Reducing Medical Device Related Pressure Ulcers: An Interprofessional Approach Using Data and Innovation to Improve Adult/Pediatric Outcomes

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Learning Objectives

1. Describe key processes using (LEAN) methodology and program components used to establish a successful interprofessional team, to develop a Pressure Ulcer prevention program to include potential skin injury related to medical devices.


3. Discuss how APRNs and direct care nurses can impact nursing’s sensitive indicators by deploying an evidence based Pressure Ulcer Prevention Model©; and MDRPrU Algorithm to improve and sustain a ‘zero zone’ PrUs.
National Pressure Ulcer Advisory Panel (NPUAP) defines a *pressure ulcer* (PrU) as a localized injury to the skin and/or underlying tissue, usually over a bony prominence, resulting from sustained pressure.\textsuperscript{1} PrUs can occur beneath Medical Devices (MDs) used for diagnostic / therapeutic purposes.\textsuperscript{1}

- Tissue injury usually mimics the shape of the device
- Tend to progress rapidly due to lack of adipose tissue

PrUs are acquired among high-risk patients in pediatric /adult hospitals, and are key indicators of the effectiveness of nursing care.
Medical Device Related Pressure Ulcers

- MDR PrUs may be more difficult to treat because device cannot always be moved or removed
- Devices are often rigid, elastic or secured with tight dressings
- Microclimate (heat and humidity of the skin also contributes
- Edema of tissue creates more pressure
- Inappropriate size and selection of product
BACKGROUND OF PROBLEM

- Past two years we have reduced our incidence of PrUs (sacral, coccyx, heel) from 5.9 to ‘zero to 0.1%’ using an Evidence Based (EB) SKIN Bundle and the 5-Layered Mepilex Border® Dressing—thus Medical Device Related PUs (MDR PrUs) significance became much more transparent.

PROBLEM:

- In 2012-13, we examined our CALNOC (Collaborative Alliance for Nursing Outcomes) nursing data, and noted a surge of MDR PUs >benchmark in Pediatrics/Adult units,

<table>
<thead>
<tr>
<th>Devices:</th>
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<tr>
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<tr>
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<td>Cast</td>
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<td>IV hub/tubing</td>
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<tr>
<td>FY 2012 - Medical Devices Related to Pressure Ulcer Prevalence N=21</td>
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<td>Ches...</td>
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<td>Trac...</td>
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<tr>
<td>EKG... ECMO</td>
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</table>
As our organizational “Traditional Pressure Ulcer” rates decreased, MDR PrUs became much more apparent.

**MDR PrUs often misidentified**

Not typically tracked, trended and reported.

Often more complicated than preventing usual PU as the device may be an essential diagnostic / therapeutic component of Tx.

Although most are avoidable, not all are!
Call To Action

GOAL

• Establish an interprofessional team to develop an performance improvement (PI) process to examine (using LEAN methods) our on-going rate of MDRPrUs in pediatric/adult patients and develop an actionable plan to sustain.

ACTION – Use PDSA Model

Plan (change) Do (change) Study (results) Act (results)
Formed a team: CNS led project (Peds CNS; Director, Nursing Research, bedside nurses, MDs, PT and Wound Program Director)

**PLAN**
- Identified the problem (50%) increase in MDR PrUs from 2011. **Total of 21 cases (FY-12)**
- Established Goal, Aims and measures

**DO** - Initial small tests of change

**Widespread testing** (immediately deployed Mepilex Border®; Lite® or Mepilex Transfer® beneath all tracheostomy plates and other respiratory devices, particularly in NICU/PEDS.

**Re-examined our SKIN BUNDLE and P & P; Began work on EB Prevention Model**
• Team examined all 21 MDR PUs occurring in FY-12-13 (reviewed stage, location, device involved, and compliance with SKIN Bundle).

• Began work to re-conceptualize our Pressure Ulcer prevention program to have a more Comprehensive Assessment & Preventive approach for MDR PrUs.

• **Prevention Model Finalized in late 2013**, to include MDR PrU elements on the Bundle with EB interventions, including frequent skin/device assessments, moisture-reducing device interface and pressure-free device interface (Mepilex® Transfer; Mepilex® Lite; Mepilex® Border).

