

# DIFFERENTIATING BETWEEN PRESSURE ULCERS AND MOISTURE LESIONS

This article focuses on the ability of nurses to assess and differentiate between superficial pressure ulcers and moisture lesions. There is also a debate over the validity of the distinction. The differentiation between moisture lesions and pressure ulcers appears complicated and highlights the need for ongoing education and training. Management strategies for both types of skin damage should be addressed as the consequences and outcomes for the patient will depend on the prevention and management strategies that are put in place.

## Key Questions

- ▶ *Moisture lesions are often mistaken for superficial pressure ulcers. How competent are nurses in differentiating between the two?*
- ▶ *Is it necessary to identify the differences between the two?*

Moisture lesions are often mistaken for superficial pressure ulcers, especially when skin damage is located in the peri-anal and natal cleft region. Characteristics of the two differ as do the management strategies. In some cases, combined lesions of both pressure and moisture damage may be present.

The reason for differentiating between the two can be viewed from both a quality of care aspect and that of achieving nationally set targets. The reduction in the incidence of pressure ulcers is part of 'Safety Express' — the Department of Health (DH)'s (2011) Quality, Innovation, Productivity and Prevention (QIPP) safe care work stream; the focus being on delivering harm-free care.

Part of the QIPP agenda is the introduction of the NHS Safety Thermometer. This allows NHS organisations to measure harm in four key areas, with pressure ulcers

being one of those. If moisture lesions are being reported as pressure ulcers then incidence/prevalence figures will be falsely elevated and targets, therefore, not achieved. This will also have a financial impact on the organisation.

### **Moisture lesions**

The term 'moisture lesion' is widely used in clinical practice, but, more recently, these lesions have begun to be called moisture-associated skin damage (MASD).

MASD is defined as inflammation and erosion of the skin caused by prolonged exposure to various sources of moisture, including urine or stool, perspiration, wound exudate, mucus or saliva (Grey et al, 2011). MASD is an umbrella term for four different types (*Table 1*).

### **Pressure ulcers**

The European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel's

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(EPUAP/NPUAP) (2009) definition of a pressure ulcer is 'localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear. A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated'.

### Pressure ulcer classification (EPUAP/NPUAP, 2009)

#### Category/stage 1: non-blanchable erythema

Category 1 pressure ulcers can be characterised as having intact skin with non-blanchable redness of a localised area, usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area. The area may be painful, firm, soft, warmer or cooler as compared with adjacent tissue. Category 1 pressure ulcers may be difficult to detect in individuals with dark skin tones. They may also indicate 'at risk' persons, according to the EPUAP definition of a grade 1 pressure ulcer.

#### Category/stage 2: partial thickness

Category 2 pressure ulcers exhibit partial thickness loss of dermis, presenting as a shallow open ulcer with a red pink wound bed, without slough. They may also present as an intact or open/ruptured serum-filled or sero-sanguinous filled blister. They present as a shiny or dry shallow ulcer without slough or bruising (bruising indicates deep tissue injury). This category should not be used to describe skin tears, tape burns, incontinence-associated dermatitis, maceration or excoriation.

#### Category/stage 3: full thickness skin loss

Category 3 pressure ulcers involve full thickness tissue loss. Subcutaneous fat may be visible,

but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling. The depth of a category/stage 3 pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and, therefore, category/stage 3 ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep category/stage 3 pressure ulcers. Bone/tendon is not visible or directly palpable in these types of ulcer.

#### Category/stage 4: full thickness tissue loss

Full thickness tissue loss with exposed bone, tendon or muscle is a prominent feature of a category/stage 4 pressure ulcer. Slough or eschar may be present and these ulcers often include undermining and tunneling. The depth of a category/stage 4 pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and these ulcers can be shallow. Category/stage 4 ulcers can extend into

