Meeting report: pressure ulcer prevention and management: do we all agree?

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Speakers

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This interactive session allowed the audience to vote live and broadcast their comments, engaging with the expert panel and providing a snapshot of views on pressure ulcer (PU) prevention and management.

The session focused on a series of statements/questions related to PU prevention and management, incorporating the expert panel's views and the audience's level of agreement:

1. "I truly believe that multilayer foam dressings must have a place in each PU prevention protocol or programme."
2. "In your opinion, what are the main criteria for dressing selection in prevention of PUs versus the management of superficial PUs?"
3. "Are incontinence-associated dermatitis (IAD) and PUs associated?"
4. "Do dressings play a role in IAD prevention?"
5. "How does incontinence impact your prevention protocol decision and how is it aligned with your PU prevention protocol?"

I truly believe that multilayer foam dressings must have a place in each PU prevention protocol or programme

The audience voted at the beginning of the session as to whether they agreed with this statement:

- 52% agreed

48% disagreed.

Lisette Schoonhoven spoke about the statement, aiming to discuss the definition of a PU, aetiology and 'what we know so far', to enable the audience to share their views.

A PU is defined as 'a 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*' (National Pressure Ulcer Advisory Panel [NPUAP] et al, 2014).

Shear is related to friction — if friction forces are high, shear forces will be high, which can have an effect on tissue *[Figure 1 and Figure 2]*.

The previous belief was that it was solely ischaemia that caused tissue damage. However, we now know that there are several mechanisms involved, including:

- Ischaemia
- Deformation
- Reperfusion
- Lymphatic flow
- Microclimate.

There are ways that PU risk can be reduced. As well as reducing the amount and duration of pressure and shear via support surfaces and repositioning, excessively dry skin may be more fragile and prone to damage, so preventive skin care and nutrition also play a part.

Prophylactic dressings are also proposed as part of PU prevention protocol, reducing friction, shear and pressure, and reducing skin moisture. Evidence suggests that multilayer dressings are the most effective dressings to

Figure 1 | Friction and shear – effects on body tissues

When a patient in contact with a support surface moves, the friction between the skin and the surface tends to hold the skin in place and a shear force occurs that displaces and deforms the deeper tissues, and may distort and compress blood vessels. If friction between the skin and support surface is reduced, the amount of shear generated will also reduce

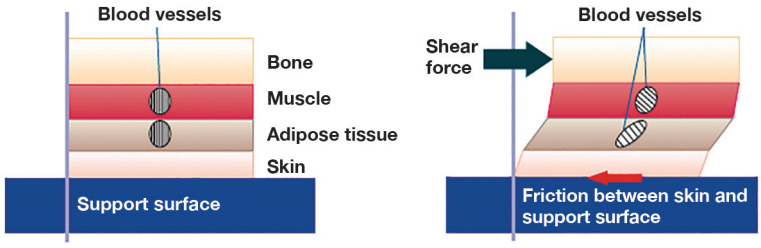

Figure 1. The effects of friction and shear (adapted from WUWHS, 2016).

Figure 2 | Pressure can produce shear deep in soft tissues over a bony prominence

Pressure applied to the skin over a bony prominence causes compression, deformation and distortion of the underlying soft tissues and produces shear within and between tissue layers

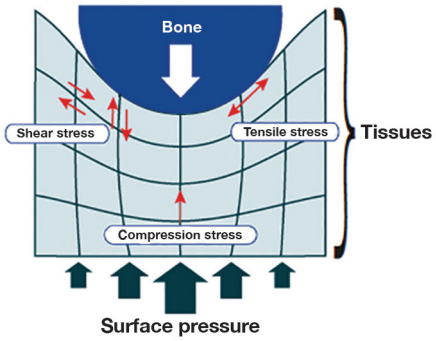

Figure 2. The effects of pressure (adapted from WUWHS, 2016).

use in PU prevention. Although more research is required, the emerging evidence according to three systematic reviews suggests:

- Use of dressings is associated with a significant decrease in PU incidence (Moore and Webster, 2013; unclear or high risk of bias, more research needed)
- Dressings as part of PU prevention may help reduce PU incidence (Clark et al, 2014; more large-scale studies needed)
- Use of a multi-layer foam dressing can reduce occurrence of PUs on anatomical locations such as the sacrum and the heel, and underneath medical devices (Davies, 2016; no assessment of quality of studies).

