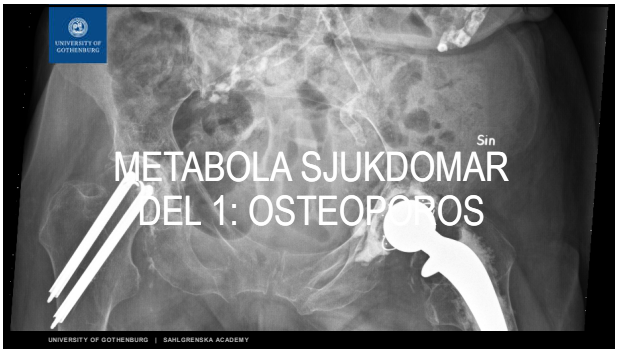

1

METABOLA SJUKDOMAR DEL 1: OSTEOPOROS

Mats Geijer
Professor, överläkare
Avdelningen för radiologi, Institutionen för kliniska vetenskaper
Sahlgrenska akademin, Göteborgs universitet

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International Osteoporosis Foundation
&
European Society of Musculoskeletal Radiology

VERTEBRAL FRACTURE INITIATIVE
Slide Kit Part 1:

Osteoporosis and Related Fractures: An Under-diagnosed and Under-treated Public Health Issue

IOF ESSR

3

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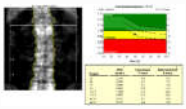
WHO-definitioner

- **Normal benmassa**
  - inom en standardavvikelse från genomsnittet hos friska unga kvinnor
- **Låg benmassa (osteopeni)**
  - mellan 1-2,5 standardavvikelser under genomsnittet
- **Osteoporos**
  - 2,5 standardavvikelser eller mer under genomsnittet
- **Etablerad osteoporos**
  - 2,5 standardavvikelser eller mer under genomsnittet, samt en eller flera lågenergifrakturer

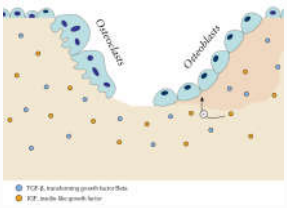


http://www.lakemedelsverket.se

5

Benfysiologi

- Omsättning (nedbrytning och bildande av ben) hela livet
- Vuxna: 4% kortikalt ben, 28% trabekulärt ben omsätts varje år



Parfitt 1983 Recent developments in bone physiology
Klintström 2017 Image analysis for trabecular bone properties on cone-beam CT data (avhandling)

6

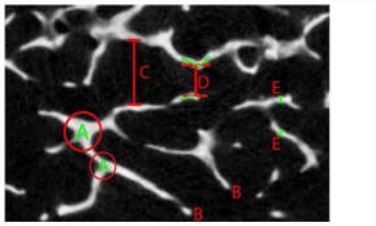


Figure 1. Definition of bone structure parameters. Trabecular nodes (A). Trabecular termini (B). Trabecular separation (C). Trabecular spacing (D). Trabecular thickness (E).

Klintström 2017 Image analysis for trabecular bone properties on cone-beam CT data (avhandling)

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Osteoporos

= systemisk skelettsjukdom karaktäriserad av

1. Låg benmassa
2. Förändrad mikroarkitektur med nedsatt benhållfasthet
3. Ökad frakturrisk
   - Lågenergifrakturer i kotor, höft, handled
   - Ökat dramatiskt: fler äldre, även oberoende av ålder
   - Höftfrakturer dubbelt så vanligt bland kvinnor
   - Skandinavien högst förekomst i världen

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Problem

- Åldrande befolkning
- Osteoporos leder till osteoporosfrakturer
- Morbiditet och mortalitet
- Kostnader

79-årig kvinna, fall ur säng

9

Lösning

- Identifiera riskpatienter och riskfaktorer
- Avlägsna riskfaktorer, förebygga och behandla osteoporos

- Starka riskfaktorer
  - Tidigare lågenergifraktur efter 50 år (handled, höft, bäcken, kota, axel)
  - Bentäthet -2,5 SD eller lägre
  - Systemisk glucocorticoidbehandling > 3 mån
  - Hög ålder
- Påverkbara riskfaktorer
  - Fysisk inaktivitet, fallbenägenhet, nedsatt syn
  - Låg vikt (BMI < 20 eller < 55kg)
  - Rökning
  - Lågt kalciumintag och/eller D-vitaminbrist

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Radiologins roll

- Diagnostisera uppenbara osteoporosfrakturer (kotpelare, sacrum, höft, knä, fotled, axel, handled)
- Utvärdera behandlingsresultat

- Identifiera riskpatienter:
- Även diagnostisera "tysta" eller tidigare frakturer
  - Kotpelare
    - Lungröntgen
    - CT thorax och buk
    - MR kotpelare

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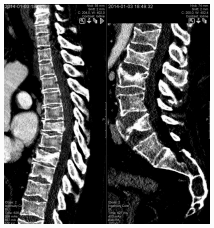
Betraktningsteknik CT - mjukdelsfönster



