressing, utilizing additional excipients to penetrate microbial extracellular polymeric substances and facilitate the antimicrobial effects of ionic silver.

Discussion: Future approaches will require next-generation wound dressings to enhance and expand the management of the above local barriers to wound healing. By addressing factors such as poorly-perfused tissue and hypoxia, dressing technology can potentially facilitate the power of the host immune and wound healing systems. A novel prototype

nitric oxide-generating dressing technology combines physical and chemical properties to not only manage exudate, infection and surface-associated/aggregated microbial communities within the dressing, but also to potentially address tissue perfusion and hypoxia, by physical means, to improve wound healing outcomes. Enhanced physical and chemical dressing characteristics (fluid absorption and donation, continuous moisture vapor transmission rate, pH), also impart an environment that is inhospitable to pathogens and development of surface-associated and aggregated microbial communities.

PI-026

Utilizing Nitric Oxide as an Antimicrobial and Antibiofilm Agent Within a Wound Dressing Is Unlikely to Face the Antimicrobial Resistance and Tolerance Challenges Associated With Antibiotics and Standard Antimicrobial Dressings

Daniel Metcalf, PhD

Introduction: The aim of this narrative review was to outline the key features of nitric oxide (NO) as an antimicrobial agent in wound care, and compare it to established antibiotics and antiseptics utilized in dressings.

Methods: A narrative review.

Results: NO is a natural molecule of our innate immune system. It is an uncharged, gaseous, diatomic free radical, with a half-life of a few seconds in biological systems. NO has numerous functions as a regulator molecule in mammalian biology, and so we have evolved mechanisms to avoid its deleterious effects. NO can pass freely across microbial cell walls and membranes, to target membrane proteins, intracellular DNA, and metabolic enzymes. These myriad antimicrobial targets of NO make resistance highly unlikely, compared to antibiotics which usually have single microbial targets. Since NO passes through mammalian tissues as a signalling molecule, it also passes freely through biofilm. NO targets structural biofilm components as well as triggering biofilm dispersal and blocking microbial communication. These multiple targets make biofilm tolerance highly unlikely, compared to antiseptics such as iodine, silver, and polyhexanide, which have to be combined with physical or chemical antibiofilm mechanisms to disrupt biofilm structure. The unhindered passage of NO into microbial cells and biofilm mean it is faster-acting than charged antiseptic molecules, which must build up at cell walls and membranes, overcoming unwanted interactions, before diffusing into cells, while they fail to efficiently penetrate complex, charged biofilm matrices. NO can be further differentiated from antibiotics and antiseptics in dressings due to the requirement for it to be generated in situ, by donors or via chemical reaction, so it can be formulated to be continually generated and longer lasting.

Discussion: NO is emerging as a novel antimicrobial and antibiofilm molecule with encouraging bench and clinical data to support its use in a wound dressing format.

PI-027

What You Can't See Can Hurt You: Sensory-Based Recognition of Heel Pressure Injuries in Melanin-Rich Skin

Mary M. Murphy Kruse, CWOCN, CWS; Daniel Hallman, DPM, MS, CWS; Lacey Bauer, MS; Jacqueline Brown, FNP-C; Mellissa Cavazos, FNP-C, CWS; Amena Babers, MSN, FNP-C, CNOR, CWS; Ida Centineo, FNP-C, CWS; Robert Frykberg, DPM, MPH; Christine Gordon, DNP, FNP; Ashley Meusa, DPM, FACPM, CWS; Judi Miller, FANP-C, APWH; Bill J. Releford, DPM; Hugh L. Richardson, DPM; Tanyikka Tinnon, MAOM; Kathryn Vatt, MS

Introduction: Pressure injuries are not simply clinical conditions, but preventable adverse events that disproportionately burden patients with darker skin tones.[1] By 2060, an estimated 32% of Americans are projected to identify as a race other than white, underscoring the urgency of equitable prevention strategies.[2] Traditional diagnostic indicators, such as non-blanchable erythema, often fail to identify early-stage injuries in melanin-rich skin, resulting in underdiagnoses, treatment delays, and progression to advanced ulcers.[3] Heels are at greater risk for pressure injuries due to limited subcutaneous padding, reduced vascular supply, and prolonged unrelieved pressure — particularly in critically ill patients.[4] Mobile wound care companies offer a crucial solution to bridging the gap due to inequitable wound care. This will deliver expert evaluation, education, and timely intervention directly to underserved or immobile patient populations.[5,6]

Methods: This project integrates current literature, bedside practice, and case-based examples to propose a structured, multimodal protocol for identifying heel pressure injuries across diverse skin tones. This protocol outlines early warning signs beyond color, such as localized warmth or coolness, tenderness, induration, and surface changes like dimpling or firmness. The protocol also emphasizes environmental factors and clinician training to improve accuracy and responsiveness.

