National Osteoporosis Society

OSTEOPOROSIS FACTS AND FIGURES V1.1

Osteoporosis is a chronic disease with late clinical consequences. For this reason it has been termed the "silent epidemic" since there are no associated symptoms or warning signs prior to fracture. Osteoporosis is usually a disease of older age, although it can affect people of any age. Bones are influenced by genetics and lifestyle and bone mass peaks by the time we are in our mid-twenties. This highlights the importance of beginning to take positive healthy lifestyle steps early in life to decrease the potentially disabling effects of osteoporotic fractures in later years.

Did you know that …

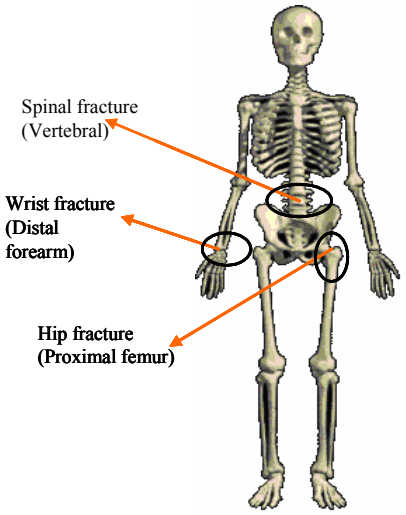
- The NOS is the biggest society representing people with or at risk from osteoporosis in the UK

There are more than 1.14 million postmenopausal women who have been diagnosed with osteoporosis after a DXA scan of the hip in England and Wales [12]

- One in two women and one in five men will suffer a fracture after the age of 50 [10]
- The lifetime risk of fracture in women at age 50 years is greater than the risk of breast cancer or cardiovascular disease[13]
- There are nearly 20 million people aged 50 years and over in the UK, which is one third of the total population [16]. By 2020 this will have increased to 25 million [17]

Over the last 200 years life expectancy in the UK has doubled and it continues to increase by 2 years in every decade; that is equivalent to12 minutes in every hour [2]*. As the population ages the prevalence of osteoporosis will increase* [12]

- A women at age 50 can expect to live for a further 32.2 years while a man at the same age is expected to live for a further 28.5 years [2]
- Within Europe, hip fracture rates vary between 2 and 3 fold between countries [18]. This variation may be related to differences in lifestyle and environment.
- The incidence of hip fracture doubled in the 27 years up to 1983 [19]
- On the basis of current trends, hip fracture rates in the UK may increase from approximately 46,000 in 1985 to 117,000 in 2016 [20]



- *Figure* 1: Illustrates the most common osteoporotic fracture sites. Over 60,000 hip, 50,000 wrist and 120,000 vertebral fractures occur each year in the UK [10, 21, 22]

- As few as 13 % of patients who have had a moderate to severe vertebral fracture in the thoracic (chest) region receive a diagnosis when they have a chest X-ray as part of their normal medical care [23]
- Drug treatments have been shown to reduce the risk of fractures by up to 50 % [24-30]
- Treatments work by either inhibiting bone resorption (bisphosphonates, SERMs), stimulating bone formation (parathyroid hormone) or by a combination of mechanisms which have yet to be fully elucidated (strontium ranelate)
- The total number of women prescribed medication for osteoporosis in the UK is approximately 480,000 [31]. Despite this:
  - One year after an osteoporotic fracture, the majority of patients are not prescribed any pharmaceutical agents for the prevention of a further fracture [32, 33]
  - 40 % of people diagnosed with osteoporotic fractures in the spine remain untreated [34]
  - After 5 years of glucocorticoid treatment only 2.4 % of people are prescribed bisphosphonates for prevention of osteoporosis [8]
- The NOS estimates that in 2004 there were 216 axial DXA scanners in England. 158 of these scanners are in the NHS while 58 are located in private settings. The average waiting time for an NHS scan was approximately 17 weeks (median: 12 , range: 2-69)

Less than 1/3 of patients who have had a low trauma fracture are referred for a DXA scan; more than 35 % of those that are scanned have osteoporosis [9]

- Approximately 13,300 DXA scans are required per million population [35]. The NOS estimates that each of the NHS scanners currently average 38 scans per week for 48 weeks a year. This suggests a deficit of up to 376,800 scans per year

So what is the cost of osteoporosis?

