Using Devices for Pressure Ulcer Prevention and Treatment

Evan Call, MS
Weber State University, Salt Lake City
Joyce Black, PhD, RN, CWCN, FAAN
Omaha, NE

The National Pressure Ulcer Advisory Panel (NPUAP) serves as the authoritative voice for improved patient outcomes in pressure ulcer prevention and treatment through public policy, education and research.

NPUAP Mission
International Guideline

NPUAP – in collaboration with the European Pressure Ulcer Advisory Panel (EPUAP) and the Pan Pacific Pressure Injury Alliance (PPPIA) – has worked to develop a NEW pressure ulcer prevention and treatment Clinical Practice Guideline and a companion Quick Reference Guide.

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NPUAP Monograph

Released in November 2012, the 254-page, 24 chapter monograph, Pressure Ulcers: Prevalence, Incidence and Implications for the Future was authored by 27 experts from NPUAP and invited authorities and edited by NPUAP Alumna Dr. Barbara Pieper.

The monograph focuses on pressure ulcer rates from all clinical settings and populations; rates in special populations; a review of pressure ulcer prevention programs; and a discussion of the state of pressure ulcers in America over the last decade.

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Save the date

Dressings for Treatment of Pressure Ulcers

Margaret Goldberg, MSN, RN, CWOCN
June 2016

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- Evan Call, MS, CSM (NRM)
  Performed testing for the following support surface companies: Span America, Tamarack, Medline, Biodel, Hill Rom, FXI, DM Systems, Hoveround, , The Roho Group, Sage, Arjo Huntleigh, Kap Medical, Freedom Medical

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- Jeffrey Levine, MD
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- Sally O’Neill, PhD
- Mary Sieggreen, MSN, CNS, NP, CVN

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Objectives

- Compare and contrast the patient risk factors for pressure ulcer development that match support surface characteristics used for prevention
- Explain the benefits of the use of low air loss or microclimate management surface, an alternating pressure surface and a continuous low pressure surface for the treatment of pressure ulcers
- Describe how to determine if a support surface is working
- Describe how to develop an algorithm for a facility to use support surfaces

Traditional causes of pressure ulcers

- Pressure
  - Perpendicular force in excess of capillary flow to tissues, hypoxia develops and tissue dies
  - Consider both intensity of pressure and duration
- Shear
  - Pull and stretch blood vessels as tangential force is applied to tissue, tissue becomes hypoxic
Microclimate as a cause of pressure ulcers

- Skin temperature and humidity at the interface between skin and the surface
- As temperature of skin rises, the metabolic needs of the skin for oxygen and glucose rises
  - 10% increased need for each 1 degree

“These substrates cannot be delivered if the skin is under pressure.”

Healing with control of microclimate

Baseline

Day 5

After 18 days
Based on degree of immobility
- Can the patient move?
- Does the patient move?

Based on degree of inactivity
- Can patient be up?
- Will patient get up?

Characteristics of high specification foam
- Depth = 6 inches thick
- Resilience = ability to return to original shape
  - High resilience is better
- Density = 35–130 density hardness
  - 35 Kg/M²
- Support factor = Inflection Density: (IFD) 1.75 to 2.4
- Cover MVTR = minimum 300 g/m²/24hrs
Resilience... Returns to original height after compression

Indentation Force Deflection
Density

Different size, same weight  More material less air

Density Impacts Breathability
Support Factor

Compression of the foam by a body lying on it allows the body to sink into the foam increasing the contact area of the body with the foam.

Foam is like a spring, the more you compress it the more it pushes back.

The portion of the body that is most deeply immersed in the foam experiences the greatest push back or highest pressure.

Pressure Redistribution, Foam
Case example

- 82 year old patient with end stage COPD, dyspneic and sits up as high as possible with arms on tray table to breathe

- Is foam enough for him?

