WORLD UNION OF WOUND HEALING SOCIETIES

Consensus document: key highlights
The role of dressings in pressure ulcer prevention

Presented at the Molnlycke Health Care Symposium *The Need for Consensus. Doing Everything Possible to Prevent Pressure Injuries* at the World Union of Wound Healing Societies Congress, Florence, Italy, 2016

CURRENT CHALLENGES IN PU PREVENTION

- Healthcare system funding
- Litigation
- Education
- Risk assessment
- Classification and diagnosis
- Unavoidability
- Monitoring and surviellance.

PRESSURE, FRICTION, SHEAR AND MICROCLIMATE

Pressure occurs when a force is applied at right angles to the surface of the skin. Pressure occurs on the skin and subcutaneous tissues. The pressure compresses the tissues and can distort or deform skin and soft tissues. Deformation of soft tissues is greater when pressure is applied over a bony prominence.

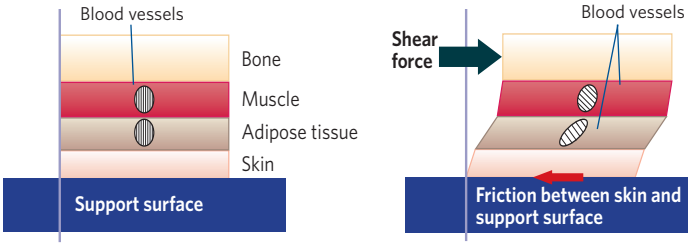
Friction is a force that occurs when two touching objects move relative to each other, e.g. friction is present between the skin and a support surface when gravity encourages a patient to slip down the bed. Friction cannot occur without some element of pressure (Figure 1). Coefficient of friction is a measure of the amount of friction that may occur between two surfaces.

Shear may result from the application of a tangential force, i.e. a force that is parallel to the surface of the skin. When there is a high level of friction between the skin and a support surface, under a tangential force, the skin will remain against the support surface while the layers of underlying tissues are deformed as they move with the patient.

Shear may also occur in and between layers of deeper tissues as a result of tissue deformation caused by pressure over a bony prominence (Figure 2). Muscle is particularly prone to damage by shear.

Figure 1 | Friction and shear — effects on body tissues

When a patient is in contact with a support surface that 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



Microclimate refers to the conditions, usually of temperature and moisture, at the skin–support surface interface. Raised skin temperature has been associated with increased risk of PU development.

High moisture levels at the skin–support surface may contribute to the development of PUs by weakening the skin and increasing the amount of friction between the skin and a support surface, increasing shear and increasing the likelihood of tissue damage.

SUPERFICIAL AND DEEP PUs

'Superficial' PUs (i.e. Category/Stage I and II) and 'deep' PUs (i.e. Category/Stage III and IV, and deep tissue injury) may result from different mechanisms (Figure 2).

Friction and shear forces applied to the skin, and other superficial skin damage (such as irritant dermatitis), are thought to be important contributors to superficial PUs. Deep PUs and deep tissue injury are thought to be due mainly to deformation of deeper tissues resulting from pressure and shear. The damage occurs initially at the muscle/bone interface, and skin breakdown occurs late in the process.

Figure 2 | Possible differences in the development of superficial and deep PUs

Outside in/Top down
Friction and shear at the surface of the skin, or other superficial skin damage such as irritant dermatitis, may cause superficial damage which changes the physical characteristics of the skin, increasing shear and pressure in deeper tissues and causing progression to deeper damage

Inside out/Bottom up
Pressure and shear cause deep tissue damage near a bony prominence, which then extends up towards the surface of the skin

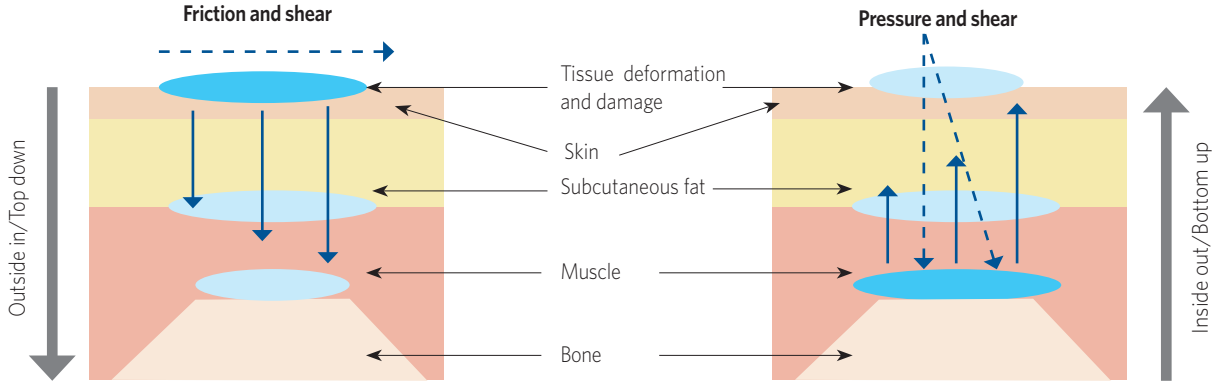


Table 1 | Modifying pressure, shear, friction and microclimate using dressing properties	
Factor	**Property of dressing that may modify factor**
Pressure	High loft (thickness or 'padding' which contains air) that cushions Large load bearing area, i.e. to redistribute pressure
Shear	Ability to absorb and redistribute shear forces through good adhesion to the skin, high loft and lateral movement of dressing layers
Friction	Outer surface with low coefficient of friction* to reduce the generation of shear
Microclimate (moisture)**	Absorbent so able to keep perspiration away from skin High moisture vapour transmission rate (MVTR) to allow moisture to be released from the outer aspect of the dressing Impermeable to liquids, e.g. urine

DRESSINGS FOR PREVENTION OF PUs

There has been increasing interest in and accumulating evidence for the use of wound dressings as an addition to standard PU prevention protocols. The effect on PU occurrence of several different dressing types has been investigated at various anatomical locations and under medical devices.

