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Preliminary Findings of the Wound Care Champion Program: An Innovation in Wound Care Education in Canada

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Cape Breton University, School of Nursing[1]; Wounds Canada[2], and the Registered Nurses' Association of Ontario[3]

Research Background

To help address the rising incidence of acute and hard-to-heal wounds, Wounds Canada and Registered Nurses' Association of Ontario co-developed the Wound Care Champion Program[1-4] The WCCP is targeted towards regulated health-care providers who self-identify as advanced-beginners in their wound care knowledge and skills.

Given that 30 to 50 per cent of health care involves wound care[5], all health professionals across sectors need a strong foundation in this area to address this significant health issue.
Comprehensive, interdisciplinary, and competency-based continuing education is critical to keep health-care professionals up to date on evidence-informed best practices.

Ethics: Cape Breton University Research Ethics Board.

Funding: This work has been funded by the Government of Ontario.

Accreditation: The WCCP is accredited - University of Toronto and the Canadian Nurses Association.

Research Primary Contact
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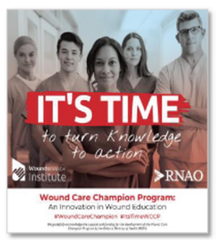
Objectives of the Wound Care Champion Program

1) To deliver evidence-informed, interdisciplinary beginner-to-proficient level wound education to regulated health-care Professionals

2) To provide clinicians with the knowledge and skills to implement evidence-based preventative and treatment interventions

3) To conduct applied program evaluation activities for the WCCP[7-15]



Methods

Procedure/Method: A person with a hard-to-heal wound often experiences a range of bio-psycho-social challenges requiring interprofessional collaboration. Existing clinician education however, provides limited opportunity for interdisciplinary wound care. To address this gap, the Wound Care Champion Program offers a comprehensive inter-professional learning experience focused on clinical care and implementation science to advance practice. Launched in 2022, with the first cohort starting in February 2023, this program brought together practitioners from across disciplines (i.e., RPN, RN, NP, PT, OT, MD, Chiropody) as a single learning community. Over 24 months, this cohort will complete:

- 43 highly interactive on-line modules
- 10 synchronous webinars and post-discussion board
- 1 virtual workshop (two 3-hour sessions) and post-discussion board
- 3 in-person skills labs (completed over two days)
- 4 robust assignments/outcomes measures (including an objective structured clinical exam [OSCE])
- Discussion boards, forums, articles and resources focused on skin and wounds in clinical practice

Data Analysis : Preliminary Findings

Findings/Results: 213 regulated practitioners across multiple settings (i.e., acute, clinic, community, home care, long-term care, rehab, Indigenous care settings) are currently engaged as a learning community within the Ontario cohort of the WCCP. In Nova Scotia, 100 participants are newly engaged in the WCCP.

As of September 2023, the Ontario cohort has had the opportunity to complete 10 webinars surrounding topics such as: foot ulcers; pressure injuries; surgical wound complications; skin tears; venous leg ulcers; and burns; participate in an implementation-focused practice change workshop and are actively connecting content to clinical practice through a faculty mentored and peer led on-line clinical community. Pre-program survey data suggest moderate levels of confidence in wound care, highlighting opportunities to improve wound care knowledge and skill, and in-turn practitioner confidence. Planned mid-point and post-program surveys and focus groups will explore shifts in levels of confidence, interdisciplinary collaboration, and clinical practices.

Implications/ Application

As an innovation in wound care education, the WCCP offers an interprofessional learning community within which clinicians across the continuum of care are advancing their skin and wound care knowledge, skills, and practice.

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The impact of prone positioning on the incidence of pressure injuries in adult intensive care unit patients: A meta-review of systematic reviews

Patton D[1], Latimer S[2], Avsar P[1], Walker RM[2], Moore Z[1], Gillespie BM[2], O'Connor T[1], Nugent L[1], Budri A[1], OBrien N[1], Chaboyer W[2].

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RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

RCSI SKIN WOUNDS, and TRAUMA - SWaT Research Centre

1. Introduction

- Although clearly advantageous for oxygenation, a high frequency of pressure injuries (PIs) has been reported in patients with ARDS nursed in the prone position for 16 hours.
- Numerous systematic reviews have examined the impact of prone positioning on outcomes, including PI.
- The objective of this meta-review was to synthesise the evidence on the effect of prone positioning on the incidence and location of PIs in adult intensive care unit patients.

2. Review Question

- What is the effect of prone positioning on the incidence and prevalence of PIs in adult ICU patients?

3. Methods

- We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to guide the conduct and reporting of the meta-review.
- Five databases were searched; data were extracted by three authors and adjudicated by a fourth.
- The AMSTAR-2 tool was used to quality appraise the selected articles.

4. Results

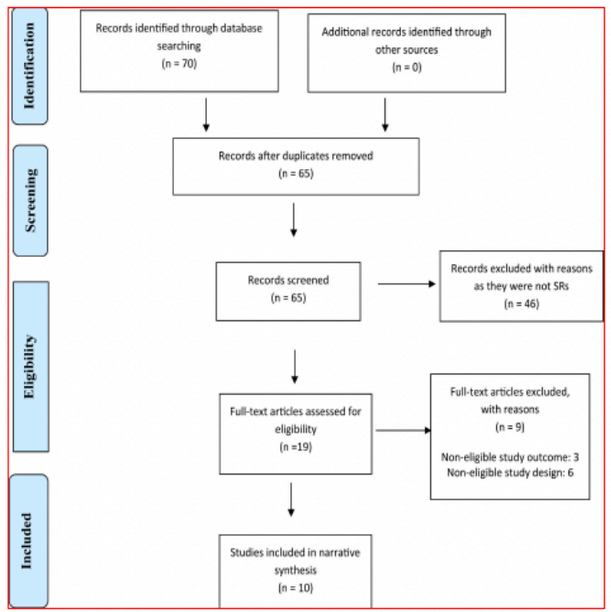
- Ten systematic reviews met the inclusion criteria.
- Three reviews were assessed as high quality, six as moderate quality, and one as low quality.
- From participants enrolled (N = 15,979) in the review studies, the cumulative incidence of prone position PI ranged from 25.7% to 48.5%.

Key Messages

26% to 49% of adult ICU patients placed in the prone position develop a PI, irrespective of the duration of proning.

We must regularly assess ICU patients' skin and PI risk when they are in the prone position & proactively implement PI prevention strategies.

PRISMA Flow Chart



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A meta-review of the impact of compression therapy on venous leg ulcer healing

Patton D[1], Avsar P[1], Sayeh A[1], Budri A[1], O'Connor T[1], Walsh S[1], Nugent L[1], Harkin D[1], O'Brien N[1], Cayce J[2], Corcoran M[3], Gaztambide M[3], Moore Z[1]

[1]Skin Wounds and Trauma (SWaT) Research Centre, School of Nursing & Midwifery, Royal College of Surgeons in Ireland, University of Medicine and Health Sciences, Dublin, IE; [2]DeRoyal Industries, Knoxville, Tennessee, USA. [3]DeRoyal International, Dublin, Ireland.

RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

RCSI SKIN WOUNDS, and TRAUMA - SWaT Research Centre

1. Introduction

- Compression therapy (CT) represents the standard of care for conservative treatment of venous leg ulcers (VLU).
- Published healing rates of VLU managed with CT vary widely from 40% to 95%.
- This meta-review of existing systematic reviews considers the impact of CT on VLU healing.

2. Review Questions

1. What is the effect of compression therapy on venous leg ulcer healing?
2. What is the effect of venous leg ulcer compression therapy on adverse events?

3. Methods

- We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to guide the conduct and reporting of the meta-review.
- Five databases were searched.
- The AMSTAR-2 tool was used to quality appraise the selected articles.
- The certainty of the evidence was appraised using GRADEpro.

4. Results

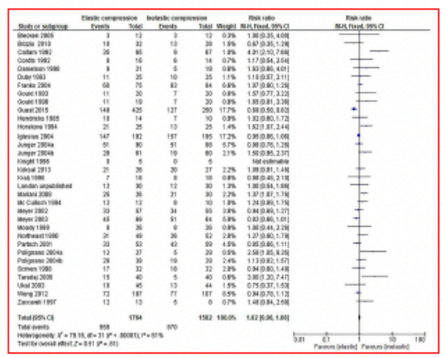
- We identified 12 systematic reviews published between 1997 and 2021.
- Three reviews were assessed as high quality, five as moderate quality, and four as low quality.
- Seven comparisons were reported, with a meta-analysis undertaken for five of these comparisons.

Key Messages

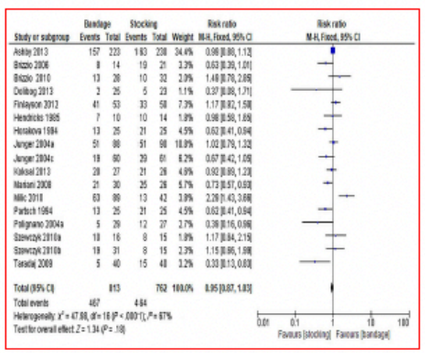
There is a statistically significant difference in venous leg ulcer healing rates when compression is utilised compared with no compression, with moderate certainty evidence.

There is no statistically significant difference in venous leg ulcer healing rates between different types of compression systems.

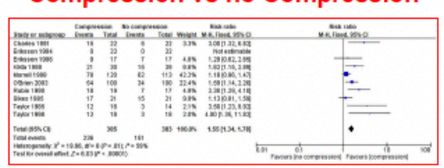
Elastic vs Inelastic compression



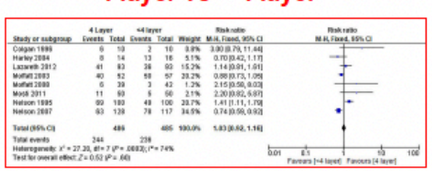
Bandage vs Stocking



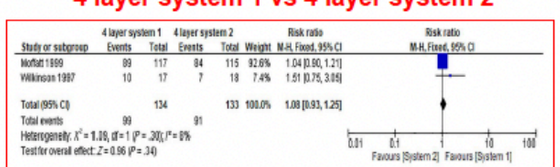
Compression vs no Compression



4 layer vs < 4 layer



4 layer system 1 vs 4 layer system 2



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Nurses' attitudes towards pressure ulcer prevention and the development of educational approaches to meet attitudinal needs.

Avsar P[1], Patton D[1], O'Connor T[1], Moore Z[1]

[1]Skin Wounds and Trauma (SWaT) Research Centre, School of Nursing & Midwifery, Royal College of Surgeons in Ireland, University of Medicine and Health Sciences, Dublin, IE;.

RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

RCSI SKIN WOUNDS, and TRAUMA - SWaT Research Centre

1. Introduction

- The attitude of nurses towards PU prevention refers to nurses' values related to risk assessment, maintaining healthy skin, management of mechanical loads, and education of the patient and their family.
- In order to understand nurses' attitudes towards PU prevention, we conducted a systematic review of research on the topic.

2. Review Question

- Do nurses have positive or negative attitudes towards pressure ulcer prevention?

3. Methods

- We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to guide the conduct and reporting of the review.
- Five databases were searched.
- Studies were quality appraised using the evidence-based librarianship (EBL) critical appraisal checklist.

4. Results

- We identified 21 studies; 20 employed a cross-sectional design and one employed a validation study.
- Two distinct instruments were used: the 'Moore and Price Attitude Scale' and the 'Attitude towards Pressure Ulcer Prevention Instrument'.
- The mean attitude score was 73% (SD: 9.2%; min 51%; max 89%).
- A total of 86% (n=18) yielded positive attitude results.

Key Messages

Nurses are positively disposed towards PU prevention, but have difficulty translating this positivity into actual practice

We need to focus on bridging this attitude-behaviour inconsistency through new educational approaches

Study details

Country	Setting	N	Instrument	Results
• Belgium • Cyprus • Ethiopia • Ireland • Jordan • Nigeria • Saudi Arabia • Sweden • Turkey • USA	• Cancer centre • Health care centre • Hospital • ICU • Nursing Home • Rehabilitation	Mean **188** (SD: 147; min 29, max 553)	• Moore & Price Attitude Scale **n=13** • Attitude towards pressure ulcer prevention (APuP) **n=7** • Unknown instrument **n=1**	• Mean: **73** • Median: **75** • Mode: **78** • SD: **9.2** • Minimum: **51** • Maximum: **89** **86% of studies show positive attitudes**

PRISMA Flow Chart

Reference

Avsar P, Patton D, O'Connor T, Moore Z. Do we still need to assess nurses' attitudes towards pressure ulcer prevention? A systematic review. J Wound Care. 2019 Dec 2;28(12):795-806. doi: 10.12968/jowc.2019.28.12.795. PMID: 31825774.

The impact of pressure ulcer prevention education on health care assistants' knowledge and skills and pressure ulcer incidence in long-term care settings

O'Brien N[1], Moore Z[1], Avsar P[1], Nugent L[1], Budri A[1], Patton D[1], O'Connor T[1].

[1]Skin Wounds and Trauma (SWaT) Research Centre, School of Nursing & Midwifery, Royal College of Surgeons in Ireland, University of Medicine and Health Sciences, Dublin, IE;

RCSI DEVELOPING HEALTHCARE LEADERS WHO MAKE A DIFFERENCE WORLDWIDE

RCSI SKIN WOUNDS, and TRAUMA - SWaT Research Centre

1. Introduction

- Older adult patients are susceptible to pressure ulcers due to the presence of co-morbidities and reduced mobility[1].
- Health care assistants represent most of the workforce in long-term care settings and play a significant role in pressure ulcer prevention[2].

2. Review Question

- What is the impact of pressure ulcer education on health care assistants' knowledge and skills?

3. Methods

- We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to guide the conduct and reporting of the review.
- Five databases were searched in November 2021.
- Quality appraisal was undertaken using the Evidence-based Librarianship checklist (Glynn, 2006).
- Data was analysed narratively and using meta-analysis.

4. Results

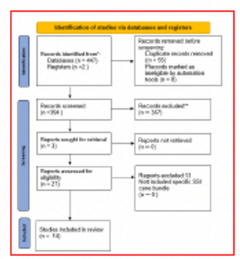
- 14 studies met the inclusion criteria.
- 6 different types of educational interventions were used.
- Four studies found an improvement in mean knowledge scores in favour of the education intervention group (MD: 5.73 (95% CI: 1.38-10.08; *p*=0.010).
- In 5 studies pressure ulcer prevalence was 7% pre-education and 4% post-education (OR: 1.69, 95% CI: 1.12-2.54; *p*= 0.01).
- In 7 studies pressure ulcer incidence was 9% pre-education and 4% post-education (OR: 2.20, 95% CI: 1.50-3.22; p=0.0001).

Key Messages

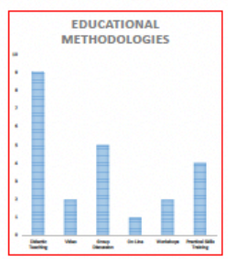
Educating health care assistants positively influences knowledge & practice in pressure ulcer prevention.

Health care assistants are essential & need education to develop their knowledge & skills in pressure ulcer prevention.

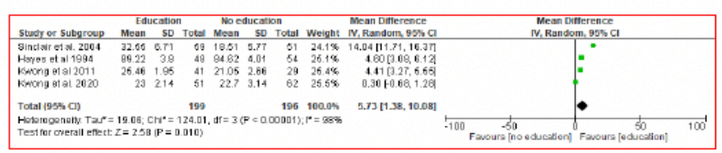
PRISMA Flow Chart



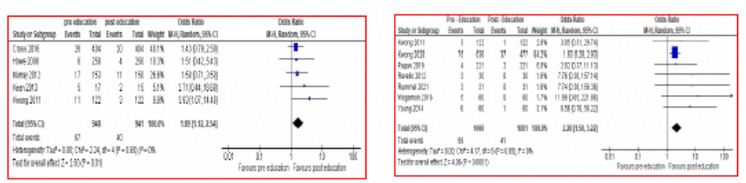
Educational Approaches



Forest Plot: Mean difference in knowledge scores



Forest Plots: OR of PU Development: A: Prevalence; B: Incidence



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The Relationship Between Sub Epidermal Moisture (SEM) Measurement and Inflammatory Markers in the Early Identification of Pressure Ulcers

Natalie L. Mc Evoy[1], Declan Patton[1], Ger Curley[1], Fiona Boland[1], Cathal Kearney[2], Grace Hogan[1], Aoife Keogh[1], Jennifer Clarke[1], Zena Moore[1]

[1] Royal College of Surgeons in Ireland, University of Medicine and Health Sciences, Dublin,

[2] Department of Biomedical Engineering, University of Massachusetts Amherst, Amherst, Massachusetts, USA

RCSI SKIN WOUNDS and TRAUMA Solid Research Centre

1. INTRODUCTION

- Research is ongoing in the areas of SEM, and the detection of biomarkers and cytokines as early determinants of PU development.
  - To date, a comparison of IL-1α and SEM measurements as early determinants of PU formation has not been made.
  - However, If both measures are exploring the same concept, i.e., early pressure ulcer development, then it is reasonable to expect that there would be a relationship between IL-1α/Total Protein and SEM measurements.

2. STUDY AIM

The aim of this study was to:

Establish the correlation between IL-1α/Total Protein (TP) and Sub-epidermal Moisture (SEM) measurement in the early identification of pressure ulcers in adult intensive care patients.

3. METHODS

- Observational research design following the STROBE guidelines.
- Sample size calculation was performed with statistical guidance from the University's Data Science Centre.
- Local research ethics committee approval was granted.
- Health Research Consent Declaration (HRCDC) approval.
- Patients identified by study gatekeeper in the ICU.
- Patients assessed for eligibility.
- Consent/assent obtained.
- Schedule of events found in figure 1.

4. RESULTS

- Very weak or weak correlations:
  - Between SEM delta measurements and IL-1α/Total Protein readings on all the study days, for all anatomical locations.
  - Between SEM delta measurements and Blood C-Reactive Protein readings on all the study days, for all the anatomical locations.
  - Between IL-1α/Total Protein and Blood C-Reactive Protein readings on all study days, for all anatomical locations.

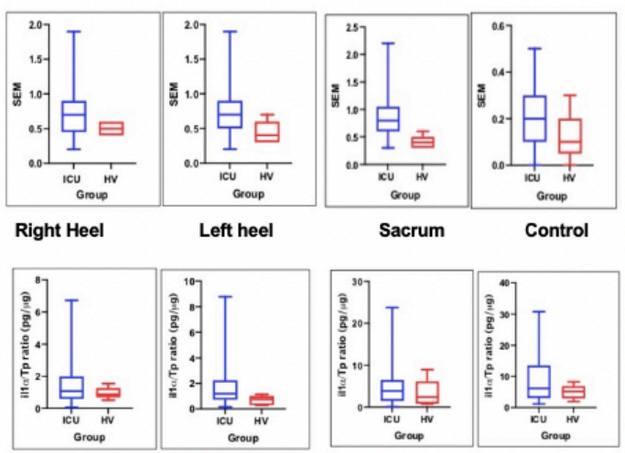
5. CONCLUSION

- Given the weak or very weak correlation between SEM and IL-1α/Total Protein one must question whether they are actually measuring the same process.
- However, SEM readings are consistent with other studies.
- Feasibility:
  - IL-1α/Total Protein difficult to assess in the clinical setting
  - SEM easy and straight forward
- Need more evidence to determine that SEM is picking up local inflammation with more in-depth analysis against other relevant markers such as pain, temperature, skin hydration and ultrasound.

Figure 1: Schedule of events

Visit #	1	2	3	4	5	6
Visit Type	Screening	Daily visit	Daily visit	Daily visit	Daily visit	Daily visit
Visit schedule	Day -3 to 0	Day 1	Day 2	Day 3	Day 4	Day 5
Informed Consent	X					
Eligibility determination & baseline demographics		X				
Braden Scale		X		X		X
Sebutape		X	X	X	X	X
SEM measurement		X	X	X	X	X
Visual skin assessment		X	X	X	X	X
Routine bloods documented		X	X	X	X	X
Care as planned		X	X	X	X	X
Continence status		X	X	X	X	X

Figure 2: ICU participants versus healthy volunteers: SEM delta IL-1α/Total



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IRISH RESEARCH COUNCIL An Chomhairle um Thaighde in Éirinn

Funding information: Enterprise Partnership Scheme with Bruin Biometrics; Irish Research Council, Grant/Award Number: EPSPG/2019/475

Improving Capture of Pressure Injuries in Acute Care Inpatient Hospital Data to Support Quality of Care

Authors: Renata Iannucci, Margaret Penchoff, Cassandra Linton, Keith Denny, Canadian Institute for Health Information (CIHI)

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Introduction

Pressure injuries (pressure ulcers) can be debilitating and life-threatening and can increase hospital stays and costs, but they are preventable.[1,2,3] However, pressure injuries are potentially under-reported in Canadian acute inpatient hospital administration data submitted to the Discharge Abstract Database (DAD). Data from the DAD is used for decision-making and planning to help determine funding, and for performance and outcome measurement.

When a patient is admitted to an acute care inpatient facility, demographic and administrative data (e.g., admission date, date of birth, health card number) is collected during registration (Figure 1). Diagnosis information is collected using codes from the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada* (ICD-10-CA). All of this data is submitted to the DAD. Historically, for an ICD-10-CA code to be assigned, it had to be documented by a physician and be mandatory to code. However, the requirement for a diagnosis to be documented by a physician presents a challenge in the case of pressure injuries because that information is more likely to be documented by a nurse or another regulated allied health professional. Due to the potential under-reporting, CIHI investigated ways to improve pressure injury data.

Figure 1 **Data flow: From collection upon patient's admission to submission to CIHI**

For more information
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38661-0823

Approach

In collaboration with stakeholders, CIHI investigated opportunities to improve pressure injury data submitted to the DAD, through the following activities:

- A multi-year review of pressure injury volumes
- A discussion with stakeholders to better understand
  - Pan-Canadian data collection practices
  - Best practices for data collection, including clinical documentation
  - Opportunities to expand data collection by allowing use of non-physician documentation to inform code assignment
  - The impact of data collection on hospital indictor reporting (e.g., frailty and hospital harm)

The investigation yielded 2 key findings:

- Pressure injuries are more likely to be documented by a nurse than by a physician.
- There wasn't an ICD-10-CA diagnosis code to identify suspected deep pressure-induced tissue damage.

Addressing data collection challenges

In response to the challenges related to data collection, CIHI developed the following:

- Effective April 2022, a **new *Pressure Ulcers* coding standard** that directs coders that
  - It is mandatory to assign an ICD-10-CA code from category L89 Decubitus [pressure] ulcer and pressure area for any pressure injury whenever documented by a physician or a regulated allied health professional (Figure 2).
  - In addition to the ICD-10-CA code, they must also apply the diagnosis prefix N when the pressure injury is documented **only** by a non-physician regulated allied health professional.
- A **new ICD-10-CA code** to identify suspected pressure injury: L89.6 *Suspected deep pressure-induced tissue damage, depth unknown* (Figure 3).
- These changes were implemented for data submissions to the DAD starting April 1, 2022. This informed 2022–2023 data, which has been used for this analysis.

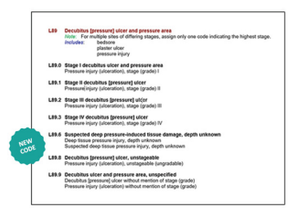
Figure 2 ***Canadian Coding Standards for ICD-10-CA and CCI* directive statement from the *Pressure Ulcers* coding standard**

DAD and NACRS directive statement

N Assign a code from category L89 *Decubitus [pressure] ulcer and pressure area* whenever a diagnosis of pressure ulcer is documented, **mandatory**, regardless of significance.

- Apply the prefix N, **mandatory**, when a diagnosis of pressure ulcer is documented by a regulated allied health professional.