Undesirable Effects of Tissue Loading, in One Position
Immersion: How far does the occupant sink in

Overlay use

- As a bridge for patients who have short-term immobility
  - Provide higher immersion than foam
- Can be sent along with patient to next level of care
- Be cautious that height of overlay does not raise the height of the bed and increase fall risk with injury
Case example

- 52 year old with diabetes and peripheral arterial disease, admitted for revascularization of leg
- DTI found on heel when elastic stocking removed
- Does this patient need a heel offloading device?

Case example

- 65 year old patient having elective total knee replacement. Epidural used for pain control the night of surgery.
- Patient can lift leg up off of bed, but does not unless coached to do so
- Does his heel need additional protection?
Proper Heel Elevation Off the Surface

What’s wrong with this picture?
Case example

- 79 year old patient in ICU with sepsis from a urinary tract infection. BP has been low (MAP ≅ 65), so is being supported by vasopressive meds. On mechanical ventilation, so HOB is up 30 degrees. Turning has been infrequent, at times her BP falls slightly when moved.
- Can we use the “turn feature” on the bed as turning?

The body cannot leave the bed!

Continuous rotation beds do not lift the patient from the bed
Shear forces can create larger wounds
Stop these beds on each shift to allow inspection of the skin
Apply dressings to reduce shear
Case example

- 65 year old postoperative patient with orders for “progressive mobility” and to be “up in bedside chair as tolerated”. Patient given IV Fentanyl before getting up and medicated often due to pain while seated.
- How long should he be up? How can we keep the skin intact on his buttocks and sacrum when he slouches?

Progressive Mobility

Progressive mobility programs are calling for sitting up "as long as tolerated". Leads to too many hours in a chair and sitting on the sacrum. Even if sitting erect pressures on the ischial tuberosites are high.
Does repositioning help?

Ensure that you don’t just move the tissue load to another location.

Proper Side Chair Presents No Additional Risk
Chair cushion options

Air Cell  Foam  Gel  Air Columns

Support Surfaces for Treatment

- Part of the concept of the 3-legged stool
- Pressure ulcers form due to pressure, therefore redistributing pressure is the most important component of care
- Ongoing pressure will delay healing and increase the risk of further ulceration

The 3-legged stool analogy for pressure ulcer healing is:
1. Pressure redistribution
2. Nutritional support
3. Topical wound care

And like the stool, if one leg is missing the stool tips over... and the wound does not heal
Getting pressure off of the pressure ulcer

- Turning the patient into a position where he/she is not lying on the ulcer
- Limiting sitting on the ulcer to 1 hour 3 times a day
- Upgrading the support surface
  - Overlays
  - Microclimate Control
  - Alternating Pressure
  - Continuous Low Pressure

High Immersion

Powered surfaces with high immersion into air pockets
Allows patient to remain on fewer turning surfaces without ulcerating
Low Air Loss – beds or mattress replacement

- Blowing air helps to dry the skin (manage microclimate)
  - Patient must be moved on the bed
- Often combined with a high immersion surface

Alternating Pressure

- Powered mattress or mattress replacement with air cells that inflate and deflate
- Premise is that these small movements aid in blood flow
- Does not "move the patient"
Case example

- Patient 60 year old male developed sacral ulcer during hospitalization for stroke and at risk for aspiration
- Patient is always in Semi-Fowler's position (HOB up 30–45 degrees)
- Does he need a different support surface?

Case example

- 84 year old with a pressure ulcer on left hip
- Does not stay positioned on back or right side
- Does this patient need a different support surface?
Is the support surface working?

- Assess the bed on each shift
  - Powered --plugged in?
  - Low air loss -- Leaking air?
  - Alternating pressure – air cells moving?
- Assess overlay with linen change
  - Air cells deflated?
- Assess chair cushion daily
  - Foam leaving body imprints?
  - Gel separated?
  - Air cells inflated?

Algorithm for support surfaces

- Consider your usual cases of pressure ulcers
  - Foam with or without alternating air cells
    - ICUs need a more sophisticated pressure redistribution surface
    - Overlays for short term immobility
    - Bariatric beds for weights over 350 lbs or wide girth
  - Use high immersion beds for
    - High risk patients (Avoid unstable SCI)
    - Ulcerated patients with goal of healing
    - Surgical repair
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