

# Health, Bones and Vitamin D in Developmentally Disabled Patients

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# What will be Discussed

- **What is osteoporosis?**
- **Why should we worry about it?**
- **What are the issues facing with development disabilities?**
- **How can you make a diagnosis?**
- **What has been done for patients with disabilities?**
- **What can we do to improve the situation?**



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# **Osteoporosis & Dissabilities: What is the Problem?**



# What is Osteoporosis?



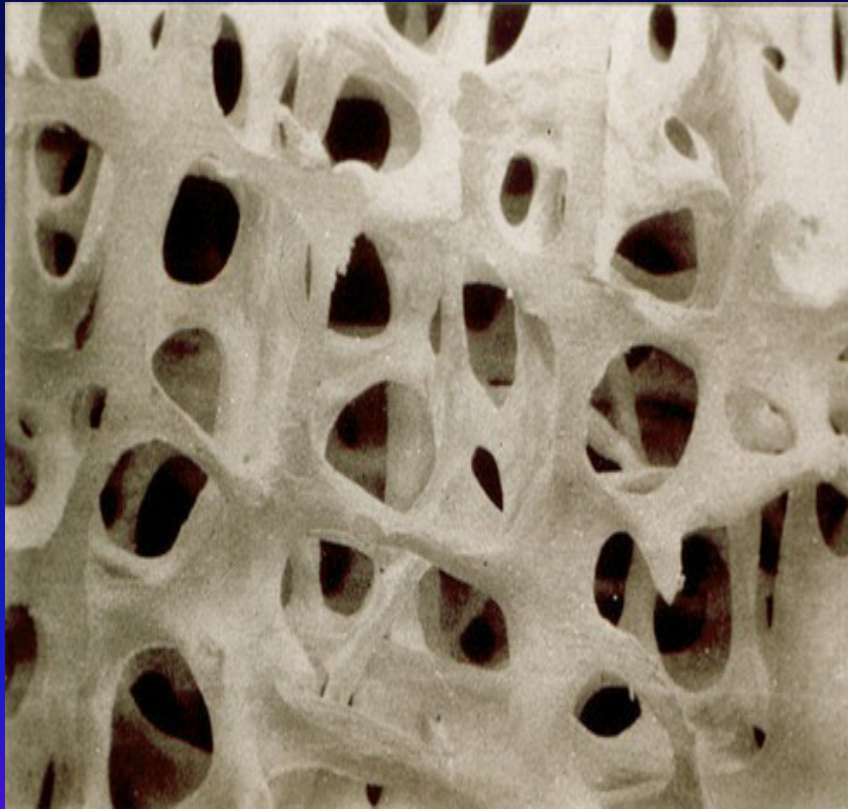


# Osteoporosis - Definition

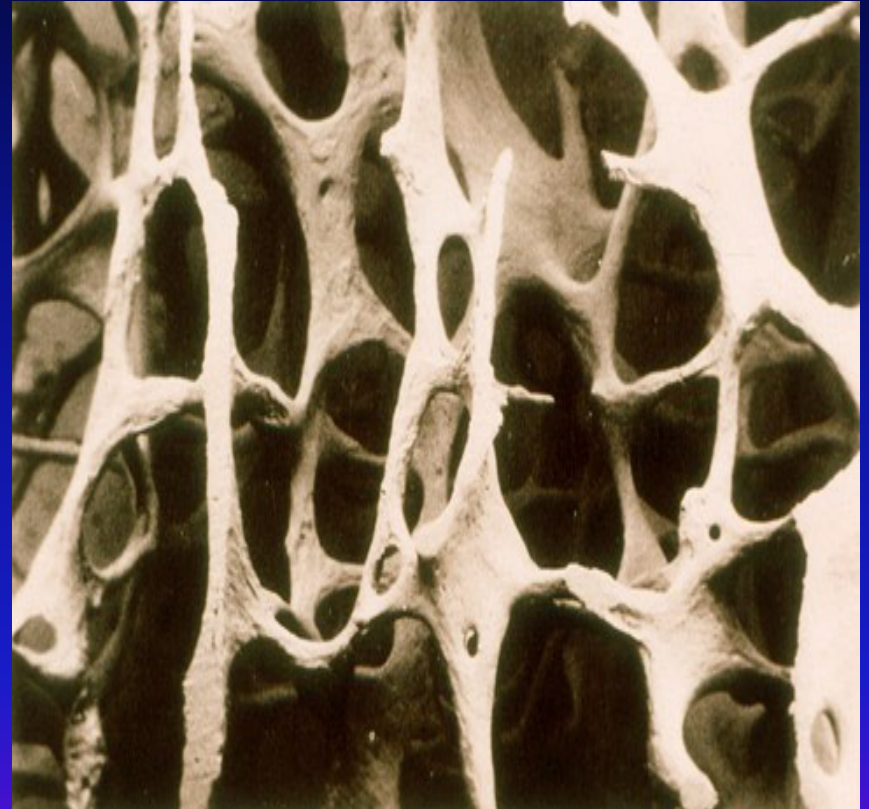
**“Skeletal disorder characterized by compromised bone strength, predisposing to increased risk of fractures” \***