Figure 3 **ICD-10-CA v2022 pressure injury codes**



Results

Actions taken to improve pressure ulcer data were successful

- Since the release of the *Pressure Ulcers* coding standard, there has been an increase in the percentage of cases with a pressure ulcer recorded on the abstract — from 0.8% of total hospital stays submitted to the DAD (n = 24,812 of 3,193,402) for 2021–2022, to 1.3% (n = 32,222 of 2,524,639) for 2022–2023 (Figure 4).
- The increase may be partially explained by the new coding direction in the *Pressure Ulcers* coding standard and partially explained by the reduction in the denominator. It is now mandatory to record an ICD-10-CA code for a pressure injury whenever it is documented, regardless of whether the pressure injury is documented by a physician or a non-physician.
- In 2022–2023, there were 32,222 cases with a pressure injury submitted to the DAD.
  - 19.4% (n = 6,248) of the cases were documented by a regulated allied health professional (Figure 5). These nearly 20% of cases may not have been captured prior to the new coding standard.
  - 62.2% (n = 20,038) of the cases had the stage of the pressure injury documented:
    - 22.8% (n = 4,560) were identified as documented by a regulated allied health professional (prefix N was applied to the code from category L89 *Decubitus [pressure] ulcer and pressure area*).
    - 77.2% (n = 15,478) were documented by a physician.
- For the 37.8% (n = 12,184 of 32,222) of cases where the stage of the pressure injury was unspecified, 86.1% (n = 10,496) were documented by a physician and 13.9% (n = 1,688) were documented by a regulated allied health professional.
- The stage was identified in 73.0% (n = 4,560 of 6,248) of the cases of pressure injuries documented by a regulated allied health professional, and in 59.6% (n = 15,478 of 25,974) of the cases of pressure injuries documented by a physician. Knowing the stage improves the quality of the data.
- The new ICD-10-CA v2022 code L89.6 *Suspected deep pressure-induced tissue damage, depth unknown* was recorded on 7.2% (n = 2,335 of 32,222) of abstracts with an ICD-10-CA code for pressure injury recorded.

Analysis

The data is presented as a percentage of total discharges with an ICD-10-CA code recorded on the DAD abstract using 2022–2023 records received as of the year-end closing date June 30, 2023. A fiscal year is defined as April 1 to March 31 of a given year.

Figure 4 **Percentage of discharges with pressure injuries submitted to the DAD, 2018–2019 to 2022–2023**

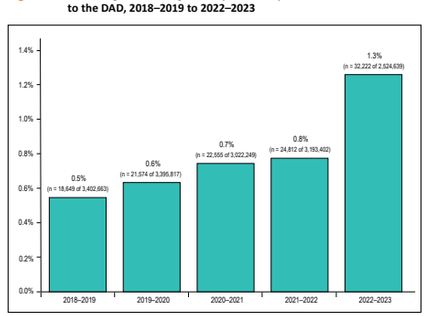
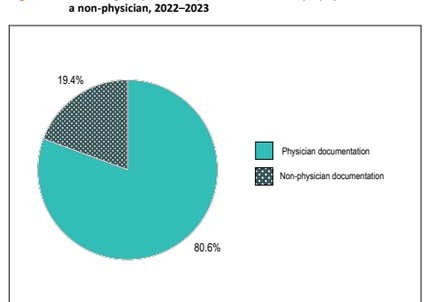


Figure 5 **Percentage of pressure injuries documented by a physician versus a non-physician, 2022–2023**



Limitations

While our analysis shows an increase in pressure injuries, there's no way to identify how many pressure injuries are still not being captured.

The results represent 1 year of data. More years of data will give a better picture of improved data and data quality.

The potential impact of COVID-19 on hospital stays and data submissions must also be taken into consideration. There was a decrease in discharges submitted to the DAD during the COVID-19 pandemic. Refer to cihi.ca for more information.

The ICD-10-CA code assigned is based on clinical documentation, which varies by physicians and regulated allied health professionals at the facility and jurisdictional levels.

Conclusion

The 2022–2023 data shows an improvement in the capture of pressure injury data in the DAD after the implementation of the new coding standard. This may allow for better reporting and evaluation of the data used for quality of care.

Acknowledgements

We gratefully acknowledge CIHI's classification specialists, program area staff and members of the National Coding Advisory Committee (NCAC) for their contributions to the coding standard that led to improving national data on pressure injuries.

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0010: One size doesn't fit all: a collaborative approach incorporating validated low air loss pressure redistribution surface for effective client outcomes

Presented by Magda Kitto RN BN NSWOC and Holly Burton BScOT

Aim

A case study incorporating a collaborative approach in conjunction with use of an alternative pressure redistribution surface (PRS) for improved skin, wound and client outcomes.

Background

A 47-year-old client living with obesity in a long-term care setting with multiple comorbidities was selected for this case study. The client had chronic full-thickness wounds on the posterior thighs for over 3 years, which were caused by moisture-associated skin damage and Hidradenitis Suppurativa, complicated by pressure, friction and shearing. Various PRS options were introduced, but limited progress was observed in terms of skin and wound healing. Concerns regarding pain, bed mobility, and transfers persisted.

Methods

Following a comprehensive assessment, active client engagement, and careful consideration of the client's complex needs, a collaborative and individualized care plan (CP) was formulated.
The development of the CP encompassed the inclusion of the client's perspective, their active participation in selecting appropriate dressings, and specific care requirements aligning with best practice standards. The CP addressed various factors including:

- ✓ Pain
- ✓ Equipment
- ✓ Moisture
- ✓ Nutrition
- ✓ Pressure, Friction and Shear
- ✓ Skin and Wound Management

Methodology

To address the primary areas of concern including microclimate management, pressure, friction, and shear reduction, an industry partner was consulted. Trial of a reactive/constant low air loss surface was initiated. Surface features targeting microclimate management included an integrated pump under pelvic section and crush resistant top layer providing reduced heat and moisture at skin and surface interface. The surface was chosen after analyzing the National Pressure Injury Advisory Panel Support Surface Standard (NPIAP S3I) testing data on heat withdrawal, evaporative capacity, and interface pressure.

Client was concordant with CP, staff education was provided, and interdisciplinary participation included:

- ➢ Occupational Therapist (OT)
- ➢ Director of Care (DOC)
- ➢ Registered Dietitian (RD)
- ➢ Nursing staff
- ➢ Physician

Results

Following the implementation of the CP revision, including the introduction of the new PRS, a significant reduction in posterior thigh wounds was observed within the first two weeks, ranging from 35% to 99%. Subsequent weeks showed a continued wound reduction of 20% to 40%.

The management of bacterial burden was addressed using the Wound Prevention and Management Cycle. Additionally, there was a noticeable decrease in moisture, friction, pressure, and pain, as indicated by pain scale measurements and client reports of increased comfort and improved tolerance for offloading in bed.

No issues were reported regarding transfers, bed mobility, or sleep disturbances caused by noise from the internal low air loss pump.

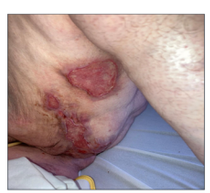


Figure 1. Day 1

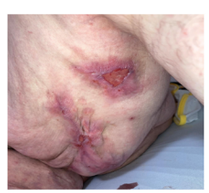


Figure 2. 60 days after CP revision

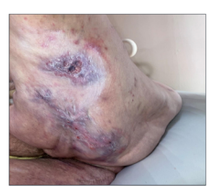


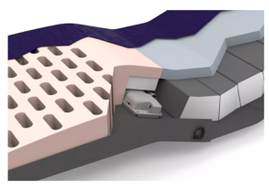
Figure 3.180 days after CP revision

Discussion

Following the Implementation of the CP:

- ➢ Significant reduction (35 – 99%) of posterior thigh wounds observed within the first two weeks
- ➢ Continued reduction (20 – 40 %) of wounds observed in subsequent weeks
- ➢ Decrease in moisture, friction, pressure, and client reported pain

Validated low air loss combined with reactive pressure redistribution provided superior microclimate management, resulting in an improvement in the challenging issues of moisture, pressure, friction, and shear affecting clients skin and wound status.



Conclusions

The use of validated low air loss components combined with a reactive pressure redistribution surface has proven to be effective in managing microclimate and improving recalcitrant moisture, friction, and shear-associated skin and wound conditions. This case study highlights the importance of a collaborative and individualized client-based approach, as well as the value of leveraging industry partnerships to explore treatment options that can enhance quality of life.

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0011

A Pressure Injury Prevention (PIP) Quality Improvement (QI) Pilot of Sub-Epidermal Moisture (SEM) in Acute Care

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Abstract

The Provizio SEM Scanner is a non-invasive, portable skin assessment device used to augment pressure injury risk and skin assessment by detecting inflammation within damaged sub-epidermal tissue four to five days before the signs of a pressure injury are visible[1,2].

Introduction / Background

Early pressure-induced cell and tissue damage begins at a cellular level[3].

Ischemic damage caused by occlusion of blood vessels can take several hours to develop however, cell deformation occurs within minutes when tissue is exposed to high pressure strains[4]. There may be clinically significant tissue damage before visual or tactile symptoms, such as discoloration or changes are observed on the skin surface. The current approach of visual skin assessment is a macroscopic observation attempting to identify microscopic changes, which identifies existing damage rather than preventing it[5]. Tissue inflammation is the first response to damage and causes increased dilation and permeability of surrounding blood vessels. This leads to leakage of plasma and fluid, creating a layer of sub-epidermal moisture (SEM). Increased vascular permeability allows fluid to enter the extravascular space leading to a build up of edema, which is not visible to the naked eye[6]. SEM is a biophysical marker, a product of the leak of plasma after the inflammation process, which increases local vascular permeability[3]. This objective biomarker can potentially allow for the detection of pressure injuries before visual manifestation occurs[1].

The objectives of the Provizio SEM Scanner Pilot were to:

1. **Evaluate the impact of SEM assessments on facility-acquired pressure injuries**
2. **Evaluate the impact of SEM assessments on the current standard of care**

Methods and Materials

The QI proposal was developed and submitted to the University of Alberta Research Ethics department for review by the PIP Program Lead; ethical approval was not required. One 33-bed Medicine unit at the Misericordia Hospital (Covenant Health) was purposefully selected to implement and evaluate the technology within the current practice. This decision was based on having baseline data, PIP champions, engaged leadership providing operational approval and an engaged Clinical Nurse Educator (CNE).

In partnership with ARJO, an implementation and education plan was developed to conduct the six-week pilot of the Provizio SEM Scanner from September 6th-October 14th, 2022. A baseline pressure injury audit of all patients using a head-to-toe method was conducted one month prior to the pilot.

One-hour education sessions were available to all disciplines working on the unit for a two-week period. The in-person education sessions, in collaboration with the PIP leads and industry, included a standardized PowerPoint presentation about the technology, a review of the current standard of care within the SSKIN+ bundle (skin and risk assessment using the Braden Scale, support surface, keep turning and repositioning, incontinence and moisture management, nutrition and additional (+) interventions such as sacral prophylactic dressings and patient education), hands on scanning on a heel and sacral model, and one return demonstration on one consenting patient. All educational resources were made available on the unit during the implementation. Staff support was provided by daily (during day and evening) in- person support from ARJO, the CNE and PIP Lead.

SEM assessments were conducted based on inclusion/exclusion criteria (Figure 1) and a co-designed assessment protocol (Figure 2) Scans were completed during morning risk and skin assessments and documented on a paper patient data record (Figure 3)

INCLUSION CRITERIA	EXCLUSION CRITERIA
• Minimum age 18 • New admission to unit • Braden Scale Total Score 18 or less, or if clinical judgment indicates • Patient, family, or legal representative able to provide verbal implied consent (written optional) • Heels and sacrum accessible to scanning and skin is intact	• Physical act of performing inspections and measurements contraindicated due to patient condition (for example, safety risk or end of life)

Figure 1.

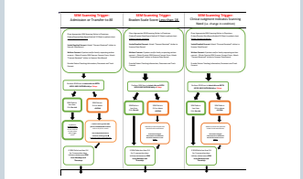

Figure 2.

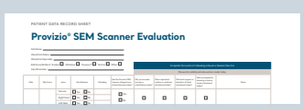

Figure 3.

Results

Post-pilot facility acquired rate decreased from 9% at one month baseline to 0%. A total of 2039 scans were completed on 97 patients. A total of 69 patients had a SEM Delta of 0.6 or greater, no skin discoloration and were assessed at low risk for the development of pressure injuries with the Braden Scale. 74% of clinical decision-making was changed due to SEM scans.

SEM Delta results in the sacrum and heels trended downwards over 6 weeks. (Figures 4, 5 and 6)

Figure 4.

Figure 5.

Figure 6.

The assessment protocol was modified week four based on feedback from the implementation team. No adverse events were reported. No patients refused to participate in the pilot and no patients requested written consent to participate. Two patients developed pressure injuries due to non-adherence to preventative interventions. All assessments and interventions were performed by Nursing staff and nursing students. A total of 20 staff, 8 student and 1 patient evaluations were received with most of the staff stating they would adopt this technology into practice and that the pilot was worth the effort. A cost-avoidance analysis identified an annual cost savings of $1,446, 991 for pilot unit. These projected cost-savings are currently undergoing an independent validation within the organization.

Discussion

The pilot was successful in completing the objectives and identified adaptations, barriers and facilitators related to the technology in practice. The main facilitators included having a dedicated implementation team including a pilot and implementation lead, champions, leadership, and industry support. Two groups of nursing students were highly engaged in the pilot. Operational leadership was critical to support the time required to implement the pilot within the allotted time frame. Leadership played a pivotal role in being receptive to exploring the targeted innovation in practice. The main barrier identified by both front-line teams and leadership was the perceived cost of prevention and the technology. Front-line nurses expressed concerns about the cost of preventative interventions such as support surfaces and prophylactic dressings. Some staff were concerned about the time and effort to upgrade support surfaces and there was no algorithm available nor support surfaces to provide surface upgrades to patients. Projected sensor consumption was not calculated pre-pilot and the incremental cost required ongoing approval from financial stakeholders.

The second critical barrier was the lack of collaborative practice as nursing was the only discipline to participate in the assessments and interventions. Staff continued to perform scans without reviewing the previous scans and interventions to evaluate the response to the interventions. All disciplines must be aware and involved in assessments, strategies, and evaluation of the response to the interventions. A multi-disciplinary approach is also important to support patient and family awareness, engagement, and education in pressure injury prevention. Additional barriers included lack of time, workload, competing priorities and confidence in technology.

Three scanners were provided however the staff suggested that more scanners would be helpful. The pilot took place September 2022 and according to the leadership, teams were experiencing post-pandemic fatigue. During weeks 4 and 5 some patients were diagnosed with COVID-19 increasing workload and stress. Staff did report that participation in the pilot was a welcome change as they were excited to participate in the evaluation of a technology that had the potential to make a difference. Adaptations to the protocol were made during week 5 based on feedback to reduce sensor consumption while continuing to monitor SEM responses. These included modifying the inclusion criteria with a Braden score of <18 rather than 18 or<, consulting Allied Health teams for independent patients who had a SEM Delta of 0.6 or >, scanning until the SEM Delta was <0.6 for two rather than three consecutive days, and scanning patients on one side of the unit on evening shift to reduce workload. This adaptation did not negatively impact pilot outcomes. Staff responded favorably to this adaptation as there was a better fit within the current work flow processes.

Conclusion

The Provizio SEM Scanner technology informed providers of the objective risk for the development of pressure injuries and enhanced early and targeted anatomy specific interventions. SEM assessments contributed to higher quality care, elimination of preventable facility-acquired pressure injuries and an estimated cost avoidance of $1,446,991 annually which is currently under internal review. This small pilot identified the gaps in the teams collaborative practice model of care and highlighted the need for further education and engagement related to role clarity and implementation and evaluation of the SSKIN+ bundle. In collaboration with operational leadership, front line teams and the Pressure Injury Prevention Program, current care processes related to pressure injury prevention interventions are currently being updated.

The organization is reviewing the results and recommendations and will determine how this technology can add value and translate into capacity and workload benefit. Covenant Health is collaborating with Alberta Health Services to determine next steps in alignment with research and QI provincial road maps for potential scale and spread within the province of Alberta, and exploring funding opportunities. Assessment of organizational readiness related to predefined evaluation parameters and unit-level readiness related to collaborative practice and application and evaluation of the SSKIN+ bundle through regular education, are key lessons learned. Taking time to adapt and self-organize knowledge to the local context may improve acceptance and adherence to best practice changes[7]. When end users are engaged in the process of adapting knowledge to the local environment, there is a greater sense of ownership over its' use. The Provizio SEM Scanner 6-week pilot was a successful QI initiative conducted in partnership with Covenant Health teams at all levels and ARJO. Knowing the patient's individual responses to pressure and shear forces, using technology, such as SEM measurement, will enable the detection of anatomical areas responding adversely.[8]

Thank you to the Covenant Health Clinical and Operational Leadership, front line teams and ARJO for their participation and support.

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Interprofessional Wound Care Team Competency Framework: Results from a Canadian adapted e-Delphi Study

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UQTR Université du Québec à Trois-Rivières

Background

- An **interdisciplinary** health care **approach** is essential to adequate wound care [1].
- There is **no consistent framework** to support interdisciplinary wound care teamwork in Canada.
- A **comprehensive** framework requires competencies that consider a **variety of stakeholders and lenses**.

Aim

- **Seek expert consensus** in both Canada and internationally on core competencies **to prevent and manage** all types of wounds inclusing diabetic foot ulcers (DFUs) within a team.
- **Create framework** with competencies **transferable** across different organizations, provinces, territories and wound types.

Method

Draft
- Rapid Reviews [3]
- Content

- **Blind extraction** of draft competencies from Wounds Canada Best Practices
- **Rapid review** of existing frameworks:
  - Medline
  - Grey literature
- Integrated valuable info. from rapid review to create **preliminary draft.**

Feedback
- Team Draft Iterations

- **8 Co-PIs** provided **feedback on all competencies** of preliminary draft.
  - Clarity, redundancy, novelty

Online Questionnaire
- Qualtrics
- Team Pilot

- Online questionnaire created using **Qualtrics software**.
- Composed of **156 competencies** and **open-ended questions.**
- Relevance of competency rated using **9-point likert scale.**

Adapted e-Delphi [4-5]

3 Anonymous Rounds
- Demographic Data
- Agreement on Relevance
- Open-Ended Questions

- **Experts invited** to 3-round e-Delphi via email.
- **Round 1:** Agreement rating of **156 competencies** and open-ended questions.
- **Round 2:** Agreement rating of competencies **<80% agreement** and **new competencies.**
- **Round 3:** Feedback on definition of **"Wound Care Expert".**

International Validation
- Expert International Wound Care Perspective
- Qualtrics Online Questionnaire

- **International experts** invited to participate in an online questionnaire via Qualtrics
- **Relevance and comprehensiveness** of all 7 roles evaluated using **5-point likert** scale
- **Open-ended questions** to gather any feedback, comments or suggestions to improve the framework

Patient Perspective Captured

6 patients/caregivers provided feedback on the framework:

✓ Evaluated 19 directly **patient-related competencies** and shared/explained opinions of agreement or disagreement.

✓ CanMED **definitions** assessed.

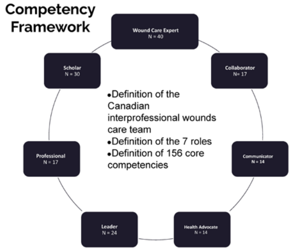
✓ Shared **challenges** and **obstacles** to be solved through framework.

✓ Suggested **potential competencies** addressing areas missed.

Transdisciplinary patient-oriented research

Results

Projected Competency Framework

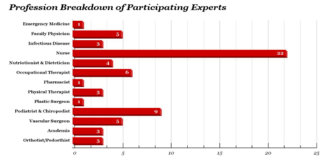


- Each competency was **categorized** to one of the **CanMED roles** [2] and corresponds to an attribute that could be **found in at least one professional** in an adequate wound care team.
- These **roles** were defined **within the context of a wound care team.**
- The **definitions** of these roles **evolved** throughout the study as **feedback and multiple lenses were considered.**

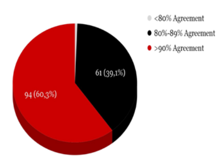
Experts

- **N= 66 wound care experts** from **10 different provinces** representing **13 different stakeholders** participated in the e-Delphi study.
- **Canadian Provinces/Territories included:** ON, BC, QC, MB, SK, AB, NS, NB, YT, NT
- Expert **experience** in limb preservation ranged from **2-16+ years.**

Profession Breakdown of Participating Experts

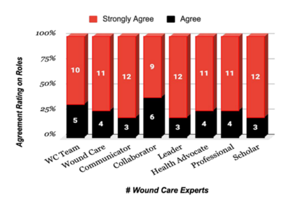


Adapted E-Delphi



- **44% response rate** out of 149 invited experts.
- **155** out of the 156 competencies were **selected** to be kept as part of the **final framework** as they reached an agreement percentage **above the 80% threshold in round 1st round.**
- The final competency was later agreed upon in **2nd round.**
- The **communicator role** was the **most agreed** upon. as 13/14 competencies reached 90% agreement.
- The definition of a **wound care team** was agreed upon in the **3rd round**

International Validation (n=15)



- **100% of experts** either **agreed or strongly agreed** on the relevance, accuracy and comprehensiveness of each role and its competencies.
- **Relevance and accuracy** was **strongly agreed** upon **74%** of the time and **comprehensiveness** was **strongly agreed** upon **66%** of the time.
- **All feedback** provided was **positive and encouraged implementation of the framework**
  - *"Excellent framework that should be globally implemented"*
  - *"Terrific work and I hope you export this from Canada worldwide!"*

Conclusion

- **Foundation** when beginning to **establish** novel and **adequate wound care teams for prevention and management of DFUs.**
- Promote **consistent practices and team approach** across Canada when preventing and managing all types of wounds..
- Emphasize importance of **interdisciplinary health care** and **accessibility to different specialists** to provide patients the best care.
- Support **education**. within wound care teams and patient interactions.

Next Steps

- Developing **indicators for competencies.**
- **Implement** framework into practice.

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DRESSED FOR SUCCESS: PREVENTION OF RADIATION INDUCED SKIN BREAKDOWN IN BREAST CANCER PATIENTS USING SOFT SILICONE FILM DRESSINGS: RESULTS OF A CASE SERIES WITH PATIENT REPORTED OUTCOMES

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Background

Radiation dermatitis (RD) is a common adverse effect of radiation treatment (RT) with 95% of patients experiencing some degree of radiation induced skin reactions, such as erythema, pruritis, pain and edema[1]. Nearly all women who receive RT for breast cancer experience some degree of RD. Evidence for the use of a soft silicone film dressing applied prior to RT commencement has been investigated in randomized clinical trials with statistically significant results in reduction of RD severity in breast cancer patients[2-3], including statistically lower incidence of grade 2 and grade 3 RD versus standard of care[3].

Purpose

This case series was conducted in a NSWOC-led outpatient clinic located in Vancouver, CA where use of SSF to prevent RD in breast cancer patients is standard practice. The purpose of this case series and post-RT patient survey was to describe clinician observed and patient reported outcomes (PROs) associated with using soft silicone film (SSF) dressings to prevent radiation dermatitis (RD) in breast cancer patients undergoing radiation treatment (RT).

Radiation Dermatitis Severity Scale

DERMATITIS RADIATION Adapted NCI CTCAE (Version 4.03)				
GRADE 1 (Mild)	GRADE 2 (Moderate)	GRADE 3 (Severe)	GRADE 4 (Life - threatening)	GRADE 5
Faint erythema or dry desquamation	Moderate to brisk erythema; patchy moist desquamation, mostly confined to skin folds and creases; moderate edema	Moist desquamation in areas other than skin folds and creases; bleeding induced by minor trauma or abrasion	Life-threatening consequences; skin necrosis or ulceration of full thickness dermis; spontaneous bleeding from involved site; skin graft indicated	Death

BC Cancer. Symptom management guidelines: Radiation dermatitis. Retrieved from http://www.bccancer.bc.ca/nursing-site/Documents/16.%20Radiation%20Dermatitis.pdf

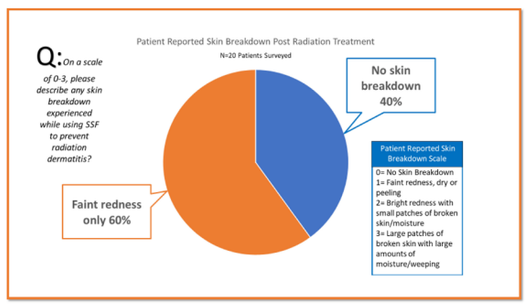
Methods

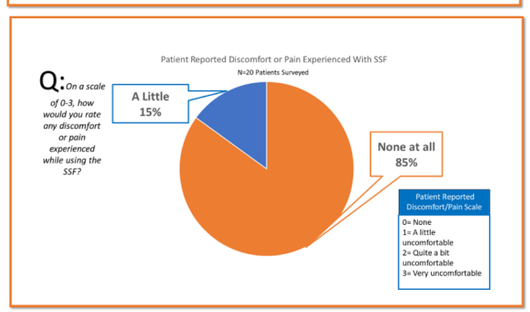
Within 24 hours of starting RT, SSF dressings were applied to the breast area of 20 women and remained in place during and up to two weeks after RT completion. Clinical data collected by a certified wound care nurse included regular skin assessment and surveillance for RD development. PROs were collected via telephone surveys after RT completion and asked patients to rate RT related skin breakdown, impact of the SSF on daily life, SSF related pain and willingness to recommend the SSF intervention to other breast cancer patients undergoing RT.

