

Scientists working with Department of Defense to find ways to help our injured soldiers

Minneapolis, MN - Scientists in Minneapolis received almost \$1million from the Department of Defense to look at ways to decrease the loss of life and limb for soldiers with blast injuries. Researchers will study the best ways to use commercially available bone graft materials, bone growth factors and antibiotics for treatment of infected segmental bone loss, which frequently occurs in combat casualties.

“The devastating open wounds that soldiers are experiencing from blast injuries, especially IED’s, are complicated by loss of bone and by a high risk of infection, both of which are very difficult to heal,” said Joan Bechtold, Director of the MORF Biomechanics Laboratory and an investigator on the study. “Our studies will help physicians choose how best to apply state-of-the-art bone growth factors and antibiotics to heal the bone and to avoid infection.”

Injuries to the extremities are extremely common, occurring in up to 80% of battlefield casualties in Iraq and Afghanistan. High energy blasts such as those from improvised explosive devices (IEDs) create devastating extremity injuries. There is significant bone and tissue loss as well as infection caused by bacteria invading the wound. This requires treatment for extremely serious infections as well as for bone loss. While military orthopaedic surgeons are using state-of-the-art techniques, these practices are often inadequate.

Over 8,500 casualties have been evacuated from the Global War on Terrorism, with the majority needing orthopaedic care. More than 40,000 orthopaedic surgical procedures have been performed on these service members.

While the type of trauma that creates combat injuries is more severe than most encountered by civilians, high-energy trauma does occur in civilian life. Motor vehicle accidents, farm or factory accidents and falls from heights can produce severe soft tissue damage, bone loss, open skin and bacterial contamination. Even routine or low energy trauma can cause open wounds and bone loss, both contributing to difficulty healing and higher infection rates. Results from this study may also be directly applicable to the civilian trauma faced by doctors at US trauma centers.

These studies represent a collaboration of researchers at Hennepin County Medical Center (HCMC), the Midwest Orthopaedic Research Foundation (MORF), the Minneapolis Medical Research Foundation (MMRF), and the University of Minnesota.

[Hennepin County Medical Center](#) is a Level 1 Trauma Center and public teaching hospital repeatedly recognized as one of America’s best hospitals by *U.S. News & World Report*. HCMC’s orthopaedic staff cares for inpatients and outpatients, including those with multiple trauma and long-term bone disease. Among the services are fixation of bone fractures, total joint replacement, complicated back management, treatment of bone infections, and problems of the shoulder, hip, knee, hand, or foot. Research on bone infections and prostheses is also conducted in the department.

The [Midwest Orthopaedic Research Foundation \(MORF\)](#), located on HCMC’s campus, has a 20-year history of designing many innovative and creative solutions to orthopaedic problems. The lab participated in the design of the first FDA approved uncemented hip replacement, and is one of the leaders in knee replacement research in the United States. MORF also pioneered the use of specialized screws and other devices for repairing fractured hips, and has brought innovative treatments for infection to surgeons across the country and internationally.

Editors note: Drs Dean Tsukayama, David Polly, Jr. and Joan Bechtold are available for interviews.

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