Pressure Injury Risk Assessment Tools: A Literature Review

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Introduction

Definition: A pressure injury (PI) is defined by the National Pressure Injury Advisory Panel[1] as "localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device" and results from the presence of intense and/or prolonged pressure or shear. PIs can present as intact or broken skin, are often painful and are graded in stages (1 to 4) based on their size and the severity and depth of tissue layers affected.[1] PIs are a burden to both patients and health-care systems, due to their resulting pain,[1] impact on mobility and quality of life,[2] extended hospital stays and high treatment costs.[3,4,5,6]

Costs: The net and average costs of PIs in

Canada are unknown.[7] However, costs of hospital-acquired PIs in Ontario, Canada, are reported to range from $44,000 (CAD) for stage 2 PIs to $90,000 (CAD) for stage 4 PIs.[2,7] In the United States it is estimated that, in 2007, stage 3 and 4 PIs increased hospital admission costs by at least $40,000 (USD) and, in 2011, it was reported that annual costs associated with PIs ranged from $9.1-$11.6 billion (USD).[3] Annual PI-related expenses account for approximately £1.4-£2.1 billion in the United Kingdom[4] and $983 million (AUD) in Australia.[6] Current best practice guidelines recommend identifying patients at risk for developing PIs in order to develop and implement interventions to mitigate PI risk factors and prevent PI development.[8,10] This is done by utilizing PI risk assessment scales (PIRAS), with the most often used scales being the Waterlow Score, Norton Scale and Braden Scale.[9,10]

Search Strategy: A review of the literature was conducted on available PIRAS. Reviewed articles included meta-analyses, systematic reviews and clinical trials. A primary search with conducted primarily with Google Scholar which has been found to have the fullest coverage of scholarly articles across subject areas such as Martin-Martin and colleagues (2021)[78] discuss. Academic Search Ultimate and Cumulative Index to Nursing and Allied Health Literature (CINAHL) were also used.

Pressure Injury Risk Assessment Scales

Through literature review, a total of 42 unique PIRAS were identified during this study. These were developed for use in pediatric, critical and intensive care, medical units and other health-care settings. Of the identified PIRAS, 13 were specifically developed for use in a pediatric setting. All other identified PIRAS were designed for use in adult populations. Table 1 describes the adult PIRAS identified in the literature. Pediatric PIRAS are described in Table 2. The variety of adult and pediatric PIRAS is reflective of the various risk factors considered and presence in a range of health-care settings and patient populations and has also been reported to result from the use of inadequate development methods, the modification and adaptation of existing and dated PIRAS, and the use of out-dated literature reviews and research.[11] It is important to consider this, as well as all assessment items included in the multitude of existing PIRAS when developing a new tool for assessing PI development risk (For methodology, please contact the corresponding author).

Adult Pressure Injury Risk Assessment Scales

A total 29 PIRAS were identified pertaining to adult populations in various settings (Table 1). The relevance of the identified PIRAS in the literature varied. The most widely cited, referenced, and discussed PIRAS were the Braden, Norton, and Waterlow scales. Several identified PIRAS, such as the Decubitus Ulcer Potential Analyzer,[12] Pressure Area Scoring System,[13] the S.S. tool[14] and the Birty Pressure Areas Risk Assessment Scale,[15] had limited information available and related research was scarce. This was also observed by Keller et al. (2002).[16] The Braden and Norton scales were found to form the foundations of numerous other PIRAS, including the Waterlow Scale,[9,17] the Cubbin & Jackson,[18] the Douglas Risk Assessment Tool (all based on the Norton Sale)[19] and the Hunters Hill Marie Curie Centre Pressure Sore Risk Assessment Tool (based on the Waterlow and Braden PIRAS).[19] The Decubitus Ulcer Potential Analyzer was based on the Gosnell, Norton and Braden scales.[12,16] The Northern Hospital Pressure Ulcer Prevention Plan[10] and S.S. Tool[14] were developed using statistical modelling. The Fragment score[20] was developed through the adaptation of Norton and Braden scales, and statistical modelling. The Braden[21] and the PURPOSE-T[11] were developed using factors identified in the literature.

Pediatric Pressure Injury Risk Assessment Scales

Thirteen unique PIRAS were identified for use in pediatric settings (Table 2). Similar to the adult PIRAS, the relevance of individual PIRAS in the literature varied. The most widely discussed pediatric PIRAS were the Braden Q,[22] Starkid,[23]

Table 1. Description of PIRAS identified in the literature and their respective settings.