Skin Assessment Data

Pt ID	Age	Radiation Treatment Cycles	Skin Breakdown
1	73	5	None
2	46	15	None
3	49	30	None
4	67	5	None
5	76	5	None
6	51	15	None
7	44	16	None
8	53	20	None
9	32	25	None
10	36	15	None
11	54	25	None
12	51	15	None
13	42	15	None
14	47	15	None
15	29	15	None
16	76	16* BOLUS	None
17	46	15	None
18	56	15	None
19	63	15	None
20	63	15	None

Patient Reported Outcomes





Results

In this case series, none of the patients treated with SSF dressings demonstrated clinical signs of radiation induced skin breakdown. Patient reported outcomes were positive with 40% of patients reporting no skin breakdown and 60% categorizing radiation related skin issues as faint erythema. Patient reported pain or discomfort related to SSF was rated as no pain or discomfort at all in 85%. Fifty percent (50%) of patients rated the impact of the SSF on day-to-day activities as no impact at all. All patients (100%) surveyed recommended this intervention for breast cancer patients undergoing RT.

Conclusion

The positive results from this case series, along with similar results published in our prior case series of 14 patients using SSF during RT[4], provides additional real-world evidence and patient reported outcomes to a growing body of clinical evidence for a simple intervention to prevent a debilitating skin condition resulting from RT. In our study, the application of SSF dressings to protect the skin during RT prevented radiation induced skin breakdown in 100% of breast cancer patients treated. Most patients reported minimal, or no radiation induced skin issues and 100% of patients were willing to recommend this intervention to other breast cancer patients undergoing RT.

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2. Herst et al. (2014). Prophylatic use of mepitel film prevents radiation-induced moist desquamation in an intrapatient RCT of 78 breast cancer patients. Rad Onc, 110(1), 137-143.

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Troublesome Persistent Eschar? Consider a hydrophilic wound dressing to assist autolytic debridement: A case series of 6 different wound etiologies

By Rosemary Hill BSN CWOCN NSWOC WOCC (C) and Erin Meger, BSN RN NSWOC

Aim

The presence of necrotic tissue in the wound bed impedes wound healing by prolonging the inflammatory stage, delaying the proliferative reparative stage, and increasing the risk of infection.[1] Autolytic debridement is a safe, non-invasive way to remove devitalized tissue by utilizing the body's white blood cells and enzymes to dissolve necrotic tissue; however, it may be slower than other methods of debridement. Once establishing suitable vascular support for wound healing, the case series was an effort to establish if a hydrophilic wound dressing(HWD) could assist autolytic debridement by creating a moist wound environment.

Method

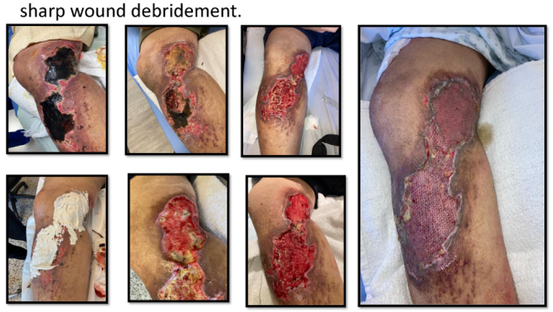
This case series involves a variety of wound etiologies including the following: large crush injury (45 years), surgical dehiscence of an orthopedic surgical repair right ankle (61 years), surgical dehiscence from a mastectomy (87 years), neuropathic ulcer dorsal aspect of foot (77), large burn (84 years), large hematoma (84 years),). In five cases the wound bed was comprised of 100% black eschar, and one case of 100% yellow slough. A "nickel" layer thick of a hydrophilic wound dressing was applied to the eschar/slough and a suitable moisture retentive dressing was applied to cover the wound area. The dressings were changed q48-72 hours. The wound sizes varied with the smallest at 1.8x1.6cm and the largest at 33x23cm. It is noted that suitable vascular support for wound.

Results

In four of the cases the hydrophilic wound dressing completely removed the necrotic tissue while the remaining cases softened the eschar allowing enhanced conservative sharp wound debridement. All cases proceeded to 100% granulation tissue with closure.

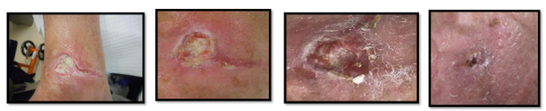
Case #1

History: 46 year old Crush Injury to Right thigh and leg. Hydrophilic wound dressing (HWD) applied, then conservative sharp wound debridement.



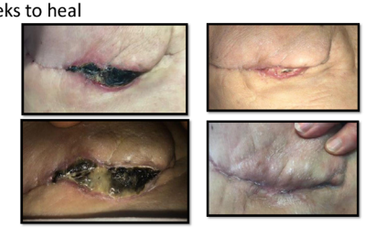
Case #2

History: 61 year old - Surgical repair right ankle, 2.5 weeks of q2—3 days of application of HWD



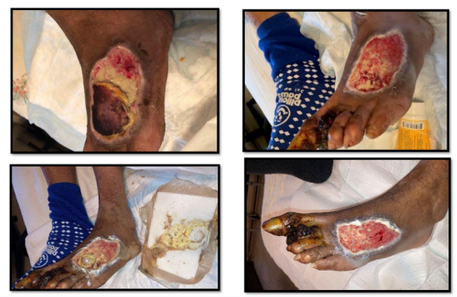
Case #3

History: 87yo Female osteo, hypotension, R breast CA Mastectomy Sx incision Eschar 5.5cm x 2.2cm HWD & Foam 5 ½ weeks to heal



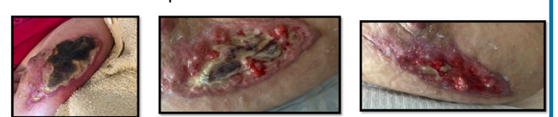
Case #4

History: 77 year old male, DM2, HTN, CAD, PVD, CVA, CRF, insulin, vasodilator, oral hypoglycemic, hemodialysis Right BKA stump with eschar. HWD & foam drsg from Oct 20-Dec 1



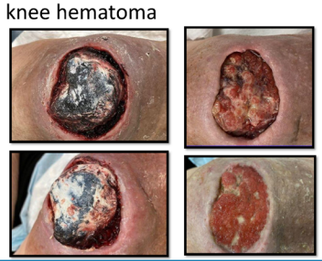
Case #5

History: 84 year old Burn 9.5cm x 4.5cm 3 weeks with HWD 1 ½ weeks with alt product for full closure



Case #6

History: 84 year old (On Xarelto – blood thinner) Fall right knee hematoma



Conclusion

Implication/Application: In certain instances, instrumental debridement may be contraindicated or health care providers do not have the skill in their scope of practice. Wound care clinicians should explore the option of a hydrophilic wound dressing to assist with autolytic debridement.

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Vancouver CoastalHealth

HOME AND COMMUNITY CARE SUPPORT SERVICES
Central East

Incorporating Advanced Wound Imaging into a Nurse-led Wound Care Inter-Professional Team

SWIFT

Michelle Barker[1], Lorrie Ann Scales[1], Tamara Spice[1], Cindy Massey Straus[1], Alison Jamieson[1], Erin Langdon[1], JoAnn Amenta[1], Heba Talla Mohammed[2], Robert D. J. Fraser[2,3]

[1] Home and Community Care Support Services Central East, Whitby, Canada [2] Swift Medical Inc. Toronto, Canada [3] Arthur Labatt Family School of Nursing, Western University, London, Canada

Overview

- Wound care is a crucial component of health care in Canada, with over $3.9 billion spent on direct wound care costs.[1]
- Home and Community Care Support Services Central East Wound Care Inter-professional Team (WC IPT) implemented a mobile digital wound care solution in 2021 to improve chronic wound care outcomes. The WC IPT utilizes their clinical expertise across sectors to collaborate, strategize and provide recommendations and treatment options on clinically complex or non-healing wounds.
- The mobile digital wound care solution was paired with advanced wound imaging (AWI) in late May 2023. The AWI captured:
  1. wound photography and digital planimetry
  2. bacterial fluorescence and
  3. thermography and temperature difference comparison.

  Thermography can indicate inflammation, infection and suggest poor perfusion that may impact oxygen delivery.[2] Fluorescence helps identify areas with high bacterial loads, supporting better wound outcomes by improving treatment decision-making.[3]

SMARTPHONE APP

Swift Skin and Wound (Swift Medical Inc, Toronto) captures scientifically calibrated visible light wound images. AWI enabled measurement to help standardize data collection.

SWIFT ACADEMY

Learning management platform that delivers education to support the use of the technology in the virtual wound care model.

IMAGING DEVICE

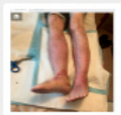
Ray 1 (Swift Medical Inc, Toronto) is a Medical imaging device that fits in your pocket. It enables home health team members to capture thermography and bacterial fluorescence images.

Procedure

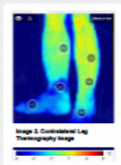
- This quality improvement project assessed the feasibility of incorporating AWI into the WC IPT regional wound care program and its clinical impact on decision-making, such as altering cleansing solution, dressing selection, and antibacterial and offloading management, resulting in increased clinician confidence.
- Patients with chronic non-healing wound(s) that continued to demonstrate no progression towards healing of at least 10% per week and who required frequent wound care dressing changes were eligible for evaluation using the AWI as part of the WC IPT comprehensive wound care assessment.
- A tracking document was utilized to monitor the clinical impact of using the device in the home care setting and collect perception of clinician confidence after AWI.

Case Study #1: Poor Vascular Status

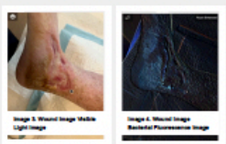
An 82-year-old patient with a non-healing lower limb wound was referred to the WC IPT to re-evaluate and determine if wound could move from a slow-to-heal status to healable. AWI including thermography and bacterial fluorescence were added to the patient care plan. The Ray 1 thermography image showed a lower temperature distal to the right ankle, which correlated with the clinician's monophasic Doppler wave assessment that indicates diminished vascular status.



As noted in the thermographic image shown (image 2), the decreased temperature below the right ankle aligns with the edge of the wound and may relate to decreased vascular flow. This image and data was shared to escalate follow up with the vascular specialist related to bypass failure.



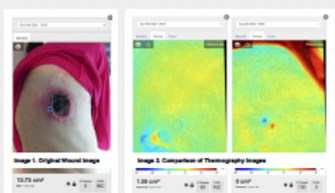
As per the fluorescent images shown (image 4), a pseudomonas (indicated by the cyan colour) was present at the wound edges, augmenting the NERDS assessment of localized bacterial burden and confirming the absence of systemic infection from the STONEES assessment. WC IPT members were able to confidently recommend and initiate a change in the cleansing solution to address bacterial burden and reduce the need to seek emergency medical follow up, and need for antibiotics was ruled out.



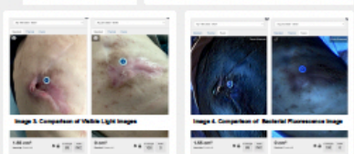
Case Study #2: Pressure Injury

A 60-year-old patient with non-healing pressure injury despite interventions including advanced modalities and adjunctive therapies was referred to the WC IPT. AWI including thermography and bacterial fluorescence were added to the patient care plan.

Ray 1 imaging demonstrated an even skin temperature, which helps to assess if pressure was impeding healing (as noted by the lack of colour change in image 2). Shearing force was suspected, recommending a change in repositioning care, to prevent trauma.



Fluoresecent images (image 4) supported the negative NERDS and STONEES assessments as no cyan or red/pink were shown (indicating no high levels of pseudomonas or bacteria). Data was shared with the physician.



In addition, nursing consulted the wound resource care coordinators and further recommendations were made including; change in dressing type, decrease in dressing change frequency and review of nutritional status as an impediment to healing. Once identified and addressed, healing was supported, avoiding any further complications and no referral for emergency care was needed.

Findings/Results:

- Through the project, 11 Registered Nurses and Registered Practical Nurses were trained on using the AWI device in May 2023. Since then, 63 evaluations have been completed using the Ray 1 device by 6 nurses.
- For these assessment visits, the AWI helped prevent referral for Emergency Department (ED) follow up **10 times** and follow-up care planning was changed **56%** of the time after imaging.

16% Of patients were diverted from ER by AWI assessment

60% Of treatment plans were changed after AWI

56% Of evaluations resulted in increased clinician confidence

Conclusions

- Incorporating AWI into the WC IPT regional wound care program empowered and strengthened the capacity of the WC IPT.
- AWI allowed the WC IPT team to provide virtual and face-to-face wound care consultations, ensuring all patients throughout our region continue to have access to and receive seamless, evidence-based, high-quality wound care.
- AWI enhanced and supported clinician knowledge, judgement and treatment decisions on complex or non-healing wounds. Clinical impact on decision-making, such as altering cleansing solution, dressing selection, antibacterial and offloading management, resulted in increased clinician confidence.

  Challenges included:
  - ➔ Staffing turnover combined with health human resource capacity impacted utilization of AWI.
  - ➔ Lack of long-term evaluation caused difficulty in determining impact on healing outcomes, complications and to avoid unnecessary costs.
  - ➔ Education: More work needs to be done to include referral partners involved in the circle of care.

Applications

- AWI may provide a useful clinical addition to digital wound photography and planimetry.
- AWI demonstrates the potential to expand the tool set that clinicians have access to in the home care setting, promoting value based care in home and reducing patient ED presentation.
- Accessibility of images in a cloud based solutions creates the possibility of sharing with regional wound care teams and experts based at hospitals. Communication is a key part of wound care.

The digital wound management solution with advanced imaging helps keep patients in the home, and ensure they have access to quality and collaborative team based care.

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Muscle Pump Activator (MPA) Device: A Case Study in Managing a Non-Healing Lower Leg Wound and Pain

Author: Angela Arsenault RN, BN, IIWCC-CAN, MN, NP

Aim

To treat a non-healing lower leg ulcer and manage pain using an MPA device

Procedure/Method

- An 81-year-old female admitted to a Long-Term Care facility from a Rehabilitation Centre presented June 13, 2022 with a right leg below knee amputation (July 2021) and a left leg 20x14cm circumferential ulcer.
- The wounds had been present for greater than 3 years. Her pain was 10/10 using a Visual Analog Scale (VAS). Multiple treatment modalities were used with no improvement.
- Comorbidities were hypothyroidism, hypertension, atrial fibrillation, and obesity. Medications were ASA, levothyroxine, metropolol, and hydromorphone.
- The MPA device was chosen based on Harris et al 2020.[1] Consent for photos and publication was obtained. It was initiated September 2022 and placed over the left fibular head.[2]
- Worn 7 days/week, 12 hours/day, the MPA activates calf and foot muscle pumps generating 60% of the blood flow of continuous walking. This action augments venous return, reduces edema, increases microcirculation, and improves blood flow to the wound and periwound area.

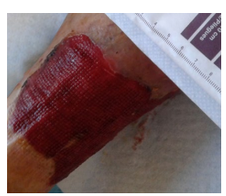
Findings/Results

- Within the first day of treatment the resident described improvement in pain from 10/10
- to 2/10 VAS. Wound surface area decreased by 1cm^2 in the first week. Following 4 weeks of therapy the MPA therapy was reevaluated and the resident's pain returned to 10/10 VAS when the therapy was off.
- It was decided to continue the MPA device to manage pain. In August 2023 the wound dimensions decreased by half and were no longer circumferential, the wound tissue was granulating, and the resident no longer required hydromorphone with a VAS of 0/10..

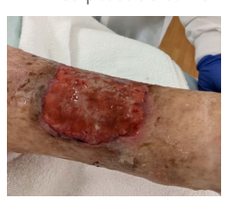
Implications/Applications

- In 2023, Bull et al reported that the MPA device improved the rate of wound healing twofold over a four-week period in a 60 patient RCT.
- In the same study, reduction in VAS pain score was greater for patients who received the MPA device when compared with patients who received Standard of Care (SOC) only.[3]
- The application of the MPA device can significantly improve wound healing outcomes and decrease/alleviate pain. The resident expressed that using the MPA device was a positive experience, and she was pleased to have her pain managed.

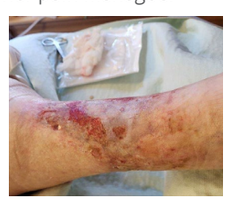
June 13, 2022



December 21, 2022



January 28, 2023



August 1, 2023

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0018 Alberta Atlas of Healthcare Variation: Pressure Injuries in Long Term Care

Erin Thompson, Senior Project Manager, Improving Health Outcomes Together (IHOT); Michael Sidra Senior Program Director, IHOT; Charlene Brosinsky, Advisor, Accreditation; & Marlene Varga, Clinical Nurse Specialist, Covenant Health

Alberta Health Services (AHS)

BACKGROUND

Pressure injuries can result in extensive harm and suffering, chronic wounds, or death[1]. Most are preventable!

What is the prevalence of Pressure Injuries[2]?

- 26% in all healthcare institutions across Canada
- 29.9% in non-acute care settings
- 22.1% in mixed healthcare settings
- 15.1% in community care

What is an Atlas of Variation?

An Atlas of Variation is a document or tool that analyses information routinely gathered by the health system and shows how healthcare varies across geographic areas, clinical areas, and across time.

Why is understanding variation in Pressure Injuries important?

- Consistent and evidence-based healthcare practices for pressure injury prevention (PIP) are essential: resident care should **not** vary unnecessarily by healthcare environment or by care provider.
- Variations in care may lead to poor patient outcomes because of harmful or ineffective interventions.
- Understanding this variation is critical to improving the quality, value, and appropriateness of healthcare. Some variation is desirable and warranted, but where variation is unwarranted, it signals opportunities for improvement in care.

Long Term Care in Alberta

- In Alberta, long term care facilities are accommodations designed for individuals with complex medical needs who cannot remain at home safely or in supportive living[3].
- They are operated directly by Alberta Health Services (AHS) or by contracted service providers.

OBJECTIVES

The atlas is intended to:

- **Prompt constructive discussion and investigation** on variation in pressure injuries among AHS clinical and administrative leaders and with partners
- **Stimulate action to improve resident outcomes!**

The atlas does **not** suggest ideal levels or judge performance, instead, it offers a data-driven analysis that enables continuous quality improvement.

> *"Stimulating interest and curiosity is the first step towards action and a reduction in unwarranted variation"*
> ~ DaSilva et.al 2016

METHODS

Who was involved?

The Improving Health Outcomes Together (IHOT) Team led a multidisciplinary working group with subject matter experts from AHS and Covenant Health to develop the pressure injury atlas topic which included developing visuals to highlight the variation and the accompanying narrative to provide context to the topic.

How did we do it?

What did we include?

The working group selected three key quality indicators to analyze as noted in Table 1.

Quality indicators are derived based on the coding of the interRAI Resident Assessment Instrument Minimum Data Set 2.0. (RAI-MDS 2.0), which is a point in time assessment. Quality indicators are measures which flag potential quality issues that may need further review or investigation.

Table 1: Pressure Injury Quality Indicators

Code	Quality Indicator	Numerator	Denominator
PRU05	Percent of residents who had a pressure ulcer at stages 2 to 4	Residents who had a pressure ulcer at stages 2 to 4 on their target assessment	Residents with valid assessments
PRU06	Percent of residents who had a worsened pressure ulcer at stages 2 to 4	Residents who had a pressure ulcer at stages 2 to 4 on their target assessment and whose pressure ulcer stage is greater on their target compared with their prior assessment	Residents with valid Assessments
PRU09	Percent of residents who had a newly occurring pressure ulcer at stages 2 to 4	Residents who had a pressure ulcer at stages 2 to 4 on their target assessment and no pressure ulcer at stages 2 to 4 on their prior assessment	Residents with valid assessment excluding those with stage 2 to 4 ulcers on their prior assessment

The Atlas of Variation Pressure Injury Topic examines variation in pressure injury rates across 181 long term care facilities during 2017/18 to 2021/22 using the RAI-MDS 2.0. *Note: The number of facilities varies quarter to quarter.*

Benefits

In long term care facility living, every resident is required to have a standardized assessment completed on admission, quarterly, and with significant change. In Alberta, one of the assessments is the RAI- MDS 2.0, which provides the ability to compare provincially and nationally.

Limitations

A limitation is that the quality indicators do not include Stage 1 pressure injuries, unstageable pressure injuries, deep tissue injuries or mucosal membrane pressure injuries. Pressure Injury staging validity may be a limitation.

Additionally, potential data entry or coding errors entered into the system cannot be adjusted for in the data.

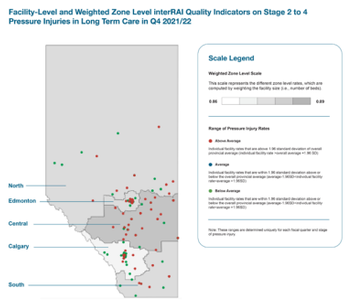
RESULTS

What did we find?

Overall, median pressure injury rates varied between 6% and 7% from 2017/18 to 2021/22, while maximum pressure injury rates showed greater variation over time, between 22% and 47%. We also found larger variation in pressure injury rates in facilities with smaller bed sizes and in subsequent assessments compared to first assessments.

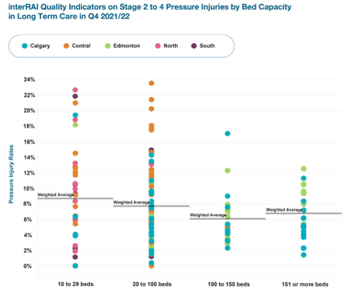
In Q4 2021/22, the weighted Stage 2 to 4 pressure injury rates ranged from 6% to 9% across the zones in the province (Figure 1).

Figure 1: Variation across the Province



In Q4 2021/22, pressure injury rates displayed higher weighted average and larger variations for facilities with fewer beds (Figure 2).

Figure 2: Variation across Facilities and Bed Capacity



CONCLUSIONS

- Mapping variation is an **invaluable tool** for understanding how our healthcare system differs across Alberta.
- Potential reasons for variation may include complexity of residents, resources (e.g. support surfaces, mattresses, staffing, wound care), patient and family factors (e.g. resident choice or lack of awareness and engagement), and prevention strategies.
- Awareness and understanding of variation in pressure injury rates across long term care is critical to improving the quality, value, appropriateness, equity, and effectiveness of healthcare, and represents an opportunity to improve local and systemic approaches to improving prevention in Alberta.
- **Next Steps** may include:
  - ✓ Continuing Care Teams (AHS and partners) investigate opportunities based on the variation highlighted in the atlas.
  - ✓ Continuing Care Teams continue to improve data quality and reporting of pressure injuries.
  - ✓ Continuing Care Quality Teams to support implementation of larger skin integrity processes to put evidence into practice.

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International Guidelines for Pressure Injuries

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Covenant Health

Three Cases of Enhanced Healing of Hard to Heal Wounds Using a Novel Tissue Regenerative Matrix*

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Introduction

- To date, hard-to-heal wounds (HHWs)—those that do not respond to current treatments—represent a considerable source of morbidity due to the population aging and the increasing of comorbidities: hence, the management of HHWs generate considerable health costs.[1]
- It is claimed that as much as half of chronic wounds fail to heal with current treatments.[2]
- HHWs fail to progress through the orderly phases of healing but remain in a self-perpetuating inflammatory stage, despite adequate wound management.[3]
- ECM-based scaffolds are decellularized tissues that can stimulate natural tissue regeneration capacity by providing native tissue-specific ECM signals, directing anti-inflammatory macrophages and activating constructive remodeling.[4]
- In this case series, we report on the use of a novel product to treat wounds that have failed to heal using current treatments including debridement, off-loading, autologous grafts, Negative Pressure Wound Therapy (NPWT), Hyperbaric Oxygen Therapy (HBOT).
- This novel ECM-based human tissue regenerative matrix* is devoid of cellular materials and comprised of intact collagen, elastin, proteoglycans, cytokines and growth factors.

Case History

- We present 3 cases of hard to heal wounds. Participant #1 is a 63 year old female with a necrotic toe-fusion surgical site.
- Participant #2 is a 37 year old male with a charcot foot deformity and large DFU.
- Participant #3 is an 87 year old male diabetic with a non-healing leg amputation site.
- In each case, multiple attempts with current standard and advanced adjuvant treatments did not achieve wound closure.

