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Health Rest

Glossary of Health Care Terms

Common Healthcare Mattress Terminology

What do all those terms really mean?

To help with your assessment of both manufacturers and products, we've developed a comprehensive glossary that encompasses current offerings within the healthcare support surface marketplace.

Please contact us if you have any questions; disagree with one of our definitions; would like to add a term to the list; or need more information about any of the topics included here.

Active support surface: Powered support surface that can change its load distribution properties, with or without a patient's weight on the surface. Zones or individual cells within the support surface change constantly with inflation or deflation of specific air bladders, based on preset cycles.

Adaptive/adaptive flotation: Term used for a support surface that can self-adjust to redistribute pressure, either with or without an external power source.

Air flotation mattress: Support surface that utilizes pressurized air bladders (sometimes in alternation, sometimes not) to facilitate pressure redistribution.

Air fluidized therapy: Type of support surface that provides pressure redistribution via a fluid-like medium created by forcing filtered, temperature-controlled air through mini silicone-coated ceramic beads. The patient "floats" on a sheet on top of the beads. Also known as AFT.

Alternating pressure: Function of a therapeutic air mattress that provides pressure redistribution via predictable, timed changes in inflation and deflation, usually in an A-B-A-B pattern, across multiple air or air/foam cells. Provides regular, frequent, automatic changes in distribution of body pressure. Air movement between cells is powered, i.e. with an external air pump.

Anatomical zone: Portion of a mattress's top layer whose pressure redistribution properties are matched to the body part typically resting there when a patient is supine. See "Multi-zoned surface."

Articulation: Term that refers to the bending of an adjustable bed. Such a bed with "two-point articulation" folds in two separate places, creating three distinct sections – head, foot and middle. Each section can be elevated and/or angled separately to achieve the desired position. Also known as gatching.

Auto contour: Bed articulation mode where the knee is raised slightly whenever the head of bed is raised. Often an automatic setting on the control panel of an electric bed. Used to reduce pressure on the patient's sacrum.

Auto-firm: Pump mode common in low air loss mattress systems. Inflates all cells equally to provide additional surface stability for patient transfer or medical procedure. Pump automatically resumes the pre-selected treatment level after a fixed period of time (usually 20-30 minutes).

Bariatric: Refers or relates to the overweight or obese. A bariatric mattress is made larger (usually 42" wide x 80-84" long) than a standard medical twin size, with firmer foams for more robust support.

Biocompatibility: Compatible with living tissue; a substance that is not toxic, injurious or physiologically reactive with tissue, nor will it cause immunological rejection by a living system.

Bonnell innerspring: Original, oldest and most common spring design for innerspring mattresses, characterized by knotted, round top, hourglass-shaped steel wire coils. Not normally used in healthcare surfaces, but common in home or long term care mattresses.

Bottoming out: Condition on a support surface caused when the patient's weight is able to fully compress all foam layers in the mattress, leaving the body with no resilient support above the medical bed frame. Also occurs during power outages, if the support surface has air-only cells or another form of air-supported technology. See "Maximum user weight."

Cell: Component of a support surface that contains air or an air/foam combination, typically found in alternating pressure or low air loss mattresses. Such designs may contain from four to twenty cells, running horizontally or vertically, and encased within a foam structure. Individual cells may inflate or deflate in a fixed pattern via use of an external pump; or self-adjust in air content as the patient's weight shifts. Vertical (longitudinal) cells may also be used in a lateral rotation function (see "Lateral rotation). May be called an air bladder if the surface is air-only, e.g., a low air loss mattress.

Contraindication: Condition or factor that provides a reason to withhold medical treatment or use of a device, due to the harm it may cause the patient. E.g., spinal disorders or cervical traction are contraindications for use of alternating pressure or air fluidized mattresses.

Conventional foam: Porous polymer material that conforms in proportion to applied weight. Air enters and exits the foam cells relatively rapidly, allowing foam to re-form to its original shape quickly.

Convertible mattress: An alternating pressure surface design that self-adjusts to transfer patient load, with or without the use of power. Made with air/foam cells that provide a comfortable sleep surface even when not connected to an external air pump. Can be converted to full alternating pressure with use of the pump.

