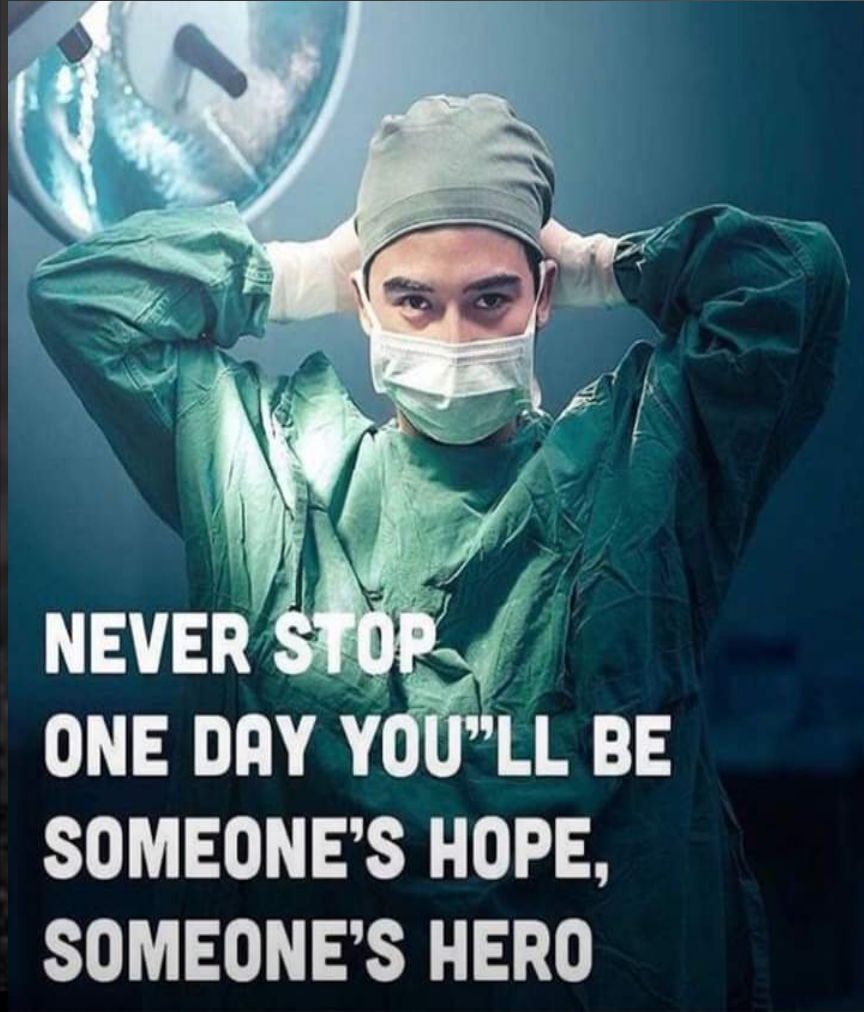


*welcome*



**NEVER STOP  
ONE DAY YOU'LL BE  
SOMEONE'S HOPE,  
SOMEONE'S HERO**



- The one who works with his hand is a craftsman.
- The one who works with his mind is a scientist.
- The one who works with his heart is an artist.
- But the one who works with his hand, mind and heart is a SURGEON!!!

