Developed by the BC Provincial Nursing Skin and Wound Committee in collaboration with Wound Clinicians from:

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TITLE	**Guideline: Braden Scale for Predicting Pressure Ulcer Risk in Adults & Children[1] / Infants**
Practice Level	• Nurses in accordance with health authority / agency policy. • Clients [2] at risk for skin breakdown require an inter-professional approach to provide comprehensive, evidence-based assessment and treatment. This clinical guideline focuses solely on the role of the nurse, as one member of the inter-professional team providing care to these clients.
Background	• The total Braden and Braden Q scores help nurses to determine (1) the intensity of preventive interventions for clients and (2) the probability that a pressure ulcer will occur. Subscale scores assist in determining (1) specific client problems / deficits that require further assessment, and (2) specific preventive interventions. • The Braden and Braden Q Scales must be used in conjunction with a head to toe assessment when developing a plan for preventive management. **The Braden Risk Assessment Scale** • The Braden Scale (see Appendix A) has established validity and reliability and is the most widely used risk assessment scale in Canada. • Some factors not included in the Braden Scale such as advanced age, hypotension, hemodynamic instability fever, prolonged ICU stay, severity of illness, comorbid conditions such as diabetes and peripheral vascular disease and obesity can increase pressure ulcers risk beyond the score indicated on the Braden Scale. • Some research indicates that the Braden Scale has poor predictive validity for critically ill clients.[14, 18, 26, 34] However other evidence [22, 54] supports the total Braden Scale score in critical care although the subscales of activity and nutrition are not good predictors of pressure ulcers formation.[18] • Implementing evidence-based bundles of skin care interventions for all clients in a critical care unit has been shown to be effective in decreasing the rate of pressure ulcer formation. [7, 24] **The Braden Q Risk Assessment Scale** • The Braden Q Scale (see Appendix B) is used for assessing pressure ulcer risk in the pediatric populations including neonates and children older than 8 years. • The Braden Q was adapted from the Braden Scale for use in the pediatric population. The descriptors have been modified to reflect the developmental needs of the pediatric population and the unique clinical context for neonates, infants and children in acute care. • The Braden Q scale has been tested for validity and reliability.
Indications	This guideline has been developed for use in those areas where the Braden Scale or Braden Q Risk Assessment Scales are used by staff to determine a client's risk status for skin breakdown.
Definitions	**Active Support Surface** – An externally powered therapeutic support surface that can change its load – distribution properties with or without applied load. These surfaces reduce the pressure against the client's skin regardless of whether they move. Examples include alternating pressure mattress and lateral rotation mattresses. **"Bottoming out" –** A term used to indicate that the support surface is not providing sufficient pressure redistribution; can be assessed by placing a hand underneath the support surface to determine if bony prominences can be felt. **Braden Scale** – Assesses each client according to 6 subscales: sensory perception, skin exposure to moisture, the client's level of activity, the client's ability to change positions, nutritional intake and the presence of friction and shearing force. Total Braden Scale scores range from 6 to 23 with lower scores indicating higher risk. Risk scores range from 6 - 18 from at-risk to very high risk. **Braden Q Scale –** Assesses each pediatric client according to 7 scales: sensory perception, skin exposure to

[1] Clients are considered to be children if they are 18 years of age and under.
[2] The term client includes recipients of care in the community (client), residential care (resident) and acute care (patient).

	moisture, the client's level of activity, the client's ability to change positions, nutritional intake, the presence of friction and shearing force and tissue perfusion / oxygenation. The total Braden Q score ranges from 7 – 28 indicating risk to very high risk. Lower scores indicate higher risk. The cut off score indicating risk is 16. There is not a range of scores indicating gradations of risk. **Bundle –** A small group of evidence-based interventions that, when implemented as a group of interventions to all clients on a regular basis (usually at a specific time) show improved clinical outcomes. **Friction** – A mechanical force that occurs when repeated movements occur over surfaces such as bedding, creating localized heat and abrasions It results in the loss of protective layers of skin. **Hemodynamic instability –** A state where the circulatory system is not able to adequately perfuse the tissues and the client requires pharmacologic or mechanical support to maintain a normal blood pressure or adequate cardiac output. It is due primarily to hypovolemia, sepsis and cardiac problems. **Intertrigo** – Itching, burning, redness and possibly open areas where opposing skin surfaces touch and rub, such as the groin, axilla, breasts (especially if large and pendulous) and between the toes. Is more common in those with diabetes. Caused by yeast or bacteria. **Knee gatch –** A bed that has an adjustable joint under the knees allowing the legs to be flexed and raised; the legs are fully supported by the bed when raised. **Pressure redistribution** – The ability of a support surface to distribute load over a larger body area to reduce pressure over bony prominences. **Therapeutic Support Surface** – Devices (active and reactive support surfaces) used to redistribute pressure loads and manage skin microclimate in order to prevent or promote healing of pressure ulcers. Includes foam mattresses, integrated bed systems, overlays, seating cushions and seating overlays, pillows and offloading devices such as foam supports and heel boots. **Reactive Support Surface** – A powered or non-powered therapeutic support surface that can change its load-distribution properties in response to an applied load. Examples include memory form replacement mattresses, static air overlays, low air loss mattresses. **Shear** – A mechanical force that moves underlying bony structures in an opposite direction to overlying tissue resulting in to tissue ischemia and ulceration often accompanied by undermining and possibly tunnelling and/or deep sinus tracts beneath the ulcer.
Related Documents	Guideline: Assessment and Treatment of Pressure Ulcers in Adults & Children Guideline: Prevention of Skin Breakdown Due to Pressure, Friction and Shear in Adults & Children Flow Sheet: Braden Risk Assessment & Interventions Algorithm: Braden Scale Intervention