Results: Clinicians who incorporated sensory-based assessments, palpation, temperature, and visual inspection significantly improved early-stage detection rates of pressure injuries in patients with darker skin tones. This comprehensive approach improved diagnostic accuracy, reduced the severity and progression of pressure injuries, and led to a more equitable standard of wound care across diverse patient populations.

Color is only one part of the assessment puzzle and is often the least reliable in darker skin tones. Equitable wound care requires a shift from "see the wound" to "feel the warning signs." Integrating sensory assessment into routine care, particularly for high-risk anatomical sites like the heels, is essential to ensuring accurate, timely, and inclusive diagnosis.

Discussion: Equitable wound care demands more than visual inspection alone. Incorporating structured tactile assessments — particularly at high-risk sites like the heels — can eliminate diagnostic blind spots caused by skin tone variability. This protocol marks a necessary shift in pressure injury prevention that prioritizes healthcare equity and clinical vigilance.

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PI-028

Improving Wound Hygiene Through Fluorescence Imaging: A Focus on Spatial Patterns in Diabetic and Venous Leg Ulcers

Alisha Oropallo, MD, FACS, FSVS, FAPWCA, FABWMS; Amit S. Rao, MD; Farisha Baksh, BS; Sally Kaplan, RN; Micaela D. Gray, MSc

Introduction: Wound cleansing, performed at every wound care appointment, is necessary to put stalled wounds back onto a healing trajectory and to prevent infection and its complications. The advent of bacterial fluorescence imaging technology* for wound care has changed our understanding of bacterial distribution in wounds and allows us to evaluate wound hygiene efficacy in real-time. Clinical studies using fluorescence imaging show that significant bacterial colonization is frequently left behind following standard cleansing practices1, highlighting the potential for improvement.

Methods: We present a clinical algorithm for effective wound hygiene informed by real-time fluorescence imaging of bacteria and biofilm. Clinical cases illustrate this approach and demonstrate consistent spatial patterns of bacterial fluorescence in venous leg ulcers (VLUs) and diabetic foot ulcers (DFUs). We also discuss practical insights obtained from our routine use of fluorescence imaging that will improve wound hygiene practices for clinicians without access to this technology.

Results: Clinically unremarkable VLUs and DFUs frequently display fluorescence signals indicating high levels of bacterial colonization. For VLUs, cyan fluorescence indicating Pseudomonas aeruginosa is often clustered along the inferior wound edge. Red fluorescence indicating a mixture of bacterial species is more common in DFUs, usually forming a "ring" around the ulcer that extends a few centimeters from the wound edge. We recommend fluorescence imaging before and after wound cleansing, and that providers use fluorescence signals to guide cleansing towards bacterial-laden regions. In cases where bacterial fluorescence cannot be removed after a single round of guided hygiene, we recommend additional rounds and/or additional measures such as debridement and topical antimicrobials. This approach aligns with published guidelines for fluorescence imaging[3] and has led to improved healing outcomes in clinical studies.[4]

Discussion: Wound care providers should exercise a high index of suspicion for bacterial colonization in asymptomatic wounds, and particularly for P. aeruginosa in VLUs. Areas of focus for wound cleansing may differ between VLUs and DFUs, however thorough hygiene across the entire wound bed and periwound is always recommended. Fluorescence imaging is useful for guiding wound cleansing, for confirming its efficacy, and for assessing the need for additional measures such as debridement or antimicrobials.

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PI-029

A Novel Glove Box Design Decreases Glove Box Surface Contamination and Glove Waste in a Simulated Healthcare Setting

Tim Rose, PhD; Nikita Shah, MS; Fernando Juarez, MS; Vanessa F. Bermudez, MA; Gregory J. Gomez, RN, BSN, MPH

Introduction: Non-sterile, single-use medical gloves are essential for reducing the risk of cross-contamination in healthcare settings.[1] However, glove boxes and unused gloves can become contaminated during the act of glove withdrawal, potentially increasing the risk of pathogen transmission.[2-7] This study compared glove box surface contamination and glove loss between a novel glove box, designed to better facilitate glove withdrawal, and a standard glove box.

