



# Using the Braden Q Scale to Predict Pressure Ulcer Risk in Pediatric Patients

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The Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk (Braden Q Scale) is a widely used, valid, and reliable pediatric-specific pressure ulcer risk assessment tool. Since its original publication, requests for clarification on how best to use the tool across the wide spectrum of pediatric patients commonly cared for in health care systems have been received. Common clarifications focus on using the Braden Q Scale as originally designed; specifically, not using untested derivations of the tool, and not using the Braden Q Scale to predict medical device-related pressure damage. The purpose of this article is to provide practical information on how best to use the Braden Q Scale and how to score a pediatric patient's risk for pressure ulcers. Accurate assessment of patient risk for pressure ulcers is the first step in guiding appropriate nursing interventions that prevent pressure ulcers. Patient assessment, scoring, and common clinical scenarios are presented.

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PREVENTING PRESSURE ULCERS is an important phenomenon of concern to pediatric nurses. Pressure ulcers in this population represent a serious yet preventable iatrogenic injury. Numerous health care organizations track their pressure ulcer prevalence rates to describe, in part, the quality of the nursing care they provide within their institution. These data are also used to benchmark nursing care quality across health care organizations.

To better understand an institution's pressure ulcer rate, it is also important to understand their patient populations' level of risk for pressure ulcers. Successful pressure ulcer prevention programs should be assessed from a perspective of identifying at-risk patients who remain pressure ulcer free. Tools that describe pressure ulcer risk should predict patients at risk and patients not at risk for pressure ulcer development. Initiating pressure ulcer prevention strategies

for at-risk patients, rather than all patients, will optimize the appropriate use of resources.

The Braden Q Scale (Table 1) is a valid and reliable pediatric-specific pressure ulcer risk assessment tool. Since its original publication in 1996, the authors have received numerous requests for clarification on how best to use the tool across the wide spectrum of pediatric patients commonly cared for in pediatric health care organizations. The purpose of this article is to provide practical information on how best to use the Braden Q Scale and how to score a pediatric patient's pressure ulcer risk. Patient assessment, scoring, and common scenarios are presented.

## Development of the Braden Q Scale

Quigley and Curley (1996) developed the Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk by adapting the adult-based Braden Scale for Predicting Pressure Sore Risk (Bergstrom, Braden, Laguzza, & Holman, 1987) with the permission of its primary author (personal communication,

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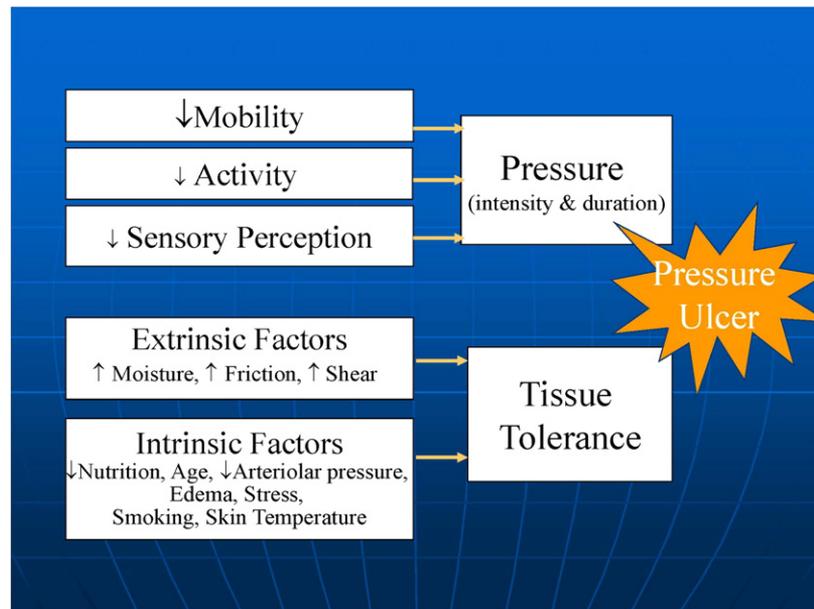
**Table 1** The Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk

