



Management of Lower Extremity Wounds with Exposed Bone Using a Transforming Powder Dressing: A Case Series

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Disclosures

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“The views expressed in this case series are those of the author and do not necessarily reflect the official policy or position of the Defense Health Agency, Department of Defense, nor the U.S. Government.”

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Background

Exposed Bone Wounds Are Difficult to Manage

Challenges:

- Infection risk
- Osteomyelitis
- Delayed healing
- Limb loss/amputation
- Frequent dressing changes
- Pain during wound care

Traditional approaches:

- Wet-to-dry dressings
- Negative pressure wound therapy (NPWT)
- Skin grafting/flap coverage

“What is Transforming Powder Dressing (TPD)?”

Mechanism: hydroxy-methacrylate based transforming powder with a reported wear time up to 30 days⁷



Potential advantages:

- Oxygen-permeable granules absorb moisture to form a wound matrix
- Allows excess exudate to flow via vapor transpiration
- Prevents bacterial penetration
- Dressing eventually dries and flakes when the wound heals

- Reduced dressing changes
- Reduced wound disruption
- Portable and lightweight
- No power source required
- Easy to use



US Military Partnerships Advancing TPD

Military Funding Partners / Clinical Collaborators

- Congressionally Directed Medical Research Program (CDMRP)
- Defense Health Agency-Small Business Innovation Research (DHA-SBIR) – Phase 2 and Phase 2 Sequential
- Military Infectious Diseases Research Program (MIDRP)
- Medical Technology Enterprise Consortium (MTEC)
- Naval Advanced Medical Development Command (NAMDC)
- US Army Institute of Surgical Research (USAISR)
- Walter Reed Army Institute of Research (WRAIR)

Veteran Affairs Medical Centers

- Baltimore / New York / Dallas / Houston / San Diego

Procurement Contract Listings

- DAPA / FSS / ECAT

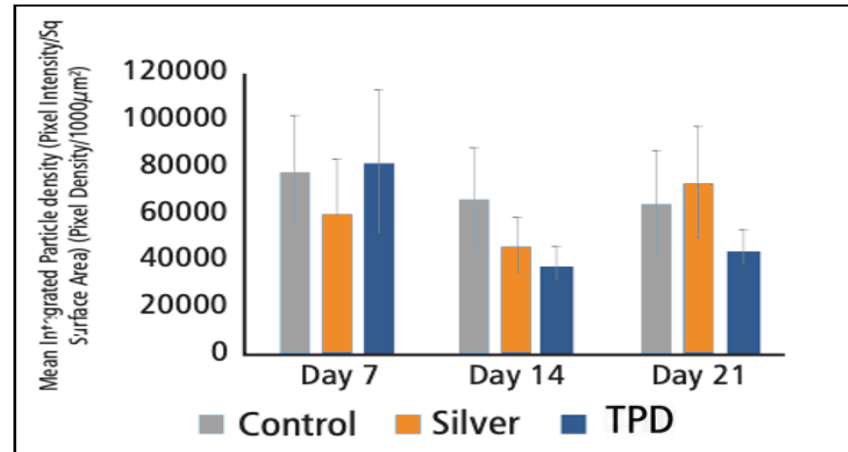
Background Data: Pre-Clinical Results

USAISR DEEP PARTIAL THICKNESS BURN MODEL

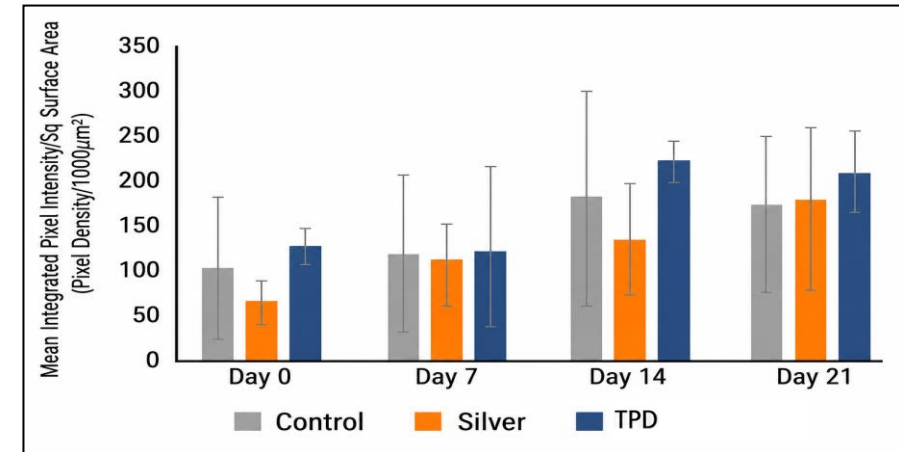
TPD group demonstrated:

- Faster resolution of inflammatory markers
- Higher levels of Vimentin growth protein at each time point
- Faster re-epithelialization

