



***Foundation Education Resource  
For Health and Social Care Workers***

# Core Learning - Session Two

## Osteoporosis / Bone Health

**Aim:**



To improve awareness and knowledge of bone health and osteoporosis among health service workers

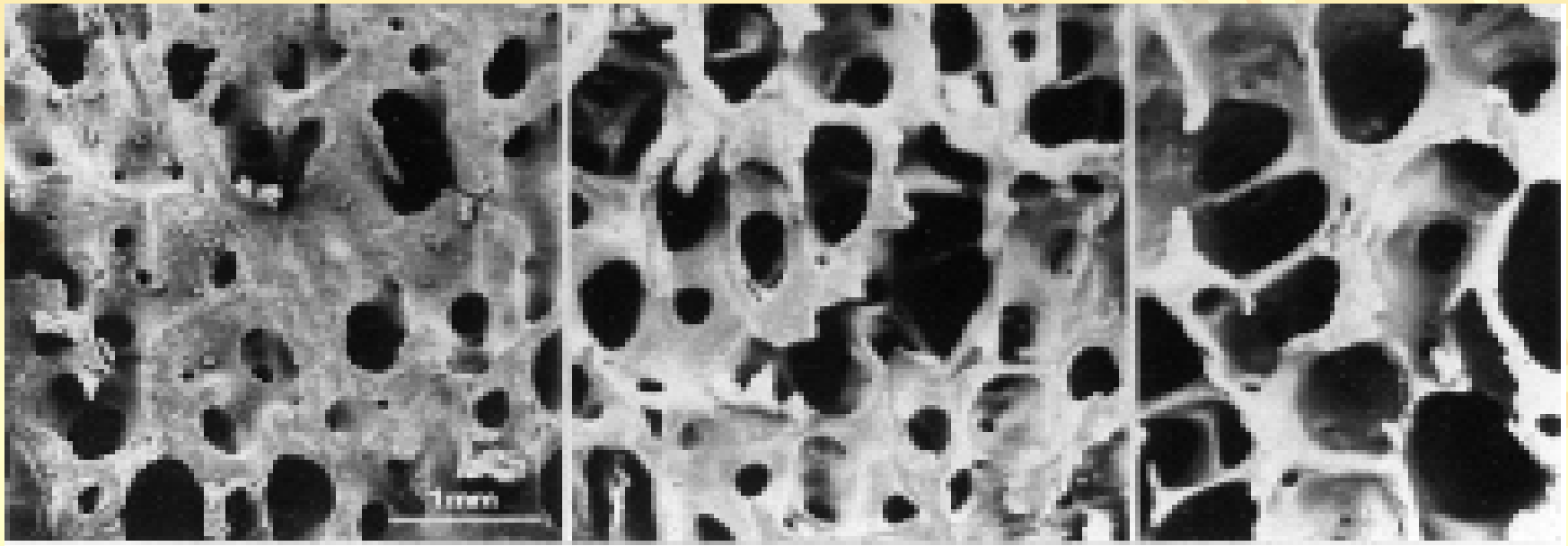
# Keeping Bones strong /preventing Osteoporosis

- To ensure the best bone health possible across all stages of life it is important to have adequate calcium intake, vitamin D levels and appropriate physical activity.
- Bones grow during childhood and adolescence and peak bone mass (strongest bone) is usually reached between age 25 and 30 with men reaching it earlier than women.
- Exercise and a good diet in childhood and adolescence are very important in aiming for the best possible peak bone mass.

# What is Osteoporosis

- The word osteoporosis literally means “porous bones” It occurs when bone loses an excessive amount of their protein and mineral content particularly calcium
- Over time bone mass therefore bone strength is decreased , as a result bones become fragile and break easily

**Osteopenia:** Mild thinning of the bone mass but is not as severe as osteoporosis



# Risk Factors for Osteoporosis (National Osteoporosis Foundation 2013)

## **Risk Factors for Osteoporosis (National Osteoporosis Foundation 2013)**

- There are many factors that can increase the risk of osteoporosis. Some of these are different for men and women. Osteoporosis can occur at any age in both males and females, and persons of all races. One in five men (over 50) and 1 in 2 postmenopausal women (over 50) will develop a fracture during their lifetime (Irish Osteoporosis Society Guidelines 2010).