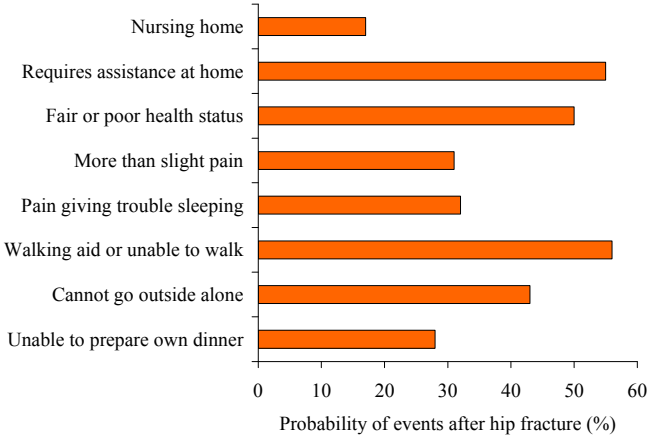
OSTEOPOROTIC FRACTURES CAN HAVE HUGE PERSONAL COSTS….

Hip Fracture

- For women, the 1 in 6 lifetime risk of sustaining a hip fracture is greater than the 1 in 9 risk of developing breast cancer [36]
- 80 % of older women would rather die than experience the reduced quality of life that follows a serious hip fracture and subsequent admission to a nursing home [37]

Hip fractures cause more than 1150 premature deaths each month [4]

- UK based research has shown mortality of 18 % at 3 months following a hip fracture [38]. In total approximately 14,000 people die each year following a hip fracture in the UK [4]



- *Figure 2:* During the first 12 months after a hip fracture over half of people who walked unaided prior to the fracture will be unable to walk independently. 55 % of patients will require assistance at home and a third will experience difficulty sleeping due to pain [39]

Fear of falling can provide a significant limitation to daily activities [5]

- 12 months after a hip fracture 60 % of patients are limited in at least one class I activity of daily living (e.g. feeding, dressing, toileting) and 80 % are unable to do one or more class II activities of daily living (e.g. shopping, gardening, climbing stairs) [40]

Vertebral Fracture

- Only a quarter of vertebral fractures are due to falls, most are caused by routine, everyday activities such as bending or lifting light loads [41, 42]. In contrast over 90 % of hip fractures are falls related [43]
- 40 % of patients diagnosed with a vertebral fracture will have constant pain and the majority will have difficulties with activities of daily living [44]
- Cumulative loss of quality of life from a diagnosed vertebral fracture is substantial and has been estimated as about one half of that due to a hip fracture [45]

A woman with one or more vertebral fractures has a 4.4 fold higher mortality rate than a woman who has no vertebral fractures [11]

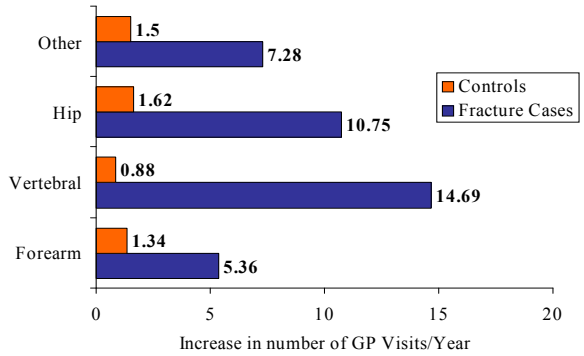
- Multiple fractures of the spinal bones cause progressive loss of height, kyphosis and severe back pain in the early stages. The loss of mobility that results can exacerbate underlying osteoporosis [46]

…. AND INCUR MASSIVE COSTS TO THE NHS

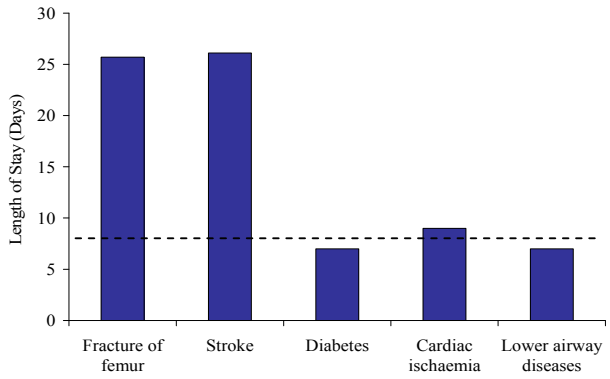
- The combined cost of hospital and social care for patients with a hip fracture amounts to more than £1.73 billion per year in the UK [47]. This is very similar to the £1.75 billion that coronary heart disease costs the healthcare system each year [48]

The total cost of all fractures each year in the UK is the same as the predicted cost of London hosting the 2012 Olympics

