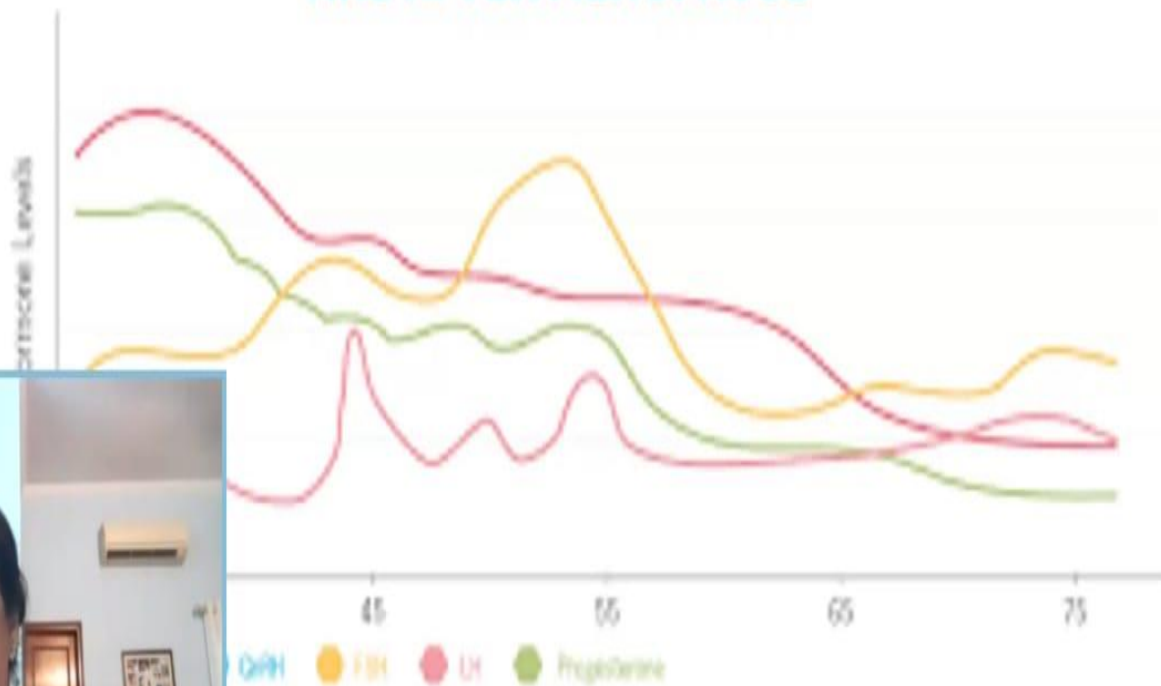


# ENDOCRINE PERSPEVTIVE OF MENOPAUSE

## HORMONES LEADING UP TO, DURING, AND AFTER MENOPAUSE



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- **Prev Experience:** Attending Consultant (Endocrinology) with Sitaram Bharti Institute of Science and Research, New Delhi.
- **Life Member** - AACE, Endocrine Society of India, RSSDI, Association of Physicians of India, UP Diabetes Association
- Expert speaker for various forums such as Indian Medical Association, Association of Physicians of India, Orthopaedic Society, Ghaziabad Obstetrics & Gynaecology Society and Surgical society
- Publications in National and International Journals





# Endocrine Perspective on Menopause

Dr Swapnil Jain  
DM Endocrinology

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Dr Swapnil ... (cohost)



# Menopause

- Menopause is the permanent cessation of menses as a result of irreversible loss of ovarian functions of ovulation and estrogen production. (*Gk. men - month, pausis- cessation*)
- It is usually a gradual process starting with a climacteric or pre-menopause phase of about 2-6 yrs.
- Indian age of onset of menopause is about 51 yrs.

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## Factors affecting Onset of Menopause

- Genetic – dominant pattern of inheritance through maternal or paternal relatives is noted.
- Weight – Obese women have late menopause
- Higher Parity – later menopause has been noted.
- Smoking causes early menopause by ~1.5 yrs
- Alcohol delays the onset of menopause. These females have higher estrogen levels and higher bone mass.
- Unlike decline in age of menarche, age of menopause has not changed much over the centuries.

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## Hormonal changes during Menopause

- FSH levels increase and Inhibin levels decrease significantly.
- LH – also increases, but to a lesser extent
- Primary steroid products of post menopausal ovary are Androstenedione and Testosterone
- Estradiol – levels fall to  $< 20\text{pg/ml}$

Derived from peripheral conversion of Androstenedione  $\rightarrow$  Estrone  $\rightarrow$  Estradiol

Testosterone – production decreases by about 25 %.