### **Women**

- A lack of oestrogen caused by:
- Early menopause (before the age of 45).
- Early hysterectomy (before the age of 45), especially if both ovaries are removed.
- Missing periods for six months or more (excluding pregnancy), as a result of over exercising or over dieting.

# Risk Factors for Osteoporosis

## Men

- Low levels of the male hormone testosterone (hypogonadism)
- **Family History:** Family history of osteoporosis is a very strong risk factor, particularly if it includes a history of hip fractures as approximately 80% of a persons bone is genetic.
- **Age:** Bone loss increases in later life so by the age of 75 about half of the population will have osteoporosis. As we get older bones become more fragile and more likely to break.



# Risk Factors for Osteoporosis

- **Race:** Osteoporosis affects men and women of all races. But Caucasians and Asian women are more at risk. Dark skinned people tend to have larger bones, however they have decreased ability to absorb vitamin from the sun.
- **Low Body Weight:** If you have low BMI (body mass index) you are at greater risk of developing osteoporosis.
- **Previous Fractures:** If you have already broken bones easily, including in the spine after minor trauma.
- **Some medical conditions increase your risk;**
- **Rheumatoid Arthritis:** The disease itself and steroid treatment can increase the risk.
- **Eating Disorders:** People who have a history of eating disorders may have missed out on vital nutrients to their bones at a vital stage of development.
- **Gastrointestinal Disorders:** Disorders such as Coeliac disease, Crohns Disease Ulcerative Colitis or primary Biliary Cirrhosis.

# Risk Factors for Osteoporosis

- **Endocrine Disorders:** Disorders such as Hypogonadism, cortical or thyroid and parathyroid hormone problems, diabetes turners syndrome in females and Klienfelters in males.
- **Medications:** Some medicines can increase the risk of osteoporosis e.g. corticosteroids (7.5 mgs daily for more than 3 months), some anti convulsants post organ transplant therapy diuretics.
- **Chemotherapy or Radiation:** Any adult or child who has received or who will be receiving treatment should have a DEXA scan.

## Life Style factors

- Lack of regular weight bearing exercises
- Low daily intake of calcium and or Vitamin D
- Excessive physiological stress
- Smoking
- Excessive alcohol consumption
- Excessive exercise particularly with inadequate caloric intake
- Getting too much protein increase calcium loss
- Excessive sodium and caffeine



# Risk Factors for Osteoporosis

These factors associated with osteoporosis can be categorised as:

- non-modifiable risks like age, family history of osteoporosis
- modifiable factors which are mainly lifestyle and dietary choices which a person can try to control.

## **Modifiable Factors**

- Exercise Nutrition and balanced diet Low dietary calcium Vitamin D
- Deficiency Low body mass index Smoking Alcohol Caffeine

## **Non Modifiable Factors**

- Age Race Gender
- Family history (parent with hip fracture) Previous fracture Ethnicity (more common in Caucasians and Asians) Early menopause / hysterectomy
- Long term glucocorticoid (steroid) therapy

# Risk Factors for Osteoporosis

- Often the first time a person realises they have osteoporosis is when they fracture a bone.
- If an older person has had a previous fracture as a result of very little trauma (fragility fracture), then they need to have their osteoporosis managed and it is especially important that they are assessed by their doctor.
- Getting the appropriate management at this point may prevent a future fracture. It is especially important that they are assessed by their doctor regarding their bone health and their need to be on medications, supplements or taking specific exercise.

# Prevention of Osteoporosis

- Given the modifiable risk factors, there is a great deal that can be done at all different stages in life to guard against osteoporosis and to reduce the risk of fracture.
- Appropriate diet and exercise are critical in aiming to maximise bone mass. Diet is also important to support muscle strengthening exercise programmes and to slow down the effects of ageing on muscle
- Strong muscles are important for everyday function and reducing the risk of falls. Strong muscles are important in maintaining strong bones.

