

The HemCon Bandage

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One of the biggest factors of death from battlefield wounds is severe bleeding. "With funding from the U.S. Army Medical Research & Materiel Command and based on research by Dr. Kenton Gregory and Dr. Bill Wiesmann, the Oregon Medical Laser Center and Providence Health Systems, developed a bandage designed to save the lives of U.S. soldiers injured in combat" (Military Medical Technology). The firm 4x4 inch dressing called HemCon is durable enough to withstand blunt force as well as extreme field conditions. This includes severe weather and temperatures as well as rugged terrain. Sterile, individually packaged, and lasting up to two years, the HemCon dressings are available in a variety of sizes and configurations, are stable at room temperature, and are simple to use and conform to irregular or curved wound surfaces. Easily removable with saline solution or water, these conditions make it an optimal solution for treating battlefield wounds (Military Medical Technology).

Approved by the U.S. Drug and Food Administration 2003, contains positively charged molecules of a natural polymer called chitosan derived from the exoskeletons of crab, shrimp, and other crustaceans. These polymers attract negatively charged red blood cells. While a regular gauze or tourniquet has little effect in stopping spurting wounds, "the HemCon bandage triggers an adherent clot that halts the bleeding" (Military Medical Technology). Because HemCon does not include clotting factors or human proteins, the patient avoids many serious problems such as allergic reactions. In 2001, HemCon Medical Technologies, Inc. was founded in Portland, Oregon to manufacture the HemCon bandage and in 2004, the Army named the HemCon Bandage one of the year's "Top 10 Greatest Inventions." Then in 2006, Israel's IDF began testing HemCon for possible adoption (Military Medical Technology).

Another type of HemCon bandage that is not only limited to battle wounds is the HemCon Dental Dressing, which is normally used for oral surgeries. This specific form of bandage is an oral wound dressing intended as a "physical barrier for temporary protection of oral mucosa tissue and to provide pain relief" (Antimicrobial).

An important effect of the HemCon Dental Dressing is chitosan's antimicrobial activity (Antimicrobial). The importance of an antimicrobial, locally operative product has increased greatly due to the global growth in antibiotic-resistant bacteria,

especially when such products are used to treat wounds that are potentially contaminated. According to the FDA, the antibacterial effect of chitosan can be credited to a great extent to the positive charge of the amino groups. This is due to an interaction with the cell walls of the gram-negative bacteria, which causes the cell wall to disintegrate and the bacteria to die. "The positive charge causes this antibacterial effect and creates a binding with the red blood cells" (Antimicrobial). The red blood cells then form a spongy-like seal that stops the bleeding, independent of blood cells and clotting factors. The seal also works as a prevention of endotoxic bacteria from getting into the blood, where they can cause blood poisoning (Antimicrobial).

HemCon's oral surgery products are vacuum-packed and the dressings specifically are sterilized by gamma rays. The dental dressing can be cut to size with scissors and applied with tweezers, with no stitches necessary for the bleeding wound. However, it should not be placed into the extraction wound. The positively charged chitosan attracts the negatively charged red blood cells, and within two minutes a strong adhesive seal forms between the HemCon dressing and the wound. The seal then stabilizes the wound surface, stops the bleeding without clotting, and prevents infection (Antimicrobial). One doctor who used the new HemCon Dental Dressing on a difficult patient taking blood thinners and having uncontrollable bleeding after a tooth extraction stated that "the bleeding stopped completely and immediately...I just couldn't believe it" (Adams). With the advancements in the HemCon bandages, patients are healing faster and easier than ever before, whether in the battlefield or in civilian life.

Works Cited

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