

# Find Penicillin Effective In Blood Vessel Operations

ANN ARBOR -- Penicillin has been found so effective against the common *Staphylococcus aureus* that University of Michigan surgeons are now using it to protect all of their patients who undergo blood vessel surgery.

Infection is not common in operations in which defective arteries are replaced with plastic tubes. But when infection does occur "it's catastrophic," said Dr. S. Martin Lindauer. In one recent study, nine of 12 patients with infections died, and another lost his leg.

Bacterial contamination of surgical wounds is serious at best. But despite all precautions, there is no such thing as a completely sterile operative wound.

DR. LINDENAUER, assistant professor of surgery at the U-M Medical School, says that although the use of antibiotics is still a controversial issue among surgeons, "serious consideration should be given to the prophylactic use of antibiotics in elective vascular reconstructive surgery."

Two research studies have convinced U-M surgeons that the "appropriate use" of antibiotics--before, during, and after operations to implant plastic arteries--can prevent loss of life or limb.

"We started out very skeptically," Dr. Lindauer said. "But we're so convinced now that antibiotics can be effective that we're not willing to take chances with patients. Vascular graft infection doesn't happen very often, but when it does it's catastrophic."

Dr. Lindauer and Dr. William J. Fry, professor of surgery, investigated 890 cases involving the use of plastic prostheses at the U-M and affiliated hospitals. Of 12 infections there were nine deaths (a mortality of 75 per cent) and one patient required an above-the-knee amputation.

The cause of death, the surgeons discovered, was most often due to hemorrhage. The *Staphylococcus aureus* was responsible in most cases.

VASCULAR SURGERY is usually necessary to correct an aneurysm of the aorta, an abnormal enlargement of the arterial wall. Graft infections usually originate in the groin and the spread of infection often requires amputation because the graft has to be removed.

In recent research, U-M surgeons isolated *Staphylococcus aureus* from a human wound infection and used it to inoculate groups of animals in four operative procedures to test the effectiveness of penicillin. In each wound organisms suspended in saline solution were dropped directly onto the artery prior to closing. No penicillin was given to control animals. The other animals were given procaine penicillin 24 hours before surgery and for three days afterward.

Animals who had not received the antibiotic became infected. None of the animals who were given penicillin developed an infection.

DR. LINDENAUER emphasizes that "the antibiotics must be given before the operation as well as intraoperatively to be effective. Just giving them postoperatively is a futile afterthought."

Many factors are involved in surgical wound infections, the surgeon notes, including: the number of organisms inoculated, the presence of foreign bodies, the patient's age and

physical condition, the length of operative procedure, and the duration of preoperative hospitalization.

It's not surprising that there have been conflicting results in evaluating the effectiveness of antibiotics, he says.

In studies showing antibiotics to be of no value, frequently the antibiotics have been administered too late, he points out.

"Researchers have demonstrated that there is a decisive time beyond which the use of

antibiotics will not be helpful. Just three hours after the inoculation of organisms, antibiotics will be of no value in preventing infection. Ideally, they should be started 12 hours preoperatively, continued intraoperatively, and then for a short

time postoperatively."

THE SURGEON ALSO explains that "most clinical studies have been retrospective in design and conducted without control patients. As one would expect, they show an increase

in wound infection in patients receiving antibiotics since the most susceptible group is likely to have been chosen to receive the antibiotics."

Valid studies, however, indicate that prophylactic antibiotics will decrease the inci-

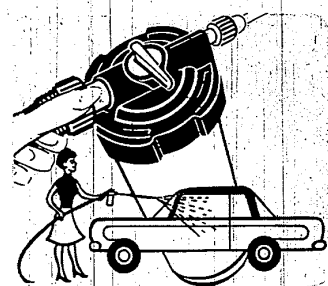
dence of wound infection, he says.

"Investigators have shown there is no such thing as a sterile operative wound...just degree of contamination. One researcher has shown that a single silk suture can contaminate

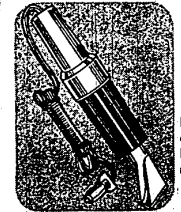
the infective ability of bacteria up to 10,000-fold.

"It seems reasonable," he says, "to (test the effectiveness of) the infective potential of foreign bodies (vascular prostheses) by using antibiotics, when the risk is so great."

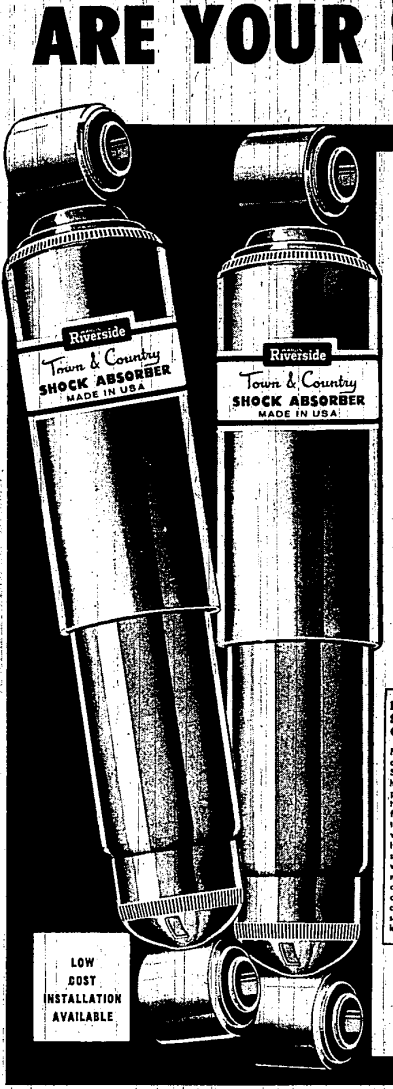
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