**\* National Institutes of Health Consensus  
Development Panel on Osteoporosis Prevention  
Diagnosis, and Therapy**

# Trabecular Deterioration in Osteoporosis



Normal Bone



Osteoporosis

# **Osteoporosis is a Largely Under-diagnosed Condition**

- **Often diagnosed after a fracture**
- **Patient may be asymptomatic prior to fracture**
- **Low bone mass density (BMD) is considered the “disease”**
- **Fragility fractures are the “consequences” of the disease**

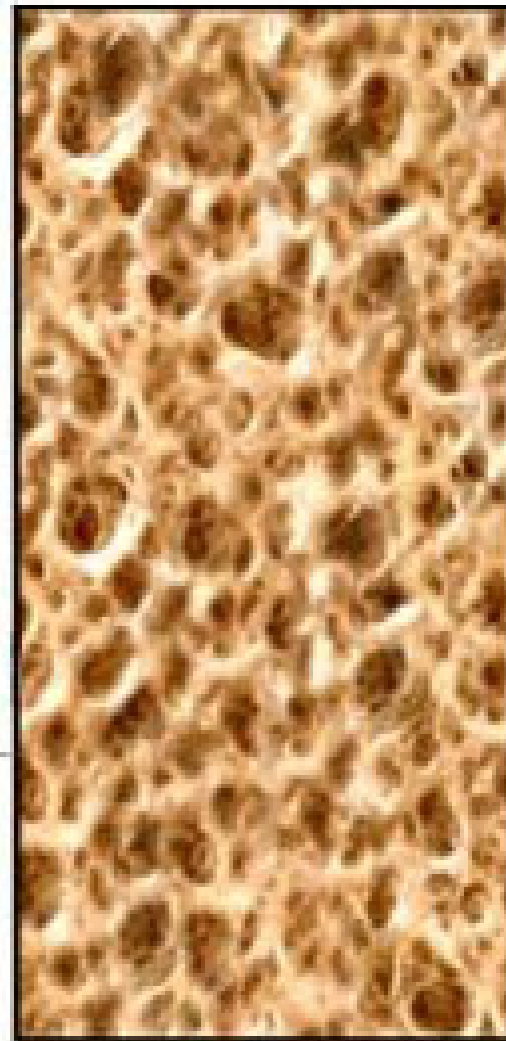


# According to the National Osteoporosis Foundation (NOF):

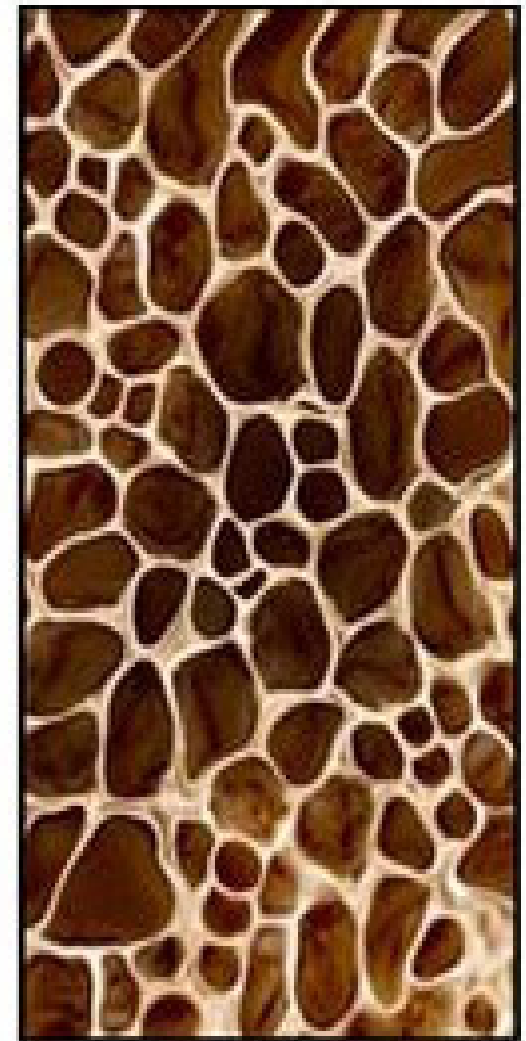
- **44 million people in the U.S. have low BMD ( $< 1\text{g}/\text{cm}^2$ )**
  - **10 million of those have osteoporosis**
  - **34 million have osteopenia and are at risk of for osteoporosis**
- **Projection: By 2020 there will be almost 14 million Americans with osteoporosis.**

