monitoring ICP. The most promising solution is a sensor originally developed at Ames Research Center for measuring air pressure over an airfoil in wind tunnel tests of aircraft. It is an inductively powered capacitive transducer—that is, a sealed pressure-measuring cell that reports ICP by telemetry.

The ICP monitor has a number of advantages. It is "minimally invasive," meaning that, while penetrating the skull, it does not penetrate the dura, the tough membrane that forms a protective cover around the brain tissue. Once implanted, the scalp is closed over the transducer, reducing risk of infection and allowing the patient freedom of movement. Most important, the monitor can report continuously with a higher degree of accuracy than is currently obtainable.

A program to validate the ICP monitor is under way and the system then will be evaluated on neurosurgical patients. Konigsberg Instrument Co., Pasaddena, Cal. is producing pre-production ICP monitors for test and evaluation.

Liquid-Cooled Garment

Because there is no atmosphere to impede the sun's rays, it gets pretty hot on the moon—up to 250 degrees F. For that reason, astronauts working on the lunar surface wore a special suit consisting of a nylon outer layer supporting an inner network of tubing. Cool water flowing through the tubes kept the moonwalker comfortable. Researchers at NASA-Ames have made advancements in the Apollo suit design that offer highly efficient temperature control, and they have applied this technology to development of a water-cooled, brassiere-like garment used to aid the detection of breast cancer.

A liquid-cooled bra, offshoot of Apollo moon suit technology, aids the cancer-detection technique known as infrared thermography. Water flowing through tubes in the bra cools the skin surface to improve resolution of thermograph image.

Cancerous tissue gives off more heat than normal tissue and this forms the basis for a cancer-detection technique known as infrared thermography. However, it has been difficult to interpret thermograph results for detecting cancer in its earliest stages.

The liquid-cooled bra, being evaluated by the Breast Cancer Detection Demonstration Center in Oklahoma City, cools the breast to improve resolution of the thermograph image. Cancerous tissue recovers from cooling faster than normal tissue because of the increased blood flow characteristic of cancerous tumors. By increasing the temperature difference between normal and cancerous tissue through cooling, the differentiation becomes more apparent on the thermograph. The NASA-Ames bra contains tubes which carry the water to and from a pumping refrigeration unit.

Help for Crippled Children

Children with cerebral palsy have nervous system defects which lead to muscular spasticity and loss of coordination. Many of these children have great difficulty walking because certain muscles are in a constant state of contraction.

Surgical techniques can lengthen muscles or tendons to improve the child's walking pattern, but it is vital to diagnose accurately the particular spasticity problem of each patient; the individual muscles causing the handicap vary greatly from child to child. It is difficult by physical examination alone to determine precisely which muscle groups are most involved. Biotelemetry has provided a solution. For the past two years, the Children's Hospital at Standord, assisted by NASA and the Stanford Biomedical Application Team, has been applying biotelemetry to the cerebral palsy problem.