National Pressure Ulcer Advisory Panel
Support Surface Standards Initiative

Terms and Definitions Related to Support Surfaces

Ver. 01/29/2007

Historically, support surfaces were characterized in many different ways: by Medicare B category; by design; by materials in the finished product; by pressure decreased to below 32 mmHg; and as static or dynamic. (The preceding list is not exhaustive.)

Terms such as "static" and "dynamic" refer to clearly different conditions or states of activity. In the world of support surfaces, however, the initial descriptive intent of these words changed and came to mean "non-powered" and "powered," respectively.

Other phrases applied to support surfaces have included "pressure reduction" and "pressure relief." The word "pressure" describes a force over an area. We know that a person cannot be weightless and so cannot be completely free of pressure. Attempts to reduce pressure on a bony prominence, for instance, must look to the other component of the description: area. Either the area in contact with the support surface can be increased, or contact can be temporarily removed or shifted to other areas. In the first case, immersion and envelopment are the phenomena that produce reduction in pressures at bony prominences. In the second, the change in areas of contact over time is the therapeutic consideration.

We therefore propose the term "pressure redistribution" to supersede these two terms.

It was clear that other terms were also misused, confused, and confusing. These terms and definitions are proposed to supplant terms that have been commonly used and confused. They have been developed to provide a common understanding of terms that refer to basic physical concepts and design considerations; and product characteristics.

Let us begin with the **definition of support surface**: "A specialized device for pressure redistribution designed for management of tissue loads, micro-climate, and/or other therapeutic functions (i.e. any mattresses, integrated bed system, mattress replacement, overlay, or seat cushion, or seat cushion overlay)."

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PHYSICAL CONCEPTS RELATED TO SUPPORT SURFACES

Term	Definition
FRICTION (FRICTIONAL FORCE)	The resistance to motion in a parallel direction relative to the common boundary of two surfaces
COEFFICIENT OF FRICTION	A measurement of the amount of friction existing between two surfaces
ENVELOPMENT	The ability of a support surface to conform, so to fit or mold around irregularities in the body.
FATIGUE	The reduced capacity of a surface or its components to perform as specified. This change may be the result of intended or unintended use and/or prolonged exposure to chemical, thermal, or physical forces.
FORCE	A push –pull vector with magnitude(quantity) and direction(pressure, shear) that is capable of maintaining or altering the position of a body
IMMERSION	Depth of penetration (sinking) into a support surface.
LIFE EXPECTANCY	The defined period of time during which a product is able to effectively fulfill its designated purpose.
MECHANICAL LOAD	Force distribution acting on a surface
PRESSURE	The force per unit area exerted perpendicular to the plane of interest
PRESSURE REDISTRIBUTION	The ability of a support surface to distribute load over the contact areas of the human body. This term replaces prior terminology of pressure reduction and pressure relief surfaces.
PRESSURE REDUCTION	This term is no longer used to describe classes of support surfaces. The term is pressure redistribution; see above.
PRESSURE RELIEF	This term is no longer used to describe classes of support surfaces. The term is pressure redistribution; see above.
SHEAR (SHEAR STRESS)	The force per unit area exerted parallel to the plane of interest
SHEAR STRAIN	Distortion or deformation of tissue as a result of shear stress

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COMPONENTS OF SUPPORT SURFACES

Note: Components of any support surface may be used alone or in combination.

Term	Definition
AIR	A low density fluid with minimal resistance to flow
CELL/BLADDER	A means of encapsulating a support medium.
VISCOELASTIC FOAM	A type of porous polymer material that conforms in proportion to the applied weight. The air exists and enters the foam cells slowly which allows the material to respond slower than a standard elastic foam(memory foam)
ELASTIC FOAM	A type of porous polymer material that conforms in proportion to the applied weight. Air enters and exists the foam cells more rapidly, due to greater density.(non-memory)/
CLOSED CELL FOAM	A non-permeable structure in which there is a barrier between cells, preventing gases or liquids from passing through the foam.
OPEN CELL FOAM	A permeable structure in which there is no barrier between cells and gases or liquids can pass through the foam.
GEL	A semisolid system consisting of a network of solid aggregates, colloidal dispersions or polymers which may exhibit elastic properties. (Can range from a hard gel to a soft gel)
PAD	A cushion-like mass of soft material used for comfort, protection or positioning.
VISCOUS FLUID	A fluid with a relatively high resistance to flow of the fluid.
ELASTOMER	Any material that can be repeatedly stretched to at least twice its original length; upon release the stretch will return to approximately its original length.
SOLID	A substance that does not flow perceptibly under stress. Under ordinary conditions retains its size and shape
WATER	A moderate density fluid with moderate resistance to flow

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FEATURES OF SUPPORT SURFACES

A feature is a functional component of a support surface that can be used alone or in combination with other features.

TERMS	DEFINITION
AIR FLUIDIZED	A feature of a support surface that provides pressure redistribution via a fluid-like medium created by forcing air through beads as characterized by immersion and envelopment.
ALTERNATING PRESSURE	A feature of a support surface that provides pressure redistribution via cyclic changes in loading *and unloading* as characterized by frequency, duration, amplitude, and rate of change parameters.
LATERAL ROTATION	A feature of a support surface that provides rotation about a longitudinal axis as characterized by degree of patient turn, duration, and frequency.
Low Air Loss	A feature of a support surface that provides a flow of air to assist in managing the heat and humidity (microclimate) of the skin.
Zone	A segment with a single pressure redistribution capability.
Multi-Zoned Surface	A surface in which different segments can have different pressure redistribution capabilities.

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CATEGORIES OF SUPPORT SURFACES

Term	Definition
REACTIVE SUPPORT SURFACE	A powered or non-powered support surface with the capability to change its load distribution properties only in response to applied load.
ACTIVE SUPPORT SURFACE	A powered support surface, with the capability to change its load distribution properties, with or without applied load.
INTEGRATED BED SYSTEM	A bed frame and support surface that are combined into a single unit whereby the surface is unable to function separately.
NON-POWERED	Any support surface not requiring or using external sources of energy for operation. (Energy = D/C or A/C)
POWERED	Any support surface requiring or using external sources of energy to operate. (Energy = D/C or A/C)
OVERLAY	An additional support surface designed to be placed directly on top of an existing surface.
MATTRESS	A support surface designed to be placed directly on the existing bed frame.

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