# Osteoporosis in Normal vs. Patients with Developmental Disabilities

<b>Condition</b>	<b>Normal Population</b>	<b>Developmental disabled patients</b>
<b>Undiagnosed</b>	<b>40%</b>	<b>95%</b>
<b>Prevalence of: Low bone density</b>	<b>15%</b>	<b>70%</b>
<b>Vitamin D deficiency</b>	<b>40%</b>	<b>90%</b>
<b>Falls</b>	<b>1</b>	<b>30-times higher</b>
<b>Fracture rates</b>	<b>1</b>	<b>12-times higher</b>
<b>Life expectancy</b>	<b>70-80 yrs</b>	<b>20-50 yrs</b>



Normal bone



Osteoporosis

# Those Affected:

- **In older women, incidence of osteoporotic fractures is greater than incidence of myocardial infarction, stroke, and breast cancer combined.**
- **Can appear in both men and women, adults & children**
- **Osteoporosis and fractures are not solely the outcome of post-menopausal women**

# U.S. Fracture Incidence:

- **Approx. 1.5 million people per year have osteoporosis-related fragility fractures:**
  - 700,000 spine
  - 300,000 hip
  - 250,000 wrist
  - 300,000 other
- **Economic costs, including rehab, hospitalization, and nursing home care:**
  - Direct cost in 1995 - \$13.8 billion
  - 2003 -\$17 billion
  - 2008 -\$21 billion

# Health Costs of Osteoporosis-Related Falls and Fractures

- 1.5 million osteoporosis-related fractures in the U.S. annually
- In New Jersey osteoporosis-caused bone fractures (~36,630 each year), cost \$496 million annually
- Hospitalization due to Hip fractures cost between \$18,000-\$26,912. Double by 2020 to an estimated \$60,000.
- Falls the second leading cause of injury-related New Jerseyans 65 years and older
- >90 percent of hip fractures are associated with osteoporosis and nine out of 10 are the result of a fall.
- Between 2000 and 2005, fatality from falls among New Jerseyans 65 to 84 years old and 85 years and older has nearly doubled.

# **A Person Who Survive a Hip Fracture Face Many Challenges**

- **20% of hip fracture patients may require long-term nursing home care.**
- **50% never regain their ability to walk independently, and up to 20% die within one year due to complications of the fracture or accompanying surgery.**
- **Nearly 33% of people are totally dependent on others for their care following hip fracture.**
- **The elderly in hospitals or nursing homes are at high risk for falls and fall-related injury. Approximately 75% of nursing home residents fall each year**

# **Osteoporosis can be prevented or treated!**

## **Tips to Keep Bones Strong**

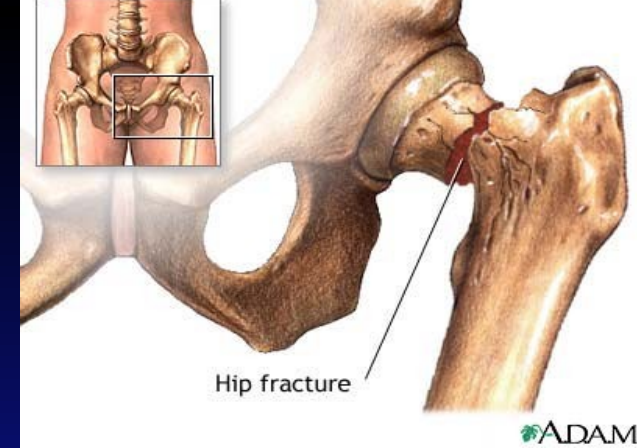
- Get enough calcium and vitamin D**
- Do weight-bearing and resistance exercise for bone and muscle strength, flexibility, and balance**
- Avoid smoking and limit alcohol**
- Ask your healthcare provider about getting a bone density exam (DXA)**



