

WOUND AGENT INFORMATION

As supplied by Allison Domney, National Sales Manager APE Medical & Vet Supplies

Chlorhexidine

Chlorhexidine is still widely used as an antiseptic for hand washing, as a surgical scrub and as a navel dip for foals and wound irrigation.

Discovered in the late 1940s, Chlorhexidine showed rapid bactericidal activity against various nonspore-producing bacteria by damaging the outer cell layers and causing leakage of the cytoplasm membrane.

Antibacterial activity against *Staphylococcus aureus*, *Pseudomonas aeruginosa* and other bacteria has been reported, but methicillin resistance has also been noted, keeping Chlorhexidine from being a first choice for wound treatment.

Honey

Honey is another old remedy that has been making a strong comeback, and various researchers have identified nearly 70 bacterial species susceptible to its actions, along with evidence that its use will promote healing in topical wounds. The antimicrobial action of honey arises from the osmolality, acidity and hydrogen peroxide created on the wound surface when it's used and from the presence of yet-unidentified honey photochemical.

Particularly impressive and encouraging is honey's bactericidal action against methicillin-resistant *S. aureus* (MRSA) and vancomycin-resistant enterococci (VRE), which are proving to be difficult microbes for more traditional antibiotics to handle. Honey operates by targeting multiple, nonspecific cellular sites, thus making it more difficult for microbes to overcome this agent. Multiple animal studies have identified honey's ability to promote wound healing and have documented its use in treating many types of distal limb wounds.

Hydrogen peroxide

Hydrogen peroxide is an antiseptic and disinfectant product that has also been around for a long time. It has broad-spectrum activity against bacteria, principally gram-positive species. It exerts its effect through oxidizing properties that produce free radicals to react with lipids, proteins and nucleic acids that disrupt cellular activity and kill microbes. Negative reports of air emboli and tissue irritation with hydrogen peroxide use have caused some to back off on its utilization, and there's insufficient research to make definitive statements about the place of hydrogen peroxide in wound management.

Iodine

The element iodine was discovered in 1811 and was tried as a wound treatment for many years, principally during the American Civil War. In its elemental form, it inhibited bacteria but also caused pain, skin irritation and discoloration. The development of iodophors—mixtures of polyvinyl surfactant iodine complexes such as Povidone-iodine—in the late 1940s made this agent safer, less painful and more effective. Iodophors release low-level concentrations of free iodine that produce multiple cellular effects by binding to proteins, nucleotides and fatty acids to block hydrogen bonding. Povidone-iodine has broad-spectrum activity against microbes, including bacteria, mycobacteria, fungi, protozoa and viruses.

Some controversy exists regarding the use of Povidone-iodine. Severe metabolic acidosis has been reported after use, and although these are isolated cases with questionable methodology, there's still a strong view in human medicine that Povidone-iodine use should be restricted to brief topical application on superficial wounds, rather than long-term use on large wounds. Clearly, more research should be done in this area to increase confidence concerning iodophors use and to possibly clear the path for increased application of this treatment agent

Silver

Of all the older antimicrobial agents enjoying renewed interest, perhaps the one with the most tremendous potential is silver. Colloidal silver is effective against bacteria in extremely low concentrations. Studies have

shown 0.01 to 0.04 ppm to be effective against hundreds of types of bacteria and 3 to 5 ppm to be effective against nearly 650 different microbes.

Colloidal silver is a solution in which microscopic, electrically charged particles of silver are in suspension. Electrolysis of very pure water (less than 1 ppm of contamination) using a 99.9 percent pure silver electrode places a positive charge on silver ions and places them in solution.

The quality of the water and the silver are crucial to the production of a functional product, as is the strict control of current flow. Tap water contains roughly 100 to 300 ppm of dissolved solids, so highly distilled or deionised water must be used, but the resultant product has tremendous potential to provide veterinarians with antimicrobial agents that can take on the resistant bacteria and viruses we're increasingly encountering.

Multiple research projects have shown silver sulfadiazine (SSD) to possess broad-spectrum antibacterial, antifungal and antiviral activity. Hanson notes, "SSD's antibacterial activity includes *Pseudomonas* species, and contrary to what has been noted in other species, it does not decrease the rate of wound contracture in horses."

Many silver-based wound treatment products are coming into the veterinary marketplace, and there likely will be more as ongoing silver research continues to show promise.