



International Osteoporosis Foundation

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# Invest in your bones

# Osteoporosis in Men

## The 'silent epidemic' strikes men too

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Written on behalf of the IOF Committee of Scientific Advisors by Ego Seeman, MD, Professor of Medicine, University of Melbourne, Austin Hospital, Melbourne, Australia. Prof. Seeman is an IOF International Board member and editor of *Progress in Osteoporosis*, he is also president of the Australian and New Zealand Bone and Mineral Society.



Old Man at Twilight / Viejo crepuscular, 1918, Salvador Dalí

# IOF and Osteoporosis

**The International Osteoporosis Foundation (IOF)** is a worldwide organization dedicated to the fight against osteoporosis. It brings together scientists, physicians, patient societies and corporate partners. Working with its more than 165 member societies in over 80 countries, territories and regions, and other healthcare-related organizations around the world, IOF encourages awareness and prevention, early detection and improved treatment of osteoporosis.

**Osteoporosis**, in which the bones become porous and break easily, is one of the world's most common and debilitating diseases. The result: pain, loss of movement, inability to perform daily chores, and in many cases, death. One out of three women over 50 will experience osteoporotic fractures, as will one out of five men<sup>1,2,3</sup>. Unfortunately, the identification of people at risk is far from being a standard practice. Osteoporosis can, to a certain extent, be prevented, it can be easily diagnosed and effective treatments are available.

Find out if you are at risk, take the IOF One Minute Risk Test at: [www.osteofound.org](http://www.osteofound.org)  
The IOF Risk Test is also included in Appendix 1 of this report.



The IOF 'Invest in your bones' publications are written in support of IOF member activities around the world and are translated into many languages.

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# Foreword

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*Why am I walking through the snow to study osteoporosis in men?*

*More than 20 years ago, my mentor Professor B.L. Riggs suggested that time in the winter evenings should not be wasted for fear that one day Time might waste me. He felt that I should not miss the opportunity to see how the snow glistened in the starry night and how the crisp stillness listened to my steps crunching the snow underfoot as I walked to the medical records department of the Mayo Clinic to look through several hundred files of men with fractures.*

*What sort of punishment is this I wondered? I've come to study osteoporosis, a disease of women, not of men! Why was I being subjected to this irrelevant task? Was this a test of my character, a trial by ice to see whether I was worthy? Well, this 'punishment' was of course, like many initiations under the guidance of a Mentor, a Shogun, a Master, one of the most rewarding aspects of my career in clinical research in osteoporosis.*

*We now know that this disease does not just occur in women. It does not show any sex discrimination, it is an equal opportunity disease. Although it affects men less commonly than women, men who do sustain fractures may suffer more severely in terms of the quality and quantity of their lives than when fractures occur in women<sup>4,5</sup>. Men and women lose about seven years of life after a hip fracture but this amount is a greater proportion of the number of years of life left in men than women.*

*Unfortunately, most men, most doctors and most governments are not aware of the problem of osteoporosis in men. When a male patient enters the doctor's office, the doctor thinks of heart disease, cholesterol problems, blood pressure and strokes, sometimes prostate, lung or bowel cancer, but osteoporosis and fractures – never or rarely.*

*Lack of female hormone, estrogen, at the time of menopause causes rapid thinning and loss of bone in mid-life in women. Men also have a decline in male hormone levels, testosterone, but this occurs slowly across the whole of adult life. By old age (over 65 years of age), about 30% of men have lower than normal levels of male hormone. This lack of male hormone in men causes bone thinning as well as loss of sex drive.*

*Males are often unwilling to mention to the doctor that, well, things are not like they used to be, and if the doctor does not ask, this important problem in men will be missed. Yet both bone thinning and the loss of sex drive can be prevented by the administration of male hormone. This deficiency can be identified by a simple blood test.*

A handwritten signature in black ink, appearing to read 'Ego Seeman'.

Melbourne, Australia  
Prof. Ego Seeman

# Invest in your bones

## Osteoporosis in Men

### The 'silent epidemic' strikes men too

## Introduction

This publication is the fourth in a series of popular publications on osteoporosis, released on World Osteoporosis Day, October 20. It aims to highlight the relatively ignored issue of osteoporosis in men, show how men's bones differ from women's, look at challenges in awareness, diagnosis and treatment, and suggest what steps should be taken so that we can prevent fractures in men. Real-life stories, sharing the experiences of issues men face in dealing with their osteoporosis, complete the report.

Traditionally thought of as a women's disease, in the last decade the notion that bone loss is also an inevitable consequence of ageing in men has finally emerged.

**Although fragility fractures are less common in men than in women, when they occur, these fractures can be associated with higher morbidity and death than in women<sup>4</sup>.**



Fracture incidence varies markedly from country to country in men and women, but the burden of fractures is growing because life expectancy for both men and women is increasing. There will be more elderly people in the world predisposed to having fractures. The result will be diminished independence and mobility for an ever-growing number of people; for some it will be the cause of death. As well as the human distress, escalating direct and indirect healthcare costs will bring further burden on already stretched healthcare budgets.

We can easily improve the situation for men and women by increasing awareness of the problem of osteoporosis and by taking appropriate steps in fracture prevention. Osteoporosis can be diagnosed and treatment is available. Individuals, general medical practitioners, specialists such as rheumatologists, urologists, radiologists, orthopedic surgeons, nurses and healthcare policy-makers, all have important roles to play.

**Overall, one in five men over the age of 50 will have an osteoporosis-related fracture in their remaining lifetime<sup>1,2,3</sup>. This varies by country; a study in Australia anticipates one in three men over 60 will suffer a fracture due to osteoporosis<sup>6</sup>.**

# The problem of fractures in men

Greater awareness of the consequences of the menopause to the quality of life in women has emerged during the last half of the 20th century. However, it is only in the last 20-30 years that the problem of osteoporosis and fractures has received any attention. Even now, most doctors still remain uninformed regarding the serious implications of these fractures.

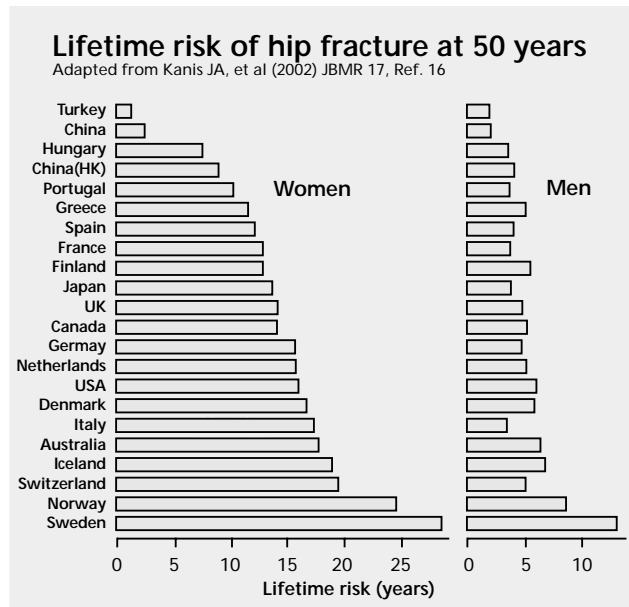
Most women with fractures receive no tests to check their bone density, no blood tests to check for lack of vitamins that can cause bones to become brittle and receive no treatment, even though treatments are available.