The Braden Q Scale					
Intensity and Duration of Pressure					Score
<b>Mobility</b> The ability to change and control body position	<b>1. Completely immobile:</b> Does not make even slight changes in body or extremity position without assistance.	<b>2. Very Limited:</b> Makes occasional slight changes in body or extremity position but unable to completely turn self independently.	<b>3. Slightly Limited:</b> Makes frequent though slight changes in body or extremity position independently.	<b>4. No Limitations:</b> Makes major and frequent changes in position without assistance.	
<b>Activity</b> The degree of physical activity	<b>1. Bedfast:</b> Confined to bed	<b>2. Chair fast:</b> Ability to walk severely limited or nonexistent. Cannot bear own weight and/or must be assisted in to chair or wheelchair.	<b>3. Walks Occasionally:</b> Walks occasionally during day, but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	<b>4. All patients too young to ambulate OR walks frequently:</b> Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.	
<b>Sensory Perception</b> The ability to respond in a <u>developmentally</u> appropriate way to pressure-related discomfort	<b>1. Completely Limited:</b> Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation <b>OR</b> limited ability to feel pain over most of body surface.	<b>2. Very Limited:</b> Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness <b>OR</b> has sensory impairment which limits the ability to feel pain or discomfort over half of body.	<b>3. Slightly Limited:</b> Responds to verbal commands, but cannot always communicate discomfort or need to be turned <b>OR</b> has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	<b>4. No Impairment:</b> Responds to verbal commands. Has no sensory deficit, which limits ability to feel or communicate pain or discomfort.	
Tolerance of the Skin and Supporting Structure					
<b>Moisture</b> Degree to which skin is exposed to moisture	<b>1. Constantly Moist:</b> Skin is kept moist almost constantly by perspiration, urine, drainage, etc. Dampness is detected every time patient is moved or turned.	<b>2. Very Moist:</b> Skin is often, but not always moist. Linen must be changed at least every 8 hours.	<b>3. Occasionally Moist:</b> Skin is occasionally moist, requiring linen change every 12 hours.	<b>4. Rarely Moist:</b> Skin is usually dry, routine diaper changes, linen only requires changing every 24 hours.	
<b>Friction - Shear</b> <i>Friction:</i> occurs when skin moves against support surfaces <i>Shear:</i> occurs when skin and adjacent bony surface slide across one another	<b>1. Significant Problem:</b> Spasticity, contracture, itching or agitation leads to almost constant thrashing and friction.	<b>2. Problem:</b> 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.	<b>3. Potential Problem:</b> Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relative good position in chair or bed most of the time but occasionally slides down.	<b>4. No Apparent Problem:</b> Able to completely lift patient during a position change; 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 at all times.	
<b>Nutrition</b> Usual food intake pattern	<b>1. Very Poor:</b> NPO and/or maintained on clear liquids, or IVs for more than 5 days <b>OR</b> Albumin <2.5 mg/dl <b>OR</b> Never eats a complete meal. Rarely eats more than half of any food offered. Protein intake includes only 2 servings of meat or dairy products per day. Takes fluids poorly. Does not take a liquid dietary supplement.	<b>2. Inadequate:</b> Is on liquid diet or tube feedings/TPN which provide inadequate calories and minerals for age <b>OR</b> Albumin <3 mg/dl <b>OR</b> rarely eats a complete meal and generally eats only about half of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement.	<b>3. Adequate:</b> Is on tube feedings or TPN, which provide adequate calories and minerals for age <b>OR</b> eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered.	<b>4. Excellent:</b> Is on a normal diet providing adequate calories for age. For example: eats/drinks most of every meal/feeding. 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.	
<b>Tissue Perfusion and Oxygenation</b>	<b>1. Extremely Compromised:</b> Hypotensive (MAP <50mmHg; <40 in a newborn) <b>OR</b> the patient does not physiologically tolerate position changes.	<b>2. Compromised:</b> Normotensive; Oxygen saturation may be <95 % <b>OR</b> hemoglobin may be < 10 mg/dl <b>OR</b> capillary refill may be > 2 seconds; Serum pH is < 7.40.	<b>3. Adequate:</b> Normotensive; Oxygen saturation may be <95 % <b>OR</b> hemoglobin may be < 10 mg/dl <b>OR</b> capillary refill may be > 2 seconds; Serum pH is normal.	<b>4. Excellent:</b> Normotensive, Oxygen saturation >95%; Normal Hemoglobin ; & Capillary refill < 2 seconds.	
<b>Total:</b>					

From Quigley and Curley (1996).

Nancy Bergstrom, December 12, 1994). The adult-based Braden Scale was selected because it was the most valid and reliable instrument at the time and also because it was constructed from a physiologically based conceptual frame-

work that was population independent (Braden & Bergstrom, 1987). The framework identifies two critical determinants of pressure ulcers: pressure and tissue tolerance (Figure 1). Factors considered when assessing the intensity and duration



**Figure 1** The conceptual framework identifying etiological factors of pressure ulcers. Adapted from Bergstrom, Braden, Laguzza, and Holman (1987).

of pressure include the patient's mobility, activity, and sensory perception. Intrinsic and extrinsic factors are considered when assessing the patient's tissue tolerance. Intrinsic factors include the patient's ongoing nutritional status, age, and tissue perfusion/oxygenation; extrinsic factors include the skin's moisture and exposure to both friction and shear.

The Braden Q Scale includes the six original Braden subscales (mobility, activity, sensory perception, moisture, friction and shear, and nutrition) but adds a seventh subscale, that is, tissue perfusion/oxygenation. The Braden Q Scale modifications of the adult-based tool reflect the unique developmental characteristics of pediatric patients, the prevalence of gastric/transpyloric tube feedings, and the availability of blood studies and noninvasive technology in the acute care pediatric setting. Adding the tissue perfusion/oxygenation subscale was also consistent with Braden and Bergstrom's original conceptual framework (1987) and optimizes the use of data common to acute care settings.

