Implementing evidence-based clinical pathways for improved pressure injury (PI) population intervention outcomes.

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Fundamental gap in understanding PI etiology and pathophysiology

The effect of Incipient invisible microscopic damage, i.e., Sub-epidermal Moisture (SEM), or localized oedema[1,2], is not being addressed in pressure injury (PI) prevention standard of care practices.

X Risk assessment tools are subjective and not anatomy specific[3];

X Anatomy-specific prevention interventions occur after Visual skin assessments (VSA) confirm skin redness = damage already occurred;

Current SoC ≠ Prevention

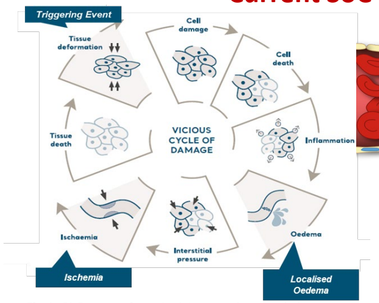


Fig 1: PI Damage Cascade Adapted with permissions from: Ousey, K. and A. Gefen. "Update to Device-Related Pressure Ulcers: Secure Prevention. Covid-19, Face Masks and Skin Damage." Journal of Wound Care, 2020.

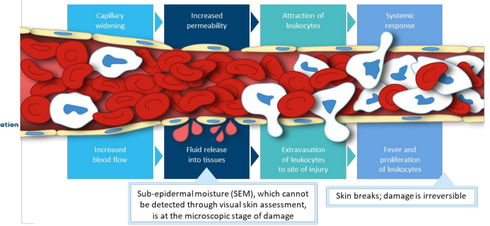


Fig 2: Invisible damage at the microscopic level;

SEM, or localized oedema is an early biomarker of pressure-induced damage

SEM assessment Technology*

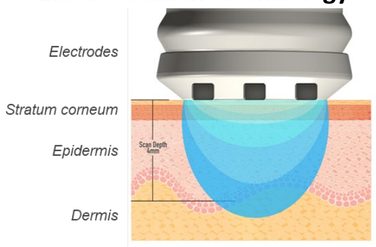


Fig 3: SEM Assessment Technology

✓ Objective, anatomy specific risk assessment

✓ Skin tone agnostic

✓ Early indication of risk (Median 5 days before VSA)[4]

✓ Enables keeping the skin intact even before skin redness

Uses biocapacitance sensors to compute a SEM delta value; SEM Δ ≥ 0.6 indicates increased risk of developing PIs at specific anatomies.

Study Design

An evidence-based review approach was used to develop SEM assessment-based PI prevention pathways to implement in real-world care settings for treating SEM, also known as persistent focal oedema[5], and achieving PI prevention.

Primary End Point

- Develop clinical pathways
  - Comprehensive literature review
  - "(sub-epidermal moisture) OR (sub epidermal moisture) OR (SEM Scanner)"
  - International Clinical Practice Guidelines[2]
- Real-world implementation of technology
  - Modernized PI reduction program
  - Treating SEM/localized oedema as a stage 1 PI
  - SEM assessment as an adjunct to SoC
  - 28 acute care settings
  - Pre and Post implementation data analysis

Results

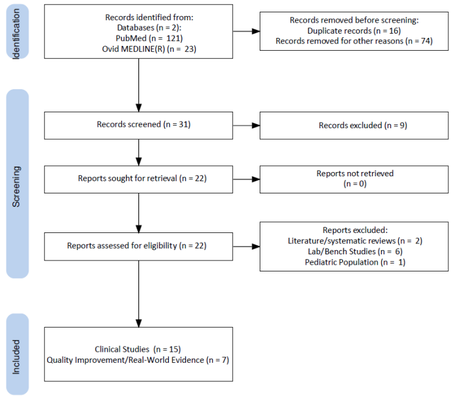


Fig 4: Literature Review Search Results

Step 1: On Admission

➢ Initial risk assessment, VSA and SEM assessment by health care practitioners (no additional resources)

Step 2: During Stay

➢ Routine scanning coincides with risk and skin assessments (no change to current practice)

Step 3: At Discharge

➢ Transfer a complete patient record with evidence of current tissue status

➢ Facilitates integrated care

Fig 5: Implementing SEM assessment technology into clinical practice

Clinical Pathway

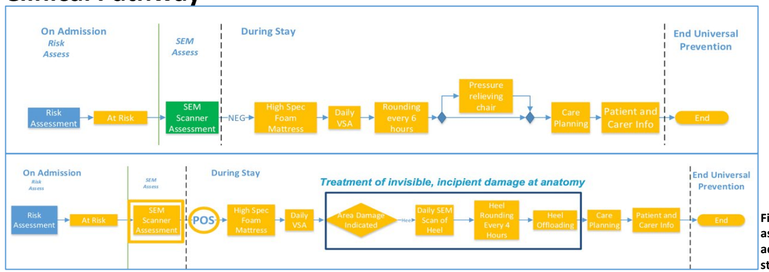


Fig 6: SEM assessments as an adjunct to existing standards of PI care

✓ No new staff

✓ No new resources

✓ No new interventions

✓ Acting on raised SEM delta (SEM Δ≥ 0.6)

✓ Directing anatomy –specific

✓ Early interventions before skin redness

Real-World Impact

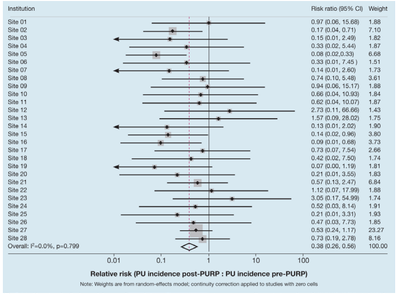
➢ 1995 Patients: Total at-risk patients scanned across 28 global facilities

➢ 83.9% SEM assessments: indicated a prompt for clinical action (SEM Δ≥0.6)

➢ 100% PI incidence reduction achieved in 19/28 facilities during the program (Zero HAPIs)

➢ 6 Sites achieved statistically significant PI incidence reductions (p<0.05)

➢ RR=0.38: Meta-analysis identified statistically significant reduction in relative PI incidence risk post implementation (p<0.05)



Ousey K, et al. Sub-epidermal moisture assessment as an adjunct to visual assessment in the reduction of pressure ulcer incidence. J Wound Care. 2022 Mar 2;31(3):208-216

Conclusion

Real-world implementation of SEM assessment technology into PI prevention pathways enables early, anatomy-specific interventions. Objective SEM assessment data enables clinicians to treat localized oedema, even before skin redness, enabling facilities to achieve consistent PI incidence reductions at scale.

References

1. Ousey, K. and A. Gefen. "Update to Device-Related Pressure Ulcers: Secure Prevention. Covid-19, Face Masks and Skin Damage." Journal of Wound Care, 2020.
2. EPUAP/NPIAP/PPPIA. "European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. The International Guideline." EPUAP/NPIAP/PPPIA, 2019.
3. Fletcher, J. "An Overview of Pressure Ulcer Risk Assessment Tools." Wounds UK, vol. Vol 13, 2017.
4. Okonkwo et al, 2020. A blinded clinical study using a subepidermal moisture biocapacitance measurement device for early detection of pressure injuries. Wound Repair Regen.
5. WHO 2020. ICD-10 : International Statistical Classification Of Diseases And Related Health Problems : Tenth Revision. 2nd ed. US Revision Geneva: World Health Organization.

* Provizio® SEM Scanner