

Nutrition and Bone Health: Overview (43406)

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Historically, studies of nutrition and bone health have focused on the role of calcium. Clearly, however, many other nutritional as well as life-style factors will play a role in the maintenance of bone health and the prevention of osteoporotic fractures. In the following papers, Drs. Heaney and Weaver have reviewed recent information on the effects of calcium on bone mass and strength with particular attention to the complexities involved in the analysis of a calcium effect. These complexities not only involve the population and type of bone loss under consideration, but also the type of calcium supplementation and the factors that influence calcium absorption from foods and supplements.

The role of other nutrients in maintaining bone health was also considered, including recent data supporting the role for protein supplementation in speeding recovery from hip fractures. Adequate nutrition will be important in maintaining muscle mass as well as the functions of the cardiovascular and nervous system, which are important in preventing or minimizing the trauma from falls. The total amount of muscle and fat covering the hip may be important in distributing the effect of impact and decreasing the likelihood of fracture.

The last two papers in this series may point to new directions in research on nutrition and bone health. Although 1,25-dihydroxyvitamin D is accepted as the active hormone in the vitamin D hormone system, 24,25-dihydroxyvitamin D has been repeatedly studied for its possible effects on skeletal metabolism. The studies of Dr. Matsumoto and his colleagues provide some of the firmest evidence that this metabolite can have biological effects, probably largely as a modulator of the action of the 1,25-dihydroxyvitamin D hormonal form. The role of this interaction in bone health remains to be explored.

Dr. Bolander has presented an analysis of the role of growth factors in fracture healing, which may provide the basis for an exploration of the mechanisms by which malnutrition impairs fracture healing at the molecular level. The effects of protein and calorie malnutrition on circulating growth factors is well established, but effects on the local production of growth factors represents a new and potentially fruitful area for study which could be applied not only to the repair of skeletal injuries, but also to repair of many other forms of injury. Thus, a link is provided to discussions in subsequent sessions of this conference on the relationship between nutrition and the inflammatory response.

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