Clinical Situation

- Participant #1 had exposed hardware removed and persistent dried bone was exposed with a wound size of 5.2 cm x 2.0 cm. The wound remained open for 9 months.
- Participant #2 had a deep infection present and required extensive surgical debridement with a wound size of 9.0 cm x 4.5 cm. The wound was open for 4 weeks.
- Both participants #1 and #2 received standard of care wound treatment (debridement, wound dressings) but failed to close.
- Participant #3 had a stump flap necrose that required debridement. The participant refused revision surgery. Instead, the participant received HBOT and NPWT treatments with slow healing. The wound remained open for 5 months.

Actions Taken

- A new tissue regenerative scaffold derived from human skin* (Fig. 1) was used to treat each participant after debridement and the creation of a lightly bleeding base in each wound.
- For participants #1 and #2, pieces of the scaffold were sized to match the wound area.
- For participant #3, only two pieces of the scaffold measuring 5 cm x 5 cm and 3 cm x 3 cm were available and applied to a part of the open stump wound.

Figure 1. *Tissue Regenerative Scaffold*

- All participants had a secondary dressing applied on top of the scaffold (Tegaderm Silicone foam®) that was changed weekly.

Results

- Participants did not have any complications during treatment. New tissue growth, both in area and depth, was observed.
- In particular, the amputation stump displayed regenerative stimulation of the entire wound site by partial coverage with only 2 pieces of product. Refer to Figures 2-4.

Figure 2. *Participant #1 – Toe Fusion, Bone Exposure.*

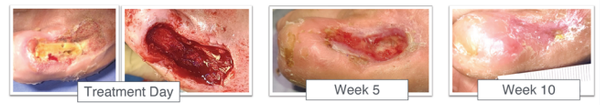


Figure 3. *Participant #2 – Large DFU.*

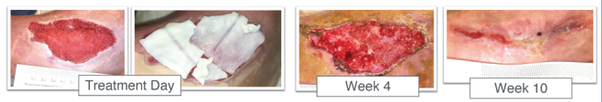
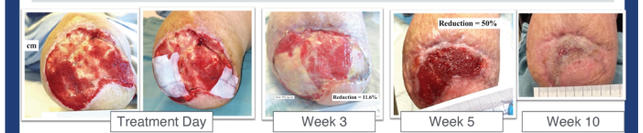


Figure 4. *Participant #3 – Amputation Stump.* *Note partial coverage with tissue regenerative matrix.*



- All participants achieved closure (complete epithelialization) after 10 weeks post treatment with only one application of the tissue regenerative scaffold*.

Implications for Practice

- A new tissue regenerative scaffold* used here provided reduced inflammation, new ECM matrix stabilization and stimulation of the participant's cells to facilitate effective healing.
- This product may help to provide a more effective treatment for HHWs by providing key features missing in current treatments.

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Acknowledgements

*DermGEN™ for the study was supplied by RegenMed under license from DeCell Technologies Inc.

Investigating Reasons for Healing and Non-Healing Ulcers Using Multispectral Near-Infrared Imaging: A Case Series

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Objective

Explore the utility of mobile multispectral NIRS in understanding the factors contributing to the healing or non-healing status of ulcers.

Introduction

Ulcers pose a significant challenge in healthcare, often leading to prolonged suffering, increased healthcare costs, and reduced quality of life for patients. The ability to accurately assess tissue oxygenation and identify factors influencing ulcer healing is crucial for implementing appropriate treatment strategies. Mobile multispectral near-infrared spectroscopy (NIRS) has emerged as a promising non-invasive tool for evaluating tissue oxygenation levels and investigating the reasons behind healing and non-healing chronic ulcers. This case series aims to explore the utility of mobile multispectral NIRS in understanding the factors contributing to the healing or non-healing status of ulcers.

MIMOSA Pro.
MIMOSA Diagnostics Inc.

Methods

A retrospective case series design was employed, involving patients with ulcers who underwent evaluation using multispectral NIRS. A hand-held multispectral NIRS imaging device* that measures tissue oxygenation was used. The device also measured temperature. Patient demographics, clinical characteristics, NIRS findings, wound characteristics, and subsequent healing outcomes were collected and analyzed.

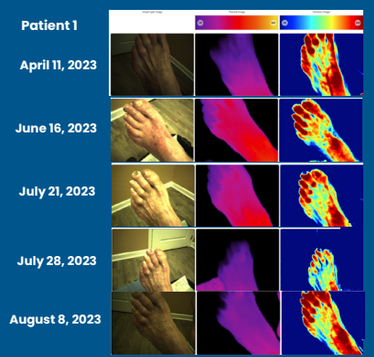
Discussion

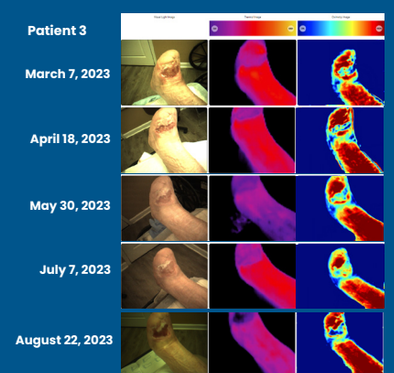
The findings from this case series highlight the potential of mobile multispectral NIRS in investigating the reasons behind healing or non-healing chronic ulcers. By providing real-time and objective information on tissue oxygenation, NIRS aids in identifying underlying factors that influence ulcer healing outcomes. This knowledge enables clinicians to implement targeted interventions, such as optimizing perfusion and modulating oxygenation levels, thereby promoting wound healing and improving patient outcomes. Furthermore, the portability and ease of use of mobile NIRS devices allow for convenient monitoring of tissue oxygenation at various stages of ulcer care.

RESULTS

The case series included four patients with ulcers of varying etiologies, sizes, and durations. Multispectral NIRS analysis demonstrated significant differences in tissue oxygenation levels between healing and non-healing ulcers. The results revealed factors such as impaired tissue perfusion and compromised oxygenation with non-healing ulcers. Additionally, NIRS data provided valuable insights into the effectiveness of ongoing treatment interventions by monitoring changes in tissue oxygenation over time.

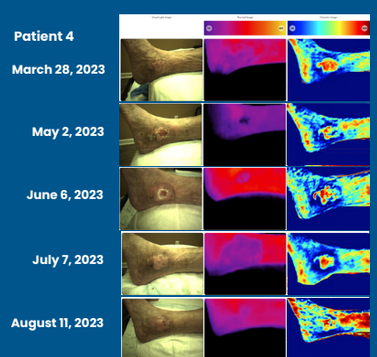
Patient 1 – A 63 year-old man presented with a callus on the tip of the 2nd toe caused by his diabetes, hammer toe and a history of neuropathy, venous insufficiency and PVD. A wound eventually formed. The patient is receiving radiation and chemotherapy for pre-existing lung cancer. The patient is a smoker. The foot was revascularized on June 4th and July 20th. Though the second toe continued to show adequate oxygenation, the wound still persists.





Patient 3 – A 64-year-old man with a wound caused by his diabetes. The patient is a smoker. As a result of gangrene, he required a transmetatarsal amputation (TMA). Post amputation he presented with a diabetic foot ulcer, just above his TMA. Blood flow and his A1C were good. His oxygenation levels fluctuated but were adequate overall. The wound above the TMA site was slow to heal, even with healing ultimately plateauing.

Patient 2 – A mid-70s male with a history of diabetes, chronic kidney disease, and small vessel disease presented with a gangrenous helix with exposed bone. The patient was revascularized and subsequently underwent a toe amputation. Post the toe amputation, a secondary mid-foot amputation was necessary. Due to continued healing issues the patient was admitted to the hospital for a proximal Chopart's procedure. The patient received a graft and began hyperbaric oxygen therapy, supported by Vacuum-Assisted Closure (VAC) and total contact casting. The patient then underwent an open Achilles tenotomy and subsequent wound VAC. The patient just completed 40 hyperbaric oxygen treatments and is on a healing trajectory.



Patient 4 – A 62-year-old man with a history of smoking, alcoholism, significant PVD and venous insufficiency presented with a foot ulcer over his left lateral malleolus (March 28th, 2023). The patient was revascularized on June 26th. Treatments included use of an antimicrobial gel, hydroconductive dressing with multilayered compression, and offloading. The wound progressed well and is close to healing.

Assessing a wound's neovascularization in real time using multispectral near-infrared imaging

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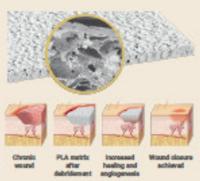
Background

Objective:

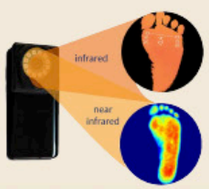
- To assess the wound bed of patients treated with **polylactic (PLA) wound closure matrices** using a novel multispectral near-infrared imaging device to monitor tissue oxygenation and temperature.

Background:

- Chronic wounds are characterized by being arrested in the inflammatory phase of healing, which causes impaired neo-angiogenesis, local hypoxia and low healing potential.
- There is mounting evidence of increased angiogenesis in chronic wounds treated with polylactic acid (PLA) dermal matrices because the **lactate** released by them acts as a paracrine agent (lactormone) with potent signaling effects that include:
  - **Hypoxia mimicking** and triggering of **neo-angiogenesis**
  - **Cell survival and proliferation**
  - **Anti-inflammation**
  - **Wound pH acidification**
- A novel **point-of-care wound imaging device** is capable of assessing tissue oxygenation via near-infrared spectroscopy, and temperature via long-wave infrared imaging, which are indicative of perfusion to the tissue.
- Therefore, we sought to determine whether the vascular changes in a wound bed induced by PLA matrices could be captured using the aforementioned imaging device.



PLA guided closure matrices have a highly porous structure that is designed to be used as a scaffold for tissue repair. However, as the material is degraded in an 8 to 12-week period, it is metabolized to lactate. This increases the local concentrations of lactate in the wound bed and triggers a pseudo-hypoxic reaction that in turn, upregulates VEGF expression and enhances the neo-angiogenesis of the wound bed.

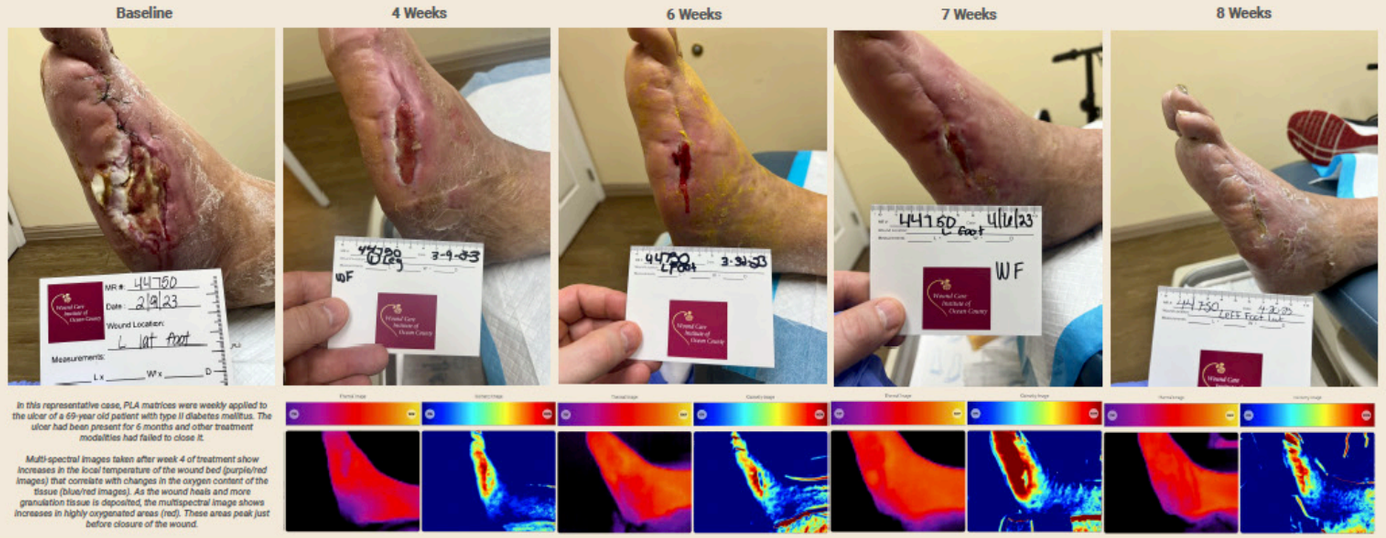


By using a combination of near-infrared spectroscopy and long-wave infrared thermal imaging, a novel handheld imaging device is capable of assessing the tissue oxygenation of the skin and wound beds.

Methods

- A series of 5 patients with chronic wounds received weekly applications of PLA matrices until healing. The **application protocol** was as follows:
  - **Wound bed preparation** - including debridement and hemostasis.
  - **PLA closure matrix application** - including the application of the matrix in intimate contact with the full wound surfaoe, its fixation with a non-contact adhesive barrier, and the application of absorbent dressings and compressive bandages as needed.
- The **wound imaging protocol** consisted in the acquisition of images using the point-of-care device positioned at 20 to 30 cm from the wound bed, and 90° in respect to it, following its manufacturer's instructions.
- The matrices were left to integrate for 7 days. On every subsequent visit, an assessment of the wound was made visually and using a point-of-care multispectral near-infrared imaging device capable of quantifying tissue oxygenation level and temperature in the tissue and week-to-week changes were recorded and correlated with healing.
- A qualitative assessment of the images was performed by a trained user blinded to the treatment or time-points.

Results



In this representative case, PLA matrices were weekly applied to the ulcer of a 69-year old patient with type II diabetes mellitus. The ulcer had been present for 6 months and other treatment modalities had failed to close it.

Multi-spectral images taken after week 4 of treatment show increases in the local temperature of the wound bed (purple/red images) that correlate with changes in the oxygen content of the tissue (blue/red images). As the wound heals and more granulation tissue is deposited, the multispectral image shows increases in highly oxygenated areas (red). These areas peak just before closure of the wound.

- Following the application of PLA matrices, ulcer healing improved significantly in most patients.
- The matrices induced a robust healing response characterized by the deposition of large content of granulation tissue and the apparition of thick epithelial borders in the wound's edge.
- In line with these findings, the oxygen saturation of the wound bed increased over time, as well as the temperature of the peri-wound area.

Discussion

- Animal studies and limited human data have demonstrated that the lactate from the PLA matrices upregulates the production of VEGF, thereby inducing a potent neo-angiogenic response.
- However, in clinical practice, due to practical and ethical concerns, it is not always feasible to obtain tissue samples to assess this healing response.
- The use of novel multispectral near-infrared imaging devices capable of recording and measuring temperature as a proxy of perfusion and the oxygen saturation of a wound bed offers a powerful insight into the physiology of healing.
- These devices are predicted to have a significant impact on the wound treatment paradigms, as they offer non-contact, real-time, and low-cost physiological monitoring of healing tissue.

In summary, here, we confirm how the external administration of lactate into a wound bed leads to an increased angiogenic response that is critical for achieving healing.

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Older Adults Aging in Place: The impact of remote monitoring and education in the prevention of lower extremity wounds

Tracey Rickards,* Christina Roberts*, Surajudeen Shittu*, Tracey Smith*, Karen Cross**

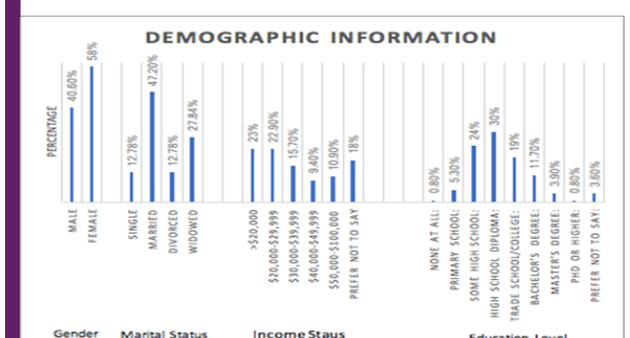
*Faculty of Nursing, University of New Brunswick, NB, Canada , *Faculty of Medicine, Department of Surgery, Dalhousie University, NS, Canada

Objective

Outreach foot care in the community can be used as a tool for engagement with older adults, enabling healthcare professionals to gain entry to older adults' home to facilitate care and support in aging.

Background

Diabetic Foot Ulcers (DFU) are one of the most serious and common complications of diabetes accounting for 70% of all non-traumatic lower limb amputations in Canada (1,2) and are documented as one of the top five most costly hospital admissions (3). Research shows that regularly scheduled interventions can prevent 80% of all DFUs (4-6). Yet, Canada was reported to have the lowest rate of high-risk diabetic foot screening among the UK, USA, New Zealand, Australia, and Germany (7). Through the Mobile Seniors' Wellness Network (MSWN) a multidisciplinary team focused on a holistic assessment, education, and problem-solving with the older adult to enhance their ability to remain in their home safely and with confidence. Approximately 50% of the older adults in the MSWN project are living with diabetes, and many struggle with self-management due to limited income, access to health services, and transportation. Foot care is a service that many older adults cannot afford and have not experienced, thus the MSWN team was able to step-in and fill the gap. We focused on the needs of older adults living rurally and within a 90-minute radius of Fredericton, NB, Canada.



Methods

The MSWN is an intervention study that took place between November 2020 and December 2022 and engaged English-speaking people, 55 years of age and older, in their homes, during the global pandemic. The foot care trained registered nurse visited older adults on six occasions to provide foot care, health assessments, education, and complete wellness referrals. During this timeframe, the Registered Social Worker focused on addressing holistic needs related to quality of life and connected the older adult with required home support services. Validated tools were used to assess anxiety, depression, diabetic knowledge, fall efficacy, frailty, loneliness, quality of life, and diabetic foot ulcer wound classification. The mobile multispectral near-infrared spectroscopy device (MIMOSA) paired with a smartphone was integrated into foot care to provide tissue oximetry and temperature of the feet. This additional quantitative data was valuable to the RN's assessment, foot care interventions, and consultations with specialist physicians.

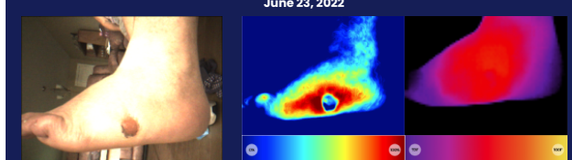
Conclusion

Implementing a widespread diabetic foot screening strategy in Canada such as RNs being deployed to the homes of older adults as outlined in the MSWN project has the potential to save healthcare resources while preventing DFUs and other limb- and life-threatening foot ulcers.

RESULTS

- 366 older adults enrolled, 313 completed with a mean age 75.6 (95% CI +/- 0.89). 6% were living with active DFUs
- 53.8% were high or urgent risk based on the InLow, with the score after 3 visits significantly lower (Mdn = 1; moderate risk) than the baseline (Mdn = 2; high risk), z = -2.09, p = .036 with preliminary analysis.
- Education provided by RNs fostered improved understanding of how to protect the at-risk feet of older adults.
- It was found that overall depression, anxiety, and loneliness scores improved with the team's interventions.
- Older adults were provided with crucial social supports and services to support ongoing aging in place.
- Using the MIMOSA scanner provided RNs with data that influenced therapy decisions and consultations with specialists.

June 23, 2022



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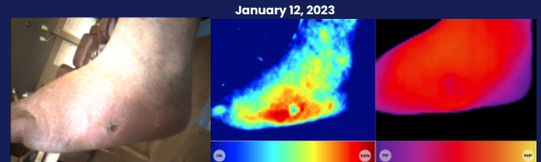

"It was nice to have someone check in on you. Not just the foot care – it's a social thing. It was nice to have access to information if we needed it. I felt wanted – like old people finally matter. We sometimes feel like we are part of the scrap pile."

This program was funded by the Healthy Seniors Pilot Project

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Focus on quality of life with older adults receiving mobile footcare and social support services at home

Tracey Rickards*, Joshua Allen*, Monnah Green*, Christina Roberts*, Tracey Smith*, Surajudeen Shittu*, Lynsey Wilson Norrad*, Karen Cross**

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HELP WITH 'THE LITTLE THINGS' GOES A LONG WAY

Introduction

In New Brunswick, Canada:

- 2nd oldest population with 21.9% aged over 65 (1-3)
  - With a prediction of 31% by 2038 (4)
- 3rd highest percentage of rural-dwelling citizens. (2,3)
- 1 in 9 older adults living below the poverty line (5)
- 2nd highest household food insecurity (6).
- 30% increased use in local food banks in the past year (6)

The Mobile Seniors' Wellness Network (MSWN) is a person-centered, multi-disciplinary mobile health and social support service aimed to address social isolation, frailty, and vulnerability while supporting aging in place for older adults living in New Brunswick. We used footcare as a tool for engagement with older adults. Rural living compounds stressors for older adults such as home maintenance, transportation, food insecurity, financial constraints, lack of social support, and decreased access to healthcare services.

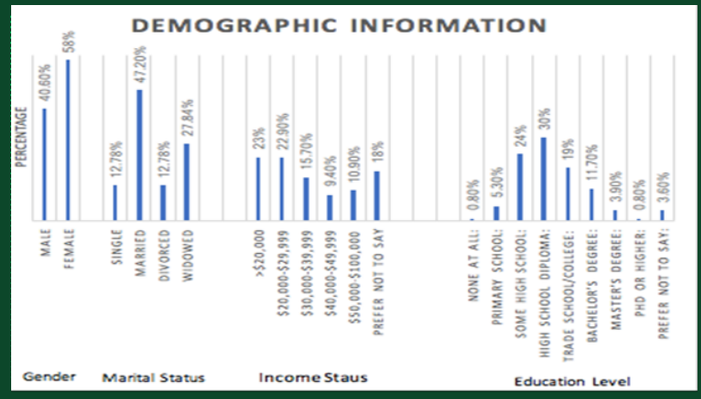
Results

- 366 older adults enrolled, 313 completed with a mean age 75.6 (95% CI +/- 0.89)
- Depression scores after 3-months (M = 4.49, SD = 5.44) are significantly better than at baseline (M = 5.31, SD = 5.50), p = .01. The positive effect at 3-months was sustained at 6-months with no significant change.
- The mean anxiety score decreased significantly from 5.15 (SD = 6.17) before the intervention to 4 (SD = 5.24) after the intervention of 3-months, $t(332) = 5.92$, $p < 0.001$.
- The mean loneliness score decreased from baseline at 1.95 (SD = 1.738) to 1.87 (SD= 1.659) after 3-months of the intervention but was not statistically significant.

"The social worker was very helpful and made me feel like I wasn't going to be left behind or that I wasn't falling through the cracks."

Methods

This intervention study enrolled older adults aged 55 years plus living in rural communities within a 90-minute drive of the province's capital city during the COVID-19 pandemic.
The foot care trained Registered Nurse (FCRN) visited older adults six times with an interval of four-six weeks while Registered Social Workers (RSWs) visited at baseline, three-months, and six-months post-enrollment, and as needed. The FCRN and RSW assessed the older adults' health status and collected data using validated tools including the InLow 60-Second Diabetic Foot Screen (InLow), World Health Organization- Quality of Life Survey (WHO-QOL), MIMOSA Foot Scanner, Brief Patient Health Questionnaire (Brief PHQ), Geriatric Anxiety Inventory (GAI-20), The Falls Efficacy Scale, deJong Gierveld Loneliness Scale, Pictorial Fit-Frail Scale, and The Diabetes Knowledge Questionnaire. Referrals were made to services within the older adults' community through the collaboration of the FCRN and RSW.



Conclusions

With the mobile interdisciplinary team collaboration, older adults had positive outcomes when connected to services and programs supporting aging in place. New connections included services and programs to assist older adults to age in place including home repair grants, food baskets, transportation, home assistive devices, community support, and social engagements. All of which enhanced their confidence to age in place. In the current healthcare crisis, deploying an MSWN model provides quality in-home supports to older adults and is cost-effective.

This program was funded by the Healthy Seniors Pilot Project

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Keys to Sustainable Pressure Injury Prevention in ICU: Interdisciplinary Collaboration and Engagement

Allison Da Silva, RN, WOCC(C), Hetal Bambharoliya, RN, BScN, Trillium Health Partners

Background and Purpose

Pressure Injuries (PI) are a significant cause of morbidity and mortality in patients. Patients in intensive care units (ICU) are the highest risk population with prevalence rates ranging from 12-37%.[1]
Special considerations must be made for the ICU patient population.[2,3]
At Trillium Health Partners (THP), a large community teaching hospital with 61 med-surge ICU beds, results were trending above 20% ICU acquired PI incidence in 2022. This prompted a call-to-action that generated a quality improvement initiative to improve practices in PI prevention. See **Table-1** for long term goals of this QI project.