Assessment and Determination of Prevention Goals

Assessment

1. The Braden and Braden Q Scales are **one part** of a comprehensive assessment that includes:
    a. Client concerns
    b. Risk factors for skin breakdown (Link to Prevention DST), e.g. poor mobility, poor nutritional intake, incontinence, co-morbid medical conditions, such as diabetes and peripheral vascular disease, prolonged surgery, hemodynamic instability, low diastolic pressure (less than 60 mmHg), fever and smoking or excessive alcohol use.
    c. Risk factors unique to children include duration of intubation, large head circumference, cerebral palsy, spina bifida and congenital heart defects.
    d. Age.
    e. The presence of pain.
    f. Diastolic pressure and hemodynamic stability.
    g. Fever.

h. Nutritional concerns such as obesity and poor protein and caloric intake.
i. Sensation in the lower extremities (Link to Lower Limb DST; Diabetic Ulcer DST).
j. Head to toe skin assessment (Link to Prevention of Skin Breakdown DST).
k. History of and / or presence and characteristics of pressure ulcers (Link to Pressure Ulcer DST).

2. Complete the initial Braden or Braden Q Scale Risk Assessment:
    a. ICU / CCU: on admission.
    b. Operating Room (OR): pre-operatively.
        i. Risk status is based on the Braden Scale score and risk factors for surgery-related pressure ulcers [3]. Operating room staff must communicate the client's risk status, post-op skin assessment, the need for a therapeutic support surface and other pertinent information to PARR / PACU staff following surgery.
    c. Acute Care / Sub-Acute / Rehabilitation: on admission.
    d. Community Care: during the initial home visit.
    e. Residential Care: non-ambulatory residents on admission and ambulatory residents within 48 hours of admission in conjunction with the interRAI Pressure Ulcer Risk Assessment (PURS).
    f. Acute Psychiatry / Geriatric Psychiatry: on admission.
    g. Pediatric Units: on admission.

3. Steps to complete the Braden Scale include:
    a. Assess each of the 6 categories and select the description for each category that best describes the client's current condition. Each of the 6 subscales is scored from 1 to 4 except for friction / shear, which is scored from 1 to 3.
    b. Calculate the total score which will be between 6 and 23 points. The lower the score, the greater the risk for skin breakdown. Clients scoring 18 or less are considered to be at risk.
        i. At risk : 15 – 18
        ii. Moderate risk: 13 – 14
        iii. High risk : 10 – 12
        iv. Very high risk: 9 or less

4. Steps to complete the Braden Q Scale include:
    a. Assess each of the 7 subscales and select the description for each category that best describes the pediatric client's current condition. Each of the 7 subscales is scored from 1 to 4.
    b. Calculate the total score which will be between 6 and 23 points. Clients scoring 16 or less are considered to be at risk. The lower the score, the greater the risk for skin breakdown however degree of risk is not noted with this tool. Once the client is determined to be at risk, appropriate interventions should be implemented based on the most at-risk subscale(s).
    c. "OR" statements are used to provide multiple assessment points. When used the client need only have 1 of the elements listed. Score the client on the element that provides the lowest score.

5. Clients with additional risk factors not included in the Braden or Braden Q scales, such as an existing pressure ulcer, hemodynamic instability, low diastolic pressure and fever may be at greater risk than that indicated by the total score on these Scales.

[3] Surgery-related risk factors include procedures lasting more than 4 hours [1] , specific surgeries (cardiac, vascular, trauma, transplant or bariatric), positioning during surgery (sitting), weight or nutritional extremes, age over 62, albumin less than 3.5 and an ASA score 3 or greater.

Interventions

Based on the overall Braden or Braden Q Risk Assessment scores, the individual Risk Assessment sub-scores and in conjunction with the client / family, develop a plan of care that incorporates client concerns, treatment of risk factors for skin breakdown, intended and unintended outcomes, client education and discharge plans if indicated.

1. Reassess clients who score less than or equal to18 (Braden Scale) or 16 (Braden Q Scale):
    a. ICU / CCU: at least every 48 hours.
    b. Acute Care: every 48 hours and post operatively.
    c. Sub-Acute & Rehabilitation Units: every 48 hours.
    d. Community Care: every week for 3 weeks then quarterly and following hospitalization.
    e. Residential Care: every week for 4 weeks, then monthly or quarterly (based on agency policy) and following hospitalization.
    f. Acute Psychiatry / Geriatric Psychiatry: every 48 hours.
    g. Pediatric Acute Care and PICU: every 12 hours. Other pediatric units: every day.

2. Reassess all clients, irrespective of the previous degree of risk or the care setting whenever the clients condition changes.

