Challenges in management of osteoporotic fracture

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Introduction

- Osteoporotic fracture a **major public health concern**, with 1 in 3 women and 1 in 10 men having a fragility fracture in their remaining lifetime after the age of 50 years
- Between 2010 and 2040, the number of high risk individuals is **predicted to double worldwide**, with the largest increases expected in Africa, Latin America and **Asia**
- Today the **direct cost of managing fragility fractures worldwide** is estimated to be in excess of **$100 billion** USD ($100,000 million in Europe) with **indirect costs** close to **$200 billion** ($200,000 million in Europe).
- Osteoporotic fracture is associated with **reduced quality of life** and **significant morbidity, mortality and utilization of healthcare resources**

Introduction

- In Europe and North America, data show that the **burden and cost** of fractures is **similar to cardiovascular disease and greater than many cancers**, although osteoporosis receives considerably less attention
- The "**osteoporosis care gap**" is estimated at approximately 70% in Europe and North America and is now recognized as a **patient care crisis**

Challenges in management of osteoporotic fracture

1. Increased risk of fracture

The stiffness correlate to the third power of bone mineral density (**Stiffness = BMD^3**)

a small change in bone density results in large increase in fracture risk

2. Increased risk of implant failure

Screw fixation strength is highly dependent on cortical thickness.

1 mm loss in cortical thickness → 50% decrease in strength of fixation

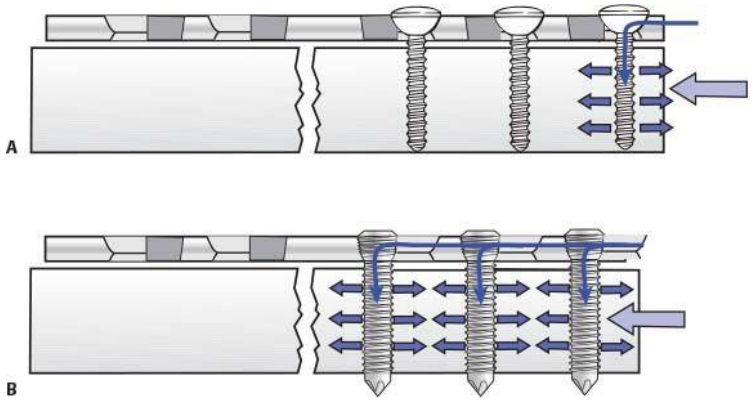
TABLE 1-5. Minimum Bone Mineral Density for Fixation Failure

Location	Minimum BMD for Implant Stability (mg/cm^3)
Proximal femur	250[133]
Proximal humerus	95[135]
Vertebral body (pedicle)	95–150[222]
Vertebral body	220[163]

Challenges in management of osteoporotic fracture

- Compromised fixation

1. Direct screws into locations with greatest BMD
2. Using locking implants
3. Improvements in screw fixation using cement



- Quality of callus

1. use of relative stability techniques such as intramedullary nails
2. Bone augmentation technique
3. Treatment of osteoporosis

The importance of prevention

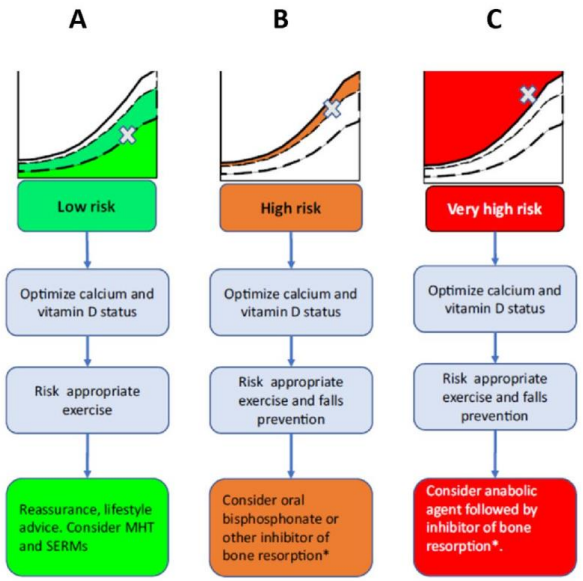
- Up to **50% of patients will not return to prior mobility** 1 year following hip fracture.
- Approximately **20% to 65%** of patients living independently prior to hip fracture will **require assistance** in completing pre-fracture activities of daily living.

Case

- 81 years old female
- Falling from the ground
- History of:
  proximal humerus fx
  distal radius fx
  vertebra fracture

The best ways to prevent osteoporotic fractures

- There is increasing evidence to suggest that the **anabolic agents** are **superior in efficacy, and rapidity of action**, to the **antiresorptive agents** in their ability to increase bone mineral density and prevent fractures
- the current **evidence base supports an "anabolic first" approach** in patients found to be at very high risk of fracture, followed by maintenance therapy using an antiresorptive agent, and with the subsequent need for antiosteoporosis therapy addressed over a lifetime horizon.
- the ESCEO and the IOF, in the European guidelines, recommend **FRAX based approaches**



MHT, menopausal hormone therapy;
SERM, selective estrogen receptor modulator;

Risk assessment

- In general, the **relative risk of fracture following a previous fracture** is increased by approximately **2-fold**
- There are several risk factors for refracture:

1. **The site of a previous fracture.** The risk of second fracture was highest in index clinical vertebral (18%) and hip fractures (14%)
2. **The number and severity of previous fractures**
3. **Age and sex**, higher in men than in women and decreased progressively with age
4. The **recency of a prior fracture,** highest in the immediate 1 to 2 years following a major osteoporotic fracture
   elevated imminent fracture risk, as, the RR was 5.3 within 1 year, 2.8 within 2–5 years, 1.4 within 6–10 years and 0.41 after 10 years