Pressure Injury Risk Assessment Scale	Setting	Reference
Andersen	Not specified	Andersen et al., 1982;[37] Keller et al., 2002[16]
Braden	Medical and Surgical	Adibelli & Korkmaz, 2019;[38] Bergstrom et al., 1987[21]
CALCULATE	Critical and intensive care	Richardson & Barrow, 2015;[39] Richardon & Straughan, 201[40]
Centraal Begeleidingsorgaan voor de Intercollegiale Toetsing (CBO)	Geriatric; Long-term care	Keller et al., 2002;[16] Van Marum et al., 2000;[41] Verschueren et al., 2011[42]
Conscious level, Mobility, Haemodynamics, Oxygenation, Nutrition (COMHON) Index	Critical and intensive care	Fulbrook & Anderson, 2015[43]
Cubbin & Jackson Scale (revised in 1999)	Critical and intensive care	Cubbin & Jackson, 1991;[44] Jackson, 1999[45]
Douglas	Critical and intensive care	Keller et al., 2002;[16] McGill & Chaplin, 2002;[19] Prichard, 1986[46]
DUPA	Critical and intensive care	Jiricka et al., 1995;[12] Keller et al., 2002[16]
Fragment	Medical and Surgical; Critical and intensive care; Neurology; Dermatology	Perneger et al., 2002[20]
Gosnell	Critical and intensive care; Spinal cord injury	Najmanova et al., 2021;[47] Zhang et al., 202[48]
Hunters Hill Marie Curie Centre (HHMCC)	Palliative Care	Chaplin, 2000;[49] McGill & Chaplin, 2002[19]
InterRAI	Geriatric; Long-term care	Poss et al., 2010[50]
Knoll Tool	Medical and Surgical	Aronovitch et al., 1992[51]
Maelor (previously known as Medley)	Medical and Surgical; Geriatric; Long-term care	Gleeson, 2015;[31] Johansen et al., 2014[32]
Modified Braden	Medical and Surgical	Kwong et al., 2005[55]
Modified Knoll	Medical and Surgical	Armstrong & Bortz, 2001;[77] Aronovitch et al., 1992[51]
Modified Norton	Medical and Surgical	Gunningberg et al., 200[52]
Northern Hospital Pressure Ulcer Prevention Plan (NHPUPP)	Medical and Surgical	Page et al., 201[10]
Norton	Medical and Surgical	Anthony et al., 2008;[53] Norton et al., 1962[54]
Pressure Area Scoring System (PASS)	Critical and intensive care	Batson et al., 1993;[13] Keller et al., 2002[16]
Pressure Sore Prediction Score (PSPS)	Medical and Surgical	Hamilton, 1992;[76] Keller et al., 2002[16]
PURPOSE-T	Medical and Surgical; Community	Coleman et al., 2017[56]

Pressure Injury Risk Assessment Scale	Setting	Reference
Ramstadius Tool	Medical and Surgical	Sharp & McLaws, 2006[57]
S.S. Tool	Critical and intensive care	Suriadi et al., 2008[14]
SCIPUS	Spinal Cord Injury; Rehabilitation	Delparte et al., 2015[58]
Shape Risk Scale	Medical and Surgical; Bariatric	Soppi et al., 2012[59]
Sunderland	Critical and intensive care	Lowery et al., 1995[60]
Walsall	Community	Chaloner & Franks, 1999[61]
Waterlow	Geriatric	Anthony et al., 200853; Jalali & Rezaie, 2005;[17] Waterlow, 1985[9]

and Glamorgan scales.[24] Some scales, such as the Bedi,[25] Derbyshire,[26] Burn Pressure Ulcer Risk Assessment Scale[2,7] and Cockett[28] were not as relevant in the literature in comparison. This was also observed by Kelechi et al.,[29] and Kottner et al.[30] The majority of pediatric PIRAS identified were based upon or are modifications of existing scales, such as the Braden and Waterlow scales, or are combinations of multiple scales. This is seen in the Bedi scale,[25] which was developed by modifying the adult Waterlow scale to fit a pediatric population,[30] and the Derbyshire, which was developed by combining items from both the Maelor[31,32] and adult Waterlow scales. The Burn Pressure Ulcer Risk Assessment Scale[27] utilized a modified Delphi technique, which considered the opinions and experiences of field experts, in the development of their scale.[30] As previously reported by Kottner et al.,[30] several scales were based on literature reviews, including the and pediatric Waterlow,[33] Barnes,[34] Cockett[28] and Garvin[35] scales and findings from their research, as seen in the Glamorgan scale.[36]

