

Clinical practice guidelines on menopause: *An executive summary and recommendations

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INTRODUCTION

Guidelines are a method of translating the best available evidence into clinical, communicable, organizational, and policy making statements in the hope of improving health-care and/or policies. Unlike protocols, guidelines are meant to aid the clinician in decision making. Do we need country-specific guidelines? Yes, we do, given the fact that the model of health-care delivery system and the prevailing environment of one country may not be extrapolated to that of another.

“Working with what you have, where you are, and not with what you wish for” is the principle each one of us follow in clinical practice to give the best to our patients. This guideline hopes to bridge the gap between evidence-based practice, backed by scientific evidence and

experience-based practice, based on the published and unpublished Indian data and expert opinions. The target readers of the guidelines are the adult women, members of the Indian Menopause Society (IMS), allied professionals, health-care providers and policy makers.

India is a land of rich and diverse cultural heritage. It is a land of diversity in terms of socio-economic, religion, culture, beliefs, education, and nutrition, urban, rural, and geographical regions. The dilemmas and challenges

*This is a summary and recommendations from the detailed document on Clinical Practice Guidelines on Menopause published by Jaypees. (R-indicates Recommendation with Grading, the detailed references is listed in the main document. The text of the unpublished references can be procured from Dr. Meeta at drmeeta919@gmail.com)

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are unique to different regions, and solutions need to be planned accordingly. The specific issues pertaining to Indian women include an early age of natural menopause, genetic, and environmental influences, nutritional deficiencies and excesses resulting in physiological differences. These factors contribute significantly to an increased incidence of diabetes, cardiovascular disease, osteoporosis, and thyroid dysfunction. Genetic components are likely to play a prominent role in these disorders; for example, polymorphisms in estrogen receptors alpha and vitamin D receptor have been implicated in the pathogenesis of osteoporosis. Indians are known to be deficient in vitamin B12, folic acid, and vitamin D. In India, cancer cervix is the leading cause of genital cancers, and the peak incidence of breast cancer occurs at an earlier age than the Caucasians. India has the problem of urbanization bringing in new cultures and life-style leading to problems of obesity. There is a change from the traditional food to stored fast food. In the urban areas, there is breakdown of joint family system leading to nuclear families. The social support from the family during the transitional phase and ageing is dwindling on one side, and on the other side, life span has increased in the last two decades. The earlier age at menopause has several implications and challenges for health-care in India. There will be a large number of women who spend a substantial part of their life after menopause. Health-care providers will need to initiate programs and provide appropriate care for the large population of women living beyond menopause. In addition, attention needs to be directed toward implementing programs that will help to sensitize and increase awareness of menopause among women in India.

OBJECTIVES

- To assist health-care practitioners in providing optimal and holistic care to the women in transition phase.
- To aid primary care physicians to decide when to refer patients with difficult problems to the relevant specialists.
- To sensitize the health-care professionals, policy makers toward the health of the ageing woman and thus promote the concept of menopausal clinics.
- To stimulate interest in research on all aspects of menopausal medicine.

METHODS

The planning to publishing of the document took 24 months. The core committee was formed and a broad-based multi-disciplinary list of experts was invited to write on the topic of their expertise. Majority of the reviews and deliberations were by e-mail. A one day intensive contact program of the contributors was convened at

Hyderabad on September 8, 2012, and each topic was presented and deliberated upon. Consensus was obtained by an automated response system. Finally, the document was validated by an external review board.

The guideline is based on three previous documents released by the IMS and other global guidelines on menopause management. Data were sourced from the electronic database PubMed, MEDLINE, Cochrane Data-base of Systematic Reviews and published guidelines on menopause management. The Appraisal of Guidelines Research and Evaluation,^[1] instrument was used to appraise published guidelines. Abstracts from papers and posters presented at the National IMS meetings, published and unpublished studies, expert opinion was considered. Cost-effectiveness of diagnosis and treatment is based on the available market value.

System for grading: Evidence used in the document

The quality of evidence and the level of recommendation were done using the Grades of Recommendation, Assessment, Development, and Evaluation system.^[2]

Recommendations are based on strong evidence and, suggestions on experience-based evidence. This method is adapted to unite the diverse conditions of India with the best available data and the rich experience-based evidence from the experts.

Grades of evidence

- High quality Grade A: Further research is very unlikely to change our confidence in the estimate of effect.
- Moderate quality Grade B: Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- Low quality Grade C: Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- Very low quality Grade D: We are very uncertain about the estimate.

Strength of recommendation

In terms of the strength of the recommendation, strong recommendations use the phrase “recommend,” and weak recommendations use the phrase “suggest.”

Research questions are placed at the end of each chapter in the monogram.

Benefits of using the guidelines

Benefits of using this guidelines are (i) improved quality of care (ii) Early detection and management of non-communicable disease (iii) understanding the urgent

need of conducting preventive health programs by all stakeholders related to women's health, and (iv) additionally, in view of the great lacunae in Indian data, it is hoped that the guidelines will help stimulate interest in research in various aspects of menopause.

CONCLUSIONS

The onus of developing specialty menopause clinics akin to antenatal clinics in the private and public sectors besides developing management of menopause as a medical specialty within obstetrics and gynecology care lies with the government and non-government organizations. Meanwhile, the aim of the guideline is to provide a resource book to aid the busy clinician in extending optimal care to the aging woman. The guideline is no doubt limited by the paucity of robust research evidence in India due to various factors, but effort has been directed to tailor the recommendations to the diverse Indian scenario with the best available evidence.

This is one of the endeavors of the IMS to work toward the slogan *"Fit @ Forty, Strong @ Sixty, Independent @ Eighty."*

ACKNOWLEDGMENT

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management of menopause in India. A special thanks to Dr. Shaantanu Donde, Dr. Ganesh Uchit for sourcing the data.

DISSEMINATION OF THE GUIDELINE

Executive Summary and Recommendations is available on the IMS website www.indianmenopausesociety.org.com. It is published in the Journal of midlife, official publication of the IMS. M/s Jaypee Brothers Medical Publishers are our partners in publishing the monogram on the clinical practice guidelines on menopause.

Revision of the guideline

It is recommended that the Guidelines are upgraded every 5 years.

Editorial independence

The views expressed are independent of any extraneous influences.

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SECTION I

GENERAL CONSIDERATIONS

1. Menopause is a transition phase from the reproductive to the non-reproductive phase in a woman's life.^[1] It is nature's protective phenomenon against reproductive morbidity and mortality in the ageing population. Today, we are aware that menopause has much wider implications than simply loss of fertility. It sets the stage for ageing and accelerates the process of non-communicable disorders.
2. Menopause is diagnosed retrospectively by history. Markers for diagnosis of menopause are preferably restricted for use in special situations and for fertility issues. Levels of (FSH) Follicular Stimulating Hormone > 10 IU/L are indicative of declining ovarian function. FSH levels > 20 IU/L are diagnostic of ovarian failure in the peri-menopausal age group with vasomotor symptoms (VMS) even in the absence of cessation of menstruation. FSH levels > 40 IU/L done 2 months apart is diagnostic of menopause. Anti-mullerian hormone becomes undetectable,

inhibin levels fall, and antral follicular count and ovarian volume decreases at menopause. Menstrual irregularity is the only objective marker to define and establish the menopause transition.^[2]

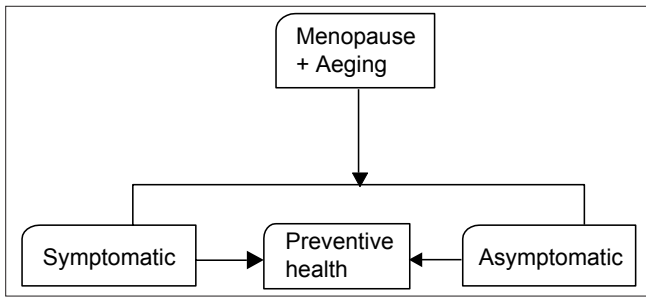
TERMINOLOGY

3. Natural or spontaneous menopause: It is recognized to have occurred after 12 months of amenorrhea for which there are no obvious pathological and physiological causes. It is a retrospective diagnosis. It occurs due to depletion of ovarian follicles resulting in near complete, but natural diminution of ovarian hormone secretion. There is no independent biological marker for menopause.^[3,4,5]
4. Pre-menopause: It is often used to refer the entire reproductive period, up to the final menstrual period.^[4]
5. Peri-menopause: It is the period immediately prior to and up to 1 year after the final menstrual period. It may last for 3-5 years. The characteristics are increased blood levels of FSH, anovulatory cycles, significantly reduced fertility and erratic menstrual periods, and onset of symptoms. This term is used interchangeably

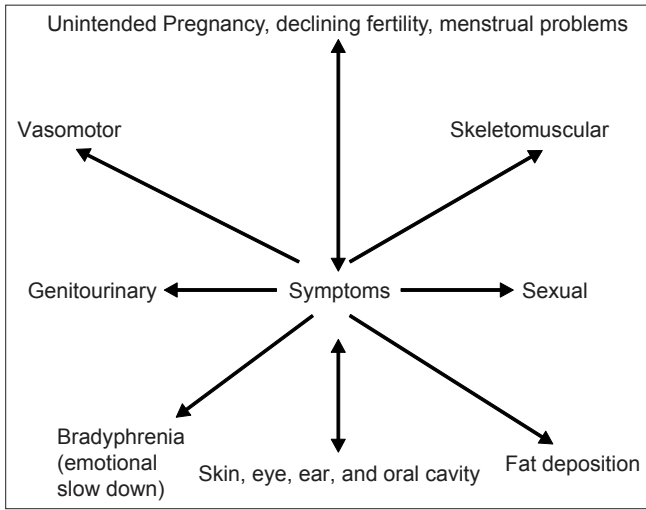
- with menopause transition.^[4,5]
6. Menopause transition: It is the term coined by Stages of Reproductive Aging Workshop (STRAW) group, and during this period, disturbed menstrual cycle and endocrine changes are observed.^[5]
 7. Climacteric: Literally, it means the rungs of a ladder. It is interchangeable with peri-menopause and menopause transition. When associated with symptoms, it is termed as the climacteric syndrome. This term is preferably not to be used in scientific papers.^[4]
 8. Post-menopause: It is the span of time dating from the final menstrual period, regardless of whether the menopause was spontaneous or iatrogenic.^[5]
 9. Senescence: It is the period after the age of 60 years.^[3]
 10. Premature menopause: It is the spontaneous menopause occurring two standard deviations (SDs) below the mean estimated age for the reference population. Traditionally, it is considered to be below the age of 40 years.^[4,5] We may consider it as occurring below 38 years*.
 11. Induced menopause: Cessation of menstruation that follows bilateral oophorectomy or iatrogenic ablation of ovarian function.^[4]
 12. Temporary menopause: It is a term preferably not to be used, since definition of menopause is complete cessation of menstruation. Rarely, ovarian function is interrupted for a period of time and later resumes.^[4]
 13. Early menopause: It is the time span between the spontaneous or iatrogenic menopause occurring between the age of 40 years and the accepted typical age of menopause for a given population.
 14. Delayed menopause: It is not defined but may be important in terms of the increased problems associated with the hyperestrogenism and is used in this guideline. It is two SDs above from the natural average age of menopause in a given population. We may consider it to be beyond 54 years*.
*We need population-based studies to derive at the cut off values.
 15. Post-menopausal bleeding (PMB): It is the occurrence of vaginal bleeding following a woman's final menstrual cycle and not on cyclical hormone therapy. However, vaginal bleeding that occurs 6 months after amenorrhea should be considered suspicious and warrants investigation.
 16. Staging system: The staging system of a physiological event is to improve comparability of strategies and facilitate clinical decision making. In 1997, Behram Ankelesaria in India, published a simple method of staging of menopause to understand and deal with the problems of the transition phase and beyond.^[6,7] STRAW (2001) aimed to classify the woman's life in three phases: Reproductive, menopause transition, and post-menopause based on the menstrual cycle, endocrine parameters, and ovarian reserve markers. This was applicable only to healthy women.^[5] 2012 STRAW + 10- provides a greater clarity for menstrual pattern and is applicable to most women, except for those with premature ovarian failure (POF).^[8]
 17. The life expectancy in India has taken a quantum jump from 30 years in 1940s to 61 years in 1990s. According to the world health organization's (WHO's) health statistics 2011, in India an average female life expectancy in 2011 is 68 years and is projected an increase to 73 years by 2021.
 18. The estimated mean age of menopause is 46 years in India, and is lower than that of the Caucasians.^[9-25,26] From the available Indian data, it is hypothesized that an early age of menopause predisposes a woman to chronic health disorders a decade earlier than a Caucasian woman. It is reported that osteoporotic fractures occur 10-20 years earlier in Indians compared to Caucasians.^[27,28] The first myocardial infarction attack occurs in 4.4% of Asian women at a younger age than in European women.^[29] In India Type 2 Diabetes Mellitus (DM) occurs a decade earlier than the Caucasians.^[30] Breast cancer incidence peaks before the age of 50 years.^[31] Cervical cancer is leading cause of mortality due to cancers in women. The highest age specific incidence rate of 98.2/100,000 for cancer cervix was seen in the 60-64 year age group.^[32]
 19. The burden of cardiovascular disease (CVD) in India is projected to increase by 115% from 1990 to 2020,^[33] and cerebrovascular incidence by 104%.^[34] The migrant population from the Indian subcontinent in the UK is known to be at a significantly higher risk of developing diabetes and CVD.^[35] The mean bone mineral density (BMD) in India is about two SDs lower than in women in the western population.^[36-45] The prevalence of low bone mass is to the extent of 40% from the age of 40 years and increases to more than 62% by age 60 years and 80% by the age of 65 years.^[46-66] The above facts indicate the need to have well planned cost effective systems in place to promote a healthy and an active ageing population.

