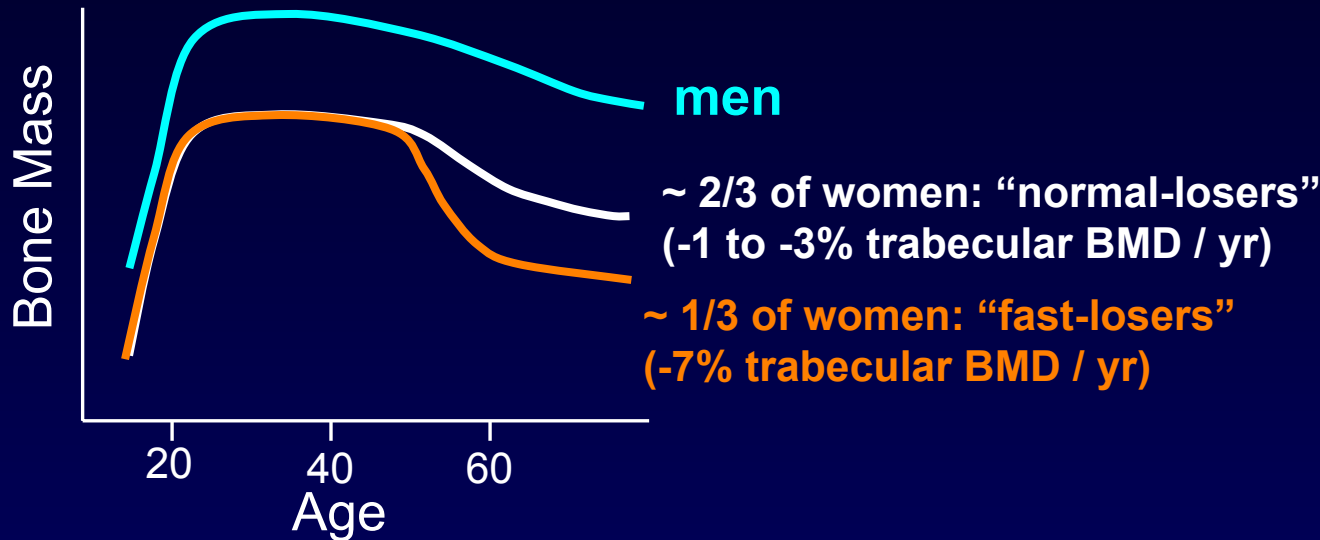


Changes in Bone Mass with Age



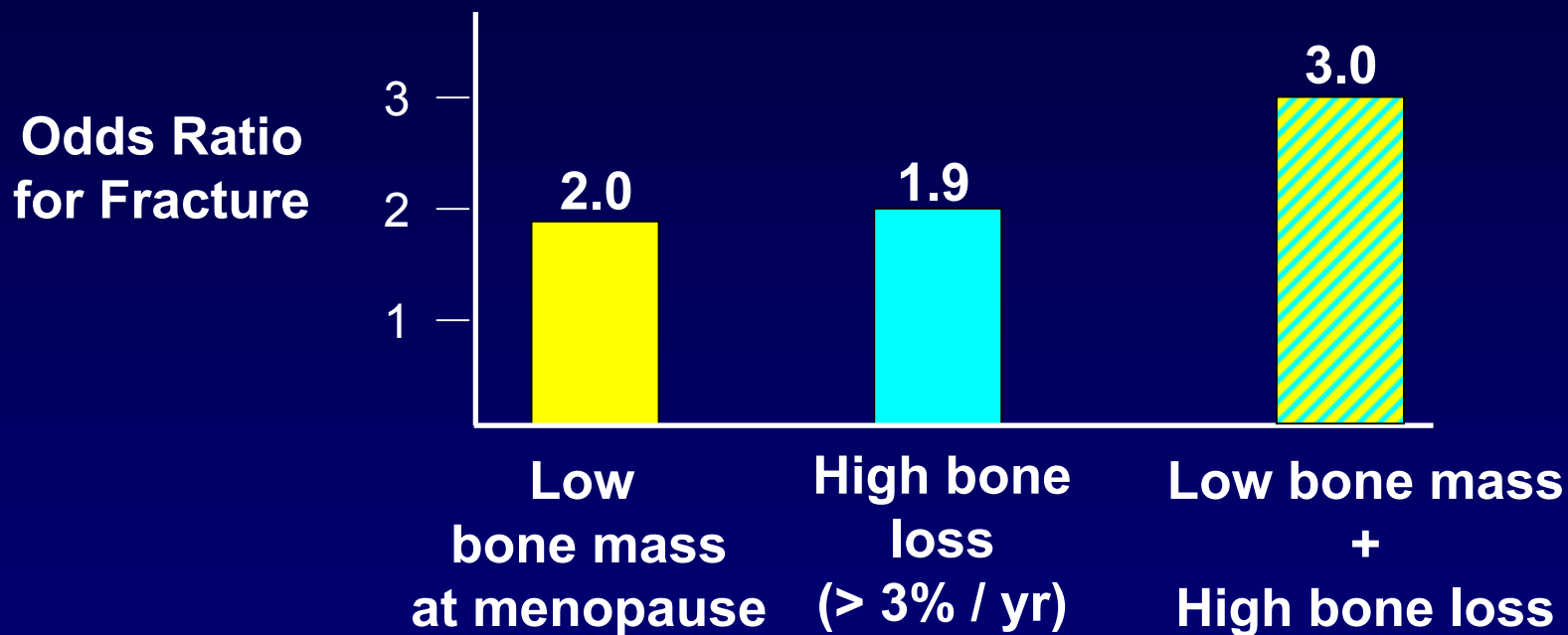
“It is unclear at present what are the factors enhancing bone loss in this subset of early postmenopausal women.

