

Are pressure ulcer grading & risk assessment tools useful?

The purpose of pressure ulcer risk assessment and grading tools are to help assess a patient's potential risk of pressure ulcer development and to determine the extent of pressure damage, respectively. Despite their longevity there is a paucity of research available to endorse risk assessment and grading tools, resulting in a lack of consensus of opinion among experts and practitioners alike. So are risk assessment and classification/grading tools really useful or are they mere 'paperwork exercises' that limit the practitioner's time for patient care?

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KEY WORDS

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The first pressure ulcer risk assessment tool was developed in the 1960s. Subsequent tools have been based on a similar design comprising a selection of intrinsic and extrinsic factors that are believed to contribute to pressure ulcer development. Each risk factor is awarded an arbitrary numerical value, and practitioners are expected to choose at least one option from each parameter, and then calculate a final score. The final score is supposed to reflect the degree of risk a patient has of developing a pressure ulcer (Waterlow, 1987; Bergstrom et al, 1987; Bridel, 1994; Edwards, 1996).

Historically, the rationale for using risk assessment tools has been to help staff identify an individual's level of risk on admission in an endeavour to minimise further risk by identifying priorities of care (e.g. nutritional

support, skin care), and to establish a baseline for future reference, particularly if complications arise following admission (Effective Health Care Bulletin, 1995; Hampton, 1997; Bates-Jensen, 2001). Nevertheless, critics have argued that risk assessment tools are merely an 'ad-hoc assembly of factors', and that their use results in over-prediction and inappropriate use of resources and, ultimately, that clinical judgement is more important (Effective Health Care Bulletin, 1995; McGough, 1999). To gain a better understanding of how risk assessment tools are meant to be beneficial to clinical practice, this review will take a look at the construction of pressure ulcer risk assessment tools.

Construction of pressure ulcer risk assessment tools

During a literature search, McGough (1999) identified over 40 pressure ulcer risk assessment tools; however, none of them have proved to be consistently reliable for all clinical environments. One reason for this is that different

patient groups have different care requirements. For example, the needs of an elderly patient are different from those of an acute surgical patient. This paper will now review three of the most commonly used pressure ulcer risk assessment tools in the UK.

Pressure ulcer risk assessment tools The Norton Scale

In 1962, Doreen Norton devised the first pressure ulcer risk assessment tool, which was specifically designed for an elderly care environment. Following discussion with her colleagues, she identified five key risk factors that were further separated into sub-divisions, with one or two word descriptions to describe variations of each risk factor, as illustrated in *Table 1*. Using this tool, the descriptions with the lowest value represented the worst scenario. The range of possible total scores varied between 5 and 20, with an arbitrary cut-off score of 14, which equates to the individual being 'at risk' (Norton et al, 1962). Although innovative for its time,

Table 1
The Norton Scale

Physical condition	Mental condition	Activity	Mobility	Incontinent
Good 4	Alert 4	Ambulant 4	Full 4	Not 4
Fair 3	Apathetic 3	Walk-help 3	Slightly limited 3	Occasional 3
Poor 2	Confused 2	Chair-bound 2	Very limited 2	Usually urine 2
Very bad 1	Stupor 1	Stupor 1	Immobile 1	Doubly 1

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Table 2

Predictive validity of risk assessment scales

Scale	Author	Sensitivity	Specificity
Braden	Bergstrom et al, 1992 (short stay)	100%	90%
	Bergstrom et al, 1992 (ICU)	83%	90%
	Braden et al, 1994 (nursing home)	46%	88%
	Langemo et al, 1991 (orthopaedic)	64%	87%
	Barnes et al, 1993 (cardiothoracic)	73%	91%
Waterlow	Smith, 1989	73%	38%
Norton	Norton et al, 1962 (elderly care)	63%	70%
	Goldstone et al, 1982 (orthopaedic)	89%	36%
	Smith, 1989 (orthopaedic)	50%	31%

the Norton scale has little research to endorse its use outside of an elderly care setting. Furthermore, subsequent modified versions of this tool have incorporated nutrition as a risk factor, highlighting recent research alluding to the importance of nutrition and wound healing, and have also stratified the degrees of risk (Wai-Han et al, 1997; NMPDU, 2002; EPUAP, 2003).