# *Don't bend* **Osteoporosis** *to*



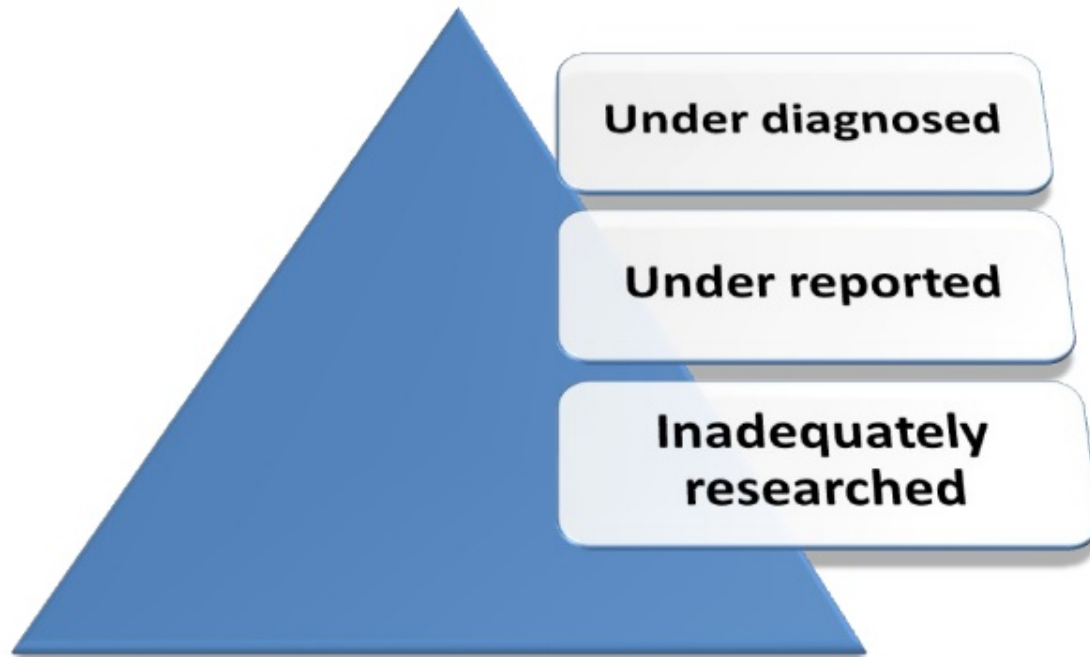
**Dr. Mriganko Bhattacharjee**

Assist. Professor

Orthopaedics & Trauma Surgery

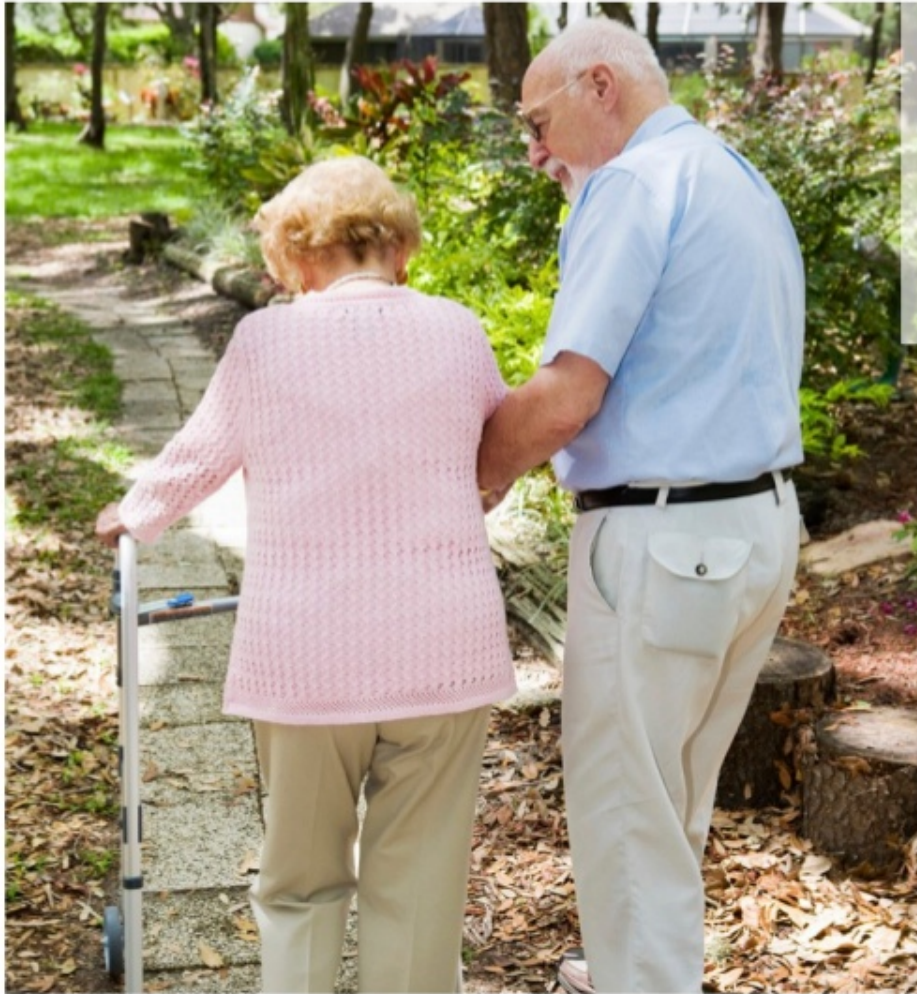
Rangpur Community Medical  
College, Hospital.





## **Challenges of Osteoporosis**





**“  
Men grow old, pearls  
grow yellow, there is  
no cure for it”  
Chinese proverb**





1 2 3 4

Age

5 6 7 8



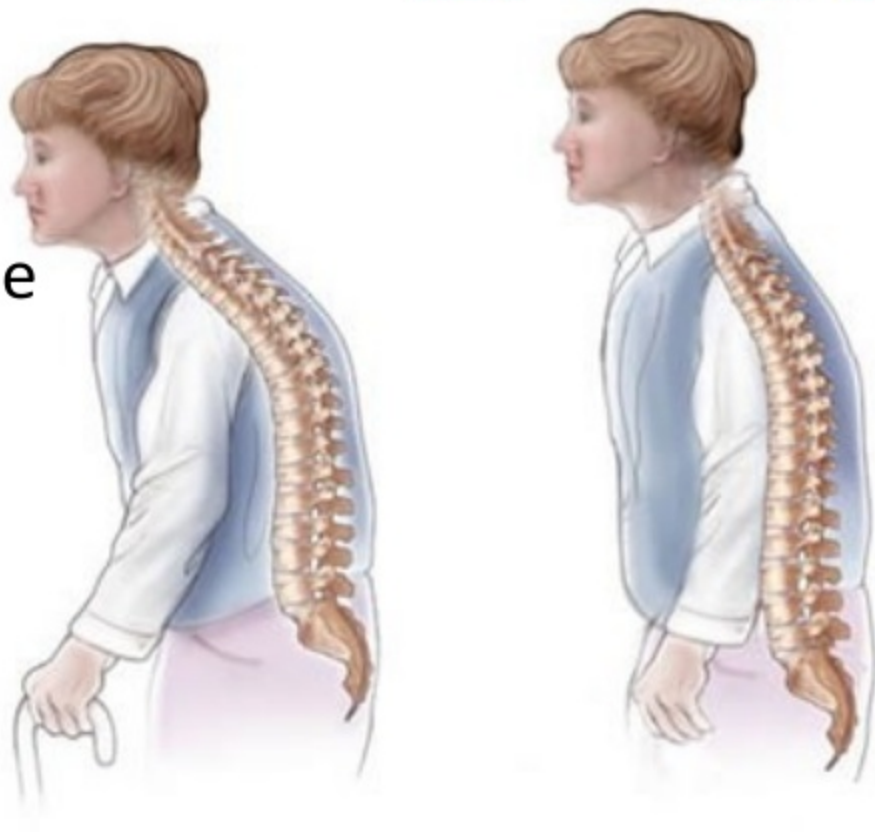
*Just a number only...*

# ***Osteoporosis***

## ***Definition:***

It is a disease where

- decrease in the density of bone
- decreasing its strength and
- resulting in fragile bones.