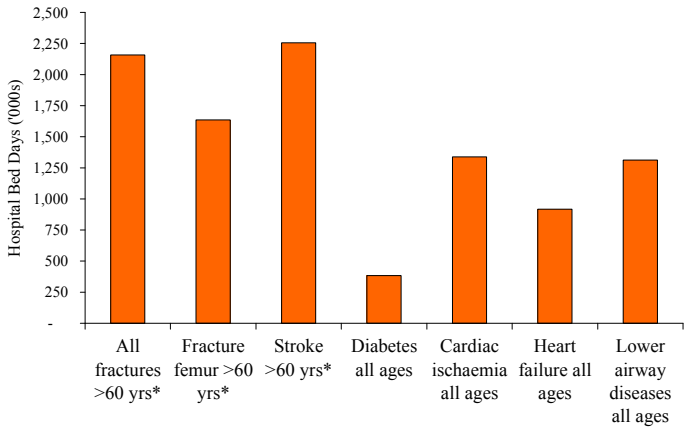
- The cost of treating all osteoporotic fractures in post-menopausal women has been predicted to increase to more than £2.1 billion by 2020 [49]
- In 2001, the combined NHS and social care costs for a single hip fracture in the UK were estimated to be £20,000 [47]. Recent evidence suggests that each hip fracture costs the NHS alone £12,137 over £7,000 more than the figure used in earlier estimates [50]
- *Figure 3:* Fractures can result in more than 13 extra consultations with the GP in the year following the injury [51]



- Hip fracture patients occupy more than 1 in 5 orthopaedic beds [52]



- *Figure 4:* The average length of stay in hospital for people with a fracture of the femur is 26 days, compared with an average of 7.9 days for all other diseases [53]

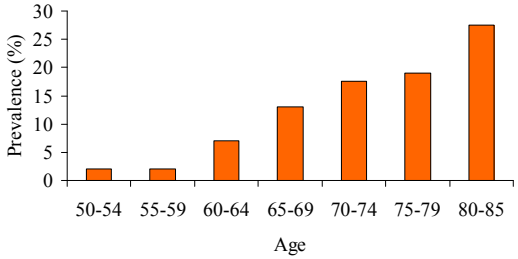


- *Figure 5:* Each year fractures in patients aged 60 years and over account for more than 2 million hospital bed days in England [53]

Factors Relating to Osteoporosis

Genetics and Age

- Parental history of fracture (particularly a family history of hip fracture after the age of 50) increases an individual's risk of experiencing a fracture [54]
- Twin and family studies suggest that osteoporosis has a large genetic component [55, 56]
- Changes in age are approximately 7-fold more important than changes in BMD in predicting fracture risk [57]



- *Figure 6:* Prevalence of osteoporosis in women increases markedly with age after the menopause, from 2 % at 50 years of age rising to over 25 % at 80 years [12]

Bone Mineral Density (BMD)

- Measurements of BMD are widely recognised as being effective at identifying patients who are at a higher than average risk of fracture [14, 58, 59]

The ability of BMD to predict fracture is comparable to the use of blood pressure to predict stroke and substantially better than the use of serum cholesterol to predict myocardial infarction [14, 15]

- 75-90 % of the variance in bone strength is related to BMD [60]. Risk of fracture increases by around 1.5 times for every standard deviation loss of BMD [13, 61]
- The causes of osteoporotic fractures are multi-factorial, thus not all patients identified by BMD as high risk will actually suffer fractures while a proportion of individuals thought to be at low risk will sustain a fracture [61, 62]

Bone mass at 70 is equally as dependent on the peak bone mass attained in the 20's as the amount of bone loss experienced in later life [6]

Physical Activity

- Bone loss generally occurs at 1-2 % per month during prolonged periods of bed rest [63]
- Professional tennis players may have more than 25 % higher bone density in their serving arm compared to their non serving arm demonstrating that the effect of physical exercise is both site and force specific [64]
- The health benefits of exercise have been demonstrated in both sexes up to the age of 90 years [65]. For optimal protection, activity should be maintained throughout life. For post menopausal women the most effective form of exercise to strengthen bones is impact exercise [66], including walking [67]
- Exercise can improve mood, reduce anxiety and enhance self-perception [68]
- Physical activity can delay the progression of osteoporosis by slowing the rate at which bone mineral density is reduced from the late 20's onwards [69]

More than 1 in 3 adults (1 in 2 over 50 year olds) are currently inactive, that is, they participate in less than 30 minutes of activity per week [3]

- Balance and strength exercises can help to reduce the risk of falling and the number of falls experienced [70]

- Active women, who walk for at least 6 hours per week, have a 55 % reduction in risk of hip fracture (41 % in women who walk for 4 hours a week) compared to sedentary women who walk for less than 1 hour per week [71]

Nutrition

- A balanced diet provides all the vitamins and minerals required to develop and maintain strong bones. The recommended daily intake (RDI) for calcium in adults is 700 mg although more may be required for people with osteoporosis [72]