Androgen : Estradiol ratio sharply increases – being the cause of mild hirsutism.

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## Physiological changes

- Vaso motor symptoms
- Urogenital Atrophy
- Cardio vascular Disease
- Osteoporosis
- Psychological changes

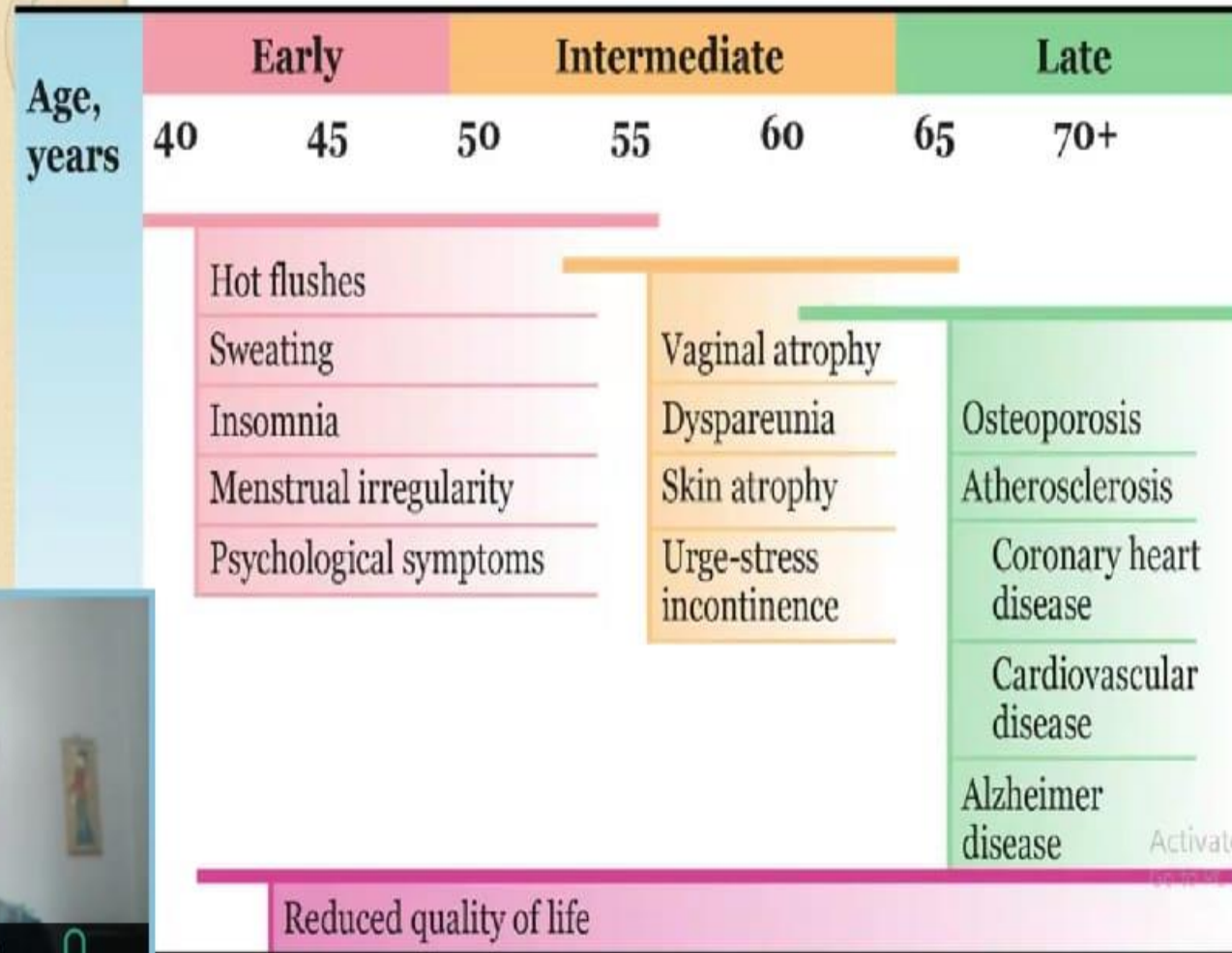


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# The consequences of estrogen deficiency vary from peri-menopause to advanced age



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## Vaso motor symptoms

- Hot Flashes – caused by the sudden reduction in estrogen levels
- LH (not FSH) surge is also believed to cause these flashes
- Hypothalamic GnRH surges are also postulated to be the cause of these flashes.