The largest randomised controlled trials of use of multilayer dressings in prevention (Kalowes, et al 2012; Santamaria et al, 2015) are single-centre studies on critically ill patients in emergency departments and ICUs, which found significant reduction in PU incidence on the sacrum and heels.

The international guideline recommends that use of dressings in PU prevention should be considered. In suitable patients, consider applying a polyurethane foam dressing to bony prominences (e.g. heels, sacrum) for the prevention of PUs in anatomical areas frequently subjected to friction and shear (NPUAP et al, 2014).

When selecting a prophylactic dressing, consider:

- Ability of the dressing to manage microclimate
- Ease of application and removal
- Ability to regularly assess the skin
- Anatomical location where the dressing will be applied
- The correct dressing size (NPUAP et al, 2014).

It is important to note that more research on the use of dressings is needed and that prophylactic dressings should always be used alongside standard PU prevention methods (repositioning, support surface, skin care, nutrition). Prophylactic dressing use may not be suitable for all patients; indications include immobility, atypical movement, use of medical devices and presence of scar tissue (World Union of Wound Heal Societies, 2016).

Key learning points

- In dealing with protocols of care and prevention of PUs, consider pressure, friction and shear, and the underlying mechanisms involved
- As well as reducing these forces, PU

prevention should incorporate a preventative skin care regimen (fragile, dry skin may be more prone to damage) and can include prophylactic dressing use
- See above considerations of the clinical scenario and the individual patient when selecting a dressing for prophylactic use.

In your opinion, what are the main criteria for dressing selection in prevention of PUs versus the management of superficial PUs?

The audience were canvassed for their initial opinions on this statement. The answers for important criteria to consider included:

- Wear time
- Ease of inspection
- Pain
- Patient factors.

Jacqui Fletcher spoke about the similarities and differences in criteria for prevention versus management of PUs. While the criteria may differ, there is also an overlap — for instance, wear time and ease of inspection would apply in both instances.

Selection of dressings for managing superficial PUs should be based on the objectives set for managing the wound; these will vary considerably from wound to wound and depending on the location of the wound — for example, the need for an adhesive border may vary. Properties such as absorbency should also be considered for a superficial ulcer, but this will vary according to the individual patient and their wound.

When managing a superficial PU, it is important to consider the definition of 'superficial'. Classifying PUs as superficial or deep was developed as a way of recording PUs without relying on a subjective numbering system. Therefore, 'superficial' generally refers to a Grade 1–2 PU that involves the superficial layers of the skin.

Important criteria to consider when selecting a dressing for management include:

- What is the main objective of care?
- How wet is the wound?
- How deep is the wound?
- Is necrotic tissue present?
- Is the wound infected?
- Is pain an issue?
- Condition of the surrounding skin
- Location of the wound.

In managing a superficial ulcer, it is also important to think about preventing further damage, as well as managing the wound itself, therefore, the factors that are important in a dressing for prevention should also be considered.

When selecting a dressing for PU prevention, some of the factors are the same – a reduction in pressure, shear, friction and managing the microclimate. An important consideration is the ability to inspect the skin, so while the dressing must stay in place during use, it should also be possible to remove it to facilitate skin inspection and replace. It is also vital to consider the individual patient and their needs. For instance, the dressing properties needed for an immobile patient would be different from those for a patient with atypical movement.

Key learning points

- In selecting a dressing for either prevention or management, it is important to consider the individual patient and their needs
- For management it is also vital to consider treatment objectives as well as preventing further damage
- Main criteria the audience voted for included wear time, ease of inspection, pain and patient factors.

Are IAD and PUs associated?

The audience initially voted on this question, with the following responses:

- Yes 39%
- No 2%
- Perhaps 5%
- Sometimes 54%.

Jan Kottner spoke about the question of whether IAD and PUs are associated, and stated that the answer can be both 'yes' and 'no' depending on the perspective. Looking at the definition of PUs and IAD:

- A PU is a 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.
- IAD is an irritant contact dermatitis due to prolonged exposure of the skin surface to urine and/or stool.

