

**OSTEOPOROSIS THE SILENT KILLER: KNOW IT TO FIGHT IT**

**OSTEOPOROSIS THE SILENT KILLER  
KNOW IT TO FIGHT IT**

**PROF. FRANCESCO BOVE**

PRESIDENTIAL FOUNDATION

UNICAMILLUS INTERNATIONAL MEDICAL UNIVERSITY ROME

NEW YORK • ITALIAN CONSULATE • MARCH 19, 2025



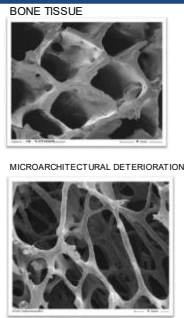
UNIVERSITÀ MEDICA INTERNAZIONALE  
**UNICAMILLUS**  
ROMA • VENEZIA • CEFALU'



FOUNDATION  
FOR THE FIGHT  
AGAINST OSTEOARTHRITIS  
AND OSTEOPOROSIS

## OSTEOPOROSIS THE SILENTKILLER

- ❑ REDUCED BONE MASS
- ❑ MICROARCHITECTURAL DETERIORATION
- ❑ INCREASED FRACTURE RISK
- ❑ SOCIAL AND ECONOMIC IMPACT



### Introduction

Osteoporosis is a chronic condition characterized by reduced bone mass and microarchitectural deterioration of bone tissue, leading to increased fracture risk.

More specifically it is a decrease in the number of trabeculae after menopause, completed to trabecular thinning as well as decrease in cortical thickness and increase in its porosity.

Osteoporosis is not usually diagnosed and remains asymptomatic; it does not become clinically evident until fractures occur.

The silent killer is a pathology with a high social and economic impact.

It acts causing fractures, when the pathological process is already advanced and therefore, in order to fight it, it is important to know how to recognize it.

## WOMAN'S HEALTH

OSTEOPOROSIS IS A MAJOR PUBLIC HEALTH ISSUE ESPECIALLY AMONG WOMEN

- ❑ HIGH SOCIAL AND ECONOMIC IMPACT
- ❑ CAUSING PAIN, DISABILITY, LOSS OF INDEPENDENCE
- ❑ POST MENOPAUSE
- ❑ ESTROGEN DEFICIENCY
- ❑ LOWER BONE MASS PEAK



Osteoporosis is a major public health issue, causing pain, disability and loss of independence.

## Epidemiology

Osteoporosis affects millions of people worldwide, particularly postmenopausal women, due to estrogen deficiency and a lower bone mass peak than in men.

## EPIDEMIOLOGY: GLOBAL PERSPECTIVE

### 200 ML PEOPLE IN THE WORLD



1/30F WOMEN 2/5 AGED 80 2/3 AGED 90  
AGED 60

#### EPIDEMIOLOGY in USA

10.2 ML  
WOMEN MORE THAN 80%

FRACTURE RISK  
1 IN 3 WOMEN  
1 IN 5 MEN  
WILL EXPERIENCE A FRACTURE

ECONOMIC BURDEN  
\$57BL. 2018  
EXPECT TO RISE AS POPULATION AGES

Source: IOF (International Osteoporosis Foundation)

According to the International Osteoporosis Foundation (IOF), approximately 200 million people suffer from osteoporosis globally.

Among the 10.2 million adults estimated to have osteoporosis in the United States, more than 80% were women

In the United States, in 2018, the cost of osteoporosis related fractures was estimated at \$57 billions and this is expected to rise as the population ages.

## HIP FRACTURES

- MAN AND WOMAN AFTER 65 YEARS
- MOST SEVERE MORBIDITY AND MORTALITY  
(MORTALITY: 25% IN THE YEAR FOLLOWING FRACTURES)
- MICROARCHITECTURAL DETERIORATION
- DECREASE OF CORTICAL THICKNESS



### **The silent killer causes fractures**

The most common fractures occur in the hip, spine, and wrist, with hip fractures being the most severe in terms of morbidity and mortality.

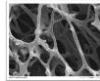
Hip fractures occur for microarchitectural deterioration and decrease of cortical thickness in men and women after 65 years. Women are more often affected than men and the incidence rates rise exponentially with age.

The pathogenesis of fractures depends on many factors other than osteoporosis. For example, extraskkeletal factors, such as the risk of falling, increase spontaneously.

25% die in the year following the hip fractures

## SPINE FRACTURES

- IN THE WOMEN AFTER MENOPAUSE
- EARLY MICROARCHITECTURAL DETERIORATION
- MANY ARE ASYMPTOMATIC



## Spine fractures

Identifying the incidence of vertebral fractures is difficult because many are asymptomatic or cause too few symptoms to provoke investigation. It is greater among women after menopause for the early microarchitectural deterioration.