Flashes are more common in early menopausal period and climacteric, and tend to decrease in intensity and frequency after ~ 4 years.

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## Vasomotor symptoms (VMS) in menopause: a biomarker of CVD risk

Condition associated with VMS	RR (95% CI)
Coronary heart disease (CHD)	1.48 (1.20, 1.83)
Stroke	1.43 (1.07, 1.92)
Cardiovascular disease (CVD)	1.54 (1.27, 1.86)

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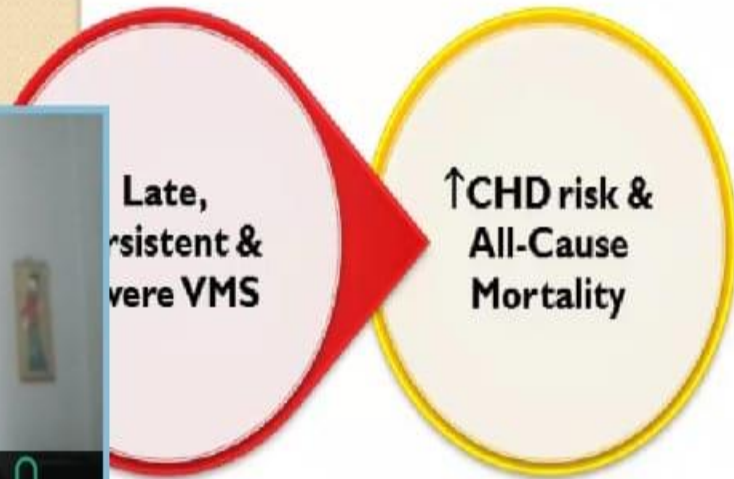
# Vasomotor symptoms (VMS) in menopause: a biomarker of CVD risk

Women experiencing VMS have significantly higher

Blood pressure

Total cholesterol levels

Body mass index



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## Urogenital Atrophy

- Loss of vaginal lubricating fluid, elasticity – leads to dryness and dyspareunia
- Sexual activity is not affected.
- Urge /Stress incontinence is increased – distressing symptom
- Increased tendency of lower genital tract infections, esp fungal in diabetics
- Vaginitis, non bacterial urethritis is increased
- Skin collagen content & elasticity is decreased

## Cardio-vascular effects

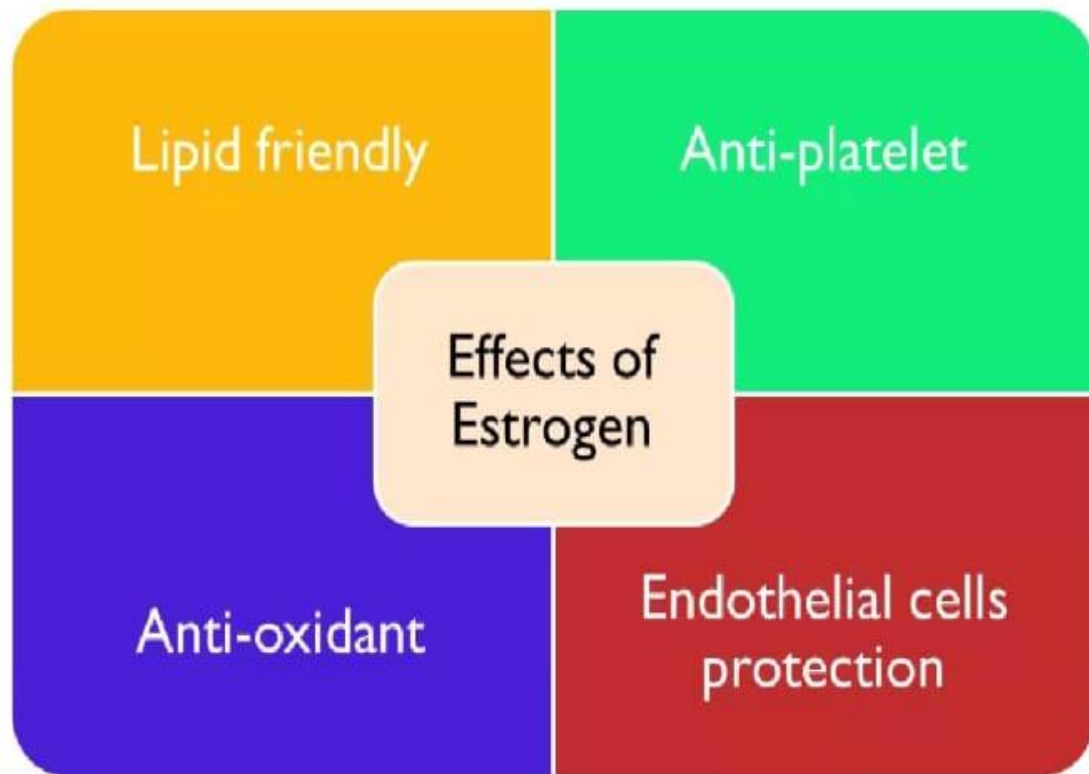
Premenopausal women lag behind men in incidence of Coronary artery disease by about 10 years.