Methods: This non-blinded, non-randomized, feasibility study was conducted in a clinical evaluation room. Participants (n=30) wore finger paint-coated gloves and pulled gloves from each of the two glove boxes (novel and standard), with two participants assigned to each box. Participants stopped after 125 glove pull attempts or once all gloves were removed from the box, whichever came first. Finger paint was reapplied as needed, or after every 25 glove pull attempts. Surface contamination was assessed by finger paint coverage on the boxes (inside, outside, total). Glove loss was measured by subtracting the total number of glove pull attempts from the total number of gloves in each box. Statistical analyses included Paired T-Tests and the Wilcoxon Signed-Rank Test, with results significant at $p < 0.05$.

Results: The novel glove box had significantly less contamination on the inside (p=0.0006) and total (p=0.0328) box surfaces, with a median percent difference of 44% less contamination inside and 15.7% less total contamination compared to the standard glove box. No significant difference was found in outside surface contamination. The novel glove box also had significantly fewer gloves lost (p=0.0009) compared to the standard glove box, with an average of 11.8% fewer gloves lost.

Discussion: In this study, the novel glove box demonstrated lower box surface contamination and glove loss compared to the standard glove box. These findings suggest that the novel glove box may help reduce glove waste and box surface contamination, potentially lowering the risk of pathogen transmission in healthcare settings.

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PI-030

No Clinic, No Problem: The Mobile Wound Care Revolution

Seana Rutherford, DNP, MSN, APRN, FNP-C, CWS, WCC

Introduction: Chronic wound represent a significant burden to our healthcare system, contributing to high rates of morbidity and mortality among affected patients. These wounds often require frequent ambulato-

ry care visits at a wound center for management, yet many patients face barriers to accessing care, including transportation challenges, limited resources, and inadequate support at home. A novel mobile wound clinic model addresses these challenges by delivering nurse practitioner led, evidence-based advanced wound care directly to patients in their homes, reducing costs and improving both patient access and outcomes while providing personalized care plans.

Methods: A nurse practitioner led mobile wound clinic provides direct care in patients' homes, replacing the need for weekly ambulatory wound center visits. Key interventions include comprehensive assessment, evidence-based wound treatment, bedside education, and evaluation of in-home resources such as caregiver support, wound care supplies, and durable medical equipment (DME). Collaboration with the interdisciplinary care team ensures a holistic approach, incorporating advanced wound care therapies, the use of technology for wound monitoring, serial debridements, and tailored nutrition interventions to optimize healing. Skilled home health agencies partner to facilitate continuity of care and track patient outcomes including wound healing rates, cost benefit analysis, and hospital readmissions.

Results: The mobile wound clinic included more than 1,560 unique patient visits over 12 months in a metropolitan area and reflects significant growth in patient volume as time progressed. This novel clinic approach eliminates the need for transportation to ambulatory wound centers and replaces one skilled home health nurse visit per week, contributing to measurable cost reductions and improved wound healing rates. Additional results include improved communication and faster delivery of new orders to skilled home health care agencies. Patient satisfaction scores highlight the benefit of in-home assessment, advanced wound care delivered on-site, and individualized care plans, along with a reduction in hospital readmissions related to wound complications.

Discussion: The nurse practitioner led mobile wound clinic demonstrates a scalable and effective model for improving access to wound care while reducing healthcare costs. By addressing barriers such as transportation and limited resources, this novel approach improves patient outcomes and satisfaction. Limitations include regional variability in patient demographics and access to skilled home health agencies and resources. Further studies are needed to explore long-term cost effectiveness and scalability in diverse settings.