## AGING POPULATIONS IN ITALY

- OVER 65  
24,1% - 14,177 ML
- OVER 80  
7,7% - 4,530 ML



SOURCE ISTAT2023

The global burden of osteoporosis is increasing due to aging populations.

Currently in Italy, 24.1% of the Italian population is over 65 years of age, and 7,7 ultra octogenarians.

But the provisional estimates, in the most optimistic cases, forecast that in next 20 years, 30% of the population will be over 65 years of age, with more than 10% of ultra-octogenarians.

## BURDEN OF OSTEOPOROSIS IN ITALY

- 4,36 ML SUFFER FROM OSTEOPOROSIS
- 6,3% OF TOTAL POPULATION
- 23% WOMEN - 7% MEN
- 200.000 INCIDENCE OF HIP AND SPINE FRACTURES
- € 9,5ML DIRECT AND INDIRECT COST



## Osteoporosis in Italy

### Epidemiology

Italy has one of the oldest populations in Europe, making osteoporosis a major public health concern. It is estimated that over 4.36 million Italians suffer from osteoporosis, representing the 6,3% of the total population, 23% women and 7% men, with women accounting for nearly 80% of cases. The incidence of hip and vertebral fractures in Italy is approximately 200,000 per year for both.

### Financial burden

Considering that the financing of the national health service is 136,5 billion for year, the total cost for osteoporosis was estimated at Euro 9.5 billion, about 7% of the total budget. This includes both direct cost (such as hospitalization and treatments) and indirect cost (such as disability and loss of productivity).

The Italian healthcare system faces challenges in optimizing fracture prevention and post-fracture care.

Many factors influence the development of the osteoporotic process. We can divide them in 2 groups:

#### RISKFACORS CANNOT BE CHANGED

1. AGE
2. GENDER
3. FAMILYHISTORY
4. PREVIOUSFRACTURE
5. MENOPAUSE/HISTERECTOMY
6. MEDICATION
7. OTHER DISEASES



### OSTEOPOROSIS RISK FACTORS CANNOT BE CHANGED

**-Age:** The older you are, the more likely you are to have osteoporosis. Around 75% of fractures due to osteoporosis happen in people aged 65 and over.

**-Gender:** Women are more likely to develop osteoporosis than men

**-Family history** of osteoporosis: You are at greater risk if your parents had osteoporosis or a broken hip.

**-Previous fracture:**

If you've broken a bone after a minor fall, this is a sign that you may have osteoporosis

**-Menopause/hysterectomy:** Oestrogen has a protective effect on bone, and with menopause women start to lose bone at a faster rate. That's why women who have early menopause (before age 45) or have had a hysterectomy, are at greater risk.

### **-Medications**

Certain medications have side effects that are linked to osteoporosis or increased fracture risk. These include:

- Long-term glucocorticoid therapy

### **-OTHER DISEASES**

Some diseases may weaken bones and increase the risk of osteoporosis and fractures. Among these, the more common diseases and disorders are:

- Rheumatoid arthritis
- Nutritional/gastrointestinal problems
- Chronic obstructive pulmonary disease (COPD) and asthma
- Endocrine disorders
- Immobility
- Chronic kidney disease
- Cancers (including prostate and breast cancer)
- Haematological disorders



## RISKFACORS YOU CAN CHANGE

1. EXCESSIVE ALCOHOL
2. SMOKING
3. LOW BODY MASS INDEX  
NUTRITION
4. VITAMIN D DEFICIENCY
5. EATING DISORDERS
6. INACTIVITY
7. LOW DIETARY CALCIUM INTAKE
8. FREQUENT FALLS



## OSTEOPOROSIS RISK FACTORS YOU CAN CHANGE

### **-Excessive alcohol intake**

### **-Smoking**

Smoking almost doubles the risk of hip fracture compared to risk in non-smokers.

### **-Low body mass index**

BMI below 19 is a significant risk factor

### **-Poor nutrition**

. 'Malnutrition' is a major concern in seniors who are at greater risk of falls and fractures as a result

### **-Vitamin D deficiency**

Low levels of [vitamin D](#) are common, particularly among seniors who do not go outdoors, or in the winter months in northern latitudes.

### **-Eating disorders**

Disorders such as anorexia or bulimia can result in extreme weight loss, which is dangerous for bone health.

### **-Inactivity (not enough exercise)**

Lack of exercise results in bone (and muscle) loss.

### **-Low dietary calcium intake**

[Calcium](#) is a very important nutrient for bone health. With age, the body's ability to absorb calcium declines, which is one of the reasons why seniors also require higher amounts.

### **-Frequent falls**

People who have a tendency to fall are at higher risk of fracture.