This is because of metabolic effects of estradiol -

- LDL is decreased
- HDL increased
- Lipo protein (a) - reduced
- Retards atherosclerosis

All these effects are rapidly reversed after menopause

# Estrogen and Cardio-protection



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# Is Menopause a risk factor for CVD??

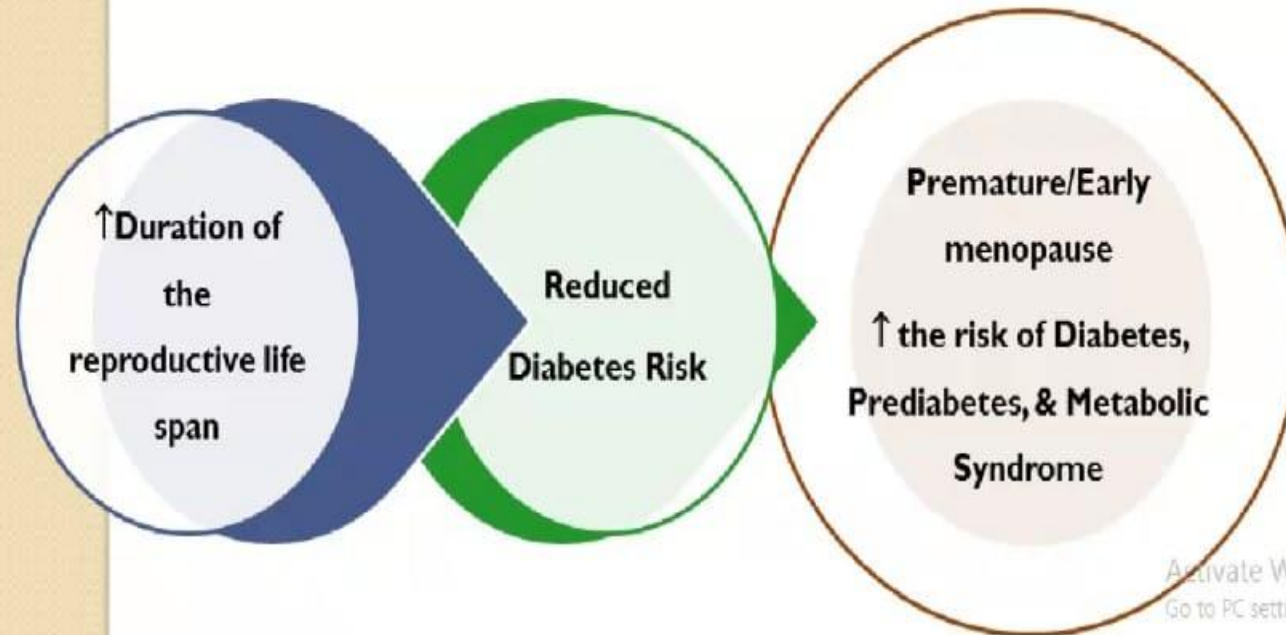


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# Menopause & Diabetes

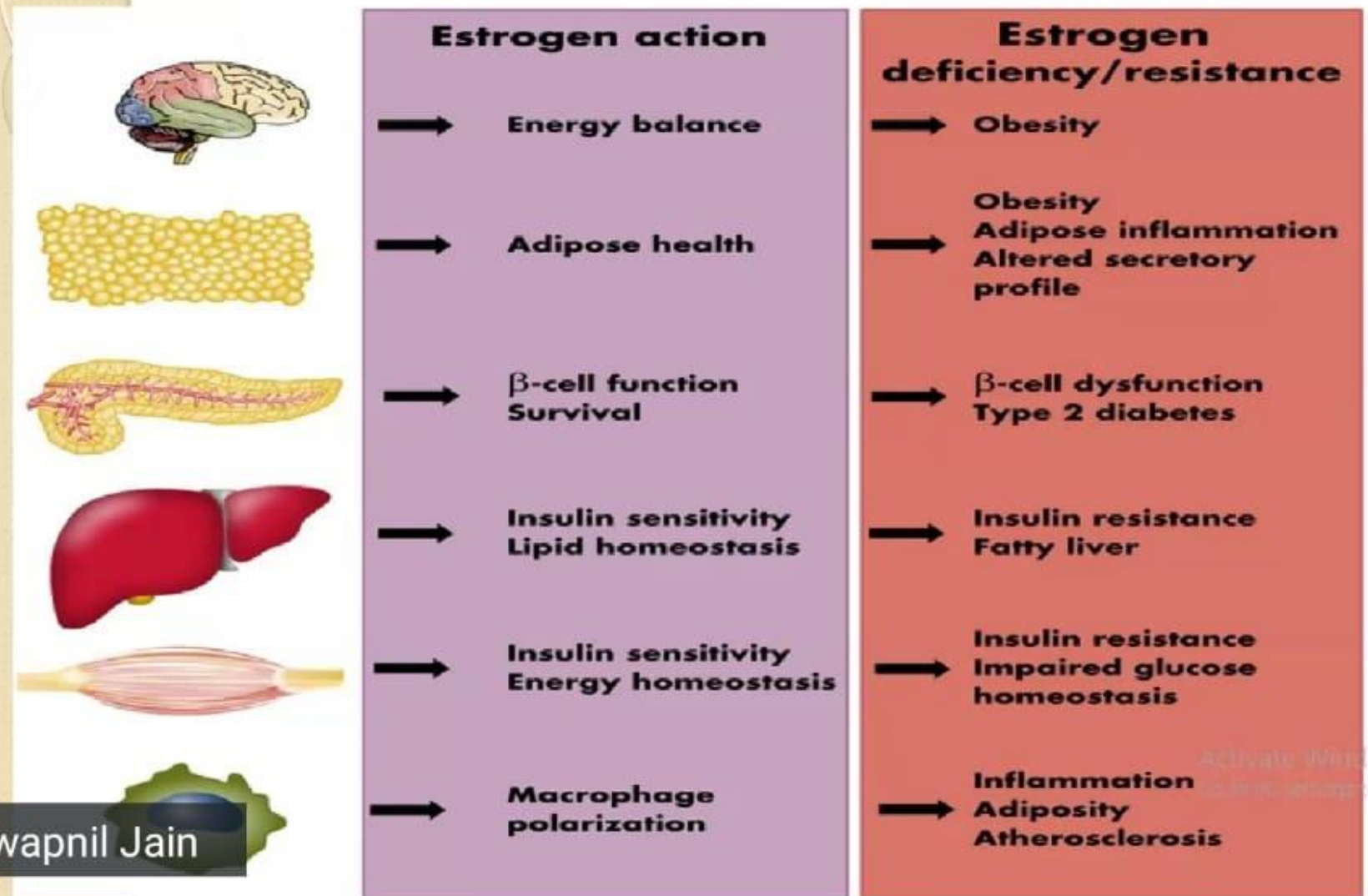
Women with a reproductive lifespan <30 years had a 37% higher risk of T2DM than women with a reproductive lifetime of 36–40 years

(n=124379; WHI study 2017)



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# Impact of MHT on the risk of T2DM



Speaking: Dr Swapnil Jain

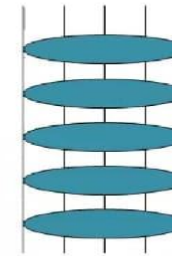
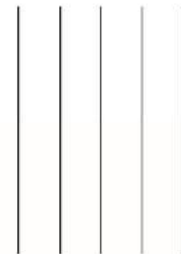
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# Osteoporosis



Bone matrix formed of collagen



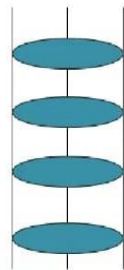
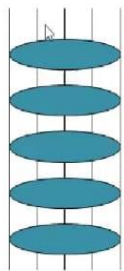
Calcium Hydroxyapatite deposits on the matrix