Convoluted foam: Foam "peak and valley" sculpting design resembling an egg crate (thus its nickname). Used to provide additional surface cushioning, a softer feel, increased air circulation and reduced pressure points. Can be used as the top layer of a laminated foam mattress, or as a freestanding overlay.

CNC-cut foam: Foam that has been sculpted in two or three directions via use of a Computer Numerical Control (CNC) machine. The machine offers far more options in foam design than simple convoluter equipment.

CPR valve: Quick air release valve on an air system mattress, allowing caregivers to properly conduct CPR on a flat, stable surface. Valve is closed at the end of the procedure, letting the mattress re-inflate.

Dynamic surface: Support surface that creates movement under the patient either with or without an outside power source. Movement is caused by air flowing through lateral or longitudinal cells, which may be air-only or air/foam combinations. Used in cases where the patient cannot move independently; has only one uninjured side for repositioning; or has other perfusion issues. Also called a high tech surface.

Egg crate foam: See "Convoluted foam.

Entrapment: Condition that occurs when a body part of a patient – most often, the head – becomes trapped or entangled between a hospital bed frame and its mattress, or becomes trapped in some part of the bed's rails, IV poles or other equipment. The FDA has defined seven separate "entrapment zones" that hospital bed and mattress manufacturers must be mindful of as they design integrated or replacement support surfaces.

Envelopment: Characteristic of a support surface allowing it to mold or conform to the unique shape of a human body, without causing a substantial increase in pressure. The higher surface contact decreases the pressure over the total body area, helping to improve blood flow and tissue integrity.

Fire barrier: Additional fire protection added to a mattress, in the form of a nonwoven or knitted sock of flame resistant material that fits over a mattress or cushion underneath its outer cover. Gradually replacing older methods of flame retardance involving use of chemicals within foam materials.

Fire resistant: Made from materials that are inherently nonflammable, i.e. with flame resistance built into their chemical structures.

Fire retardant: Chemically treated to be slow burning or self-extinguishing when exposed to an open flame.

Flippable/turnable: Design style of a support surface that extends product life by allowing the mattress to be used on both top and bottom sides (flipped) or rotated from head end to foot end (turned). Not normally used in acute care surfaces, where foam layers are specifically designed to offer anatomic zones and progressive support.

Flotation: Support surface characteristic that lifts or suspends certain parts of the patient's body above the horizontal plane, causing a sensation similar to floating and eliminating almost 100% of the surface contact – and thus pressure – with the suspended areas. See "Alternating pressure."

Foundation: Any base or support placed beneath a mattress. Most often refers to a box spring, but can also mean other types of constructions like platforms and slatted bases. Not commonly used in acute care settings.

Fowler position: Common medical bed position allowing patient to sit. Fowler positions may be described as low, semi, standard or high depending on the head of bed's angle from its base. A 45-60° angle is considered standard. Knees may be bent in any of the Fowler positions. All sitting positions place additional pressure on the patient's sacrum. See "Auto contour."

Full size mattress: 5" wide by 75", 80" or 84" long. Also called a double bed or standard bed. Sometimes 80" and 84" lengths are referred to as Full Extra Long.

Gel: A semi-rigid colloidal dispersion of a solid with a liquid; may exhibit elastic properties. Commonly used in pressure-relieving devices, both as 100% gel layers or inserts, and as an agent mixed with different types of foam to create a softer, more immersive surface. Polymer type gels offer far better durability and performance than water/cellulose types.

Group I: One of three groups of support surfaces set up by CMS (Centers for Medicare and Medicaid Services) to facilitate reimbursement. A Group I surface is defined as a pressure reducing mattress overlay or mattress, designed to be placed on top of a standard hospital bed or home mattress. An overlay may be powered or non-powered; mattresses are non-powered. Surfaces can be high density foam, gel, air or water filled, or self-adjusting alternating pressure. Considered the "prevention" group for purposes of pressure injury control.

