

Session VI

Trabecular Architecture and Bone Strength

The material in this session will be very important to the overall theme of this meeting: aging and bone quality. This is because most fractures in the elderly involve trabecular bone and we are becoming increasingly aware of the ways in which trabecular architecture—i.e., trabecular connections and orientation, as opposed to volume fraction—affect bone strength. To help us better appreciate the nature of trabecular bone, we begin with a paper by Lis Mosekilde which very graphically illustrates the effects of aging on the architecture and strength of trabecular bone. Next, Steve Goldstein discusses ways in which the connectivity of trabecular bone can be measured, and its relationship to mechanical properties. In the third paper, Philip Ross examines the possibility that fracture in one trabecular region precipitates a second fracture elsewhere, which could help explain why some elderly individuals have multiple fractures, and others have few or none. Following that, and in a related vein, Robert Recker presents an analysis of histomorphometric data from individuals who have similar amounts of bone, but architectural differences which may cause some to fracture while others do not. Then Nicholas Fazzalari presents the final paper in the session, in which he analyzes fatigue fractures in trabeculae, which are increasingly suspected to be a component of bone weakness in the elderly. Together, these papers comprehensively cover some of the latest data and theories in this area.

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