Build capacity with the point of care staff and unit level leadership- education & resources
Reinforce the standard of care using the hospital's information system
Increase engagement in the ICU team- positive reinforcement and ongoing feedback using data and quality improvement science to enact change ideas with the goal of sustained improvement

Table-1

Methods

A dedicated temporary critical care wound care specialist was added to the ICU team to facilitate this initiative. Representatives from each discipline in ICU participated in change initiatives with a focus on interprofessional (IP) collaboration and accountability. Monthly audits were conducted to monitor pressure injuries, healed wounds, and prevention interventions. Changing the culture around PI prevention in ICU required a different perspective. Using a smart goal with action items **(Figure 1),** the IP team was able to make specific changes to practice and process based on input from all levels.

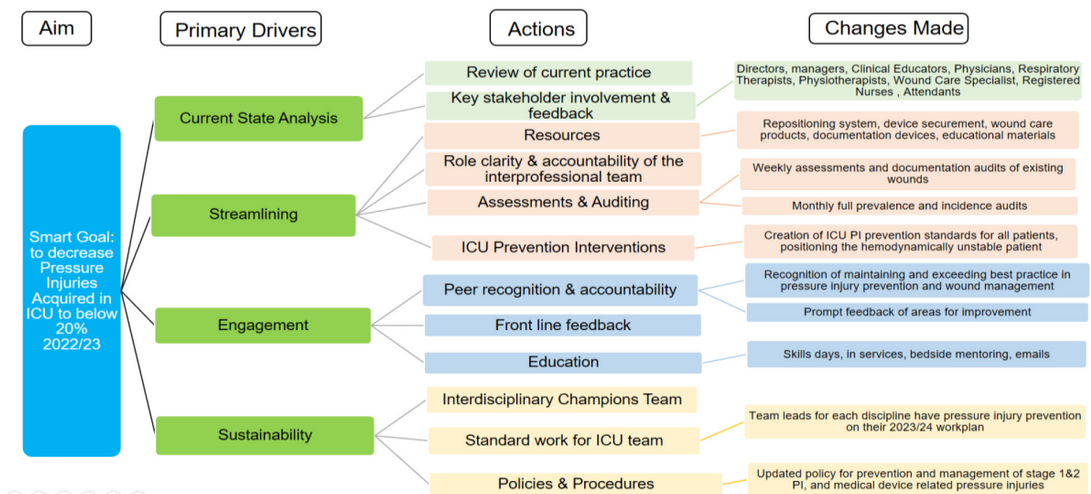

Figure 1: Hospital Acquired Pressure Injury Driver Diagram

Results and Discussion

- 2022/23: monthly ICU acquired PI scores started to decline across units in December 2022 once these actions became standard practice.
- The June 2023 performance result of 5.5% is the best single survey audit result since February 2019 which is a source of pride for teams especially in the face of current capacity and workforce challenges **(Figure 2).**

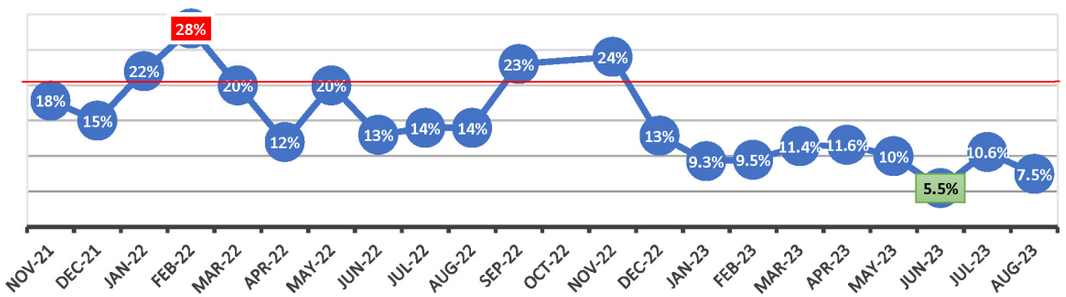

Figure 2: THP monthly ICU Acquired Pressure Injury Rates 2022-23

Conclusion

It is through application of QI methodology and collaboration with all disciplines, the ICU team was able to continuously improve ICU acquired PI rates over eight consecutive prevalence and incidence audits.

Recommendations

- PI prevention must be a continuous top priority in the ICU setting
- Culture change takes time and patience; slow and steady evidence-based focus will produce results
- Ensure clear roles and accountabilities for IP team members supported by leadership with a vision of shared governance.

Acknowledgements

THP ICU staff & physicians, in particular critical care director, managers and educator team as well as our patients and their families.

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Trillium Health Partners

MAKING ORTHOTIC OFFLOADING DEVICES ACCESSIBLE

for people with diabetic foot conditions

A collaboration between BC PharmaCare and health authority professionals

Lori Haggstrom (Ministry of Health) | Shannon Handfield RN BSN WOCC (C) | Rosemary Hill, BSN CWOCN WOCC (C)

Aim

To develop a Ministry of Health/health authority program that ensures access to offloading devices for people recovering from a diabetic foot ulcer (DFU) or other diabetic foot (DF) conditions.

Method

2019: B.C. requests two studies on the use of DFU offloading devices:

- Canadian Agency for Drugs and Technology in Health (CADTH) review
- Health technology assessment (HTA)

The studies highlight that:

- Offloading devices are effective
- Patients face financial barriers to obtain a device

June 2022: PharmaCare partners with the provincial total contact cast (TCC) working group (nurses specialized in wound ostomy continence, occupational therapists, a physiotherapist and an orthopedic surgeon) to provide full-service treatment and post-treatment maintenance care for people with a DFU or DF conditions.

Decision made to develop the program in steps.

Results

January 2023: Step 1 of the program launches. PharmaCare covers offloading devices for patients who have a DFU successfully closed with TCC.

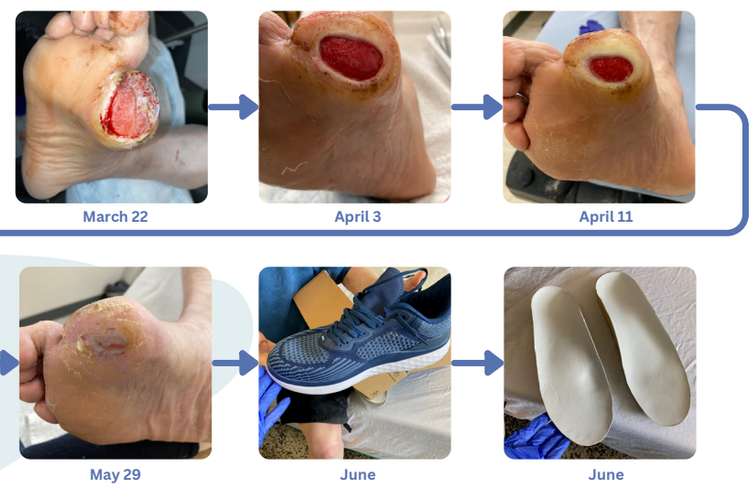
Patients must be referred to a PharmaCare-enrolled orthotist by the health authority outpatient/ community clinic that is providing the wound care treatment. The orthotist applies for coverage of the offloading device.

The referral form, a list of currently approved clinics and orthotists, plus information for patients is available on the PharmaCare website.

Early 2024 (projected): Evaluation of step 1 of the program.

Case study

A 56-year-old presents to clinic with a DFU. They begin TCC. Once the DFU is closed, the patient visits an orthotics provider for an offloading device and footwear.



Conclusion

Through successful partnership, PharmaCare and the TCC working group have made the first step towards a program to treat and manage DF conditions through effective treatment of the wound, followed by an appropriate offloading device. Local, regional and provincial/ territorial processes need to designate human, material and financial resources to support the program.

"Offloading is of paramount importance. Inappropriate pressure must be modified or removed." — Wounds Canada, 2021

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Quantifying Surgical Site Infection Rates in Ontario Using Health Administrative Data

Catherine Liang, Julie Skelding, Carol Kennedy, Jennifer White, Stacey Johnson, Karine Baser

Ontario Health, Clinical and Quality Standards Program

Wounds Canada National Conference 2023

AIM

Surgical site infections (SSI) are the most common type of health care-associated infection among surgical patients. Ontario Health has developed the Surgical Site Infections quality standard addressing care for people of all ages who have a surgical procedure that requires an incision (a cut through the skin). It applies to care in all settings where surgical care is provided and surgical wounds are managed.

To support the spread and adoption of the SSI quality standard, our aim was to quantify the burden of SSIs in the Ontario population. SSI estimates are usually limited to survey data and those reported by select hospitals participating in surveillance networks and thus not provide a complete estimate of SSIs in the population. To address this, we used province-wide health administrative data to examine SSIs across Ontario, stratified by health care setting and sociodemographic factors.

METHODS

We identified SSI diagnoses in hospitalizations and emergency department (ED) visits as infections following a procedure and obstetric surgical wound infections (ICD-10-CA codes T81.4 and O86.0) using the Discharge Abstract Database (DAD) and the National Ambulatory Care Reporting System (NACRS), respectively. SSIs in the primary care setting were identified with ICD-9 code 998 (adverse effects of surgical and medical care) in the Ontario Health Insurance Plan (OHIP) Claims Database.

We defined the SSI rate as the number of health care visits with an SSI diagnosis within 30 days post-discharge from surgery, per 1,000 surgeries. Inpatient surgeries were counted once if multiple surgical procedures were performed within the same hospitalization. Surgeries within the scope of the SSI quality standard included procedures involving an incision identified by CCI codes in the DAD for inpatient surgeries and in NACRS for day surgeries. Procedures with nonconventional surgical incisions (i.e., vaginal hysterectomy, transurethral prostate resection) were excluded. Procedures outside of the scope of the SSI quality standard were also excluded: those involving intravascular catheters, shunts, endoscopy, or pin sites, oral surgeries, and ophthalmological surgeries. SSI visit volumes and rates are presented by various stratifications.

Abbreviations: CCI, Canadian Classification of Health Interventions; ICD-9, International Statistical Classification of Diseases, Injuries, and Causes of Death, 9th Revision; ICD-10-CA: International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Canada.

FINDINGS

In Ontario in FY 2021/22, there were half a million surgeries and over 280,000 health care visits with an SSI diagnosis, almost all of which were in primary care (Fig. 1).

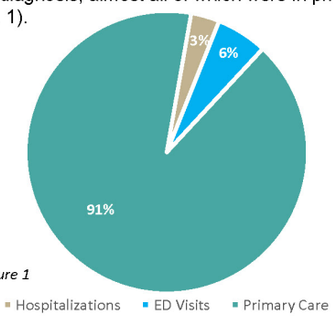

Figure 1

Overall, the FY 2021/22 SSI rate was 134 SSI visits 30 days post-surgery: 5 hospitalizations, 22 ED visits, and 107 primary care visits with SSI, per 1,000 surgeries.

- The highest rate of SSI hospitalizations occurred in people aged 65+, and the highest rate of SSI ED visits 30 days post-surgery occurred in people aged 18-44
- Females had a higher rate of SSI ED visits 30 days post-surgery, while males had a higher rate of SSI primary care visits

Overall, FY 2021/22 surgical volumes in Ontario were evenly distributed by neighbourhood income quintile. However, the number of SSI hospitalizations was 35% higher among people living in the lowest vs. highest income quintile neighbourhoods, while the number of SSI ED visits differed by 26% between income quintiles (Fig 2).

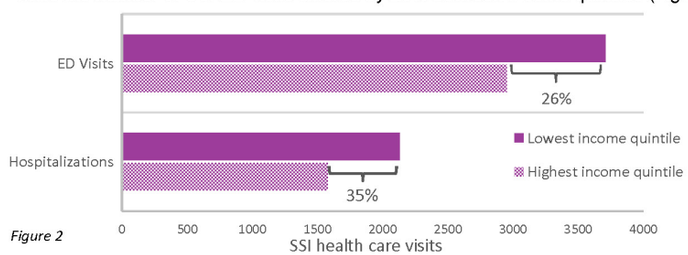

Figure 2

Surgical volumes declined in FY 2020/21, partly due to COVID-19, with a slight increase in FY 2021/22, during which the rate of SSI ED visits greatly increased (Fig. 3).

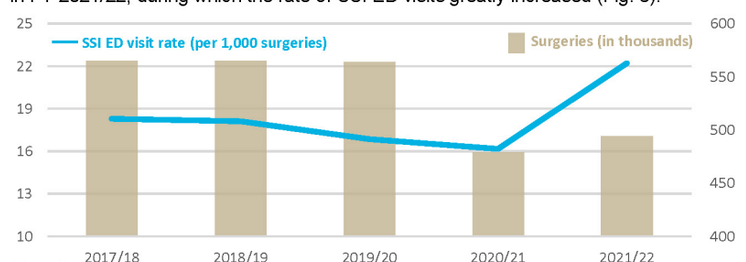

Figure 3

IMPLICATIONS

Health administrative data can be leveraged to estimate SSI volumes and rates in the entire Ontario population. As surgery volumes increase to pre-pandemic levels, the potential for higher overall surgical volumes to be associated with higher SSI rates should be considered. Socioeconomic disparities exist in hospitalizations and ED visits for SSIs. The high SSI rates 30 days post-surgery and large proportion of SSI diagnoses in primary care settings highlight the need for improved coordination during discharge to the community and post-surgical care in the community. The SSI quality standard is intended to help patients and caregivers understand what to expect from clinicians and health care organizations after receiving surgery, and to encourage clinicians and organizations to measure success and prioritize improvement efforts.

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Ontario Health

Effect of a Lipidocolloid Dressing on Extracellular Matrix Synthesis

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INTRODUCTION

Urgotul®, a lipido-colloid dressing, showed a stimulating effect on fibroblast proliferation. During wound healing, the function of fibroblasts is to reconstitute the extracellular matrix network consisting of collagens, elastin, glycosaminoglycans (GAGs), fibronectin, etc. The aim of this study was to investigate the effect of Urgotul® on the extracellular matrix synthesis.

MATERIALS AND METHODS:

Normal Human Dermal Fibroblast (NHDF) were cultivated at 37°C in DMEM supplemented with 10% fetal calf serum to confluency. A piece of dressing or a reference compound (positive control) were applied onto the cell layers for 72 hours. Neosynthesis of total GAGs was measured by [3H]-glucosamine incorporation in GAG fraction and sulphated GAGs by 35S-sulfate incorporation; collagen and fibronectin were quantified using specific ELISA assays; matrix organization was visualized by immunofluorescence according to two protocols, one with permeabilisation of cells before labeling (for the detection at the same time of the proteins in cells and of those already secreted and associated for forming the extracellular matrix) and the other without permeabilisation focused on only the extracellular proteins.

Fig. 1 - Effects of Urgotul on the production/release of soluble (pro)collagen I and fibronectin; ELISA essays

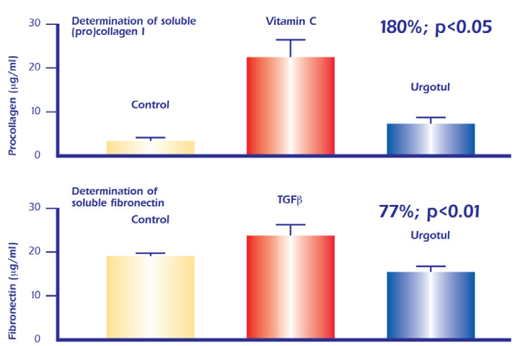
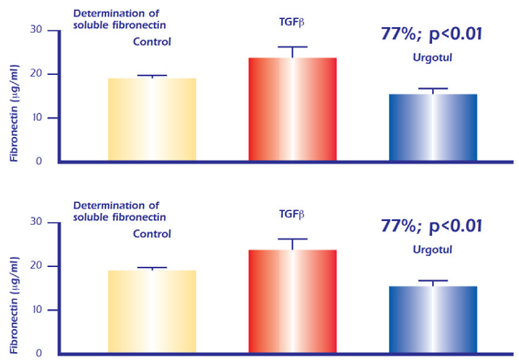


Fig. 2 - Effects of Urgotul on the neosynthesis of total GAGs (glucosamine incorporation in the GAGs fraction) and sulfated GAGs (sulfate incorporation in the GAGs)

* not statistically significant because of a rather high level of fluctuation and a strong stimulation observed with the reference compound (TGFβ)



RESULTS

In all these experiments, Urgotul® did not significantly modify the overall viability of the confluent fibroblast cultures (MTT assays, not shown). Neosynthesis of some components of dermal matrix were stimulated or modified.

Urgotul® stimulated the production/release of soluble (pro) collagen I significantly.(Fig. 1)

Urgotul® moderately stimulated the neosynthesis of glycosaminoglycans by fibroblasts since it stimulated both glucosamine and sulfate incorporation into GAGs from total (soluble + layer) cultures. (Fig. 2)

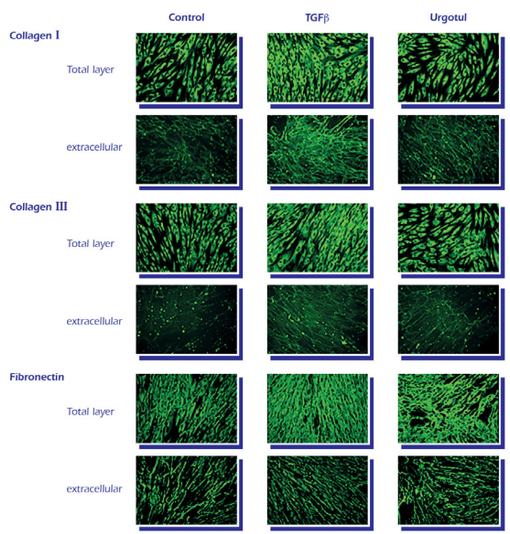
In contrast, the concentration of soluble fibronectin was shown reduced after Urgotul® application. (Fig. 1)

These differences suggested a possible modification of the extracellular matrix produced by the cells after Urgotul® treatment. Fig. 3 shows immunolabelling of selected markers in cell layers. Acccording to the protocol with cells permeabilisation, no clear effect of Urgotul® could be observed.

RESULTS CONT'D

According to the other protocol, Urgotul® seemed to increase the density and the organization of collagen fibres, especially collagen III. In addition, Urgotul® could increase the amount and labelling of fibronectin molecules associated to extracellular matrix. This last result could be in relation with the decrease in soluble fibronectin molecules observed previously. These visual results should be confirmed and precised in further studies.

Fig. 3 - Immunolabelling of cell layers after treatments; for each marker, first row shows total layers (extracellular matrix & incellular proteins; protocol 1, cell permeabilisation); second row represents the label of the extracellular proteins only (no permeabilisation, protocol 2)



CONCLUSION

Urgotul®, a contact layer used in acute and chronic wounds, stimulates fibroblast proliferation and has an influence on dermal matrix synthesis; both activities are potentially crucial for an optimal promotion of wound repair.

A LARGE REAL-LIFE STUDY ON THE USE OF A NOVEL GENTLE SILVER ANTIMICROBIAL BARRIER DRESSING, TLC-AG* IN THE MANAGEMENT OF WOUNDS DURING THE COVID-19 PANDEMIC

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[1]HELBRA, GERMANY; [2]UNIVERSITY HOSPITAL ESSEN, GERMANY.

INTRODUCTION

This study aimed to evaluate the clinical outcomes of wounds at risk of infection or presenting with clinical signs of local infection in an unselected cohort of patients, when treated with…treated with two antimicrobial contact layers impregnated with silver, TLC Ag* (Technology LipidoColloid-Ag healing matrix), under real-life conditions during the COVID-19 pandemic.

The Technology LipidoColloid (TLC) matrix consists of a proven gentle atraumatic non silicone adhesive that incorporates within it the gel forming agent carboxymethyl cellulose. This matrix is coated on to a perforated polymer membrane to allow exudate to freely pass through. The matrix is also incorporated with a powerful yet gentle ionic silver antimicrobial barrier agent that is designed to prevent infection and the construct is then called the TLC-Ag* matrix. In contact with wound exudate, the carboxymethyl cellulose component in TLC or TLC-Ag forms a gentle, nonadherent gel layer that is ideal for placement on sensitive wounds. The matrix can also be applied to an absorbent foam, and then provided with an atraumatic/gentle border to form the bordered version of the TLC Ag bordered products.

Both the TLC technology and the silver containing TLC Ag technology have been studied via randomized controlled trials (RCTs). Due to its very gentle nature, the TLC technology has also been studied, demonstrating excellent results, on the pediatric population which is deemed a population particularly sensitive to pain for obvious reasons. Remarkably, it is one of the very few dressing technologies which have been studied on a large cohort of pediatric patients with epidermolysis bullosa, a condition that is associated with much pain and misery. RCTs on the technology that have been done, consisted of well structured inclusion and exclusion criteria that may exclude some patients who present with wounds at the clinics and are still good candidates for the novel dressings. This study reported is a somewhat different in that it is a large observational study with an "all comers" approach, an approach that is true to real life, in the sense physicians will use the product as they deem it fit for any patient they treat.

The objective of this study was to check if clinical effectiveness, a hallmark of observational studies, could be established on a large population of patients treated with all the variables, such as serious advanced age, comorbidities, the use of immunosuppressive drugs, etc. that are screened out of tightly controlled randomized controlled trials that are more designed show clinical efficacy than clinical effectiveness.

METHOD

A large (728 patients), prospective, multicentered, observational study with two TLC-Ag dressings (TLC-Ag, and TLC-Ag bordered) was conducted between May 2020 and May 2021. After recording the description of the treated patients and wounds, the main objectives were to assess the wound healing outcomes, the changes in wound infection status over a maximum period of four weeks of treatment. Also, the overall clinical assessment of performance, local tolerance and acceptability of dressings were studied. All patients received adequate standard of care, judged appropriate by the investigating physicians, considering their expertise in this field of wound care. Reduction of antibiotic usage over time was monitored.

RESULTS

A total of 728 patients with wounds of various etiologies and wound infection status were treated with the evaluated dressings in 39 centers for a mean duration of 26±19 days, with an intermediate visit conducted in 712 (97.8%) patients after a mean period of 12±9 days. At the initial visit, it was established that the majority of patients (60.4%) had a wound infection, based on direct indicators and/or clinical signs, while the remaining cohort presented first one or some (not all) clinical signs of a local wound infection (25.1%) or were at risk of wound infection based on clinical judgment (13.2%) (unclear status in 1.2%). Throughout the study period, all the parameters of wound infection continuously decreased, resulting at the final visit in a reduction by 78.9% of the prevalence of local wound infections and by 72.0% of the clinical signs of wound infection, the most rapidly diminished clinical sign being wound deterioration. Table 1 and Figure 1 shows the change in wound infection, direct indicators and clinical signs of wound infection over the treatment period.

Concurrently, in terms of the healing process, 92.1% of the wounds healed or improved, 3.2% remained unchanged and 1.7% worsened (data missing for 3.0%), and an improvement of the periwound skin was reported in 65.7% of the patients (Figure 2). Overall, the two dressings were 'very well accepted' by the majority of patients, with no uncomfortable feeling at wearing and no pain at dressing removal. The TLC Ag technology was assessed by the physicians as 'very useful' in the majority of the cases with a 'very good' efficacy in terms of antimicrobial activity and promotion of the wound healing process. Similar results were reported regardless of the wound type treated or of the TLC-Ag dressing evaluated. Final results of these patient and clinician inputs are shown in Figure 3. Success of the dressing seen under the challenging times of COVID 19 when many patients had to change dressings at home shows that this TLC Ag technology is patient friendly enough for them to learn how to use the product, and to use it successfully at home without visiting a clinic.

CONCLUSION

These results are consistent with previous clinical evidence on TLC-Ag dressings. They support the good efficacy, good tolerability and usefulness of these antimicrobial dressings in the management of patients with wounds at risk or with clinical signs of local infection, in association with appropriate standard of care.

Table 1. Change in wound infection, direct indicators and clinical signs of wound infection over the treatment period

	Initial visit (n=728)		Intermediate visit (n=728; 16 missing visits)		Final visit (n=728; 22 missing visits)		Reduction versus initial visit	
	n	%	n	%	n	%	Intermediate visit (%)	Final visit (%)
Wound infection	**440**	**60.4**	**247**	**33.9**	**93**	**12.8**	**43.9**	**78.9**
Direct indicators of wound infection	**304**	**41.8**	**155**	**21.3**	**72**	**9.9**	**49.0**	**76.3**
Purulent discharge	199	27.3	67	9.2	13	1.8	66.3	93.5
Surgical septic wound	97	13.3	47	6.5	30	4.1	51.5	69.1
Positive laboratory test*	101	13.9	58	8.0	35	4.8	42.6	65.3
Clinical signs of wound infection	**600**	**82.4**	**382**	**52.5**	**168**	**23.1**	**36.3**	**72.0**
Spontaneous pain/tenderness	366	50.3	197	27.1	71	9.8	46.2	80.6
Increased local temperature	356	48.9	158	21.7	33	4.5	55.6	90.7
Induration/swelling/oedema	258	35.4	137	18.8	74	10.2	46.9	71.3
Increased in level of exudate and/or change of exudate colour or smell	216	29.7	73	10.0	19	2.6	66.2	91.2
Wound enlargement/worsening	124	17.0	8	1.1	5	0.7	93.5	96.0
Wound stagnation/wound healing delay	84	11.5	35	4.8	15	2.1	58.3	82.1
Erythema	25	3.4	16	2.2	1	0.1	36.0	96.0
Suspicion of biofilm presence	22	3.0	8	1.1	3	0.4	63.6	86.4
Others	20	2.7	19	2.6	10	1.4	5.0	50.0

*Laboratory tests were performed in 178, 118 and 94 patients at the initial, intermediate and final visits, respectively.