• Revised Skin Assessment Policy/Procedure and SKIN bundle
Device Related Drill Down
Know the Risks and Devices

MEDICAL DEVICES RELATED TO PRESSURE ULCER

Check for potential skin breakdown under areas with the following devices:

- Arterial lines and securement devices
- Central venous & dialysis catheters
- Compression leg devices/stockings
- Drain Devices (any type)
- GI / GU Devices
- Intra-aortic balloon pumps
- Line device (tubing, or any securement device of any kind)
- Monitoring devices
- Oxygen Delivery Devices
- Orthopedic / Neuro Device
- Soft restraints (ankle/wrist)
- Velcro straps

Oxygen Delivery Type
- BIPAP
- CPAP
- Endotracheal tube
- Face mask
- Nasal cannula
- Trach plate
- Oxygen tubing/nasal cannula

GI/GU Devices
- Abdominal Binder
- Fecal tube/pouch
- G or J Tube
- NG Tube
- Ostomy equipment
- PEG tube
- Urinary catheter

Monitoring Equipment
- Blood Pressure Cuffs
- Electrodes
- Pulse Oximeter

Orthopedic / Neuro Devices
- Any splints for immobilization
- Brace
- Cervical collars
- Orthotic foot splints
- External Fixation
- Halos

ACTION: Team should select MDs available in the facility based on the devices’ ability to induce the least degree of damage from the forces of pressure and/or shear.

Pressure Ulcer Prevention Model

Goal: Adult and Pediatric patients will be free of pressure ulcers (PrUs) and skin injury
Strategy: Conduct a Comprehensive Pressure Ulcer Assessment on Admission/Reassessment every shift
Prevention: Evaluate risk for pressure ulcers (Braden Scale/Braden Q/NSRAS), include those caused by Medical Devices (MDs)

Inpatient Algorithm

Interprofessional team develops integrated PrU prevention plan of care (POC) using MHS EB SKIN Bundle
1. Specific to risk profile for each patient.
2. Implement SKIN
   a. Support surface — select appropriate pressure-relieving/redistribution equipment or devices to protect vulnerable skin/bony prominences
   b. Skin inspection — regular Q Shift assessment of entire skin
   c. Keep moving — implement turn/reposition schedule that optimizes independent movement & reduces friction shear
   d. Incontinence/moisture management (incontinence, perspiration or exudate)
   e. Use skin barrier products to manage moisture next to the skin in conjunction with a skin care routine to keep skin clean and dry

MEDICAL DEVICE(S) RELATED PrUs
Check for Pressure & Skin Breakdown Under:
- Central venous & delivery catheters
- Compression leg devices/stockings
- Drain Devices
- GI/GU Devices
- Line device (tubing secured)
- Monitoring Devices
- Oxygen Delivery Devices
- Orthopedic/Neuro Devices
- Soft restraints (ankle/foot); Patient ID arm bands

Wound Evaluation and Treatment, Including Documentation of Intervention

Is there evidence of skin alteration or wound?
- Yes: Rigorous PrU/Wound Evaluation
- Yes: Document scope & Digital photo of the PrU/Wound according to guidelines
- Obtain consult (WOCN; MD)
- All-inclusive patient assessment/wound appraisal
  - H & P
  - Wound stage, description
  - Etiology of PrU/Wound
  - Nutritional status
  - Bacterial colonization/infection
  - Psychosocial needs
- Identify Evidence Based Treatment Goals / Referrals as needed
- Implement Interventions and Document
  - Appropriate wound healing drug
  - Moist wound bed
  - Topical treatments
  - Debridements
  - Adjunct therapies
  - Pain management
  - Nutrition
  - Surgical repair
  - Education
  - PU Offloading Regimen

Safe Transitions of Care
Interprofessional, Nurse-to-Nurse ‘Handoff’ and documentation.
- Discharge or transfer of care
- Interfacility communication

Patient Admitted

Is Patient at Risk?

Risk Assessment/Documentation
- Conduct a comprehensive risk and skin assessment, Adult-Braden Scale; Pediatric-Braden Q; Neonatal Skin Risk Assessment Scale (NSRAS)
- Reduced mobility/activity Skin changes (redness/blisters/erythema/dryness); prematurity
- History of PrUs: Poor circulation at diabetes, PVD
- Increased skin moisture (e.g. due to incontinence, perspiration)
- Poor nutritional status
- Extremely low birth weight (LBW) neonates (<1200g)
- Age (over 65 years) in the presence of other risk factors such as loss of sensation or ability to report discomfort due to sedatives or poor cognitive function
- Use of sedatives, dopamine, oxygen use and postoperative steroid therapy

Nutrition and hydration — check patient’s weight and monitor any changes. Encourage patients to eat and drink regularly to maintain a good nutritional status. If appropriate, check nutritional status using assessment tool (e.g. Nutrition Risk Screen (NRS) consult with dietician for nutrition problems.
- Document all measures in place & communicate with IPT
- Provide education for patient and caregivers
- Assess risk for PrUs: If patient has Medical Device(s), if yes, assess type, and deploy Mepilex Border™/Mepilex Transfer® or Lite®
SKIN** Bundle