Today, the lack of awareness of osteoporosis and fractures as a disease in men is similar to the lack of awareness in women 50 years ago.

Men do not realize that the 'silent epidemic' of osteoporosis affects them and that their bones are becoming thinner and more porous and brittle during adult life.

## ■ The size of the problem

Over a man's lifetime just under half of the bone mass achieved during growth to young adulthood is lost. This loss of bone is the same as the amount lost in



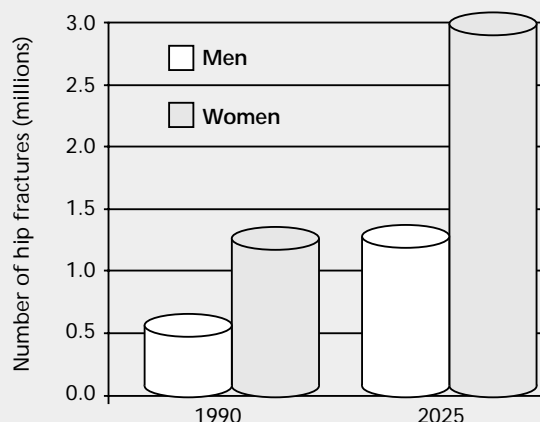
women but men compensate better by laying down more new bone on the outer surface of the bone as part of the natural process of bone remodeling<sup>7</sup>. However, this addition of new bone on the outside surface does not entirely compensate for the loss of bone on its inside surface and so about one in five men over 50<sup>1, 2, 3</sup> will have a bone fracture that reduces the quality of their lives, and reduces the length of their lives<sup>5</sup>.

The lifetime risk of a man suffering an osteoporotic fracture is greater than his likelihood of developing prostate cancer<sup>17</sup>.

About one in every four to five hip fractures in people over 50 occurs in men<sup>9</sup>. Apart from lack of male hormone, bone thinning is a problem in men who smoke cigarettes and take alcohol in excess. Many illnesses that require cortisone treatment such as rheumatoid arthritis and asthma can be complicated by osteoporosis and fractures as a secondary effect of the medication, in men as well as in women.

By 2025, number of hip fractures in men will equal number of hip fractures in women in 1990

Adapted from Cooper C, et al, Ref. 9





Because we live longer and the global population is increasing, the total number of hip fractures in men in 2025 will be similar to that presently found in women<sup>9</sup>. By 2025 the hospital wards will be filled with greater numbers of hip fractures in both sexes. It is not difficult to appreciate that this will produce a huge health burden on the community.

**In Sweden, osteoporotic fractures in men account for more hospital bed days than those due to prostate cancer<sup>8</sup>.**

Fractures of the spine occur more commonly in men under 50 than in women, perhaps because trauma is more frequently involved. In older men, the risk of spine fracture is about half that of women but even so, this is still common and X-ray surveys suggest that 20% to 30% of all men over 65 have a spine fracture<sup>7</sup>.

## ■ Reduced life span in men

The shortening of life span after a fracture is probably partly due to the fact than men have other illnesses, so the fracture plus other illnesses 'break the camel's back' (Fig. 1, p. 15). When men with hip fractures have no other illnesses their life expectancy is no different to that of healthy men. But when there is other illness present the life span is reduced in men with and without hip fractures, but more reduced in men with hip fractures<sup>5</sup>.

## ■ ... and the cost to society

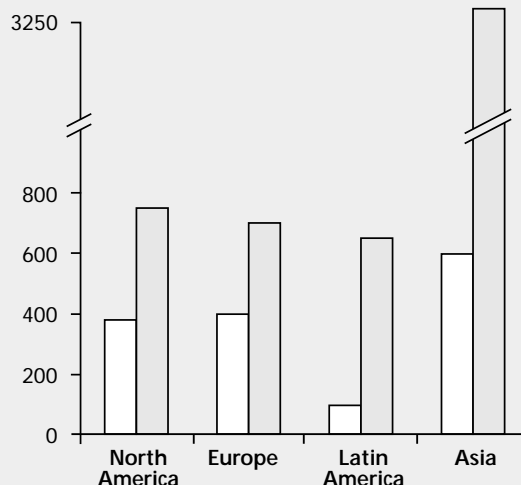
Osteoporosis-related fractures are expensive both in terms of human distress and in cost of care. By 2050, 6.4 million people will suffer a hip fracture every year, with 51% of these fractures in Asia<sup>9</sup>. In China, one in six men (16%) has one or more vertebral fractures<sup>10</sup>. In the US and Europe, one in every four or five hip fractures occur in men<sup>9</sup>. For men and women, it is estimated that in the US, direct expenditures (hospitals and nursing homes) for osteoporotic and associated fractures in 2001 was \$17 billion, and the cost is rising<sup>11</sup>. In Europe in 2000, the number of osteoporotic fractures was estimated at 3.79 million of which 0.89 million were hip fractures (179,000 hip fractures in men and 711,000 in women). The total direct costs were estimated at approximately \$38.6 billion (euro 31.5/£21.2 billion) and these are expected to increase to approximately \$93.2 billion (euro 76/£51.1 billion) in 2050 based on the expected increase in the number of elderly in Europe<sup>12</sup>.

**Hip fractures account for a larger proportion of all fracture expenditures in men than women (73% versus 61%). Overall, 23% of the hip fracture expenditure occurs in men<sup>4</sup>.**

### Projected burden of osteoporotic hip fractures for men and women, worldwide

Estimated n° of hip fractures (1000s)

□ 1990  
□ 2050



Total n° of hip fractures:  
1990 = 1.66 million;  
2050 = 6.26 million

Adapted from Cooper C., et al,  
*Osteoporosis Int.* 2:285-289, 1992, Ref. 9

# How do men's bones differ from women's bones?

During childhood and adolescence our bones increase in length and width to reach their adult peak density at about 20-30. After this, they start to become thinner very slowly. Certain factors can accelerate the rate at which bone mass is lost, leading to porosity and thinning and the disease known as osteoporosis.

Men with spine fractures have smaller bones, the shell of the bone is thin and porous, the honeycomb or sponge-like bone that really functions like a spring or shock absorber is thinned, the honeycomb connections making the bone 'spring-like' are lost, so that when a force is placed on the bone it does not 'give' but rather cracks under the load and may collapse completely, resulting in a fracture of the spine. If fractures occur



there may be severe pain, loss of height, and severe curvature of the spine. If there is severe curvature this can impair the function of the lungs and impair normal breathing.

This porosity and thinning of bone originates in two ways. First, during growth it is possible that lack of exercise, insufficient calcium in the diet, smoking, excess alcohol, inappropriate steroid use, delayed puberty and other factors might prevent the skeleton from developing its full potential size and bone structure. In addition, we know that the healthy sons of men with osteoporotic fractures have thinner bones than other young men, so genetic factors, that we still don't understand, can also determine whether one man will develop a smaller skeleton with a lower bone mass than another man. If we could identify what genes determine this we might be able to study how to remedy the problem. At this time, we have not identified any genes that tell us which person will have a smaller or larger bone mass.