# Prevention of Osteoporosis

## Diet

Everyone needs a balanced diet to promote strong bones. A good diet includes sufficient calories, protein, fat and carbohydrates, as well as minerals and vitamins

- Calcium and Vitamin D are the most important of these for bone health.
- **Calcium** is essential throughout life for bone health and the prevention of osteoporosis.. Calcium comes from the food that we eat, when we consume less calcium than our body requires, it is taken from our bones (National Osteoporosis Foundation - US, 2013).
- Dairy products (milk, cheese and yoghurt) are the richest source of calcium. Consuming 3 servings a day will help meet your calcium needs. Low fat dairy products have similar calcium content to full fat products so calcium intake need not be compromised if people have to alter dietary intake for health reasons.

# Prevention of Osteoporosis

- The recommended daily allowance\* of calcium is:

Women	Allowance
Aged 19 to menopause	1000 mg/day
Post menopause	1300 mg/day
Men	Allowance
Aged 19–65 years	1000mg/day
65+ years	1300mg/day

- <http://www.iofbonehealth.org/calcium-calculator>



# Prevention of Osteoporosis

- **Vitamin D** plays a vital role in bone health – without it calcium, which is required for strong and healthy bones cannot be absorbed.
- Sunlight exposure is probably the most important source of Vitamin D and people should aim to expose skin to natural sunlight to achieve requirements. Diet can provide vitamin D and this may be particularly important for people not frequently exposed to sunlight. The richest sources of dietary vitamin D include:
  - Oily fish
  - fish liver oil
  - Liver
  - Eggs
  - Milks
  - Spreads

# Prevention of Osteoporosis

**The recommended daily\* vitamin D intake is:**

## **Women and Men**

- 51 to 65 years                      400 IU/day
- 65+ years                            600 IU/day

## **Calcium and Vitamin D Supplementation**

- Supplementation with calcium and vitamin D may be necessary for people who do not get outdoors much or who have restricted exposure to sunlight or who have a restricted diet. Older frail people may have insufficient exposure to sunlight and a low dietary intake thus decreasing vitamin D levels in the blood.
- **Calcium and Vitamin D supplements are only necessary:**
- If a person is not getting adequate amounts of Calcium via diet or Vitamin D via diet and exposure to sunlight
- If a person is unable to absorb sufficient calcium and Vitamin D

# Prevention of Osteoporosis

- **Protein**

- Protein is important for muscle and bone health. European guidance for the diagnosis and management of osteoporosis in postmenopausal women recommends a daily intake of at least 1g/kg body weight of protein for all women aged over 50 years (Rizzoli et al, 2014). So if a person weighs 65kg that means eating a minimum of 65g of protein.

- **Sources of protein**

- Lean red meat, Chicken, Hummus, Kidney beans, Lentils, Salmon
- There are two other factors to consider in a person's diet; alcohol and caffeine

- **Alcohol**

- Excessive alcohol intake can increase loss of calcium from bone. The Department of Health and Children recommend not more than 14 units per week for women and 21 units for men. No more than 3-4 units should be taken in any one day. People should try to have a few alcohol free days every week.

# Prevention of Osteoporosis

## **Caffeine**

- Caffeine can increase the amount of calcium lost from a person's body. Daily intake of coffee (not more than 3 cups) and high caffeine drinks (e.g. cola) should be limited.

## **Smoking**

- Give up smoking!

## **Exercise for Bone Health**

Exercise is important in promoting bone health. The overall goal is to prevent a fracture and this can be achieved by:

- Building bone or slowing down bone loss
- Preventing falls

# Prevention of Osteoporosis

## Key points for bone building:

- To build bone, or slow down the rate of bone loss, exercises which load bones are necessary.
- Bones can be loaded by impact exercise such as jogging, skipping, and jumping for the hips and spine or taking load through the arms.
- Resistance training using weights, resistance machines or elastic band/tubing will also improve bone health.
- The best way of improving bone health through exercise is by performing a structured mixed loading programme consisting of resistance training and impact such as jumping, jogging, step training and walking (Howe, 2011).