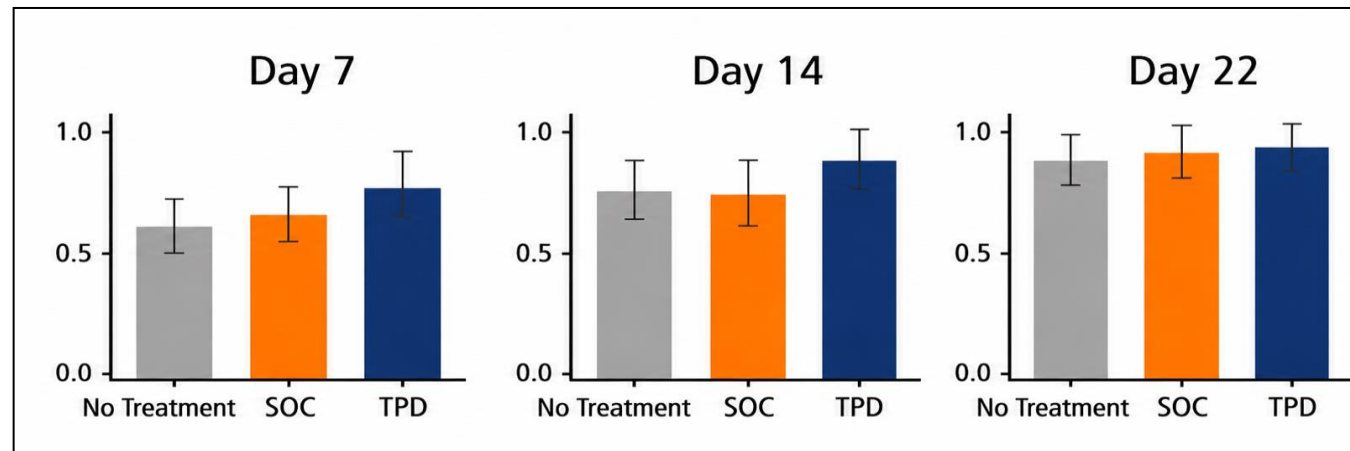
IL-6 COUNTS



VIMENTIN

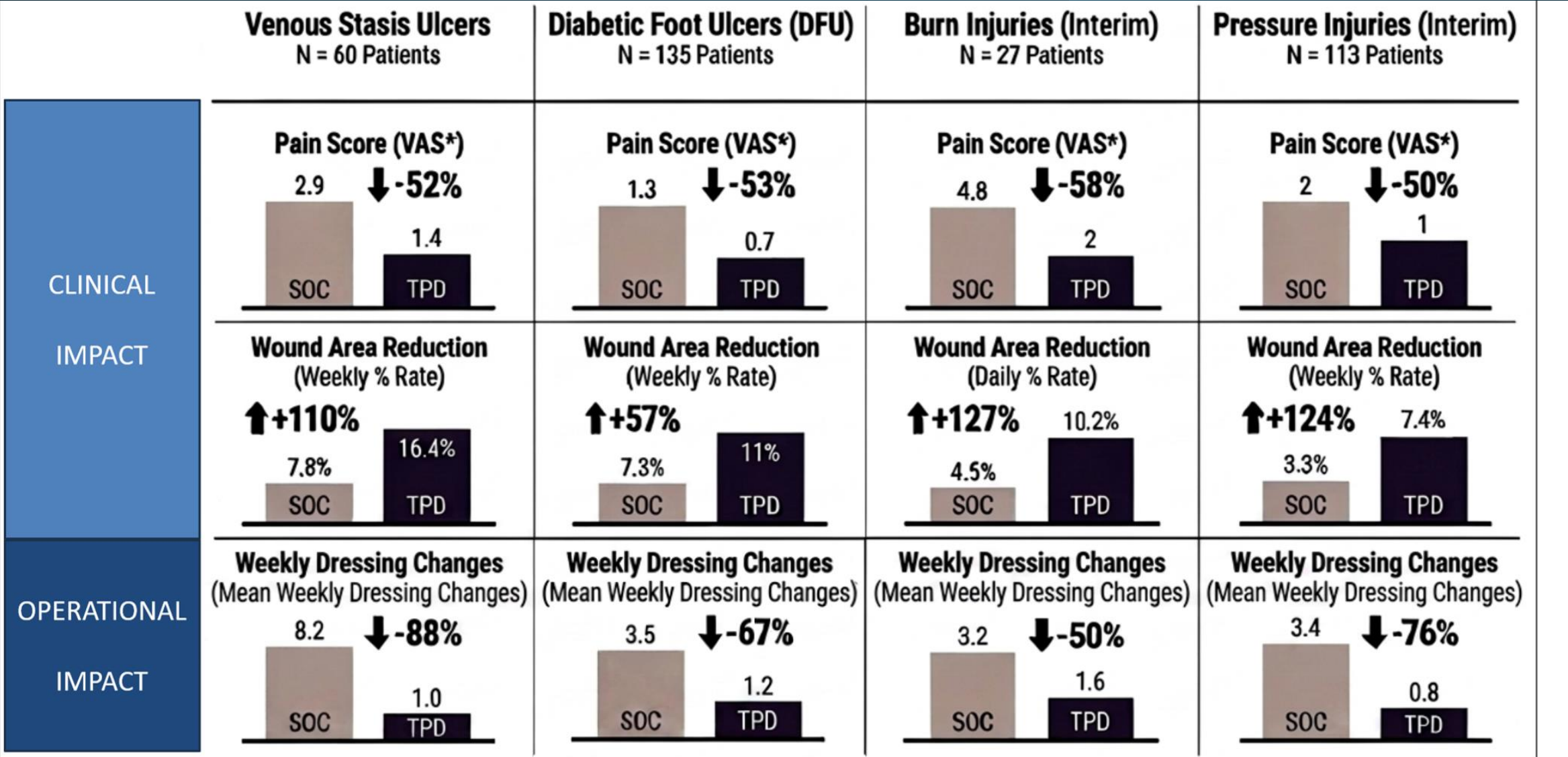


WOUND RE-EPITHELIALISATION



*Results presented show representative images from one of three pigs included in the study Funding Sponsor: Effort sponsored by the US Government (Naval Medical Research Command (NMRC) -Naval Advanced Medical Development (NAMD) thru Medical Technology Enterprise Consortium (MTEC) under Other Transaction Agreement Number W81XWH-15-9-001. | Source: Natesan, Shanmugasundaram, PhD, Altrazael Life Sciences Inc., UT Health San Antonio; Larson, David A., MS, The Metis Foundation; Christy, Sean, BS, The Metis Foundation; Christy, Robert J., PhD, UT Health San Antonio, "A Transforming Powder Dressing (TPD) to Improve Healing of Deep Partial Thickness Burn Wounds," Poster Presentation, Symposium on Advanced Wound Care (SAWC) Spring 2023, National Harbor, MD.

Background Data: Summary Outcomes from 4 RCTs



*Pain associated with dressing changes was assessed using the Visual Analog Scale (VAS): A tool to measure pain intensity from 0-10.

SOURCES VLU: Mahmood, B. A., ElSayed, E. H., Abd Elghany, S. M., Elnaggar, D. F., Youssef, H. A. A., & Abdelmaksoud, S. M. (2023). A new powder dressing for management of chronic venous ulcers. Dermatologic Surgery. | DFU: Lavery, Lawrence, DPM, MPH et al., "Prospective, Randomized, Phase IV Clinical Trial Comparing a Novel Transforming Powder Dressing to Standard of Care in Treatment of Wagner Grade 1 and 2 Diabetic Foot Ulcers (DFU), Poster Presentation, American Diabetes Association Scientific Sessions 2025, Chicago, IL. | Burn: Yanavich, C., Rolniak St. John, S., Quintana, M. de S. B., Schulman, C., Joe, V., Bozeman, M., Park, C., & Saxe, J. (2026, August). Phase IV randomized controlled study of an extended-wear transforming powder dressing in partial-thickness burns: Interim results [Poster presentation]. Military Health System Research Symposium (MHSRS), Kissimmee, FL. | Pri: Data on file at Altrazael Life Sciences Inc. | FUNDING SPONSORS: DFU and Burn RCT: Naval Medical Research Command-Naval Advanced Medical Development via the Medical Technology Enterprise Consortium OTA-W81XWH-20-9-0024 | Pressure Injury RCT: Congressionally Directed Medical Research Program (CDMRP) via U.S. Army Medical Research Acquisition Activity (USAMRAA) W81XWH-21-1-0616