INDIVIDUALIZED PLAN FOR MENOPAUSE

20. Each woman needs an individualized health plan management. It is most important to distinguish between a symptomatic and an asymptomatic menopausal woman. Women may present at the menopausal clinic with menstrual problems, menopausal symptoms or request for a general health check-up, or as an opportunistic contact to be picked up by the health professional [Flowchart 1 and 2].^[67-71]



Flowchart 1: The Physician's role and approach



Flowchart 2: Issues in symptomatic women

SECTION II

SYMPTOMS OF MENOPAUSE, ISSUES RELATED TO MENOPAUSE TRANSITION, AND AGEING

Fertility

21. After the age of 30 years, if a woman does not conceive naturally within 6 months, the couple should have an infertility work-up (Grade B).
22. In women with a single ovary, previous ovarian surgery, poor response to Gonadotropins, previous exposure to chemotherapy or radiation, or unexplained infertility should undergo ovarian reserve testing even before the age 30 years and in all women it is done beyond ≥ 30 years (R: Grade B).
23. In women > 40 years who do not conceive within 1 to 2 cycles of controlled ovarian hyperstimulation, (IVF) *In vitro* Fertilization should be considered (Grade B).
24. The only effective treatment for ovarian ageing is oocyte donation. A woman with decreased ovarian reserve should be offered oocyte donation as an option as pregnancy rates associated with this

Table 1: Percent pattern of contraception use in the age group of 35-49 years in different countries

| Type of contraception | Country | | | |
|-----------------------|------------|----|-----|-----------|
| | AP (India) | UK | USA | Hong kong |
| COC | 3 | 10 | 8 | 39.1 |
| Condoms | 1.9 | 20 | 15 | 41.5 |
| IUCD | 1.7 | 7 | 10 | 13 |
| Sterilization | 72 | 48 | 65 | 0.5 |
| Other | 21.1 | 15 | 2 | 16.5 |

COC: Combined oral contraceptive; IUCD: Intra uterine contraceptive devices

Table 2: Risk of deaths with contraception compared to no contraceptive method

| Age | 35-39 years | 40-44 years |
|------------------|--------------------|--------------|
| No contraception | 11.7/100,000 women | 20.6/100,000 |
| With OCPs | 1/100, 000 women | 1.9/100,000 |

OCPs: Oral contraceptives pill

treatment are significantly higher than those associated with controlled ovarian hyperstimulation or *in vitro* fertilization with a woman's own eggs (Grade B).

25. The risk of spontaneous pregnancy loss and chromosomal abnormalities increases with age, and the couple need to be counseled on this aspect (Grade B).
26. Preconception counseling with an emphasis on optimal general health, screening for medical conditions such as hypertension, diabetes, and pregnancy-related risks should be addressed for women of more than 40 years (Grade B).

Contraception

27. Pregnancies in elderly women are associated with higher maternal and perinatal morbidity and mortality. There is an increased risk of fetal malformations. This can also lead to psychological and potential domestic and social consequences.
28. Pattern of contraception use in the age group of 35-49 years in different countries [Table 1].^[72-75]
29. The annual risk of deaths associated with using no method of contraception far exceeds that for use of any method among all age groups [Table 2].^[73]
30. Sterilization: It is highly effective, safe and a single act, case fatality rate with tubectomy is 1-2/100,000 procedures. However, it is a permanent method. Vasectomy is even safer except for minor complications (Grade A).
31. Oral contraceptives pill (OCPs): These are effective, easy to use, and reversible. Low-dose OCPs have non-contraceptives health benefits with an increased safety profile (Grade A).
32. For women, above the age of 35, careful personal and family history, and accurate measurement of blood pressure (BP), breast examination,

screening for diabetes, and lipid profile should be performed (Grade A).

33. Healthy women of normal weight, non-users of tobacco, doing well on a combination contraceptive pill can continue this method until the age of menopause and up to a year or two later, after analyzing the risks and benefits (Grade B).
34. If oral contraceptives are continued before major surgery, heparin prophylaxis should be considered (Grade B).
35. Administration of OCPs in normal eumenorrheic women has no effect on BMD and bone metabolism. Conversely, depot medroxyprogesterone acetate (DMPA), is associated with bone loss, which returns to normal, after stopping DMPA. Yet, caution needs to be exercised in women at a high-risk of osteoporosis. Short- or long-term use of DMPA in healthy women should not be considered as an indication for dual X-ray energy absorptiometry (DXA) or other tests that assess BMD (Grade C).
36. Change over from oral contraceptive to Hormone Therapy (HT) is carried out at an arbitrary, age of 45-50 years or if serum FSH: (LH) Luteinising Hormone ratio of > 1 , FSH > 30 IU/L (Grade B).
37. Progesterone only contraceptive is an ideal method in women with a past history of venous thromboembolism (VTE) and gallstones. Limitations are erratic and scanty periods. The levonorgestrel-Intra Uterine System (LNG-IUS) – this is correct apart from being used as a hormonal contraception is most effective hormonal therapy for heavy menstrual bleeding and for treating bleeding disturbances associated with endometrial hyperplasia (Grade B).
38. Intra-uterine contraceptive devices (IUCDs) are effective, but sometimes can cause menorrhagia and dysmenorrhea (Grade B).
39. Emergency contraception is an effective emergency method, but it is not as effective and consistent as the use of other contraceptive (Grade C).

Perimenopausal bleeding

40. It is suggested to incorporate the use of PALM-COEIN (polyp, adenomyosis, leiomyoma, malignancy and hyperplasia, coagulopathy, ovulatory dysfunction, endometrial, iatrogenic, and not yet classified) classification for abnormal uterine bleeding (Grade C).
41. Common cause are anovulatory bleeding, leiomyoma, endometrial, polyp, endometrial hyperplasia, and endometrial cancer (EC).^[76]
42. Substantial evidence exists to indicate that sonohysterography is superior to transvaginal ultrasonography (TVS) in the detection of intra-cavitary lesions, such as polyps and submucosal

leiomyomas (Grade A).

43. Endometrial tissue sampling should be performed in patients with (AUB) Abnormal Uterine Bleeding who are older than 40 years (Grade C).
44. TVS is the primary screening test for AUB, and Magnetic resonance imaging (MRI) should be considered when the diagnosis is inconclusive (Grade C).
45. Persistent bleeding with a previous benign pathology, such as proliferative endometrium, requires further testing to rule out focal endometrial pathology or a structural pathology, such as a polyp or leiomyoma (R: Grade B).
46. Management depends on the cause, cost benefit analysis of therapy and the patient's choice (R: Grade C).

PMB

47. PMB is defined as uterine bleeding occurring after at least 1 year of amenorrhea. Its incidence is about 10-15%.
48. Women with PMB have a 10-15% chance of having EC. Conversely, 90% of the EC in the post-menopausal period present with PMB. Hence, immediate evaluation is required.
49. Common cause of PMB is due to atrophic changes in the vagina and the endometrium.
50. A detailed clinical and drug history is important as some over the counter drugs like “Ginseng” can cause PMB.
51. A thorough clinical examination is carried out to rule out cervical, vulval and vaginal cancer, atrophic vaginitis, urinary, and anal causes for bleeding.
52. Women with PMB may be assessed initially with TVS, an endometrial biopsy (Grade A).
53. Endometrial thickness is measured as the maximum anterior – posterior thickness of the endometrial echo on a long-axis transvaginal view of the uterus.
54. Women with PMB with an endometrial thickness of ≤ 4 mm in transvaginal scan do not require endometrial sampling unless they are at a high-risk for endometrial carcinoma or bleeding is episodic.
55. If endometrial thickness is > 4 mm in TVS, it is important to consider endometrial sampling. In women with homogeneous and normal morphology, women on HT and hypertensive medication, the acceptable combined thickness is 6 mm.
56. A focal increased echogenicity or a diffuse heterogeneity in the endometrium even in a thin endometrium warrants further investigations.
57. Out-patient endometrial sampling devices such as Pipelle and out-patient hysteroscopy can be carried out wherever possible.
58. If the endometrial biopsy tissue is reported as insufficient for diagnosis, and endometrial thickness

on transvaginal ultrasonography is less than 4 mm, follow-up is sufficient. Recurrent episodes warrant further investigations.

59. Dilatation and curettage and fractional curettage are useful in low resource settings. Saline infusion sonography and 3D (USG) Ultrasonography play a limited role in PMB evaluation.