3. **Sensory Perception Subscale** (Link to Braden Scale Interventions Algorithm)
    a. For clients who score less than or equal to 3 out of 4:
        i. Elevating heels:
            - Elevate heels off the surface of the bed at all times even when using a therapeutic support surface; Use pillows, therapeutic pressure offloading devices or devices specifically designed for the client.
            - Support the knees to avoid hyperextension when heels are elevated.
            - Heel elevation in bed is especially important for clients with diabetes mellitus, peripheral vascular disease, neuropathy and during and following surgery. Do not use rolled blankets, towels, or pillow cases, incontinent pads or IV bags to elevate heels.
            - Heel protectors provide protection from friction and shear but not from pressure as they do not elevate the heels off the bed.
    b. For clients who score less than or equal to 2 out of 4 on both the sensory perception and mobility subscales:
        i. Consider an active-powered support surface; use a Therapeutic Support Surface Decision Algorithm, if available, or consult with an occupational therapist, physiotherapist or wound clinician if assistance is needed to select or access a support surface.
        ii. Consider appropriate heel off-loading device, consult with an occupational therapist, physiotherapist or wound clinician as needed.
        iii. For clients undergoing a surgical procedure greater than 90 minutes in length, consider a therapeutic support surface on the operating table if one is not already in place. Heels should be elevated off the operating table at all times unless this interferes with the surgical procedure

4. **Moisture Subscale** (Link to Braden Scale Interventions Algorithm)
    a. For clients who score 3 out of 4:
        i. Establish a bowel and/or prompted voiding program for clients who are incontinent and support clients to toilet as frequently as necessary to maintain continence.
        ii. Avoid using incontinent briefs / pads unless client cannot toilet successfully. If using briefs or pads check them with every repositioning or every 4 hours if the client positions independently and change when soiled or wet.
        iii. Do not “double pad”; if the client voids large amounts use a more absorbent product, change the continence brief more frequently or use a condom catheter for males.
        iv. Do not use soaker pads if the client is wearing incontinence briefs.

v. Do not use multiple layers of bedding or padding, especially 'soaker pads'. For therapeutic support surfaces use only those coverings/pads that are air-permeable and recommended for therapeutic support mattresses or seating surfaces.
vi. Gently cleanse skin folds and perineal area after each incontinent episode with a no-rinse pH balanced skin cleanser and pat dry when finished; do not rub the skin.
vii. Apply a skin protectant / barrier cream product to protect skin from urine, feces and perspiration.
viii. To prevent and treat intertrigo in groins, axillas and under breasts, separate skin folds with wicking material or moisture transfer dressings to reduce friction and absorb moisture.
ix. If possible, remove the transfer board, slider sheet or lifting sling from under the client after use as they can potentially cause areas of moisture under the client.
x. During surgical procedures, avoid pooling of all surgical solutions and body fluids under the client.
xi. Avoid the use of powders and talc to reduce moisture.

b. For clients who score less than or equal to 2 out of 4 or who have pressure ulcers, skin irritation or maceration:
i. Follow all the above mentioned moisture-related interventions.
ii. Protect sacral or perineal wounds from feces and infected urine; use a fecal collector bag, condom catheter or indwelling catheter if appropriate for the client until the incontinence problem has been addressed.
iii. Consider use of a low air loss therapeutic support surface (active support surface); consult with an occupational therapist, physiotherapist or wound clinician if assistance needed to select or access a low air loss support surface.
iv. Consult a wound clinician or physician / NP for unresolved intertrigo, incontinence associated dermatitis or if a yeast or bacterial skin infection is suspected.

5. **Mobility / Activity Subscales** (Link to Braden Scale Interventions Algorithm)
a. For clients who score 3 out of 4 or who have reddened areas:
i. Client to be repositioned every 2 hours [4] using either a full turn or small shift of position
ii. For clients undergoing a surgical procedure greater than 90 minutes in length, consider a therapeutic support surface on the operating table if one is not already in place. Heels should be elevated off the operating table at all times sunless this interferes with the surgical procedure.
iii. Avoid positioning the client on a pressure ulcer or reddened area; if this is not possible then limit the time to less than 1 hour and assess for further damage.
iv. For clients who are side laying use foam wedges or pillows to support a lateral position with a 15-30 degree tilt and place a pillow between the ankles and knees to avoid contact between these bony prominences.
v. Elevating the heels off the surface of the bed – See Sensory Perception subscale # a (i – iii) on page 4.
vi. Instruct the chair bound client to shift weight every 15 minutes if the client can move independently in the chair.
vii. Provide clients with devices that will enable independent positioning and transfers, such as trapeze bars, transfer boards and bed rails. Consult with a physiotherapist or occupational therapist, if required.
viii. Remove patient handling equipment (repositioning/transfer boards, slider sheets, and lift slings) from under the client after use if they could potentially cause areas of pressure.
ix. Inspect the skin for any new or additional damage each time the client is repositioned, toileted or assisted with ADLs.
x. Do not use multiple layers of bedding or padding, especially 'soaker pads'. For therapeutic support surfaces use only those coverings/pads that are air-permeable and recommended for therapeutic support mattresses or seating surfaces.
xi. Ensure that bed linens beneath the client are smooth and unwrinkled.

