Discussion/General Information

Pressure reducing support surfaces are designed to prevent or promote the healing of pressure ulcers by reducing or eliminating tissue interface pressure. Most of these devices reduce interface pressure by conforming to the contours of the body so that pressure is distributed over a larger surface area rather than concentrated on a more restricted site. Pressure reducing support surfaces that contain multiple components are categorized according to the clinically predominant component, which is usually the topmost layer of a multi-layer product.

For all types of support surfaces, the support surface provided should be one in which the individual does not "bottom out." Bottoming out is the finding that an outstretched hand, placed palm up between the undersurface of the overlay or mattress and the individual's bony prominence (coccyx or lateral trochanter), can readily palpate the bony prominence. This bottoming out criterion should be tested with the individual in the supine position with their head flat, in the supine position with their head slightly elevated (no more than 30 degrees), and in the sidelying position.

In a meta-analysis by Nicosia and colleagues (2007) the authors concluded data support the use of foam mattresses, air mattresses or overlays versus a standard hospital mattress to reduce the risk of developing heel pressure ulcers. However, the authors noted the results are limited based on the small number and poor quality of controlled clinical trial data included in the meta-analysis.

Definitions

Pressure Ulcer (National Pressure Ulcer Advisory Panel, 2007)
A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction. 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 Stages

Suspected Deep Tissue Injury:
Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.
Further description:
Deep tissue injury may be difficult to detect in individuals with dark skin tones. Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. Evolution may be rapid exposing additional layers of tissue even with optimal treatment.

Stage I:

Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.
Further description:
The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Stage I may be difficult to detect in individuals with dark skin tones. May indicate "at risk" persons (a heralding sign of risk).

Stage II:

Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.
Further description:
Presents as a shiny or dry shallow ulcer without slough or bruising.*This stage should not be used to describe skin tears, tape burns, perineal dermatitis, maceration or excoriation.

*Bruising indicates suspected deep tissue injury

Stage III:

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 tunneling.
Further description:
The depth of a stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep stage III pressure ulcers. Bone/tendon is not visible or directly palpable.

Stage IV:

Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling.
Further description:
The depth of a stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue and these ulcers can be shallow. Stage IV ulcers can extend into muscle and/or supporting structures (e.g., fascia, tendon or joint capsule) making osteomyelitis possible. Exposed bone/tendon is visible or directly palpable.

Unstageable:

Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed.
Further description:
Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined. Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as "the body's natural (biological) cover" and should not be removed.

Support Surface Descriptions/Definitions

Group 1

Group 1 pressure reducing support surfaces include: pressure pads for mattresses, non-powered pressure reducing mattresses and powered pressure reducing mattress overlay systems.

Pressure pads for mattresses describe non-powered pressure reducing mattress overlays. These devices are designed to be placed on top of a standard hospital or home mattress. This includes:

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A gel or gel-like mattress overlay, which is characterized by a gel or gel-like layer with a height of 2 inches or greater

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An air mattress overlay, which is characterized by interconnected air cells having a cell height of 3 inches or greater that are inflated with an air pump

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A water mattress overlay, which is characterized by a filled height of 3 inches or greater

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A foam mattress overlay, which is characterized by all of the following:

1.

Base thickness of 2" or greater and peak height of 3" or greater if it is a convoluted overlay (e.g., eggcrate) or an overall height of at least 3 inches if it is a non-convoluted overlay

2.

Foam with a density and other qualities that provide adequate pressure reduction

3.

Durable, waterproof cover

Non-powered pressure reducing mattresses include:

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A foam mattress, which is characterized by all of the following:

1.

Foam height of 5 inches or greater

2.

Foam with a density and other qualities that provide adequate pressure reduction

3.

Durable, waterproof cover

4.

Can be placed directly on a hospital bed frame

5.

An air, water or gel mattress, which is characterized by all of the following:

1.

Height of 5 inches or greater of the air, water or gel layer

2.

Durable, waterproof cover

3.

Can be placed directly on a hospital bed frame

Powered pressure reducing mattress overlay systems (alternating pressure or low air loss) are characterized by all of the following:

1.

An air pump or blower that provides either sequential inflation and deflation of air cells or a low interface pressure throughout the overlay

2.

Inflated cell height of the air cells through which air is being circulated is 2.5 inches or greater

3.

Height of the air chambers, proximity of the air chambers to one another, frequency of air cycling (for alternating pressure overlays), and air pressure provide adequate patient lift, reduce pressure, and prevent bottoming out

Group 2

Group 2 pressure reducing support surfaces include: powered pressure reducing mattresses, semi-electric hospital beds with powered pressure reducing mattresses, powered pressure reducing mattress overlays, advanced non-powered pressure reducing mattresses and advanced non-powered pressure reducing mattress overlays.

A powered pressure reducing mattress (alternating pressure, low air loss, or powered flotation without low air loss) is characterized by all of the following:

1.

An air pump or blower that provides either sequential inflation and deflation of the air cells or a low interface pressure throughout the mattress

2.

Inflated cell height of the air cells through which air is being circulated is 5 inches or greater

3.

Height of the air chambers, proximity of the air chambers to one another, frequency of air cycling (for alternating pressure mattresses), and air pressure provide adequate patient lift, reduce pressure, and prevent bottoming out

4.

A surface designed to reduce friction and shear

5.

Can be place directly on a hospital bed frame

A semi-electric hospital bed with a fully integrated powered pressure reducing mattress that has all the characteristics defined above is considered a group 2 pressure reducing support surface.

An advanced non-powered pressure reducing mattress overlay is characterized by all of the following:

1.

Height and design of individual cells provide significantly more pressure reduction than a group 1 overlay and prevent bottoming out

2.

Total height of 3 inches or greater

3.

A surface designed to reduce friction and shear

4.

Documented evidence to substantiate that the product is effective for the treatment of condition described by the coverage criteria for group 2 support surfaces

A powered pressure reducing mattress overlay (low air loss, powered flotation without low air loss, or alternating pressure) is characterized by all of the following:

1.

An air pump or blower that provides either sequential inflation and deflation of the air cells or a low interface pressure throughout the overlay

2.

Inflated cell height of the air cells through which air is being circulated is 3.5 inches or greater

3.

Height of the air chambers, proximity of the air chambers to one another, frequency of air cycling (for alternating pressure overlays), and air pressure to provide adequate patient lift, reduce pressure, and prevent bottoming out

4.

A surface designed to reduce friction and shear

An advanced non-powered pressure reducing mattress is characterized by all of the following:

1.

Height and design of individual cells provide significantly more pressure reduction than a group 1 mattress and prevent bottoming out

2.

Total height of 5 inches or greater

3.

A surface designed to reduce friction and shear

4.

Documented evidence to substantiate that the product is effective for the treatment of conditions described by the coverage criteria for group 2 support surfaces

5.

Can be placed directly on a hospital bed frame

Pressure reducing support surfaces that contain multiple components are categorized according to the clinically predominant component, which is usually the topmost layer of a multi-layer product. For example, a product with 3-inch powered air cells on top of a 3-inch foam base would be categorized as a powered overlay not as a powered mattress.

Group 3

Group 3 pressure reducing support surfaces include air fluidized beds. An air fluidized bed uses the circulation of warm filtered air through small, silicone coated ceramic beads creating the characteristics of fluid. When the individual is placed in the bed, his/her body weight is evenly distributed over a large surface area, which creates the sensation of "floating."