

Biomedicine

Joanne Silberner reports from Monterey, Calif., at the American Heart Association's Science Writers Forum

Investing in CPR

A new understanding of how cardiopulmonary resuscitation (CPR) works has led to the development of a vest that, when rhythmically inflated, replaces manual chest compression. The vest was developed at Johns Hopkins University in Baltimore as a more efficient way of moving blood through the body when the heart fails. Researchers have already used it on several brain-dead people to prove its efficacy, and trials in emergency situations are expected soon.

The vest evolved from a change in the understanding of CPR. When the procedure was first introduced in 1960, it was thought to move blood through the body by direct compression of the heart between the sternum and backbone. But studies at Johns Hopkins and the University of California at Los Angeles (SN: 12/6/80, p.359) have shown that a general increase in pressure within the chest, rather than direct manipulation of the heart, is what squeezes blood to the rest of the body.

Henry R. Halperin, Myron Weisfeldt and several others at Hopkins developed the vest in a series of studies on dogs whose heartbeats were experimentally interrupted. In a recent trial they compared the vest with normal and extra-strong manual compression, and found that the vest pushed more blood and that more dogs survived.

The Hopkins researchers plan soon to try a human-sized vest on people who fail to revive after conventional CPR, Halperin says.

Baby fat

Overfeeding baby female baboons makes the primates fatter-than-normal adults, according to a study by Douglas S. Lewis and his colleagues at the Southwest Foundation for Biomedical Research in San Antonio, Tex. The association may apply to humans, Lewis says, but he is quick to caution that no benefits of *underfeeding* were seen and that parents should not underfeed their babies in order to ensure a svelte adulthood for them.

Lewis and his colleagues gave 40 percent more formula than usual to 12 baby baboons, gave 30 percent less than normal to another 8 and gave 12 enough calories to equal what they would have gotten from breast feeding. They kept the animals on the diets from birth to 4 months of age, then allowed them to eat as much as they wanted. Their weight and amount of fat were monitored for 5 years.

While the overfed baboons were initially fatter, by 1 year of age there were no differences. But the effect in 5-year-old female baboons — physiologically the equivalent of 15-year-old humans — was distinct. The percentage of weight due to body fat was 28 percent in the females overfed as infants, compared with 7 percent in both the normal-fed and underfed. No such difference was seen in the males — possibly, Lewis suggests, because while female baboons at age 5 have just completed puberty, males are in the midst of the process. After puberty, he says, things may even out.

While some researchers maintain that obesity is caused by excess fat cells, the current study suggests that this may not be the case, Lewis says. The difference here, he says, was due to an enlargement of the fat cells, not an increase in their number.

The results indicate that infant overfeeding is a potential factor in adult obesity. But in humans, he says, "The great majority of obese infants do not become obese adults." He suspects adult obesity may be a two-step process. Somehow overfeeding endows an enhanced capability of storing fat, and then factors such as diet or genetics kick in during adulthood.

In any case, he emphasizes, parents concerned about what their children will look like as adults shouldn't deny them food as youngsters. "There's no evidence that underfeeding keeps the animal leaner than a normal infant," he says.

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Environment

Moms-to-be banned from 'chip room'

Earlier this month, AT&T announced that it would no longer allow pregnant women to work on its semiconductor production lines, the so-called "clean rooms." Other microelectronics firms have offered their pregnant employees the option of transferring out of production areas where exposure to chemicals and gases is possible. This spreading concern over pregnancy risks follows the recent report that women in the semiconductor industry may be more likely to miscarry.

The study — done under contract for Digital Equipment Corp., a computer manufacturer with various locations in Massachusetts — was conducted by scientists from the University of Massachusetts at Amherst. Results from the epidemiologic study, released to Digital but yet to be formally published, indicate that women in the microchip etching area had nearly twice the miscarriage rate found in the general population. Data collection for the study began in 1984 at Digital's Hudson, Mass., plant, after employees became suspicious about the number of miscarriages among them.

Harris Pastides and Edward J. Calabrese, who expanded the study to 744 subjects when initial data from a smaller group did not reveal anything unusual, conclude in their report that workers treating chips with etching acids and gases have a first-trimester miscarriage rate of 39 percent. Workers in another area where chips are washed in acids had a miscarriage rate of 29 percent, not statistically significant according to Pastides. He told SCIENCE NEWS that the unexposed control group had an 18 percent rate, within the national average range of 10 to 20 percent. Although it caused alarm in the industry, the Digital study does not prove a cause-effect relationship between miscarriage and chip production. It also does not identify individual chemicals as possible culprits.

Pastides refused to give full details of the study prior to publication in a medical journal, but he told SCIENCE NEWS that there were only 12 miscarriages in each of the two exposed groups. "The finding is not based on a huge number of miscarriages or pregnancies," he says. "So it certainly calls for replicative studies. . . . We also really need to do more extensive exposure measurements."

Al + fluoride = Bad mix for cooks?

Aluminum's known neurotoxic effects have put the metal on a list of suspicious characters (SN: 10/1/83, p.213). Furthermore, several studies last year found that aluminum compounds can be released from metal utensils during cooking. Now, experiments in Sri Lanka suggest that this leaching is "dramatically enhanced" by water containing fluoride, in levels normally used in municipal fluoridation.

In a letter published in the Jan. 15 NATURE, scientists at Hantana's Institute of Fundamental Studies and The University of Ruhuna say that water with 1 parts per million (ppm) of fluoride frees nearly 200 ppm of aluminum when boiled 10 minutes in aluminum cooking pots. That is 1,000 times the aluminum leached by nonfluoridated water. Prolonged boiling further raises the aluminum concentration to about 600 ppm. The rate of dissolution is affected by water and food acidity.

Biotech suit thrown out by judge

A lawsuit over the White House's biotechnology regulations was dismissed late last month by a U.S. district judge. Filed by activist Jeremy Rifkin against the administration and six federal agencies, the suit claimed that the guidelines were adopted through an illegal process and that they did not include an environmental impact statement. The decision essentially means that Rifkin must sue agencies individually if he dislikes the beleaguered guidelines, which have been attacked by scientists as well (SN: 8/2/86, p.71).

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