**Table 1**  
*Types of MASD*

<i>Type of MASD</i>	<i>Definition/characteristics</i>
<i>Incontinence-associated dermatitis (IAD)</i>	<i>Prolonged contact with the skin of urine or faeces is also known as IAD. Typically presents as inflammation of the skin surface characterised by redness and, in some cases, swelling and blister formation (Voegeli, 2012).</i>
<i>Peristomal moisture-associated dermatitis</i>	<i>Inflammation and erosion of skin, related to moisture, that begins at the stoma/skin junction and can extend outward in a four-inch (10cm) radius (Colwell et al, 2011)</i>
<i>Periwound moisture-associated dermatitis</i>	<i>When high volumes of exudate are produced, healing may be affected as the overhydrated skin becomes macerated, potentially leading to skin breakdown (Cutting, 1999). Exudate from acute wounds contains proteolytic enzymes that tend to be inactive. In contrast to this, chronic wounds have a higher amount of proteolytic enzymes, which tend to be more active and predispose skin to breakdown (Colwell et al, 2011).</i>
<i>Intertriginous dermatitis</i>	<i>An inflammatory skin condition that affects opposing skin surfaces. Commonly found in the axillary and inguinal skin folds, as well as under the breasts in females (Black et al, 2011). Thought to be caused by the friction that occurs when the skin rubs together and is worsened by trapped moisture, which is a result of poor air circulation (Black et al, 2011). Leads to mild erythema and may progress to more severe inflammation with erosion, oozing, exudation, maceration and secondary infection (Hahler, 2006).</i>

muscle and/or supporting structures (e.g. fascia, tendon or joint capsule), making osteomyelitis or osteitis likely to occur. Exposed bone/muscle is visible or directly palpable in category/stage 4.

EPUAP issued a statement regarding pressure ulcer classification, differentiation between pressure ulcers and moisture lesions (Defloor et al, 2005) (Table 2).

**Differentiation**

Evidence has highlighted that nurses have problems in correctly grading pressure ulcers and differentiating between moisture lesions and pressure damage (see Figures 1–4 for examples of differentiation). This is highlighted in a study by Defloor et al (2006) and Beeckman et al (2007).

The difficulty in differentiating between the two is highlighted in a study by Defloor et al (2006). This study examines the inter-rater and

intra-rater reliability of classifying pressure ulcers using the EPUAP classification system with the use of photographs of both pressure ulcers and moisture lesions.

Defloor et al (2006) highlight that inter-rater reliability reflects the degree to which two or more observers, operating independently, assign the same grade ulcer. Intra-rater reliability reflects the extent to which a pressure ulcer is graded similarly on two separate occasions by the same observer.

In the first phase of the study, some 56 photographs, together with a random selection of nine photographs from the same set, were presented to 473 nurses. This allowed concurrent intra-rater reliability to be evaluated by comparing the nurses' first assessment with their second assessment of the same nine photographs.

The second phase of the study

involved 86 nurses and the intra-rater reliability was evaluated by presenting the same 56 photographs twice at an interval of one month. On both occasions, the photographs were presented in a different random order. All of the nurses were familiar with the EPUAP classification system and they not receive any additional training on classification.

The participants were asked to classify the lesions as normal skin, blanchable erythema, pressure ulcers (four grades) or incontinence lesions. In both phases of the study, inter-rater and intra-rater reliability of the EPUAP classification was very low. Defloor et al (2006) concluded that differentiating between pressure ulcers and incontinence lesions appears difficult.

A similar study carried out by Beeckman et al (2007) examined the EPUAP classification system for pressure ulcers, (European