Therefore, these are two very different conditions caused by different aetiologies. However, irrespective of these differences, there are associations between IAD and PUs, especially from a clinical perspective:

- Individuals at PU risk are very often incontinent and vice versa. Care-dependent or critically ill individuals are often affected by incontinence, immobility and other factors that are (either directly or indirectly) responsible for both IAD and PUs. There is a correlation between IAD and PUs that is very

often seen in clinical practice and supported by epidemiological studies. Sometimes this coexistence represents a challenge in making the correct diagnosis. In individuals with superficial lesions at the sacral area, it therefore is not always clear whether it is a PU or an IAD.

- In addition to this coexistence, increased skin surface moisture (e.g. due to incontinence) is an indirect causal factor for PU development. Increased skin surface moisture changes the skin's mechanical properties (for instance, the stiffness and the coefficient of friction) but also its barrier properties. Thus the skin and underlying soft tissues may be more susceptible to deformation. This is true for both existing and healed IAD. It can be assumed that the skin's resistance is decreased when IAD lesions are present and this may increase PU risk.

In summary, IAD and PUs are different things and it is very important to distinguish between the two. At the same time, there are associations in terms of coexistence and also in terms of decreased damage thresholds and increased risk. IAD decreases the cutaneous tissue integrity and thus may increase PU risk. Interestingly, epidemiological evidence also supports this association in reverse; individuals with mobility and repositioning problems are also more likely to develop IAD if incontinence is present.

Key learning points

- There is an association between IAD and PUs that is often seen in clinical practice and supported by epidemiological studies
- Increased skin surface moisture (e.g. due to incontinence) is an indirect causal factor for PU development
- Although IAD and PUs are separate and distinct, it is important to consider their associations, both in risk and clinical factors
- Making the correct diagnosis is key — it can be unclear whether superficial lesions at the sacral area are PU or IAD.

Do dressings play a role in IAD prevention?

The audience were initially asked for their views on whether dressings play a role in prevention of IAD:

- Yes 25%
- No 51%
- Sometimes 24%.

Zena Moore spoke on the subject, explaining that it is important to understand the potential that dressings may have in IAD prevention, particularly given the prevalence of IAD – for example, found to be 30% among nursing home residents (Van Damme et al, 2016). This is a new area of focus that currently requires more research.

Topical agents have been widely used in the past, but it is now thought that dressings can act as a skin barrier and thus protect the skin from incontinence-related moisture and irritants. Presenting a table of current evidence and findings on the role of dressings in IAD prevention, it was noted that the studies appeared to show that there was no difference
in the incidence of IAD among the study groups, and no difference in the mean IAD severity scores *[Table 1]*.

However, it is important to note this does not mean that dressings make no difference. The small sample sizes of the studies, plus their methodological heterogeneity, mean that they may not provide an accurate full picture.

From a clinical perspective, the use of dressings to prevent IAD has been shown to perform in a similar manner to the existing products in use, such as barrier creams. Thus, considerations such as comfort, pain, frequency of application required, time to application and re-application and health economics all warrant consideration, in order to place the impact of dressings into wider context.

Furthermore, the management of microclimate is of particular clinical importance and, in the field of pressure ulcer prevention, dressings have been shown to play a role. Thus, it is reasonable to assume that in the prevention of IAD, dressings could potentially impact on microclimate, therefore providing clinical advantage.

It is also useful to note that a global expert panel (Beeckman et al, 2015) suggested a structured skincare regimen for the prevention of IAD, consisting of two key interventions:

- Cleansing the skin (CLEANSE)
  To remove urine and/or faeces, i.e. the source of irritants that cause IAD. This should be done prior to the application of a skin protectant as part of a routine process to remove urine and faeces
- Protecting the skin (PROTECT)
  To avoid or minimise exposure to urine and/or faeces and friction.

The use of dressings in this regard requires more research; currently, in the absence of more robust evidence, it should not be assumed that use of dressings does not make a difference.

Table 1. Dressings for the prevention of IAD.

