

www.outpatientsurgery.net

# Outpatient Surgery

November 2009 Magazine®

## The ASC Industry's Extreme Makeover

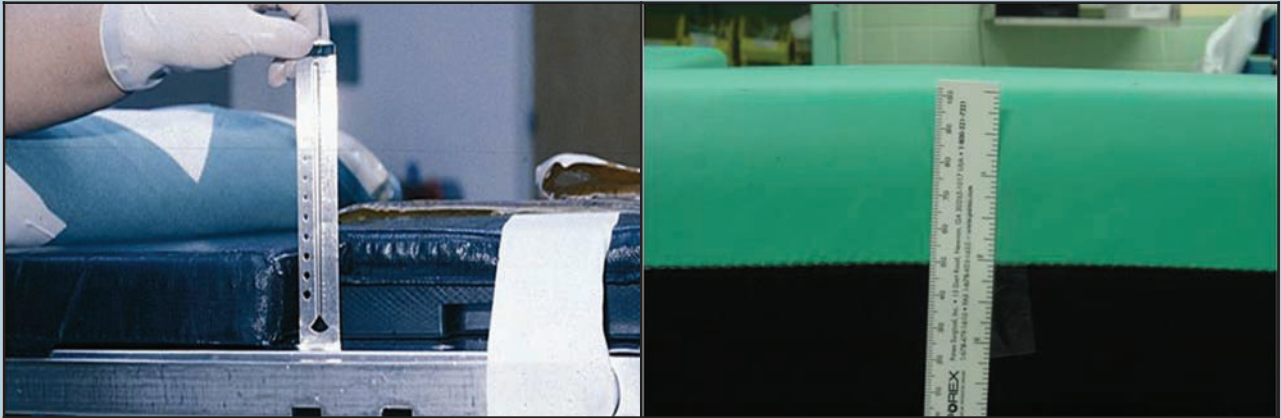
Can surgery centers  
put on a better face for  
federal policymakers?

**P. 28**

*"We're either not well  
known or, where we are  
well known, we're not  
well liked."*

— Marian Lowe,  
executive director of the  
ASC Advocacy Committee





▲ **THICKER IS BETTER** Do your pads and positioners measure up? Get a ruler and measure the thickness of your OR table pads. If they're only the standard 2 inches (left), they may not be thick enough to protect your patients' skin.

# Materials That Help Reduce PRESSURE INJURIES

The latest in devices and materials that redistribute pressure to prevent tissue damage.

Suzy Scott-Williams, MSN, RN, CWOCN | Memphis, Tenn.

**M**anufacturers have devised innovative ways to transform the standard OR table into a kinder, gentler surface that helps to maintain proper blood flow and prevent tissue injuries. Here's a review of the latest in pressure redistribution materials and devices.

## Thicker table pads

The most common strategy for reducing pressure injuries in the OR is to supplement the standard 2-inch operating table pad with a gel pad over top, but the continued prevalence of pressure injuries in surgical patients indicates that this strategy alone isn't enough. Gel pads are great for padding and positioning, as they offer protection against shearing and friction on superficial tissues, but their benefits are limited if the OR table surface underneath doesn't provide enough immersion. Start with a thicker operating table pad — 3.5 to 4 inches, instead of the standard 2 inches. This will let the body

become more immersed in the pad, which helps to offload and equalize pressure on the deep tissues, particularly over bony prominences.

In new draft guidelines for patient positioning in the OR, the National Pressure Ulcer Advisory Panel (NPUAP) and the European PUAP recommend using a pressure redistributing mattress on the operating table for at-risk patients. But the organizations say there's not enough evidence to recommend the best pressure redistribution intervention or product. You'll have to do your own research when investigating pads and positioners to determine the best fit for your facility and patient population. Ask manufacturers to provide objective clinical data and case studies to back up their claims about pressure redistribution. Some are beginning to offer data from CT scans and laser Doppler technology, which gives you a more objective view of how pressure affects tissues, nerves and blood flow.

