The Braden Scale: Using Subscales to Assess Risk and Plan Care

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Objectives

After participating in this program, participants will be able to:

- Identify the Six Subscales of the Braden Scale
- Describe the relationship between the subscale total score and levels of risk of developing a pressure ulcer
- Identify the 3 R’s of Interventions to diminish exposure to pressure ulcers
The Braden Scale

Using Subscale Scores to Assess Risk and Plan Care

LEVELS OF PRESSURE SORE RISK USING BRADEN SCALE

- MILD RISK 15-18
- MODERATE RISK 13-14
- HIGH RISK 10-12
- VERY HIGH RISK ≤ 9
Levels of Risk | Score Ranges | Approximate PVP
--- | --- | ---
Mild Risk | 15-18 | 30-60%
Moderate Risk | 13-14 | 50-75%
High Risk | 10-12 | 60-90%
Very High Risk | 9 and below | 100%

Predictive Value of Positive Result (PVP) (TP/TP+FP) across a range of scores

Figure 1

All At-Risk Patients Are Not Created Equal: Analysis of Braden Pressure Ulcer Risk Scores to Identify Specific Risks


FIGURE 1. Braden Scale score values. Percentages represent the percent of patients with the given score that developed a pressure ulcer.
Both Cases Braden Scale = 12

Which case is probably a True positive and which is probably a False positive?

- 24 yr old male
- Appears healthy, well-nourished
- Hernia repair
- Immediate post-op Braden Scale score =12

- 60 yr old male
- 500 lbs (272.3 kg)
- Hypoventilation syndrome
- Low PO₂
- CHF, edema, low BP
- Somnolent
- Admission Braden Scale score = 12

Both Cases Braden Scale = 21

Which is Probably a True negative and which is probably a False negative?

- 70 yr old male
- Appears healthy and but overweight
- Diabetic with arterial insufficiency, peripheral neuropathy and hx of diabetic ulcers
- Admitted for laparoscopic cholecystectomy
- Pre-op Braden Scale score = 21

- 30 yr old male
- Marathon runner
- Appears healthy but very thin
- Admitted for arthroscopy
- Pre-op Braden Scale score = 21
Risk Assessment

+ 

Consideration of Individual Factors

+ 

Clinical Judgment

= 

Better Prediction and Better Prevention

Subscales as predictors


- Settings: 161 hospitals, all specialties and categories throughout Germany
- Subjects: 28,299 adult patients, average 65.4 and 55% female.
- Methods: controlling for age, subscales were entered into a special statistical method (Chi-square automatic interaction detection) to determine which subscales were predictive of superficial pressure ulcers and which were predictive of full-thickness ulcers (Stage III and IV).
- Friction and Shear was the strongest predictor of Stage II ulcers
- The mobility subscale score of 1 (completely immobile) was the strongest predictor of Stage III and IV ulcers
Subjects and setting:
- 12566 adult patients in ICU or progressive care units within Mayo Clinic with scores of 18 or less
- 416 patients with HAPU stage 2-4 were studied

Friction and shear subscale had the greatest predictive power
Interesting interactions were noted
- Patients scoring 1 on both activity and moisture had a 57% increase in risk (as compared to patients with a score of 1 on only one of those subscales.
- Patients who scored the lowest (1) on both mobility and sensory perception subscales had a 67% increase in risk as compared to those with 1 on mobility but a higher sensory perception subscale score.

Risk Assessment as Clinical Data

- Each subscale score serves as
  - an initial appraisal of patient’s specific problems and functional deficits
  - A flag for assessments that need to be explored further
  - A guide to the types of interventions that should be used

- Total scores and levels of risk serve as
  - An estimate of the probability that a pressure ulcer will occur
  - A guide to the intensity of the interventions that should be used.
PLANNING CARE BY RISK FACTORS

Interventions from NPUAP –EPUAP Guidelines will be indicated with a green asterisk

Sensory Perception

- Level Of Consciousness
  - Carefully assess ability to move in bed and supplement any deficit
  - If sensory perception is a 1 and mobility is a 1, the patient is profoundly immobile and an active powered surface is likely to be necessary

- Cutaneous Sensation
  - Protect all bony prominences that are affected by sensory deficits
Activity

- If patient can ambulate with assistance, be certain to plan carefully for assistance.
- If patient is chairfast, provide good positioning, good support surface and frequent repositioning in the plan.
- For Chairfast or Bedfast Patients, examine mobility within that environment closely.

Mobility

- As mobility scores decrease, your concern about the adequacy of the support surface should increase.
- As mobility scores decrease, your concern about repositioning.
- The less the patient moves, the more the bed should move for them.
- At lowest scores, use active powered surface, 30 degree rule and supplement with small shifts.
Managing Moisture

- Use commercial moisture barrier
- Use absorbent pads or diapers that wick and hold moisture
- Address cause if possible
- Do prompted voiding and hydration in conjunction with turning schedules
- Manage tube feedings appropriately

Nutrition

- Screen and assess the nutritional status of every patient at risk
- Refer each patient with nutritional risk and pressure ulcer risk to nutritionist and other health care professionals as appropriate
- Minimally offer 30-35 kcal per kg of body weight per day and 1.23-1.5 g/kg/day and 1 ml of fluid per kcal per day
Specific Nutritional Interventions

- For those at risk who have special needs that make it difficult to meet their nutritional needs with ordinary oral intake, high protein mixed oral or enteral supplementation should be provided in addition to usual diet.

- Administer between meals to avoid interfering with normal appetite.