PI-031

Sustaining Excellence in HBOT Safety: Centralized Management of Routine Safety Protocols Using Digital Tools

Elaine Song, MD, PhD, MBA; Catherine Milne, MSN, APRN, WOCNF; Chelsea Thompson, EMT, CHT, CWCA, WPC; Tiffany Hamm, BSN, RN, ACHRN, CWS; Jeffrey Mize, RRT, CHT, UHMSADS

Introduction: The 2025 chamber explosion in Michigan is a sobering reminder that safe provision of hyperbaric oxygen therapy (HBOT) is a primary objective for any facility seeking excellence in care.[1] The Undersea and Hyperbaric Medical Society (UHMS) recommends maintaining inspection logs for all hyperbaric equipment.[2] However, in practice, these logs are often paper-based and inconsistent, leading to challenges such as limited storage, time-consuming reviews, and a lack of real-time insights - particularly for organizations managing multiple sites.

To address these obstacles, we developed and implemented a centralized digital safety solution designed to standardize, track, and document routine safety protocols across multicentric HBOT programs.

Methods: (1) Applying design thinking methodology[3], we developed the solution within a clinical decision support web application* and implemented it across a multicentric HBOT program. (2) Paper-based routine safety protocols - including HBOT chamber and unit inspection templates, annual chamber maintenance logs, adverse event forms, and training modules - were converted into digital checklists, interactive clinical pathways, and digital forms. These were assigned as recurring tasks to each site's safety coordinator. (3) User feedback was continuously incorporated to optimize functionality and adoption.

Results: Results The digital solution, including routine safety checklists, annual maintenance documents, monthly training modules, and adverse event reporting, was successfully implemented. Key outcomes included: Seamless, fully integrated, and audit-ready digital workflows; Real-time dashboards for monitoring task completion, resulting in a 100% completion rate of safety checklists and training modules; Instant access to actionable insights through embedded AI-driven analytics of adverse event data; Significant time savings for hyperbaric technologists and managers during daily inspections and reviews.

Discussion: Previous evaluations demonstrated that compared to paper-based documentation, digital checklists reduce the time required for daily maintenance checks and record reviews by 50%, while strengthening the culture of safety.[4] The integration of digital routine safety protocols into a user-friendly, centralized platform further enhances compliance, safety, and preventative maintenance efforts across multicentric HBOT programs while reducing the risk of preventable accidents.

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PI-032

Enhancing an AI-Powered Clinical Decision Support Tool for User-Centered Wound Care - A One year follow up

Elaine Song, MD, PhD, MBA; Tiffany Hamm, BSN, RN, ACHRN, CWS; Catherine Milne, MSN, APRN, WOCNF; Charlotte Hope Kwon, RRT, CHT, CWCA; Michael White, MD, UHM, MMM, CWS

Introduction: The integration of artificial intelligence (AI) into clinical decision-making can revolutionize wound care by providing wound care providers with rapid access to reliable, evidence-based information. However, there have been usability challenges in our previously reported deployment.[1,2] This secondary study aimed to refine the use of responsible AI to enhance user experience while reducing the risk of AI hallucinations and empower wound care clinicians to find evidence-based, reliable answers more quickly.

Methods: Using the Design Thinking methodology , the solution was developed as a module within a decision support platform with evidence-based knowledge base that is continually updated (KB). Four wound care clinicians were interviewed and observed interacting with the AI interface in real time to identify both intuitive areas and challenging areas of the tool.

Feedback was incorporated into multiple iterations of the interface to optimize user experience.

Results: Initially, the AI model was limited to generating responses for a predefined set of question/prompts, accessible through a dropdown menu. Clinicians found this interface restrictive, often struggling to find prompts relevant to their specific clinical queries. They emphasized the need for usability improvements, especially when custom searches yielded no results, and expressed a preference for a free-text input option to enable more precise queries, essential for complex wound care scenarios. To address these concerns, the interface was redesigned, grouping the predefined questions/prompts into categories (e.g., "wound care", "HBOT"). Additionally, a new search bar was introduced to handle unexpected queries not covered by the existing prompts. Clinicians can now perform AI-enhanced free-text searches, retrieving answers exclusively from a trusted, editor-vetted KB, ensuring all responses are based

on reliable, evidence-based information. This guarantees that the content is accurate and trustworthy. Following these enhancements, clinicians reported satisfaction with the improvements and felt that their feedback had been valued.