The Braden Q Scale was validated in 2003 in a multisite prospective cohort descriptive study of 322 pediatric intensive care patients who were on bed rest for at least 24 hours (Curley, Razmus, Roberts, & Wypij, 2003). This study established the predictive validity of the Braden Q Scale in acutely ill pediatric patients and identified the critical cutoff for classifying patient risk as a score of 16. At a score of 16, the sensitivity of the Braden Q Scale is 88% and the specificity is 58% (Box 1). These data are consistent with those reported for the predictive validity of the Braden Scale (with cutoff scores 16–18) in various adult patient populations within tertiary care settings (Bergstrom, Braden, Kemp, Champagne, & Ruby, 1998); specifically, the Braden Scale sensitivity ranges from 38% to 88%, and its specificity ranges from 68% to 92%.

The Braden Q Scale was validated in pediatric patients 3 weeks to 8 years of age. The specific age of 21 postnatal days was selected because at 3 weeks of age the skin reaches relative maturity comparable to a full-term infant, regardless of the infant's gestational age at birth (Malloy & Perez-Woods, 1991). The selection of 8 years of age reflected conventional norms; specifically, in 1994, the American Heart Association considered patients older than 8 years to be an adult in terms of treatment (Chameides & Hazinski, 1994). Patients with congenital heart disease were excluded because the impact of chronic hypoxemia on pressure ulcer development was unclear. An opportunity exists to further validate the Braden Q in the preterm and neonatal population (less than 21 postnatal days), in the adolescent and young

#### Box 1

##### What do the numbers mean?

Sensitivity is the percentage of patients who developed a pressure ulcer who were assessed as being at risk for a pressure ulcer. Good sensitivity indicates true positives while minimizing false negatives. Specificity is the percentage of patients who do not develop a pressure ulcer and who were assessed as being not at risk for developing an ulcer. Good specificity identifies true negatives and minimizes false positives (Ayello & Braden, 2002). The patient benefit of preventing pressure ulcers in an at-risk group exceeds the patient risk of implementing prevention interventions in a low-risk group; thus, a high sensitivity is desired in a pressure ulcer risk assessment tool (Braden and Bergstrom, 1994). Complete balance between sensitivity and specificity cannot be achieved.

adult population, and in the patients with congenital heart disease. The Braden Q Scale is specifically designed to predict pediatric pressure ulcer risk. Other metrics are more general and combine pressure ulcer risk and risk of other types of skin injuries (Bolton, 2007; Gray, 2004; Willock, Anthony, & Richardson, 2008).

### Scoring the Braden Q Scale

The Braden Q Scale is composed of seven subscales. All seven subscales are rated from 1 (*least favorable*) to 4 (*most favorable*); patients receive only one score per subscale. Total Braden Q Scale scores range from 7 (*highest risk*) to 28 (*lowest risk*), with a score of 16 or lower identifying pediatric patients at risk for pressure ulcers (Curley et al., 2003). In both the Braden and Braden Q Scales, a higher score generally indicates healthier patient condition and function. Patients are scored by physical assessment, patient/parent interview, and chart review. Each subscale is presented in the following sections.

#### Mobility

##### Definition

Describes the patient’s ability to independently change and/or control their body position. Descriptors range from *completely immobile* (1) to *no limitations* (4). Repositioning by the caregiver (such as parent or nurse) is not included when evaluating the patient’s independent level of mobility.

##### Assessment

Patients can be assessed in any location, for example, in their bed/crib, chair/infant seat, wheelchair.

##### Scoring

4. *No limitations.* Makes major and frequent changes in position without assistance.
3. *Slightly limited.* Makes frequent although slight changes in body or extremity position independently.
2. *Very limited.* Makes occasional slight changes in body or extremity position but unable to completely turn self independently.
1. *Completely immobile.* Does not make even slight changes in body or extremity position without assistance.

How do I score these common scenarios?	Score
• 3-Month infant with good head control who can roll over front to back but not back to front	4
• Patient moves independently	4
• Epidural catheter for pain control, decreased movement of lower extremities, able to move rest of body well	3
• Child able to make slight changes on own but needs assistance to fully turn	2
• Hemiparesis, one side with decreased/no function (regardless of age)	2

(continued)

• Lower body paralysis, able to move and transfer (regardless of age)	2
• Postoperative patient in lower extremity traction	2
• Child with baseline neuromuscular weakness who can make slight changes in position but cannot turn self, sit unassisted, or walk	2
• Patient in total body cast (spica) who cannot make even slight changes in body position and is turned by caregiver	1
• Patient intubated and receiving neuromuscular blockade to support ventilation	1
• Patient requiring assistance for all turns	1

#### Activity

##### Definition

Describes the patient’s current degree of physical activity. Descriptors range from *bedfast* (1) to *walks frequently* or *patient too young to ambulate* (4).

##### Assessment

Interview the primary caregiver about the patient’s baseline developmental ability to ambulate. Activity is assessed from a developmental perspective, for example, many toddlers take their first steps between 9 and 12 months of age, cruise by moving on two feet while holding onto stationary objects, then walk independently by the time they are 15 months old. The Braden Q’s activity subscale is scored based on the patient’s acquisition of these developmental milestones by 15 months of age. After 15 months of age, all patients are scored on their current activity/ability to ambulate.

