Research Update

Sticks and stones not only cause of children's broken bones

Many children break their forearms because of poor bone health, a New Zealand physician has concluded. Dr. Ailsa Goulding of the Department of Medicine at Otago University and her research group recently published the world's first study of bone density and body composition in children with arm fractures (*J Bone Miner Res* 1998;13:143-8).

The group studied 100 girls aged 3 to 15 who had forearm fractures and a similar control group. No control group members had previous fractures, contrasting with 33 girls in the experimental group who had had at least 1 broken bone before the study. Most forearm fractures result from trivial falls "at less than standing height" onto an outstretched arm, and Goulding suggests that bone weakness is responsible in the majority of cases. The researchers found that girls with fractures tended to be obese and to have low levels of dietary calcium compared with girls in the control group.

Although forearm fractures have long been much more common in children than within other age groups, Goulding says the incidence has been poorly documented. In contrast, Colles' fractures in older women are well studied as an outcome of osteoporosis. The researchers measured the children's bone density and body composition with dual-energy x-ray absorptiometry and supplemented this information with a questionnaire on health and nutrition. Bone density in the group of girls with fractures was lower at all tested sites than in the control group. Dietary calcium was significantly lower in the 11- to 15-year-old girls in the group with fractures; many of these girls were also overweight. Among girls aged 8 to 10, those with fractures carried 35% more body fat than girls within the control group. Goulding points out that overweight children are probably less active and may be more likely to fall heavily and sustain fractures than those of normal weight.

Many overweight children do not have greater bone mass than average-weight children but they carry disproportionately high levels of body fat on their juvenile skeletons. Goulding concludes that fractures are a "previously unrecognized adverse consequence of obesity in children." — © *Heather Kent*

Research news . . .

Postcrash impact of car accidents on children

One in every 3 children involved in a car accident experiences post-traumatic stress disorder, according to a British study (*BMJ* 1998; 317:1619-23). The prospective study showed that children aged 5 to 18 can face severe psychological effects following road traffic accidents. The likelihood of PTSD after an accident was unrelated to the type of accident, the age of the child or the nature of the injuries sustained. However, PTSD was more common among girls than boys. It was also more likely if the child had suffered a previous trauma or if he or she perceived the accident to be life threatening. The authors noted that the psychological needs of children involved in accidents are largely unrecognized.

Protein kills HIV-infected cells

Scientists have genetically engineered a protein that tricks HIV-infected cells into killing themselves — a strategy that may also prove successful in treating patients infected with the hepatitis C virus, cytomegalovirus and malaria (*Nat Med* 1999;5[1]:29-33). This "Trojan horse" approach has been developed because of the threat posed by new strains of HIV that are resistant to the protease inhibitors now being used as therapy. The engineered protein is programmed to kill cells (apoptosis) when it becomes processed into an active form by HIV protease. Other pathogens that encode proteases could also be targeted by such proteins.

Gene therapy for hemophilia B in dogs and mice

Hemophilia B, the genetic disorder that causes a deficiency in factor IX and spontaneous bleeding in many organs, affects about 1 in 25 000 men. Now gene therapy has been used to treat the disorder successfully in mice and dogs. Two studies (*Nat Med* 1999;5[1]:56-63,64-70) have shown that injections of an adenovirus containing the missing gene effectively corrected hemophilia for periods varying from 8 to 17 months. Gene therapy caused only transient side effects and no toxicity.