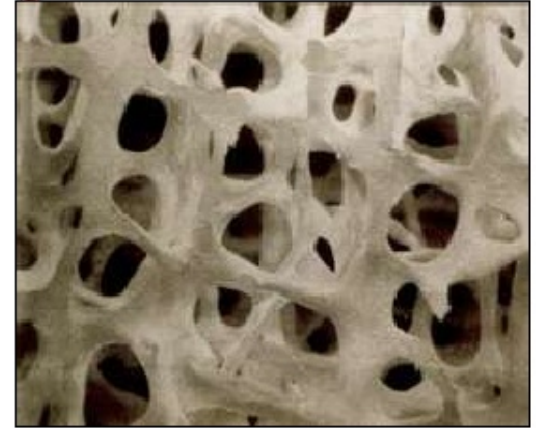




# Definition of Osteoporosis

## National Osteoporosis Foundation:

- a disease characterized by low bone mass and micro-architectural deterioration of bone tissue, leading to bone fragility and an increased susceptibility to fractures.”



## World Health Organization (1994) :

- bone mineral density T-score greater than  $-2.5$  standard deviations from the mean peak adult bone mass (ie. a woman in her 30's).”



# *Composition of Bone*



Bone has both **Organic** and **Inorganic** components

Organic part - consists mainly of protein collagen & specialized cells called **osteoclasts, osteoblasts, and osteocytes**

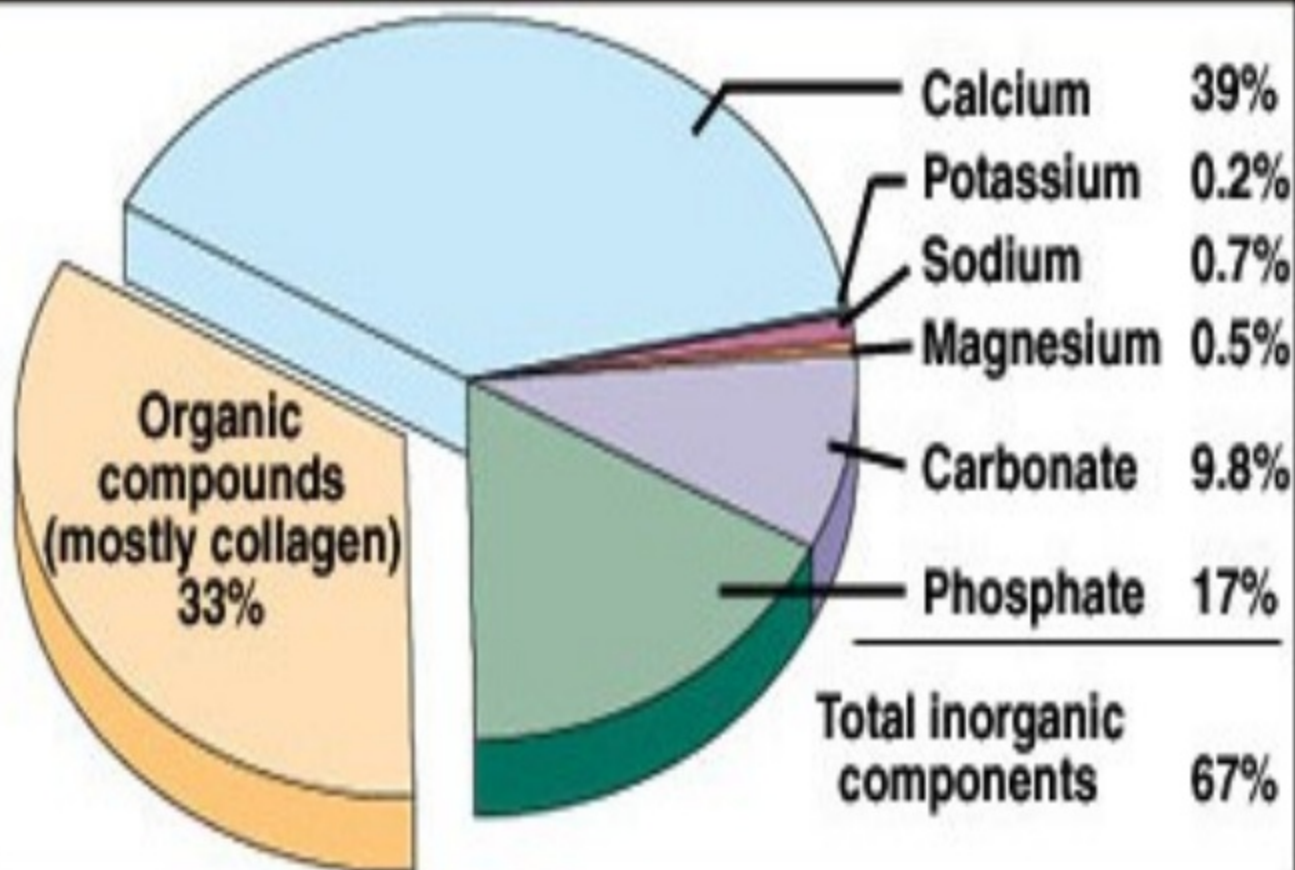
Inorganic part - consists mainly of **calcium phosphate.**