Group II: One of three groups of support surfaces set up by CMS to facilitate reimbursement. A surface classified as Group II is defined as a powered, pressure reducing mattress overlay or replacement mattress, either alternating pressure or low air loss. Considered the "treatment" group of products used for pressure injury control.

Group III: One of three groups of support surfaces set up by CMS to facilitate reimbursement. Group III contains air fluidized products used for treatment of severe pressure ulcers, burns and other life-threatening conditions.

Hammocking: Tendency of a mattress, especially of poorly specified foams, to sink in the center and cause a V-shaped valley that concentrates pressure on bony prominences of the body like a hammock. May occur vertically, making it difficult to turn or get out of bed; or horizontally at the sacrum, causing a curved spine during sleep.

HAPU or HAPI: Hospital-acquired pressure ulcer or pressure injury (newer terminology); an injury that develops while a patient is hospitalized.

Heel gradient/heel slope: Mattress feature where foot end slopes downward at a 10-20° angle, protecting the heels by transferring pressure to less vulnerable calves. A slight slope can decrease interface pressure by as much as 27%.

High resiliency foam: A type of open cell foam with a higher support factor than viscoelastic foam. Its greater elasticity allows the foam to spring back into shape almost immediately after compression. Contours well to the human body, and offers a longer useful life than conventional foams.

High-risk surface sculpting: Style of sculpting foam top layer of support surface, using greater than normal depth (2-4") in channels or foam shapes. For patients at high risk of developing pressure injuries.

High-specification foam mattress: A more complex foam construction, usually laminated in multiple layers and with anatomical zones, that allows optimum immersion and envelopment while making it easy for the patient to change positions. Characteristic of healthcare mattresses more so than of dormitory or other institutional designs.

HOB: Head of bed; refers to the top section of a medical bed that is hinged for movement.

Horizontal friction: Resistance to motion in a parallel direction occurring at the shared boundary of two surfaces, e.g. a patient's body and a medical bed surface. See "Shear."

ILD/IFD: Indentation Load Deflection or Indentation Force Deflection – measurement of a foam's stiffness or compressibility. Calculated as the number of pounds needed to indent a 15x15x4 square of the foam by 25%, or 1". The practical application is to estimate a mattress's conformability, ability to immerse the patient or ability to support the patient and prevent bottoming out. A "good" ILD for a mattress' top layer foam is in the 10-20 range.

Immersion: How far a load, e.g. a patient's body, sinks into a support surface. Too much immersion may cause bottoming out; too little may indicate surface is too firm, causing increased pressure on bony prominences and raising the risk of pressure injuries.

Ingress/egress: Entering or leaving a medical bed, facilitated by bed rail or mattress design. E.g. a raised-edge mattress has an opening between raised sections to allow the patient to easily get in and out of the bed. Patient fall risk can be impacted by the mattress's design. See "Rail."

Innerspring mattress: Any mattress constructed around a core of tempered coil springs. The metal springs are typically surrounded by several layers of foam and upholstery to provide additional comfort and protection to the user. See "Bonnell innerspring."

Integrated bed system: A medical bed frame and support surface combination that is designed to function as a single unit using the bed's power source. Typically the surface is unable to function separately.

Intended use: The correct, safe use of a product as specified in the manufacturer's instructions, e.g. using a support surface on the medical bed model for which it was designed.

Interface pressure: The force per unit area that acts perpendicularly between an applied load, e.g. a patient's body, and the support surface. Pressure is affected by the rigidity of the surface; the type of body tissue in contact; and size/shape/weight of the body being supported. A low-specification or standard mattress may have interface pressure as high as 100 mmHg, which can result in pressure injuries.

Inverted seam: Mattress sewing style where stitched seams are on the inside of the cover, i.e. cover is sewn inside out, then turned and applied over the foam or other core. Common in healthcare mattresses as a way to prevent fluid ingress. Also used in other markets for bed bug prevention.

King mattress: Mattress that measures 76" wide x 80" long. Not a typical healthcare size.

Lateral rotation: Function of a support surface (or a kinetic bed or turning bed) that can be programmed to rotate a patient up to 40° in either direction from flat supine. Mattress typically has longitudinal (top to bottom) air cells on each side, whose inflation/deflation gently raise and push the patient into a new position. Not a substitute for regular and clinically recommended repositioning, but good if the patient cannot tolerate manual handling due to pain levels.