Figure 1

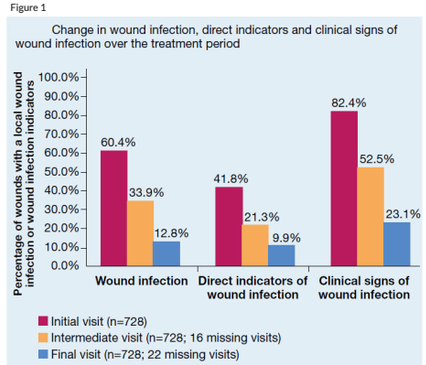


Figure 2

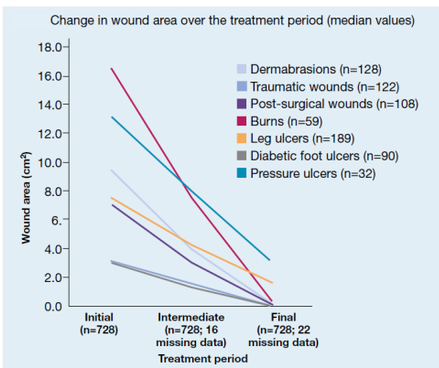
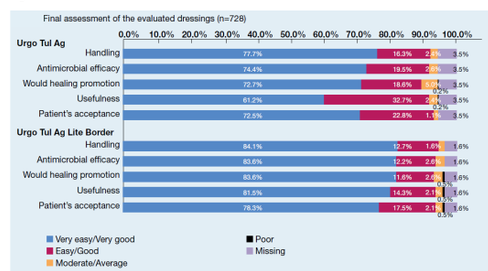


Figure 3



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*TLC Ag Dressing: Urgotul Ag and Urgotul Ag bordered dressings, Urgo Medical

Poster was created with support from Urgo Medical North America

Validation of a sub-epidermal moisture scanner for early detection of pressure ulcers in an *ex vivo* porcine model of localized oedema

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Introduction

Pressure ulcers (PUs) represent one of the leading unsolved medical complications worldwide, affecting 2.5 million patients and costing upwards of twenty billion dollars annually in the US alone.
It is crucial to detect damage early and put appropriate care in place.

Detecting PUs currently relies on subjective tissue assessment such as visual skin assessment (VSA).
Relying on visual skin changes means that objective and anatomy-specific preventive care typically does not begin until damage has already occurred and visibly manifests on the skin surface.

CLINICAL NEED
There is an unmet need for solutions that can detect early tissue distress prior to visual damage occurring.

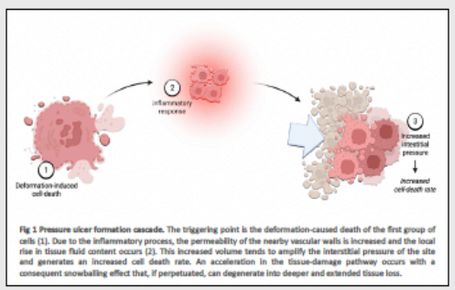


Fig 1 Pressure ulcer formation cascade. The triggering point is the deformation-caused death of the first group of cells (1). Due to the inflammatory process, the permeability of the nearby vascular walls is increased and the local rise in tissue fluid content occurs (2). This increased volume tends to amplify the interstitial pressure of the site and generates an increased cell death rate. An acceleration in the tissue-damage pathway occurs with a consequent snowballing effect that, if perpetuated, can degenerate into deeper and extended tissue loss.

Detecting the presence of localised oedema is based on measuring tissue fluid changes characteristic of oedema – an early event in PU formation, where tissue damage is microscopic and precedes visual changes.

SEM AS BIOMARKER
The presence of elevated **sub-epidermal moisture (SEM)** is a biophysical marker of early, non-visible tissue damage.

The Provizio® SEM Scanner (Bruin Biometrics, LLC, Los Angeles, USA) uses biocapacitance sensors to detect changes in the electrical properties of specific soft tissues and measure the relative SEM.

Objectives of the study

1. To develop and validate a **novel oedema model** in *ex vivo* porcine tissue
2. Using the porcine model to mimic the oedema condition associated with early PU damage at, and around, bony prominences
3. Over a series of tests, to correlate increasing induced fluid volumes with SEM device measures
4. Characterise the spatial variation in SEM measurements between normal tissue and oedematous tissue

MAIN OBJECTIVE
Investigate the accuracy of a novel diagnostic device for measuring SEM as a potential indicator of skin damage and pressure ulcer formation

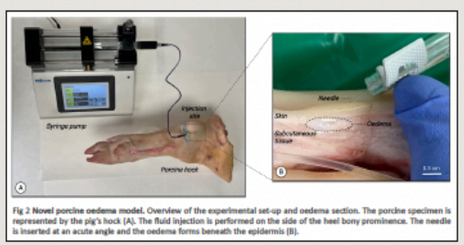


Fig 2 Novel porcine oedema model. Overview of the experimental set-up and oedema section. The porcine specimen is represented by the pig's hock (A). The fluid injection is performed on the side of the heel bony prominence. The needle is inserted at an acute angle and the oedema forms beneath the epidermis (B).

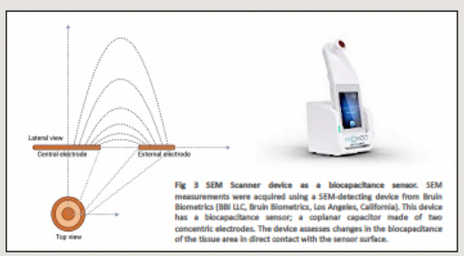


Fig 3 SEM Scanner device as a biocapacitance sensor. SEM measurements were acquired using a SEM-detecting device from Bruin Biometrics (BBI LLC, Bruin Biometrics, Los Angeles, California). This device has a biocapacitance sensor; a coplanar capacitor made of two concentric electrodes. The device assesses changes in the biocapacitance of the tissue area in direct contact with the sensor surface.

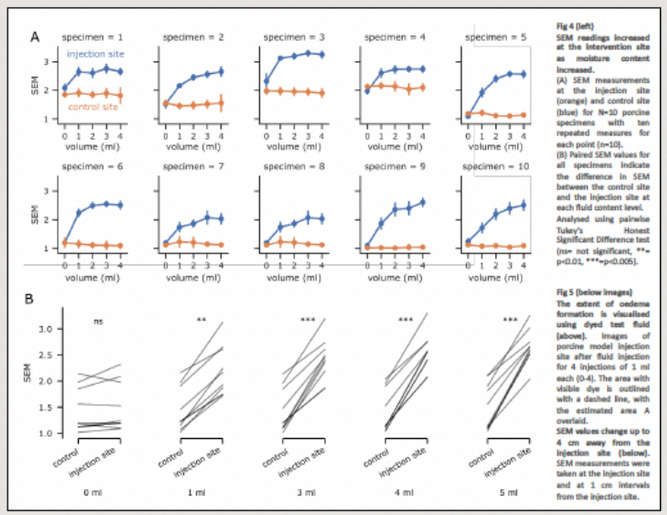


Fig 4 (left)
SEM readings increased at the intervention site as moisture content increased.
(A) SEM measurements at the injection site (orange) and control site (blue) for N=10 porcine specimens with ten repeated measures for each point (n=10).
(B) Paired SEM values for all specimens indicate the difference in SEM between the control site and the injection site at each fluid content level. Analysed using pairwise Tukey's Honest Significant Difference test (ns= not significant, **=p<0.01, ***=p<0.005).

Fig 5 (below images)
The extent of oedema formation is visualised using dyed test fluid (above). Images of porcine model injection site after fluid injection for 4 injections of 1 ml each (0-4). The area with visible dye is outlined with a dashed line, with the estimated area A overlaid.
SEM values change up to 4 cm away from the injection site (below). SEM measurements were taken at the injection site and at 1 cm intervals from the injection site.

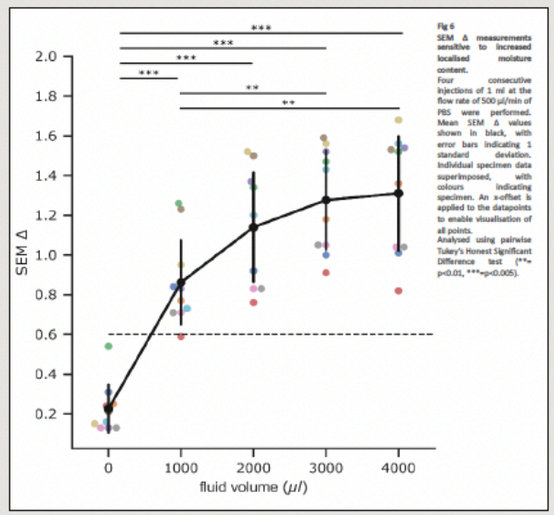
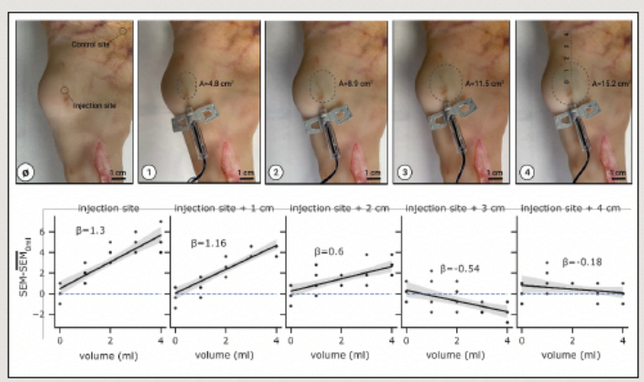


Fig 6
SEM Δ measurements sensitive to increased localised moisture content.
Four consecutive injections of 1 ml at the flow rate of 500 μl/min of PBS were performed. Mean SEM Δ values shown in black, with error bars indicating 1 standard deviation. Individual specimen data superimposed, with colours indicating specimen. An x-offset is applied to the datapoints to enable visualisation of all points.
Analysed using pairwise Tukey's Honest Significant Difference test (**=p<0.01, ***=p<0.005).



Conclusions

SEM delta values correlate with observed healthy tissue and induced localised oedema in an ex vivo model.

Significance

Skin and tissues absent of visual or tactile symptoms of damage but with an SEM delta above the threshold value are locally oedematous.

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Brunetti et al., (2023)

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Promoting Foot Self-Assessment and Self-Management with a Commercially Available Infrared Thermometer: Findings of a Mixed Methods Study

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2023 NATIONAL CONFERENCE
Knowledge and Innovation to Drive Change

Promoting Foot Self Assessment and Self-Management with a Commercially Available Infrared Thermometer: Findings of a Mixed Methods Study

Dr. Kathleen Stevens*, Dr. Donna Moralejo,
Memorial University Faculty of Nursing;
Dr. Steven Ersser, Bournemouth University,
Dr. Cathy MacLean, University of Saskatchewan

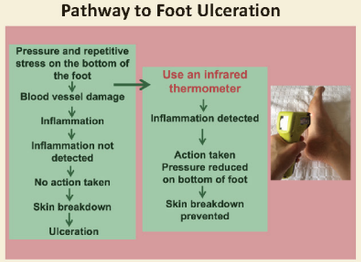
1 Introduction

- Daily foot assessment, with appropriate action, is recommended for patients with diabetes to prevent diabetic foot ulceration (DFU).
- Affordable self-management tools and education are needed to support foot assessment and direct action.
- Three RCTS (Armstrong et al., 2007; Lavery et al., 2004; Lavery et al., 2007) and a pilot RCT (Skafjeld et al. 2015) indicated that the use of temperature monitoring with a ***medical grade infrared thermometer*** was an effective way to predict and prevent DFUs.
- A 2015 study compared a low-cost, ***commercially available infrared thermometer (CAIT)*** to medical grade thermometers and found them to be a reliable measure of skin temperature (Mufti et al., 2015), but CAITs have not been assessed in practice.
- What is needed is an increased understanding of the usability, benefits, and challenges of using a CAIT.
- This three-phase study evaluated the impact on assessment and the patient perspective of using a $30 CAIT. This poster reports the findings of **Phases 2 and 3.**

Commercially Available Infrared Thermometer (CAIT)

2 Foot Ulceration & Thermometry

Pathway to Foot Ulceration

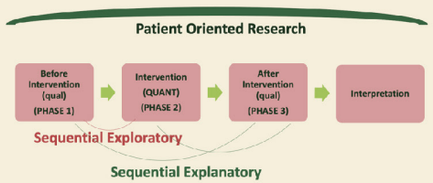


Detecting a Temperature Difference

- Participants were directed to assess their foot temperature daily for inflammation.
- If there was a temperature difference of **> 4 degrees F (> 2.2 degrees C)** between the two feet, participants were directed to take action (e.g., rest their feet that day).
- If the temperature was still elevated in 48 hours, the participants were directed to see their healthcare provider.

3 Research Questions and Methods

Mixed Methods Model



Research Questions (Phases 2 and 3):

1. Does a foot health intervention that utilizes a CAIT reduce DFU?
2. Does a foot health intervention that utilizes a CAIT improve foot assessment?
3. What are the participants' experiences with foot self-management and the intervention? (In terms of challenges and benefits)
4. Would participants continue to use the CAIT and why?

This sequential exploratory and explanatory mixed methods research design had three phases.

Phase 1: self-management was explored using qualitative methods. Interviews were conducted with patients, linked support persons, and healthcare providers and what was learned informed the education + CAIT intervention (n = 24).

Phase 2: a 6-month pilot RCT was conducted to test the intervention's effectiveness. Patient participants were randomized to the thermometer and education group (n = 34) and education-only group (n = 26).

Phase 3: Six from the thermometer and education group (n=6) and three from the education-only group (n=3) were interviewed regarding their experiences.

4a Results

Characteristic of Sample	Thermometer and Education % (n)	Education-only % (n)
Gender	Male 52.84 (18) Female 47.06 (16)	Male 57.69 (15) Female 42.31 (11)
Age in years (mean)	66.2 (range 38-80)	65.69 (range 49-86)
Taking insulin **Fisher's exact p = 0.009**	No **70.59** (24) Yes **29.41** (10)	No **34.62** (9) Yes **65.38** (17)

- There was no difference between the two groups for DFU.
- The intervention group had more days where an assessment was completed **(M:150.98 vs 119.84, p = .02).**
- When years with diabetes was controlled for, group significantly predicted whether an exam was completed > 80% of the time **OR: 3.54; 95% CI: 1.11 – 11.29; p = 0.032) R^2 = 0.0989**
- At 3 months, more participants had no calluses in their left or right foot **(intervention group: 43.8% and 41.9%; control group: 36.4% and 31.8%)** compared to baseline **(17.6% and 20.6% and 15.4% and 15.4% respectively).** The differences were not significant or sustained at 6 months **(intervention group: 25-28.2% and control group 20-31.6%).**
- In the exit interview, **96.8%** of participants indicated they would continue to use the CAIT.
- Participants in the intervention group with multiple sources of support completed more days assessment **(M: 165 days)** vs spousal support alone **(M:146)** or family support **(M:102).** Similar trends were seen in the control group for multiple sources of support **(M:134)** vs other sources **(M: 89-121).**

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4b Results

Participants' Perspectives: Benefits, Challenges, and Reasons to Continue Using the Thermometer

Benefits	Challenges	Reasons to Continue
• Prompted a more thorough foot assessment • Monitored for "hot spots" • Provided direction for action • Increased the structure of the assessment • Provided reassurance about foot health • More awareness of the surface of foot • Facilitated a discussion with healthcare providers about foot health	• Unsure of thermometer purpose • A lot of steps to complete a temperature assessment • Musculoskeletal and vision issues • Not taking action based on temperature difference of > 4 (i.e., "wait to see what happens") • Unsure about what would be a foot concern • Interpretation of results (e.g., blaming the temperature difference on the room temperature)	• Practical and part of regime, part of "toolkit" • Identify any inflammation and issues • Keep a record and have a baseline assessment • Monitor hot spots or if they noticed any redness or had pain • Another step in the inspection process • When a concern was identified with a visual inspection

The temperature check and visual check goes "hand in hand."

it (the thermometer) allowed me to have confidence in my ability to determine if the issue I identified was a serious matter or not.

I would use the thermometer as "something could be going on that my eyes cannot see"

5 Discussion and Conclusion

- Findings suggest that the use of a CAIT is an available low-cost tool that could support foot self-management for people with diabetes.
- Using a CAIT may offer several benefits, such as promoting foot assessment and direction for action.
- Understanding possible challenges with using the CAIT and involving, as appropriate, support persons with foot self-assessment can help healthcare providers strengthen patient education and foot self-management.
- Future research is needed to determine the optimal schedule and technique for CAIT assessment and to better understand decision making related to foot self-management (e.g., why patients take action or do not take action).

Therefore, a commercially available thermometer (CAIT) is an available affordable tool that could support self-assessment and self-management for people with diabetes.

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Developing a Best Practice Guideline on Risk Assessment, Prevention and Treatment of Pressure Injuries

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McConnell, H., RN, BScN, MA(Ed); Grinspun, D., RN, BScN, MSN, PhD, LLD(hon), Dr(hc), DHC, FAAN, FCAN, O.ONT

Background/Introduction

The **Registered Nurses' Association of Ontario** (RNAO) is the professional association representing registered nurses, nurse practitioners and nursing students in Ontario, Canada. RNAO advocates for healthy public policy, promotes excellence in nursing practice and influences decisions that affect nurses and the public they serve. The International Affairs and Best Practices Guidelines Centre is a signature program of RNAO which focuses on the development, dissemination and active support of the uptake of evidence-based clinical and healthy work environment best practice guidelines (BPG), and the evaluation of their impact on patient/resident/client, organizational, and health system outcomes.

Objectives

The purpose of this guideline is to provide nurses, members of the interprofessional team and other stakeholders with evidence-based recommendations related to risk assessment, prevention, and treatment of pressure injuries (PIs).

Guideline Development Methodology

A 6-step process was followed to develop the guideline (see Fig. 1). GRADE & GRADE CERQual methodologies were used to conduct the systematic reviews and recommendation development.

- RNAO convened a panel of 17 interprofessional experts (subject matter/professional expertise & persons with lived experience).
- The expert panel prioritized five recommendation questions to be addressed within the BPG.
- Five outcomes of importance were selected for each recommendation question.
- Systematic reviews started in 2023.

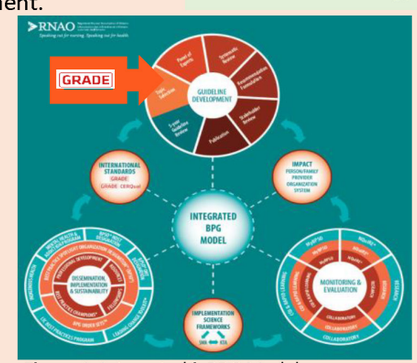

Figure 1: Integrated iaBPG Model

Priority Recommendation Areas and Outcomes

1. Use of preventive care bundles
2. Repositioning frequencies
3. Prophylactic dressings
4. Technologies for early detection and treatment of PIs
5. Powered support surfaces

Common Outcomes:

Incidence rate; healing rate of PIs; comfort of interventions; adverse effects of technology related interventions; & satisfaction with care

Differences Between Previous Editions and Upcoming Version

- Focus on PI risk assessment, prevention and management of PIs
- Use of GRADE Methodology
- Recommendation questions prioritized based on the current practice needs

Systematic Review Process and Recommendation Development

- Six databases searched
- 2135 articles screened independently by two reviewers

- Quality appraisal of included studies
- Tools used: ROBIS, ROB 2, ROBINS-I

- Quality of body of evidence rated using GRADE
- Evidence Profiles (EPs) and Evidence-to-Decision (EtDs) frameworks created

- Expert panel to participate in a consensus building process to finalize recommendations

Next Steps

- Stakeholder review of draft BPG Spring 2024
- Expected to be published in Summer 2024

Conclusions

This BPG will have significant implications for clinical practice, education, research and policy. It will highlight areas for future research and identify evaluation and monitoring indicators for use.

This work is part of the Best Practice Guidelines (BPG) Program, funded by the Government of Ontario.

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Quality of life and perception of care in individuals with diabetic foot ulcer in a suburban area: Preliminary results

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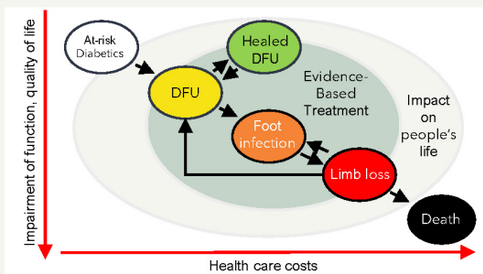
1 INTRODUCTION

Québec = 1 200 000 of people with diabetes melitus (DM)[1]

- > 34% will develop diabetic foot ulcer (DFU)[2] and up to 65% will have recurrence within 5 years;
- DFU leads to important biopsychosocial and financial consequences; (See figure 1)[3]
- According to the **Quintuple Aim**: ↑ patient experience (+ ↑ staff well-being, ↓ healthcare costs, ↑ health equity and ↑ population health) improves the performance of a healthcare system.[4]
- Dedicated limb preservation team for this population is needed to improve health outcomes and quality of care.[5]

Fig. 1. Effects related to wound complications on quality of life and costs (Figure adapted from Barshes 2013)[3]



Aim : To describe a group of people treated for DFU in a suburban area of Quebec (Canada) where there is no dedicated limb preservation team by

- **Evaluating their health-related quality of life** (HRQOL)
- **Evaluating their perception of care**

2 METHODS

Study Design: Cross-sectional descriptive study

Settings: Health and social services of Centre intégré universitaire de santé et services sociaux Mauricie et Centre-du-Québec (CIUSSS-MCQ)

Sample Size : N=45 (95% confidence level; 5% margin of error)

Inclusion Criteria

- ✓ Type 1 or 2 diabetes;
- ✓ ≥18 years old;
- ✓ Have had ≥ 2 encounters for a DFU
- ✓ Be treated at the CIUSSS-MCQ;

Exclusion Criteria

- X Be jointly treated outside the CIUSSS-MCQ affiliated clinics
- X Be hospitalized

Data Collection

Self-reported validated questionnaires:

- Diabetic Foot Scale Questionnaire (DFS-SF)[6]
  5-point Likert scale ranging from 1 (not at all) to 5 (a great deal)
- Quality of care from the patient perspective (QPP)[7]
  4-point Likert scale ranging from 1 (do not agree at all) to 4 (completely agree) for Perceived reality), and ranging from 1 (of no importance) to 4 (of the very highest importance) for Subjective importance

Example of an item:	Perceived reality (PR)				Subjective importance (SI)			
Pain relief?	1	2	3	4	1	2	3	4

1. Identification of potential participants treated for DFU in different hospitals of the region (by nurses, by poster)
2. Phone contact with potential participants by research team (explanations, eligibility, consent)
3. Completion of questionnaire by phone (40 min)

3 PRELIMINARY RESULTS AND DISCUSSION

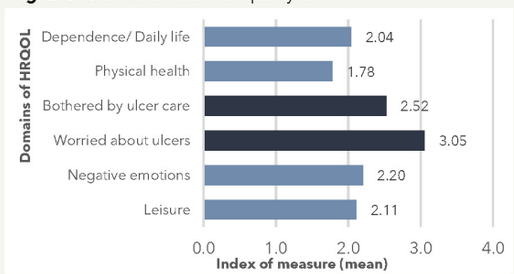
1- Demographic Data

Sex: Male (67%)
Mean age: 62 years
DM type: Type 2 (73%)
N=15

1st episode of DFU: 47%
Recurrence of DFU: 13%
New DFU: 40%

2- Perception of HRQOL

Fig. 2. DFS-SF mean scores of quality of life



Items that affected the most the HRQOL are:

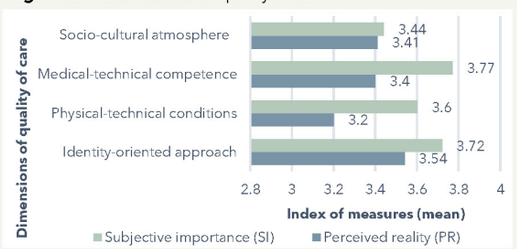
- **Worried that you may need an amputation** *(Mean score (MS): 3.60)*
- **Having to keep weight off your foot with a DFU** *(MS: 3.13)*

Item that affected the least the HRQOL is:

- **Pain while walking or standing** *(MS: 1.73)*

3- Perception of Quality of Care

Fig. 3. QPP mean scores of quality of care



High quality of care = PR score > SI score[7]

- Thus, PR score < SI score for all subscales

Overall, care they received could be improved.