##### Scoring

4. *All patients too young to ambulate OR walks frequently.* Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.
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.
2. *Chair fast.* Ability to walk severely limited or nonexistent. Cannot bear own weight and/or must be assisted into chair or wheelchair.
1. *Bedfast.* Confined to bed.

How do I score these common scenarios?	Score
• All infants and toddlers ≤15 months old that are unable to walk from a developmental perspective (unable to independently walk across a room)	4
• Otherwise healthy infant with pneumonia on mechanical ventilation	4

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• Patient who ambulates with a physical therapist twice a day, but chairfast or in bed most of the day	3
• Ten month old infant with decreased “cruising” due to chest tube in place	3
• Adolescent who can be pivoted from bed to chair	2
• Patient with cerebral palsy and spasticity who is only able to tolerate bed to chair for short periods	2
• Patient with spina bifida who is paraplegic	2
• Patient ordered for bed rest	1
• Ten month old infant who was cruising prior to admission and now on bedrest	1
• 2-Year-old in body cast, needs full assistance to be moved	1
• 8-Year-old asthmatic on continuous nebulizers and oxygen using a urinal	1

## Sensory Perception

### Definition

Describes the patient’s ability to respond in a developmentally appropriate way to pressure-related discomfort. Descriptors range from *completely limited* (1) to *no impairment* (4). Alterations in this subscale can be related to changes in level of consciousness, changes in sensation, or both. Common responses to pressure-related discomfort include movement and verbal or nonverbal clues, for example, facial grimacing or moaning. If the patient has a scoring difference between the consciousness and sensation parameters, then select the patient’s lowest score. The most abnormal variable determines the patient’s score, and the patient need not demonstrate all variables at a particular level.

### Assessment

Review patient’s medical record for a history of decreased motor response to sensory stimulus and/or assess the patient’s sensory response to touch over bony prominences. Use progressive level of stimuli to assess level of consciousness; voice then touch then noxious stimulus. Use the Glasgow Coma Scale to assess level of consciousness or the State Behavioral Scale to assess level of sedation (Curley, Harris, Fraser, Johnson, & Arnold, 2006).

### Scoring

4. *No impairment*. Responds to verbal commands. Has no sensory deficit which limits ability to feel or communicate pain or discomfort.
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 one or two extremities.
2. *Very limited*. Responds only to painful stimuli. Cannot communicate discomfort except by moaning or rest-

lessness OR has sensory impairment which limits the ability to feel pain or discomfort over half of body.

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 surface.

How do I score these common scenarios?	Score
• 2-Year-old with pneumonia who cries when the nurse nears the crib, resists medical procedures, and communicates pain in a developmentally appropriate manner	4
• 8-Year-old admitted to rule out appendicitis with pain score 7 of 10	4
• Lightly sedated intubated patient (State Behavioral Scale—1)	3
• Nonverbal 5-Year-old with severe cognitive impairment who flinches with IV insertion and cries out when diapers are changed	3
• Alert patient with spina bifida, no lower extremity sensation	2
• Epidural in place for lower extremity pain control	2
• Heavily sedated patient who does not respond to a painful stimulus (State Behavioral Scale—3)	1

## Moisture

### Definition

Describes the degree to which the patient’s skin over bony prominences is exposed to moisture. Subscale descriptors range from *constantly moist* (1) to *rarely moist* (4). The frequency of linen change is used as a proxy measure to describe situations where body fluids are not contained by a continence device or a dressing. Moisture includes perspiration, urine, feces, wound drainage, or any other drainage that would be detrimental to skin integrity over bony prominences.

### Assessment

Skin moisture is determined by touch or visualization over bony prominences. Skin fold moisture is not considered. Number of linen changes due to perspiration, draining wounds, and incontinence are noted.

### Scoring

4. *Rarely moist*. Skin is usually dry, routine diaper changes, linen only requires changing every 24 hours.
3. *Occasionally moist*. Skin is occasionally moist, requiring linen change every 12 hours.
2. *Very moist*. Skin is often but not always moist. Linen must be changed at least every 8 hours.
1. *Constantly moist*. Skin is kept moist almost constantly by perspiration, urine, drainage, etc. Dampness is detected every time patient is moved or turned.

How do I score these common scenarios?	Score
<ul style="list-style-type: none"> <li>• Patient has urinary tube and rectal pouch. No leakage from either but would be constantly moist if tube/pouch not in place</li> </ul>	4
<ul style="list-style-type: none"> <li>• 4-Year-old who is febrile and diaphoretic, linens changed twice a day</li> </ul>	3
<ul style="list-style-type: none"> <li>• 5-Year-old with recent abdominal procedure with placement abdominal drain and also with fecal incontinence</li> </ul>	2
<ul style="list-style-type: none"> <li>• Patient with large abdominal wound requiring minimum of three dressing changes a day. Bed linens moist and changed with each dressing change</li> </ul>	2
<ul style="list-style-type: none"> <li>• Infant with 12 liquid stools per day, contained by diapers</li> </ul>	1
<ul style="list-style-type: none"> <li>• Patient post hypoxic ischemic event with temperature instability and frequent diaphoretic episodes</li> </ul>	1