Protect Your Patient’s SKIN
Pressure Ulcer Prevention

**Surface:** Specialty Mattress; Z-flo, Waffle cushion

**Keep Turning:** Offload heels
Apply Mepilex Border® to sacrum / or other pressure points; Use Mepilex® Border/Transfer® Mepitel® Lite to prevent Medical Device related PrUs

**Incontinence:** Perineal care every two hours
Moisture barrier; Avoid diapers except for excessive stool, urine

**Nutrition:** Dietary consult for nutritional deficits;
Carry out orders

TISSUE INJURY MORE THAN SKIN DEEP

BEST PRACTICES TO PREVENT MEDICAL DEVICE RELATED INJURIES

• Choose the correct size of medical device to fit the patient size (e.g. TEDs, Trach, masks etc)
• Cushion the Skin with Mepilex® products (3x3, 4x4, border dressings and 4x4 Lite dressing) to place under devices and/or bony prominences to help prevent HAPUs from medical devices
• Remove or move the device daily to assess skin
• Watch for edema under device(s)
• Confirm devices are not beneath the individuals (can be “lost” in bariatric patient skin folds.
• Organize Skin Surveillance Teams
# Protecting Against Device Related Pressure Ulcers

**Device**
- CPAP/BiPAP
- Tracheostomy Care
- Tracheostomy Tie Irritation
- Restraints Skin Damage
- Braces
- Rigid Casts/Splints/Traction
- Nasal Cannulae with ear protection
- Nasal Cannulae: Nose
- Tubes/Catheters

**Problem**

**Protection**

**Protect tissue and minimize friction, shear and moisture from fixed devices**

<table>
<thead>
<tr>
<th>Directions</th>
<th>Suggested Products</th>
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<tbody>
<tr>
<td>Apply dressing to protect bony prominences and skin that will be in contact with NIVM (Non invasive ventilation mask)</td>
<td>Mepilex® Lite</td>
</tr>
<tr>
<td>Apply dressing to skin under trach plate. Drain sponges may be placed on top to catch secretions.</td>
<td>Mepilex® Lite</td>
</tr>
<tr>
<td>Apply dressing to skin under trach ties.</td>
<td>Mepilex® Lite</td>
</tr>
<tr>
<td>Apply dressing to skin at risk from friction or shear under restraint.</td>
<td>Mepilex® Lite or Mepilex® Border</td>
</tr>
<tr>
<td>Apply dressing to protect bony prominences and skin that will be in contact with brace.</td>
<td>Mepilex® Lite or Mepilex® Border</td>
</tr>
<tr>
<td>Apply dressing to the contact points of the ears, or behind the ears.</td>
<td>Mepilex® Lite or Mepilex® Border</td>
</tr>
<tr>
<td>Apply dressing to skin under the nares.</td>
<td>Mepilex® Lite</td>
</tr>
<tr>
<td>Apply dressing to skin under bumper or drain. Anchor device.</td>
<td>Mepilex® Lite</td>
</tr>
</tbody>
</table>

**Notes:**
- Fenestrate/cut Mepilex® Lite PRN to accommodate tube sites
- When cutting Mepilex® Lite, leave backing film in place. Cut to desired shape
- Products listed on this guide are not suitable for fixation of life sustaining devices
- DO NOT CUT Mepilex® Border
- Wear time: Up to 7 days, if dressing intact
- Dressings with Safetac® technology DO NOT require use of skin barrier products

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The information provided herein is not to be construed as the practice of medicine or substituted for the independent medical judgment of a practitioners treating clinician. This information, including but not limited to suggestions for product wear time, product selection, and suggested use is based on generalizations, and does not consider the unique characteristics of an individual patient. Each patient’s clinician shall remain solely responsible for assessing the severity of patient wounds, determining the appropriate treatment, and managing treatment of the wound. For additional information, please refer to the applicable product insert or contact Mölnlycke Health Care at 1-800-562-9877.

The suggested topical management options and change rates are the treatment choice of your facility and may not reflect the opinions of Mölnlycke Health Care or in the case of products manufactured by a company other than Mölnlycke HealthCare, the manufacturer’s recommended usage guidelines.
Skin Surveillance Team (SST): Implemented Nov. 2013

- The **Skin Surveillance Team** is a interdisciplinary team that reviews and discusses patients that are at high risk for skin breakdown. The team rounds on Tuesday’s (Peds Rehab) and Thursday’s (Gen. Peds). The SST rounds in ICU (M-W-F).