Geijer 2012 Bone bruise, lipohemarthrosis, and joint effusion in CT of non-displaced hip fracture
Henes 2014 Detection of occult vertebral fractures by quantitative assessment of bone marrow attenuation values at MDCT

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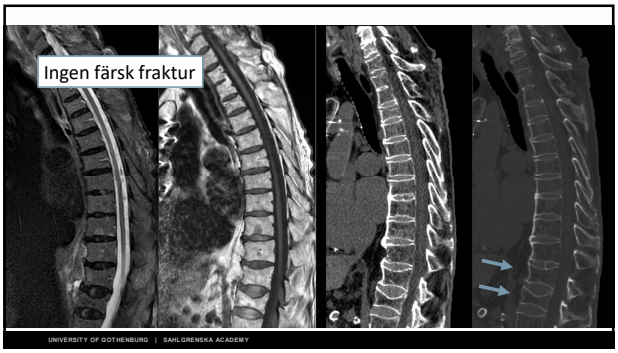

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Referenser

Röntgenundersökningar
- Jackson 2000 Vertebral fracture definition from population-based data: Preliminary results from the canadian multicenter osteoporosis study (CaMos)
- Lentle 2007 Recognizing and reporting vertebral fractures: Reducing the risk of future osteoporotic fractures
- Ensrud 2011 Vertebral fractures
- Schousboe 2008 Vertebral fracture assessment: The 2007 ISCD official positions
- Majumdar 2005 Incidental vertebral fractures discovered with chest radiography in the emergency department: Prevalence, recognition, and osteoporosis management in a cohort of elderly patients
- Gehlbach 2000 Recognition of vertebral fracture in a clinical setting
- Kim 2004 Underreporting of vertebral fractures on routine chest radiography

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Referenser

CT
- Lee 2016 Opportunistic screening for osteoporosis using the sagittal reconstruction from routine abdominal CT for combined assessment of vertebral fractures and density
- Chan 2012 Incidental vertebral fractures on computed tomography
- Bartalena 2009 Prevalence of thoracolumbar vertebral fractures on multidetector CT: underreporting by radiologists
- Williams 2009 Under-reporting of osteoporotic vertebral fractures on computed tomography

MRT
- Terakado 2017 A Clinical Prospective Observational Cohort Study on the Prevalence and Primary Diagnostic Accuracy of Occult Vertebral Fractures in Aged Women with Acute Lower Back Pain Using Magnetic Resonance Imaging
- Pham 2005 "Occult" osteoporotic vertebral fractures: vertebral body fractures without radiologic collapse

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Patofysiologi

- Primär osteoporos
  - postmenopausalt relaterat till östrogenbortfall
- Sekundär osteoporos
  - underliggande sjukdomar
  - läkemedel
- Efter 65-årsåldern sker förlusten i samma hastighet hos båda könen

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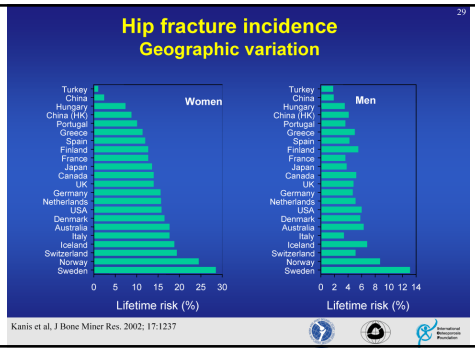

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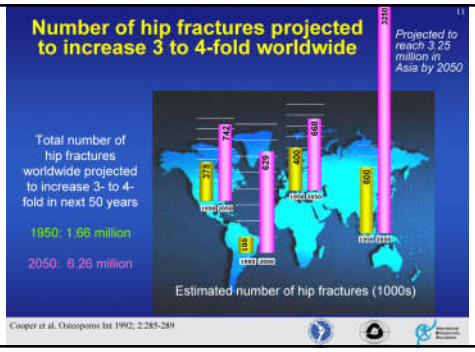

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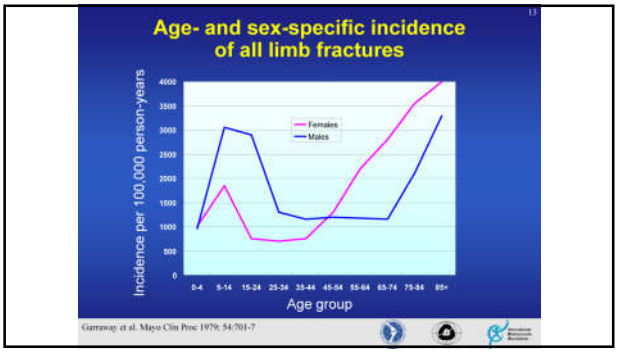