Highest difference between PR and SI : «physical-technical conditions », especially for :

- *« I had access to the apparatus and equipment that was necessary for my medical care (as far as I can tell) » (PR :3.20 vs SI : 3.60)*

5 WORK IN PROGRESS

To be done:

- Continue recruitment of participants to achieve target n=45
- Complete data analysis
- Disseminate outcomes

Then: Improve health care services!

6 IMPLICATIONS/APPLICATIONS

Patient experience of quality of life and perception of care = important data to ↑ DFU care services and health outcomes especially in suburban areas according to the Quintuple aim.

This project will provide valuable outputs for care organization and trajectories, and to promote DFU prevention and management interventions, especially where there is no dedicated limb preservation team[7].

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Funding : Fondation Santé Trois-Rivières, CIUSSS-MCQ, Ordre des podiatres du Québec, Diabète Québec.

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Healing rate and time to closure of VLUs: a real-world evaluation of a Muscle Pump Activator (MPA) device as an adjunct to compression therapy

Authors: Holly Murray BNSc RN WOCN NSWOC WOCC(C), Rochelle Duong RN, BScN, IIWCC, MHA

Aim

A service evaluation of a muscle pump activator (MPA) as an adjunct to compression therapy.

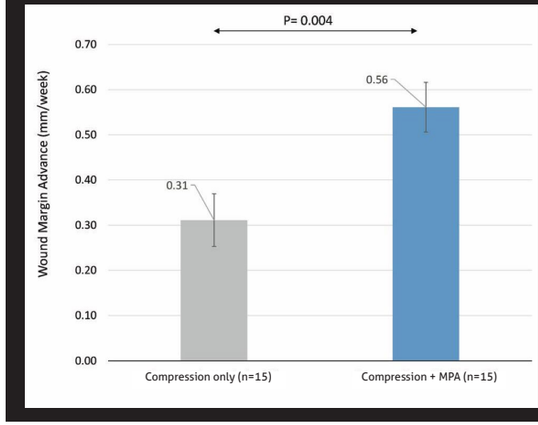
Procedure/Method

- Fifteen (15) patients with venous leg ulcers (VLU) were prescribed MPA, using the geko™ device (W-2) for 6 hours per day, 6 days per week.[1]
- Wounds were selected for size, with an inclusion criterion of maximum 12cm.[2]
- Wound progress was compared with 15 retrospective control patients, matched for ulcer size and age.[2]

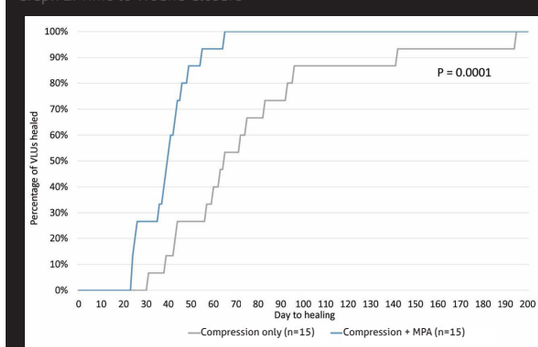
Findings/Results

- The retrospective group had a healing rate of 0.31mm/week (95% CI 29-37 mm/week), whereas the prospective compression + geko™ group had a healing rate of 0.56 (95% CI 50-62 mm/week). p=0.004 (Student t-test).
- All wounds in both groups healed completely during the course of the trial.
- Mean time to closure for the retrospective group was 77 days (95%CI 66-88 days), whereas the MPA group had a mean time to closure of 40 days (95% CI 37-43 days) p=0.005 (Student's t-test).
- The Kaplan Mier plot shows that the trajectory of the geko™ device group diverges from the compression-only group within 23 days, with all patients in the geko™ device group exhibiting complete healing by day 64, as opposed to day 195 for the compression-only group. The difference between the two lots is very highly significant (Log-rank test p=0.0001).

Graph 1: Rate of Wound Margin Advance



Graph 2: Time to Wound Closure



Implications/Applications

- A regimen including MPA as an intervention for the acceleration of wound healing resulted in significantly faster wound margin advance, and significantly less time to heal, than retrospective matched controls.[3]
- In 2023 an RCT of 60 patients by Bull et al it was reported that the MPA device (the geko™ device, W-3 the latest iteration of the geko™ devices for wound care) improved the rate of wound healing twofold when used for 12 hours/day over a four-week period both in terms of wound margin advance and percentage area reduction.[4]

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MDPOCAN0702

Implementing needle flexor tenotomies as a simple solution for treating apical ulcers in neuropathic feet

By: Catherine Méthot BSc, DCh, IIWCC and Ruth Thompson MCISc-WH, DCh, IIWCC

Aim

Needle flexor tenotomies (NFT) were incorporated into our practice, offering a low-risk procedure promoting healing and prevention of recurrence in patients with a lesser apical toe ulcer. NFT was offered as a surgical offloading option for hard-to-heal ulcers. This procedure is aligned with the IWDGF Guidelines. (1)

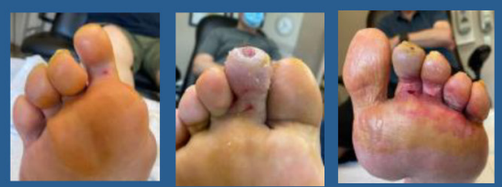
Procedure/Method

A retrospective analysis of patients who received a NFT between May 2021 and September 2022 at our hospital outpatient chiropody wound clinic was performed. Information regarding success rate, length of time to wound closure, re-occurrence of wound and complications was compiled. Inclusion criteria included sensory neuropathy, flexible claw toe deformities and chronic or acute ulcers.

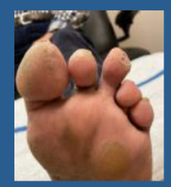
Patients chosen for this procedure all had flexible claw toe deformities, with chronic or acute apical lesions. Patients were assessed for neuropathy and the associated plantar digital nerve was anesthetized with 2% xylocaine plain when sensation was intact.

The flexor tendon was palpated for location and the area was prepped with betadine. An 18 Gauge needle was used, bevel up, inserted at the proximal plantar aspect of the toe until the bone was felt. The needle was retracted and moved in a right-left fashion to cut the tendon, all while extending the toe with the other hand, until partial or full release of the tendon was obtained. A simple dressing was applied to the puncture site.

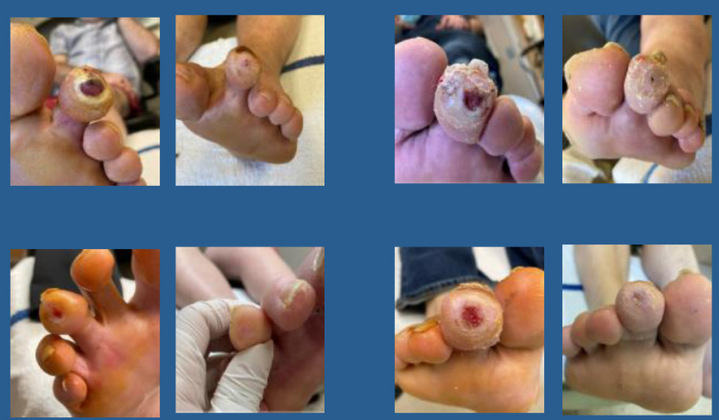
Examples of location for needle insertion.



Example of a complication.



Examples of cases reviewed.
Pre-tendon release on left Post-tendon release on right. Fourteen day interval.



Findings/Results:

A chart audit of patients meeting the criteria was performed. Twenty-one patients met the criteria and signed consent. Five patient charts were excluded as they did not meet the inclusion criteria. A cohort of sixteen patient charts were reviewed.

Follow-up visits occurred within an average of seventeen days and 100% of these demonstrated complete wound closure. Examination at the follow-up visits found thirteen complete tendon releases and three partial tendon releases. A minor complication of a floating toe was reported in two cases. No recurrence documented at the one-year mark.

Implications/Applications:

The implementation of NFT has been successful in our clinic. The procedure takes about three minutes and can be performed during a regularly scheduled appointment. The only additional material required is the beveled 18 Gauge needle and local anesthesia in rare cases when necessary. NFT are a simple, effective, and low-cost option for ulcerated or at-risk flexible claw toe deformities.

Reference:

1. Bus SA, Armstrong DG, Crews RT, et al. (2023). Guidelines on offloading foot ulcers in persons with diabetes (IWGDF 2023 update). *Diabetes/Metabolism Research and Reviews*. https://doi.org/10.1002/dmrr.3647

Efficiency of New Smart Instillation Technology with Negative Pressure Wound Therapy in Managing Complex Chronic and Surgical Wounds: Case Series

Rosemary Hill, BSN, CWOCN, WOCC (C); Lions Gate Hospital, North Vancouver, BC

Aim

- We report our initial experience with a new smart technology integrated into a negative pressure wound therapy (NPWT) device with topical solution instillation[1] in managing complex wounds containing large areas of devitalized tissue and/or yellow fibrinous slough.

Procedure/Methods

- NPWT with instillation and dwell time (NPWTi-d) of saline was applied via a reticulated open-cell foam dressing with through holes (ROCF-CC)[2] in four large complex wounds.
- Antibiotics were administered as appropriate.
- Surgical debridement was performed prior to NPWTi-d initiation and at dressing changes as needed in one wound; the other three wounds were not surgically debrided.
- The smart instillation software was employed to automatically determine solution volume according to wound size.
- Default settings were used to instill saline into the wound bed with a 10-mintue dwell time, followed by 2 hours of negative pressure.
- Dressings were changed three times per week.
- Therapy was switched to conventional NPWT when the wound bed was covered with clean granulation tissue.

Findings/Results

- Smart technology automated several therapy initiation steps that were previously more time-consuming and complicated.
- The automation reduced guesswork and led to faster and easier NPWTi-d setup.

Cases

Case 1. A 62-year-old male presented with a pressure injury on his right posterior thigh. The wound was debrided, and NPWTi-d was initiated. After 39 days of NPWTi-d, the wound was clean and considerably smaller. Therapy was switched to NPWT and the patient was discharged to community care.

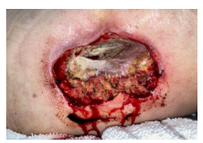


Figure 1A. Pressure injury with presence of devitalized muscle after conservative sharp debridement

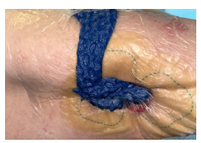


Figure 1B. NPWTi-d applied with ROCF-CC dressing, bridged to the lateral thigh for offloading

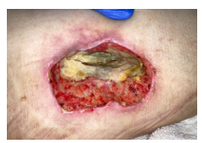


Figure 1C. After 6 days of NPWTi-d, devitalized tissue was softened and easier to debride

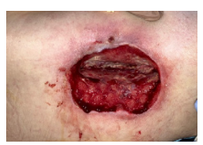


Figure 1D. After 14 days, the wound bed was mostly clean and granulating

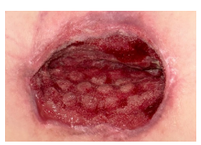


Figure 1E. After 27 days, the wound bed was well granulated; therapy was switched to NPWT on day 39

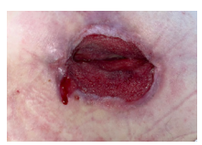


Figure 1F. NPWT was discontinued after 30 days and an antibacterial foam dressing was used until surgical flap closure

Case 2. A 23-year-old male presented with a deep infected soft tissue wound from an injection site. Antibiotics were initiated. NPWTi-d was utilized for 22 days, until the wound was covered with healthy granulation tissue. Therapy was switched to traditional NPWT for one week, then a split-thickness skin graft was applied. NPWT was used as a bolster over the skin graft, and graft take was 100%.

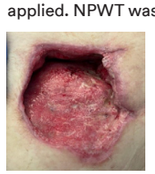


Figure 2A. At presentation

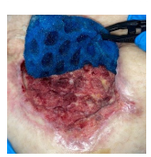


Figure 2B. Foam dressing removal after 4 days of NPWTi-d (second dressing change)

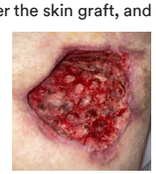


Figure 2C. After 8 days of NPWTi-d

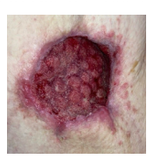


Figure 2D. After 15 days of NPWTi-d, wound depth was filled in

Case 3. A 73-year-old female presented with a hematoma on her right shin after a fall. The eschar was lifted off and the wound bed was irrigated. NPWTi-d was utilized for 10 days. The patient was discharged to community care.

Figure 3A. Wound covered with eschar at presentation

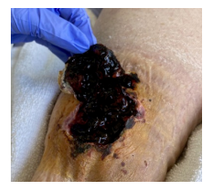


Figure 3B. Lifting off eschar prior to initiating NPWTi-d

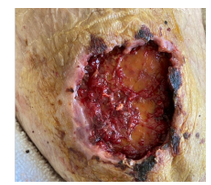


Figure 3C. After eschar removal and irrigation, NPWTi-d was initiated

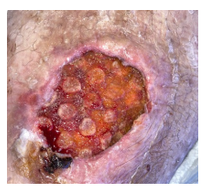


Figure 3D. After 2 days of NPWTi-d

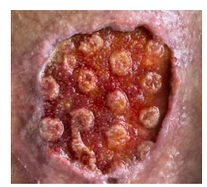


Figure 3E. After 6 days of NPWTi-d

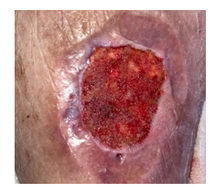


Figure 3F. After 10 days of NPWTi-d

Case 4. A 90-year-old female presented with midline dehiscence from a bowel resection and ileostomy. Antibiotics were initiated. NPWTi-d was utilized for 10 days, then switched to traditional NPWT. The patient passed away due to causes unrelated to wound care.

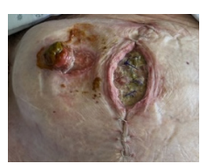


Figure 4A. Wound covered with devitalized tissue at presentation

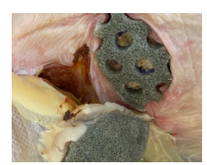


Figure 4B. NPWTi-d dressing application

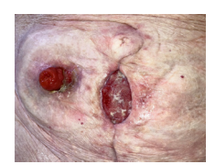


Figure 4C. After 10 days of NPWTi-d and 4 days of NPWT

Findings/Results (Cont'd)

- No saline leaks occurred during therapy.
- The duration of NPWTi-d ranged from 10 to 39 days.
- All wounds previously covered with devitalized tissue were converted to clean granulating wounds during therapy (**Figures 1-4**).

Implications/Applications

- In this case series, new smart technology simplified usability by automatically estimating and distributing the appropriate level of instilled solution volume and adjusting the volume as the wound size decreased.
- The smart instillation feature was easy to use and distributed adequate volumes of topical solution to facilitate regular cleansing and hydromechanical removal of devitalized tissue through the ROCF-CC dressing.

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1. Kim PJ, Attinger CE, Constantine T, et al. Negative pressure wound therapy with instillation: International consensus guidelines update. *Int Wound J.* 2020;17(1):174-186.
2. Têot L, Boissiere F, Fluieraru S. Novel foam dressing using negative pressure wound therapy with instillation to remove thick exudate. *Int Wound J.* 2017;14(5):842-848.

Presented at Wounds Canada, September 28-30, 2023, Niagara Falls, ON

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RAPID-CASE Evaluation of a prescribing consultation model

Jill Gould
Senior Lecturer
UNIVERSITY OF DERBY

Background

- There are **99,454** Community Nurse / non-medical prescribers licensed to prescribe in the United Kingdom (U.K.) (NMC, 2023)
- Community Practitioner Nurse Prescribing (CPNP) was legalised in 1992, enabling independent prescribing of wound care products (JFC, 2023).
- **136 million** visits for wound care take place annually in the UK with an estimated cost of **£8.3 Billion** ($14.3 Billion) (Guest, 2021)
- **81%** of wound care costs were incurred in the community (Guest, 2021) and approximately **50%** of Community Nurses' workload is for people with wound care needs (Guest, 2021, QNI, 2023).
- The "Prescribing Pyramid" (NPC, 1999) provided an assessment framework for prescribers, but has not been updated since 1999.
- The **RAPID-CASE** prescribing consultation model (Gould and Bain, 2022) was developed for prescribers, including nurses who assess, diagnose and agree treatment plans for people with wound care needs.

Aim

To evaluate a prescribing consultation model.

Methods

- An online evaluative questionnaire was distributed to a target sample of prescribers, prescribing students, community practitioners, and prescribing educators.

Findings

- **100%** of respondents reported currently using some form of consultation model, with most (94%) saying they found it helpful
- Most respondents were using the 1999 Prescribing pyramid (48%), and / or the Calgary-Cambridge model (50%), among other models.
- Only 14% had used the RAPID-CASE model previously, but **95%** stated they were somewhat or very likely to use it in the future.
- Suggested uses include as a learning tool for new prescribers, an aide-memoire to guide assessment; a way to record CPD / reflections; a teaching tool.
- **Suggested improvements** included**:** adding a phase before the consultation start around gathering information; making it less clinician-focused; adding "health literacy" in assessment and "health inequalities" in psychosocial assessment, further embedding person-led decision making; Add "A' for Align (e.g. align your knowledge of the person and the context before meeting the person for assessment; and including "lifestyle advice" as a treatment option.

References

Gould J, Bain H (2022a) Principles and practice of nurse prescribing-Transforming Nursing Practice Series. SAGE Publications Ltd

Gould, J. and Bain, H. (2022b) Assessment framework for prescribing: lower limb skin tears *August 2022 Journal of Community Nursing 36(4):42-49* https://www.jcn.co.uk/journals/issue/08-2022/article/assessment-framework-for-prescribing-lower-limb-skin-tears

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Joint Formulary Committee and Nurse Prescribers Advisory Group (2023) Nurse prescribers' Formulary [online]. BMJ Group and Pharmaceutical Press, London. Available online: https://bnf.nice.org.uk/nurse-prescribers-formulary/

Nursing and Midwifery Council (2023) Annual Data Report. Available online: www.nmc.org.uk/about-us/reports-andaccounts/registration-statistics/

R	A	P	I	D
Rapport	**Assessment (bio-medical)**	**Psycho-social**	**Investigations**	**Diagnosis**
Consent/capacity Person's view of the health issue (presenting complaint - PC) Ideas, concerns, expectations	History of PC & actions so far Medical history Current health Allergy Status Medications	Social history Family history Social and mental well-being Potential vulnerabilities	Physical examination Tests Investigations Referral	Differential & Working diagnoses Summary Shared understanding
STOP AND THINK BEFORE PRESCRIBING: **Is a prescription needed?** Self-care / Advice Referral Medicines Optimisation & De-prescribing	**C** **Cost-effective** On formulary? Available OTC? Generic? Pack size?	**A** **Appropriate** Suitable for the person? Acceptable? Is concordance likely?	**S** **Safe** Contra-indications? Side-effects? Interactions? Safety-netting?	**E** **Effective** Evidence-based? Guidelines? Justifiable?

Discussion

- The RAPID-CASE model evaluated very positively with respondents stating they would be likely to use it in the future.
- Suggestions for development include more emphasis on a person-centred approach with a clearer focus on shared decision making
- Lifestyle options should be more apparent in the "Is a prescription needed" section.
- A revised model should be developed and it is proposed that evaluation by practitioners and educators is further undertaken.
- A strategy to disseminate the model is needed to help aid consistency across prescribing practitioners.

✓ Conclusion and recommendations

The RAPID-CASE consultation model was seen as useful by participants. Some aspects of the model would benefit from further development and evaluation. Additionally, research into clinical decision-making for prescribing is recommended.

Applying RAPID-CASE to a skin tear injury

RAPID — ASSESSMENT OF BIO-MEDICAL

Table 2: Examples of assessment questions

When did this happen?	
▪ How long ago?	
▪ Has there been any treatment applied?	
How did this happen?	
▪ Was there a fall?	
▪ Was there loss of consciousness?	
Why did this happen?	
▪ Medical history:	
◦ Is there reduced tissue perfusion? e.g. Raynaud's, arterial or peripheral vascular disease, anaemia etc	
◦ And/or comorbidities? diabetes, cardiac/respiratory/renal disease, malignancy, rheumatoid arthritis, impaired immune response, impaired cognition (sensory, visual, auditory), history of falls	
▪ Medication history	
◦ Steroid, cytotoxic, immunosuppressant therapies, opioids, medicines affecting the nervous system, polypharmacy, etc?	
◦ General health, nutrition, hydration, mobility and activity level?	
◦ Skin health and condition (e.g. thin, dry, friable, fragile)?	
◦ Previous episodes: any previous skin tears?	

Table 3: ABCDEs of skin tear wound assessment (Gould and Bain, 2022, based on Wounds UK, 2020)

A. Anatomical location	▪ Be precise and use noted locations or an image chart
B. Bleeding or haematoma	▪ Note amount or size of haematoma; treat bleeding
C. Condition and integrity of skin flap and surrounding skin	▪ See diagnosis section for types/classification of skin tears
D. Dimensions and wound bed	
E. Exudate	▪ Volume, type, colour and odour
S. Signs of infection	▪ Redness, increased temperature at site

RAPID — RAPPORT

RAPID — PSYCHOSOCIAL AND CONTEXT

Table 4: Contributing psychosocial factors

Psychological	▪ Social isolation ▪ Anxiety or low mood, signs of depression
Lifestyle factors	▪ Alcohol intake/illicit drug use ▪ Smoking
Social and setting	▪ Family/carers, support system ▪ Falls safety (e.g. stairs, furniture, rugs, lighting etc)
Other	▪ Was this preventable? ▪ Vulnerabilities, safeguarding?

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Heather Bain
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RAPID — INVESTIGATIONS/ CLINICAL EXAMINATION(S)

Table 5: Investigations

Observing for signs of underlying causes/risks	▪ Dizziness, confusion, ataxia ▪ Weight loss, cachexia or malnutrition (MUST score) ▪ Peripheral vascular/circulatory issues ◦ ABPI assessment as indicated
Infection	▪ Check warmth, exudate, colour, odour ▪ Wound swab

Note: Infection is the most common complication of a laceration (NICE, 2021b). Although not specific to skin flaps, NICE (2021b) guidance states:
There is a high risk of infection in people with a laceration contaminated with soil, faeces, body fluids, or pus. The risk of infection is increased further with factors such as:

- Wound length of more than 5cm
- Foreign body present before cleaning of wound
- Diabetes mellitus
- Oral corticosteroid treatment and other causes of immunosuppression
- Age older than 65 years
- Stellate shape or jagged wound margins
- Wound location on the lower extremity
- Presentation more than six hours after injury

RAPID — DIAGNOSIS

Skin tear definition and classification

Definition (LeBlanc et al, 2019)

'A traumatic wound caused by mechanical forces, including removal of adhesives. Severity may vary by depth (not extending through the subcutaneous layer).'

ISTAP classification (LeBlanc et al, 2013)

Classifies as type 1, 2 or 3 based on skin loss:

Type 1: No skin loss: Linear or flap tear which can be repositioned to cover the wound bed

Type 2: Partial flap loss — which cannot be repositioned to cover the wound bed

Type 3: Total flap loss — exposing entire wound bed

STOP AND THINK BEFORE PRESCRIBING

Medicines optimisation and de-prescribing can be pertinent where the person's wound or deteriorating health is caused by the effect of medicines. In some cases, the benefit of a treatment may no longer outweigh the risk of harm.

CASE — COST-EFFECTIVE

The cheapest products are not always the most cost-effective - for example, trauma was caused on removal, this could result in deterioration and delayed healing.

CASE: APPROPRIATE

Choice of treatment is dependent on the individual; for example sensitivities or allergies. Concordance is dependent on a shared understanding and agreement between the prescriber and the person receiving treatment.

CASE: SAFE

It is important to consider risks of harm and the need to prescribe cautiously. For skin tears, 'medical adhesive related skin injuries' (MARSI) are a known cause of injury (LeBlanc et al, 2020).