Discussion: The enhancements to the AI-powered clinical intelligence solution for wound care successfully addressed user feedback, resulting in an interface that is more intuitive, responsive, and reliable. These updates improved the tool's usability, making it better suited to support clinicians' needs in complex wound care scenarios. These improvements underscore the role of responsible AI in shaping the future of clinical decision-making, providing safer and more effective support for healthcare professionals

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PI-033

In Vitro and in Vivo Studies of Zeolite-Encapsulated Silver on an Extracellular Matrix Substrate for Wound Healing Applications

Bo Wang, PhD

Introduction: Chronic wounds are often associated with vascular, diabetic, and pressure ulcers, and majority (78%) of these wounds are infected with biofilms (1). We present in vitro and in vivo data on a silver-zeolite plus quat actives on an extracellular matrix dressing which disrupts biofilms (2), is antiviral (3) and promotes wound healing from an inflamed, stalled state to a remodeled, healed state, reducing the need for painful debridement and improving patient outcome.

Methods: For the in vitro studies, a colony biofilm model was used, and the activity of the dressing is compared with four silver-based commercial dressings towards mature biofilms of Pseudomonas aeruginosa PAO1 and methicillin-resistant Staphylococcus aureus. For the in vivo study, partial thickness wounds were created on dorsal skin regions of swine, infected with PA01 biofilm, treated with the dressing and a commercial dressing and focused on wound healing as the primary outcome measure.

Results: Results show that the actives are effective at inhibiting biofilm formation and destroying mature biofilms and antiviral. The encapsulation protects the silver from rapidly precipitating in biological fluids. The colloidal nature of the zeolite makes it possible to make uniform deposits on a commercial extracellular matrix membrane to manufacture the dressing. The dressing performs well in comparison to four major commercial wound dressings in a colony biofilm model. In the in vivo study, our primary outcomes were percent wound re-epithelialization, collagen deposition, and granulation tissue formation, assessed histologically at 12 days post-burn. The application of actives in their parent form produced the highest degree of wound re-epithelialization, while the dressing also significantly outperformed both the control (saline) and the commercial dressing.

Discussion: The advantages of the ABF-XenoMEM dressings stem from 1) lower cytotoxicity, 2) disruption of biofilm EPS layer by surfactant while killing of bacteria released by silver, 3) slow-release of actives from the dressing over seven days, 4) penetration of actives into different depths in the wound as encapsulated silver is not precipitated in the wound surface, 5) the stimulating of wound-healing proteins and dermal fibroblasts by the supporting ECM matrix.

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PI-034

Pilot Study: Principles of Plastic Surgery for the Neurosurgeon — Optimizing Cranial Incision Planning and Vascular Preservation

Rose V. Zach, BS; David Rincon, BS; Jacob Koster, Sc.B.; Taylor Kreul, BS; Isabel L. Bauer, MD; Kristin Nosova, MD, MBA; Robert Bina, MD; Jimmy Chim, MD

Introduction: Cranial neurosurgical procedures require a thorough understanding of soft tissue anatomy to preserve vascular supply for successful healing. This study aims to pilot the development of a practical guide for neurosurgeons by integrating key plastic surgery principles focusing on vascular preservation, incision planning, and layered closures.

Methods: We conducted a pilot synthesis combining anatomical and surgical literature with expert-informed perspectives from plastic surgery and neurosurgery. This preliminary framework includes case-based recommendations for common cranial approaches, aiming to evaluate feasibility and inform larger-scale guideline development.

Results: Pilot findings demonstrated that the scalp's vascular supply is densely organized within the subcutaneous connective tissue, underscoring the need for meticulous handling. Critical arteries for flap viability include the superficial temporal artery (STA), posterior auricular artery, and occipital artery. Anatomical studies show STA bifurcation above the zygomatic arch in ~74% of cases (average diameter 2.73 ± 0.51 mm), with the frontal branch typically dominant. Integrating preoperative Doppler flowmetry and angiosomal mapping enhances planning, with prior reports showing 100% flap survival in full-thickness reconstructions when vascular preservation strategies are employed. The guide recommends curvilinear rather than U-shaped flaps, layered closure (dura, bone, pericranium, skin), and use of pedicled pericranial flaps — particularly bipedicled designs from the STA and posterior auricular arteries — for high-risk reconstructions.

Discussion: This pilot study demonstrates the feasibility of integrating plastic surgery principles into cranial neurosurgical practice. Early interdisciplinary collaboration and application of these preliminary guidelines may enhance incision planning and wound healing. Future work should focus on validating these recommendations in clinical settings and expanding interdisciplinary protocols for complex cases.