Quality of life (QOL)

60. The WHO defines QOL as an individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards, and concerns. The two terms in common usage are global QOL and health-related Quality of life (HRQOL). WHO- Several questionnaires are used to assess HRQOL.
61. QOL as it relates to menopausal women is usually referring to health-related QOL, taking into account a woman's symptoms.^[77,78] Commonly used are Greene Climacteric Scale, Women's Health Questionnaire, Menopause Rating Scale and Utian Quality of Life Scale.
62. When evaluating drug therapies, besides safety, and efficacy, it is important to know the effect of the drug on QOL.^[79]
63. Some studies show that low dose hormone replacement therapy (HRT) significantly improves overall measures of QOL in early menopause.
64. Some studies show that low dose HT significantly improves overall measures of QOL. HT had mixed effects on QOL among older women from the (HERS) Heart and Estrogen/Progesterone Replacement Study trial, whereas the Women's Health Initiative (WHI) trial investigators found that estrogen plus progestin did not have a clinically meaningful effect on HRQOL.
65. An Indian study has shown an improvement in QOL in women receiving tibolone.^[80]

VMS

66. In a multi-centric hospital, urban-based study conducted by the Indian Menopause Society (IMS), the incidence of VMS was found to be 75%.^[50] There is a wide variation in prevalence of symptom reporting, ranging from 19% to 75% from various studies conducted in India.^[81-86] The prevalence in UK Asians was reported as 71%,^[87] and in Australian Indians as 33%.^[26]
67. VMS present as hot flushes, cold sweats, and night sweats. VMS may be reported in the menopause transition, reach the maximum intensity during the first 2 years post-menopause and then declines over time. VMS generally last for 6 months to 2 years, although some may experience for 10 years or longer. We need to exclude other causes of flushing before planning

treatment.

68. Grading of VMS is important to plan management, follow-up and for research. Grades of hot flashes are classified as: Mild – feeling of heat without sweating; moderate – feeling of heat with sweating; and severe – feeling of heat with sweating and palpitation that disrupts usual activity.
69. Life-style modifications may be recommended to reduce mild VMS (Grade A).
70. The most effective treatment for VMS is HT (Grade A) Ref Section V.
71. Low dose oral contraceptive pills can be used in the menopause transition phase for relief of symptoms (Grade A).
72. Non-hormonal prescription agents may relieve VMS, but have their own side-effects. These can be considered when HT is contraindicated or not desired (Level 1B).
73. Complementary and alternative treatments should be advised with caution as the data are still insufficient especially in moderate to severe VMS (Level 1B).

Urogenital symptoms

74. The prevalence of urogenital symptoms in the post-menopause in the IMS study was 15%.^[50] It presents as vaginal dryness in 32%, pruritus vulvae 10-17%, dyspareunia, and urinary urgency 10%.^[88,89] It is due to urogenital atrophy as a result of declining estrogen levels and may also present as recurrent urinary tract infections.^[90] Though it affects the QOL, women in general do not complain about it; hence, suggestive questions need to be posed during history taking.
75. Physical signs of vulvovaginal atrophy are variable and include reduced vulval fat, reduced vaginal rugae, and blood flow leading to a pale appearance; a change from moderately acidic range (pH 3.5-5.0) to a neutral range (pH 6.0-8.0) in vaginal pH, there is a shift in the vaginal maturation index.
76. Vaginal lubricants can be recommended for subjective symptom improvement of dyspareunia (Grade C).
77. Vaginal moisturizers can be offered for vaginal dryness and dyspareunia (Grade A).
78. Estrogen therapy (ET) – Ref Section V 241-245.
79. Lifestyle modification, bladder drill, and pelvic floor exercises are recommended for urinary incontinence (Grade B).

Sexual problems

80. A woman's sexual response to her partner is significantly related to her baseline feelings for the partner, their relationship qualities, and partner's age and health.

81. Sexual dysfunction is multifactorial and needs to be addressed accordingly.
82. Vaginal atrophy with ageing leads to dyspareunia.^[88] Dyspareunia leading to sexual dysfunction is corrected by local ET.
83. Acquired sexual desire disorder in some women responds to testosterone therapy. Formulations of testosterone for use in women are not available in India. Testosterone preparations meant for males should not be prescribed for women. Tibolone is a good option; since, it contains androgenic activity and can be used to treat libido problems.

Non-communicable diseases

CVD

84. The incidence of CVD in Indian women has been noted to have significantly risen. The projected death's from CVDs by 2020 is estimated to be 42% of the total deaths. The prevalence rate of stroke is 545.1/100,000 persons. The case fatality rate is 41% in 30 days.^[91,92] The prevalence of hypertension is 20.4-22% in the urban area and 12-17% in rural area.^[93] From the Indian Million Death Study 2009, CVD emerges as the major cause of mortality, 16.8% in the rural and 28.6% in the Urban area. 79% of sudden cardiac deaths in rural South India occurred at home.^[94]
85. Risk factors – Ref Section IV Clinical Evaluation - 212, 215.
86. Prevention and management
 - Life-style interventions (Grade A).
 - Encourage optimal BP < 120/80 through life-style approaches (Grade A).
 - Pharmacotherapy if BP ≥ 140/90 to avoid end-organ damage, more so in diabetes (Grade A).
 - Use thiazide diuretics unless there is an absolute contraindication. Optimal lipid targets (Grade A).
 - Low density lipoprotein (LDL) < 100 mg/dL, high density lipoprotein (HDL) > 50 mg/dL, triglycerides < 150 mg/dL, non-HDL cholesterol < 100 mg/dL (Grade A).
 - High-risk: Initiate statin if LDL > 100 mg/dL (Grade A).
 - Inter-mediate risk: Initiate statin if LDL > 130 mg/dL (Grade A).
 - Life-style approaches and pharmacotherapy to achieve near-normal HbA1c Glycosylated Haemoglobin (<7%) in women with diabetes (Grade A).
 - Aspirin in high-risk women (75-162 mg/day) (Grade A).
 - Routine use of aspirin in women < 65 years of age is not recommended for MI prevention (Grade C).
 - HT is not indicated solely for primary or secondary

cardio protection (Grade B).

- Do not use antioxidant supplements for CVD prevention (Grade C).
- Do not use folic acid, with or without B6 or B12 supplements for CVD prevention (Grade C).

The metabolic syndrome: Insulin resistance (IR)

87. The prevalence reported in the peri-menopause in India is 22.2% rising to 32.2% to 48% in the post-menopause.^[95,96] It is 1.5-2 times more common in women than in men.
88. The metabolic syndrome is also known as IR syndrome and syndrome X and an average of 40% of the Indian women are affected.
89. Clinical conditions associated with IR include type 2 diabetes, CVD, polycystic ovary syndrome (PCOS), non-alcoholic fatty liver, obstructive sleep apnoea, and certain cancers. It is also a prominent feature of the metabolic syndrome.
90. Diagnosis of metabolic syndrome: Abdominal obesity defined as > 35 inches in females; serum triglycerides > 150 mg/dL; BP > 130/85 mmHg; and fasting plasma glucose > 110 mg/dL.
91. Effect of HT: A meta-analysis of pooled data from 107 trials concluded that HT reduced IR, abdominal obesity, new-onset diabetes, lipids, BP, adhesion molecules, and procoagulant factors in women without diabetes and reduced fasting glucose and IR in women with diabetes. The effects were diminished by the addition of progestin (Grade A).
92. The basis of dietary recommendations is to reduce exposure to insulin both as a result of dietary stimulus and through decreased IR (Grade B).
93. We should advocate exercise as it improves insulin sensitivity, aiming for a minimum of 30 min of moderate physical activity/exercise per day.
94. Indications for intervention by Body mass index (BMI) category [Table 3].

DM

95. India has 63 million people with diabetes and is second

Table 3: BMI category

Category and intervention

| | |
|---------------------------|---|
| Underweight (18.5): | Encourage balanced diet and exercise |
| Healthy (18.5-24.9): | Encourage balanced diet and exercise |
| Overweight (25-26.9): | Lifestyle (diet, exercise, and behavior therapy) |
| Overweight (27-29.9): | Lifestyle plus drug therapy if co morbidities*exist |
| Obese class 1 (30-35): | Lifestyle plus drug therapy |
| Obese class 2 (35-39.9): | Lifestyle plus drug therapy, plus surgery if co morbidities*exist |
| Obese class 3 (above 40): | Lifestyle, drug therapy, and surgery |

*Co morbidities: Hypertension, diabetes, and hyperlipidemias; BMI: Body mass index

largest in numbers, the first being China. The prevalence rates of diabetes in the last 30 years has increased from 2.3% in urban and 1.2% in rural areas (1971) to 15-20% in urban and 10% in rural areas (2012). The prevalence in hospital based multi-centric study by the IMS in post-menopausal woman was 12%. In India, Type 2 DM occurs a decade earlier than the Caucasians. More than 50% of the subjects are undiagnosed.^[97]

96. Risk factors: Ref Section IV - 213.
97. Screening: Opportunistic screening for all women above the age of 30 years, every 3 years for younger women with risk factors (Grade C). Diabetic women should be screened for hypertension, dyslipidemia, micro-albuminuria, and undergo yearly eye check.
98. The goal in management is to maintain the HbA1c around < 7% and control risk factors for CVD.
99. It may be indicated to evaluate the endometrium by transvaginal scan before starting HT.

Thyroid disease

100. The prevalence from hospital-based data in post-menopausal women for hypothyroid in India is 3-7%.^[50,98]
101. Hypothyroidism is much more common in older than younger individuals. Symptoms and signs include lethargy, constipation, dry skin, alopecia, memory impairment, and depression. The individual is often obese and may have elevated cholesterol.
102. The prevalence of hypothyroidism is approximately 5% in otherwise healthy individuals. Thyroid-stimulating hormone (TSH) is a good screening test.

Anemia

103. Anemia is common in the elderly people in India. Prevalence of iron-deficiency anemia, vitamin B12 deficiency, and folate deficiency is common, and should be an integral part of management of menopause.

CENTRAL NERVOUS SYSTEM

Dementia

104. In 2010, there are 3.7 million Indians with dementia, 2.1 million women and 1.5 million men and the total societal costs is about 14,700 crore. While the numbers are expected to double by 2030, costs would increase 3 times. Prevalence of dementia is 0.6-3.5% in rural India and 0.9-4.8% in Urban India.^[99]
105. The core mental functions are memory, communication and language, ability to focus and pay attention, reasoning and judgment, activities of daily living, and visual perception. Impairment of any two functions is suggestive of dementia (B).
106. Many dementias are progressive, early diagnosis allows a person to get the maximum benefit from available

treatments and provides an opportunity to plan for the future (B).

107. Factors that increase the risk of dementia are family history, genetic factor apolipoprotein E (APOE), minimal cognitive impairment (MCI), CVD risk factors, physical inactivity, diabetes, hypertension, dyslipidemia, smoking, obesity, autoimmune diseases, depression and stress, social engagement and diet, head trauma and traumatic brain injury, and age (Grade B).
108. An objective marker is examination of (CSF) cerebrospinal fluid for amyloid beta or tau protein and phosphorylated tau protein concentration. They have the sensitivity of between 94% and 100% (A).
109. ET is not currently recommended for reducing risk of dementia developing in post-menopausal women or retarding the progress of diagnosed AD (A).
110. For best preservation of memory and cognition, women should be advised about the importance of good overall health, good cardiac and vascular health, exercise, maintenance of active mind, avoidance of excessive alcohol consumption, and measures to reduce risk of diabetes and hypertension. HT is not indicated for neuroprotection (A).
111. Introduction of accessible diagnostic and early stage dementia care services such as memory clinics is recommended (Grade C).

Sleep

In a study conducted in UK Asians, sleep problems were noted in 32%. A large study of over 9,000 older adults age of > 65 year found that 42% of participants reported difficulty initiating and maintaining sleep.^[100] The estimate of prevalence of sleep disorders in India, by WHO extrapolated from US data is 156,628,027 in 1,065,070,607 population.