CASE: EFFECTIVE

Best practice recommendations for skin tears (LeBlanc et al, 2019) outline treatment aims linked to the stages of injury. For example, initially controlling bleeding and treating the cause of the injury where appropriate.

USE OF A NOVEL HUMAN DECELLULARIZED DERMAL MATRIX FOR CHRONIC WOUNDS: A CASE SERIES.

Surgery UNIVERSITY OF TORONTO

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UHN Toronto General Hospital

INTRODUCTION

- Chronic lower extremity wounds present a significant challenge to healthcare systems worldwide and despite several advances in wound treatments, hard-to-heal wounds, such as diabetic foot ulcer fail to heal within a reasonable timeframe.
- DermGEN™ is a novel decellularized dermal matrix approved by Health Canada and serves as a natural scaffold that promotes the migration of cells to facilitate tissue regeneration

OBJECTIVE

This study aimed to assess the results of using a novel acellular dermal matrix (DermGEN™) to treat complex and chronic lower extremity wounds.

METHODS

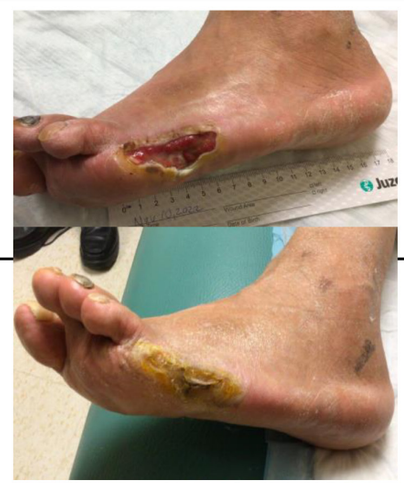
- We prospectively collected data from consecutive patients who underwent application of an Acellular Dermal Matrix (DermGEN™) for chronic and complex wounds of the lower extremities.
- It is a novel decellularized dermal matrix approved by Health Canada and serves as a natural scaffold that promotes the migration of cells to facilitate tissue regeneration, which can be applied in the clinic.
- Baseline demographics, co-morbidities, wound photos and vascular status were recorded and patients were followed for 6 months.

RESULTS

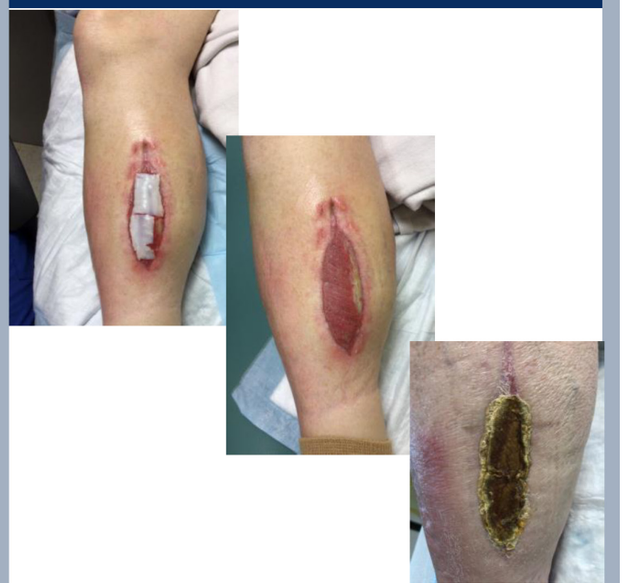
- There were eight patients (87.5% male) in the study group, with a mean age of 68.3 +/- 16.89 years.

RESULTS

- Five patients had diabetic foot wounds, one had peripheral vascular disease and two had fasciotomies.
- Mean HbA1c was 7.02%(IQR 4.9-7.4%).
- Average wound area was 23.3 cm^2 +/- 13.85.
- After placement of DermGEN™, six patients (75%) experienced complete graft incorporation and healing of the wound.
- The remaining patients demonstrated a reduction in wound size by 45% and 53%.
- The average time to healing was 16.71+/- 5.29 weeks.
- There were no recurrent wounds in the healed group at 6 months.



RESULTS



CONCLUSIONS

- These findings provide evidence that DermGEN™ may be an effective therapy to promote wound healing for complex wounds in the lower extremities.
- The ease of handling and a one-time application of the product may represent cost-saving advantages in addition to improved wound-healing outcomes.

Use of Continuous Diffusion of Oxygen in a Non-Healing Wound due to Radiation-Induced Injury

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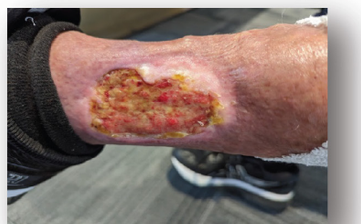
Karen E Campbell RN, PhD, NSWOC, WOCC(C), Consultant EO2;
Patti Burke-Martin BScN, Country Manager, EO2 Concepts

Aim: The purpose of this poster is to review the use of Continuous Diffusion of Oxygen (CDO) in an elderly woman with an almost 5-year-old wound caused by radiation therapy.

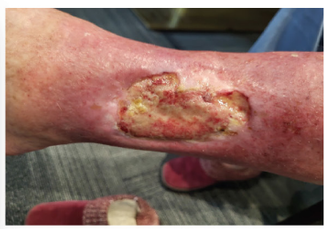
Procedure/Method:

- Our patient is a 91-year-old female diagnosed with squamous cell cancer (SCC) of her L lower leg in late 2018
- Treated with radiation for 6 weeks resulting in a large non-healing ulcer over the lower leg.
- Refused a skin graft after a bad experience with grafting for a melanoma
- She's had numerous types of dressings but all caused significant hypersensitivity reactions of the skin and had to be discontinued. Arterial Doppler studies were normal.
- Trial of the neuromuscular electrostimulation device but it triggered her trigeminal neuralgia and was discontinued.
- She has had ongoing hyperbaric oxygen therapy from 2020, tapering to once weekly since late 2022.
- All therapies to date have helped with healing but the wound has still not closed.
- CDO was started in April 2023, providing constant 100% oxygen to the wound surface 24/7 using a specialized oxygen delivery dressing.

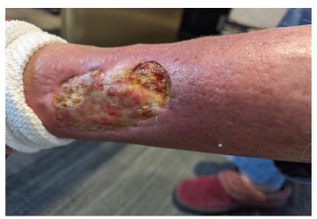
Before 10 cm by 5 cm



Mid-treatment 6.5 cm by 3 cm



After 5 cm by 8 cm



Findings/Results: She continues to use the CDO device with apparent more rapid healing, healthy granulation tissue in the wound bed and elimination of pain. It is easy for her to manage the device independently. When CDO was started at 7 ml/hr, the wound was 10 cm x 5 cm. O2 flow rate was increased gradually to 11ml/hr. Wound size has reduced now 5 by 8. She has had persistent pseudomonas which has somewhat delayed healing. She is very active, lives on her own, gardens and maintains her home, and does all her own dressings. An application was made to her private insurance and they are providing coverage.

Implications/Applications: CDO therapy can be considered an effective adjunctive or primary therapy in people with chronic, difficult-to-treat, radiation-induced ulcers.

You Breathe Continuously… …Your Wound Should Too

Muscle Pump Activator (MPA) Device: A Case Study on Limb Salvage in a Patient with Critical Ischemia and Non-healing Ulcers

Jack Wan, RN and Sarah Wong, MD, FRCSC

Scarborough Health Network, Division of Plastic Surgery, Scarborough, ON

Introduction

- Patients with critical lower leg ischemia have significant peripheral complications such as ulceration and a high risk of lower limb amputation estimated as high as 40% within one year.
- The functional disability after amputation is tremendous and imposes a high economic burden on patients and health systems.[1]
- The aim of our study was to evaluate the MPA device to treat non-healing lower leg ulcers secondary to critical limb ischemia.

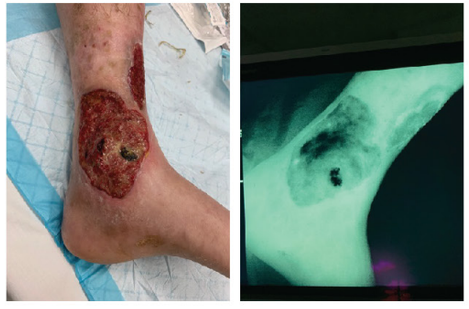
Methods

- A patient was managed in a hospital wound care clinic for end stage vascular disease and two non-healing ulcers of the left leg. The patient did not respond to all other evidence-based best practice modalities for three (3) years. It was decided to start the MPA device November 2022. There were 2 treatment periods of 3 months with a 1 month break in between.
- The MPA device was initiated to increase blood flow to the affected limb. [2,3] The device is placed over the fibular head of the affected limb as per the manufacturer's instructions or use. [4] The device stimulates the common peroneal nerve which activates the calf and foot muscles which decreases edema and improves blood flow to the wound and peri-wound region. The wear time is 12 hours per day for seven days per week.

Results

- Of the two chronic ulcers, one of the ulcers completely healed in 6 months and the second is more than 50% closed in 8 months (Figure 2).
- Wound bed perfusion was measured with a Spy machine which is a fluorescence imaging system and the images corresponded with the remaining area that is still open. There is evidence of increased blood flow to the healed skin area (Figure 1).
- The patient was able to ambulate after 3 months with a prosthesis on the other leg which had already been amputated.

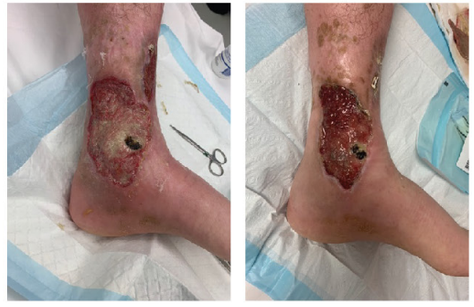
Figure 1. Clinical appearance and fluorescence image of wound after 3 weeks on MPA



Observations

- There was a significant improvement in surrounding soft tissue edema noted after 2 weeks of treatment initiation. This led to easier and less painful dressing changes with less frequency. Compression wraps were also re-started and the patient was able to begin physiotherapy for ambulation.
- When the MPA was started, wound discharge increased 50% requiring changes to a more absorbent dressing and antibiotics to decrease risk of infection. This "initiation effect" lasted approximately 2 weeks.
- There is a "rebound effect" after stopping the treatment where the edema returns as the patient ambulates requiring another treatment round.

Figure 2. Clinical appearance of wound before and after 8 months



Conclusions

- The MPA device can be used in a novel way to reduce lower leg edema in addition to healing chronic wound ulcers.
- There is an increase in blood perfusion to the surrounding soft tissue with the use of a MPA device that may be advantageous in healing wounds in patients with critical ischemia.
- We present a successful case study on using the MPA device for limb salvage. This effective tool adds to the evidence around MPA and can be implemented as an additional measure to reduce limb amputation in patients.

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4. Manufacturers Information for Use. Firstkind Ltd. Online available: geko User Information

Continuous Diffusion of Oxygen Therapy For a Pressure Injury: A Case Study

Hennick Bridgepoint Hospital
Sinai Health

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Family & Community Medicine UNIVERSITY OF TORONTO

Introduction

Continuous Diffusion of Oxygen (CDO) therapy is an evidence-based treatment that has been shown to promote healing for chronic wounds such as pressure injuries through cell proliferation, collagen synthesis, and epithelization[1,2,3].

CDO uses a rechargeable, battery-powered, portable device to extract oxygen from air. The device pressurizes the wound through the tubing, to continuously deliver oxygen 24 hours a day, thus enabling a moist and oxygen-rich environment for wound healing[4].

Objective

The aim of this case study is to exhibit the use of CDO on a reoccurred chronic stage 3 pressure injury to the left trochanter.

Method/Procedure

Medical Background
In June 2023, a 62 year old male in a complex care unit at a rehabilitative hospital in Toronto, Ontario was treated with CDO for his reoccurred stage 3 pressure injury to the left trochanter. His wound was open for five months prior to initiating CDO and was being treated with conventional dressings. Patient requires total care and has a tracheostomy, indwelling catheter, and gastrostomy tube. Patient was optimized nutritionally and with therapeutic surfaces. A caregiver was frequently present to aid with hygiene care and repositioning.

Procedure
Once CDO therapy was initiated, a hand-held fluorescence imaging device was used to visualize bacteria and to measure the wound weekly.

To support the use of the CDO therapy, unit nurses were trained on how to apply the dressing and charge the machine by the wound care nurse at patient's bedside. The patient's caregiver was also provided with education on CDO therapy and device maintenance. The wound care team was available during work hours to troubleshoot any issues that arose. The CDO representatives were consulted on wound characteristics and changes.

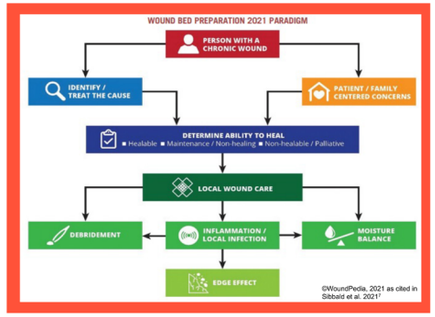
Results

	CDO rate	Measurement	Exudate	Appearance (wound bed)	Suffering Pain Assessment in Advanced Dementia (PAINAD) Scale[4]	Undermining	Reevaluate	Edge (periwound)
Week 0	9 mL/hr	9.73 cm^2	Large serosanguinous No odour	95% granulation with darkening maroon discoloration 5% slough	0	10 o'clock – 5 o'clock for 2.6 cm	Complete	Scar tissue
Week 1	9 mL/hr	10.62 cm^2	Moderate serosanguinous No odour	80% granulation tissue with darkening maroon discoloration 15% hypergranulation tissue 5% slough	0	9 o'clock – 6 o'clock for 2.0 cm	Complete	Scar tissue Macerated
Week 2	9 mL/hr	9.77 cm^2	Small serosanguinous No odour * odour present a few days after	75% granulation tissue 25% slough	0	12 o'clock – 4 o'clock for 1.7 cm	Complete	Scar tissue. Re-epithelialization
Week 3	9 mL/hr Increased to 15 mL/hr a few days later	9.73 cm^2	Small serosanguinous No odour	80% granulation tissue 20% slough	0	12 o'clock – 5 o'clock for 2.0 cm	Complete	Scar tissue Re-epithelialization
Week 4	15 mL/hr	8.93 cm^2	Small serosanguinous No odour	95% granulation tissue with darkened maroon discoloration 5% slough	0	12 o'clock – 7 o'clock for 2.5 cm	Complete	Scar tissue
Week 4.5	Therapy stopped a few days later	Not assessed	Small/moderate serosanguinous Yes odour - absent after wound cleansing	75% granulation tissue 20% darkened granulation tissue 5% slough	0	Not assessed	Complete	Scar tissue

Tool adapted from MEASURE framework (Keast et al., 2004)[4]

Findings

- **Week 2:** Wound depth and exudate amount decreased, and dressing change frequency was decreased from daily to every 2 days. However, malodour was noted and daily dressing changes were resumed (in addition to antibiotic treatment to address inflammation/local infection). Wound care nurse noted dressing changes were inconsistent with wound care orders.
- **Week 3:** No significant changes to wound measurement or characteristics. CDO rate was increased to 15 mL/hr a few days later.
- **Week 4.5:** Staff nurse documented that caregiver had been actively involved in wound dressing changes that were inconsistent with the current wound care orders. Overall, tissue quality was improved and there was a slight decrease in wound size. CDO therapy was stopped. Patient resumed conventional dressings.



Summary

- CDO represents an advanced therapeutic modality for wound healing. It serves as an adjunctive therapy, enhancing wound healing processes.
- Initial improvements in wound characteristics, particularly in wound size and tissue quality, were attributable to CDO therapy.
- Comprehensive training on CDO therapy application and equipment charging is imperative for nurses, and when appropriate, patients and caregivers.
- This case study demonstrates the usage of CDO to encourage wound healing in a chronic pressure injury.
- Patient and caregiver factors can significantly influence both the provision of wound care, and wound healing potential.
- Although CDO has the potential to accelerate wound healing, it is not always able to overcome patient factors that are significant barriers to wound healing.

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Impact of adhesive-free wound dressing system on patient quality of life and dressing-related pain in hidradenitis suppurativa patients: pilot study

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2023 NATIONAL CONFERENCE
Knowledge and Innovation to Drive Change

Impact of adhesive-free wound dressing system on patient quality of life and dressing-related pain in hidradenitis suppurativa patients: pilot study

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Introduction – Why Was This Study Needed?

Various guidelines on managing hidradenitis suppurativa have been published since 2015, all recognising the importance of wound care for managing HS, however evidence supporting effective dressings for use in HS is lacking (1). There are just a few articles examining dressings for HS, which include the recommendation of items such as sanitary napkins and adult nappies (2). These recommendations highlight the lack of products being developed by industry specifically for patients with HS, that address the difficulties facing patients on a day-to-day basis. Many research articles on HS wound care focus on post-surgical care, and for many patients, the day-to-day management of exudate and odour imposes a significant burden and impacts quality of life (3).

HS patients experience many challenges in the day-to-day management of their HS lesions and wounds. A recent study found that the majority of patients use dressings regularly to manage their HS, with over half of patients needing dressings for more than 6 months out of every year (3). Over 80% of patients believe that tending to their wound care has a negative impact on their quality of life. A staggering 93% (n=845) s have experienced a dressing leak or fall-off (3). Over 80% of patients experience dressing related pain, with 43% describing dressings changes as "very painful", while the majority of the patients reported adhesive sensitivity (3). Adhesive dressings and tapes are known to damage the integrity of the skin, causing pain, irritation and skin stripping.

Patients also spend considerable time every day applying and changing wound dressings. This is particularly challenging due to the location of HS in difficult to dress areas of the body such as the armpits and groin (3)

There is a notable lack of wound care products developed specifically to address the basic wound care criteria for HS wound management , and there are not many studies evaluating dressings for everyday use in HS. The trial product in this study was developed specifically for HS patients, and this study was needed to evaluate the impact of a product designed uniquely for use in HS, that requires no adhesives to be used on the skin.

The Trial Product

HidraWear is a new product designed to meet the needs of HS patients. The product requires no adhesives to be used on the skin and enables patients to complete a dressing change quickly and easily. To use the product, the patient puts on the garment and ensures a good fit. They then place the dressing underneath the garment in the affected area, and secure it in place with the fastening tab.

The trial product consists of a specially designed medical retention garment, used with the super absorbent dressing and fastening tab.

The corresponding dressing is applied to the affected area, underneath the garment. It can be adjusted to the correct location as required.

The dressing is then securely retained in place by attaching the co-packed fastening tab through the openings in the garment.

Method

A 21-day single-arm, unblinded, pilot trial was conducted to assess ease of use and the impact of the trial product on various aspects of wound management in HS. Participants were female, >18 years old with a diagnosis of HS. Participants were provided two trial garments and trial dressings as required, to use over a 21-day period in the home setting.

A seven-item questionnaire using an 11-point visual analogue scale was completed by the patients, to capture criteria such as ease of use, time spent on dressings, comfort, dressing related pain, body confidence and confidence in the dressings.

The Dermatology Quality of Life Index (DLQI) questionnaire completed by the patients on day 0, day 7, 14 and 21. The results were measured against the patients' previous products and methods of managing their HS wounds. Day 0 measured the patients' previous products and methods of dressings their wounds.

The primary objective was to evaluate the ease of use of the trial dressing system compared to the patient's previous product use. The secondary objectives were to evaluate if the trial dressing system:

- Is comfortable for patients
- Improves quality of life
- Is faster to use than current products
- Reduces dressing related pain
- Provides secure dressing retention

Results – What Did This **Study Show**?

Reduction in dressing related pain

High levels of dressing related pain were measured at baseline with a mean reported pain score of 5.53 on day zero. Dressing related pain was significantly reduced throughout the study, with an overall mean score of 0.8 by day twenty-one (Figure 2). 95% CI: [3.6,5.9], *P* <0.001, where the CI represents the likely improvement from Day 0 to Day 21. Further to that, of the patients who required pain relief in advance of a dressing change at baseline (n=5), none required pain relief in advance of a dressing change by day 21.

Using the trial product

Patients found using the trial dressing system more comfortable than traditional dressings. The mean baseline score (10 = extremely uncomfortable) was 8.1, which was reduced to 1.0 on day 21. 95% CI: [6.0,8.2], P <0.001 (Table 2) . The trial dressing was found to be easier to apply, adjust and remove than traditional dressings, with a baseline score of 6.5 (10 being very difficult) reduced to 0.6 (zero being extremely easy) on day 21. 95% CI: [4.6,7.1], P <0.001 (Table 2). Patients also found they spent less time tending to their wounds. With a mean baseline score of 6.9 (10 being very time consuming) reduced to 0.7 (zero being very quick) at day twenty-one. 95% CI: [5.2,7.4], P <0.001 (Table 2)

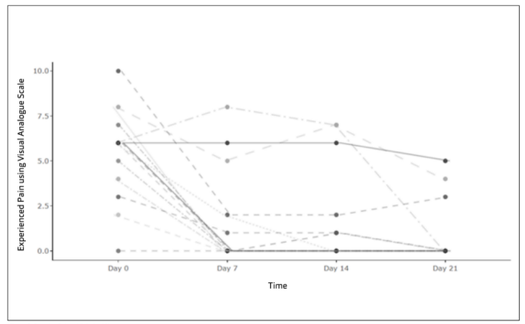

Figure 2: Dressing Related Pain (n=15)

DLQI

At baseline, the DLQI scores indicated that HS had a very large or extremely large effect on daily life in 53.3% (n=8) of patients; had a very large effect on 40% (n=6) of patients and had a moderate effect of 6.7% (n=1) of patients. The mean DLQI score at day 0 was 19.3 (Table 1)

DLQI scores continued to improve and at day 21, a clinically meaningful improvement of the DLQI had occurred in 100% (n=15) of patients (Figure 3), whereby a reduction in score by 5 or more points meets the minimal clinically important difference (MCID). The mean score on day 21 was 4.53 (Table 1). HS had an extremely large effect zero patients, a very large effect on 13.3% (n=2) of patients, a moderate effect on 20% (n=3), a small effect on 40% (n=6) and no effect on 26.7% (n=4). Patients experience a significant improvement in dermatological quality of life, 95% CI: [12.1,17.5], P <0.001.

Table 1: Mean DLQI Scores (n=15), a lower score indicates an improvement.

Time	Mean DLQI Score	Standard Deviation
Day 0	19.3	5.7
Day 7	10.2	6.3
Day 14	7.9	5.3
Day 21	4.5	3.9

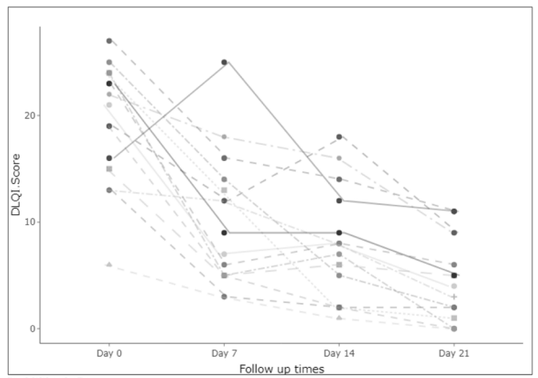

Figure 3: DLQI Scores Over Time

Confidence in the products ability to retain exudate

Patients were found to have higher confidence in HidraWear's ability to retain exudate and remain securely in place. 95% CI: [5.9,8.5]. On an 11-point visual analogue scale, the mean baseline score of 8.4 in dressing retention and leak prevention was reduced to 1.2 on day 21

Body Confidence

Patients also experienced an improvement in body confidence, reducing a mean baseline score of 8.5 on a ten-point scale where a score of 10 correlates to poor body confidence, to 4.2 on day 21 (Figure 6) 95% CI: [3.6,5.8], P <0.001 (Table 2)

Table 2: Mean Scores for the 11-point visual analogue scales used (n=15), a lower score indicates an improvement.

Criteria	Day 0 (Current Product)	Day 21 (Trial Product)
Ease of Use	6.5	0.6
Time Consuming	6.9	0.7
Dressing Comfort	8.1	1
Body Confidence	8.5	3.8
Dressing Confidence	8.4	1.2
Dressing Related Pain	5.5	0.8

Conclusion – Why is This Important?

This pilot study demonstrates that a wound care product tailored to the needs of the HS patient can have a very significant beneficial effect on quality of life, particularly with regard to the most distressing symptoms of the condition, namely pain, discharge, comfort, time constraints and ability to work or study.

The results illustrate the improvement made to patients' day to day activities and quality of life when effective HS specific wound care products are provided. Wound care is an essential component in the treatment journey of patients. The authors advocate for wound care provision to HS patients, and this study supports the case for wound care dressings and supplies to be prescribed to the patient.

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