[4] Community clients who need repositioning require the involvement of a family caregiver and / or home support services.

xii. Do not use rings or donut shaped devices to reduce pressure over bony prominences; do not massage reddened bony prominences.
xiii. If the client can ambulate with assistance, provide assistance to walk at regular intervals.
xiv. If a therapeutic support surface is needed, use a Therapeutic Support Surface Decision Algorithm, it available, or consult with an occupational therapist, physiotherapist or wound clinician if assistance is needed to select or access a support surface.
xv. Clients on a therapeutic support surface are repositioned every 2- 4 hours. The frequency depends upon their overall assessment, Braden Scale score, ability to reposition independently, the severity of the pressure ulcer, if present, and the characteristics of the client's support surface.
xvi. When repositioning clients on a therapeutic support surface monitor the surface daily or with each home visit to ensure proper inflation and functioning; check that it is not "bottoming out".

b. For clients who score less than or equal to 2 out of 4 or who have pressure ulcers, add the following to the previous interventions as indicated:
i. Establish a written client specific 24-hour repositioning schedule that establishes every 1-2 hourly turns depending on the client risk status and irrespective of the client's therapeutic support surface. High-risk individuals with poor tissue tolerance may require small shifts in position between turns.
ii. If the mobility and the sensory perception sub-scales both score 2 out 4, consider an active-powered support surface (mattress or bed); use a Therapeutic Support Surface Decision Algorithm or consult with an occupational therapist, physiotherapist or wound clinician if assistance is needed to select or access a support surface.
iii. Consider appropriate heel off-loading device, consult with an occupational therapist, physiotherapist or wound clinician as needed.
iv. Use small frequent repositioning shifts between a full position turn to redistribute the pressure.
v. If the client is chair bound or sits for long periods, use a therapeutic support surface on the chair and consider limiting chair sitting to 1-2 hour intervals. Reposition chair bound clients who cannot move themselves every hour.
vi. If the client has an ulcer on a sitting surface reduce sitting time to 2 sessions / day less than or equal to 45 minutes each time and reduce this further if ulcer(s) deteriorates (new bruising, increased drainage, increased wound pain or increased spasms for spinal cord injured clients).
vii. If the client is sitting in a tilting wheelchair then use the tilt feature regularly to alleviate pressure. The chair must be tilted at least 30 degrees to alleviate pressure over the sitting surface. Consult with an occupational therapist for tilt schedule as necessary.
viii. Consider pressure redistribution devices, such as gel pads to reduce pressure when using commode chairs and bath benches.
ix. Consult with a physiotherapist, occupational therapist or wound clinician as required to develop a mobility and exercise plan, choose appropriate turning schedule or select or access a support surface.

6. **Nutrition Subscale** (Link to Braden Scale Interventions Algorithm)
a. For clients who score 3 out of 4:
i. Maximize the client's nutritional status through adequate protein[5] and calorie intake, especially with Stage 3 and 4 ulcers, if compatible with goals of care.
ii. Encourage 1500 – 2000 mL of fluid daily or greater than or equal to 30 mL of fluid / kg of body weight; offer fluids every 2 hours for adult clients with dehydration, fever, vomiting, profuse sweating, diarrhea or heavily draining wounds unless contraindicated, e.g. heart failure, renal failure, liver dysfunction or low body weight elderly clients.

[5] Clients should receive 1.0 – 1.4 g of protein / kg body weight per day with Stage 1 – 2 pressure ulcers and 1.5 – 2.0 g of protein / kg of body weight with Stage 3 – 4 pressure ulcers [28, 35]. Assess renal function if increased protein intake is indicated.

iii. For pediatric clients, encourage fluid based on an appropriate weight based calculation (100 mL/kg for 1st 10 kg, 50 mL/kg for 2nd 10 kg, 20 mL/kg for remainder).

b. For clients who score 2 or less out of 4 and / or have a non healing or Stage 3 / 4 ulcer:
   i. Consult with a dietitian, if available.

7. **Friction / Shear Subscale** (Link to Braden Scale Interventions Algorithm)
   a. For clients scoring less than or equal to 2 on Braden Scale or less than or equal to 3 on the Braden Q:
      x. When sitting, ensure client's feet are supported directly on the floor, on a foot stool or a foot rest so that the hips and knees are at 90 degrees to prevent sliding down in the chair.
      xi. If the resident is sitting in a tilting wheelchair then use the tilt feature regularly to alleviate pressure. The chair must be tilted at least 30 degrees to alleviate pressure over the sitting surface. Consult with an occupational therapist for a tilt schedule as necessary.
      xii. Elevating the head of the bed (HOB):
         - Limit head-of-bed elevation to 30 degrees unless contraindicated by a medical condition or dysphagia.
         - For clients on bed rest limit HOB elevation (30^0 or less) to short periods of time (45 minutes or less if the client has an ischial or sacral ulcer unless the client is eating, has an enteral feed, is at risk for aspiration pneumonia or this is contraindicated by a medical condition.
         - Ensure the bed is flat when moving the client up in bed, then raised the knee gatch 10 – 20 degrees before the HOB is raised. [6] Ensure the client's hip bones are aligned 10 cm above the point where the bed flexes.
      xiii. Use a lift or transfer sheet to minimize friction and/or shear when repositioning; do not drag the client.
      xiv. For lateral transfers (bed to stretcher or stretcher to operating table) use sliding boards, roll boards or transfer sheets to minimize shearing.
      xv. Consider the use of patient handling equipment, such as, positioning slings with ceiling lifts, to avoid shear and friction when repositioning.
      xvi. Elevating the heels off the surface of the bed – See Sensory Perception subscale # a (i – iii) on page 4.
      xvii. Use products such as elbow and heel protectors to minimize contact between the skin and bed linen; synthetic sheepskin does not reduce friction / shear.
      xviii. Consult with an occupational therapist, physiotherapist or wound clinician as necessary.