# Composition of Bone...

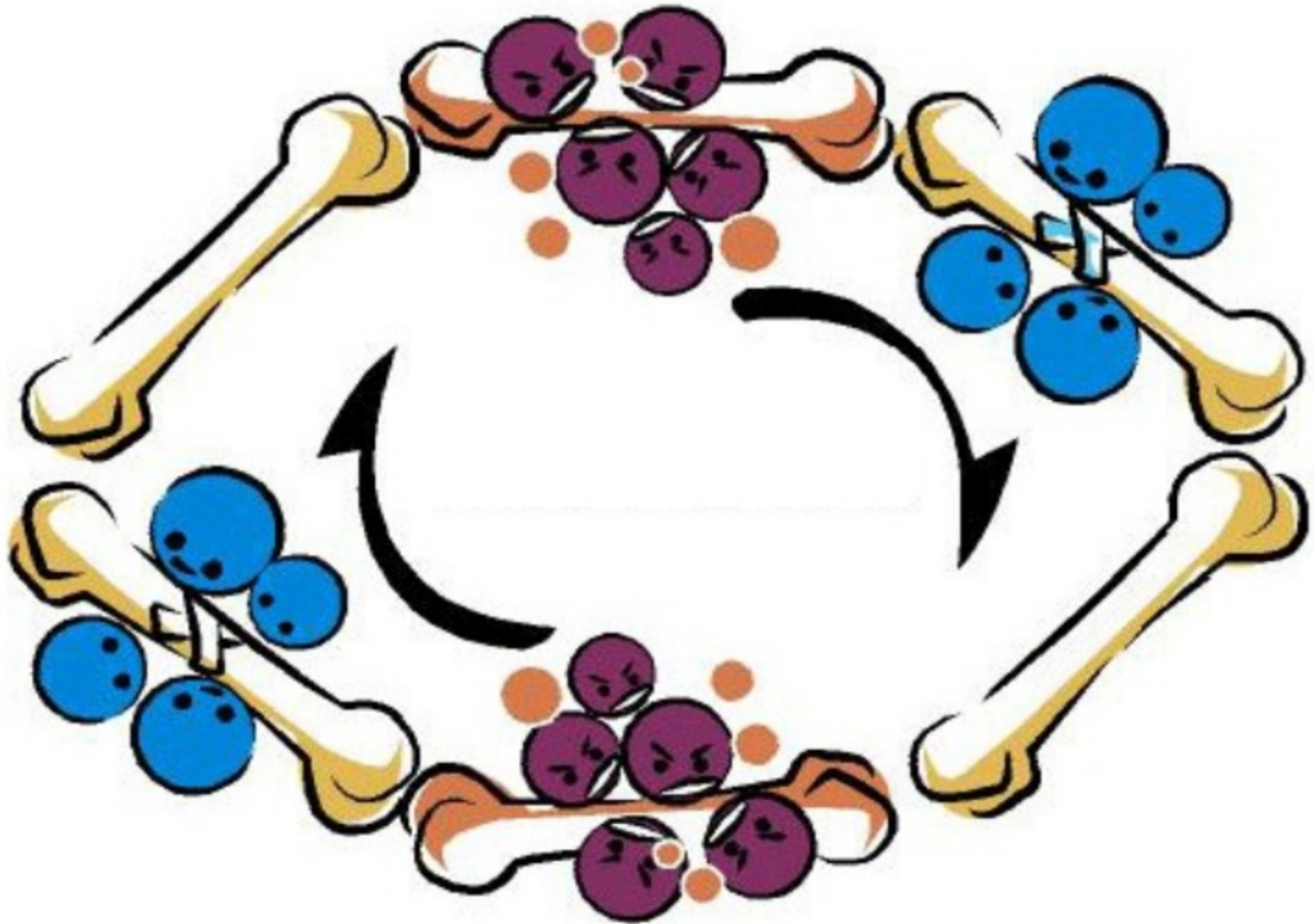


Composition of Bone



Amount in bone as percentage of the total amount in the body

|           |     |
|-----------|-----|
| Calcium   | 99% |
| Potassium | 4%  |
| Sodium    | 35% |
| Magnesium | 50% |
| Carbonate | 80% |
| Phosphate | 88% |



**Remodeling bones run throughout the life**





**Formation**

**Resorption**

*Healthy Bone Balance*



Source: U.S. Office of the Surgeon General





***Osteoporosis  
is it only for women?***



*Osteoporosis,  
only for older people ??*



# ***Types of osteoporosis***

## ***Primary Osteoporosis***

- **Postmenopausal Osteoporosis**
- **Senile Osteoporosis**

## ***Secondary Osteoporosis***

- **Diet**
- **Drug**
- **Endocrine disease**
- **Other Systemic Disorders.**





# Prevalence



**Osteoporosis, “the silent thief of your bone”**



# Prevalence...



# *Prevalence...*



**Worldwide, over age of 50**

- **1 in 3 women / 1 in 8 men have osteoporosis.**
- 80 % of those suffering from osteoporosis are women.
- Affects 75 million persons in the US, Europe and Japan.
- Osteoporosis is responsible for 1.3 millions fractures each year in usa.