Author/Year	Country	Setting	Design	Number	Dressing	IAD
Zehrer et al 2004	USA	Nursing Home	Descriptive	250	Group 1: Petroleum Group 2: Petroleum Group 3: Cavilon barrier film three times a week Group 4: Cavilon barrier film once a day	Incidence: 33% in all groups
Bliss et al 2007	USA	Nursing Home	RCT	981	Group 1: Cavilon barrier film Group 2: 43% petrolatum Group 3: 98% petrolatum Group 4: cream with 12% zinc oxide + 1% dimeticone	Incidence: Group 1: 3.5% Group 2: 2.1% Group 3: 4.0% Group 4: 4.1%
Brunner 2012	USA	Critical Care	RCT	64	Group A: Cavilon Skin Cleanser, and Cavilon No Sting Barrier Film Group B: Cleanser, moisturiser, barrier washcloth, Comfort Shield Perineal Care Washcloth Dimethicone 3%	Number of events Group A: 6 Group B: 5
Park 2014	Korea	ICU	RCT	102	Control: Standard care Experimental: silicone border foam and standard care	IADS score (Mean and SD) Control: 0.98 ± 1.25 Experimental: 0.54 ± 0.73(EX)

Key learning points

- The use of dressings to prevent IAD has been shown to perform in a similar manner to existing products in use (e.g. barrier creams), so the individual scenario may warrant consideration of dressing use
- Dressings could provide a clinical advantage in management of microclimate
- In addition, it is recommended to use a structured skincare regimen.

How does incontinence impact your prevention protocol decision and how is it aligned with your PU prevention protocol?

The audience were initially invited to share their views on this, providing the following suggestions of relevant topics:

- Mobility issues
- Dressing definitions should be clear
- IAD should be included in pathways
- Protocol required
- Consistent skin care regimen needed.

Sylvie Meaume explained how the risk factors for PUs are well known and can also be either intrinsic or extrinsic:

Intrinsic

- Immobility
- Malnutrition
- Incontinence
- Poor skin condition
- Low blood pressure
- Neuropathy
- Psychological disorders
- Age
- Previous history of PU
- Acute disease
- Chronic disease
- Critical illness.

Extrinsic

- Pressure
- Friction
- Shear force
- Maceration.

Risk factors for IAD may be less well known; while risk assessment tools for IAD have been developed, they are not as widely used. The risk factors include:

- Type of incontinence
  - Faecal incontinence (diarrhoea/formed stool)
  - Double incontinence (urinary and faecal)
  - Urinary incontinence
- Frequent episodes of incontinence (especially faecal)
- Use of occlusive containment products
- Poor skin condition (e.g. due to ageing, steroids, diabetes)

- Compromised mobility
- Inability to perform personal hygiene
- Pain
- Raised body temperature (fever)
- Medication (antibiotics, immunosuppresants)
- Poor nutritional status
- Critical illness.

Knowledge and training in recognising and differentiating PU and IAD vary, and further education tends to be needed. It can be challenging to differentiate between IAD and a superficial PU; however, it is important to remember that 'not everything red is a PU!'.

While they are different, there is a crossover between IAD and PUs. In both cases, prevention is essential. Again, there is some crossover between prevention strategies, while IAD prevention focuses more on the skin only.

PU prevention strategies:

- Pressure-relieving support
- Redistributing and prevention of shear forces
- Nutrition
- Hygiene: gentle cleansing, moisturising, skin protection
- Potential for use of dressings

IAD prevention strategies:

- Prevent aggressive cleansing
- Prevent excessive moisture with appropriate pads and devices
- Skin hydration
- Barrier cream or film
- Potential for use of dressings.

Key learning points

- It is important to consider the combination of both intrinsic and extrinsic risk factors
- In making an accurate diagnosis, remember: 'not everything red is a PU!'
- In all cases, appropriate prevention strategies (see above for details) are essential.

Summary: what have we learned?

Dimitri Beeckman summarised the key learning points of the session:

- PUs are associated with deformation and ischaemia, but is is also vital to consider the role of moisture in PU risk to design proper protocols of care and prevention
- IAD and PUs are separate but related — the two frequently overlap in at-risk patients
- It is key to include skin care as part of a structured treatment/prevention regimen for PU and IAD, while it is an option to include prophylactic dressings
- Different selection criteria may apply when choosing the right dressing for either management or prevention of PUs. WINT

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