112. A detailed assessment of menopausal symptoms should always include questions about sleep pattern. Sleep questionnaires or sleep diaries can be useful to assess sleep in detail (Grade C).
113. Adverse life-style factors, social factors, and risk factors should be considered and treated accordingly (Grade C).
114. If insomnia is identified, medical or psychiatric causes of insomnia should be ruled out and if present, treated accordingly. If specific neurological or breathing disorders are suspected, further investigations and referrals to specialists should be initiated (Grade B).
115. Sleep hygiene measures and life-style modifications should be recommended as first line of treatment. Psychological treatments such as (CBT) Cognitive Behavioral Therapy should also be considered (Grade C).
116. If insomnia is resistant to life-style modifications, then hypnotics, benzodiazepines or melatonin agonists can be used in the short-term, but there is no definite or

convincing evidence to suggest its efficacy. These should only be prescribed by supervision or after liaison with psychiatrists or sleep experts (Grade C).

- 117.No recommendations can be made about use of herbal remedies for insomnia as there is insufficient evidence. Mind body therapies such as yoga and tai chi have some evidence, but need further rigorous studies to prove its effectiveness (Grade D).

SKELTOMUSCULAR SYSTEM

Osteoporosis

Basic concepts

- 118.WHO defines osteoporosis as “a systemic skeletal disease characterized by low bone mass (measured as BMD) and microarchitectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture and involves the wrist, spine, hip, pelvis, ribs or humerus.”^[101] The National Institute of Health definition is “a disease characterized by decreased bone strength and propensity to fall.”^[102]
- 119.The diagnosis of an osteoporotic fracture, the clinical end-point of osteoporosis is by the presence of fragility fracture (clinical or by investigation) and or by BMD [Table 4].
- 120.The “gold standard” method of BMD testing is by DXA. Its value is expressed in SD units from the population mean in young adults (T-score) or from the mean in an age-matched population (Z-score). The reference range recommended by the International Osteoporosis Foundation, International Society of Clinical Densitometry, WHO and National Osteoporosis Foundation for calculating the T-score in post-menopausal women is the National Health and Nutrition Examination Survey III reference database in Caucasian women aged 20-29 years for BMD (T-score) based diagnosis of osteoporosis for post-menopausal women WHO.^[103,104]
- 121.The Z-score describes the number of SDs by which the BMD in an individual differs from the mean value expected for age and sex. It is mostly used in children adolescents and pre-menopausal women. A Z-score below - 2 is regarded as abnormal and should be referred to as “low for age.” A low Z-score in a post-menopausal woman indicates the need to evaluate for secondary osteoporosis.
- 122.Osteoporosis is classified as primary and secondary
- Primary osteoporosis is seen in post-menopausal women in whom there is no specific pathogenetic mechanism other than age. There is an accelerated bone loss at the rate of 2-5% per year due to declining estrogens levels and is seen in the first 5-7 years after menopause. Later age-related bone

loss occurs at a rate of 1% per year in both sexes and affects the cortical and trabecular bone.

- Secondary osteoporosis is due to specific causes.
- 123.Bone is a dynamic tissue with a continuous remodeling leading to formation of new bone and absorption of old bone. A mismatch of this process forms the basis for osteoporosis while defective mineralization of the newly formed osteoid is called osteomalacia.
- 124.A fragility fracture has been defined by the WHO as “a fracture caused by injury that would be insufficient to fracture normal bone: The result of reduced compressive and/or torsional strength of bone.”
- 125.Clinically, a fragility fracture can be defined as one that occurs as a result of minimal trauma, such as a fall from a standing height or less or no identifiable trauma.

Screening and diagnosis

- 126.Osteoporosis is asymptomatic unless a fracture occurs. Early diagnosis in the asymptomatic period is and timely management of osteoporosis will prevent the associated morbidity and mortality. In the absence of a validated population screening tool for post-menopausal osteoporosis in India, a case finding strategy utilizing clinical risk factors with the addition of DXA as needed is suggested (Grade C).
- 127.Opportunistic screening for women above 40 years is suggested. Risk assessment factors for fractures are derived by history and clinical examination.
- 128.It is important to distinguish between those risk factors,

Table 4: WHO BMD (T-score) based diagnosis of osteoporosis for postmenopausal women

| Normal | T-score above (i.e., better than)-1.0 |
|-----------------------------|--|
| Osteopenia or low bone mass | T-score between-1.0 and-2.5 |
| Osteoporosis | T-score below (i.e., worse than) or equal to-2.5 |
| Severe osteoporosis | T-score below-2.5 with fragility fracture |

WHO: World Health Organisation; BMD: Bone mineral density

Table 5: Essential R (Grade A)

| Test |
|---|
| Complete blood picture, ESR |
| Random blood sugar |
| Serum calcium |
| Preferably fasting serum phosphorus |
| Serum creatinine |
| Serum albumin |
| Alkaline phosphatase |
| Serum tissue stimulating hormone |
| 25 hydroxy vitamin D |
| X-ray of thoracolumbar spine (lateral view) |
| PTH (based on clinical judgment) |

ESR: Erythrocyte sedimentation rate; PTH: Parathyroid hormone

which lead to reduced bone mass from those which predispose to osteoporotic fractures with a BMD not in the osteoporotic range.

129. Major risk factors defined by WHO are advancing age, prior fragility fracture, low BMI, family history of fracture, smoking, and more than three drinks of alcohol per day (Grade A).
130. Environmental factors include nutrition (calcium intake using the quick dietary calculator, protein) physical activity and sunlight exposure, which are important modifiable risk factors in India. Relevance of risk of falling increases with ageing (Grade B).
131. Case finding for secondary osteoporosis is practiced in high-risk disease subgroups, such as chronic glucocorticoid users and patients with rheumatoid arthritis, collagen vascular disease, or inflammatory bowel disease, hypogonadism, thyroid dysfunction, type 2 diabetes (Grade A).
132. Women presenting with fracture complain of severe pain, which is sudden in onset with minimal trauma, or chronic pain localized to the mid back, may radiate to the abdomen. Generalized bone pain indicates osteomalacia or metastasis.
133. Physical examination should include the height and weight annually, check for balance and gait, get up, and go test by asking the women to get up from the chair without using their arms. Kyphosis and dowager's hump is seen in the late stage of osteoporosis (Grade A).
134. Laboratory studies [Table 5]
135. The fracture risk assessment tool (WHO FRAX)
 - For online use is available for India (<http://www.shef.ac.uk/FRAX>). FRAX is a validated and widely accepted tool used world-wide to identify patients in the osteopenia group most likely to benefit from treatment. It predicts the 10 year absolute risk for a fracture in an individual and the cost-effective analysis determines the interventional threshold above which treatment is cost effective. All this is possible and valid when adequate data on the prevalence of osteoporotic fractures, mortality rates, and health economics data are available for the country. FRAX is country specific, and until more Indian data is available on the prevalence of osteoporotic fractures and mortality rates, the usage of FRAX in the Indian context for uniform guidance on intervention threshold is to be applied cautiously. Having said that, an enormous advantage of FRAX is that it can be used without BMD also to identify cases at risk for fractures. In view of the limited availability of (DXA) Dual Energy X-ray Absorptiometry machines in India, it will be helpful to use FRAX without BMD in Indian context. Given the heterogeneity of Indian scenario, intervention

thresholds and management may need to be individualized (Grade C).

136. Heterogeneity in different regions of the country and the prevalence of nutritional and other risk factors unique to the Indian population have not been considered in the calculation of FRAX (R: Grade B).
137. It is suggested to conduct central DXA of spine and hip in all women 5 years beyond the natural age of menopause and in women less than 5 years since menopause with 1 high clinical risk or more than 2 clinical risk factors. This suggestion is based on the following. Early age of natural menopause that is 46.7 years in Indian women,^[10] life expectancy of a woman is 68 years (WHO statistics 2011), accrual of low peak bone mass,^[38] early age of presentation of fracture,^[27,39] accelerated bone loss in the immediate 5 years of menopause and the trabecular bone is affected more.^[43] Stratification by age shows that the prevalence of low bone mass is to the extent of 40% from the age of 40 years and increases to more than 80% by the age of 65 years (Grade C).
138. Indications for DXA (Grade B):
 - All post-menopausal women more than 5 years of menopause.
 - Women with fragility fractures.
 - Post-menopausal women less than 5 years of menopause with risk factors.
 - Women in menopause transition with secondary causes.
 - Radiological evidence of osteopenia and presence of vertebral compression fracture.
 - Before initiating pharmacotherapy for osteoporosis.
 - To monitor therapy – the interval to the next test should depend on the calculated individual risk and would mostly be scheduled between 1 year and 5 years later.
 - Emerging indications are to measure total body fat and lean tissue mass.
139. The diagnosis is based on central DXA of the spine, total hip, and neck of femur. If this is not feasible, lower one-third of the radius (33%) is measured. The Caucasian female normative database is used as a reference for T-scores (R: Grade A).
140. The lowest BMD score obtained from all sites is used for diagnosis (R: Grade A).
141. Screen post-menopausal women for secondary osteoporosis if history or examination show systemic disease or low Z-scores on DEXA (R: Grade A).
142. R peripheral DEXA (X-ray based) may be used as a mass screening tool because of its high negative predictive value (R: Grade C).

Management

143. Involves a population and a personalized-based approach.

Table 6: Recommended dietary allowance of calcium in women

| Group | Calcium (mg) |
|-----------------------|--------------|
| Adult | 600 |
| Pregnancy, lactation | 1200 |
| Post-menopausal women | 800 |

Table 7: Quick dietary calcium assessment chart: A tool for a quick assessment of total dietary calcium intake

| Source | Calcium (mg)* | No. of servings | Total calcium (mg) |
|-------------------------------|--------------------------------------|-----------------|--------------------|
| Dietary | 300-525/1 glass 300/1katori curds | × | |
| Non-dietary | 200-300 | × | |
| Total intake of calcium in mg | | | |

*Approximate estimates; Calculate the total daily dietary intake by entering the sources and the number of servings from dietary and non-dietary sources before supplementation

The target is primary prevention (population-based), intervention, and rehabilitation (individualized).

144. Fracture risk is obtained by BMD (both primary and secondary causes) and the presence of clinical risk factors for osteoporotic fracture. For treatment purpose, combining BMD with clinical risk factors provides a better estimate of fracture risk. We simply should not treat T-scores, but must take a patient's full clinical status into account to make therapeutic decisions.
145. The term prevention and treatment in the context of osteoporosis has to be understood. The term prevention is used to denote the prevention of bone loss in post-menopausal women with osteopenia (T-score between 1 and 2.5) and increased fracture risk. Treatment is defined as a reduction in fracture risk in post-menopausal women with osteoporosis.

Universal recommendations

146. Life-style management: Balanced diet, adequate physical activity, exposure to sunlight, avoidance of bone depleting agents such as tobacco, alcohol, etc.

Nutrition

- The recommended dietary allowance (RDA) of calcium intake for Indian population [Table 6].^[105]
- Assess the total calcium intake from dietary sources and if needed, supplements are used to correct the deficient balance. The intake should exceed > 800 mg/day (Grade B). The risk of cardiovascular events, calculi are not observed with the recommended doses of calcium.
- The following tool depicted in Table 7 can be used for a quick calculation of daily calcium intake.
- Calcium content of Indian foods [Table 8].