Study Methods

Management of Lower Extremity Wounds with Exposed Bone using TPD: A Case Series

Study Design

- Retrospective case series
- Academic outpatient wound center
- Five adult neuropathic patients
- Complex foot wounds with exposed bone
- Failed standard wound care prior to TPD initiation

Treatment:

- Weekly evaluation
- Monitoring for progression and complications

Primary Outcomes:

- Time to epithelialization
- Complications
- Limb salvage

Patient Characteristics

PATIENT 1: 33-year-old male with surgical wound



PATIENT 2: 62-year-old male with 4th MT pressure wound post TMA



PATIENT 3: 82-year-old male with great toe IP joint pressure wound



PATIENT 4: 61-year-old male with lateral 5th MT pressure wound



PATIENT 5: 74-year-old male with lateral malleolus pressure wound



Results

- 5/5 wounds healed
- Complete epithelialization in 4–10 weeks
- One patient avoided amputation
- No treatment-related complications

“Could TPD Fill a Capability Gap?”

Potential advantages:

- ✓ Lightweight
- ✓ No power requirement
- ✓ Minimal supply burden
- ✓ Extended wear
- ✓ Reduced dressing changes
- ✓ May protect exposed bone and tendon

Potential military applications:

- Prolonged casualty care
- Special operations medicine
- Humanitarian missions
- Shipboard medicine
- Remote expeditionary environments
- Military treatment facilities

Drug Delivery Capacity and Future Combination Products Offer Potential for Local Care Customization

- Completed porcine studies showing sustained release of antibiotics / hemostats / growth factors

TPD IN THE MILITARY HEALTH SYSTEM: TRANSLATING EVIDENCE INTO STANDARDIZED CARE

From Research to Readiness – Advancing Wound Care Across the Continuum



TPD is at a pivotal inflection point—poised to move from demonstrated clinical benefit to standardized use across the Military Health System for improved outcomes and operational readiness.

Questions?

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