# *Prevalence...*



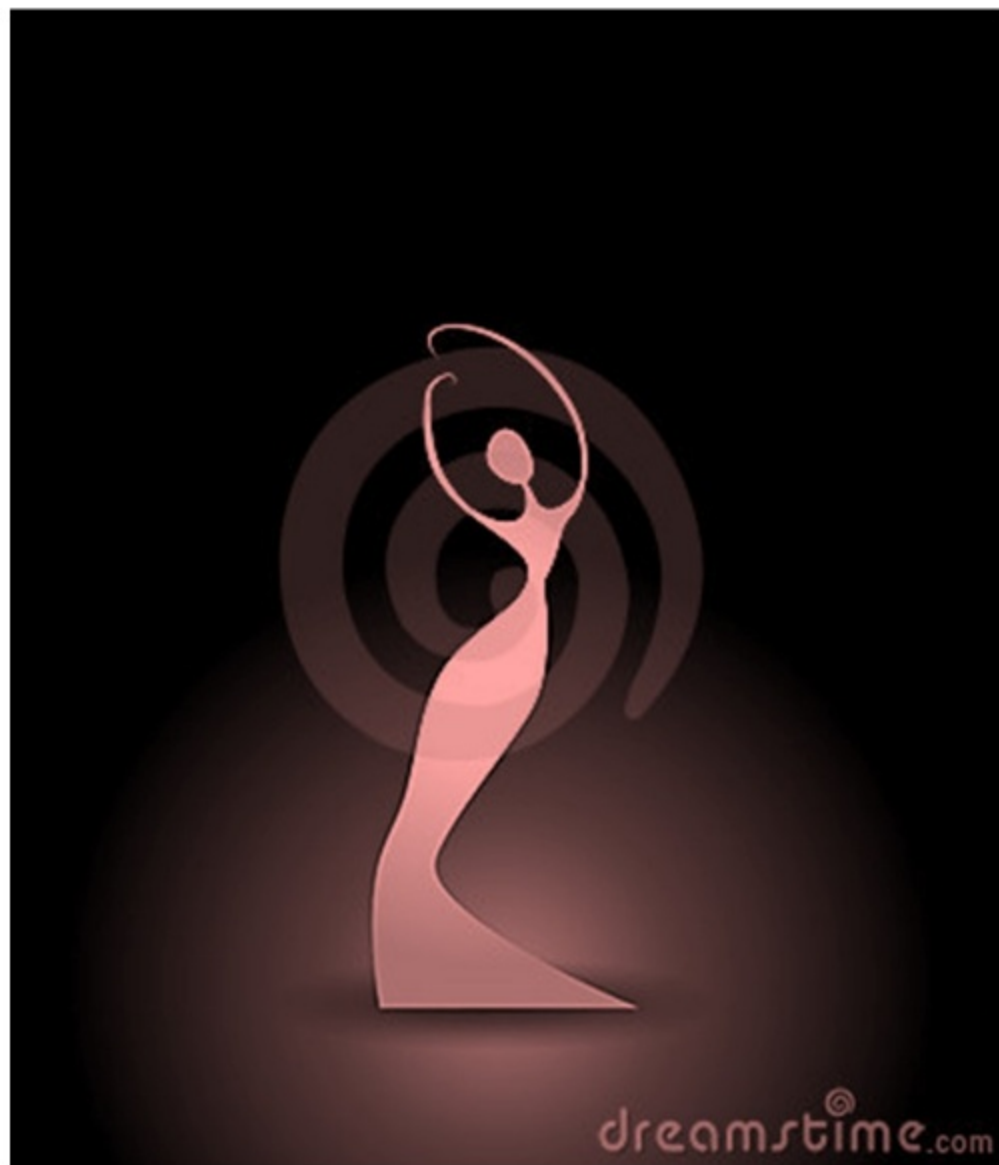
Approximately 1 in 2 women and 1 in 4 men over age 50 will have an osteoporosis related fracture in their remaining lifetime.





# ***Risk factors of Osteoporosis***

# Risk factors



## Being Female

With the onset of **menopause** (mid-forties or fifties), **diminishing estrogen levels** lead to **excessive bone resorption** that is not fully compensated by an increase in bone formation



# ***Risk factors...***

## **Older age**

***“Forty is the old age of youth,  
fifty is the youth of old age.”***



## ***Risk factors...***

- **Being female**
- **Older age**
- **Family history of osteoporosis.**
- **History of broken bones**
- **Low sex hormones**
  - Low estrogen levels in women, including menopause
  - Missing periods (amenorrhea)
  - Low levels of testosterone in male.



# ***Risk factors...***



- **Diet**
  - Low calcium intake
  - Low vitamin D intake
  - Excessive intake of protein, sodium and caffeine
- **Inactive lifestyle**
- **Smoking , Alcohol abuse**





# ***Risk factors...***

- **Certain medications**
  - steroid, anticonvulsants etc
- **Certain diseases**
  - anorexia nervosa, rheumatoid arthritis, gastrointestinal diseases and others





***How does  
Osteoporosis presents ?***



# ***presentations***

- People may not know that they have osteoporosis until they break a bone.



**Compression  
Fracture**



# ***presentations***



**Persistent, unexplained back pain**

# ***Presentations...***

- Vertebral (spinal) fractures may initially be felt or seen in the form of
- **Persistent, unexplained back pain**
  - **Loss of height**
  - **Spinal deformities such as kyphosis or stooped posture.**



# Diagnosis

- **Bone mineral density (BMD)** tests can measure bone density in various sites of the body.
- **BMD test is done to diagnose and predict fracture risk and to monitor therapy.**
- **S.Calcium, S.Phosphate, S. ALK.Phos,S.PTH Level**
- For patients on pharmacotherapy, it is typically performed 2 years after initiating therapy and every 2 years thereafter; however, more frequent testing may be warranted in certain clinical situations.





# Diagnosis



©ADAM, Inc

**Painless, non-invasive, effective  
diagnostic tool**



# Diagnosis...

- **Dual-energy X-ray Absorptiometry (DXA) Scan**
  - “Gold-standard” for BMD measurement.
  - Measures “central” or “axial” skeletal sites: spine and hip.
  - May measure other sites: total body and forearm.
  - Validated in many clinical trials.
  - Available in Bangladesh.



# Diagnosis...

- Dual-energy X-ray Absorptiometry (DXA) Scan

| Classification      | T-score                                       |
|---------------------|---|
| Normal              | -1 or greater                                 |
| Osteopenia          | Between -1 and -2.5                           |
| Osteoporosis        | -2.5 or less                                  |
| Severe Osteoporosis | -2.5 or less<br>and <i>fragility fracture</i> |