Risk assessment

- To targeting of the most effective treatments to patients, it is required to stratify patients according to baseline fracture risk

- To identify high risk patients:

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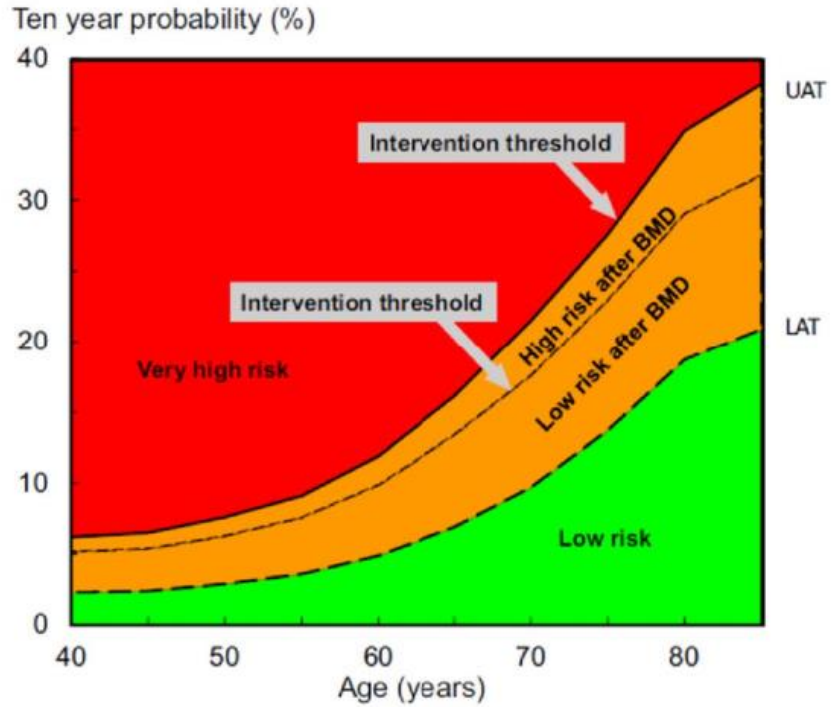

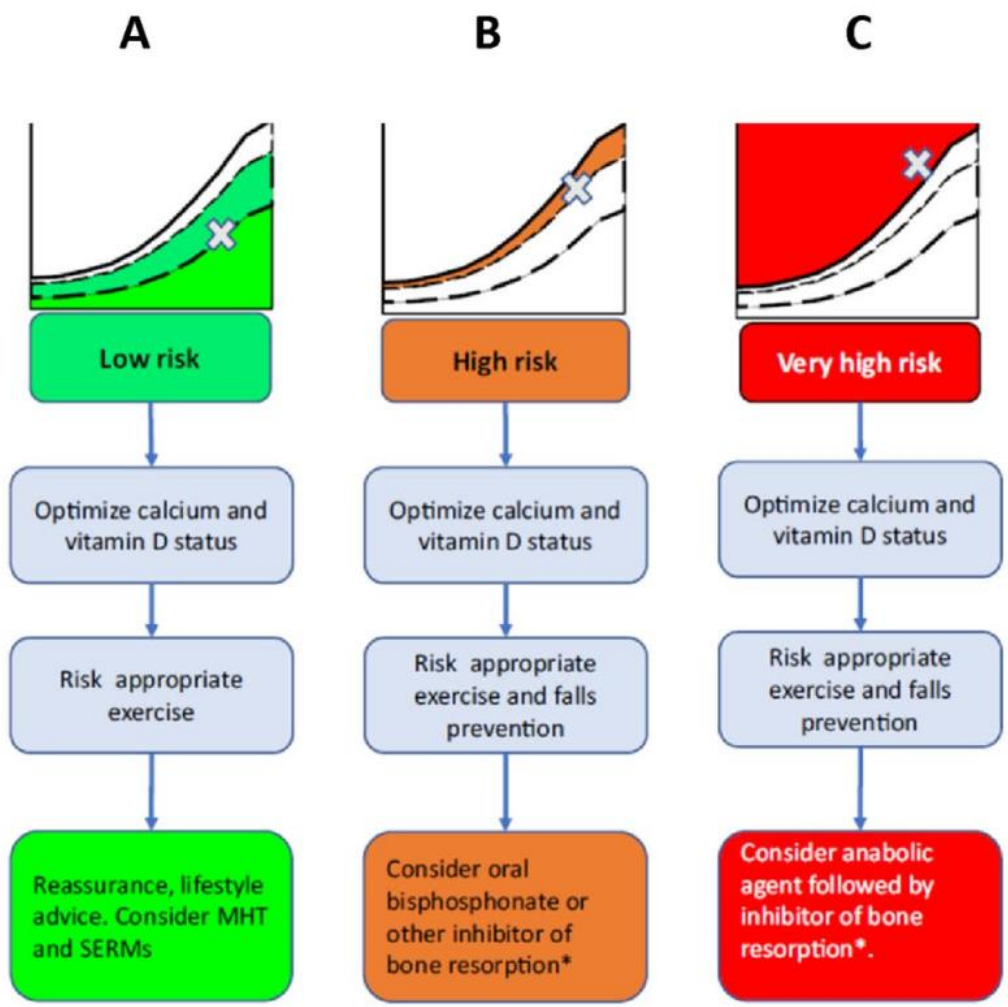

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Thanks for your attention