## Prevention Strategies

Osteoporosis is a condition that can be prevented by starting with lifestyle changes that need to be modified

### Lifestyle Modifications

Prevention of osteoporosis involves multiple lifestyle factors, including:

- **Calcium and Vitamin D Intake:** Adequate calcium (1,000–1,200 mg/day) and vitamin D (800–1,000 IU/day) are essential for bone health.
- **Physical Activity:** Weight-bearing and resistance exercises help maintain bone density and reduce fracture risk.
- **Avoidance of Risk Factors:** Smoking and excessive alcohol consumption are linked to reduced bone mass and increased fracture risk.

## PREVENTION STRATEGIES

### PHARMACOLOGICAL INTERVENTIONS

- BIPHOSPHONATES
- DENOSUMAB
- SELECTIVE ESTROGEN RECEPTOR MODULATORS (SERMs)
- PARATHYROID HORMONE ANALOGUES



## Pharmacological Interventions (secondary therapy)

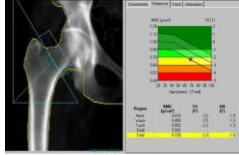
For individuals at high risk of fractures, pharmacological treatments include:

- **Biphosphonates** (e.g., alendronate, risedronate) – first-line drugs that reduce bone resorption.
- **Denosumab** – a monoclonal antibody that inhibits bone loss.
- **Selective Estrogen Receptor Modulators (SERMs)** – used for postmenopausal women to prevent bone loss.
- **Parathyroid Hormone (PTH) Analogues** – stimulate bone formation in severe osteoporosis cases.

## PREVENTIONS STRATEGIES

### SCREENING AND EARLY DIAGNOSIS

- DEXA
- FRAX Tool



## Screening and Early Diagnosis

Early detection of osteoporosis through bone mineral density (BMD) assessment via dual-energy X-ray absorptiometry (DXA) is crucial. The FRAX tool is also widely used to estimate fracture risk based on clinical factors. In Italy, screening programs target high-risk populations, but their coverage remains suboptimal.

## PREVENTIONS STRATEGIES

### AILA FOUNDATION IMPROVES AWARENESS



Osteoporosis: the Silent Killer – Editor: Gangemi – 156 Pages

## AILA FOUNDATION

For the prevention of osteoporosis, communication is of fundamental importance for the improvement of awareness.

This is exactly what the AILA Foundation (Foundation for the fight against Arthritis and Osteoporosis), has focused on: developing citizens awareness in order to prevent osteoporosis.

In particular by translating scientific data, making them reach everyone, but, at the same time, involving politicians from different sectors to take appropriate measures to contain the phenomenon.

For this strategy it was fundamental to give clear, simple, but effective messages, that everyone could understand, making them interesting, spreading them also in political centers.

Therefore the AILA award was created - Project Woman – which during its 23 Italian editions and some international ones, has rewarded numerous people of several fields (medical, scientific, artistic, cultural) in order to involve several areas of the society in wide reflection about women's health, carrying out the Award in the most important political forums such as the Chamber, the Senate, the Capitol in Rome and, last but not least, the Italian Embassy in Washington (in 2010 and 2011).

## PREVENTIONS STRATEGIES



Monica Fornier receives the Aia Award in Rome - 2017

In 2017, among those who received the award, stood out Monica Fornier, the moderator of this conference.

## PREVENTIONS STRATEGIES



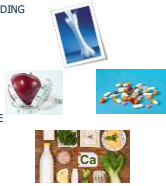
XXIV Edition AIA AWARDS  
Rome, June 23, 2025

This year, the 24<sup>th</sup> edition will be held in one of the most picturesque locations in the world, the Archeological Park of the Colosseum – Temple of Venus.

## CONCLUSION

PREVENTIVE STRATEGIES INCLUDING

- ❑ LIFESTYLE MODIFICATIONS
- ❑ EARLY DIAGNOSIS
- ❑ PHARMACOLOGICAL TREATMENTS
- ❑ PUBLIC HEALTH INITIATIVE
- ❑ IMPROVING AWARENESS
- ❑ SCREENING AND ACCESS TO EFFECTIVE TREATMENTS



## Conclusion

Osteoporosis is a major public health issue with significant epidemiological, social, and economic implications.

It is one of the major challenges in the women's health with a significant impact on the quality of life.

In Italy and worldwide, the increasing elderly population is expected to exacerbate the burden of osteoporosis-related fractures.

Preventive strategies, including:

- lifestyle modifications (proper nutrition, physical activity and risk factors management)

- early diagnosis,

- pharmacological treatments,

are essential to reduce fracture risk and associated costs.

Public health initiatives should focus on improving awareness, screening, and access to effective treatments to mitigate the growing impact of osteoporosis.