So, partly, the lack of bone in old age is because some men develop a smaller skeleton with less bone mass. This suggests that the prevention of bone brittleness requires attention to skeletal health throughout the whole of life – during growth as well as during ageing.

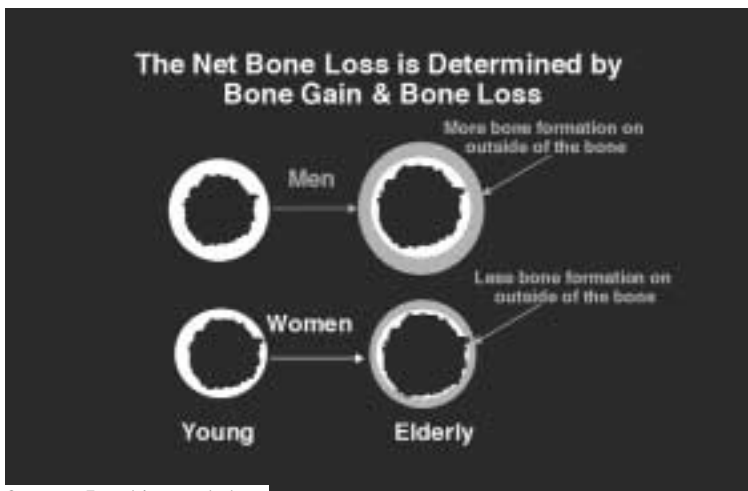
Secondly, during ageing, bones become thinner in men just as they do in women; the reasons for this thinning process have been less studied in men than in women.

**Both lifestyle and genetic factors have a role in determining bone density and strength. Prevention of brittleness requires attention to skeletal health during growth as well as during aging.**

## ■ Bone – a living tissue

Bone is a remarkable tissue with the same strength as cast iron, while remaining as light as wood. It can adapt to its functional demands and repair itself. Bone is made up of two major types, trabecular bone (spongy or cancellous) and cortical bone – the part of the bone that forms the outside shaft. Trabecular bone gives supporting strength to the ends of weight-bearing bone.

The skeleton has a way of rejuvenating itself throughout the whole of life, and old parts of bone can be replaced with new bone. It seems that when old and damaged bone is removed, bone cells that make new bone, known as osteoblasts, come in and replace it. However, when the new bone is deposited, the amount is just a little less than the amount of bone removed in the remodelling process. This means that there is a little less bone each time the renovation takes place. Over many years the skeletal mass becomes less and less. In men, this



Seeman E., with permission

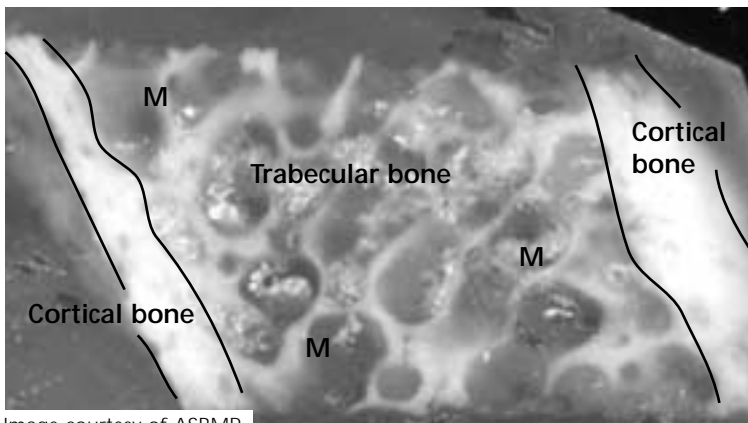


Image courtesy of ASBMR

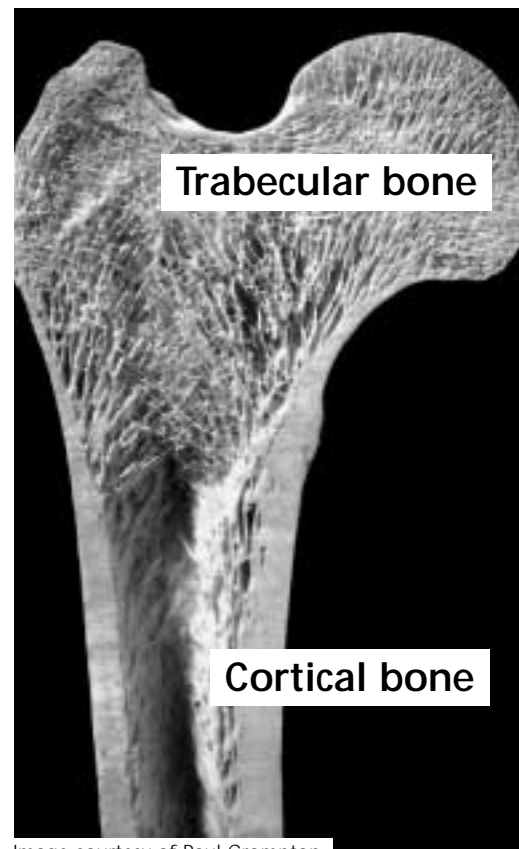


Image courtesy of Paul Crompton

thinning process is less severe compared to that seen in women. In women complete plates of bone are removed resulting in loss of honeycomb connections (Fig. 2, p. 15). In men, there is thinning but the connections from one plate to another are better maintained.

Another important difference in men and women probably explains why fractures occur less commonly in men. At the same time as bone is being lost on the inside of the bone adjacent to the marrow cavity, there is new bone being deposited, like a coat of paint on the outside of the bone. The amount of new bone deposited on the outside surface is about three times more in men than in women. It is like men getting three new coats of paint while women only get one (See drawing at top left). This increases bone size, and so maintains the strength of the wider bone as well as offsetting bone loss from the inside of the bone.

## ■ The impact of hormones and vitamins

Many hormones and vitamins look after the skeleton during ageing. Two important hormones are the male hormone, testosterone, and the female hormone, estrogen. Estrogen is present in much lower amounts in men than in women but it is also important in men's health. As the levels of both of these hormones decline during ageing and become half those seen in young men, bone is lost, becoming brittle, just as in women. Lack of estrogen in men is likely to be responsible for the decline in trabecular bone density, as in women. Why men seem to be able to deposit more bone on the outside of the bone than do women is not known. It may be that they have more male hormone, testosterone, but this has not been proven.

In men and women over 65, the intestine cannot absorb calcium from the diet as well as in youth. As a result our bodies produce a hormone that makes the bone give up its calcium into the blood stream. Known as the parathyroid hormone, its presence increases in elderly men and women, and further contributes to the bone thinning process in old age. One of the reasons calcium tablets are given to the elderly is to try to overcome the low calcium absorption problem and in turn bring a halt to the high level of parathyroid hormone which eats away at bone.



# Challenges in diagnosis and treatment

Often the only time a patient realizes he has a problem is when he breaks a bone – and even then the diagnosis of osteoporosis is often overlooked by doctors unless they call for a bone mineral density (BMD) test.