...Perhaps a *genetically determined* increased responsiveness of bone in the presence of estrogen deficiency may predispose some postmenopausal women to excessive bone loss.”

Riggs, Khosla, and Melton, 2001

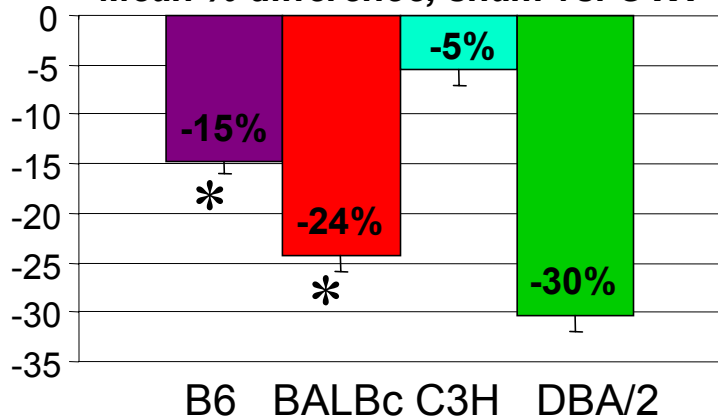
Why is rate of bone loss important?

BMD and rate of bone loss are independent predictors of fracture risk

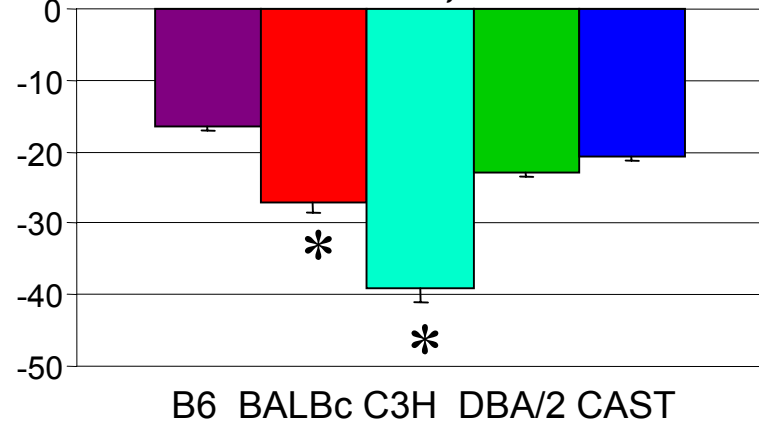


Strain-related differences in bone loss following ovariectomy in adult mice

Vertebral Trabecular BV/TV
Mean % difference, sham vs. OVX



Prox. Tibia Trabecular BV/TV
Mean % difference, sham vs. OVX



Interaction between bone loss and mouse strain: $p < 0.005$

Skeletal Fragility and Menopause

- **Bone mass and rate of bone loss are independent predictors of fracture risk**
 - Need to identify clinically useful predictors of rate of bone loss
 - Biochemical markers?
 - Genetic determinants ?

- **Structural / material changes underlying increased skeletal fragility subsequent to estrogen deficiency are poorly understood**
 - Relative role of bone mass vs rate of loss on bone strength
 - Few data in large animal models (mostly rodents)
 - Human data are mainly from iliac crest biopsies, which may not accurately reflect changes at skeletal sites that fracture