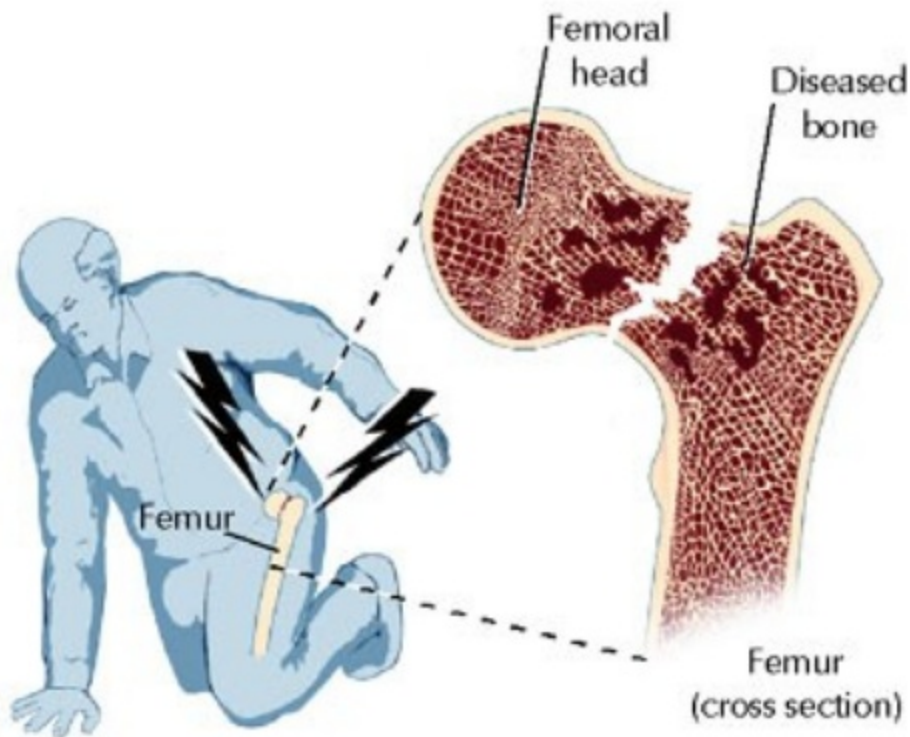


# Complications

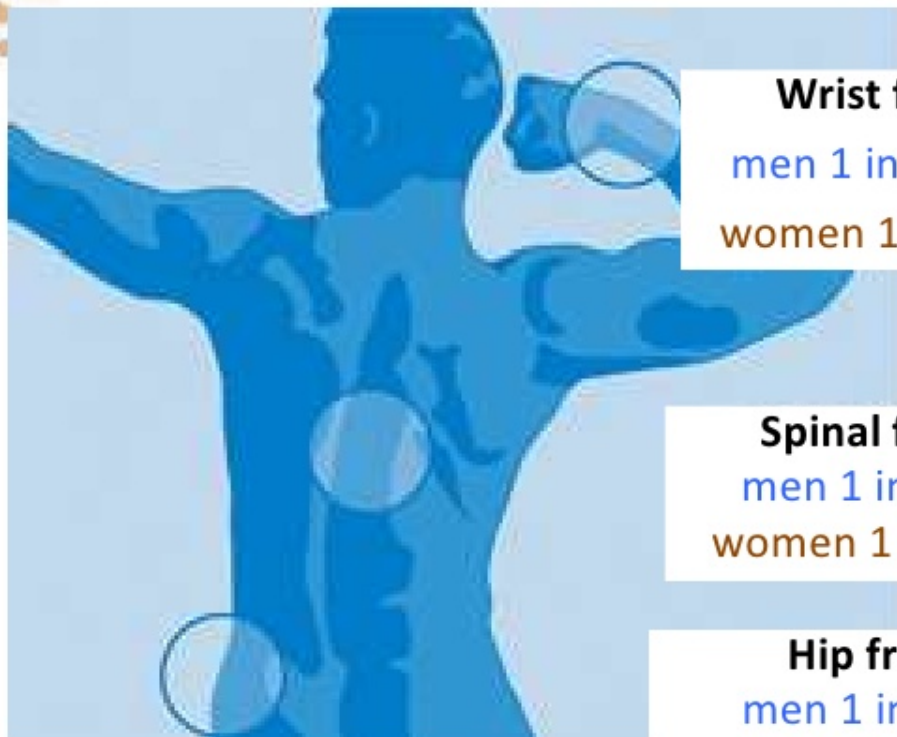
## FRACTURE ,

The most serious complication of Osteoporosis that leads to

- Increased morbidity
- Increased mortality
- Decreased quality of life



# Complications...



## **Wrist fracture**

men 1 in 40 (2.5%)

women 1 in 6 (16%)

## **Spinal fracture**

men 1 in 20 (5%)

women 1 in 6 (16%)

## **Hip fracture**

men 1 in 17 (6%)

women 1 in 6 (17.5%)



# Complications...

- Women with hip fracture are at a **four** fold greater risk of a second one.
- 1 in 4 (**25%**) people die within a year of the fracture
- **1 in 4** become disabled
- 2 of the 4 can walk again but with lower mobility than before.
- Many become isolated and depressed.







***Management***



[dreamstime.com](http://dreamstime.com)