Laboratory, animal, computer modelling and clinical studies have shown that a variety of dressing materials may reduce friction, shear and pressure, and reduce the likelihood of altering skin moisture to a point where the skin may be weakened (Table 1).

Dressing composition and construction have a marked impact on the effect of a dressing on pressure, shear, friction and microclimate. Different anatomical sites vary in skin properties, shape of underlying bony prominence, and thickness and types of subcutaneous tissue present

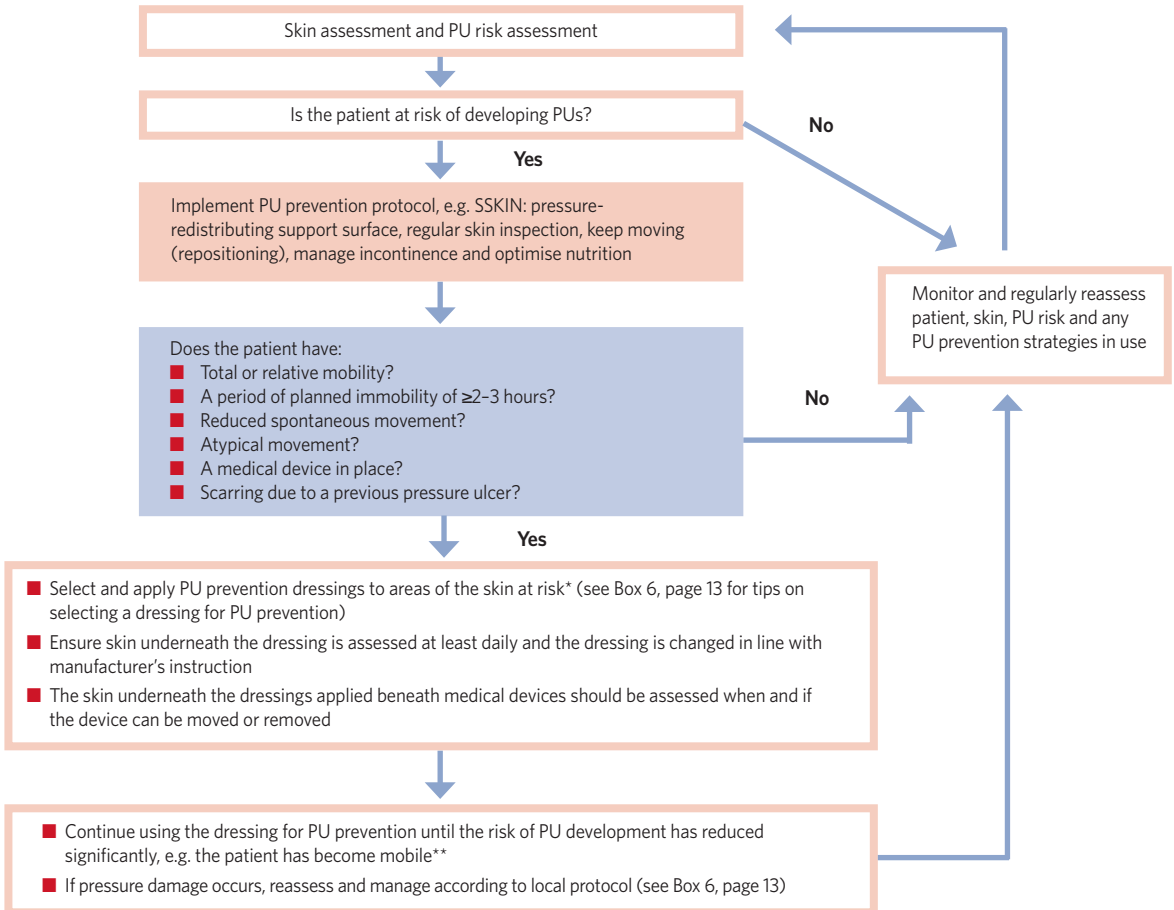
Understanding how dressing materials and construction affect pressure, shear, friction and microclimate helps to establish the ideal properties of a dressing for prevention.

IMPLEMENTATION AND CHANGING PRACTICE

Successful integration of use of a dressing for prevention of PUs into clinical practice is dependent on organisational, educational, behavioural and logistical factors that will be individual to each healthcare setting. There are a number of key principles involved in successful implementation including creating a climate for change; engaging and enabling; implementing and sustaining. A multidisciplinary approach is crucial in gaining support for changes and in ensuring effective implementation.

Evaluation of changes made to practice in PU prevention is essential for ongoing refinement and development of PU prevention protocols, and requires ongoing data collection to measure clearly defined outcomes.

Figure 4 | Algorithm for the use of dressings for PU prevention



*Body sites on which dressings for PU prevention have been investigated include sacrum, heels and trochanters. However, application of a suitable dressing to another anatomical site at risk of pressure damage may be considered

**N.B According to patient risk and local protocol, other PU prevention strategies should be continued when the dressing is discontinued