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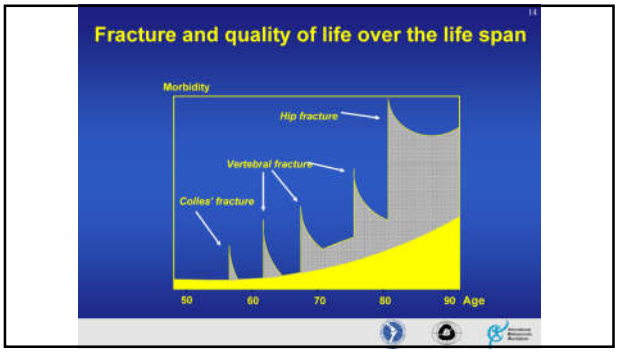

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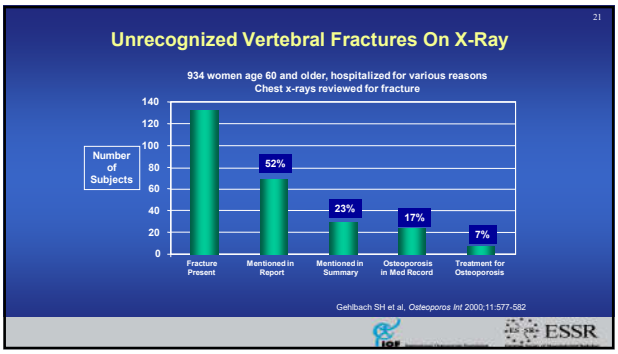

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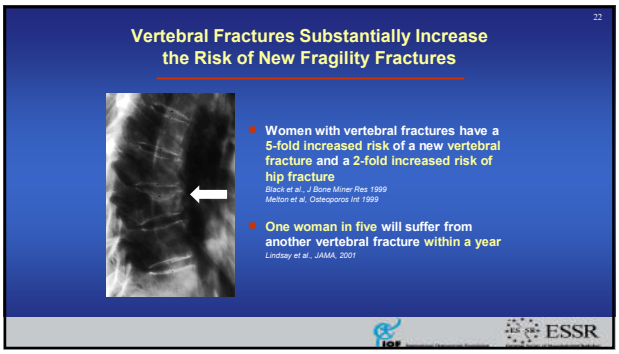

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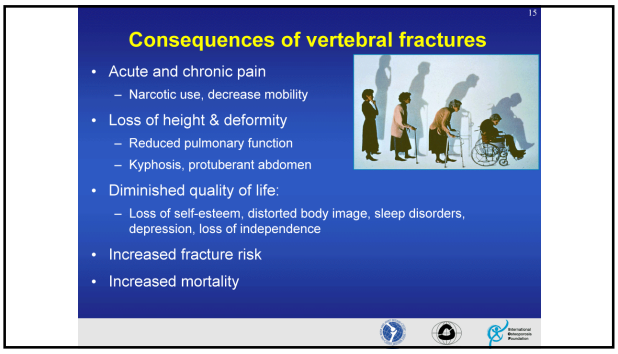

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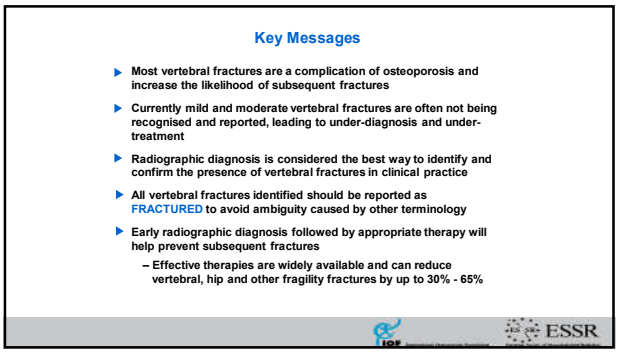

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Felkällor

Mb Scheuermann, ej osteoporosfrakturer
Normalvarianter
Missbildningar

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Ann Intern Med. 2013 April 16; 158(8): 588–595. doi:10.7326/0003-4819-158-8-201304160-00003.

Opportunistic Screening for Osteoporosis Using Abdominal Computed Tomography Scans Obtained for Other Indications

Perry J. Pickhardt, MD, B. Dustin Pooler, MD, Travis Lauder, BS, Alejandro Muñoz del Rio, PhD, Richard J. Bruce, MD, and Neil Binkley, MD
University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin

- 2063 CT-DXA pairs in 1867 adults (1511 women [81%]; mean age, 59.2 years [SD, 12.5]).
- Median time between abdominal CT and DXA studies was 67 days (interquartile range, 27 to 118 days).
- CT-attenuation values were significantly lower at all vertebral levels for patients with DXA-defined osteoporosis (P< 0.001).
- An L1 CT-attenuation threshold of 160 HU or less was 90% sensitive
- A threshold of 110 HU was more than 90% specific for distinguishing osteoporosis from osteopenia and normal BMD

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Stressfraktur sacrum

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Litteratur

- Link 2015 Radiology of Osteoporosis. Can Assoc Radiol J.

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UNIVERSITY OF GOTHENBURG

mats.geijer@gu.se
0725-00 89 46

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