# *Beat The Break*

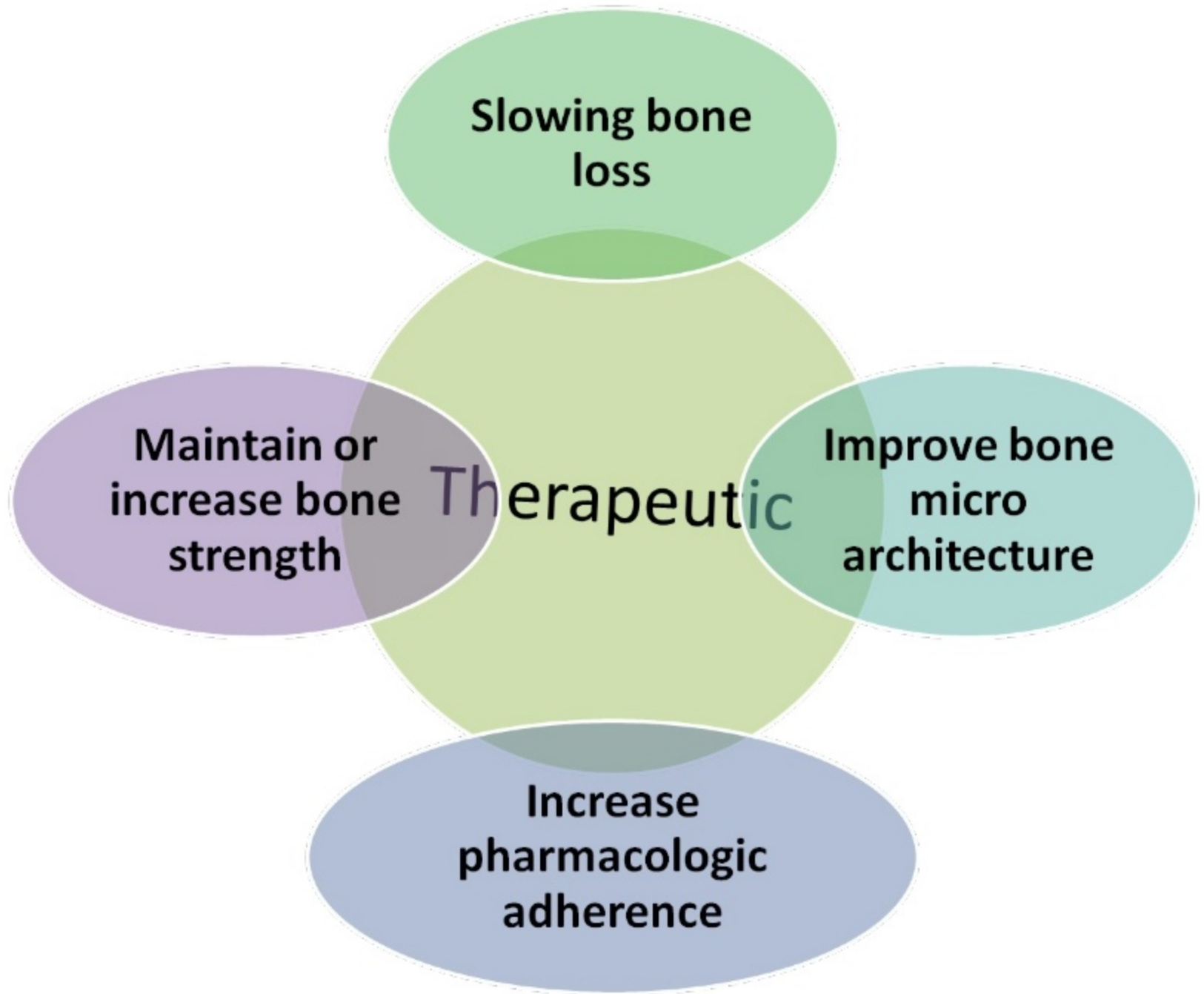


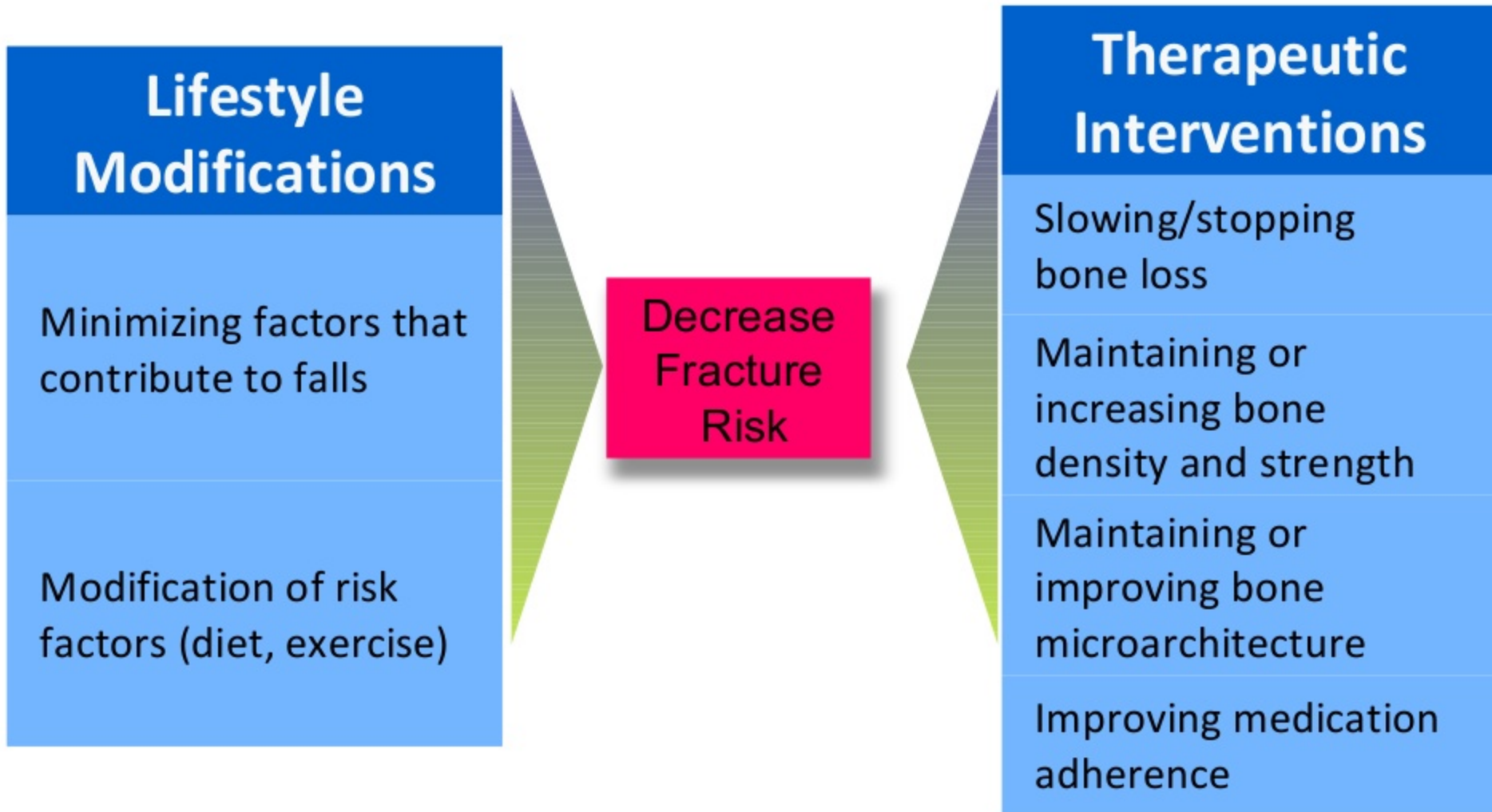


## *Goals of management*

- Prevent further bone loss
- Increase or at least stabilize bone density.
- Relieve pain and prevent fracture.
- Increase level of physical functioning
- Increase quality of life







# *Pharmacologic management*



- **Supplements**  
such as which maintain bone mass Calcium, Vitamin D
- **Anti-resorptive agents**  
which inhibit bone resorption eg. Bisphosphonates
- **Anabolic agents,**  
which stimulate bone formation and, in turn, increase bone mass.



**Drug:** Upto 5 years of osteoporosis

|                       |   |
|-----------------------|---|
| 1 <sup>st</sup> year  | <ul style="list-style-type: none"><li>• Calcium supplementation-1000-1500 mg/day</li><li>• Inj.Vitamin D- 600 – 2800 IU/day</li></ul>   |
| 2 <sup>nd</sup> year  | <ul style="list-style-type: none"><li>• Estrogen replacement- 0.625 mg/day</li></ul>  |
| 3 <sup>rd</sup> years | <ul style="list-style-type: none"><li>• Bisphosphonate:<ul style="list-style-type: none"><li>– Tab.Alendronate-70 Mg/weeks</li><li>– Tab.Risedronate- 35 mg/week</li><li>– Tab.Ibandronate- 150 mg/month</li><li>– Inj.Zoledronic acid- 5 mg/year</li></ul></li></ul> |
| 4 <sup>th</sup> years | <ul style="list-style-type: none"><li>• Calcitonin- intranasal 200 IU/day or S/C 50 – 100 IU/day.</li></ul>   |
| 5 <sup>th</sup> years | <ul style="list-style-type: none"><li>• All.</li></ul>  |

### Classification of Bisphosphonate:

| Generation                 | Name of Bisphosphonate | Relative patency |
|----------------------------|------------------------|------------------|
| 1 <sup>st</sup> generation | • Etidronate           | 1                |
|                            | • Clodronate           | 10               |
| 2 <sup>nd</sup> generation | • Pamidronate          | 100              |
|                            | • Olpadronate          | 200-500          |
|                            | • Ibandronate          | 500-1000         |
|                            | • Alendronate          | 1000-2000        |
| 3 <sup>rd</sup> generation | • Residronate          | 2000             |
|                            | • Zoledronate          | 10000            |



## *Hormone replacement Therapy*

- For many years, HRT was the only therapeutic available for the management of osteoporosis.
- HRT patients were found to be at a significantly increased risk of
  - Breast cancer
