Sweethearts resist infection

Here's another use for sugar — as packing for hard-to-heal surgical wounds. The July 27 LANCET contains an account of using sugar to fill open, infected wounds following chest surgery.

Jean Louis Trouillet and his colleagues at the Hôpital Bichat in Paris tried the procedure on 19 critically ill patients with mediastinitis, a swelling of the tissue between the lungs that sometimes follows heart surgery. They filled the patients' wounds with "ordinary granulated sugar" and changed the dressing several times daily. Fourteen of the patients were discharged an average of 54 days after wound treatment, compared with an average of 85 days found in a retrospective analysis of mediastinitis patients treated previously with conventional antibiotics. The remaining five test patients died before discharge, but not, the researchers report, as a result of wound complications.

The French scientists aren't the first to report on the use of sugar to prevent infection and promote wound healing. Leon Herszage of Buenos Aires and Richard A. Knutson of the Delta Orthopedic Center in Greenville, Miss., both began using it independently in 1976. Herszage reported on its use in 120 patients in an Argentine medical journal in 1980; Knutson reported on 605 patients in the November 1981 SOUTHERN MEDICAL JOURNAL.

Knutson first used sugar to treat two patients with severe antibiotic-resistant skin ulcers, after a nurse told him she had used sugar on bedsores. He has since used sugar in combination with povidone-iodine, an antiseptic, on more than 3,000 patients with burns, ulcers, lacerations, gunshot wounds and amputations. The Hôpital Bichat results, he told SCIENCE NEWS, "closely parallel ours." The French researchers note that "the explanation for the success of sugar treatment is ... still being debated and probably complex." Herszage has suggested that bacteria in the wound become dehydrated when the high osmotic pressure fostered by the sugar draws their water out; Knutson says the sugar may also block the bacteria's access to nearby nutrients.

Bank for babies in distress

Respiratory distress syndrome (RDS), a potentially fatal lung-collapsing condition common in premature babies, results from a paucity of a vital lung chemical called surfactant. But longer-term fetuses whose gestational age is 35 weeks or older produce an excess of surfactant and excrete it into the amniotic fluid. To share the wealth, T. Allen Merritt of the UCSD Medical Center in San Diego has established an amniotic fluid bank.

Merritt and his colleagues have found that surfactant can be used to treat RDS (SN: 5/14/83, p. 310), and have recently found that the substance can also *prevent* it. The syndrome afflicts some 50,000 babies in the United States each year. Donations are sought from mothers who give birth, after a full term, by cesarean section; the fluid is aspirated out of the amniotic sac just before delivery.

Medicine capsules

- Can going to the doctor make a child sick? It's not likely, according to a Harvard Medical School report in the Aug. 15 NEW ENGLAND JOURNAL OF MEDICINE. Researchers compared the frequency of infectious illness among 127 young children in the week following an office visit for well-baby care with an equal number of children who had not been to their doctors during that period. They found an equal incidence of illness.
- University of California at San Diego researchers report in the August ARCHIVES OF INTERNAL MEDICINE that the detergent polysorbate 60 does not reverse male baldness, though 25 percent of the 141 men in the trial perceived an improvement. Finnish researchers had previously reported success in an uncontrolled clinical trial. Minoxidil, a high blood pressure drug, remains under investigation as a hair regenerator.

Shut out the light

Bright lights in hospital nurseries may contribute to the development of an eye disease in premature babies, according to researchers at George Washington University in Washington, D.C., reporting in the Aug. 15 NEW ENGLAND JOURNAL OF MEDICINE.

Among premature infants less than 2.2 pounds, 19 out of 21 (86 percent) of those exposed to bright light later developed retinopathy — a degenerative eye disease common in premature infants (SN: 12/1/84, p. 351) — while only 21 out of 39 (54 percent) of those exposed to dimmer light developed retinopathy. Older infants — more than 2.2 pounds, but still premature — also developed fewer cases of retinopathy if they were cared for in dimmer light, but the differences were not significant, according to the researchers.

The researchers report that although the typical level of lighting in offices is 40 to 50 footcandles, lighting in intensive care nurseries averaged 90 footcandles in 1982 and can go as high as 190 in some — not counting additional lighting from sunshine and sunlamps, which may add 300 footcandles.

In the study, bright lights averaged 60 footcandles and the dimmer lights 25 footcandles. The researchers suggest that a cycle of dark/dim or dark/light might be better for infants' eyes than the 24 hours of bright light common in hospital nurseries.

Research and testing without animals

Scientists are finding ways to run tests and conduct research using fewer experimental animals. For example, Salwa Elgebaly at the department of surgery at the University of Connecticut in Farmington has found a way to study eye injuries using corneas from cow eyes salvaged from slaughter houses. Instead of using lab animals, Elgebaly keeps the isolated cows' corneas alive in little baths of nutrient solution called "corneal cups." After damaging the corneas, Elgebaly looks for changes in the cells of the cornea, and for "chemotactic factors" in the fluid over the cornea. The presence of the chemotactic factors — which are known to attract white blood cells — shows that in a whole animal, white blood cells would have been attracted to the injured cornea, inciting an immunologic response that would further damage the cornea, Elgebaly says.

Elgebaly's corneal cup technique could also replace the Draize Eye Irritancy Test, she says, wherein commercial products are tested on live rabbits' eyes until the rabbits go blind. "Scientifically, the corneal cup model is well accepted," she says, but adds that it must be tested with a broader spectrum of toxic products in order to be accepted for commercial use. Elgebaly has applied to the Johns Hopkins Center for Alternatives to Animal Testing (CAAT) in Baltimore, Md., for support for this research.

Meanwhile, another researcher, at the Johns Hopkins School of Medicine, has developed an alternative way to test food and fecal samples for infant botulism bacteria.

"This is a very popular test for many other diseases," says researcher Manouchehr Dezfulian. In the test, the enzyme-linked immunosorbent assay (ELISA), antibodies to the botulism toxin are bonded to the walls of small wells in a plastic plate. The "antitoxin" is then exposed to the sample and to another round of antitoxin. If the sample contains botulism toxin, a sandwich of antitoxin/toxin/antitoxin forms, which turns yellowish green when exposed to an enzyme.

The whole procedure takes only a few hours. The antibodies for the test can be produced by injecting rabbits with harmlessly diluted toxin and then taking blood samples from the rabbits. Two rabbits produce enough antibody in four weeks to replace thousands of mice, according to CAAT. The new method is also faster, cheaper and often more reliable than the old one, which took up to two weeks and involved injecting mice with potentially toxic samples and waiting to see if the mice died.