***Tips for Bone Health (Appendix 5)***



# Who needs to be screened for osteoporosis by DXA?

- A DXA scan is recommended, generally, for people who are at high risk of osteoporosis (see risk factors above, then a DXA is not necessary).

## **What is DXA?**

- A bone density scan called a DXA scan is used to measure the density of bones. The letters DXA stand for: **D**ual-energy **X**-ray **A**bsorptiometry. This test is currently the most accurate and reliable means of assessing the strength of one's bones and risk of fracture. It is a simple painless procedure that uses very low doses of radiation.

# Treatment options for Osteopaenia /Osteoporosis



# Treatment with Osteoporosis Medication (National Osteoporosis Foundation)

- There are many things to think about when choosing the right osteoporosis medicine. You and your healthcare provider may want to look at:
- **Your gender.** Calcitonin (Fortical® and Miacalcin®), estrogen and hormone therapies, and estrogen agonists/antagonists (Evista®) are only approved for women. Some bisphosphonates ®) are approved for both men and women.
- **Your age.** Some medicines may be more appropriate for younger post-menopausal women while others are more appropriate for older women.
- In general, osteoporosis medicines are not recommended for pre-menopausal women. Certain osteoporosis medicines are approved for the prevention and treatment of osteoporosis in pre-menopausal women, as a result of the long-term use of steroid medicines.

# Treatment with Osteoporosis Medication (National Osteoporosis Foundation)

## **How severe your osteoporosis is.**

- Osteoporosis medicines work in different ways. A person with more severe bone loss or a broken bone may take a different medicine than a person with less bone loss. (Forteo®).

## **Personal preference.**

- Do you prefer a pill, liquid or IV medicine or one that is given as a nasal spray or an injection? Does it work better for you to take your medicine every day, once a week, once a month, several times a year or even once a year?

# Secondary Prevention Following Fragility Fracture

## Secondary Prevention-Following Fragility Fracture

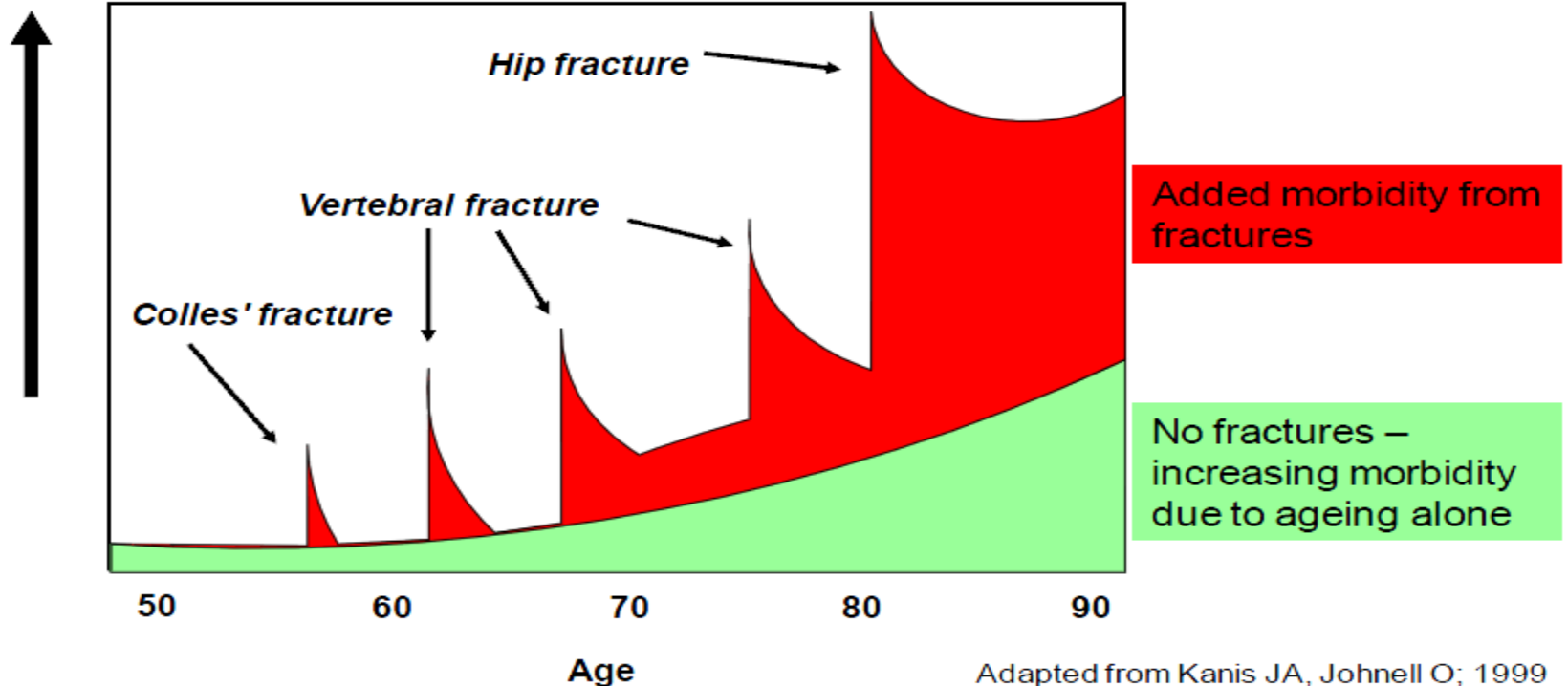
- There is now a growing body of evidence on the effectiveness of secondary prevention using anti-resorptive drugs to improve bone quality.
- One of the most important initiatives for minimising the burden of osteoporosis related fractures is to identify people who have sustained a minimal trauma fracture early and initiate appropriate treatments (Department of Health, Western Australia: Osteoporosis Model of Care. Perth: Health Networks Branch, Department of Health, Western Australia; 2011.page 16).



