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Combat Zone

Battle-tested bandage fights infection, costs



by Sudip Bose, MD, FACEP, FAAEM, and Kathy Boston, RN, CVN

Your healthcare facility is undoubtedly taking extensive steps to prevent and manage hospital-acquired infections, but when it comes to bleeding wounds and surgical incisions, are you doing enough?

Meticulous handwashing, using properly laundered or disposable surgical gowns and using sterilization protocols for equipment are common sense infection control practices. These tried and true methods will bring down the rate of hospital-acquired infections. But when it comes to bleeding wounds and surgical procedures, the antibacterial nature of hemostatic dressings can also play an important role in reducing the risk of infection, saving both money and lives.

Hemostatic agents have been used in the healthcare profession for centuries. The most common current method of controlling bleeding involves elevation and applying direct pressure to a wound. Now, an innovative product has been developed that quickly and effectively seals wounds and allows the body to form a clot that stops hemorrhaging.

Hemostatic bandages and dressings provide an effective way to decrease the risk of infection.

The dressings, developed by HemCom Medical Technologies Inc., use chitosan, a naturally occurring, biocompatible polysaccharide derived from shrimp shells. The shells are processed, chemically treated, made into bandage form and then sterilized for patient use. Chitosan bandages stop bleeding—even extensive arterial bleeding—within two to five minutes. The antibacterial properties of the bandages may help prevent infection in the wound and possible transmission to other patients and healthcare providers.

The antibacterial characteristics of the dressings also make it easier for medical professionals to help prevent infections at incision site wounds. This potentially decreases patient complications and length of stay, thus enhancing patient outcomes.

It All Adds Up

The Centers for Disease Control and Prevention (CDC) estimates that 1.7 million patients acquire infections each year while in a hospital. Of those, an estimated 103,000 die as a result of hospital-acquired infections.¹

An estimated 2.6 percent of nearly 30 million operations are complicated by surgical site infections (SSIs) each year, according to the Institute for Healthcare Improvement. That's an astounding 780,000 patients. Each SSI is estimated to increase a hospital stay by an average of 7.5 days and adds more than \$3,000 in charges.²

In addition to the direct concern for patient health, hospital-acquired infections add an estimated \$30.5 billion annually to the nation's hospital costs. Patients, taxpayers and insurers pay a portion of that cost, but hospitals absorb much of it.³

Beginning in October 2008, the Center for Medicare and Medicaid Services (CMS) will no longer pay hospitals for additional costs associated with treating patients for certain hospital-acquired infections and medical errors. Payments will be withheld for care associated with treating certain catheter-associated urinary tract infections, vascular catheter-associated infections, mediastinitis after coronary artery bypass graft (CABG) surgery, and five other medical errors unrelated to infections (bed sores, objects left in patients' bodies, blood incompatibility, air embolism and falls).⁴

What does this mean for healthcare facilities? It all adds up to an increase in cost, *if infections are not managed appropriately*. Hospitals will be responsible for the cost of preventable infections, with the exclusion of the highly publicized MRSA, as long as they can prove to federal agencies they are billing for MRSA and not some other organism.⁵

Given new CMS rules and proven infection statistics, the impact on profitability is clear. Upgrading infection management with products like the HemCon® Bandage, which can help prevent wound infection and possible transmission, can not only improve patient safety—they can also improve a hospital's bottom line.

Battlefield-tested Bandage Now Available to Acute Care Market

Antibacterial, hemostatic dressings have already demonstrated their value in perhaps one of the most challenging medical environments: the battlefield. The original HemCon Bandage was developed for use by the U.S. Army. On the front lines of combat, it is critical to quickly and effectively control hemorrhaging so that injured soldiers can be stable enough to transport for surgical intervention. Since the bandage is easy to use, flexible, portable and durable, it is optimal for use on the battlefield.

Using the unique chitosan technology, the dressings control bleeding by becoming extremely adhesive when in contact with blood. This seals the wound and attracts red blood cells to the bandage, forming a clot that stops hemorrhaging. The bandage is labeled on one side to assist in the application process and prevent sticking to healthcare personnel. The dressings function independently of the clotting cascade, and the body's natural clotting occurs in conjunction with acute wound healing. The bandages are effective on high-pressure, high-flow arterial bleeds and even in situations where gauze, pressure dressings and other traditional methods fail.

Hemorrhage is the leading cause of preventable death on the battlefield,⁶ and HemCon Bandages have saved more than one hundred lives on the front lines of combat.⁷ The antibacterial benefits of the dressing have been an added bonus. Of course, the battlefield environment is not the most

sterile location, and experience has shown that shrapnel and blast injuries lead to a high percentage of wound infections. In addition to providing hemorrhage control, a product that can concurrently decrease infections is favorable.

Since its initial engagement to develop the bandage with the U.S. Army, additional chitosan-based products for use in acute care settings have been developed.