Discharge Planning

1. Discharge planning, if discharge is anticipated, should be initiated during the initial client encounter and should support timely discharge and optimal client independence.
2. When a client who is at risk for or currently experiencing skin breakdown is being transferred between units or to another care setting (acute care, community care or residential care), ensure the receiving unit / setting is provided with a care plan that outlines the current client care including strategies for reducing risk status and preventing skin breakdown.
3. Advance notice should be given when transferring clients who need specialized pressure redistribution equipment to ensure it is in place at the time of transfer.

Client Outcomes

1. Intended
   a. The skin remains intact.
   b. Pressure ulcer (if present) heals.
   c. The Braden Scale or Braden Q is completed according to this guideline or agency policy.

[6] Clients post hip and knee arthroscopy should not have the knee gatch raised to avoid flexion or these joints.

2. Unintended
    a. The client develops a pressure ulcer.
    b. Existing pressure ulcer does not heal or deteriorates.
    c. The Braden Scale or Braden Q is not completed according to this guideline or agency policy.

Documentation

1. Document initial and ongoing Braden Risk assessments on the Braden Risk Assessment & Interventions Flow Sheet (BRAIFS) as per the Braden Risk Assessment & Interventions Flow Sheet (BRAIFS) Documentation Guidelines; document the Braden Q Risk Assessment on a designated form according to agency guidelines.
2. For clients at risk for developing pressure ulcers, document care plans, clinical outcomes and care plan revisions, as indicated as per agency guidelines.

Bibliography

1. Agency for Healthcare Research and Quality. (2011). Preventing pressure ulcers in hospitals: A toolkit for improving quality of care. Retrieved from http://www.ahrq.gov/professionals/systems/long-term-care/pressure-ulcers/pressureulcertoolkit/putool3.html
2. Anthony, D., et al. (2010). A comparison of Braden Q, Garvin and Glamorgan risk assessment scales in pediatrics. *Journal of Tissue Viability*. 19: 98 – 105
3. Ayello, E., et al. (2008). Preventing pressure ulcers and skin tears. In: Capezuti E., Zwicker, D., Mezey, M., Fulmer, T., (Eds). Evidence Based Nursing Protocols for Best Practice. 3rd. Ed. New York: Springer. pp. 403 – 429 Retrieved from www.guideline.gov
4. Ayello, E., et al. (2004). Pressure Ulcers: Braden Score Interventions. In: Baranoski S, and Ayello EA. Wound *Care Essentials: Practice Principles*. Springhouse, PA: Lippincott Williams & Wilkins. p. 240 – 270.
5. Ayello, E et al., (2002). How and why to do pressure ulcer risk assessment. *Advances in Skin and Wound Care*. 15(3): 125 – 133.
6. Baharestani, M., et al. (2007). Pressure ulcers on neonates and children: A NPUAP white paper. *Advances in Skin and Wound Care*. 20(4): 208 – 220.
7. Belt, D. (2006). ICU uses "bundles" to make huge improvements. *Healthcare Benchmarks and Quality Improvements*. 13(11): 124 – 125.
8. Bergstrom, N., et al. (1987). The Braden Scale for predicting pressure sore risk. *Nursing Research*. 36(4): 205 – 210.
9. Bergstrom, N., et al. (1998). Predicting pressure ulcer risk: A multisite study of predictive validity of the Braden Scale. *Nursing Research*. 47(5): 261 – 269.
10. Bergquist, S. (2001). Subscales, sub-scores, or summative score: Evaluating the contribution of Braden Scale items for predicting pressure ulcer risk in older adults receiving home health care. *Journal of Wound Ostomy Continence Nursing*. 28(6): 279 – 289.
11. Braden, B., et al. (2005). Preventing pressure ulcers with the Braden Scale: An update on this easy-to-use tool that assesses a patient's risk. *American Journal of Nursing*. 105(6): 70 – 72.
12. Brown, S. (2004). The Braden Scale: A review of the literature. *Orthopedic Nursing*. 23(1):30 – 38.
13. Chan, W., et al. Assessing predictive validity of the modified Braden scale for prediction of pressure ulcer risk in orthopaedic patients. *Journal of Clinical Nursing*. 18: 1565 – 1573.
14. Cho, I., et al. (2010). Braden Scale: Evaluation of clinical usefulness in an intensive care unit. *Journal of Advanced Nursing*. 66(2): 293 – 302.
15. Clinical Practice Guidelines: Interior Health, 2012; Fraser Health.
16. Comfort, E. (2008). Reducing pressure ulcer incidence through Braden Scale risk assessment and support surface use. *Advances in Skin and Wound Care*. 21(7): 330 – 334.
17. Cox, J. (2011). Predictors of pressure ulcers in adult critical care patients. *American Journal of Critical Care*. 20(5): 364 – 375.
18. Cox, J. (2012). Predictive power of the Braden Scale for pressure sore risk in adult critical care patients: A comprehensive review. *Journal of Wound Ostomy Continence Nursing*. 39(6): 613 – 621.
19. Curley, M., et al. (2003A). Predicting Pressure Ulcer Risk in Pediatric Patients. The Braden Q Scale. *Nursing Research*. 52(1): 22 – 33.
20. Curley, M., et al. (2003B). Pressure ulcers in pediatric intensive care: Incidence and associated factors. *Pediatric Critical Care Medicine*. 4(3): 284 – 290.
21. deSousa, D., et al. (2010. Predictive validity of the Braden Scale for Pressure Ulcer Risk in elderly residents in long term care facilities. *Geriatric Nursing*. 31(2): 95 – 104.