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Normal

Osteoporosis

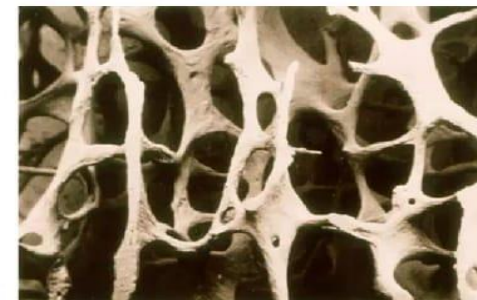
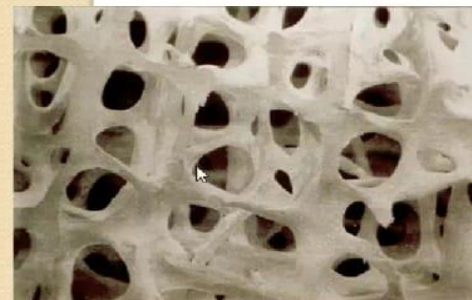


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Normal Bone

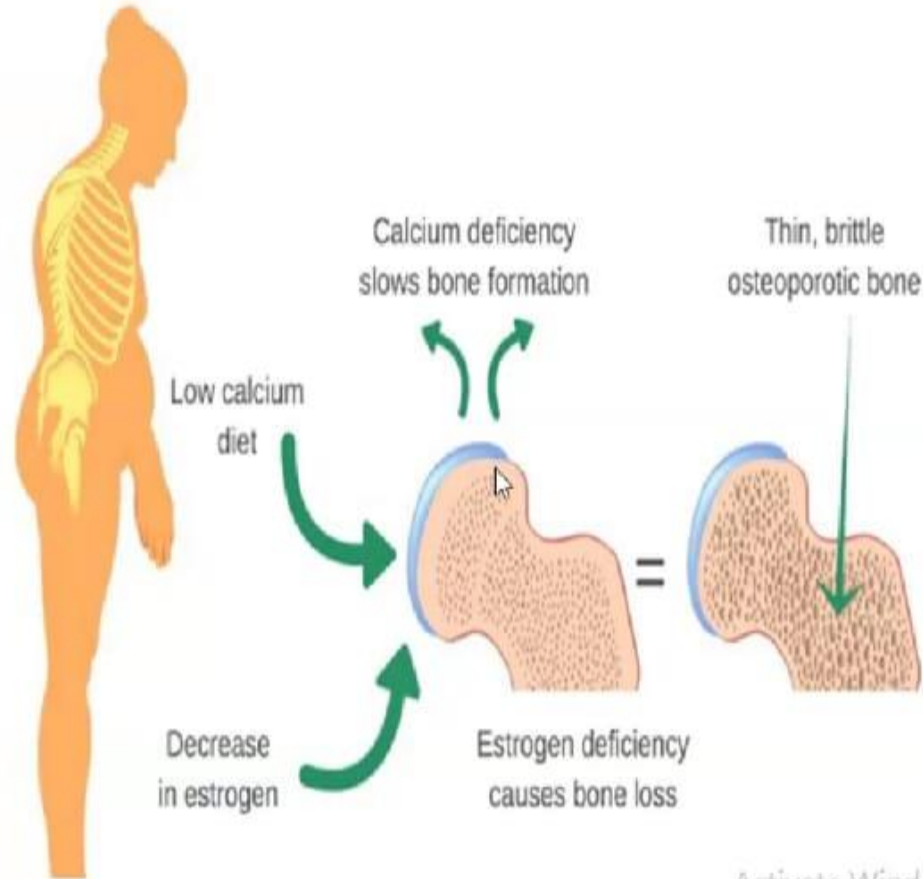
Osteoporotic Bone



Dr Swapnil Jain is sharing.