The best way of identifying men at high risk for fracture is to measure their bone mineral density. This non-intrusive and painless test is a scan that indicates bone strength and should be available for men worried about osteoporosis, just as a measurement of blood cholesterol or blood pressure helps us identify men at risk for heart disease and stroke. In general, a level of bone density that is around the lower limit in normal young men is recommended to be a 'cut-off value'. Any men with bone density below this lower limit should be considered as having osteoporosis and therefore should be considered for treatment.

However, it can happen that people are found to have a fragility fracture, even with a normal bone mineral density, in which case they still need to be treated immediately, especially in the case of vertebral fracture.

There are gender differences in determining risk of hip fractures. In aging women spinal fractures are a strong indicator of risk of hip fracture but in men a wrist fracture, also called a Colles' fracture, is a better indicator of later hip fracture.<sup>15</sup>

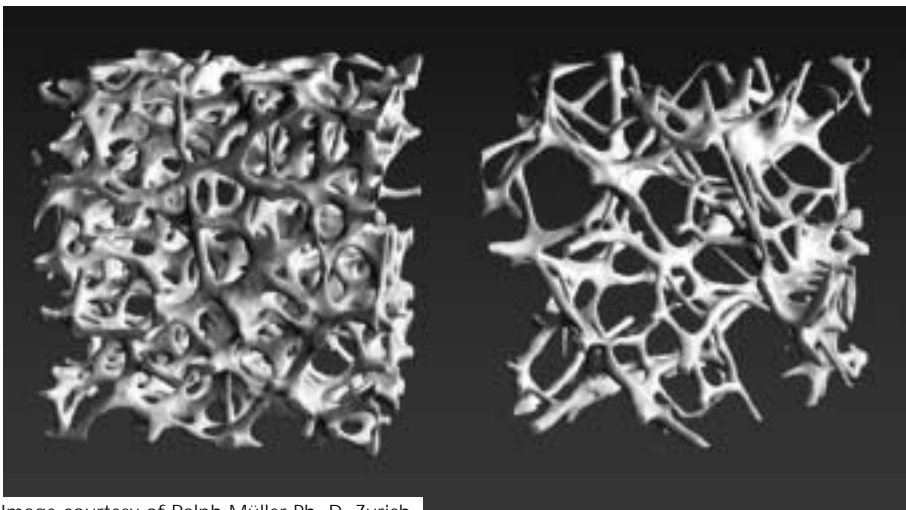
At a personal level, men and women can take the IOF One Minute Risk Test (see p. 14). The exercise helps people determine for themselves if they are at risk of osteoporosis and can serve as a starting point for discussion with a physician, who may then recommend a bone mineral test. The risk for hip (Fig. 3, p. 15)<sup>13</sup> or spine fracture at any level of bone density is similar in men and women. However, the reason fewer men than women have fractures is because at any age, there are fewer men with BMD below the fracture threshold, so fewer men are at risk for fracture than women (see Fig. 4, p. 15 for prevalence of osteoporosis and osteopenia in men and women). Also, men have a shorter average life span and fewer falls than women.

## ■ Fewer approved treatments for men than for women

Only a handful of osteoporosis treatments have been approved for use by men – the others have not been subjected to the lengthy and expensive clinical trials that are required.

Drugs have been less studied in men than in women with osteoporosis. At present the best studied drug for men is from the bisphosphonate drug group, alendronate. There is evidence also for other drugs such as risedronate and etidronate and the bone building drug parathyroid hormone, which makes new bone on the outside and inside surfaces of the bone, helping to reconstruct the skeleton and rejoin the disconnected trabeculae (struts and plates) in the spongy bone.

- Testosterone increases bone density in men with low levels of this male hormone.
- Calcium supplements have not been well studied in men but probably should be administered in men taking less than one gram of calcium daily.



Left: healthy bone,  
Right: osteoporotic bone

# So how shall we prevent the first fracture?

Osteoporosis is one of the more preventable diseases associated with ageing. Paying attention to skeletal health throughout life, from childhood onwards, is the most effective way of building and maintaining bone strength, thus decreasing bone loss and brittleness that can lead to the first fracture.

## ■ Role of the individual

Assess your risks and seek advice from your doctor. Diet, exercise, sex hormones, lifestyle and the use of certain medications are the major ways of maintaining and restoring bone health.

- **for the elderly:** learn about fall prevention programs including muscle strengthening through exercise and medical assessment including balance and vision; check for potential dangers in the home, such as poor lighting and slippery rugs. If osteoporosis has been diagnosed, consider protective garments such as hip protectors.

## Health problems in ageing men

- Heart disease – cholesterol**  
higher than 200 (US scale),  
or 5.2 mmol/litre, risk of stroke
- Blood pressure**  
higher than 150 over 100,  
risk of heart attack
- Prostate cancer**  
a prostate specific antigen greater  
than 10 indicates warning sign
- Osteoporosis – bone density**  
bone mineral density lower than  
-1 to -2.5 standard deviations (SD),  
risk of osteoporotic fracture

- **diet:** a balanced diet rich in the essential nutrients for bone health, includes calcium, which strengthens bone, and vitamin D, which helps the body to absorb calcium. Between 25 and 65 years of age, men need at least one gram of calcium a day, increasing to 1.5 grams daily for the over 65s. Sunlight is a natural source of vitamin D and exposure to as little as ten minutes a day can be sufficient or vitamin-rich foods can be recommended.

- **physical activity:** weight-bearing exercise, such as walking, tennis and jogging may assist in maintaining muscle strength, coordination and flexibility and reduce the risk of falls. Resistance training and lifting weights may help maintain bone density.

- **lifestyle choices:** smokers lose bone more rapidly than non-smokers – give up smoking! Alcohol excess may inhibit calcium absorption and bone formation. The importance of building bone mass during puberty is explained further in the IOF report “Invest in Your Bones – How diet, lifestyle and genetics affect bone development in young people.”

- **medication:** use of some medications, such as steroids (often used for asthma, arthritis and kidney disease) and anticonvulsants, can accelerate the onset of osteoporosis.

## ■ Role of the physician

Osteoporosis is a public health problem in men. When a male enters the consulting room the doctor thinks about cardiovascular disease, lipids, hypertension, alcohol and tobacco abuse, prostate cancer, but not about loss of height, kyphosis, hypogonadism, or symptomatic or asymptomatic fractures. It is unlikely that hypertension or hypercholesterolemia would be left untreated in a man discharged from hospital following a myocardial infarction. However, only 10-20% of women, and probably fewer men with osteoporosis and fractures are investigated or treated despite the fact that a prevalent fracture is a predictor of further fractures.

The reason for this is historical; osteoporosis was unstudied by most medical students, methods for measuring bone mineral density (BMD) were not available and no drugs were available to reduce fracture risk. So, osteoporosis and fractures were believed to be ‘normal’ ageing, an inevitable and untreatable consequence of ageing rather than a disease. This is incorrect.

Educational programs are needed to ensure that physicians recognise osteoporosis and fractures also occur in men and that investigation and treatment is needed, just as it is in women.



