



patient

Comfort

Patient Comfort Systems

Patients often complain about being uncomfortable during their MRI and other imaging studies. A significant part of their discomfort relates to the mattress pads currently available on the MRI as well as PET, CT, Nuclear medicine and X-Ray tables. The current pads were not developed with the purpose of maximizing patient comfort nor do they use the latest technology.

Patient Comfort Systems introduces its new patient comfort technology using viscoelastic pressure managing material. This heat sensitive material molds to the patient's exact body shape and contours to evenly distribute weight and pressure.

What is the Patient Comfort System?

The Patient Comfort System was developed over a 2-year period in close cooperation with leading imaging centers to maximize patient comfort as well as conform to the specific requirements for compatibility and safety. The Patient Comfort System incorporates viscoelastic material.

This viscoelastic material used for medical imaging has been specifically formulated to maximize patient comfort and maintain a thin form factor while optimizing the available free space for the patient when inside the MRI bore. These mattresses and positioners are compatible with existing tables and are designed to simply replace the current pads.

The basic system consists of four rectangular mattress pads covered with advanced breathable space-age waterproof material which resists staining and makes cleaning easier. A knee wedge and neck roll are also included to maximize patient comfort. To increase safety, all pads have an anti-slip undersurface to keep the pads in place while patients are getting on and off the table. Also available are pressure-managing mattresses designed for use in the CTL coil, many varieties of positioners and a pillow that fits into the MRI bore.





Basic Mattress Pads and Wedge



Positioning Cushions



Neck Roll



Anti-slip Surface

Technology

The viscoelastic technology used in the Patient Comfort System was initially developed in conjunction with NASA to help manage the high g-force tissue loads experienced by astronauts during space flight.

"This material is amazing. When I first felt it in one hand with the other hand holding the older pads that we received from the MRI manufacturer, I was blown away with the softness and the firm support it had. My patients simply love it. This has reduced motion and callbacks and made our patients happier. As an added bonus my referring doctors realize how much we care about their patients' comfort."

"I started Patient Comfort Systems to make this material available to other imaging centers and hospitals."

*Peter Rothschild, M.D. MRI Radiologist
President and Founder, Patient Comfort Systems*

The basis of this technology is an expanded urethane cellular matrix with viscoelastic properties; in essence it is a solid with the behavior of a fluid. This material is highly effective in forming to body contours and distributing body weight.

These mattresses redistribute the load (patient body weight) from areas of high concentration to areas of low concentration by two processes:

1. Immersion, which decreases the pressure by increasing the contact area.
2. Envelopment, which is the micro-configuration of the support surfaces over the body, thereby decreasing peak pressure.

The result is a pressure equilibrium which helps to maintain normal blood flow allowing the skin and underlying tissues to be perfused properly.

Peak Pressure

Peak pressures are observed typically at the bony prominences of the head, scapulae, sacrum, trochanteric head, and heels. These pressures are experienced when the support material has lost the ability to redistribute load away from these prominences. As increased pressure compresses the tissues between the surface and the underlying bone, blood flow is shunted away from the area. This results in decreased oxygen perfusion to the underlying tissue and is experienced by the patient initially as discomfort and ultimately as pain. The standard table pads used today on MRI or other imaging tables are made of resilient foams which produce uneven pressure distribution and areas of peak pressures. The discomfort associated with peak pressure is a primary reason that patients move during MRI scans. These patients are moving to relieve the pressure forces and thereby allow blood flow and oxygenation back into the body areas that had been deprived. The Patient Comfort System automatically allows for dynamic changes in the pressure profile and thus maintains tissue blood flow and oxygenation, resulting in greater patient comfort and significantly less motion.



The Mechanism of Bottoming Out

It is important to know that peak pressure is a problem that results in patient discomfort and to the furthest extreme tissue damage, it is important, to understand what causes this. Peak pressure loads are primarily the result of a phenomenon commonly referred to as bottoming out. This is a term borrowed from the support surface industry to describe what happens when a patient comes into contact with the surface on which a support mattress has been installed. The practical impact is that there is no longer any pressure redistribution and peak pressures result.

Traditional foam pads allow the patient to bottom out when they become so compressed and hard, or simply worn out, that the redistribution of weight is no longer possible. As weight becomes increasingly concentrated (peak pressure), there is essentially no way for the body to relieve venous congestion. The pressure spikes associated with bottoming out commonly occur in the occipital area, sacrum, heel, trochanters, and scapula. When external forces are greater than the internal blood pressure of the capillaries, blood flow is severely restricted resulting in tissue ischemia, pain, discomfort and erythema (one of the earliest signs of a pressure ulcer).

The viscoelastic core used in the manufacture of the Patient Comfort System utilizes a combination of materials with various densities and flow rates designed to properly support the body and keep it suspended above the solid table on which the mattress is placed. This effectively manages the forces which can lead to bottoming out.



A traditional pad (left) demonstrating bottoming out and viscoelastic material (right) showing that weight is redistributed without bottoming out



Patient comfort mattress redistributes pressure while maintaining support



"I have experienced the viscoelastic material and have been impressed with the technology. These are clearly the pads I want the imaging centers that scan my patients to use."

Richard Nolan, M.D.
Orthopedic Surgeon

Research

Extensive studies of patients with spinal injuries, amputation, multiple sclerosis and end stage renal disease have shown that Patient Comfort Systems' mattresses and positioners decrease the average interface pressure and significantly decrease the peak loading pressures. This has been shown to reduce pressure ulcers, back pain and sciatica. This redistribution of pressure over a larger area is what makes these pads so comfortable.

Patient Comfort Systems' pads incorporate ultra-strong fabric along with sewn and welded seams to protect core material from bodily fluids. This construction also prevents cracking and tearing at the pad corners, where exposure is greatest. Both the viscoelastic pad cores and cover fabrics are manufactured using a permanent antimicrobial agent to inhibit the growth of harmful bacteria. The vapor and moisture-impervious cover will not allow fluids to pass through it and can be cleaned with any standard approved hospital disinfectant. It also stretches, thereby decreasing shear and maceration. This material increases patient comfort when compared to standard plastics covers.

Patient surveys have clearly demonstrated that when given a choice, patients will overwhelmingly choose the Patient Comfort System over the standard table pads.

What is most relevant to medical imaging centers are studies which show that Patient Comfort Systems' mattresses manufactured with viscoelastic materials, significantly decrease motion during MRI scans. This means fewer callbacks for imaging centers and hospitals and higher quality studies.

Operating Rooms

Mattresses with viscoelastic materials are used in operating rooms where patients are on the surgical table for extended periods of time. Therefore, many referring doctors will already be familiar with this type of technology.

Covering Materials

The material covering the pads is made from advanced breathable but waterproof polymer which allows easy maintenance and cleaning. It is also vapor-permeable and can stretch, thereby decreasing shear and maceration. This material increases patient comfort when compared to the standard plastic covers that cannot breathe.