Low air loss (LAL): Type of support surface that provides a flow of air beneath and through a vapor-permeable and moisture-wicking mattress cover, to assist in managing the heat and humidity of the skin. Generally used in combination with alternating pressure technology. "True" low air loss, while not a clearly defined category, generally refers to an air-based system that uses a blower rather than a compressor or pump to move air through and beneath the mattress cover. Note that blower systems often quote a theoretical air flow that is not normally achieved when the blower is connected to a mattress.

Mattress extender: Fabric-covered foam construction, generally made of the same materials as the support surface, that extends the length or width of a mattress.

Maximum user weight: Maximum safe patient weight recommended for a piece of durable medical equipment, without considering the additional weight of bed linens, medical devices, etc. See "Weight capacity."

Memory foam: See "Viscoelastic foam."

Microclimate: In healthcare, refers to the mix of temperature, moisture and air movement that develops at the patient skin/support surface interface.

mmHg pressure: Millimeter of mercury; unit of measure equal to the pressure it takes to support a column of mercury one millimeter high. Common belief in healthcare mattress design is that skin pressure higher than 32 mmHg causes capillaries to close, cutting off air and nutrient supply to the skin and hastening its decline. In recent years number has been lowered, especially for elderly patients with more vulnerable skin.

Moisture vapor permeable: A substance that allows moisture in vapor form to pass through it.

Moisture vapor transfer rate (MVTR): Measure of the passage of water vapor through a substance. Also called water vapor transmission rate (WVTR). Usually indicated as grams per square meter over a period of time, e.g. 24 hours.

MRS: Mattress replacement system. Refers to support surfaces sold separately from medical beds, or non-OEM mattresses purchased as replacements.

Multi-zoned surface: A support surface in which different segments can have different pressure redistribution capabilities. Matches the mattress characteristics to the body areas most likely to develop pressure injuries.

Non-powered: Any support surface not requiring or using external sources of power (AC or DC) for operation.

Offloading: Process of redistributing pressure across a wider contact area.

Overlay: A support layer, usually no deeper than 4-5", designed to be used on top of a mattress.

Perfusion: Capillary blood flow; passage of blood and fluid through the capillary bed; the ability of the body to efficiently move blood to all extremities.

Powered: Any support surface requiring or using external sources of power (AC or DC) to operate. Typical models would include alternating pressure, low air loss and lateral rotation mattresses.

Pressure injury (formerly pressure sore/pressure ulcer/decubitus ulcer/bedsore; new definitions developed by the NPUAP in 2016): Injury that develops due to unrelieved pressure on the skin of patients with limited mobility and other vulnerabilities. May begin as a small area of redness or discoloration and gradually progress to an open wound, with penetration to the bone at Stage IV severity. Development of pressure injuries is influenced by heat, moisture, general condition of the skin, patient nutrition and other factors.

Pressure redistribution: Support surface's ability to distribute load over contact areas with the body. Especially in vulnerable areas like the sacrum or heel, softer foams, surface sculpting, heel slopes, four-way stretch fabrics and other changes in materials and manufacturing are made to avoid extended direct pressure on any one body part.

Pressure reduction, pressure relief: Now considered obsolete terms; see "Pressure redistribution."

Progressive support/resistance: Layering of various firmnesses of foam to allow for a tissue-friendly, softer top layer and a stiffer, more supportive bottom layer.

Pulsation: A form of alternating pressure that uses a shorter peak inflation time and a more frequent cycle time. The effect is of massage or stimulation, rather than just redistribution of pressure.

Quaternary: As applied to the healthcare market, an ammonium chloride compound with positive charges that works as a surfactant. Has general antimicrobial properties. Used in cleaning and disinfecting of hard surfaces.

Queen mattress: Measures 60" wide x 80" long. Currently the most common consumer (end user) mattress size.

Rail: Part of a support surface's construction consisting of firm foam edges that form a perimeter for the central components of the mattress. Rails are generally 2-3" wide, as deep as the mattress' design, and surround all four sides of the center foam.