## Memory foam in the OR

A growing number of positioners and pads designed for the OR now incorporate viscoelastic foam, which the NPUAP defines as “a type of porous polymer material that conforms in proportion to the applied weight.” Originally developed by NASA in the 1960s, the material, also known as “memory foam,” has an open-cell, permeable structure that lets it react to a patient’s weight and body heat and thereby mold itself to the patient’s body. Because of its ability to conform better to bony prominences, viscoelastic foam provides better pressure redistribution than a standard foam pad. In fact, a 2005 study showed that a multilayer viscoelastic foam pad significantly reduced patients’ risks of developing



### Fast Facts About Pressure Ulcers

- Pressure ulcers are traditionally associated with long-term care, but about 2 out of every 5 hospital-acquired pressure ulcers occur in surgical patients.
- Even during the relatively short procedures that make up the bulk of your outpatient surgery caseload, patients are at risk for these painful and potentially life-threatening injuries, particularly if they are elderly, diabetic or have other risk factors.
- Last year, Medicare stopped paying for the treatment of healthcare-acquired pressure injuries, meaning they could cost your facility thousands of dollars if you fail to prevent them.

pressure ulcers compared to a standard OR table mattress.<sup>1</sup>

But as with standard foam, thickness is an important factor to consider when choosing viscoelastic foam pads, particularly for use in high-risk situations. A 2006 study had to be stopped half-way through because of too many adverse events associated with using a 2-inch viscoelastic foam overlay

on an OR table during cardiac surgery.<sup>2</sup> As with standard pads, you’re better off using a thicker viscoelastic foam pad over your OR tables in situations where there’s a higher risk of tissue damage.

## Fluid immersion simulation technology

What if the experience of lying on a surgical table were as smooth and comfortable as floating in a pool? That’s the idea behind fluid immersion simulation technology, originally developed by engineer Mark Hagopian in the 1990s for the U.S. Navy to safely transfer dolphins without damaging their internal organs. The Dolphin Pad, adapted for use in the OR, is similar to a standard air mattress system, except it’s connected to a computer algorithm that, when a patient is placed on the pad, automatically measures the density, weight and surface area of the patient’s body and precisely adjusts the density of air in the mattress to simulate buoyancy. Any time the patient’s position on the pad changes, the computer automatically responds and re-profiles the air in the mattress to keep the fluid immersion simulation intact. The pads can hold up to 900kg.



**▲ SORE SPOT** Heel offloading devices like this padded boot help protect one of the body’s most vulnerable pressure points.

A study by University of California, San Diego, and U.S. Department of Veterans Affairs researchers shows promising results with this pressure redistribution technology. Ten healthy volunteers lay in various positions on a standard operating room bed and a Dolphin Pad, while researchers used several different technologies to measure tissue pressure and perfusion at points of compression. Volunteers had an 87% rate of tissue perfusion on the Dolphin Bed vs. a 16% rate of perfusion on the standard bed. Using

Laser Doppler Flowmetry, the researchers also found that the Dolphin Pad caused the least percentage of vascular occlusion (12.2%) compared to engineered foam, fluid gel and standard foam, which were all 78% or more occlusive. “Our results indicate a signifi-

cant improvement in microcirculation using the Dolphin Pad technology in comparison to regular gurneys,” the study authors conclude, though they recommend more studies to further assess the technology, particularly in high-risk populations.<sup>3</sup>

Fluid immersion simulation is by far the most advanced pressure-redistribution technology on the market — and it’s also one of the most expensive. Barnes-Jewish Hospital in St. Louis, Mo., last year outfitted 30 operating tables with Dolphin Pads at \$16,000 each. But with Medicare no longer reimbursing for healthcare-acquired pressure ulcers, you have to weigh the cost of pressure redistribution devices against the potential cost of treating a pressure ulcer incurred at your facility and any potential litigation costs that might come with it.

## Offloading the heel

Studies have shown one of the most common sites of surgical pressure injuries is the heel, and many of the advanced pressure redistributing technologies discussed above do not seem to be doing much to prevent intraoperative pressure ulcers that develop at this particularly vulnerable site. Why? For one, the heel doesn’t have a lot of natural padding to protect it from external pressure. Secondly, when the body sinks down into an air mattress, the heel acts as a fulcrum. Research has shown that heels endure a high level of pressure on standard OR table pads and even on more-advanced viscoelastic pads.



**▲ AFLOAT IN THE OR** The Dolphin Pad system automatically measures the weight and surface area of each patient and adjusts the density of air in the mattress to simulate buoyancy.

The emerging consensus is that perioperatively offloading the heel is a best practice in high-risk situations, such as patients with diabetes, peripheral artery disease or paralysis (for example, when nerve blocks are used), or in longer procedures. Traditional devices such as heel

pads, egg crates and booties pad the heel, but don’t offload the pressure. To truly relieve the pressure on this vulnerable spot, you must elevate the heel completely.