The Braden Scale

The Braden Scale was devised by American researchers in the mid-1980s. Following an extensive literature search, the foundation for this tool was based on a 'conceptual schema of aetiological factors' whereby 'pressure' and 'tissue tolerance' were identified as significant factors in pressure ulcer development. Six further parameters were identified as risk factors that could contribute to pressure or affect the tissue tolerance of the skin. The range of possible total scores when using this tool varies between 6 and 23 and, like the Norton scale, low scores signify higher risk. The cut off points that signify that an individual is 'at risk' varies between 16 and 18, depending on the clinical environment in which the tool is being used (Bergstrom et al, 1987).

One criticism of this tool is the inability of staff to distinguish what is meant by some of the parameters. An example of this is the use of risk factors, such as 'mobility and activity', whereby the authors use the term 'mobility' to question if the patient is able to relieve pressure through movement? Whereas, the 'activity' parameter relates

to the frequency and duration of a patient's movement. So, in actual fact, the terms mean different things but further clarification or education may be required at ward level. Unlike the other pressure ulcer risk assessment tools, the Braden scale has been widely researched within different clinical environments, as illustrated in Table 2. However, it is evident that the predictive validity of the Braden scale is not consistently high for all clinical areas (Capobianco and McDonald, 1996).

The Waterlow Scale

In 1987, Judy Waterlow devised the Waterlow scale following an extensive literature search and pilot studies within her local areas. She felt that the Norton scale did not address nutritional issues, account for underlying pathology, or highlight the risk of patients undergoing surgical procedures. In comparison to the Norton and Braden scale, the Waterlow scale identifies significantly more risk factors in the assessment tool, resulting in a possible total score ranging between 4 and 40. High scores signify high risk (10+ = at risk; 15+ = high risk; 20+ = very high risk). Judy Waterlow also went to considerable effort to ensure that her tool was user friendly and, by incorporating information on methods of how to prevent pressure ulcer development, she encouraged staff to be proactive in the prevention and management of pressure ulcers (Waterlow, 1988; Waterlow, 1998). However, despite its wide use within the UK, the Waterlow scale has been criticised for its lack of research and its ability to over-

predict and, consequently, result in the misuse of resources (Edwards, 1995; McGough, 1999).

More recently, Judy Waterlow has revised her original version of the Waterlow scale following collaboration with colleagues in Australia. She has made a few amendments as listed in Table 3 (Waterlow, 2005). In addition, she has produced a manual to clarify many of the 'grey areas' that arose from use of the original tool. However, once again, research is eagerly awaited to assess the revised Waterlow scale's effectiveness in clinical practice.

Which risk assessment tool is the best?

The simple answer is that there is no 'best' pressure ulcer risk assessment tool. Experts have been unable to unequivocally endorse one specific tool for all clinical areas, due to a lack of robust research (EPUAP, 1998; RCN, 2000; NMPDU, 2002). So how can we decide which tool is the most appropriate for our clinical area? It is important to consider the predictive validity of a tool when either piloting risk assessment tools within a clinical area, or when reviewing the literature. The predictive validity assesses the efficacy of a tool at differentiating between individuals who are at risk and those who are not, and this is achieved by measuring the sensitivity and specificity of a tool.

The sensitivity looks at the accuracy of the tool in predicting those who will develop the condition; the ideal tool would achieve a score of 100%. Similarly, specificity aims to ascertain a tool's ability at predicting those who will not develop a pressure ulcer, thus avoiding over prediction and a waste of resources. Once again, the ideal score for specificity would be 100%. Another factor to consider when looking at the research is inter-rater reliability, to ensure that different levels of staff can use the tool and achieve a similar outcome, thereby minimising the risk of huge discrepancies arising. Finally, when reviewing the literature, it is important to acknowledge the methodology of the study and to consider who has been involved in the