**Figure 1 (left): MASD (groin).**

**Figure 2 (right): MASD — incontinence-associated dermatitis**



**Figure 3 (left): MASD to groin.**

**Figure 4 (right): Grade 2 pressure ulcer.**



**Table 2**  
Wound-related characteristics Defloor et al (2005)

	<b>Pressure ulcer</b>	<b>Moisture lesion</b>	<b>Remarks</b>
<i>Causes</i>	<i>Pressure and or shear must be present.</i>	<i>Moisture must be present, (e.g. shining wet skin caused by urinary incontinence or diarrhoea).</i>	<i>If moisture and pressure/shear are simultaneously present, the lesion could be a pressure ulcer, as well as a moisture lesion (combined lesion).</i>
<i>Location</i>	<i>A wound not over a bony prominence is unlikely to be a pressure ulcer. If the lesion is limited to one spot, it is likely to be a pressure ulcer.</i>	<i>A moisture lesion may occur over a bony prominence. However, pressure and shear should be excluded as causes, and moisture should be present. A combination of moisture and friction may cause moisture lesions in skin folds. A lesion that is limited to the anal cleft only and has a linear shape is not a pressure ulcer and is likely to be a moisture lesion. Peri-anal redness/skin irritation is most likely to be a moisture lesion due to faeces.</i>	<i>It is possible to develop a pressure ulcer where soft tissue is compressed (e.g. by a nutrition tube, nasal oxygen tube, urinary catheter). Wounds in skin folds of bariatric patients may be caused by a combination of friction, moisture and pressure. Bones may be more prominent where there is significant tissue loss (weight loss).</i>
<i>Shape</i>	<i>Circular wounds or wounds with a regular shape are most likely pressure ulcers, however the possibility of friction injury has to be excluded.</i>	<i>Diffuse, different superficial spots are more likely to be moisture lesions. In a kissing ulcer (copy lesion) at least one of the wounds is most likely caused by moisture (urine, faeces, transpiration or wound exudate).</i>	<i>Irregular wound shapes are often present in a combined lesion (pressure ulcer and moisture lesion). Friction on the heels may also cause a circular lesion with full thickness skin loss. The distinction between a friction lesion and a pressure ulcer should be made based on history and observation.</i>
<i>Depth</i>	<i>Partial-thickness skin loss is present when only the top layer of the skin is damaged (grade 2). In full thickness skin loss, all skin layers are damaged (grade 3 or 4). If there is full thickness skin loss and the muscular layer is intact, the lesion is a grade 3 pressure ulcer. If the muscular layer is not intact, the lesion should be diagnosed as a grade 4 pressure ulcer.</i>	<i>Moisture lesions are superficial (partial thickness skin loss). In cases where the moisture lesions get infected, the depth and extent of the lesion can be enlarged/deepened extensively.</i>	<i>An abrasion is caused by friction. If friction is exerted on a moisture lesion, this will result in superficial skin loss in which skin fragments are torn and jagged.</i>
<i>Necrosis</i>	<i>A black necrotic scab on a bony prominence is a pressure ulcer, grade 3 or 4. If there is no or limited muscular mass underlying the necrosis, the lesion is a pressure ulcer grade 4. Necrosis can also be considered present at the heel when the skin is intact and a black/blue shimmer is visible under the skin (the lesion will most likely evolve into necrotic eschar).</i>	<i>There is no necrosis in a moisture lesion.</i>	<i>Necrosis starts without a sharp edge, but evolves into sharp edges. Necrosis softens up and changes colour (e.g. blue, brown, yellow, grey), but is never superficial. Distinction should be made between a black necrotic scab and a dried-up blood blister.</i>
<i>Edges</i>	<i>If the edges are distinct, the lesion is most likely to be a pressure ulcer. Wounds with raised edges are old wounds.</i>	<i>Moisture lesions often have diffuse or irregular edges.</i>	<i>Jagged edges are seen in moisture lesions that have been exposed to friction.</i>

**Table 2 (cont)**  
*Wound-related characteristics EPUAP (2005)*

	<i>Pressure ulcer</i>	<i>Moisture lesion</i>	<i>Remarks</i>
<i>Colour</i>	<p><b>Red skin:</b>                      If redness is non-blanchable, this is most likely a pressure ulcer grade 1.                      For people with darkly pigmented skin persistent redness may manifest as blue or purple</p> <p><b>Red in wound bed:</b>                      If there is red tissue in the wound bed, the wound is either a grade 2, 3 or a grade 4 pressure ulcer with granulation in wound bed.</p> <p><b>Yellow in wound bed:</b>                      Softened necrosis is yellow and not superficial: it is either a grade 3 or 4 pressure ulcer.                      Slough is creamy, thin and superficial layer: it is a grade 3 or 4 pressure ulcer.</p> <p><b>Black in the wound bed:</b>                      Black necrotic tissue on the wound bed indicates a pressure ulcer grade 3 or 4.</p>	<p><b>Red Skin:</b>                      If the redness is not uniformly distributed, the lesion is likely to be a moisture lesion</p> <p><b>Pink or white surrounding skin:</b>                      Maceration due to moisture.</p>	<p><b>Red skin:</b>                      If the skin (or lesion) is red and dry or red with a white sheen, it could be a fungal infection or intertrigo.                      This is often observed in the anal cleft.</p> <p><b>Green in wound bed:</b>                      Infection.</p> <p><i>Be aware that zinc oxide ointments may result in whitened skin.</i></p> <p><i>While eosine (red dye) is not recommended, it is still used in some areas. It will turn the skin red/brown and obstruct the observation of the skin.</i></p>

reliability study). The study was carried out over a six-month period and examined the inter-observer reliability of the EPAUP classification system and the differential diagnosis between moisture lesions and pressure ulcers.

Inter-observer reliability reflects the degree to which two or more independent assessors assign an equal value during observation or measurement (Polit and Beck, 2003). Intra-observer reliability measures the degree of reliability of a test source of a single assessor over time (Guggenmoos-Holzmann, 1993).