  - Coronary heart disease
  - Stroke and embolism
- **HRT is no more considered as the first-line therapy for the management of osteoporosis/osteoporotic fracture**





## *Calcium and Vitamin D*

- Adequate calcium intake helps to achieve a high peak bone mass during early adulthood and can slow bone loss later in life.
- **Although calcium supplementation is beneficial, it is not sufficient to treat patients with osteoporosis.**
- Vitamin D supplements confers benefits on bone mass and fracture incidence. Vitamin D is often combined with calcium for patients at risk of osteoporosis.



## Surgical treatment:

For fracture treatment:

- vertebroplasty & kypoplasty
- Hemiarthroplasty
- Total hip replacement



*How to prevent  
complication  
of  
osteoporosis ??*





## *Prevention of complications*



- Exercise/activity programs to improve strength and endurance
- Gait training
- Awareness creation to prevent slipping
- Regular medical check-up
- Treat medical conditions, e.g., as postural hypotension, anemia, dementia
- Alarm systems, assistive devices



**“ If you can’t Fly, then Run  
If you can’t Run, then Walk  
If you can’t Walk, then Crawl  
But whatever you do  
you have to keep  
MOVING FORWARD**

*-Martin Luther King Jr.-*



*Exercise*





# *Fall prevention*



# **Awesome words from ratan tata**



**"Eat your food as your  
medicine, otherwise you  
have to eat medicine as  
your food"**

## *Eat a health diet*



"People eat Vada and samosas fried in recycled spoiled oil. Relish panipuri filled with 'dirty' water. Eat pesticide laden vegetables and fruit. Pay money for a black liquid called Coke or Pepsi. Smoke, drink and chew tobacco like there is no tomorrow. And all this without thinking twice! But after I write a prescription, they ask in all seriousness"

.....

"\_Doctor, I hope there's no side effect for these!\_"\_□



*Eat a health diet*



**lean meat, fish, green leafy vegetables, and oranges and  
Off course Plenty Milk**



**Avoid smoking, alcohol and excess soft drink and coffee**



*Get moving*







Being active really helps our bones by :

- **slowing bone loss**
- **improving muscle strength**
- **helping your balance**

***Be active***

# Tips

- Building strong bones in childhood and adolescence, best defense
- A balanced diet rich in calcium and Vitamin D
- Weight bearing exercise
- Avoidance of tobacco smoking and excessive alcohol intake
- Bone density testing and medication when appropriate.







*Thank you*

