Osteoporosis in RS
What is Osteoporosis?

• Osteoporosis is a condition characterized by a decrease in the density of bone, decreasing its strength and resulting in fragile bones.
Symptoms & Signs:

- No symptoms in early stages

Symptoms occurring late include:

- Bone pain or tenderness
- Fractures with little or no trauma
- Loss of height Low back pain due to fractures of the spinal bones
- Neck pain due to fractures of the spinal bones
- Stooped posture or kyphosis
Osteoporosis - RS Vs. Norm

Bone strength vs. age (Radius)

Normative values

RS

Age
SOS units

3300 3400 3500 3600 3700 3800 3900 4000 4100 4200 4300 4400

2 7 12 17 22 27 32 37
Treatment

The goals of the treatment:
- Prevent or slow down bone loss/weakening
- Prevent bone fractures
- Control the pain
- Minimize risk of falling

Those goals could be achieved through:
- Physical activity
- Nutrition
- Medication
Physical activity

Weight bearing exercises:
• Walking, Running, Stair climbing, Dancing, standing
Treadmill training
Physical activity

Weight bearing exercises:
- Walking, Running, Stair climbing, Dancing

Resistance exercise
- Weights, Rowing machines,

Balance exercises
- Balance board,
Mobility and bone strength

\[ y = -968.75x + 2478.3 \]

\[ R^2 = 0.0687 \]

Assisted walking & Wheelchair users

Independent walkers

\[ y = -968.75x + 2478.3 \]

\[ R^2 = 0.0687 \]
Nutrition

• Get at least 1,200 milligrams per day of calcium and,
• 800 - 1,000 international units of vitamin D3
Calcium intake

\[ y = -552.83x + 3441.7 \]

\[ R^2 = 0.0585 \]
Caloric intake

- Poor caloric intake
- Adequate caloric intake

Caloric intake

Radius1
A case study –
treatment for severe osteoporosis

Child’s name: M.T.
Date of birth: Jan, 2001

Initial development: normal pregnancy and delivery, no complications

Diagnosis: Rett syndrome (11/2)
Bone fractures

January, 2006 - left knee
March, 2006 - Right Tibia

Vitamin D + Calcium
DXA findings August 2006

<table>
<thead>
<tr>
<th>PR%</th>
<th>Z Score</th>
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<tr>
<td>% of bone density for age 25</td>
<td>SD between measured value and normative values for age</td>
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<tr>
<td>31%</td>
<td>-3.8*</td>
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*Value lower than -2.5 = Osteoporosis
Bone fractures

- January, 2006 - Left knee
- March, 2006 - Right Tibia
- October, 2006 - Left hip
- April, 2007 - Right Humerus

Vitamin D + Calcium
600mg+ Fosalan
Fosalan

- Fosalan is part of a family of drugs called bisphosphonates
- It is used to prevent osteoporosis by preventing bone breakdown
Bone fractures:
- January, 2006 - left knee
- March, 2006 - Right Tibia
- October, 2006 - Left hip
- April, 2007 - Right Humerus
- June, 2007 - suspected knees
- September, 2008 - Right hip

Vitamin D + Calcium
- 600mg + Fosalan
Pamidronate (Aredia)

**Treatment protocol:**
A 30 mg dose is inserted through an Intravenous drip every three month for three days, 4 hours each day.

During each treatment blood pressure and Pulse are measured every hour.

Each day blood is measured for Urea, Calcium, Magnesium, Natrium.
Management

- January, 2006 - left knee
- March, 2006 - Right Tibia
- October, 2006 - Left hip
- April, 2007 - Right Humerus
- June, 2007 - suspected knees
- September, 2008 - Right hip
- September, 2009 - Aredia
- June, 2009 - Aredia
- September, 2009 - Aredia
- December, 2009 - Aredia

Vitamin D + Calcium
600mg
DXA Follow up - 2010

• Mineral density: 0.49 (0.33)
• % of norm for age: 83% (58%)
• Z score: -1.3 (-3.8)
• Comparison with previous findings: +49.5%
Present

- March 2010 – normal BMD discontinue Fosalan – No fractures

Future

April 2012 – another treatment with Aredia