How do I score these common scenarios?	Score
<ul style="list-style-type: none"> <li>• 12-Year-old with cystic fibrosis receiving chest physiotherapy and antibiotics, no activity restrictions</li> </ul>	4
<ul style="list-style-type: none"> <li>• Toddler on noninvasive ventilation (CPAP) who occasionally thrashes trying to remove mask</li> </ul>	3
<ul style="list-style-type: none"> <li>• 12-Year-old with cerebral palsy and contractures, elbows are red from rubbing on the bed</li> </ul>	2
<ul style="list-style-type: none"> <li>• Patient in Buck's traction, or lower extremity pin traction, or halo traction</li> </ul>	2
<ul style="list-style-type: none"> <li>• Patient post head injury who is unable to maintain proper body alignment and requires frequent repositioning due to sliding down in bed</li> </ul>	2
<ul style="list-style-type: none"> <li>• Postoperative patient who intermittently thrashes or is agitated throughout day</li> </ul>	2
<ul style="list-style-type: none"> <li>• Patients supported on high-frequency oscillatory ventilation</li> </ul>	1
<ul style="list-style-type: none"> <li>• Patients with choreoathetoid movement disorders</li> </ul>	1
<ul style="list-style-type: none"> <li>• School-age child with severe eczema and open lesions from severe pruritis</li> </ul>	1

## Friction and Shear

### Definition

Friction occurs when the patient's skin moves against a support surface, whereas shear occurs when skin and the adjacent bony surface slide across one another. Descriptors in this subscale range from a *significant problem* (1) to *no apparent problem* (4). The patient's ability to move or assist with movement or a caregiver's ability to lift a patient off the bed, versus sliding or dragging, is considered when evaluating friction. The patient's ability to maintain a position in bed, versus sliding down, is considered when evaluating shear. Many pediatric patients can be lifted to prevent friction or shear. Extremes in this category include patients with choreoathetoid movement disorders.

### Assessment

Patient observation over time.

### Scoring

4. *No apparent problem.* Able to completely lift patient during a position change; moves in bed and chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.
3. *Potential problem.* Moves feebly or requires minimum assistance. During a move, skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relative good position in chair or bed most of the time but occasionally slides down.
2. *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.
1. *Significant problem.* Spasticity, contracture, itching, or agitation leads to almost constant thrashing and friction.

## Nutrition

### Definition

The patient's nutrition is assessed by considering their *usual* food intake pattern. Descriptors range from *very poor* (1) to *excellent* (4). Very poor is identified when the patient has experienced less than a full caloric intake per kilogram of body weight for five consecutive days. The initiation of alternative methods of feeding, for example, enteral or parenteral nutrition, does not automatically assure adequate nutrition. Serum albumin levels may also be used to describe the adequacy of the patient's nutrition.

### Assessment

Evaluate the patient's nutritional intake for the five consecutive days prior to the scoring, no matter the patient location. In infants, formula or human milk feedings are equivalent to a meal. Assess enteral feedings, parenteral nutrition, and serum albumin and/or prealbumin levels.

### Scoring

4. *Excellent.* Is on a normal diet providing adequate calories for age, for example, eats/drinks most of every meal/feeding. Never refuses a meal. Usually eats a total of four or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.
3. *Adequate.* Is on tube feedings or total parenteral nutrition (TPN), which provides adequate calories and minerals for age OR 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 if offered.
2. *Inadequate.* Is on liquid diet or tube feedings/TPN, which provides inadequate calories and minerals for

age OR albumin less than 3 mg/dl OR rarely eats a complete meal and generally eats only half of any food offered. Protein intake includes only three servings of meat or dairy products per day. Occasionally will take a dietary supplement.

1. *Very poor*. NPO (nil per os) and/or maintained on clear liquids, or IVs for more than 5 days OR albumin less than 2.5 mg/dl OR never eats a complete meal. Rarely eats more than half of any food offered. Protein intake includes only two servings of meat or dairy products per day. Takes fluids poorly. Does not take a liquid dietary supplement.

How do I score these common scenarios?	Score
• Infant on infant formula, 8–10 feeds per day	4
• Healthy breast-fed infant, NPO since operation earlier in the day	4
• Infant receiving adequate calories via TPN or supplemental enteral feeds	3
• Child admitted 3 days ago with dehydration and viral illness who continues with vomiting and diarrhea on maintenance IV fluids	2
• Teenager on liquid diet for 6 days with inadequate caloric intake	2
• Surgical patient NPO for long periods every 2 to 3 days because of staged surgical procedures	2
• Child malnourished (weight-for-age equal to or less than –2 standard deviations of growth standards median) on admission due to poor oral intake for 2 weeks	1
• Postoperative patient with limited intake—sips of clears to bites of solids for 4–5 days postoperatively	1
• 6-Year-old with severe developmental delay on enteral tube feedings admitted yesterday with albumin level of 2 and below the 10th percentile for weight	1

## Tissue Perfusion and Oxygenation

### Definition

Describes the patient's perfusion and oxygenation status. Descriptors range from *extremely compromised* (1) to *excellent* (4). The availability of blood studies (hemoglobin) and noninvasive technology (oxygen saturation by pulse oximetry) allows for in-depth analysis of a patient's tissue tolerance. The patient is scored on a combination of factors, including current blood pressure, hemoglobin, oxygen saturation, capillary refill, and serum pH. In extreme, the patient's hemodynamic tolerance response to a position change is also assessed. The most abnormal variable determines the patient's score, and the patient need not demonstrate all variables at a particular level. The level of hemodynamic, vasopressor, ventilator, and oxygen support interventions is not considered—just their net result on hemodynamic status.