Table 3

Amendments to the Waterlow scale

Risk factor	Amendment in revised Waterlow
Build/weight for height	BMI score incorporated into this section
Contenance	Differentiates between urinary and faecal incontinence
Skin type visual risk areas	Defines 'discolouration' and 'broken spots' using the EPUAP classification tool
Mobility	Defines the terms 'bed-bound' and 'chair-bound'
Appetite	This has been replaced with a Malnutrition Screening Tool to identify nutritional status. (An Australian screening tool, rather than the MUST screening tool produced by BAPEN is used)
Tissue malnutrition	Clarifies single and multiple organ failure, and defines what constitutes anaemia
Neurological deficit	Limits the score for this parameter to 6
Major surgery/trauma	Incorporates a score for operations longer than 6 hours. Explains that this score can be discontinued 48 hours post-operatively if the individual is making a normal recovery
Medication	Limits the score for this parameter to 4

data collection process, as there may be an unintentional element of researcher bias (Edwards, 1996).

Guidance when using risk assessment tools

Despite the lack of research to endorse risk assessment tools, the guidance produced by the experts still advocates their use in clinical practice, although in conjunction with clinical judgement. Nevertheless, they also emphasise that risk assessment tools should be appropriate for the clinical environment in which they are being used. In addition, staff should receive adequate training to ensure that they are competent to use the pressure ulcer risk assessment tools. This is especially relevant for novice practitioners, who do not have the extensive clinical judgement skills that experienced practitioners have. Therefore, risk assessment tools may be beneficial for them, particularly when admitting patients, in order to help prioritise care until they are more familiar with their patient (EPUAP, 1998; RCN, 2000; NMPDU, 2002).

Finally, it is important to realise that because pressure ulcer risk assessment scores are part of the nursing documentation and therefore a legal document, they must be completed properly as they may be reviewed at a later date if a case of litigation arises (Dimond, 1994). This paper will now

look at the merit of some of the commonly used pressure ulcer grading/classification tools.

Pressure ulcer grading/classification tools

In 1993, the Department of Health published a report on pressure ulcers, *A Key Quality Indicator of Care*, wherein it was suggested that an effort should be made to reduce the number of pressure ulcers nationally. It was suggested that the number of pressure ulcers would be identified through prevalence/incidence studies (DoH, 1993). However, to determine the extent of pressure ulcer damage at an individual level, a pressure ulcer classification/grading tool is required.

Historically, it has been very difficult to compare and analyse national/international data obtained from prevalence and incidence studies and, thus, to ascertain if the pressure ulcer problem is increasing or decreasing. Different pressure ulcer classification/grading tools are used throughout the country, and the grades within different tools can equate to different levels of pressure damage. One example of this is that a grade 1 using the Torrance scale equates to blanching hyperaemia; conversely, a grade 1 using the EPUAP tool means that the patient has non-blanching erythema and, therefore, the data is incomparable (Sharp, 2004).

Like pressure ulcer risk assessment tools, pressure ulcer classification/grading tools are, generally, numerical systems that are used to describe the depth of a pressure ulcer by illustrating the amount of tissue loss in relation to the anatomy of the intact skin (Shea, 1975). Shea, an orthopaedic surgeon, devised the first classification tool in the mid-1970s based on an anatomical model, and subsequent researchers adopted a similar approach to describe the extent of tissue loss. This paper shall now compare the three most commonly used pressure ulcer classification/grading tools within the UK.

Torrance classification system

This pressure ulcer classification tool was devised in 1983 and has five subsections or stages (Torrance, 1983). The major criticism of this tool is that it describes a grade 1 pressure ulcer as 'blanching hyperaemia'. Critics have disputed that blanching hyperaemia represents a warning sign and thus an underlying physiological reaction to pressure, rather than actual pressure damage. Furthermore, the term hyperaemia is often used synonymously with erythema but the terms mean different things (Bliss, 1998; Bethell, 2003; Sharp, 2004).

Stirling Pressure Sore Severity Scale (SPSSS)

The SPSSS tool was developed in 1984 by Reid and Morrison at a consensus meeting (Reid and Morrison, 1994). Essentially, this tool describes four levels of pressure damage with grade one described as 'non-blanching erythema'. This tool has several levels of descriptors within each grade; however, there is mixed opinion as to whether the descriptors assist or confuse practitioners when using this tool to assess the level of pressure damage. Certainly, the authors' rationale for including the extensive descriptors was to help make things easier for practitioners. Another major criticism is that the tool suggests a grade for an ulcer that is covered with eschar. This is certainly a contentious issue as many experts argue that eschar masks the depth of underlying damage, hence making it impossible to grade the level of harm (Sharp, 2004).