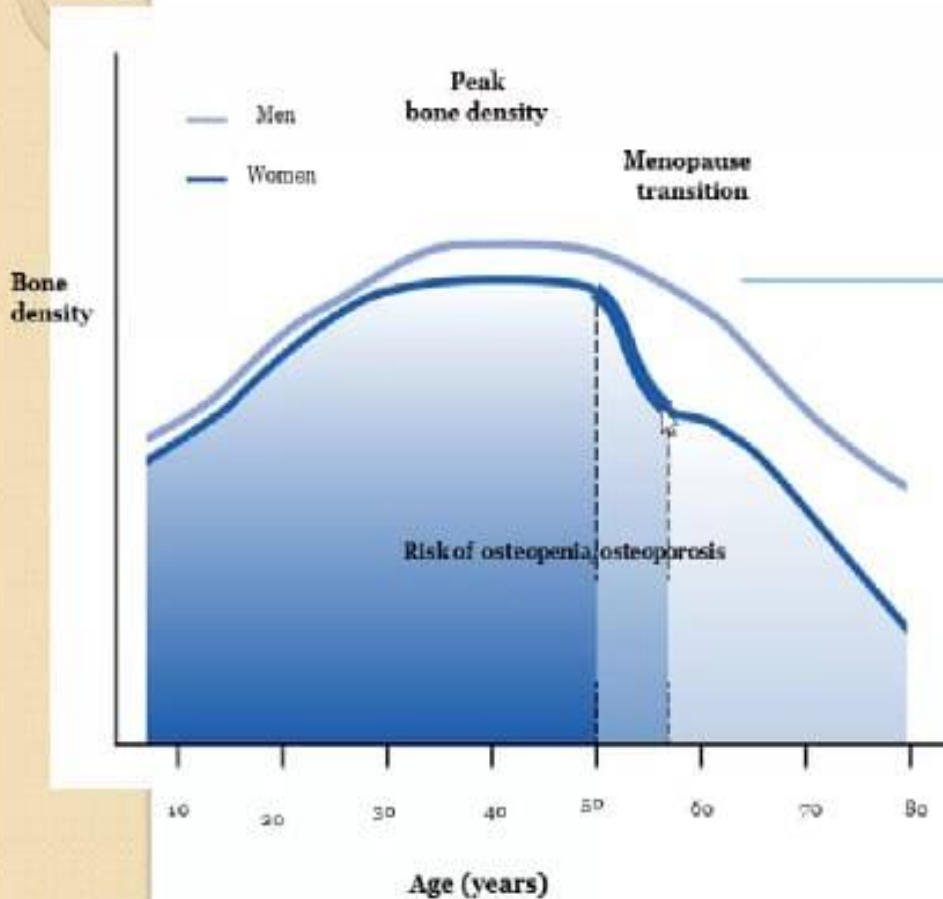
### Estrogen effects on osteocytes/osteoclasts/osteoblasts

- Regulator of bone growth
- Regulation of bone remodeling
- Decrease bone resorption
- Maintenance of bone formation
- Regulation of osteoclasts



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# Decreased ovarian function and reduced estrogen production are associated with loss of bone mineral density