### Assessment

Assess the patient's pulse oximetry (SpO<sub>2</sub>) reading, blood studies, capillary refill, and patient's physiologic response to a change in position. Not all variables need to be available. The most abnormal finding determines the patient's score.

### Scoring

4. *Excellent*. Normotensive, oxygen saturation greater than 95%, normal hemoglobin, and capillary refill less than 2 seconds.
3. *Adequate*. Normotensive, oxygen saturation may be less than 95% OR hemoglobin may be less than 10 mg/dl OR capillary refill may be more than 2 seconds; serum pH is normal.
2. *Compromised*. Normotensive, oxygen saturation may be less than 95% OR hemoglobin may be less than 10 mg/dl OR capillary refill may be more than 2 seconds; serum pH is <7.4.
1. *Extremely compromised*. Hypotensive (mean arterial pressure <50 mm Hg; <40 in a newborn) OR the patient does not physiologically tolerate position changes.

How do I score these common scenarios	Score
• 5-Year-old on supported on mechanical ventilation and dopamine drip; vital signs normal for age, normal oxygen saturation, serum pH 7.4	4
• 14-Year-old post left femur fracture repair in long leg cast with capillary refill 3–4 seconds	3
• Oxygen saturation 100% with 2 L of oxygen via nasal cannula, hemoglobin 8 g/dl	3
• Child with normal blood pressure but hemoglobin less than 10 g/dl	3
• Baby with unrepaired congenital heart defect, baseline oxygen saturation 82%, otherwise stable blood pressure and hemoglobin	2
• 3-Year-old status post abdominal surgery. No complete blood cell count results available, capillary refill time 2 seconds, oxygen saturation 94% on room air	2
• 5-Year-old on high-frequency oscillatory ventilation, blood pressure decreases with any position changes	1
• Patient admitted 24 hours ago requiring IV fluid boluses for hypotensive episodes, with significant oxygen requirement to keep oxygen saturations greater than 92%	1

Once the Braden Q Scale is completed, the subscale scores are totaled. If the patient's total score is 16 or less, then interventions to prevent pressure ulcer development are implemented. It makes intuitive sense to target interventions to bolster the less than optimal subscale, for example, optimizing nutrition if the patient scores 3 or less in the nutrition subscale or instituting a strict repositioning schedule if the patient scores 2 or less in the mobility subscale.

## Implementing the Braden Q Scale

As part of a Pressure Ulcer Prevention Program, at a minimum, a complete skin assessment that includes a Braden Q Scale score should be completed within 24 hours of admission. The authors recommend the Braden Q Scale be repeated daily on all patients who score 16 or less, are on bed rest or chairfast, or who have a change in clinical condition. The patient considered “at risk” for pressure ulcer development should have risk reduction interventions put into place to minimize risk. Once interventions are in place, the patient’s risk can be reassessed and scored periodically with interventions appropriately removed as the score improves.

Pressure ulcers in pediatrics patients have been reported to occur by a patient’s second hospital day (Curley, Quigley, & Lin, 2003). The adult-based Braden authors noted that risk assessments completed 48–72 hours after hospital admission were more predictive than admission scores (Bergstrom et al., 1998). Recent changes in federal regulations have highlighted the importance of assessing patients’ risk for pressure ulcers as soon as possible upon hospital admission. The Joint Commission and Medicare have determined that hospital-acquired pressure ulcers are not reimbursable. Since October 2008, the Centers for Medicare & Medicaid Services “present-on-admission” pressure ulcer regulations consider any pressure ulcer that is not documented within 24 hours of admission to be considered hospital acquired.

The Braden Q Scale contains all the items from the original Braden Scale and can be used in all pediatric age groups, including newborns and patients older than 8 years. Given the lack of pressure ulcer risk prediction instruments in these populations, the Braden Q Scale can be used until further validation work is completed. In pediatric-only facilities, we recommend using the Braden Q Scale for all age groups. In mixed pediatric and adult facilities, we recommend using both the Braden Q Scale for the pediatric population and the Braden Scale for the adult population. Electronic documentation systems can be programmed to compute the Braden and Braden Q Scale scores when all data elements of the Braden Q Scale are collected.