You can use pillows to do so, but they may not be practical to sustain offloading for a 3- to 6-hour procedure, since it can be difficult to ensure they stay in place. If you use pillows, make sure they contain 18 ounces or more of fill. The goal is to have the heel totally suspended and not touching the OR table surface. Heel offloading devices (also known as HOLDs), generally constructed of air, foam or a pillow-type material, are a more advanced solution that may be ideal for high-risk situations. These boot-like devices have the advantage of keeping the offloaded heel in position from the OR into the recovery and post-operative units, where the risk of pressure ulcer development is the highest.

Recent research points to a potential adverse side effect from applying devices under the Achilles tendon to offload the heel during surgery: popliteal vein compression and loss of blood flow in the leg due to hyperextension of the knee. This practice can also increase the risk of pressure over the Achilles area. Australian vascular surgeon David Huber, MD, found that patients lying supine under general anesthesia are at a heightened risk for popliteal vein compression or

### ON THE WEB

Download references for this article at [www.outpatientsurgery.net/forms](http://www.outpatientsurgery.net/forms)

occlusion when the knee is hyperextended, and that this risk increases in patients with higher body mass indexes.<sup>4</sup> Dr. Huber invented a novel heel offloading device, called GuardaHeel, that keeps pressure off the heel, ankle and Achilles tendon while simultaneously preventing popliteal vein compression and promoting blood flow through the leg by flexing the knee. GuardaHeel isn't yet available in the United States, but the principle of preventing popliteal vein compression during heel offloading is something you'll want to keep in mind when using other HOLDS, pillows or

blocks. Especially during longer procedures, make sure you're not hyperextending the knee or putting supportive pressure just below the knee when offloading the heel. **OSM**

---

*Ms. Scott-Williams ([susie.scott-williams@va.gov](mailto:susie.scott-williams@va.gov)) is a surgical QI research nurse and a certified wound, ostomy and continence nurse in the quality management department at the U.S. Department of Veterans Affairs Medical Center in Memphis, Tenn. This article is the result of work supported with the resources of and the use of the facilities at the VA Medical Center. The opinions and conclusions expressed are those of the author and do not necessarily represent the opinions or policies of the Department of Veterans Affairs.*

# The "Dolphin Pad"™ Surgical Table Surface Supplying "Fluid Immersion Simulation"™

insures normal tissue symmetry. Continuously maintains normal patency of peripheral micro circulation during extended surgical procedures.

The "Dolphin Pads" were used by the military to help transport trained dolphins.



Look at the real Scientific Research you can bet the attorneys are... "Fluid Immersion Simulation" the way of the future.

FOAM PADS, GEL PADS, VISCO ELASTIC PADS, it is what it is, no matter how great the marketing, you can not change the laws of Physics, Mechanics and/or the Human Hemodynamic System... It's all about Microvascular Blood Flow!!! Without it living tissue dies.

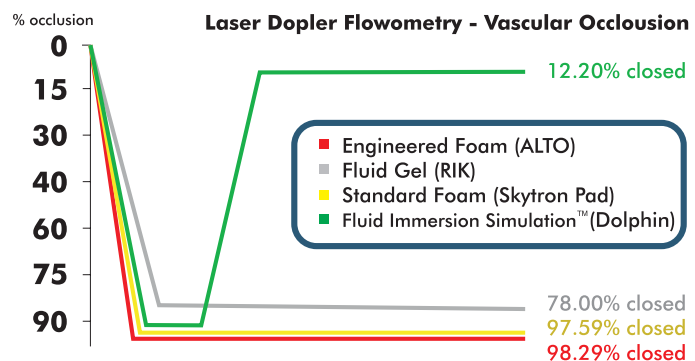
Why take a chance with PAD materials which are considered to be marginally effective (Low End) in a skilled nursing facility and classified as such by Medicare (Group One), when you are dealing with critically ill anesthetized patients undergoing lengthy surgical procedures.



## Effectiveness of the Biologics' Dolphin Bed as a Tool to Improve Tissue Perfusion in Points of Compression

Division of Plastic Surgery, UC San Diego and VA La Jolla Medical Center, San Diego, California

Som Kohanzadeh, MD; Andrew Breithaupt, MS; Artur Bondarchuk, MD; Dhaval Bhavsar, MD; Lars Evers, MD; Kevin Broder, MD; Marek Dobke, MD; Richard Bodor, MD



La Jolla Medical Center

UC San Diego

Biologics, Inc. • 33 North Garden Ave • Clearwater, FL 33755  
800.821.6341 • 727.410.4651 • www.biologics900T.com