Risk Determination

All PIRAS, with the exception of the Ramstadius tool, utilized numerical scales to determine risk level for PI development. The Ramstadius tool has been described as a combination of a PIRAS and intervention protocol using specialized mattresses and regular repositioning in at-risk patients.[67] Each assessment item in the Ramstadius tool simply requires a "yes" or "no" answer.[57] Numerical scales differed by PIRAS as to whether higher PI risk was indicated by lower or higher score. Lower scores being associated with higher risk were seen in PIRAS including the Braden,[21,38,68] Norton,[53,54,68] Cubbin & Jackson,[44,45] Sunderland,[60] Gosnell,[17,69] Starkid[29] and Braden Q scales.[29,62] Scales in which a higher score was indicative of higher risk include the Waterlow,[68] Walsall,[61] Hunters Hill Marie Curie Centre,[49] Spinal Cord Injury Pressure Ulcer Scale[58] and COMHON Index.[70] Additionally, risk levels and the pertaining score ranges varied by PIRAS. However, risk level consistently and expectedly increased as a scale's score approached its critical value (highest or lowest). Each of the identified PIRAS assigned weight to all included items that contributed to patient scoring, with the exception of the Gosnell scale.[47,48] In the Gosnell scale, all prescribed medications, food and fluid intake, vital signs and implemented interventions are included in the assessment, but bear no weight in its scoring.

Adult Risk Assessment Scale Items

A total of 50 different items were identified and used in the adult PIRAS identified. Table 3 describes the assessment items of all adult PIRAS identified in this literature review. The five most frequently occurring items in adult PIRAS were mobility (occurring in 24 of 29 identified PIRAS), mental state (19 of 29), bowel and/or bladder

Table 2. Description of pediatric PIRAS identified in the literature and their respective settings.

Pressure Injury Risk Assessment Scale	Reference
Barnes	Barnes, 2004;[34] Kottner et al., 2013[30]
Bedi	Bedi, 1993;[25] Kottner et al., 201[30]
Burn Pressure Ulcer Risk Assessment Scale	Gordon, 2008;[27] Kottner et al., 2013[30]
Braden Q	Anthony et al., 2010;[62] Curley et al., 2003;[22] Kelechi et al., 2013[29]
Cockett	Cockett, 1998;[28] Kottner et al., 2013[30]
Derbyshire	Pickersgill, 1997[26]
Garvin	Ferreira et al., 2018;[63] Garvin, 1997[35]
Glamorgan	Willock et al., 2007[24]
Neonatal Skin Risk Assessment Scale	Huffines & Logsdon, 1997;[64] Kottner et al., 2013[30]
Pattold Pressure Scoring System	Olding & Patterson, 1998;[65] Kottner et al., 2013[30]
Pediatric Waterlow	Waterlow, 1998[33]
Pediatric Pressure Ulcer Prediction and Evaluation Tool (PPUPET)	Sterken et al., 2015[66]
Starkid	Kelechi et al., 2013;[29] Suddaby et al., 2005[23]

incontinence (18 of 29), nutrition status (15 of 29) and activity (14 of 29). Several items were unique to a single PIRAS, including patient sex, carer input, body shape and hygiene. Activity, mobility, mental state and incontinence were identified PI risk factors found frequently in PIRAS, as reported in a review by Keller et al.[16] This is congruent with the most frequent assessment items identified in the current review. The authors also reported that number of and duration of surgeries, low preoperative serum protein and albumin levels, altered sensory perception, skin moisture, impaired circulation, inotropic medications, diabetes mellitus, being too unstable to turn and a high Acute Physiology and Chronic Health Evaluation (APACHE) II score may also increase the risk of PI development.[16] Impaired mobility and urinary incontinence have been reported as significantly associated with PI development.[57] However, fecal incontinence has only been weakly associated with PI development, yet fecal and urinary incontinence are commonly assessed under a single PIRAS item: incontinence.[57] It is important to consider the fact that fecal continence, along with sweat and discharge from wounds, also contributes to another assessment item found in various PIRAS: skin moisture.[16] While fecal incontinence alone may not be a major factor in PI development, it contributes to PI development alongside other minor factors commonly seen in medical, surgical and critically ill patients. While urinary incontinence is significantly associated with PI development, it has been suggested this is not as relevant in critical care settings, as most patients have a urinary catheter in place.[16] While this may reduce a patient's risk for PI, it increases their risk for urinary tract infections, which are the most common health-care-associated infection and account for 36% of total health-care-associated infections, with urinary catheter-related cases accounting for 80% of total cases.[71]