- No RDI for vitamin D is set for healthy young adults in the UK. Most of the requirement for vitamin D is obtained by the action of the sunlight on the skin during the summer months. Above the age of 65 there is a 4 fold decrease in the capacity of the skin to produce vitamin D. In these people the RDI is 10 µg/day (400 IU). Dietary sources include oily fish, eggs, margarine and some fortified cereals [72]

- 1 in 3 people living in care homes are vitamin D deficient [73]

- Supplementation with calcium and vitamin D in institutionalised elderly women can reduce the risk of hip and other non-vertebral fractures [74]

- There is no evidence that calcium and vitamin D supplementation alone can prevent fractures in community dwelling individuals [75, 76]

Falls

- Around 30 % of over 65 year olds living in the community will fall each year (increasing to 42 % in the over 75 age group), while over 60 % of people in care homes fall each year [77-79]

Falls are a major cause of disability and the leading cause of mortality due to injury in people aged over 75 in the UK [1]

- 1.22 million people were victims of a fall in their home in 2002. Of the reported falls 244,000 were experienced by people aged over 75 and 1 in 3 resulted in a fracture [80]

- 20 % of fall incidents require medical attention [81]

Previous Fracture

- Women with one existing vertebral fracture have a five fold greater risk of further vertebral fracture [82]

20 % of post menopausal women who have had a new vertebral fracture will experience a second one within a year [7]

- Adults who sustain a fracture are over 50 % more likely to have another one of a different type [83, 84]. In women over 35 years the relative risk of hip fracture increases significantly after a wrist fracture [85]

Glucocorticoids

- In patients prescribed 7.5mg, or more, prednisolone per day, the risk of non-vertebral fractures increases by over 50 % in the first year of treatment [86]

- Even low doses of oral glucocorticoids have been linked with increased risk of vertebral fracture [87]

There are as many as 350,000 people in the UK at risk of developing osteoporotic fractures due to glucocorticoid use [8]

Alcohol and Smoking

- An alcohol intake of more than 2 units per day increases the risk of an osteoporotic fracture [88]

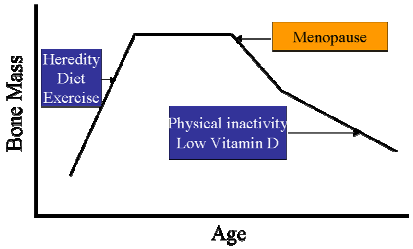
- 40 % of men and 23 % of women in Britain consume more than the recommended daily alcohol benchmark – that is more than 4 units on the heaviest drinking day for men and 3 units for women [89]

- Smokers have a significantly increased risk of having a fracture. Previous smoking also results in increased fracture risk, but lower than that of current smokers [90]

- In 2002, 1 in 10 young people in England aged 11-15 were regular smokers [91]

Menopause

- *Figure 7:* Graph to show the changes in bone mass with age in women



- During the menopause the ovaries produce lower levels of the female hormone oestrogen, which is essential for bone health. After the menopause the rate of bone loss that starts in the 30's accelerates, increasing the risk of osteoporosis [92]

- The average age at which women in the UK reach the menopause is 51 years. Premature menopause results in an early acceleration of bone loss and is a risk factor for osteoporosis in later life

- Hysterectomy with removal of the ovaries (bilateral oophorectomy) causes an instant menopause and is therefore associated with an increased risk of osteoporosis in premenopausal women [93]

Published: 5th January 2006
Last Revised: 7th February 2006

Glossary of Terms

Glucocorticoids…….A d*rug prescribed to reduce inflammation in conditions such as asthma or arthritis. Also known as "steroids"*

Kyphosis……....*A curvature of the spine, which, when looking at a side view of the spine, is in a backwards direction. Generally, kyphosis means an abnormal rounding forward of the shoulders and upper back.*

Lifetime risk……....*Risk of an event occurring within the remaining predicted lifetime*

Low Trauma Fracture….*A fracture which results from a simple fall from standing height or less*

Myocardial Infarction.....*Death of the myocardium (heart muscle) resulting from interruption of blood supply to that area of the myocardium, often referred to as a heart attack*

Relative Risk…….*The ratio of the risk of a given outcome in one group of subjects compared to another group. In a study comparing 2 treatments, a relative risk of 2 would indicate that patients receiving one of the treatments had twice the risk of an undesirable outcome (e.g. fracture) than those receiving the other treatment.*

Acknowledgements

The National Osteoporosis Society would like to thank the following people for suggestions of literature, specific advice and general comments on drafts of this document

Dr. Jonathan Bayly, Dr. Terry O'Neill, Prof. David Reid, Prof. Cyrus Cooper, Prof David Torgerson

We would also like to thank members of the National Osteoporosis Society Scientific Advisory Group who commented on facts related to their fields of expertise

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