22. Garcia-Fernandez, F., et al. (2014). Risk assessment scales for pressure ulcers in intensive care units: A systematic review with meta-analysis. *Journal of Wound Ostomy Continence Nursing*. 41(1): 24 – 34.
23. Giesbrecht, E., et al. (2011). Measuring the effect of incremental angles in wheelchair tilt on interface pressure among individuals with spinal cord injury. *Spinal Cord*. 49: 827 – 831.
24. Gray – Siracusa, K., et al. (2011). Use of an intervention bundle to eliminate pressure ulcers in critical care. *Journal of Nursing Care and Quality*. 26(3): 216 – 225.
25. Hurlow, J. Intervention protocols for Braden Scale sub-scores. Retrieved from http://woundostomycontinence.com/Bradensubscores.pd
26. Hyun, S., et al. (2013). Predictive validity for the Braden Scale for patients in intensive care. *American Journal of Critical Care*. 22(6): 514 – 520.
27. Institute for Clinical Systems Improvement. (2007). Skin Safety Protocol: Risk Assessment and Prevention of Pressure Ulcers. London: ICSI. Retrieved from www.icsi.org
28. Institute for Healthcare Improvement. (2012). What is a bundle? Retrieved from http://www.ihi.org/resources/Pages/ImprovementStories/WhatIsaBundle.aspx
29. Iranmanesh, S., et al, (2012). Relationship between Braden scale score and pressure ulcer development in patients admitted in trauma intensive care unit. *International Wound Journal*. 9: 248 – 252.
30. Junkin, J., et al. (2006). IAD prevalence in acute care. WOCN National Conference, Minneapolis, MN
31. Kim, E., et al. (2009). Comparison of the predictive validity among pressure ulcer risk assessment scales for surgical ICU patients. *Australian Journal of Advanced Nursing*. 26(4): 87 – 94.
32. Kim, E., et al. (2013). Reusability of EMR data for applying Cubbin and Jackson Pressure Ulcer risk assessment scale in critical care patients. *Healthcare Informatics Research*. 19(4): 261 – 270.
33. Kottner, J., et al. (2009). An interrater reliability study of the assessment of pressure ulcer risk using the Braden scale and the classification of pressure ulcers in a home care setting. *International Journal of Nursing Studies*. 46: 1307 – 1312.
34. Kottner, J., et al. (2010). Pressure ulcer risk assessment in critical care: Interrater reliability and validity studies on the Braden and Waterloo scales and subjective ratings in two intensive care units. International *Journal of Nursing Studies*. 47: 671 – 677.
35. Kring, D. (2007). Reliability and validity of the Braden Scale for predicting pressure ulcer risk. *Journal of Wound Ostomy Continence Nursing*. 34(4): 399 – 406.
36. Langemo, D., et al. (2008). Heel pressure ulcers: Stand guard. *Advances in Skin and Wound Care*. 21(6): 282 – 294.
37. Lexicki, L., et al. (2000). Sensitivity and specificity of the Braden Scale in the cardiac surgical population. *Journal of Wound Ostomy Continence Nursing*. 27(1): 36 – 41.
38. Magnan, M., et al. (2009). Braden Scale risk assessments and pressure ulcer prevention planning: What's the connection? *Journal of Wound Ostomy Continence Nursing*. 36(6): 622 – 634.
39. Maklebust, J. (2005). Pressure ulcers: The great insult. *Nursing Clinics of North America*. 40(2): 365 – 389.
40. Minnesota Hospital Association (2010). Preventing pressure ulcers: New lessons from Minnesota. *OR Manager*. 26(4): 10 – 14.
41. Moore, Z, et al. (updated April 27, 2008). Risk assessment tools for the prevention of pressure sores. [Cochrane Review]. In *Cochrane Database of Systematic Reviews*, 2008. Retrieved from www.cochrane.org/reviews/en/ab006471.htmL
42. National Pressure Ulcer Advisory Panel. (2007). Support Surfaces Standards Initiative: Terms and definitions related to support surfaces. Retrieved from www.npuap.org
43. National Pressure Ulcer Advisory Panel. (2007). Pressure ulcer prevention points. Retrieved from www.npuap.org
44. National Pressure Ulcer Advisory Panel (2007). Pressure Ulcer prevention and treatment: Clinical practice guideline. Retrieved from www.npuap.org/print.htm
45. Noonan, C., et al. (2011). Using the Braden Q to predict pressure ulcer risk in pediatric patients. *Journal of Pediatric Nursing*. 26 : 566 – 575.
46. Norton, L., et al. (2011). Beds: Practical pressure management for surfaces / mattresses. *Advances in Skin and Wound Care*. 24(7) : 324 – 332.
47. Pancorbo-Hidalgo, P., et al. (2006). Risk assessment scales for pressure ulcer prevention: A systematic review. *Journal of Advanced Nursing*, 54(1): 94 – 110.
48. Powers, G., et al. (2004). Validation of the mobility subscale of the Braden Scale for Predicting Pressure Sore Risk. *Nursing Research*. 53(5): 340 – 346.
49. Quigley, S., et al. (1006). Skin integrity in the pediatric population: Preventing and managing pressure ulcers. *Journal of the Society of Pediatric Nurses*. 1(1): 7 – 18.
50. Racco, M., et al. (2010). Developing a protocol for intensive care patients at high risk for pressure ulcers. *Critical Care Nurse*. 30(3): 77 – 80.
51. Reilly, E., et al. (2007). Pressure ulcers in the intensive care unit: The "forgotten" enemy. *OPUS 12 Scientist*. 1(2): 17 – 30.
52. Resar, R., et al. (2005), Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. *Journal on Quality and Patient Safety*. 31(5): 243 – 248.