## ■ Role of the orthopaedic surgeon/ radiologist

Every surgeon should consider that any fracture in a person of 50 or older might be an osteoporotic fracture. The radiologist should be aware of the radiological characteristics of osteoporosis and mention the possibility of osteoporosis in a patient's report. An educational program for radiologists, "Vertebral Fracture Initiative – to improve the recognition and reporting of vertebral fractures" is available from the IOF website: [www.osteofound.org/health\\_professionals/education\\_radiologists/](http://www.osteofound.org/health_professionals/education_radiologists/)

## ■ Role of the nurse

Often the first point of contact for many patients is the nurse. This specialist can play an important educational role and help build awareness by discussing the IOF One Minute Risk Test and bone health measures.

## ■ Role of the health care policy officials in government and insurance companies

National governments need to understand the long-term social and economic benefits that come from preventing the first fracture. Since the occurrence of a first fracture can lead to the rapid development of further fractures (in a so-called 'fracture cascade'), it is especially important that policies should promote the detection of osteoporosis **before** the first fracture occurs. A key step is to ensure that adequate diagnosis and treatment resources and reimbursement policies are made available.

If the growing burden of osteoporosis is to be reversed, the commitment to osteoporosis research must be significantly increased.

## ■ Role of the researcher

Osteoporosis in men has been less studied than for women, leading to a lack of approved treatments for men. As the momentum gains to fill this gap, an increase in research efforts will be needed to help reverse the "silent epidemic".

The IOF-supported Thematic Network on Male Osteoporosis, aims to create an algorithm for assessing absolute fracture risk in men, based on a combination of risk factors. The project began in 2002 with funding from the European Commission.

Scientific research now supports the use of proven therapies to prevent osteoporotic fractures based on the individual's probability of fracture as opposed to their bone density score alone. This new concept is currently being validated by a WHO working group (established in 1998) in collaboration with IOF and the NOF (US) to ensure the accuracy and reproducibility of this concept. The goal is to develop a user-friendly fracture risk assessment tool for family physicians for use with patients of both sexes, all ages, ethnic groups and in all countries.

# Conclusion

We have a long way to go before we reach the same level of understanding osteoporosis in men as we have in women. Bone density tests should be available to men as well as women and increased awareness of the problem of osteoporosis in men is needed at all levels in the community – in men themselves, in doctors, government health officials and in funding bodies, so that research efforts are increased and the problem of fractures in men is acknowledged. Only then can begin to prevent osteoporosis.

# Case histories



**Andrew Wishart,  
Australia**

Andrew is 41 and a mature student in his last year of earning a degree in architecture. Two years ago, at age 39, Andrew was dismantling a cupboard at home and after a big push, he felt something in his rib area. He knew immediately that a rib had fractured.

An X-ray confirmed his fears and his GP referred him right away for a bone mineral density test, as it's very unusual for a 39 year old man to have a rib fracture after such minimal trauma. Luckily she did, as the bone mineral density (BMD) test showed Andrew had severe osteoporosis.

Andrew's specialist suggested an initial treatment of calcium supplements and a once-weekly bisphosphonate tablet, an anti-resorptive drug that slows down or halts the loss of bone.

Andrew has a family history of osteoporosis – his father's mother has severe osteoporosis, as does his mother's sister. And interestingly, Andrew has a twin brother. Andrew's brother has probably not had a fracture, but is unwilling to have a BMD, because if it does show osteoporosis (without a fracture) he would have to pay for medications for the rest of his life – he does not want to put that financial burden onto his young family.

"When I was first asked to have a BMD, I thought, what is this?" Andrew recounts. "When my doctor said she was investigating the possibility of me having osteoporosis, I was somewhat dismayed as it was an 'old woman's disease', so why waste my time? But I trusted my doctor and had the test. Waiting for the results was no problem, as I didn't expect any bad news."

About a week later, as he telephoned his doctor's secretary to cancel the next appointment, his doctor contacted him to ask him to come in. "Now I was getting my first sense that maybe something might be wrong", said Andrew. "My doctor confirmed that I had osteoporosis and I was beginning to realize that my life was changing. Until now, I might get sick but the problem would go away; only now I had something that was going to be there always."

Andrew went home and decided to do some research. "My disappointment began as I realized there really is not a lot of information about osteoporosis and men. Females and males of all ages need to know about the risks of an illness that does not discriminate between the sexes. Even when men are mentioned, it relates to being about 65 years old and onward. I began to get quite depressed, wondering why I had an 'old person's' illness." The lack of information, especially regarding

how it affects younger men, made me start to feel that I had suddenly become an old man. It was not so much the thought of the illness that depressed me, but the fact that I thought my body was 'giving out on me' or starting to 'decay' at an early age.

"When I first began taking medication, the next morning I felt like I had pain in all my bones and spent the day in bed. This pain subsided the next day. The following week, I was ready for this 'side effect', only to find that it was not as severe this time. Over a period of four weeks, the side effects from the medication were hardly noticeable. The only time I notice pain now is if I forget to take my medication and have it late. But this pain is only minimal."

"Having osteoporosis has made me more aware of my day to day actions. I have started to be more careful when using stairs, and everyday activities take place with a sense of 'care'. I think twice about lifting/pushing heavy items and try to avoid this activity if I can. Thankfully, being a mature student, I am not faced with this situation too many times. I am fortunate that my life, apart from this 'care' attitude, has not really changed. But I know that this could all change in the future."

Happily, a recent test showed Andrew has an improvement in his bone density.



**Jamal Saleh, Bahrain**

"Before I knew I had osteoporosis I was physically very active. In my medical practice I used to rush about unconcerned about falling. Once I knew I had osteoporosis I developed a sudden fear of most

physical activities; maybe that was an over reaction but it was a true feeling. I now walk with care and with less confidence. I particularly avoid all slippery surfaces and polished hospital floors. When I walk up or down stairs I go slowly, watching where my feet go in every step. I was not like that before.

"Gone are the days when I would bend down to examine patients' legs. I now ask them to lie on the examination table so that I can examine them with my spine straight.

"I often look at my colleagues and compare if I have become shorter than them. My original height was 179 cm, now it is 176 cm.

"I used to help lift patients on to the operating table; it was a good way of sharing responsibility and boosting team spirit. One day I panicked when I got a sharp pain in my back after an easy patient lift. I went straight to have an X-ray taken of my spine and thankfully it was clear, no osteoporotic fracture of the vertebrae. I no longer help lift patients.

"I try to avoid doing major spine surgery; many of these operations take a minimum of three hours of continuous standing. I used to enjoy them; I still do, but suffer at the end of the day. My back, legs, and feet

would hurt for a day or two afterwards. I know that long standing is not good for osteoporosis and I also feel my bones less strong than before, as they ache more.

“I am taking more time out of my huge stock of accumulated annual leave, basically taking it easier with more breaks from my busy practice. I believe I should stay very active and productive but I also believe I should pay more attention to my body’s needs.

“I take my medications every morning, religiously, the calcium tabs and vitamin D and the once-weekly bisphosphonate tablet.