The Braden Q Scale should be used as originally designed: seven subscales with scores ranging from 1 to 4 per subscale. In computerized documentation systems, the level headings should be visible, but level descriptors can be “hidden” but be available when the cursor is placed on the data element. Permission to use the Braden Q Scale in its entirety within one’s institution is not required, but proper citation should be used: from Quigley and Curley (1996). Skin integrity in the pediatric population: Preventing and managing pressure ulcers. *Journal of the Society of Pediatric Nurses*, 1(1), 7–18. [PMID: 8951145]. Permission to republish the Braden Q Scale beyond one’s facility, for example, a journal article, is required and permission is obtained by the holder of the copyright (*Journal for Specialists in Pediatric Nursing; JournalsRights@oxon.blackwellpublishing.com*). Implementation scenarios can be found in Box 2.

### Box 2

#### Common Questions

#### **Q. Can the Braden Q Scale be used in the neonatal population?**

A. Yes. We feel the Braden Q Scale can be used in this population until a valid and reliable neonatal pressure ulcer risk assessment tool is developed. The exact role of gestational age in relation to the risk of pressure ulcer development is unclear.

#### **Q. Why were the original ages of 3 weeks to 8 years studied?**

A. The age of 21 postnatal days was selected because at 3 weeks, the skin reaches relative maturity, comparable to a full-term infant, regardless of the infant’s gestational age at birth. At the time of the Braden Q Scale development, the American Heart Association considered patients older than 8 years to be adult in terms of cardiopulmonary resuscitation management.

#### **Q. Can I base risk reduction interventions/strategies based on a subscale score instead of total score?**

A. The total Braden Q Scale scores should be computed to identify patients at risk, and then subscores can be used to focus risk reduction intervention strategies.

#### **Q. If my patient scores $\leq 16$ , is the patient considered low risk or high risk for pressure ulcer development?**

A. The patient is considered “at risk.” Degree of risk is not relevant. Once a patient is determined to be at risk, then appropriate nursing interventions should be implemented based upon the most “at-risk” subscale.

#### **Q. Can the Braden Q Scale be used in pediatric hospice or home care?**

A. Yes, the Braden Q Scale is a pediatric-specific tool that was based on Bergstrom and Braden’s conceptual framework of tissue ulceration. Most of the Bergstrom and Braden’s original work was conducted in chronic care facilities.

#### **Q. Is there anyone who should NOT be assessed with the Braden Q Scale?**

A. Adult patients in adult facilities should be assessed using the Braden Scale.

#### **Q. Can the Braden Q Scale be used to predict pressure ulcer risk during an operative procedure?**

A. No. While the Bergstrom and Braden conceptual framework can serve as a map, other preoperative and operative factors may be important, for example, positioning, temperature, and use and containment of irrigation fluid.

#### **Q. I don’t understand how to score the subscales that contain an “OR” statement.**

A. “OR” statements are used to provide multiple assessment points. When used, the patient need only have one of the elements listed. Score the patient on the variable that provides the lowest score.

**Q. What if I don't have all the data to complete a subscale?**

A. Use available data to categorize the patient. If no data are available, we suggest assigning the worst possible score of "1" to err on the intervention side.

**Q. If the tool was validated in the pediatric ICU population, can I still use it with my other pediatric patients?**

A. Yes. Patient location does not determine a patient's physiologic elements, with regard to pressure ulcer risk. The pediatric ICU was selected to study the Braden Q Scale because it provided an environment that cared for multiple types of immobile pediatric patients.

**Q. I don't understand why the nutrition scale is based on 5 days of intake, while other scales are based on current data.**

A. The nutritional subscale assessed the patient's "usual" pattern of food intake. We opted to be consistent with the adult-based Braden in assessing a 5-day pattern. An otherwise healthy child will not typically deplete their nutritional stores in 5 days.

**Q. What if my patient is malnourished on admission? What score do I give?**

A. The Nutrition subscale is based on usual food pattern intake. Thus, this patient scores a 1 or 2, depending on his/her status.

**Q. If my patient is NPO today, why doesn't he score a 1?**

A. The nutritional subscale assessed the patient's "usual" pattern of food intake. We opted to be consistent with the adult-based Braden in assessing a 5-day pattern.

**Q. What if my patient does not usually eat meat or dairy products?**

A. Many patients now follow a variety of diets that do not contain meat or dairy. It is acceptable to consider all sources of protein food sources when evaluating the nutrition subscale.

**Q. Why are prealbumin serum levels not considered in the nutrition subscale?**

A. Based on current literature, prealbumin levels can also be considered a useful tool when evaluating the nutritional status of a patient. Patients with known low prealbumin levels should score a 1 or 2 on the nutrition subscale.

**Q. Why is a sick infant patient scored a 4 for activity?**

A. The Braden Q Scale considers a patient's development. Infants are never ambulatory, but they do move independently, thus are scored a 4. Toddlers are scored based on whether they have met the walking developmental milestone by age 15 months. If they have, then they are scored on their current activity/ability to ambulate. If they are under 15 months and are not yet walking, then they score a 4, to allow for individual variation in the acquisition of this developmental milestone.