Managing Friction & Shear

- HOB Elevated No More Than 30 Degrees
- After moving from flat to elevated positioning, roll sideways to release shear forces.
- Use Trapeze When Indicated for Self-Care
- Use Lifting aids To Move Patient
- Protect Elbows & Heels If Being Exposed To Friction

- Some recent QA studies found use of silicone coated dressings or silicone skin creams can decrease incidence of ulcers, but RCT found no difference.
Conceptual Schema for Etiologic Factors in Pressure Sore Development

- Mobility
- Activity
- Sensory Perception

Extrinsic Factors
- Intensity & Duration of Pressure
- Pressure Sore Development

Tissue Tolerance

Extrinsic Factors
- Moisture
- Friction & Shear

Intrinsic Factors
- Nutrition
- Aging
- Low arteriolar pressure
- Low oxygen tension

INTERVENTIONS TO DIMINISH EXPOSURE TO PRESSURE

- 3 R’s
- Redistribution Surfaces*
  - Reactive
  - Active
  - Non-powered
  - Powered
- Remobilization
- Repositioning

*See [www.npuap.org](http://www.npuap.org) - click on Research then on Support Surface Standards Initiative
Systematic Review and Meta-Analysis of Pressure Relieving Surfaces


Summary of Meta-Analysis

- 52 randomized clinical trials
- Covering total population of 10,000 patients

- Findings
  - Advanced surfaces can reduce the development of pressure ulcer relative to standard foam mattresses by over 60%
  - Alternating pressure mattresses provide greatest reduction in risk
Support Surfaces in Patients at Risk

- Use higher specification foam than standard
- Use an active surface for patients at higher risk
- Alternating pressure active support overlays and mattresses have similar efficacy.
- Do not use small cell alternating air mattresses or overlays
- Continue to turn and reposition

Other Support Surfaces in Prevention

- Avoid use of synthetic sheepskin pads, cutouts, rings, donut – type devices or water-filled gloves

- If sheepskin is used, it should be a natural sheepskin
Repositioning

- In persons at risk, repositioning should be undertaken
- Repositioning use and frequency should be influenced by individual risk factors and the support surface being used

Repositioning Technique

- Avoid positions that cause excess pressure (side-lying, semi-recumbent) and use positions that minimize pressure and shear (30 degree lateral and HOB elevation)
- Use transfer aids to avoid friction and shear
- Avoid positioning on bony prominences with signs of skin damage

- In a series of positions with interface pressure measurements:
  - Found that raising the knees 20 degrees shifted body weight to the posterior side of the thigh, thus lowering pressure and shear at the coccyx.
  - Concluded that the knees should be raised before the head of the bed is raised.
  - It was also recommended that the patients be turned to their side briefly, to release the surface pressure and shear forces.


- Used 15 healthy volunteers to study the effects of HOB elevations of 0, 10, 20, 30, 45, 60 and 75 degrees.
  - Found that elevations of 30 degrees and higher caused peak interface pressures that were significantly greater than those experienced in the supine position.
  - The lowest sacral pressures occurred in the 0 degree elevation with only slight increases in sacral pressure at 10 and 20 degrees.
Conclusions for Supine Positioning

- Safest supine position, for those patients who can tolerate it, is with a HOB elevation from 0 to 20 degrees.

- When the nurse plans to elevate the head of the bed, the knees should first be elevated in the range of 20 to 30 degrees, according to patient condition, comfort and preference.

- When the goals of care include both prevention of pressure ulcers and prevention of ventilator associated pneumonia, an acceptable elevation for the HOB is most likely right at 30 degrees.

Protecting the Heels in the Supine Position

- The calf should be supported and the heels “floated” so they are not in contact with the surface of the bed and care should be taken to avoid pressure on the Achilles tendon.

- The knee should be in slight flexion to avoid obstruction of the popliteal vein.
Any particular device for heel elevation?

  - systematic review of methods for preventing heel ulcers
  - outlined a variety of issues with each of these studies
  - concluded that there was insufficient evidence determine which surface or heel protection device should be used in clinical practice.

90° lateral vs 30° lateral

  - compared the effects of 90 degree and 30 degree laterally inclined positions in TcP02 and TcCO2
  - demonstrated a “dramatic impairment oxygen supply” in these areas when the subjects were positioned in the 90 degree lateral position but not in the 30 degree lateral position.
Lateral Positioning and Clinical Reality

Without careful positioning, patients do not tolerate this position well.

Patients in studies of lateral positioning often spontaneously repositioned themselves.

Patients who can spontaneously reposition themselves should be put in the lateral position that is most comfortable to them.

This position is most important and better tolerated by those who are obtunded or in deep coma.

Repositioning/Turning

- **HIGH RISK** –
  - Q2h turning schedule

- **Very High Risk**
  - Supplement with small shifts
Pressure Reduction Seating

- Systematic review show no clear superiority of one over another, but need remains
- Individualization is important, particularly for those who are chairfast for all activities of daily living.
- Frequent repositioning or teach self-repositioning

Lift-offs and Weight Shifting

- Supported primarily by the opinion of clinical experts
- Coggrave and Rose (2003) studied 48 spinal cord injured patients and found it took nearly two minutes of pressure relief for reperfusion to take place.

Sprigle & Sonenblum, 2011
Repositioning Seated Patients

- Position so as to maintain full range of activities
- Minimize pressure and shear
- Use footstool or footrest when feet do not touch the floor
- Limit time in chair without pressure relief
- Give special attention to those with sensory perception deficits

Chair Positioning
(from Defloor & Grypdonck, [2000] West J Nurs)
Bottom Line

- Most pressure ulcers can be prevented
- Requires skin and risk assessment AND interventions based on risk assessment
- Requires consistent care and critical thinking
- Requires constant vigilance and continuous quality improvement
- Requires team work and commitment

Above All, It Requires Perseverance

Perseverance is not a long race; it is many short races one after another.

Walter Elliott
The Spiritual Life
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