“I had a recent DEXA measurement of my bones and there was some improvement. I was encouraged, although I tell my patients with osteoporosis not to be disappointed if their DEXA doesn’t show an immediate improvement while on treatment. I sometimes feel odd in reassuring my patients whose conditions are not improving while I know that my bone density is improving. Osteoporosis has changed many aspects of my medical and surgical practice, but it has not forced me to change my career yet. I hope it won’t come to that.”



### Ram Gulam, India

Ram Gulam was a satisfied man. He was the respected *panch* (head of the village council) in the Indian village of Larpur, in the District of Azamgarh, a hamlet of 5000 people in the state of Uttar Pradesh. He was also a well-to-do farmer, owning land and a small cattle ranch.

Pictures of Ram Gulam show a tall, proud, good looking 58-year-old man, with big moustaches and a sense of self-confidence.

One sunny morning Ram Gulam shared a pot of tea with fellow villagers and discussed an important judgment he was going to make later in the day at the village council meeting. Ram Gulam promised to objectively review both sides of the case, involving a land dispute, and excused himself to prepare for the meeting.

While in the bath Ram Gulam slipped. “The fall was trivial,” he recalls, “but the pain was excruciating.” He could not stand and his family took him to the district hospital, at Azamgarh, 40 kms away from his village. After an X-ray, the doctor on duty diagnosed a fracture to the neck of the femur and told him that he would need surgery.

Not convinced that such a small fall could cause a fracture needing surgery, he was brought by his relatives to Delhi, some 400 kms away. There, Dr Sushil Sharma, an orthopedic surgeon closely associated with the Arthritis Foundation of India, explained that Ram Gulam had broken the head of his femur, commonly called a hip fracture, because of weak bones. The surgeon operated and Ram Gulam began a long and painful rehabilitation, during which his job as commu-

nity affairs judge in the local council was provisionally taken over by another person.

Only after four months could he resume light exercise and meet friends, Ram Gulam recalls. “But I remained skeptical of my doctor’s diagnosis that I had osteoporosis – I was convinced that weak bones was a disease for women, not men,” he says.

While on one of his evening walks, Ram Gulam made a quick movement to dodge a stray dog. He slipped, fell, and fractured his other hip.

Again he saw the surgeon, and again he had a hip replacement surgery. But this time his rehabilitation was much more difficult. He was bedridden. Once again he lost his *panchayat* decision-making position at the village community court. No longer would he wear the *pagri* headgear of a judge. His esteem was gone and he had become isolated.

Today Ram Gulam is an ill and depressed man. He can walk with the help of walker, but at age of 65 he looks 90. He has started osteoporosis treatment, but after his two hip fractures the weak bones have already taken their toll.

After his second hip surgery he went for a BMD check. His T-score was -4.9, and his spine showed evidence of vertebral collapse. He has lost 4 cm in height in the past seven years, and he is in constant pain.

As he gets around the hospital corridors with his walker, Ram Gulam is totally heart broken – he has now been told that his job as the village council head has been permanently given to another man.



### Nicholas Flood, Ireland

Some osteoporosis in men is caused by trauma, linked to excessive exercise and poor nutrition which results in low levels of male sex hormones.

In 2000, Nicholas Flood, one of the world’s leading rifle “silhouette” shooters, had just returned from a competition in Brisbane, Australia. He was eager to renew his training, since “after all the time spent on the road I got soft and out of condition.”

But he overdid it and felt pain in his lower back. He visited Moira O’Brien, the sport’s medical officer and president of the Irish Osteoporosis Society. She ordered a bone density test and the results showed that Nicholas had osteoporosis.

Why would a fit athlete, just 34 years old, develop osteoporosis? There are several explanations.

The sport of silhouette shooting is particular stressful since the athlete shoots standing up, holding a rifle that can weigh up to four kilos. The shooter is forced into a position requiring two bends in the spine, putting the lower lumbar spine into extreme pressure.

Dr. O’Brien saw that by training two or three times a day, Nicholas did not give his body time to recharge. Also some of his training exercises put his skeleton under undue stress. She changed some postures, and

with the help of the National Coaching and Training Centre introduced an aerobics and stretching program.

Also, Nicholas had paid little attention to his diet. Caffeine was leaching calcium from his system, but “the main problem was simple lack of food – I thought eating was a complete waste of time,” he says. “I was very bad and my system let me know it.”

Nicholas’s injury healed and in 2004 he became the European Champion in all four rifle events, setting a new record.

He says he knows a lot of people with back problems. “I encourage people to get checked out, because your body tells you things and you have to listen to it.”

Dr. O’Brien adds “We are trying to identify the men at risk but we are also trying to make people realise osteoporosis is not just a disease of older people, that it affects men, women and children. That’s the crucial thing. All men need to be aware that they are at risk of osteoporosis and should not wait until they have broken their bones to discover they have it.”



### Sergio Barrientos Arellano, Mexico

“About five years ago, when I was 42 years old, I started feeling pain in one arm. The pain was so strong that I could not lift up my arm. I had to sleep sitting up because it hurt too much when I lay down. I

hardly slept at all. I am a bus driver and a mechanic, I had to stop working because of the pain and because I was so tired, I slept during the day. I went to see a doctor who gave me strong pain killers. He checked me for arthritis, but he found nothing. I started working again.

“After two years I started having back pain and my arm started hurting again. My bones ached: my arms, shoulders and neck. The doctor at the Social Security thought I was going to have a stroke. I had an electrocardiogram, but my heart was fine. He gave me pain killer injections and I kept going back for more injections. I thought I had bone cancer because my bones hurt so much.

“My sister recommended a chiropractor in Cuernavaca. I started seeing him every other week, driving the 40 miles from my home in Mexico City, to Cuernavaca, where I stayed three days at a time. He fixed my spine and gave me homeopathic medicine; I even thought of moving to Cuernavaca, but my job is in Mexico City. I saw another chiropractor in Mexico City but he didn’t help me, so I kept going to Cuernavaca for about a year. My two sisters and one of my brothers had the same problem.

“I was very frustrated and getting desperate because I thought there was no real solution, when my wife heard a radio program where they spoke about osteoporosis and gave a phone number. She called COMOP for information, our local Mexican Committee for Prevention of Osteoporosis, and took her mother for a DXA scan. When she realized it was a bone study, she

said, “Why don’t you go there? You’ve got nothing to lose, you may even get better.” I thought, “That can’t be the answer, osteoporosis is a woman’s disease,” but I was desperate. When I arrived at the clinic, there were only women there. They gave me a questionnaire for women, it had questions about menstruation, menopause, etc. My wife even made some jokes about it but I had a DXA scan and it showed I had osteoporosis. The doctor told me I had bones of a 60 year old and that they were so fragile they could break at any moment.

“Treatment began right away but I was very scared. I stopped working as a mechanic because I was afraid something could fall on me and break a bone, I only supervised the mechanics and drivers. I hardly went out because I was depressed. After some months I had a lab test which showed that the treatment was working. This made me feel a little better, but my bones were still fragile. I started exercising. I would take the medicine early in the morning and since I could not eat or lie down for a while I went out for a walk, about an hour every day.