# Hip Fractures

## Complications:

- 30% excess mortality within the year from the fracture (nearly 65,000 women die)
- 50% survivors are incapacitated
- 22% require long-term nursing home care
- Failure to diagnose and treat osteoporosis
- In 50% of the survivors, the second hip fracture occurs within four years



# **“Low Bone Mass” of Osteoporosis Have Multiple Causes.**

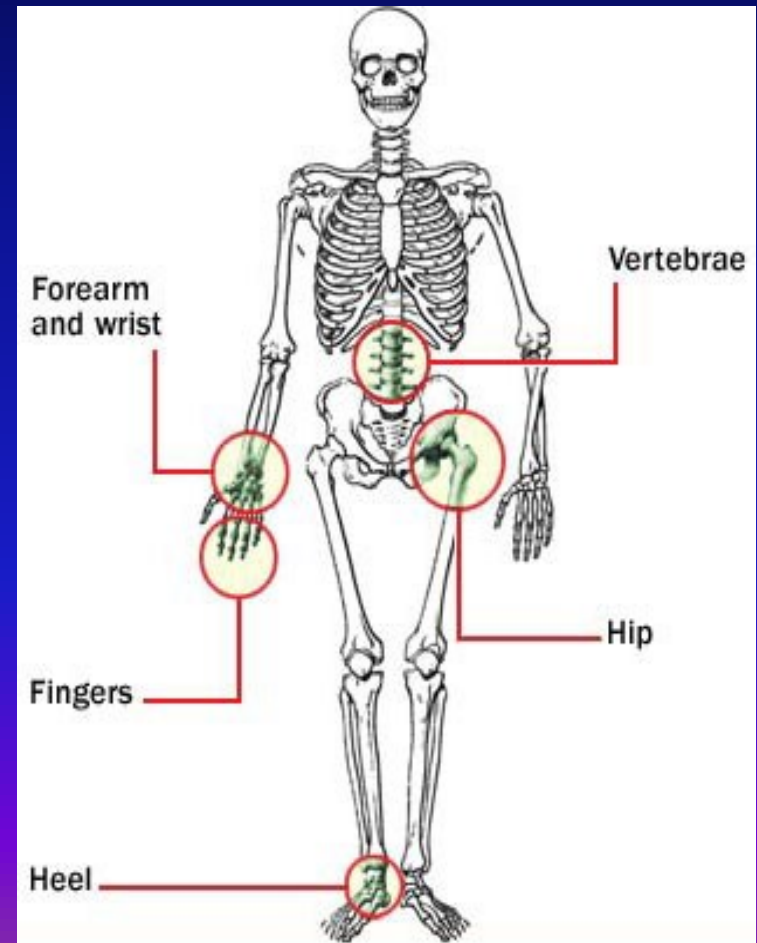
- **Vitamin D deficiency**
- **Endocrine disorders:**
  - **Glucocorticoid therapy, Cushing’s disease**
  - **Hyperparathyroidism**
  - **Hyperthyroidism**
- **Drug toxicity (anti-epileptic drugs)**
- **Immobility**
- **Hypogonadism (in men and women)**

# Populations at Risk of Developing Osteoporosis & Fractures

- Extensive steroid (glucocorticoid) use
- Eating disorders
- Persistent amenorrhea
- Low sex-hormone levels
- Thyroid/parathyroid diseases
- Frequent fallers
- Developmental disabilities

# Common site of Fractures in developmentally disabled individuals

- Fractures do not appear to be unusual in the DD population
- Cause is often undeterminable



# Diagnosis

- Usually begins with a DXA scan, which is normally straightforward in the general population
- Adults with DD may present with contractures, deformities, and movement disorders that may confound analysis of BMD.
- Regions of Interest (ROI's) may need to be adjusted for valid scan interpretations.