The first, ChitoFlex®, was created to address external, arterial bleeding wounds that require a double-sided dressing. ChitoFlex is a stuffable wound dressing that is active on both sides and is designed to be used in hard-to-reach and narrow wound tracks. The dressing was originally designed to support the needs of military medical professionals who treat penetrating injuries, such as those resulting from small arms fire or shrapnel, which cannot be addressed by other means. The dressing, which also carries antibacterial properties, is now used in emergency departments and trauma centers to treat a variety of injuries, including gunshot wounds and lacerations. The dressing provides medical professionals with

a quick-acting, natural, localized and effective solution. It can be cut or folded to fit a wound without reducing efficacy. Intended for temporary use, the dressing should be removed after 48 hours.

To address internal bleeding, ChitoFlex®-Surgical was developed to stop internal hemorrhaging caused by severe or traumatic injuries. It is designed to be used in trauma situations as a hemostatic dressing for damage control surgery as well as multiple injuries to the liver, kidney and spleen. Unlike traditional dressings, the surgical dressing protects against a wide variety of Gram positive and negative organisms, such as MRSA.⁸ The surgical dressing is designed to locally control severe bleeding without adding thrombin or other systemic drugs, making it a cost-efficient and rapid deploy option for trauma surgeons. Although this may change in the future, current guidelines state it is intended for temporary use and should be removed after 24 hours.

Hemostatic bandages and dressings provide an effective way to decrease the risk of infection. At the same time, they

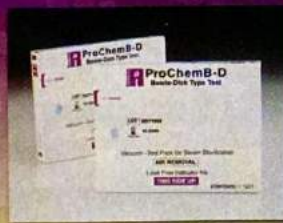
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Chitosan bandages stop bleeding within two to five minutes.

also provide the healthcare profession with a viable hemostatic solution that can advance the standard of care.

Multi-purpose Solution

Because of its unique properties, HemCon dressings can be utilized in a variety of applications. Surgery, emergency rooms, EMS, dialysis centers, catheterization labs and interventional radiology are all situations in which doctors, nurses and patients can benefit from the dressings. Patients on anticoagulant drug therapies or those who suffer from hemophilia will also find the dressings a complement to their first aid kits.

According to the CDC, hemophilia is a condition that affects 18,000 people in the United States, primarily males.⁹ Treatment for bleeding episodes requires the prompt and proper use of clotting agents.

Patients receiving anticoagulation drug therapy are also more susceptible to bleeding. Certain medications decrease the patient's clotting time and make their wounds and incisions more difficult for healthcare providers to control.

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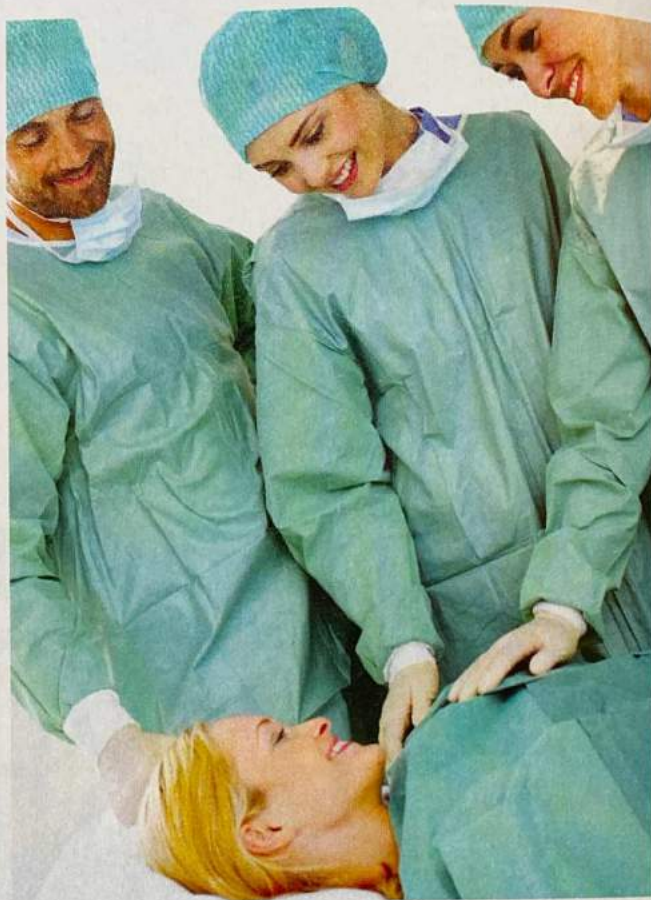
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The benefit of the dressings for these types of patients is its ability to form a clot within two to five minutes, lessening the risk of severe hemorrhaging for patients that require more precautionary care. The products enable medical professionals to quickly stabilize patient bleeding so their focus can be placed on other underlying health issues.

The bandages are also currently used by physicians in catheterization and interventional radiology labs to clot the vascular access site, as well as dialysis centers, emergency rooms and trauma centers.

