BIOMEDICINE

Artificial blood trial

The first U.S. trials of Fluosol, an artificial blood made of a perfluorochemical, suggest that the oxygen-carrying liquid may help certain patients survive after surgery.

While Fluosol has been tested extensively on patients in Japan, work in the United States has progressed more slowly because of stringent guidelines for testing experimental substances on patients (SN: 12/8/79, p. 391; 4/12/80, p. 237; 9/20/80, p. 183).

Research published in the July 29 NEW ENGLAND JOURNAL OF MEDICINE suggests that Fluosol, developed in Japan following work by U.S. scientists, helped five Jehovah's Witness patients who had refused blood transfusions after surgery. The Fluosol evidently made more oxygen available to the heart and other body tissues. All five patients survived surgery, but one patient died five days later for reasons not related to Fluosol.

Patients were given 20 milliliters per kilogram of body weight of Fluosol over a four-hour period at first, with more given later if patients were improving. By this dose schedule, a 200 pound man would receive about two quarts of Fluosol. Kevin K. Tremper and colleagues at the UCLA Medical Center in Los Angeles report that Fluosol provided as much as 20 to 30 percent of the oxygen used by body tissues. One researcher, Edward M. Levine, says Fluosol delivered a fairly substantial amount of oxygen that would not have been present otherwise.

Oxygen transported by perfluorochemicals *is* used more easily by tissues because perfluorochemical particles are smaller than red blood cells and slip through capillaries at a faster rate. And the heart doesn't have to work as hard because the Fluosol is providing extra oxygen, says Levine.

The authors report that perfluorochemicals might eventually be useful in treating heart attacks, sickle cell anemia and carbon monoxide poisoning.

Painkiller ban

The FDA has announced it plans to ban phenacetin, a drug commonly found in analgesic pain pills, starting in August of 1983, because prolonged use of the drug has been linked to kidney damage, blood disorders and cancer.

The drug has had a dubious history, starting with an FDA advisory panel in 1977 that found that "prolonged excessive ingestion of any common analgesic product containing phenacetin will significantly increase the probability of serious kidney disease and premature death." Kidney damage seems to be the most serious health problem associated with chronic use of the drug (SN: 8/23/80, p. 117). Case studies in some parts of the U.S. show that about 20 percent of patients with renal disease had taken large doses of phenacetin products. And follow-up studies in European countries where the drug has already been taken off the market show a significant decline in kidney disease. The panel also said studies suggested chronic use of phenacetin in large doses could lead to anemia and kidney and bladder cancer.

Drug companies have until Sept. 10 to protest the banning, but an FDA official says he doesn't expect any objections, because phenacetin can easily be replaced by other less harmful substances, such as aspirin.

Drug companies, anticipating the FDA ban, have already started to take phenacetin out of many analgesic compounds, but some over-the-counter products containing the substance are still available, including Coricidin, Decapryn Thephorine, Thensadil Hista-Pac and others. Some prescription drugs that contain phenacetin are, Darvon Compound, Soma, Norgesic and Sinubid. But studies show these drugs are relatively safe as long as they are taken in recommended doses. Chronic abuse seems to cause most of the health problems associated with the drug.

TECHNOLOGY

Laser patent under siege

The American Telephone & Telegraph Co. filed suit in July in the U.S. District Court in New York seeking to have a controversial laser patent held by Gordon Gould declared invalid. The company contends that the patent isn't sufficiently different from a patent awarded in 1960 to physicists working at Bell Telephone Laboratories. Earlier this year, a federal court in California upheld Gould's patent rights (SN: 3/20/82, p. 199).

In response, REFAC Technology Development Corp., which has the exclusive right to grant licenses under the Gould patents, asked the court for "injunctive relief" from "unfair competitive acts." REFAC has sued several laser companies for patent infringement. AT&T feared it would also be affected. Recently, General Motors Corp. withdrew from a patent-infringement suit and agreed to pay royalties to REFAC on the basis of value added by the use of lasers in applications covered by Gould's patent.

Forcing ceramics into shape

Ceramic parts in heat exchangers, batteries and combustors have complicated shapes. These parts, often very thin, must resist deformation and withstand high temperature, wear and corrosion. Researchers at Battelle Laboratories in Columbus, Ohio, have begun investigating a new technique for manufacturing tougher and more fracture-resistant ceramics for these applications.

Conventionally, a ceramic powder like alumninum oxide or silicon nitride, is mixed with an organic polymer and water. The polymer binds the powder together (acting like a glue) while the mixture at room temperature is forced through a die to form the required part. However, removing water after the extrusion process is completed proves to be difficult without degrading the material's strength. Beebhas Mutsuddy, head of the Battelle study team, says no water is necessary for his process. Instead, a metal-organic polymer combination is added to the ceramic powder, and this mixture is extruded at an elevated temperature. Finally, the formed part is heated strongly (a step called sintering) so that the polymer decomposes. The result is a dense, strong ceramic (with a more uniform microscopic structure) that can be used in severe environments.

A recording system for 3-D TV

Three professors at the University of South Carolina in Columbia, S.C., have invented a videotape recording system that allows television viewers to see three-dimensional images in color on their own television sets without needing special glasses or other aids. Physicist Edwin R. Jones Jr., one of the inventors, says, "There's nothing special about how you look at it. You don't have to sit in any one place. You can close one eye."

The inventors discovered their approach by observing that a one-eyed person interprets depth by moving his head and comparing a sequence of visual "frames" from different angles. Imitating this process through technology adds depth to an otherwise flat picture. The recording system uses two cameras and a special electronic encoder to produce a time-sequenced display of images from two different points of view. The images can be stored on a single videotape.

Jones says the three-dimensional effect can be exaggerated or turned down. "Anything you can capture ordinarily on TV, you can capture with this system," Jones says. "The real advantage is that, at the point of use, you don't have to have anything beyond an ordinary TV set."

The inventors are interested in refining the recording system and in studying the perceptual process involved to find out some of its limitations. They have applied for a patent on the system.