A previous study by Page et al.,[10] through literature review of demographic and clinical factors associated with PI development, identified factors with clinical relevance included age of 65 years

or greater, inability to independently move in bed, altered cognition or level of consciousness, impaired sensation, diabetes mellitus, peripheral vascular disease, impaired skin integrity, moisture, incontinence (fecal and/or urinary was not indicated), skin frailty, admission to intensive care and low body mass index. Univariate analysis and multivariate analysis identified the significant items used in their tool, The Northern Hospital Pressure Ulcer Prevention Plan, as: assistance to move in bed required, admission to intensive care, age of 65 years or greater, altered cognition or level of consciousness and impaired sensation.[10] An age of 65 years or older was also reported to have a significant association with PI development by Webster et al.,[72] along with dietary referrals and being admitted from a location other than the patient's home. While skin status has been reported to be an important predictor of PI development,[73] it is inconsistently included in PIRAS.[11] This is congruent with the observations of the current study, in which skin status was included in 12 of 28 PIRAS. In addition to skin status, Coleman et al.,[73] also identified mobility and activity, perfusion and diabetes, skin and PI status. Skin moisture, age, hematological measurements, nutrition and health status were also described to be important risk factors for PI development. Temperature and immunity were also thought to be important but were said to require further research, while little evidence was found supporting the role of race and gender in PI development.[73] While caregiver input was only found to be an assessment item in the Walsall PIRA,[61] the input and involvement of caregivers and patients is also important,[11] as this promotes their inclusion in making decisions related to and planning care.[74]

Pediatric Risk Assessment Scale Items

A total of 30 different items were identified and used for assessment in the identified pediatric PIRAS. The assessment items of the pediatric PIRAS identified in this study are identified in Table 4. The four most frequently occurring items in pediatric PIRAS were mobility (included in all 14 pediatric PIRAS), nutrition (11 of 14), skin status (8 of 14) and bowel and/or bladder incontinence (7 of 14). The fifth most frequently occurring items were poor perfusion, moisture, low weight, and devices, tubing, or lines pressing on the skin, all of which were identified in six pediatric PIRAS. Items unique to individual pediatric PIRAS included percentage of body surface area burned, prior or current PI, age, gestational age and current infection. Mobility, nutrition, skin status, incontinence were also found to be commonly included in identified pediatric PIRAS. A review by Kottner et al.,[30] had identified 12 pediatric PIRAS and approximately 33 assessment items, with 14 items occurring in only one PIRAS each. The review reported that mobility, nutrition, incontinence, weight and skin status were the most frequently occurring assessment items. Additionally, mobility was part of each PIRAS. This is congruent with the findings of this research, as mobility was an item in each of the 14 pediatric PIRAS identified in the current review. This emphasizes the importance of mobility in PI development, especially when considering the established relationship between mobility and PI development.[8] Therefore, mobility is of particular importance when assessing a pediatric patient's PI development risk or developing a pediatric PIRAS. The similarities between the current review and the findings of Kottner et al.,[30] also indicate the importance of nutrition, skin status, incontinence and weight in the assessment of PI development in pediatric populations.

Limitations

Article availability and database restrictions may have resulted in some indirect and unintended bias. However, every possible effort to circumvent database restrictions was taken. Yet, it is possible that relevant articles, additional PIRAS, or publications in other databases or gray literature could have been missed. Additionally, where the authors were only able to review articles available in English, it is possible that relevant publications were missed due to a lack of multilingualism.

Table 3. Items considered by the identified adult PIRAS.