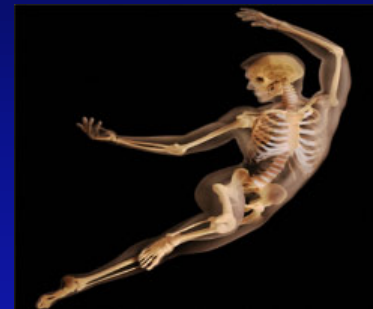
# Treatment

- **May require careful consideration of multiple co-morbid conditions**
- **No studies have been done to demonstrate efficacy of “bone-building” pharmaceuticals in persons with DD who may have low bone density**
- **Few medical specialists in treating metabolic bone disorders that are experienced with the health problems in DD population**



# Information of DD Patients

- Well established standards of care for the evaluation and management of osteoporosis and fractures in DD population are lacking.
- More clinical data and guidance are needed.
- In August 2006, Hunterdon Developmental Center (Clinton, NJ) began the “Healthy Bones Initiative” in, in an effort to proactively address these issues.



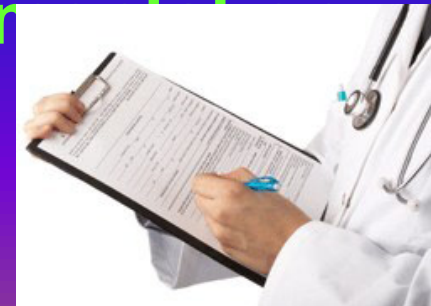
# DXA standard table DXA machine.





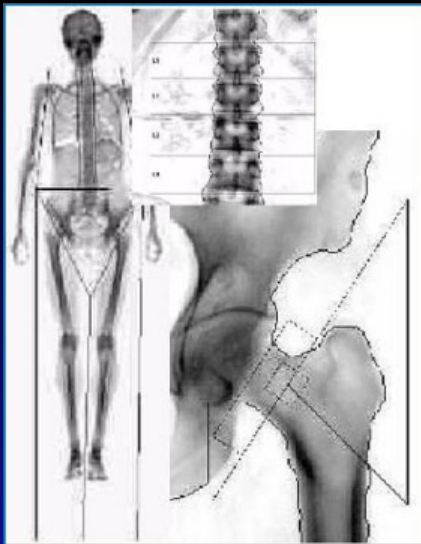
# What Kind of Outcome Data is Necessary

- Many questions remain to be answered. “Healthy Bones Initiative” will perform the outcome analysis in conjunction with an ongoing multi-modal educational program.
- To better discern the relationship of osteoporosis in the developmentally disabled individual, more data are necessary.
- Most patients need vitamin D supplements between 2,000 and 4,000 IU a day.



# Need: Outcome Data To Determine

1. **Baseline BMD's for individuals residing and perform follow-up DXA scans yearly thereafter**
2. **Baseline and yearly number of individuals in the following categories: Normal, Osteopenia, Osteoporosis**
3. **Number of osteoporotic residents with etiology of osteoporosis established**
4. **Treatment modalities: None, Calcium/ Vitamin D, Exercise, Pharmaceutical**
5. **Number of residents with low baseline BMD who demonstrate a documented increase of BMD in response to intervention/vitamin D**
6. **Individual and overall institutional fracture rates, baseline and at yearly intervals.**



# Discussion

Although ongoing data collection is necessary, preliminary findings demonstrate a high incidence of osteoporosis among DD patients

Observations together with existent data, suggest that there is (A) very high *incidence of vitamin D deficiency and osteoporosis* in DD individuals, and (B) High incidence of falls and fractures in the developmentally disabled patients.

# Discussion



- It's too early to state that bone-building pharmaceuticals are effective in the DD individuals. However, all most all patients require vitamin D supplements.
- Only a few patients require anti-osteoporosis medications.
- Avenues of managing osteoporosis and associated fractures should be evaluated, long term fashion.
- Diagnosis, early detection, and intervention are the key to adequately addressing this major disease affecting the developmentally disable patients.



# Discussion

**It is encourage to develop all disability centers to embark on a “Healthy Bones Initiative” program.**

**With adequate identification,, intervention, and data collection at the state-wide level, this should become a hot health topic in the national arena.**

# Vertebral Fractures: Accumulation of Cascade Fracture

**This is preventable**