"I have used the HemCon Bandage for a number of cardiac procedures," said Dr. Ziyad M. Hijazi, director of the Center for Congenital & Structural Heart Disease at Rush University Medical Center. "I'm impressed with the product and believe it improves patient care by offering medical staff an effective and safe way to quickly control bleeding."



Similarly, Dr. Richard Schwartz, who practices at the Medical College of Georgia in Augusta, Ga., shares his experience.

"In the emergency department I have used the HemCon Bandage when conventional means have failed," said Schwartz. "A few weeks ago I had a patient with a large lingual tumor and trismus (about 1cm). The tumor was bleeding quite briskly, and we could not get to it. I put a HemCon Bandage (1" x 3") into the patient's mouth over the bleeding tumor. I put some slight pressure on it and got control of the bleeding."

Dr. Schwartz continues, "It has also been very helpful in patients who are anticoagulated."

Saving Lives, Time and Resources

Hemostatic, antibacterial dressings have a variety of uses within the world of healthcare and infection management. By quickly controlling bleeding and effectively sealing wounds, the dressings enable healthcare providers to manage potential infection sites. The products can be especially useful in places where hemostatic agents are most necessary, like catheterization and interventional radiology labs, emergency rooms, trauma centers, operating rooms and dialysis units.

A healthcare provider's ability to manage bleeding at incision sites and wounds with hemostatic agents may also lead to reduced length of stay and decreased costs for healthcare facilities.



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Medical professionals now have the ability to reduce the 1.7 million patients suffering from hospital-acquired infections each year through the use of antibacterial hemostatic bandages and dressings. With a decrease in hospital-acquired infections, medical professionals can dedicate more time, energy and expertise to providing quality care focused on patients' primary needs.

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Sudip Bose, MD, FACEP, FAAEM, is an assistant clinical professor. During Operation Iraqi Freedom, Dr. Sudip Bose served as a physician on the front lines of combat as the sole doctor for a mobilized infantry unit. His 15-month tour marked one of the longest by a physician since World War II. Dr. Bose currently works as an attending emergency physician at Advocate Christ Medical Center, Chicago's busiest trauma center.

Kathy Boston, RN, CVN, has provided care to patients for more than 24 years as a certified vascular nurse clinician and educator in the Central Ohio area. She has treated numerous patients with bleeding and wound care issues throughout her career, working closely with physicians, nurses, patients and families. Kathy currently provides education for Cardinal Health's MidWest sales team on advanced wound care.

HemCon products are available exclusively through Cardinal Health to acute care facilities throughout the country. For more information, ambulatory centers can contact Cardinal Health at 888.444.5440; and acute care centers can contact Cardinal Health at 800.964.5227.

The Germville Tribune

Breaking News: C. Difficile Mauled by Hype-Wipe® Bleach Towelette

Germville's Most Wanted

Many colonies in Germville have been exterminated. The suspects have been identified as **Bleach-Rite® Disinfecting Spray** and **Hype-Wipe® Bleach Towelettes**. While handcuffed, **Hype-Wipe®** defiantly shouted: "We are a one-step cleaner/disinfectant and we are here to stay!" **Bleach-Rite®** showed no remorse when bragging about its extended shelf life and short kill times. Local resident, Pseu Do Monas, stated: "This is everything I hate in a disinfectant and more!"

Sports

The blinding speed of **Bleach-Rite's®** defense (registered with the EPA) obliterated quarterback Tuberculosis Tommy and the rest of his offensive line in 30 seconds. Wide receiver Coron A. Virus stated: "**Bleach-Rite®** Disinfecting Spray was unstoppable. It knocked me out in one minute."

Wanted: Dead or Alive



Bleach-Rite® Disinfecting Spray and Hype-Wipe® Bleach Towelettes

Murder in Micro Lab

Germville faces extinction by a double threat: Mayor C. Difficile stated: "The pre-mixed 1:10 dilution of **Bleach-Rite®** Disinfecting Spray will wipe out our entire vegetative cell colony in one minute, and the **Hype-Wipe®** could obliterate us in two minutes!" Citizens of Germville are on edge; Sal Mo Nella stated: "I wouldn't wish this on my worst enemy!"

Critics Corner

This month we review two action flicks: **Bad to the Bone Bleach-Rite® Disinfecting Spray** and **Hard Hitting Hype-Wipes®**. Hear what the germs had to say on their way out of the theater:

"Two thumbs down." —VRE

"My worst nightmare." —HIV

"Zero stars." —Strep To Coccus

"The longest 30 seconds of my life!" —MRSA

Investigative Reports

Germville Citizens wonder: How could **Current Technologies Inc's** products become so widespread? Our reporters uncovered numerous hospital/lab distributors and GPO's that these bleach-based disinfectants had infiltrated. The Tribune contacted **Current Technologies** at 800-456-4022 and by e-mail at currtech@qserve.net. **Current Technologies** stated: "We stand by our products. Count on **Current Technologies** for an ongoing assault on Germville."

Stay tuned for next issue: **Bleach-Rite® Test Strips Used to Identify Bleach as the Killer!**

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