53. Resar, R., et al. (2012). Using care bundles to improve health care quality. *IHI Innovation Services white paper*. Cambridge, Massachusetts: Institute for Healthcare Improvement.
54. Seongsook, J., et al. (2004). Validity of pressure ulcer risk assessment scales; Cubbin and Jackson, Braden and Douglas scales. *International Journal of Nursing Studies*. 41(2):199 – 204
55. Serpa, L., et al. (2011). Predictive validity of the Braden scale for pressure ulcer risk in critical care patients. *Revista Latino-Americana de Enfermagem*. 19(1): 1-6
56. Sonenblum, S., et al. (2011). The impact of tilting on blood flow and localized tissue loading. *Journal of Tissue Viability*. 20: 3 – 13.
57. Stechmiller, J. (2012). Wound healing. In C. Mueller (Ed.), The A.S.P.E.N Adult Nutrition Support Core Curriculum (2nd Ed.). Silver Spring, MD: American Society for Parenteral and Enteral Nutrition.
58. Stotts, N., et al. (2007). Predicting pressure ulcer risk. Using the Braden Scale with hospitalized older adults: The evidence supports it. *American Journal of Nursing*. 107(11): 40 – 48.
59. Vanderwee, K., et al. (2007). Effectiveness of turning with unequal time intervals on the incidence or pressure sore lesions. *Journal of Advanced Nursing*. 57(1): 59 – 68.

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Appendix A: Braden Scale - For Predicting Adult Pressure Sore Risk

Braden Scale - For Predicting Pressure Sore Risk					
RISK FACTOR	**DESCRIPTION**				**SCORE**
SENSORY PERCEPTION [7] Ability to respond meaningfully to pressure-related discomfort	**1. COMPLETELY LIMITED** Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation, OR Limited ability to feel pain over most of body.	**2. VERY LIMITED** Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR Has a sensory impairment which limits the ability to feel pain or discomfort over half of body.	**3. SLIGHTLY LIMITED** Responds to verbal commands but cannot always communicate discomfort or need to be turned, OR Has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	**4. NO IMPAIRMENT** Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.	
MOISTURE Degree to which skin is exposed to moisture	**1. CONSTANTLY MOIST** Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	**2.VERY MOIST** Skin is often but not always moist. Linen/ incontinent briefs must be changed at least once a shift.	**3. OCCASIONALLY MOIST** Skin is occasionally moist, requiring an extra linen / incontinent brief change approximately once a day.	**4 RARELY MOIST** Skin is usually dry; linen only requires changing at routine intervals.	
ACTIVITY Degree of physical activity	**1. BEDFAST** Confined to bed.	**2. CHAIRFAST** Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	**3. WALKS OCCASIONALLY** Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	**4. WALKS FREQUENTLY** Walks outside room at least twice a day and inside room at least once every two hours during waking hours.	
MOBILITY Ability to change and control body position	**1. COMPLETELY IMMOBILE** Does not make even slight changes in body or extremity position without assistance	**2. VERY LIMITED** Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	**3. SLIGHTLY LIMITED** Makes frequent though slight changes in body or extremity position independently.	**4. NO LIMITATIONS** Makes major and frequent changes in position without assistance.	
NUTRITION Usual food intake pattern. [1] NPO: Nothing by mouth. [2] IV: Intravenously. [3] TPN: Total parenteral nutrition.	**1. VERY POOR** Never eats a complete meal. Rarely eats more than one-third of any food offered. Eats two servings or less of protein (meat or dairy products) per day. Takes fluid poorly. Does not take a liquid dietary supplement, OR Is NPO[1] and/or maintained on clear liquids or IV[2] for more than five days.	**2. PROBABLY INADEQUATE** Rarely eats a complete meal and currently eats only about one-half of any food offered. Protein intake includes only three servings of meat or dairy products per day. Occasionally will take a dietary supplement, OR Receives less than optimum amount of liquid diet or tube feeding.	**3. ADEQUATE** Eats over half of most meals. Eats a total of four servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement when offered. OR Is on a feeding tube or TPN[3] regimen, which probably meets most of nutritional needs.	**4. EXCELLENT** Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.	
FRICTION AND SHEAR	**1. PROBLEM** Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads	**2. POCCUPATIONAL THERAPISTENTIAL PROBLEM** Moves freely or requires minimum assistance. During a move, skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	**3. NO APPARENT PROBLEM** Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair.		
RISK SCORES: AT RISK = 15 – 18 MODERATE RISK = 13 – 14 HIGH RISK = 10 – 12 VERY HIGH RISK = ≤ 9				**Total Score**	

[7] When scores differ between level of consciousness and cutaneous sensation, choose the lower of the two scores.