A convenience sample of 1,452 nurses from five European countries participated in Beekman et al's study (2007) and were asked to classify 20 validated photographs as normal skin, blanchable erythema, pressure ulcers (four grades), moisture lesion or combined lesion. All nurses were familiar

with the EPAUP classification scale. Pressure ulcers were often classified incorrectly, and only a minority of nurses reached a sustained level of agreement, while the differential diagnosis between moisture lesions appeared complicated. Overall, the inter-observer reliability was low.

It can be argued that the use of photographs only provides a two-dimensional view of wounds and the visibility of the different tissue types might be limited. No supporting patient information or history were provided alongside the photos in either Defloor et al (2006) or Beekman et al's (2007) studies. When making clinical decisions in practice, a holistic assessment has to be made; in this case, a patient history would certainly be useful when assessing if a lesion has been caused by moisture.

The findings from both studies reflect current findings in practice. MASD is still being reported as a clinical

incident, even though this information is not required and, in turn, increases the pressure ulcer incidence rate.

An observational study carried out by Kottner and Halfens (2010) focused on the inter-rater reliability and agreement of the diagnosis of moisture lesions as defined by the EPUAP wound and patient-related characteristics stated in *Table 1*. This differed from the previous two studies as it involved staff assessing skin damage in clinical practice and not the use of photographs.

The study involved home care patients. A total of 7,922 patients were included from 42 home care institutions, of which 339 patients were assessed twice. From a total of 339 assessments, nurses agreed on the diagnosis of moisture lesions (yes/no) in 321 cases. A total of 300 patients did not have any moisture lesions, which resulted in a high degree of overall agreement. Of the patients whom were assessed

**Table 3**  
Results of the study by Houwing et al (2007)

Number	Diagnosis according to EPUAP classification	Ischaemic pattern	Irritation pattern
12	Moisture lesion	4	8
1	Stage 4	1	1
1	Combination ulcer, stage 1 with a moisture lesion	1	1

as having moisture lesions, it appears that the nurses were able to identify them according to the EPUAP wound-related characteristics. Kottner and Halfens (2010) conclude that the EPAUP descriptions for the identification of moisture lesions do support the diagnostic process, but reliability should be enhanced.

### Justification

Following the previous studies highlighting nurses' ability in assessing and differentiating between MASD and pressure ulcers, Houwing et al (2007) questioned whether the distinction between the two should be made at all.

The study involved taking 14 histopathologic samples from patients with both incontinence lesions and pressure ulcers, in the attempt to identify and delineate differences in the pathophysiology and histopathology. The study attempted to gain more insight into the histopathologic changes of superficial pressure ulcers.

Two distinct findings emerged — an ischaemic pattern and a pattern of irritation (Table 3). Houwing et al's (2007) findings showed two distinct patterns from the histopathologic samples. The first pattern was characterised by ischaemia and necrosis (insufficient bloody supply and tissue death) probably caused by pressure. The second pattern was characterised by signs of chronic

irritation and an abnormal increase in the number of epithelial (skin) cells, probably due to shear and/or friction. It is evident that pressure ulcers are associated with the ischaemic histopathologic pattern, with those wounds diagnosed as moisture lesions having both the ischaemic and irritation pattern.

The findings are interesting when comparing the characteristics stated by Defloor et al (2005). Wound-related characteristics outlined by Defloor et al (2005) define moisture lesions as superficial, with no necrosis. However, the study by Houwing et al (2007) does not support this definition. The disadvantage of this study was the small sample size — a similar study with a larger sample size would have been more credible.

The authors concluded that there was insufficient evidence to justify the use of the term moisture lesion.

### Conclusion

Even with limited supporting evidence, the differentiation of superficial pressure ulcers and moisture lesions is a problem that cannot be ignored in clinical practice. Management strategies need to be addressed and not in isolation of each other. It is evident from current research that this is a challenging area of clinical practice. It is important to detect skin damage in the early stages, whatever the cause (pressure or moisture), as this allows for vital preventative

and treatment measures to be put in place to inhibit further deterioration of the skin.

There is an obvious need for ongoing education and training in this area of practice, and the current healthcare climate may be the ideal opportunity to address this issue due to the increased national awareness of pressure ulcers. Pressure ulcers are now getting the recognition they deserve and are seen as a key indicator of quality care. Training has to be championed if quality care is to be delivered and targets are to be met. Including MASD within training will highlight the importance of how and why the differentiation needs to be made — this will be beneficial for both the patient and the healthcare organisation.

This is certainly an area of clinical practice that could be further explored and developed. National guidance on the prevention and treatment of MASD would be useful as there appears to be no consensus in this area of practice at present. **WE**

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