“At my last DXA scan some months ago, it showed that my bones are getting better. I feel a lot better now that I am doing something for my bones, not only the medication, but I am exercising and eating better. If anyone suffers from bone pain, they should have their bones examined. I did not know there were bone tests. I am very lucky because I have never had a fracture, the pain warned me, but I know many people don’t realize they have osteoporosis until they break a bone. I now understand why they call it “the silent epidemic”. There should be more awareness campaigns directed to men, as is done for cancer, in which they encourage men to have check ups. Many people don’t have tests taken because they think there is no cure for this disease. It is very important to have a DXA scan, and I can testify that bones can get stronger, I am living proof of it.”



### Mike Nelson, UK

“Four years ago when I was just 37, the loss of height I had began noticing when I was 30, but which had much accelerated in the previous 12 months, meant I had shrunk by two inches – something the doctors told me was “impossible” for someone my age. They told me it was my “imagination” that I had gone to 5 ft 6 inches from 5 feet 8 inches

“It wasn’t imagination, it was osteoporosis. But the doctors didn’t recognise it. It was only when I broke three ribs after walking into a door frame that it was suggested that the fractures, my height loss and painful joints might be caused by osteoporosis. It was at my suggestion that my GP finally contacted a specialist though it took almost a year for him to be convinced – almost in desperation as nothing else would explain my problems and after all, osteoporosis did not affect men. I think the doctor was as surprised as I was when the DXA scan indicated osteoporosis.

“As far as risk factors are concerned, I think the doctors should have recognized that height loss in a young man was not normal. And I had two years of chemotherapy for Hodgkins disease and five years of protease inhibitors, which might have had an effect.

“Perhaps we should modify the risk factors reported to doctors and radiologists to include medical treatments including cytotoxic compounds and antiviral drugs. And doctors should be better informed and more receptive to considering osteoporosis as a problem in men at any age. The good thing is that I now have a reason for my unexplained problems.

“The biggest embarrassment was that in order to get a bone density scan I had to attend a “well-woman” clinic and endure some rather hostile “get out of our women-only space” remarks from the other clients. This was not the first time, as I was also required to undertake a mammogram (an even more difficult and uncomfortable procedure on a man than a woman), since my medication caused a breast-enlarging lump to appear (which after a biopsy was found to be benign). All of which seemed to defy the myth that both osteoporosis and breast cancer are women-only problems and age-related issues.

“I am campaigning locally for recognition of these problems for both younger and non-female patients and also to establish more general clinics besides the ‘well woman’ clinic. Given the intimidating atmosphere I think that many men in my situation would not have undergone the necessary examinations. I hope my story may help other people in ‘non risk’ categories to get a faster diagnosis.

“I am relieved that my latest DXA scan shows marked improvement, following treatment with bisphosphonates and a high calcium and magnesium diet. I am now near the fracture threshold rather than well outside it.

“The height loss continues and I still have painful joints from osteoarthritis, due in part to the late diagnosis of my osteoporosis. I take things more carefully now and use a stick when walking since I don’t want to fall.

“While I have not suffered any major fractures I still manage to break toes with monotonous regularity, but, perhaps fortunately, I also suffer from peripheral neuropathy so that after the initial pain I almost forget I’ve broken a bone.

“Now I also see that osteoporosis can be hereditary – my mother has osteopenia.

“But there is a further positive note. When I was originally referred to the “Well Woman Centre” I received a very frosty reception. Now the clinic recognises it has a more varied role and has become an independent osteoporosis and osteopathy centre with a much more open attitude. Could this be due to the increasing number of male patients?”



**Domingo Di Lorenzo,  
Venezuela**

“I did not ask or was not told about the risks of colon surgery for bones”. Unique optimism and a big, warm smile characterize Domingo Di Lorenzo. He is a Venezuelan engineering and maintenance worker of Italian origin. Domingo is 77 years old, and he started having vertebral fractures due to osteoporosis at the age of 65.

“When I was 40 my colon was removed due to diverticulosis. Afterwards, I never had milk or cheese since I was afraid of suffering from diarrhea. I was not told that I had to take calcium pills either. My intestine was working well, and doctors and I were very happy. I kept working as hard as usual because I liked my job a lot. I even used to go hunting despite my colostomy.”

“I had the first fracture at the age of 65. Since then, I have had several fractures but they did not cause too much pain. I noted a little humpback and realized that my height had decreased, but I did not care because there was no pain. I never thought I had osteoporosis. Indeed, I did not know anything about that disease, and doctors never mentioned it. It was not until 1997 that I was sent to a specialized center.”

Domingo suffers from secondary osteoporosis caused by a digestive surgery and chronic calcium deficit. He illustrates the lack of information about osteoporosis among patients as well as doctors. Furthermore, his example is classic evidence of the increased occurrence of new fractures once the first fracture has happened. Currently, Domingo has five vertebral fractures. His story also reflects a common masculine attitude, reluctance to find medical support when health changes occur. So often, men only look for medical support when the damage is already severe.

“Nowadays Domingo has many constraints due to his severe vertebral deformity,” explains Prof. Gregorio Riera Espinoza. “In addition, he had an aneurysm of the popliteal artery with vascular obstruction. Unfortunately this condition led to a below-the-knee amputation of the left leg 18 months ago. Nevertheless, this man still shows enthusiasm, and a kind and humble smile to life. A substantial part of his grief was caused by both society and us, as doctors. We owe it to Domingo Di Lorenzo.”

# Osteoporosis Risk Test for Men



1. Have either of your parents broken a hip after a minor bump or fall?  
 Yes       No

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2. Have you broken a bone after a minor bump or fall?  
 Yes       No

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3. Have you taken corticosteroid tablets (cortisone, prednisone, etc) for more than 3 months?  
 Yes       No

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4. Have you lost more than 3 cm (just over 1 inch) in height?  
 Yes       No

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5. Do you regularly drink heavily (in excess of safe drinking limits)?  
 Yes       No

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6. Do you smoke more than 20 cigarettes a day?  
 Yes       No

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7. Do you suffer frequently from diarrhoea (caused by problems such as celiac disease or Crohn's disease)?  
 Yes       No

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8. Have you ever suffered from impotence, lack of libido or other symptoms related to low testosterone levels?  
 Yes       No

If you answered "yes" to any of these questions, it does not mean that you have osteoporosis. Diagnosis of osteoporosis can only be made by a physician through a bone density test.

We recommend that you show this test to your doctor, who will advise whether further tests are necessary. The good news is that osteoporosis can be diagnosed easily and treated.