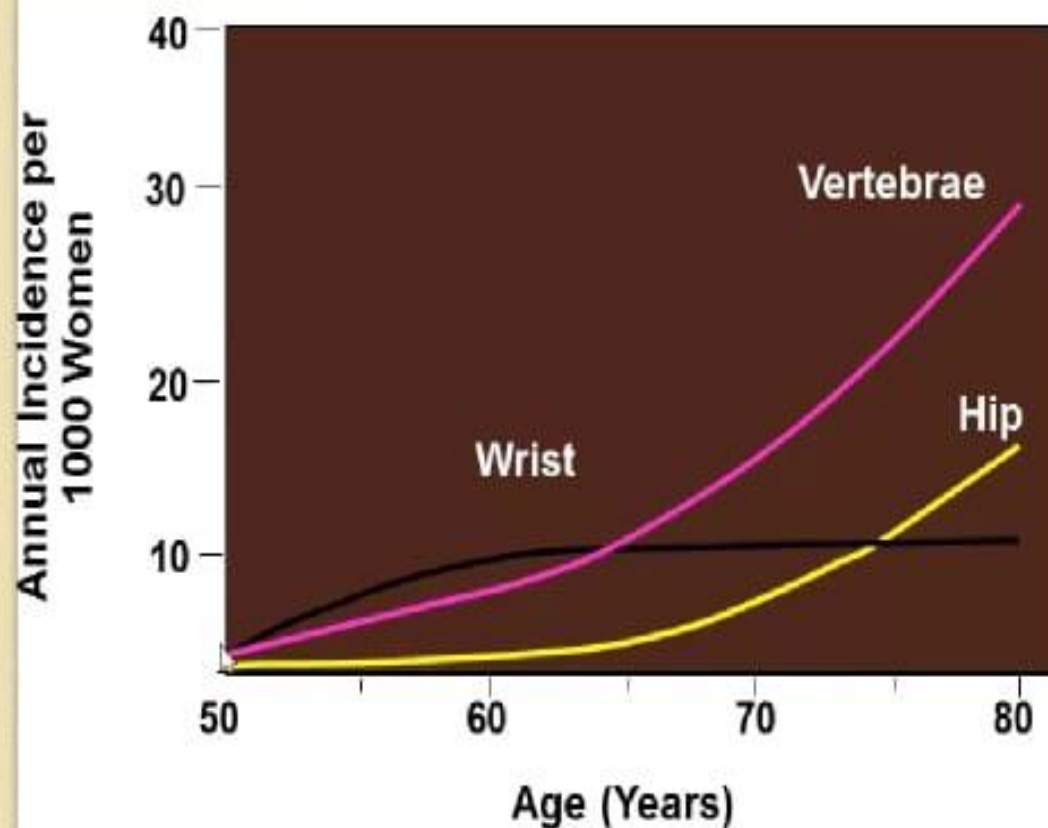


Beginning from the menopause transition, reduced estrogen leads to a decrease in critical bone mass

## Osteoporosis

- After menopause, approx 5% trabecular bone loss occurs per year (eg in vertebrae, ends of long bones)
- 1.5% loss in total bone mass per annum is noted
- This leads to vertebral compression fractures, Colles' fracture, Head of femur fracture and tooth loss

## Incidence of Osteoporotic Fractures in Women After Age 50<sup>1</sup>



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## Psycho physiological effects

- Emotional lability is increased
- Menopause is not the *cause* of clinical depression, but may aggravate a pre existing depressed state.
- Sleep disturbance due to vasomotor symptoms also contributes to mood disturbances
- Cognitive impairment – increased incidence of Alzheimer's disease has been noted

## Menopause & mood

Menopause does not happen in isolation from the social interpretations and psychological changes that may also occur in a woman's life at the same time

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# Depression & Menopause

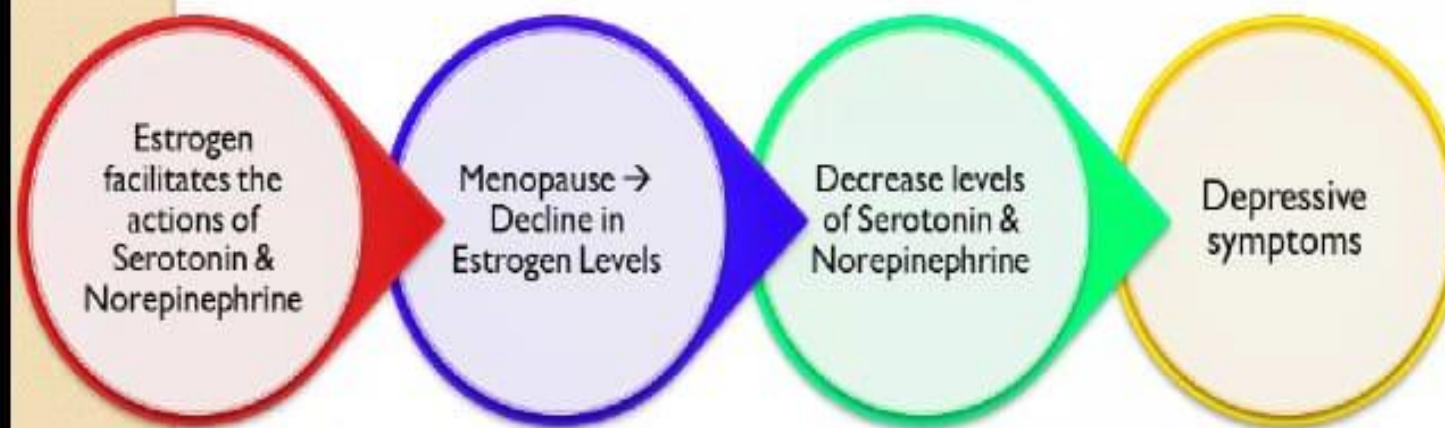
An estimated 20% have depression at some point during menopause.

Depressive symptoms **increased during transition** to menopause and **decreased in postmenopausal** women.

The strongest predictor of depressed mood was a prior history of depression, along with fluctuations in reproductive hormone levels associated with depressed mood



# Estrogen increases the effects of Serotonin & Norepinephrine



\*Exact mechanism not known

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