Table 8: Calcium content of Indian foods

| Dietary product | Serving | Calcium (mg) |
|--------------------------------|------------------------|--------------|
| Milk (cows) | 1 glass (250 mL) | 300 |
| Milk (buffalos) | 1 glass (250 mL) | 525 |
| Milk low fat | 1 glass (250 mL) | 300 |
| Curd (cows milk) | 1 katori | 149 |
| Butter milk | 1 glass (250 mL) | 75 |
| Channa (cows milk) | 25 g | 52 |
| Khoa (cows milk) | 25 g | 239 |
| Cheese slice | 20 g | 158 |
| Whole milk powder (cows milk) | | 155 |
| paneer | | |
| Chapati | 1 (25 g) | 12 |
| White bread | 1 slice | 30 |
| Ragi | 25 g | 75 |
| Rajma | 1 katori (25 g) | 65 |
| Soyabean | 1 katori (25 g) | 60 |
| Kale chane (whole bengal gram) | 1 katori (25 g) | 72 |
| Udad dal (black gram dal) | 25 g | 50 |
| Palak veg | 1 katori | 73 |
| Beetroot | 25 g | 50 |
| Methi veg | 1 katori | 395 |
| Chaulai | 1 katori | 397 |
| Beans | 1 katori | 90 |
| Bathua | 1 katori | 150 |
| Sarso | 1 katori | 155 |
| Okra (bhendi) | 1/2 katori | 65 |
| Broccoli | 1/2 katori | 50 |
| Almonds | 1 handful (25 g) | 58 |
| Cashew nut | 1 handful (25 g) | 13 |
| Dried figs | 5 whole | 95 |
| Gingelly seed (til) | 25 g (1 tablespoon) | 363 |
| Orange | 1 medium sized | 50 |
| Fish Hilsa | 25 g | 45 |
| Fish Rohu | 25 g | 160 |

- Low sodium intake: Daily salt intake should not exceed 5 g (1 tsp). Protein should be 1 g/kg body weight.^[105]
- Decrease caffeine intake (<3 cups/day), limit alcohol and avoid use of tobacco (Grade B). A cup (150 mL) of brewed coffee contains 80-120 mg of caffeine and instant coffee 50-65 mg while tea contains 30-65 mg of caffeine. Caffeine stimulates the central nervous system and induces physiological dependency. In general, low doses (20-200 mg) of caffeine produce mild positive effects such as a feeling of wellbeing, alertness, and energy. Higher doses (>200 mg) can produce negative effects such as nervousness and anxiety, especially in people who do not usually consume caffeine-containing beverages.^[105]
- In the background of widespread vitamin D deficiency in all age groups, it is prudent to adopt the US

Table 9: US endocrine society 2011 RDA

| Life stage group | RDA (IU) | Upper limit |
|------------------------------|--|-------------|
| Adults (18 years and above) | 1,500-2,000 | 10,000 |
| Pregnancy and lactation | 1,500-2,000 | 10,000 |
| Children and adults at risk* | 2-3 times the normal requirement for their age | |

*At risk: Obesity, HIV infection, on glucocorticoids, anticonvulsant, antifungal, and antiviral therapy; A desirable range is between 30 and 60 ng/mL, although levels up to 100 ng/mL are unlikely to result in vitamin D toxicity; Except in granuloma disorders, wherein it is advisable to maintain the serum levels of 25 (OH)D upto >30 ng/mL; RDA: Recommended daily allowance

Endocrine Society 2011 [Table 9] RDA.^[106] There is an urgent need for an Indian update on RDA for different age groups.

- viii. Vitamin D: Dietary sources are limited, adequate sunlight exposure has limitations and presently, food fortified with adequate vitamin D is unavailable in India. Urgent and cost-effective measures need to be implemented. Hence, it is recommended to use vitamin D as supplements (Grade A).
- ix. Recommendations for management of vitamin D deficiency and maintenance are: (Grade B).
- Cholecalciferol (vitamin D3) is available in the form of oral tablets and oral spray of 1000 IU and 2,000 IU.
 - It is also available in the form of granules and tablet of 60,000 IU.
 - Intramuscular (IM) injections of vitamin D3 are available in doses of 300,000 IU and 60,000 IU per ampoule. Injections of cholecalciferol are cost-effective may be recommended in cases of malabsorption and to increase compliance. The disadvantage is being an oily injection, it is painful, and since it is administered intramuscularly and can produce an erratic blood levels.
 - Cholecalciferol is the preferred therapy for correction of deficiency and maintenance.

Management of deficiency

- Cholecalciferol (vitamin D3) tablet or powder 60,000 IU/once a week for 8 weeks preferably with milk or.
- One IM injection of 600,000 IU is given to correct the deficiency.(not to be repeated before 6 months and may be given after confirmation of persisting low levels of vitamin D).
- Maintenance therapy (from natural sources or supplements) is advised after correction of the deficiency.

Maintenance therapy

- Cholecalciferol tablet or powder 60,000 IU once a month in summer or twice a month in winter.
- Vitamin D supplements by oral spray or oral tablets

of 2,000 IU/day, or.

- Injection of Cholecalciferol 300,000 IU IM, twice a year or 600,000 IU IM once a year.
- Cholecalciferol, 1,000 IU daily, will raise blood levels, on average, by approximately 10 ng/mL.

Upper acceptable limit

The dose for treatment should not exceed 4000 IU/day and hypocalcaemia has been reported when the dose exceeds 10,000 IU/day.

- x. Vitamin D derivatives: Calcitriol, the active form of vitamin D is reserved only for patients with chronic renal and hepatic disease Alfacalcidol is a synthetic analog of the active vitamin D metabolite calcitriol (1,25-dihydroxyvitamin D3), and it is metabolized to calcitriol by its 25-hydroxylation in the liver. It is less potent than calcitriol. The use of vitamin D derivatives necessitates monitoring of serum and possibly urine calcium. There is the risk of hypercalcaemia and hypercalciuria. Adverse effects of prolonged hypercalcemia include impairment of renal function and nephrocalcinosis.
- xi. It is preferable to get vitamin D through sunlight by exposing 20% of body surface area (face, neck, and both arms and forearms) without sunscreen for at least 30 min between 10 am and 3 pm, depending on the season, latitude, altitude, pollution, and skin pigmentation. The sunlight between 11 am to 2 pm is preferably the best.
- xii. In post-menopausal women, the intake of vitamin D should be in addition to sunlight exposure. Vitamin D supplementation (≥ 500 -2,000 IU/day) was favorable in the reduction of hip fracture and any non-vertebral fracture in persons 65 years of age or older.
- xiii. Vitamin K: For women of post-menopausal age, 180-350 μ g/day of vitamin K2-7 may need to be supplemented along with the recommended intake of calcium, magnesium, vitamin D, and a balanced diet. The current RDA of vitamin K2-7 WHO/of 65-80 μ g/day is too low and needs to be raised up to at least 100 μ g/day throughout life, with larger doses when needed.^[107] Both bone and cardiovascular health of women with osteoporosis would benefit from vitamin K2-7 intake (Grade C).
- xiv. Interestingly, exposure to complex nutrients and food constituents interact to affect bone mass, it is, however, left to individual clinician to decide on supplementing vitamin A, vitamin B12, and phytoestrogens (Grade B).

Prevention of falls

- xv. Patients should receive a multifactorial risk assessment and intervention because it is the most consistently effective strategy to prevent falls (Grade A).

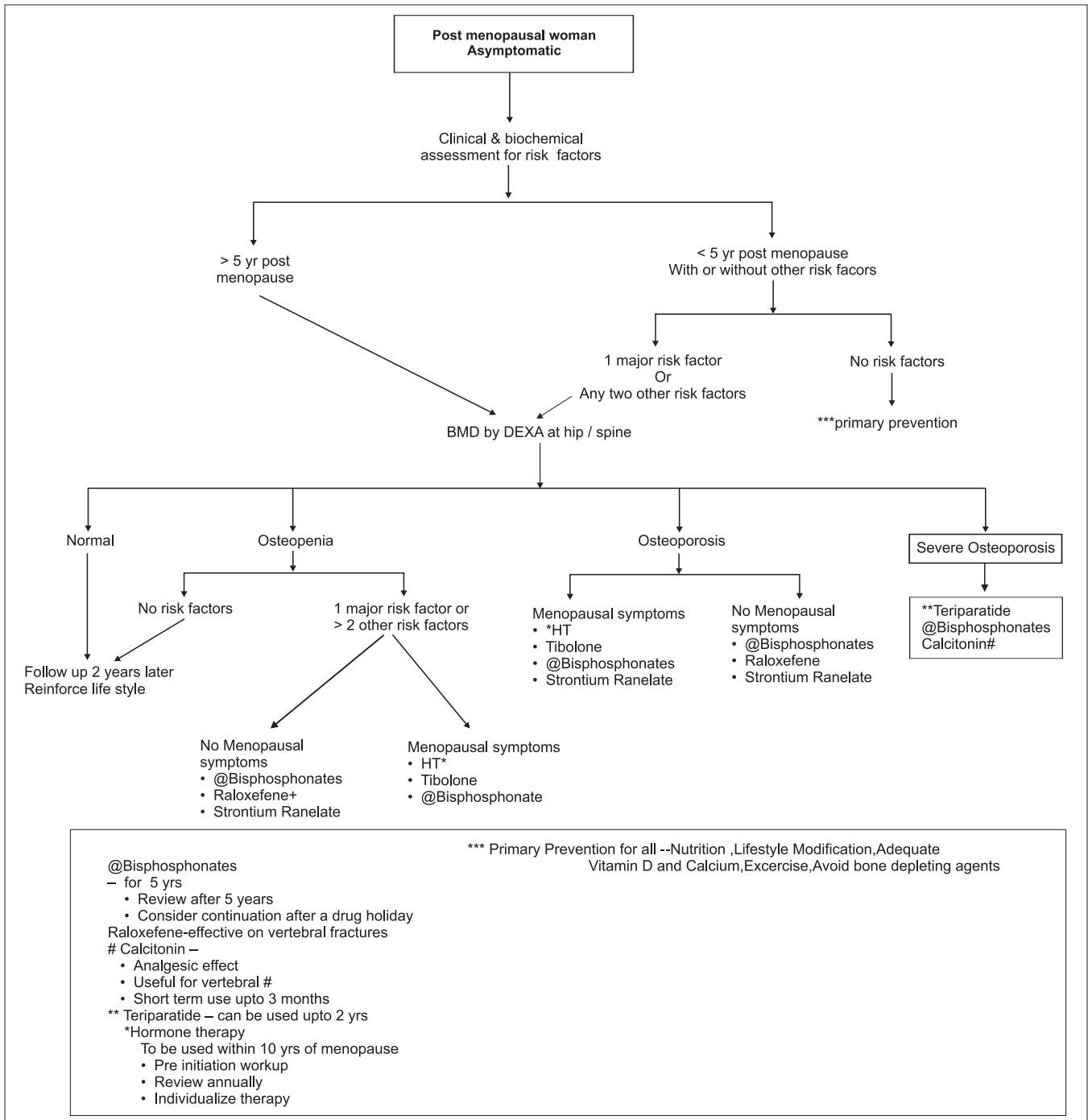
16. Home hazard assessment and modification, exercise, and physical therapy are recommended to prevent falls and injuries from falls. Biomechanics of posture and safe movements are a vital component of counseling (Grade A).

Flowcharts 3 and 4 show an approach to management of asymptomatic postmenopausal woman and postmenopausal woman with fragility fracture, respectively.