**Q. How do I score the activity subscale for a toddler who is heavily sedated or neurologically devastated?**

A. All toddlers are scored based on whether they have met the walking developmental milestone by age 15 months. If they have, then they are scored on their current activity/ability to ambulate. If they are under 15 months and have never walked, then they are scored a 4.

**Q. What defines bed rest? My patient is on bed rest with bathroom privileges.**

A. Bed rest is defined as the majority of time in bed. If the patient ambulates at least once every 2 hours during waking hours and outside the room at least twice per day, score 4. If the patient does not ambulate the hallways but uses the bathroom frequently, score 3.

**Q. Define bedfast, bed rest, and chairfast.**

A. Anyone who cannot be out of the bed or chair in every 2-hour intervals would be considered bedfast/chairfast.

**Q. What is the Modified Braden Q Scale?**

A. The Braden Q Scale was initially called the "Modified Braden Q Scale" (Quigley & Curley, 1996). However, the authors prefer the consistent use of the title Braden Q Scale for Predicting Pediatric Pressure Ulcer Risk, as discussed in their later work (Curley et al., 2003; Curley et al., 2003). The title "Braden Q Scale" is an acceptable shortened title. The "Modified Braden Q Scale," an abbreviated version of the Braden Q Scale, includes three subscales: mobility, sensory perception, and tissue oxygenation/perfusion (Curley et al., 2003). The Modified Braden Q Scale is sometimes used in pediatric ICU settings but does not allow for inter-institutional unit or cross-institutional comparison.

**Q. How should we categorize medical device-related pressure damage?**

A. Medical device-related pressure damage to the skin, often related to oximeter probes, positive pressure device masks, tracheotomy tubes, catheters and/or orthotics should be categorized and monitored separately from pressure ulcers related to immobility. Contributing or confounding factors associated with device-related pressure damage cannot be predicted with the Braden Q Scale.

## Summary

The successful implementation of any new nursing intervention depends on the degree of acceptance and support by an organization's leadership group and staff nurses. Implementing the Braden Q Scale across a health care system requires a strategic plan that includes creating system supports, an education rollout plan, and a monitoring and feedback system. Supports include embedding the Braden Q Scale into existing documentation systems. Educational plans include illustrative cases to enhance interrater reliability.

**Table 2** Metric for Monitoring Pressure Ulcer Risk

Admission Skin Assessment: Documented/not done
Braden Q Score:
Admission Score:
Highest Score:
Lowest Score:
If ≤16 subscale scores:
Mobility:
Activity:
Sensory Perception:
Moisture:
Friction and Sheer:
Nutrition:
Tissue Perfusion:
Ever a pressure ulcer? Yes/No
If yes, worse stage I/II/III/IV/unstageable
Ever a Medical device-related injury? Yes/No
If yes, device related to that injury
Medical devices used on the patient:
Sat probe
Endotracheal tube oral/nasal
NGT/NJT
GT/J
Chest tube
Central line
PIC
PIV
Total length of hospital stay
Number of hospital days Braden Q ≤ 16

Unit-based audit and feedback reports should include patient risk and nursing’s success in preventing pressure ulcers in high-risk patient groups (Table 2). Risk-adjusted unit-based reports should be benchmarked across and outside hospital systems. The benefits of using a scale for pressure ulcer risk assessment include improved and consistent assessment that

**Table 3** Prevalence Survey

Braden Q Scale (N = 248)	1 (%)	2 (%)	3 (%)	4 (%)
Mobility	7	17	13	64
Activity	11	11	12	67
Sensory perception	3	10	9	78
Moisture	1	3	9	88
Friction/Shear	2	7	25	65
Nutrition	8	15	25	52
Tissue O2 perfusion	1	9	16	75

Note: Use of subscale percentages, along with total scores, can help a facility learn which factors are placing their patients at risk for pressure ulcer development. For example, a 1-day skin prevalence audit was conducted at Children’s Hospital Boston in the spring of 2005. During the audit, each patient’s risk for pressure ulcers was assessed using the Braden Q Scale. Total Braden Q Scale scores ranged from 11 to 28, with a median of 26. Braden Q scores were 16 or less in 6% of patients, and 1.6% of patients had a pressure ulcer. Thus, despite a higher percentage of patients at-risk, only a few patients developed a pressure ulcer. Data from Noonan, Quigley, & Curley, 2006.

may help decrease unnecessary variation in the prevention and management of pressure ulcers in the hospitalized infant and child (Table 3). The use of a risk assessment scale to identify patients at risk, in combination with a comprehensive skin assessment and clinical judgment, is key to a comprehensive pressure ulcer prevention program. It is imperative that risk assessment be linked to prevention interventions to reduce the incidence of hospital-acquired pressure ulcers. When supplied with the tools, nursing metrics that describe quality patient care can change its focus from failure to success. Once implemented, the Braden Q Scale can help organizations risk-adjust their reporting of pressure ulcers, specifically from reporting the number or percent of patients who developed pressure ulcers to reporting those patients, through nursing care, who were rescued from pressure ulcers, for example, “pressure-ulcer-free days,” the number of days a patient was at risk for a pressure ulcer (Braden Q score ≤16) and never developed a pressure ulcer.

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