	Pressure Injury Risk Assessment Scale									
Item	**Andersen**	**Braden**	**CALCULATE**	**CBO**	**COMHON**	**Cubbin & Jackson**	**Douglas**	**DUPA**	**Fragment**	**Gosnell**
Mobility	x	x		x	x	x		x	x	x
Incontinence	x		x[b]	x		x	x			x
Mental State	x			x	x	x	x	x	x[b]	x
Nutrition Status			x		x	x	x	x		x
Activity		x					x	x		x
Skin Status	x					x	x			documented
Hemodynamic Status	x		x[c]			x				
Weight/BMI						x	x			
Age	x			x		x			x	
Sensory perception		x						x		
Respiration/ Oxygenation			x		x	x	x			
Moisture		x						x		
Predisposing disease, medical condition					x					
Pain							x			
Prescribed medications[a]				x			x			documented
Friction or Shear		x						x	x	
Temperature				x						
Appetite/Food Intake										documented
Perfusion/ Cardiac Insufficiency			x					x		
Fluid Intake	x									documented
Diabetes/ Hyperglycemia				x			x			
Other Items Considered			x[d]	x[e]		x[f]				

[a]Steroids, cytotoxic medications (chemotherapy medications), nonsteroidal anti-inflammatory drugs anticoagulants, sedatives, pain medications, tranquilizers, antibiotics; [b]Fecal incontinence only; [c]Serum albumin and protein; [d]Mechanical ventilation, surgery date, dialysis; [e]Neurology; [f]Hygiene

Conclusion

PI prevention and risk assessment continue to be best practice worldwide. However, there is more to PI prevention than simply completing a risk assessment form: it is important to consider and identify the individual risk factors for PI development and mitigate them as much as possible. Yet PIRAS continue to form the basis of PI prevention, and for good reason, as they have been shown to

Table 3 (Cont.). Items considered by the identified adult PIRAS.

	Pressure Injury Risk Assessment Scale										
Item	**HHMCC**	**InterRAI**	**Knoll Tool**	**Maelor**	**Modified Braden**	**Modified Knoll**	**Modified Norton**	**NHPUPP**	**Norton**	**PASS**	**PSPS**
Mobility	x	x	x	x	x	x	x	x	x		x
Incontinence		x[b]	x	x		x	x		x		x
Mental State			x	x		x	x	x	x		x
Nutrition Status	x			x	x	x					x
Activity	x	x	x	x	x	x	x		x		x
Skin Status	x			x	x						
Hemodynamic Status	x										
Weight/BMI		x			x						
Age								x			
Sensory perception	x				x			x			
Respiration/ Oxygenation		x									
Moisture	x				x						x
Predisposing disease, medical condition			x			x					
Pain		x		x							
Prescribed medications[a]											
Friction or Shear	x				x						
Temperature											
Appetite/Food Intake						x	x				
Perfusion/ Cardiac Insufficiency											
Fluid Intake						x	x				
Diabetes/ Hyperglycemia										x	
Other Items Considered		x[c]	x[d]			x[d]	x[d,e,f]	x[g]	x[d]	x[h,i,j]	x[d]

[a]Steroids, cytotoxic medications (chemotherapy medications), nonsteroidal anti-inflammatory drugs, anticoagulants, sedatives, pain medications, tranquilizers, antibiotics; [b]Fecal incontinence only; [c]History of PI; [d]Physical condition; [e]Surgery date; [f]admission date; [g]ICU admission; [h]epinephrine and/or norepinephrine infusion; [i]restricted movement; [j]too unstable to turn

be more effective in predicting PI risk than clinical judgement alone.[75] While the variety of adult and pediatric PIRAS is reflective of the risk factors considered in different settings and patient populations, it has also been reported to stem from the use of inadequate development methods, the modification and adaptation of existing and dated PIRAS, and the use of outdated literature reviews.[11] The five most frequently occurring items in adult PIRAS were mobility, mental state,

Table 3 (Cont.). Items considered by the identified adult PIRAS.

	Pressure Injury Risk Assessment Scale							
Item	**PURPOSE-T**	**Ramstadius Tool**	**S.S. Tool**	**SCIPUS**	**Shape Risk Scale**	**Sunderland**	**Walsall**	**Waterlow**
Mobility	x	x		x			x	x
Incontinence	x			x		x	x	x
Mental State				x	x	x	x	
Nutrition Status	x					x	x	x
Activity				x				
Skin Status	x	x				x	x	x
Hemodynamic Status		x		x[j]		x		x
Weight/BMI					x	x		x
Age		x		x				x
Sensory perception	x				x			x
Respiration/ Oxygenation		x				x		
Moisture	x			x				
Predisposing disease, medical condition	x			x		x	x	
Pain	x						x	
Prescribed medications[a]	x	x						
Friction or Shear	x[b]							
Temperature		x	x		x	x		
Appetite/Food Intake								
Perfusion/ Cardiac Insufficiency	x							
Fluid Intake								
Diabetes/ Hyperglycemia				x				
Other Items Considered	x[c,d,e,f]	x[g,h]	x[b,i]	x[i,k,l,m]	x[n]		x[o]	x[g,i,k,p,q]