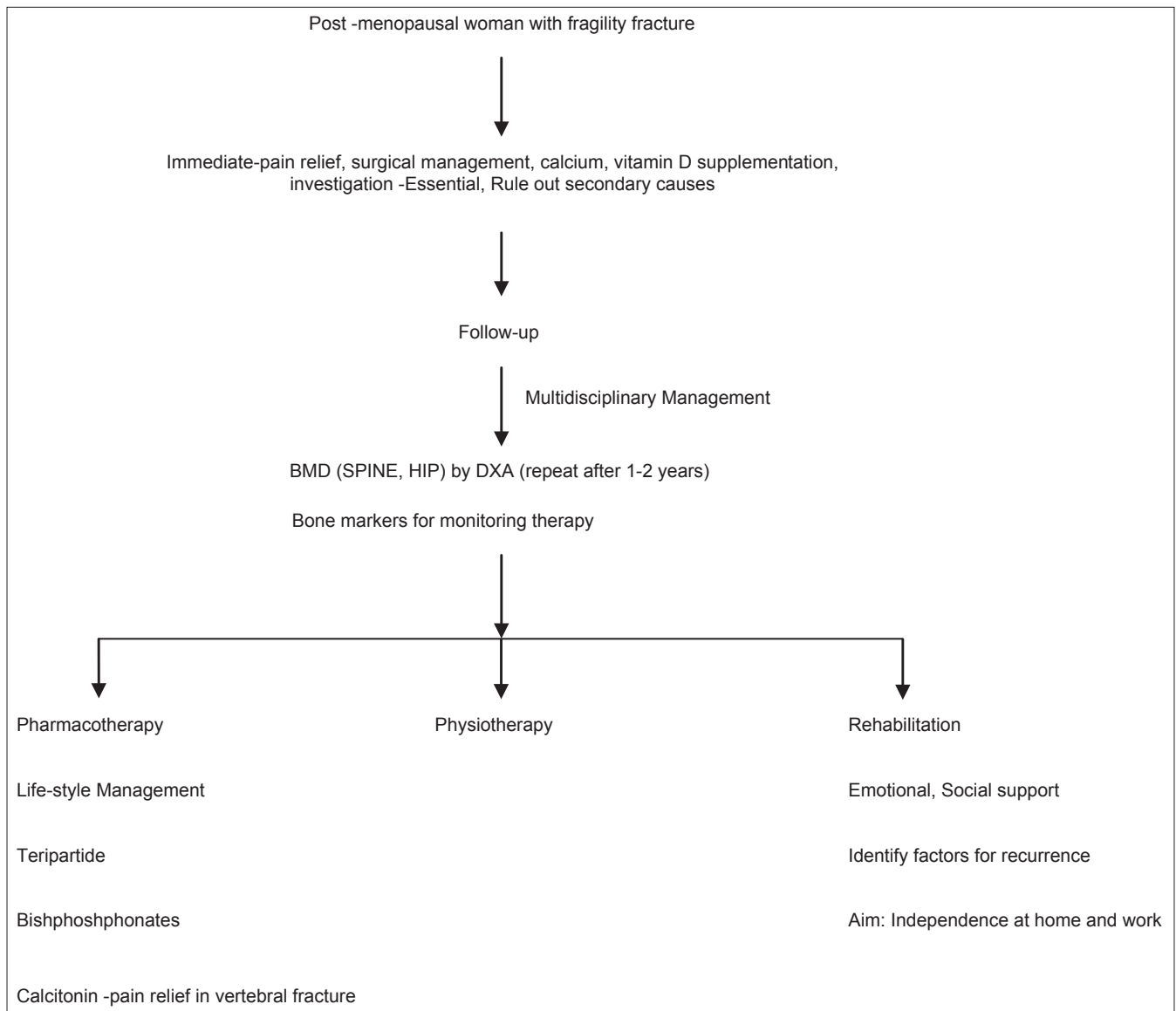
Frailty

147. Frailty: Fried *et al.* have standardized the definition as three or more of the following five criteria; unintentional weight loss, self-reported exhaustion, weakness (grip strength), slow motor performance (walking speed), and low physical activity.

Frailty-related falls and fractures have been reported with OR of 1.38-2.4 for falls and recurrent falls, 1.40 and 1.7 for hip fracture in old women. Women's



Flowchart 3: Treatment algorithm for postmenopausal women asymptomatic woman



Flowchart 4: Treatment algorithm for postmenopausal women with fragility fracture

health-care programs targeting post-menopausal women’s comprehensive care can contribute a lot by educating women as to take care of their musculoskeletal health through life-long commitment to proper nutrition, exercise, and understanding about issues related to prevention of falls.

Osteoarthritis

148. The prevalence of osteoarthritis in India as reported from a community dwellers in a small study conducted in Delhi was 47.3% and in others it is reported to be between 22% and 39%.^[108-110] Age, weight, female sex, quadriceps weakness, and overloading of the knee joint (climbing stairs, squatting posture, etc.) are the main contributors than menopause *per se* in the incidence of osteoarthritis. Those contributing factors should be addressed on a priority basis.

149. Epidemiological studies of a potential role for estrogens in osteoarthritis showed two very different findings. First, estrogen deprivation at the menopause seems to be associated with increases in the frequency of knee, hip, and finger osteoarthritis, and in the severity of hip osteoarthritis. Second, HT for the menopause may decrease the incidence and progression of hip and knee osteoarthritis.

150. The identification of the alpha and beta estrogen receptors in normal and osteoarthritic cartilage and the effects of 17 beta estradiol on cartilage *in vivo* in animals and *in vitro* confirm that the cartilage responds to estrogens. Finally, this response is dose-dependent: Physiological doses (as with HT) are protective and higher dosages are deleterious.

151. Perimenopausal women can be advised about HT and they should be aware of the fact that only

- long-standing (>5 years) use of HT can be beneficial.
152. Once osteoarthritis sets in, there is no protection from HT and osteoarthritis takes its own course. In such cases, osteoarthritis should be treated on its own merits.
153. Age, weight, female sex, quadriceps weakness, and overloading of knee joint (climbing stairs, squatting posture, etc.) are the main contributors than menopause *per se* in the incidence of osteoarthritis. Those contributing factors should be addressed on priority basis.
154. First two stages of osteoarthritis can be addressed by life-style modification, pharmacotherapy, and physical therapy (Grade A).
155. Third and fourth stages need surgical intervention for which total knee replacement is the gold standard (Grade B).

Eye

156. Blindness was more likely with increasing age and decreasing socio-economic status, and in female subjects and in rural areas. The causes of blindness were easily treatable in 60.3% (cataract, 44%; refractive error, 16.3%).^[111] Preventable corneal disease, glaucoma, complications of cataract surgery, and amblyopia caused another 19% of the blindness [Table 10].

Glaucoma

157. Glaucoma is the most common cause of irreversible, but preventable blindness world-wide. There is level one evidence to show that prevalence and/or incidence of glaucoma increases with age, women are more pre-disposed to angle closure glaucoma. Established risk factors for glaucoma are age, family history, diabetes, shallow anterior chamber, refractive status, and race (Grade A).
158. Blindness due to primary angle-closure glaucoma is potentially avoidable if this condition is detected early and peripheral iridotomy or iridectomy is performed. This requires detection of occludable angles, which lead to primary angle-closure glaucoma, using slit-lamp examination and gonioscopy. Blindness due to primary open-angle glaucoma is more difficult to prevent and medication in open angle glaucoma could prevent the progression of the disease (Grade A).

Dry eye

159. There is increased risk of dry eye in both genders with age due to decreased tear production. The incidence is more in women than men. Menopause also contributes to the ocular surface impairment due to hormonal imbalance.
160. HRT after menopause, especially unopposed ET has been proven to cause the dry eye (Grade B).

Table 10: The causes of blindness

| Disease | Percentage of contribution |
|---------------------|----------------------------|
| Cataract | 62.6 |
| Refraction error | 19.7 |
| Glaucoma | 5.8 |
| Corneal pathologies | 0.9 |
| Other causes | 11.00 |

161. Prevention of blindness:

- Improvement in the quality of cataract surgery, and increase in the number of surgeries on persons blind in both eyes
- Effective screening to detect refractive error blindness and provision of spectacles
- Initiation of long-term strategies to prevent corneal and glaucoma blindness
- Effective control of diabetes and yearly eye checkup to prevent diabetic retinopathy.

Cancers

162. A population-based study (Million Death Study cancer mortality in India: A nationally representative survey 2012) revealed that 1 in 22 men or women aged 30 years alive today in rural India is likely to die of cancer before 70 years of age based on the rates of actual deaths and in the absence of other disorders. In urban areas, the risks are 1 in 20 for men and 1 in 24 for women.^[112]

Breast cancer

163. In India, breast cancer is the second most common cancer with an estimated 115,251 new diagnoses and the second most common cause of cancer-related deaths with 53,592 breast cancer deaths in 2008.^[113,114] The age-standardized incidence rate for breast cancer in India is 22.9 per 100,000, one-third that of Western countries, and the mortality rates are disproportionately higher.^[115,116]
164. The data from atlas project suggest that breast cancer in urban areas of India is 3 times higher than in rural parts of the country.^[117-119] Indian women are more likely to develop breast cancer at earlier ages than their Western counterparts.^[31]
165. Non-modifiable risk factors for breast cancer are age, family history, benign breast disease, BRCA – Breast Cancer) 1 or 2 carriers, early menarche (<12 years), late age at menopause (after age 55), increased breast density, and a chest irradiation between ages 25 years and 55 years.
166. Modifiable risk factors are age at first child, breast-feeding, parity, obesity, physical activity, and menopausal HT.

Screening in breast cancer

167. The debate about value of screening continues. There is no organized, systematic, government funded screening program for breast cancer in India. The screening in developing countries can be regarded as “opportunistic screening.” There are no evidence-based guidelines for breast cancer screening in India at present.

Methods

- Breast cancer screening includes 3 methods of early detection (Grade C).
- Breast self-examination (BSE) monthly starting in the 20 s.
Clinical breast exams (CBE) every 3 years starting in the 20 s till 39, and annually thereafter mammographic screening (annually) starting at the age of 40 years.

BSE

- BSE is performed by the woman herself and involves examination of the breast, skin, and axillae based on palpations by her hands.
- The woman should examine the look and feel of her breasts as well as any signs, symptoms or changes to the breasts.
- BSE is recommended so that women understand their breasts for detecting any suspicious changes over time.
- Initially, BSE should be performed very frequently and regularly so that a woman understands the physiological changes that occur during the different phases of menstrual cycle and then continue monthly around 7th or 8th day of cycle. They are encouraged to report any recent or persistent changes.
- Nodular and lumpy feel of the breasts and increased pain and tenderness, which is a physiological finding prior to menstruation, needs to be explained to the patient.
- Women can be taught to examine the breasts in any of the following ways in both supine as well as standing positions.

CBE

- CBE and increasing awareness of breast cancer are viable alternative in view of limited health-care resources and advanced stage of disease distribution for Indian women in age group less than 50 years of age. Early results of trial by WHO in India (JNCI 2011) (Journal of the National Cancer Institute) and studies for cost effectiveness of screening in Indian women support that CBE is an effective way and survival can be improved by up to 16% at half the cost by use of CBE (JNCI 2008).
- For women between 50 years and 70 years of age, annual CBE and selective use of mammography,

once in 3 years, in high-risk groups, determined by the above mentioned criteria has been found to be equally effective (JNCI 2011).

- CBE is performed by the clinician or other health professional and involves a systematic examination of the breast skin and tissue.
- The health professional is looking for signs and symptoms or if any changes occur, including development of a lump or swelling, skin irritation or dimpling, nipple pain or retraction (turning inward), redness or scaliness of the nipple or breast skin, or a discharge other than breast milk.
- CBE should include all the 4 quadrants of the breast and the central nipple areola complex followed by examination of axilla and supraclavicular fossae.
- Fibroadenoma, a benign condition feels as a firm and freely mobile swelling, characteristically described as a “mouse in the breast” where as an irregular hard painless lump is characteristic of malignancy. These findings are generalized and all lumps may not classically fit into these descriptions.
- Normal breasts may feel lumpy and tender prior to menstruation, especially if felt with the tips of the fingers; hence, use of a flat hand is recommended.