# Fragility Fracture Career

## The fragility fracture 'career' - a chronic disease

Morbidity  
Dependence



# Fracture Liaison Service

## Development of a Fracture Liaison Service

- Fracture Liaison Services, commonly known as FLS, are co-ordinator based secondary fracture prevention services implemented by health care systems for the treatment of osteoporotic patients.

## The FLS is designed to:

- Close the care gap for fracture patients who are currently never offered screening and/or treatment for osteoporosis.
- Enhance communication between health care providers by providing a care pathway for the treatment of fragility fracture patients.

# Resources

- Irish Osteoporosis Society - [www.irishosteoporosis.ie](http://www.irishosteoporosis.ie)
- National Osteoporosis Foundation – [www.nof.org](http://www.nof.org)
- Osteoporosis (UK) [www.nos.org.uk](http://www.nos.org.uk)
- Strategy to Prevent Falls and Fracture in Irelands Ageing Population, 2008 – [www.hse.ie](http://www.hse.ie)
- Osteoporosis Poster – [www.bonehealth.co](http://www.bonehealth.co)
- Eat Well for Bone Health Booklet (Paula Mee, 2014) – [www.paulamee.com](http://www.paulamee.com)
- Access <http://www.iofbonehealth.org/calcium-calculator> for a calcium calculator

# List of Appendices with Sample Tools

- [Appendix 1: I had a fall poster](#)
- [Appendix 2: Level 1 Screen](#)
- [Appendix 3: Level 2: Multi-factorial Falls Risk Assessment](#)
- [Appendix 4: Falls Safety Cross](#)
- [Appendix 5: Quick Tips for Healthy Bones](#)
- [Appendix 6: Tips for Healthy Ageing](#)
- [Appendix 7: Get Up and Go Test](#)
- [Appendix 8: Multi factorial Assessment and Intervention](#)
- [Appendix 9: Sample Policy Acute setting](#)
- [Appendix 10: Intentional Rounding Chart](#)
- [Appendix 11: Safety Alert Form](#)
- [Appendix 12: Pathway for care of older person Post Fall](#)
- [Appendix 13: Post Falls assessment management pathway](#)
- [Appendix 14: Nursing Assessment prior to ringing the G.P](#)