[a]Steroids, cytotoxic medications (chemotherapy medications), nonsteroidal anti-inflammatory drugs, anticoagulants, sedatives, pain medications, tranquilizers, antibiotics; [b]includes pressure from devices, lines, and tubes; [c]history of PI; [d]clinical judgement; [e]edema; [f]epidural; [g]sex; [h]existing PI; [i]tobacco consumption; [j]albumin and hematocrit; [k]complete SCI; [l]autonomic dysreflexia; [m]hospitalization; [n]body shape; [o]carer input; [p]surgery date; [q]cachexia

bowel and/or bladder incontinence, nutrition status and activity. The four most frequently occurring items in pediatric PIRAS were mobility, nutrition, skin status and bowel and/or bladder incontinence. The fifth most frequently occurring items were poor perfusion, moisture, low weight, and devices, tubing or lines pressing on the skin, all of which were identified in six pediatric PIRAS.

Table 4. Items considered by the identified pediatric PIRAS.

	Pressure Injury Risk Assessment Scale						
Item	**Barnes**	**Bedi**	**BPURAS**	**BRADEN Q**	**Cockett**	**Derbyshire**	**Garvin**
Mobility	x	x	x	x	x	x	x
Nutrition			x	x	x		x
Skin status	x	x			x	x	
Incontinence	x	x	x		x	x	
Device-related pressure	x		x		x		
Poor perfusion		x		x			
Weight (low BMI)	x	x	x[g]		x	x	
Hemodynamic status	x	x	x		x		
Sensory perception	x			x			x
Moisture				x			x
Activity				x			
Friction/shear/ pressure	x			x			
Majory Sx/ trauma/illness	x	x			x		
LOC/Mental state		x			x		
Respiratory status					x		
Temperature					x		
Appetite		x				x	
Medication		x				x	
Sedation	x				x		
Other Items Considered		x[a-d]	x[e-f]				

[a]age; [b]cachexia; [c]circulatory/vascular disease; [d]infection; [e]percentage of body surface area burned; [f]prior or current PI; [g]defined as increased bony prominences

The relevance of these factors among various PIRAS indicate their importance in PI development and prevention. These factors should be heavily considered when attempting to mitigate PI development in all patients, regardless of PIRAS utilized in that setting. Additionally, these factors should be considered if and when developing a novel PIRAS for use in an adult or pediatric setting.

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Table 4 (Cont.). Items considered by the identified pediatric PIRAS.

	Pressure Injury Risk Assessment Scale					
Item	**Glamorgan**	**Neonatal Skin**	**Pattold**	**Pediatric Waterlow**	**PPUPET**	**Starkid**
Mobility	x	x	x	x	x	x
Nutrition	x	x	x	x	x	x
Skin status		x	x	x	x	
Incontinence	x		x			
Device-related pressure	x			x	x	
Poor perfusion	x	x			x	x
Weight (low BMI)	x		x			
Hemodynamic status	x[a]		x			
Sensory perception					x	x
Moisture		x			x	x
Activity		x			x	x
Friction/shear/ pressure					x	x
Majory Sx/ trauma/illness				x[c]		
LOC/Mental state		x				
Respiratory status			x	x		
Temperature	x		x			
Appetite						
Medication						
Sedation						
Other Items Considered		x[b]		x[d,e]		

[a]albumin; [b]gestational age; [c]head injury, illness; [d]physical disability; [e]ICU admission

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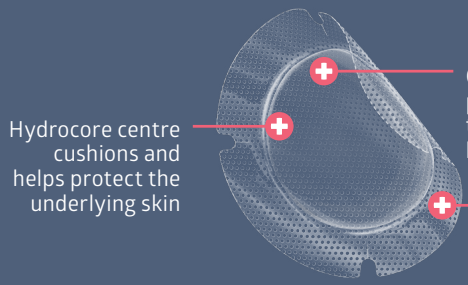

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