Appendix B: The Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk

RISK FACTORS	DESCRIPTION				SCORE
	Intensity and Duration of Pressure				
Mobility The ability to change and control body position.	**1. Completely Immobile:** Does not make even slight changes in body or extremity position without assistance.	**2. Very Limited:** Makes occasional slight changes in body or extremity position but unable to completely turn self independently.	**3. Slightly Limited:** Makes frequent though slight changes in body or extremity position independently.	4. **No Limitations**: Makes major and frequent changes in position without assistance.	
Activity The degree of physical activity.	**1. Bedfast:** Confined to bed.	**2. Chair fast:** Ability to walk severely limited or nonexistant. Cannot bear own weight and/or must be assisted into chair or wheelchair.	**3. Walks Occasionally:** Walks occasionally during day, but very short distances with or without assistance. Spends majority of each shift in bed/chair	**4. All patients too young to ambulate OR walks frequently:** Walks outside the room at least twice and inside room at least once every 2 hours during day.	
Sensory Perception The ability to respond in a developmentally appropriate way to pressure-related discomfort.	**1. Completely Limited:** Unresponsive (does not moan, flinch or grasp) to painful stimuli due to diminished level of consciousness or sedation. **OR** has limited ability to feel pain over most of the body surface.	**2. Very Limited:** Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness **OR** has sensory impairment which limits the ability to feel pain or discomfort over half the body.	**3. Slightly Limited:** Responds to verbal commands but cannot always communicate discomfort or need to be turned. **OR** has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	4. **No Impairment**: Responds to verbal commands. Has no sensory deficit which limits ability to feel or communciate pain or discomfort.	
	Tolerance of the Skin and Supporting Structures				
Moisture Degree to which skin is exposed to moisture.	**1. Constantly Moist** Skin is kept moist almost constantly by perspiration, urine, drainage etc. Dampness is detected every time the patient is moved or turned.	**2. Very Moist:** Skin is often but not always moist. Linin must be changed at least every 8 hours.	**3. Occasionally Moist:** Skin is occasionally moist requiring a linen change every 12 hours.	**4. Rarely Moist:** Skin is usually dry; requires routine diaper changes. Linen only requires changing every 24 hours.	
Friction / Shear ***Friction*** occurs when skin moves against support surfaces. ***Shear*** occurs when skin & adjacent body surfaces slide across one another.	**1. Significant Problem:** Spasticity, contracture, itching or agitation leads to almost constant thrashing and friction.	**2. Problem:** Requires moderate to maximum assitance in moving. Complete lifting withiut sliding against sheets is impossible. Frequently slides down in bed or chair requiring frequent repositioning with maximum assistance.	3. **Potenial Problem**: Moves feebly or requires minimum assistance. During a move skin slides to some extent against sheets, chair, restraints or other devices. Usually maintians good position in chair but occasionally slides down.	**4. No Apparent Problem:** Able to completely lift patient during position change. Moves in bed and chair independently & has sufficient muscle strength to lift up completely durnig move.Always maintians good position in chair or bed.	
Nutrition Usual food intake pattern.	**1. Very Poor:** NPO and/or maintained on clear liquids or IVs for more than 5 days **OR** Never eats a complete meal. Rarely eats more than half of any food offered. Protein intake includes only 2 servings of meat or dairy per day. Takes fluids poorly. Does not take a liquid dietary supplement.	**2. Inadequate:** On liquid diet or tube feed / TPN which provides inadequate calories & minerals for age. **OR** albumin less than 3 mg/dl. **OR** rarely eats a complete meal & usually only eats half of any food offerred. Protein intake includes only 3 servings of meat or dairy per day. Occasionally takes a dietary supplement.	**3. Adequate:** On tube feeds or TPN which provides adequate calories and minerals for age. **OR** eats eats over half of most meals. Eats a total of 4 servings of meat & dairy each day. Occasionally refuses a meal but usually takes a supplement if offered.	**4. Excellent:** On a normal diet providing adequate calories for age. Eats & drinksmost of every meal. Never refuses a meal. Usually eats 4 or more servings of dairy& meat daily. Occasionally eats between meals. Does not require a supplement.	
Tissue Perfusion and Oxygenation	**1. Extremely Compromised:** Hypotensive (MAP less than 50 mmHg; less than 40 in newborn) **OR** does not physiologically tolerate position changes.	**2. Compromised:** Normotensive; O_2 saturation may be less than 95% **OR** Hgb may be less than 10 mg/dl **OR** capillary refill may be greater than 2 seconds. Serum pH is less than 7.40.	**3. Adequate:** Normotensive; O_2 saturation may be less than 95% **OR** Hgb may be less than 10 mg/dl **OR** capillary refill may be greater than 2 seconds. Serum pH is normal.	**4. Excellent:** Normotensive; O_2 saturation greater than 95%; normal Hgb. capillary refill less than 2 seconds.	
Risk Score: At Risk = 16 or less				**TOTAL SCORE**	

Quigley, S. et al. (1996). Skin integrity in the pediatric population: Preventing and managing pressure ulcers. *Journal of the Society of Pediatric Nurses*. 1(1): 7 - 18