Talk to your local osteoporosis society about what changes you might make in your lifestyle

to reduce your osteoporosis risk. You can contact your national osteoporosis society via [www.osteofound.org](http://www.osteofound.org)



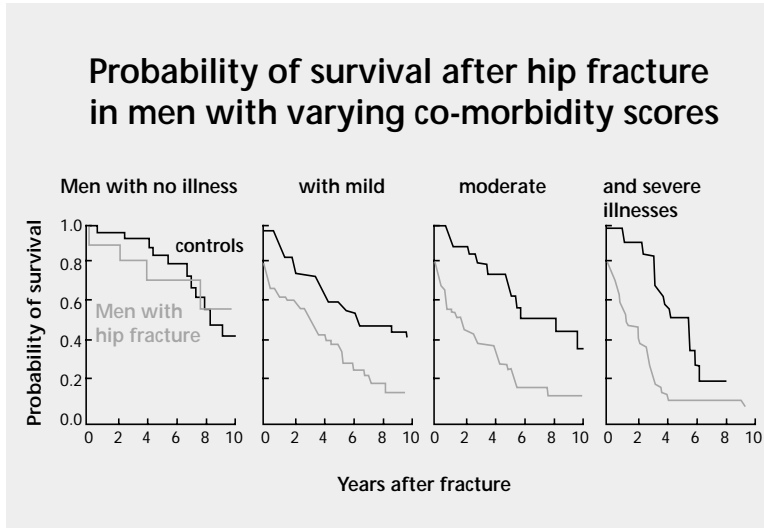
**IOF** International Osteoporosis Foundation



# Tables and figures

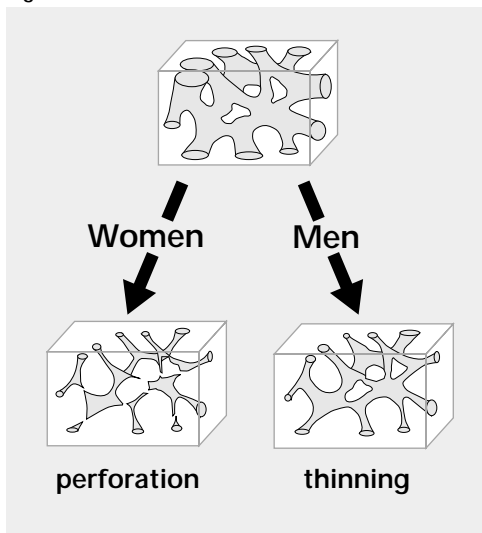
**Fig. 1** Survival is similar for men with hip fractures (solid line) and without hip fractures (broken line) in men without illness. When other illness is present, survival is reduced in men with and without hip fractures but it is always more reduced in men with hip fractures. (Adapted from Poor et al.).

Fig. 1



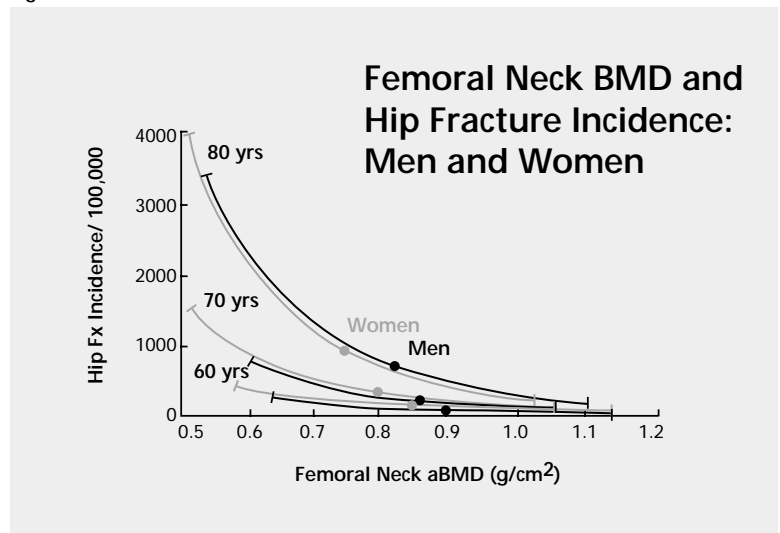
**Fig. 2** Trabecular bone thinning dominates in men during ageing while in women there is complete loss of bone structure as plates are completely lost and there is disconnection of the spongy bone (Seeman, with permission).

Fig. 2



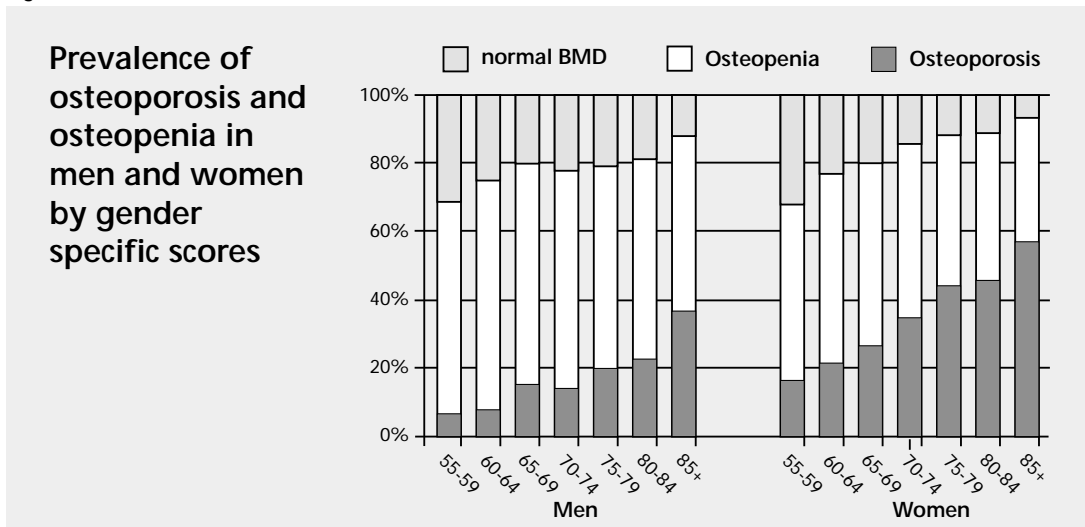
**Fig. 3** The annual incidence of hip fracture per 100,000 persons per year in men and women aged 60, 70 and 80 years. (Adapted from De Laet et al.)

Fig. 3



**Fig. 4** The presence of osteoporosis is low in men and women under 60 but increases with age so that the prevalence in men aged 75 and over is 20% and is 40% in men age 85 years and over. (Schuit SCE, et al. Ref. 14)

Fig. 4



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IOF is an international non-governmental organization which represents a global alliance of patient, medical and research societies, scientists, health care professionals and the health industry. IOF works in partnership with its members and other organizations around the world to increase awareness and improve prevention, early diagnosis and treatment of osteoporosis.

Although osteoporosis affects millions of people everywhere, awareness about the disease is still low, doctors often fail to diagnose it, diagnostic equipment is often scarce, or not used to its full potential, and treatment is not always accessible to those who need it to prevent the first fracture. IOF's growing membership has more than

doubled since 1999, reflecting the increasing international concern about this serious health problem. There are 167 member societies in more than 80 locations worldwide (July 2004).

**For more information about IOF and to contact an IOF member society in your country visit: [www.osteofound.org](http://www.osteofound.org)**

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Bone & Joint Decade



International Council of Nurses



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**“Every day, millions of men and women in every one of our countries are losing their mobility, their independence, their hope... even their lives. The key to ending this tragedy is to take action before the first fracture.”**



Queen Rania of Jordan, IOF Patron,  
speaking at the IOF-Women Leaders' Roundtable,  
Lisbon, May 2002