Raised perimeter/raised edge: Mattress design with a 2-3" raised edge on the top foam layer. Raised edge designs are used to prevent entrapment, falls and unsupervised egress from the bed.

Reactive support surface: A powered or non-powered support surface that can change its load distribution properties only if weight is applied, e.g. a patient lying or sitting on it. Surface accommodates the load by conforming to the body.

Self-adjusting mattress: Dynamic pump-free mattress system utilizing a specialized air or air/foam cell construction to maintain pressure equalization across the mattress.

Sewn seam: Cover seam created with a sewing machine (as opposed to welding equipment).

Shear: Mechanical force resulting from two factors (e.g. mattress surface and muscular structure) pulling skin in opposite directions. Commonly occurs at the sacrum, when a medical bed is raised at the head and the patient slides toward the foot end. Also called shear stress. See "Horizontal friction."

Shear strain: Damage to a patient's tissue caused by the application of shear forces.

Side perimeters/rails: See "Rail."

Static mode: Setting on an alternating pressure surface's external pump. All cells fill equally with air and remain inflated. Used in patient transfers or when administering CPR.

Static surface: Typically a surface that won't move on its own, i.e. only responds to applied load pressure. Also called low-tech surface.

Support surface: According to the NPUAP's Support Surfaces Standards Initiative, refers to a specialized pressure redistribution device, e.g. a mattress, overlay, pad or cushion, designed for the management of tissue loads, microclimate and other therapeutic functions.

Surface modified foam: A type of convolution but far shallower, offering more visual effect than therapeutic benefit.

Taped seam: Mattress construction technique, most commonly used in consumer products, where ticking seams are on the outside of the cover and then oversewn with binding tape to prevent fraying or ingress of fluids.

Therapeutic weight capacity: Highest manufacturer-recommended patient weight for safe operation of a support surface or piece of medical equipment. Should not include any overlays, linens, accessories, clothing, etc. Many manufacturers also stipulate a minimum patient weight for optimal performance of a surface or device.

Ticking: Outer cover or layer of fabric that encases the mattress or foundation.

Trendelenburg: In the Trendelenburg position, the body is laid supine, or flat on the back on a 15–30 degree incline with the feet elevated above the head. The reverse Trendelenburg position, similarly, places the body supine on an incline but with the head now being elevated.

Twin mattress: Consumer twin measure 39" wide x 75" long. A healthcare twin mattress typically measures 35" wide by 75", 80" or 84" long.

Viscoelastic foam: Porous, temperature sensitive high density polyurethane foam, commonly called memory foam, that conforms around any applied load. Softens when warm and is noticeably firmer when cold. Air exits and enters the dense foam slowly, causing the material to respond more slowly than a standard elastic foam.

Waffle: Common design of convoluted foam, used for the top layer of a mattress. As the name implies, looks like a waffle with squared sections created by cut-in grooves or separations.

Warranty, prorated: Type of warranty that does not cover the full mattress purchase price or replacement value after a certain period of time, requiring the customer to pay a portion of the original price to have it replaced.

Warranty, non-prorated: Type of warranty that provides full coverage of replacement value for a mattress if a failure in materials or workmanship occurs during the warranty period.

Waterlow Score: The Waterlow Score is an interdisciplinary assessment that determines an individual's risk of developing a PI. The scale is a baseline assessment of a client's condition that covers a wide variety of factors including mobility, continence, malnutrition and special risks.

Weight capacity: Highest safe load for a piece of medical equipment, as specified by the manufacturer. User should consider not just patient weight, but weight of patient clothing, additional accessories, medical devices, overlays, incontinence pads, bed linens and drawsheets/transfer boards. Also called maximum working load. See "Therapeutic weight capacity."

Welded seam: Support surface cover or air cell seam created by an ultrasonic or radio frequency (RF) welder, as opposed to a sewing machine. Welded seams eliminate sewn seam needle holes, helping reduce fluid infiltration into mattress interiors.

Zone: A support surface section with single pressure redistribution capability. Advanced surfaces have multiple anatomical zones.