Mammogram

- In India, breast cancer incidence peaks before the age of 50 years, and a recent review of the evidence in younger women (aged 39-49 years) based on 8 trials conducted between 2001 and 2008, suggests that mammographic screening is also beneficial in this younger age group.
- An approximate 12-15% reduction in breast cancer mortality is associated with mammography screening for women aged 40-69 years.
- Limitations of mammography in developing countries are economic constraints and quality assurance. Cost affectivity and false positives are the other limitations in the use of mammography in India.
- The decision to perform mammography should be determined with shared decision making about risks and benefits and by individual patient values.

168. MRI Currently MRI screening in combination with mammography is targeted to high-risk patients, which includes:

- BRCA 1 or 2 mutation carriers.
- Untested women who have a first degree relative with a BRCA 1 or 2 mutation.
- Lifetime risk of breast cancer of 20-25% or more.
- Received radiation treatment to the chest between ages 10 and 30.
- Genetic mutation in the TP53 Tumour Protein 53(Li-Fraumeni syndrome) or PTEN (Phosphatase

and Tensin homolog) genes (Cowden syndrome).

169. Role of (PET) Positron Emission Tomography imaging: PET has currently a limited role in breast cancer, due to its low sensitivity and is not recommended in most of the cases, especially in early disease. The most useful application of PET/CT is monitoring the changes in 18F-FDG (Flu Deoxy Glucose) uptake during chemotherapy in order to detect an early response to treatment.

Breast cancer prevention

170. The risk of breast cancer may be lowered to some extent by lifestyle changes, working on modifiable risk factors, and diligent use of HRT.

171. The best way to protect one's self is through early detection.

Prevention in high-risk population

172. Indications of risk reducing surgery, mastectomy, salpingo oophorectomy, and chemoprevention can be discussed with experts. The decision is individualized.

Cancer cervix

173. Cervical cancer is the leading cause of cancer death in women in both rural and urban areas. The cervical cancer death rate of 16/100,000 reported in the million woman death study 2012 suggests that a 30-year-old Indian woman has about 0.7% risk of dying from cervical cancer before 70 years of age in the absence of other diseases. By contrast, the risk of dying during the pregnancy for Indian women aged 15-49 years is about 0.6%.^[112]

174. India contributes to over 25% of the disease burden and more than 26% of the deaths due to cervical cancer world-wide. More than 75% of the cases presenting in the late stage of the disease renders poor prospects for survival and cure. About 1, 34, 420 new cases are being diagnosed every year.^[120,121]

175. Risk factors: HPV-Human Papilloma Virus, sexual intercourse at an early age, multiple sexual partners, sexual partners who have had multiple partners, HIV positive status, and smoking.

176. In India, currently only 4.9% of urban women aged 18-69 years are screened every 3 years (WHS India -World Health Surveys. Geneva: WHO; 2003) and 2.3% of rural women aged 18-69 years are screened every 3 years (WHS India).

177. Screening tests available

- Visual inspection.
- Visual inspection with acetic acid (VIA).
- Visual inspection with Lugol's iodine.
- PAP Papinacolou smear both conventional and liquid base cytology.

- HPV DNA testing.
- Cervicography.
- Papnet.
- Polar probe.

The first three are useful at community and low resource setting whereas, the last three are still in the experimental phase.

Primary care (Rural/Urban)

- Cytology-based screening has made little impact in developing countries due to relatively high false negative rate and lack of organized screening program and referral pattern.
- Several studies have shown the benefit of a single visit approach in the form of "see and treat," which involves VIA followed by cryotherapy. This unique approach is based on the principle that the screening test should provide rapid and accurate results and the treatment modality should be appropriate, adequate, and effective. VIA and cryotherapy satisfied these criteria and yielded satisfying results. A randomized trial in South India done by Sankaranarayanan *et al.*, in 2007 has shown 25% reduction in cervical cancer incidence and 35% reduction in mortality compared to control with VIA and cryotherapy.^[122] This approach is useful in primary care level to make the screening program more cost-effective. This can be carried out both by physicians and trained nurses and mid wives.^[120-129]
- HPV testing also has been tried in a screen and treat approach. A few studies reported screening with HPV DNA testing followed by cryotherapy. However, it has two limitations – time and infrastructure required for current HPV testing and a lack of consensus about appropriate follow-up for test positives and also treatment strategy. Hence, in some other studies, HPV DNA positive women had VIA followed by cryotherapy if VIA was positive.
- Some studies suggest that cryotherapy is protective against the future development of cervical disease among women with current HPV infection. Because of this, and due to the low morbidity of cryotherapy, the occasional treatment of screen-positive women without confirmed cervical disease is acceptable.

Secondary and tertiary Level

- PAP smear,^[130,131] and HPV DNA testing are being used commonly at secondary and tertiary care level.
- Applicability of screening techniques at different settings both in rural and urban [Table 11].
- HPV co-testing is to be performed only if the woman crosses 30 years of age as most of the HPV infection clears by then with natural immunity. If both PAP

and HPV are negative, the screening interval can be increased, which again becomes cost-effective.

- Colposcopy: For screen-positive women, post any primary screening method adopted, for diagnostic confirmation with guided biopsies. Because of hormonal changes, many post-menopausal women will have an unsatisfactory colposcopy. Estrogen treatment (estrogen cream application intra-vaginally each evening for 4 weeks and stopped 1 week before repeat cytology) will cause enough ectropion of the endocervical cells to result in a satisfactory examination.
 - Screening recommendations from different organizations [Table 12].
 - Women with negative PAP and positive HPV testing can be either rescreened with contesting in 1 year or with a test specific for type of HPV (HPV 16 and 1).
 - All these screening methods may be sometimes inconclusive in menopausal women whose transformation zone is inside the cervical canal or due to atrophic changes. Hence, choosing the appropriate test is important.
1. High-risk (oncogenic) HPV DNA testing could be adopted for appropriate triage management of post-menopausal women with unequivocal cytology results.
 2. Post-colposcopy management of women of any age with initial cytologic result of atypical glandular cells or ASC-H -'Atypical squamous cells- cannot exclude-High grade squamous intraepithelial lesion" in initial work-up does not identify a high grade lesion).
 3. In the event of availability of low-cost and rapid HPV testing as primary screening test every 5 years up to the age of 65 is recommended. With HPV testing as the primary screening method, PAP or VIA testing can be used to triage to evaluate those with HPV-positive test results to plan for appropriate treatment options.
 4. Above recommendation holds true for women seeking opportunistic services in apex and secondary care levels in public and private sector health facilities where good quality PAP cytology services and molecular testing for HPV DNA are available
178. In the absence of organized cervix cancer screening for the vast women population in rural and urban areas, once in a life time screening by contesting by combined use of cervical cytology and high-risk HPV DNA testing would be appropriate.

Primary prevention

179. Women should be educated early on to think of cervical

Table 11: Screening at different levels for cancer cervix

| | |
|------------|-------------------------------------|
| Primary→ | VIA + cryotherapy/HPV + cryotherapy |
| Secondary→ | PAP±HPV co testing |
| Tertiary→ | PAP±HPV co testing |

Pap: Papinocolou, HPV: Human papiloma virus; VIA: Visual inspection with acetic acid

Table 12: Screening recommendations from different organisations

| Age (years) | USPSTF | ACS-/ASCCP |
|--|--|--|
| 30-65 | Contesting with Pap+HPV every 5 years (preferred) Pap alone every 3 years (acceptable) (Grade A) | Same as USPSTF recommendations |
| >65 | Screening not recom-mended in women who have had adequate prior screening and or not high-risk for cervical cancer (Grade D) | Adequate prior negative screening, no H/O high grade CIN in the last 20 years, no screen Screening should not be resumed even a woman reports having a new sexual partner |
| Post-hyst-erectomy, artificial menopause | No screening if hysterectomy with removal of the cervix is performed for benign lesions and no H/O high grade CIN (Grade D) | No screening if hysterectomy is performed with no H/O high grade CIN |
| HPV vaccinated | Screening as per the age | Screening as per age |

USPSTF: United states preventive services task force; ACS: American cancer society; ASCCP: American society for colposcopic and cervical pathology; CIN: Cervical intraepithelial neoplasia; Pap: Papinocolou; HPV: Human papiloma virus

- cancer as an extension of a sexually transmitted disease.
180. Behavioral changes to reduce the risk of cervical cancer include limiting the number of sexual partners, delaying initial age of sexual intercourse, and avoiding sexually transmitted disease. The association of cigarette smoking with cervical cancer should also be emphasized.
181. An HPV vaccine needs to be promoted especially in the age group of 9 years to the age of first sexual debut. Data from a large placebo-controlled trial showed that the vaccine reduced the incidence of both HPV-16 infection and HPV-16 related (CIN) Cervical intraepithelial neoplasia.

Cancer endometrium

182. Indian incidence of EC: 4.3/100,000 as per Delhi population based cancer registry.

- EC is commonly occurs in post-menopausal women
- Overall morbidity and mortality of EC is low because most patients present at an early stage because of abnormal bleeding or PMB.
 - A strong influence of modifiable risk factors such as increasing obesity, life expectancy, and adjuvant tamoxifen use for breast cancer has been attributed.

- Adenomatous and atypical hyperplasia are the common precursors of endometrial carcinoma.
- Factors that increase the risk of EC are those associated with increase in endogenous estrogens or HT with estrogens.
- Unopposed ET in women with an intact uterus increases the risk of EC 2- to 10-fold, and risk increases with duration of use.
- Cyclic or continuous progestin given along with estrogens reduces the risk of EC.
- Relative risk of EC with obesity is 3.0 in women 21-50 lb overweight and 10 in women more than 50 lb overweight.
- Women taking tamoxifen for more than 2 years have a 2.3- fold to 7.5-fold relative risk of EC.
- The lifetime risk of EC for women with hereditary non-polyposis colorectal cancer (HNPCC) and for women who are at high-risk for HNPCC is as high as 60%.
- There is no evidence that screening by ultrasonography (e.g. endovaginal ultrasound or transvaginal ultrasound) or endometrial biopsy reduces mortality from EC. Most cases of EC (85%) are diagnosed at low stage because of symptoms, and survival rates are high.
- There is no indication that screening for EC is warranted for women who have no identified risk factors.
- It is recommended that, at the time of menopause, women at average risk should be informed about risks and symptoms of EC, and strongly encouraged to report any unexpected bleeding or spotting.
- For those with increased risk and special situations such as on HT, genetic risk, and on tamoxifen therapy should have a complete diagnostic evaluation for abnormal bleeding.
- Regular screening for high-risk group for endometrial carcinoma has not been fully evaluated.
- Women diagnosed with EC should have the benefit of multidisciplinary team approach.

Cancer ovary

183. The general or lifetime risk of ovarian cancer is 1.4%.

- The most common sign of ovarian cancer is enlargement of the abdomen caused by accumulation of fluid or a large ovarian mass. However, many women have bloating or weight gain in the abdominal area, making this sign non-specific.
- In women over 40, digestive disturbances that persist and cannot be explained by any other cause indicate the need for a thorough evaluation for ovarian cancer, including a carefully performed pelvic examination and ultrasound.