Key Points

- ▶▶ Currently there is no superior alternative to the risk assessment and classification/grading tools that are widely used in clinical practice.
- ▶▶ Despite a paucity of research available to endorse them, both tools are still recommended for use during the assessment process.
- ▶▶ If used appropriately, both tools have the potential to enhance patient care.

European Pressure Ulcer Advisory Panel (EPUAP) grading tool

The experts who constitute the EPUAP have now reached a consensus of opinion and recommend the use of the *EPUAP Guide to Pressure Ulcer Grading* (EPUAP, 2003). This tool is a modified version of the National Pressure Ulcer Advisory Panel (NPUAP) classification tool, in which some of the descriptions have been altered, and where stages have been re-named as grades. Like the SPSSS scale, the EPUAP grading tool has four grades with non-blanching erythema regarded as a grade 1 pressure ulcer. Furthermore, the EPUAP grading tool also describes some warning signs that may be evident in an individual with pigmented skin, which has not previously been addressed.

What is the best grading/classification tool?

Like pressure ulcer risk assessment tools, there is a dearth of research available to endorse one particular classification tool, although the EPUAP do now recommend the use of the *EPUAP Guide to Pressure Ulcer Grading Tool* (EPUAP, 2003). Unlike pressure ulcer risk assessment tools, where the predictive validity was an important factor when reviewing the research, it is more important to assess inter-rater reliability with classification/grading tools. This is because classification/grading tools are constructed in a similar manner; therefore, it is important to establish that when different practitioners use the tool to assess a wound, that they will reach a similar conclusion.

There are three main pieces of research assessing inter-rater reliability of pressure ulcer classification/grading tools. The method of investigation in each of the studies relied on either the use of photographs, or visual inspection of skin, to test the practitioner's ability to grade ulcers accurately. In 1996, Healey found that the increased descriptions within the Stirling (SPSSS) tool had the reverse effect than what the authors had anticipated, and actually reduced the levels of agreement between staff. Bours et al (1999) noted that there was a higher level of agreement when practitioners had the opportunity to discuss EPUAP grading as a group, in comparison to scoring pressure ulcers independently. Defloor and Schoonhoven (2004) suggested that there was a high level of inter-rater reliability among experts when using the EPUAP classification tool. However, there was difficulty in distinguishing between incontinence lesions, blisters and superficial pressure ulcers.

All of the studies above used the Kappa's co-efficient statistical test to analyse their results. However, critics have intimated that the Kappa's statistical test may not be the most reliable, raising questions about the results of these studies (Defloor and Schoonhoven, 2004). Would another statistical test show the results of these studies in a more or less favourable light? Once again, to answer this question, further research is required to establish a true picture of the efficacy of these classification tools.

Guidance when using classification tools

Like risk assessment tools, pressure ulcer classification/grading tools are regarded as important implements to help grade the extent of pressure damage and form an integral part of the nursing documentation and wound assessment. However, for the assessment to be accurate, practitioners need to be educated on how to use the tools. Looking at the larger picture, it would be beneficial if one tool was adopted at a national level to ascertain if the incidence and grade of pressure ulcers is increasing or decreasing (EPUAP, 1998). Finally, it is important that pressure ulcer classification/grading tools

are not used by practitioners to reverse grade healing ulcers, because wound healing is not simply the reverse sequence of repairing tissue that ensued from pressure ulceration (Clark, 2005).

Conclusion

Currently there is no superior alternative to the pressure ulcer risk assessment and classification/grading tools that are widely used in clinical practice. Despite a lack of consistent robust research, both tools are still recommended for use during the assessment process. Essentially, if used appropriately, both types of tool have the potential to enhance patient care, through early implementation of preventative or management strategies, to prevent or minimise further pressure damage. **WUK**

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