- Patient and family education is also provided at this time about preventative measures to protect the skin during the hospitalization and at home. We instruct on how to place Mepilex® Border Sacrum Dressing for prevention.

- **Team Members:** WOCN, CNS, Clinical Educator, Wound Warrior RN, PT, Dietitian, Specialty bed representative
Patient Selection Criteria for SST Rounds

- Patients with a Braden score of $\leq 18$/Braden Q score $\leq 16$
- Patients with an existing pressure ulcer or wound
- Patients who are on a specialty support surface due to immobility
- Patients with multiple medical devices
- Patients with moisture related skin damage
- Patients with nutritional deficits
What Occurs During SST Rounds?

- Inspects patient’s skin on bony prominences with the primary RN (including the removal of devices, if appropriate)
- Assists primary RN with repositioning patient
- Assists primary RN with diaper changes to monitor any signs of moisture related skin damage
- Starts/discontinues use of specialty support surfaces
- Evaluates accuracy of SKIN bundle documentation
- Consults with nutritionist for adequate dietary and vitamin intake to aid wound healing.
• Pressure Ulcer Prevention Model® was fully launched Dec. 2013 – beginning of 2014. Since then we’ve closely tracked incidence and prevalence (CALNOC data); along with compliance with the Prevention Model® Interventions, including MDR PrUs; and SKIN prevention bundle for past 4-Qs

• We had an absolute reduction of MDR PrUs from 0.06% incidence of stage 3+ MDR PrU's per 1000 patient days to zero in pediatrics (benchmark 0.0 – 0.04%)

• Among adults from 0.28% incidence to zero with (benchmark 0.05-0.09%,) after ‘Prevention Model®’ including MDR PrU focus, with EB Bundle strategies

• Where Are We Today? Since implementation of the PrU/MDR prevention program, we have overall sustained a ‘zero zone’ incidence, ranging (0.01-1.33) among adults and pediatric patients.
Trend Report by Total Facility - Quarterly (Magnet)

Service Line: Adult Acute Care, Post Acute (Rehab only)
Measure: % of Pt. with Hospital Acq. Press. Ulcers Category II+
Quarter: Between Jul - Sep 2013 and Apr - Jun 2015
17 - Long Beach Memorial; Total Facility
Report Group: CALNOC (N = 42)

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<tr>
<td>Total Facility</td>
<td>0.00</td>
<td>0.68</td>
<td>0.75</td>
<td>0.32</td>
<td>0.65</td>
<td>0.68</td>
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<tr>
<td>CALNOC Mean</td>
<td>0.64</td>
<td>1.24</td>
<td>1.20</td>
<td>0.93</td>
<td>0.92</td>
<td>1.23</td>
<td>1.21</td>
<td>1.46</td>
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Outperforms the benchmark for 8 of 8 quarters
Snapshot of past to current state

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<thead>
<tr>
<th>Quarter</th>
<th># of patients</th>
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<td>Q3 2014</td>
<td>2</td>
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<tr>
<td>Q4 2014</td>
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MDR Pressure Ulcer Incidence (Adult & Pediatric Combined)

PrU Model and MDR PrU Bundle implemented
• Toolkit Bag Trial - 250 Adults/250 Pediatric Families (N=500) (Spanish/English)
• We are in the process of conducting Post-Discharge Satisfaction Survey (30-Days); and Tracked Re-Admissions within 30-days for Pressure Ulcers at admission.
Key steps:

- Overall organizational goal of “zero” preventable harm. Nurse executives/managers; APRNs must lead way.
- **TEAMWORK** - House wide PrU Prevention team, Interprofessional Dashboards / Visibility boards displaying data
- Quarterly house-wide PrU prevalence study, monthly incidence density; and a strong focus on MDR PrU prevention.
- Use and audit EMR for adherence to SKIN\(^6\) Care BUNDLE;
- Skin care rounds/Daily Huddles in All units; Skin champions.
- **Application of Mepilex® Border Sacrum; Mepilex Lite® per protocol for cushioning beneath devices and to prevent other PrUs.**
- Hourly Intentional Rounding (patient/family education)
Conclusion

- CALNOC Prevalence and Incidence MDR PrU data guided and continues to contribute to the success of a comprehensive Pressure Ulcer Prevention program.
- Program education and ongoing assessment of skin integrity and the use of devices that minimize pressure.
- Interprofessional team meetings, monthly to review progress and plan.
References