184. Risk factors

- A first degree relative with ovarian cancer (mother, sister or daughter).
- Personal H/o breast cancer < 40 years or age.
- Personal H/o breast cancer < 50 and one or more close relative with breast or ovary cancer at any age.
- 2 or more close relative with breast cancer < 50 years of age or ovarian cancer at any age.

185. Screening: No screening guidelines are available for mass screening for ovarian cancer. Recommendation for screening is dependent on the risk status of women.

186. A heightened awareness of the symptoms of early ovarian cancers on the parts of the patients and practitioners may help to reduce the delay in diagnosis and hopefully result in an improvement in outcome of some progress.

187. For general population – annual pelvic examination, PAP smear, and transvaginal sonography are recommended as a part of post-menopausal surveillance.

188. Primary prevention: Limited data are available on the efficacy of prophylactic oophorectomy in decreasing the risk of ovarian cancer in mutation carriers. Still, it is recommended that prophylactic surgery be considered in BRCA mutation carriers who have completed childbearing.

Vulvar cancer

189. Epidemiology: Cancer of the vulva is a rare disease that accounts for approximately 5% of gynecological cancers. The median age of onset is approximately 65-70 years for invasive cancer and approximately 45-50 years for carcinoma *in situ*.

190. Risk factors for vulvar cancer include the following: HPV, previous genital warts, greater number of sexual partners, current smoking, abnormal PAP smear, diabetes, obesity, chronic vulvar pruritis, and poor personal hygiene have also been suggested as contributing to risk.

191. Protected intercourse, monogamy, and adequate hygiene of the external genitalia protect against vulvar cancer.

192. Prevention and detection: The prevention of vulvar cancer rests in the avoidance of risk factors and application of protective factors as summarized above. Annual examinations should be performed to check for vulvar cancer. High-risk patients should be examined every 6 months. White lesions and chronic ulcerative lesions should be biopsied for evaluation.

Stomach cancer

193. In women aged 30-69 years, the second most common fatal cancers were stomach (14.1%). Stomach cancer rates were higher in rural than in urban areas of India due to increased prevalence of chronic *Helicobacter pylori*

infection.

Million death study cancer mortality in India: A nationally representative survey 2012. This may include stomach and primary liver cancer. Prevalence of hepatitis B virus (HBV) in India was less than 1.9% in 72,000 pregnant women aged 15-49 years who were tested in 2002.

194. Nearly, 37% of all female cancer deaths were from infection-related cervical, stomach, and liver cancers and 18.3% were from tobacco-related cancers. This underscores the importance of vaccination, control of infection.^[112] Vaccination against HBV would reduce future liver cancer deaths and cirrhosis. Use of tobacco in pan and beedi should be strongly discouraged.

SECTION III

ABNORMAL MENOPAUSE

Premature menopause

195. The National Family Health Survey of 1998-99, collected information from a sample of more than 90,000 married women aged between 15 and 49 and covering 99% of India's population living in 26 states. 3.1% of the women are already in menopause by the age of 30-34, and the incidence rises to 8% for the age bracket of 35-39. At age of 48-49 years 66% of the women are amenorrheic. This is probably an overestimate for the study did not differentiate between natural, surgical or secondary causes.^[67]

196. Menopause occurring at an age less than 2 SD below the mean estimated age for the reference population is called as premature menopause.

197. Diagnosis is established by hormone analysis repeated 1 month apart. Serum FSH levels > 40 U/mL are diagnostic of POF.

198. Appropriate counseling, life-style modification and HRT form the mainstay of treatment. HRT should be started as early as possible in women with POF and continued till age of natural menopause. Androgen replacement should be considered for women with persistent fatigue, loss of libido in spite of estrogen replacement.

199. No evidence that HT increases risk of breast cancer, CVD or dementia, over and above that found in menstruating women with a normally timed menopause.

200. Women with untreated premature menopause are at increased risk of developing osteoporosis, cardiovascular disease dementia, cognitive decline, and Parkinson's and all-cause mortality.

201. Women receiving chemotherapy/radiotherapy (pelvis) should be cautioned about iatrogenic premature

menopause.

202. Hysterectomy alone can sometimes cause early menopause.

Induced menopause

203. The exact prevalence of surgical menopause is not known, but varies in the rural to urban areas and across states.

204. A significant number of hysterectomies along with bilateral oophorectomies are performed at a young age. This trend of unwarranted hysterectomies and surgical castration for fear of cancer by the professional and the women should be discouraged.

205. There is wide diversity in awareness, about public health problems and QOL among both physicians and population. There is a great need of awareness program about consequence of surgical menopause risk/benefit and in prevention of problems due to surgical menopause.

206. The exact prevalence of surgical menopause is not known, but varies in the rural to urban areas and across states.

206. The physicians should have appropriate knowledge to recognize menopausal symptoms and whenever in doubt should get the test (FSH > 40 IU/mL, E2 < 40 pg/mL).

207. Women who need oophorectomy before menopause should be counseled about the risk of surgical menopause.

208. Routine HT is not recommended for surgical menopause in post-menopausal women as primary prevention for chronic conditions.

209. HT should be considered in women less than 50 who have undergone surgical menopause.

SECTION IV

CLINICAL EVALUATION

General considerations

210. Clinical examination includes a holistic approach to health, rather than simply looking for features of menopause in isolation and this leads to diagnose the latent and overt NICD. Non communicable disease.^[68-71,132] A thorough assessment of the health-related problems helps in formulating treatment plan. Examination can be broadly divided into three main categories:

- I. General physical examination: Examination of respiratory, cardiovascular system, and bones may detect common age related problems
- II. Breast examination: This should be carried out regularly due to an increased risk of breast cancer as women get older
- III. Pelvic examination: This is performed to assess for complications of menopause, such as urogenital atrophy and must include PAP smear.

Assessment

1. Detailed history.
2. Evaluate women's need.
3. Evaluation of women's individual risk factor.
4. Assess general condition of patient.
5. Physical examination:
 - Pulse
 - BP
 - i. Optimal BP (<130/85) to be rechecked every 2 years.
 - ii. Normal level (<140/90 mmHg) to be checked yearly.
 - iii. Greater than 140/90 mmHg need second measurement to confirm diagnosis of hypertension.

Auscultation of the heart and lungs

- Height.
 - Weight.
 - Waist circumferences.
 - Calculate BMI.
 - Breast examination.
 - Pelvic examination.
211. Risk Factors for Osteoporosis: Major risk factors as defined by WHO are advancing age, prior fragility fracture, low BMI, family history of fracture, smoking and more than three drinks of alcohol per day (R: Grade A).
Environmental factors include nutrition (calcium intake using the quick dietary calculator, protein) physical activity and sunlight exposure, which are important modifiable risk factors in India. Relevance of risk of falling increases with ageing. R (Grade A).
212. Risk factors for coronary heart disease: Premature menopause, hypertension, dyslipidemia, homocystenemia, lipoprotein(a), high-risk CRP, DM, obesity, sedentary life-style, smoking, and metabolic syndrome.
213. Risk factors for DM: Advancing age, obesity, family history, hypertension, dyslipidemia, personal history of gestational DM or impaired glucose tolerance, PCOS, and physical inactivity.
214. Risk factor for deep vein thrombosis: Personal or family history of clot, if so, when and why? Prolonged immobilization-surgery or while pregnant or on the contraceptive pills. Any tests to confirm the clot history of the treatment with anticoagulants.
215. Risk factors for stroke: Hypertension, diabetes, smoking, obesity, atrial fibrillation, asymptomatic carotid stenosis, and hyperlipidemia.
216. Risk factors for Alzheimer's disease: Age, family history, genetic factor APOE, MCI, CVD risk factors, physical inactivity, diabetes, hyper-tension, dyslipidemia, smoking, obesity, auto-immune diseases, depression and stress, social engagement and diet, and

head trauma and traumatic brain injury.

Polypharmacy and thyroid disease are two examples of reversible causes of memory loss in older adults.

Investigations

217. These are necessary to establish the diagnosis, determine etiology, and screen for complication. Some investigations may be necessary to perform for diagnosis or to help in formulating a treatment plan.
218. Recommended laboratory tests:
- Complete blood picture.
 - Urine test routine.
 - Fasting glucose level.
 - Lipid profile.
 - Serum TSH.
 - Stool for occult blood.
 - PAP smear.
 - Transvaginal ultrasound.
 - Mammogram/ultrasound.
 - Eye checkup – intraocular pressures, refractive index, and retina.
219. The following investigations are not mandatory and should be chosen judiciously depending on the women's history and examination [Table 13].

SECTION V**MANAGEMENT OPTIONS****A. Counseling**

220. Today, the art of medical counseling and translating the statistics in simple language is an important part of the consultation.
221. The objectives of counseling include addressing women's questions and concerns, providing patient education, and enhancing the patient's confidence in the decision making. If a therapy is chosen, the patient and clinician should agree on the goals, risks, and benefits, whether they are short-term (menopause symptom relief), long-term (primary or secondary prevention of diseases associated with aging), or both.^[133-136]
222. The clinician should review the decisions about menopause management with the patient at subsequent visits.

Dietary prescription

223. The National Institute of Nutrition plan for an adult sedentary woman is a good strategy for healthy living [Table 14].

Exercise prescription

224. Physical exercise helps to maintain a healthy weight, improves bone density, coordination and balance, muscle strength and joint mobility, lipid profiles,

Table 13: Test performed solely on indication

| Test | Indication |
|--|--|
| FSH | Premature menopause, women on OC pills, women who had hysterectomy, doubt as to the cause of secondary amenorrhea or hot flushes, women on patches to rule out accumulation |
| Estradiol | Premature menopause, women on OC pills, women who had hysterectomy, doubt as to the cause of secondary amenorrhea or hot flushes |
| Tests to assess increased risk of thrombosis | Where there is relevant past or family history, women with previous history of unexplained thromboembolic episodes anti thrombin III, Tissue factor pathway inhibitor activity, protein C and protein S are to be estimated. Lupus anticoagulant, anticardiolipin antibodies should also be assessed |
| Endometrial biopsy | Post-menopausal bleeding, recent irregular bleeding, previous use of unopposed estrogen in the presence of uterus |
| Bone mass measurement | For specific indication. Refer Flowchart 2 |
| LFT | When relevant as with suspected liver disease or recent history of liver disease |
| Urodynamic study | To diagnose and differentiate on the severity and type of incontinence before planning surgery |
| ECG, 2D Echo, Stress test | CVD assessment |
| 25,OH vitamin D | Rule out secondary causes of osteoporosis |

FSH: Follicular stimulating hormone; LFT: Liver function tests; ECG: Electrocardiogram; CVD: Cardiovascular disease, 25, OH vitamin D 25, hydroxy Vitamin D

Table 14: Nutrition plan for an adult sedentary woman

| Food source | g/day |
|----------------------|--------------|
| Cereals and millets | 270 |
| Pulses (vegetarian) | 60 |
| Non-vegetarian | 30 |
| Vegetables | 300 |
| Fruit | 100 |
| Sugar diary products | 300 |
| Fats and oils | 20 |
| Sugar | 20 |
| Salt | 5 |
| Water | 8-10 glasses |

genitourinary problems, relieves depression, and induces sleep.

225. Combination of exercises, diet, and yoga helps the post-menopausal women to increase her metabolic rate and maintain a healthy weight.

226. Social interactions either in an exercise program or otherwise, help the post-menopausal women to improve mood, relieve depression, and anxieties.

227. Euphoria created with activity promotes her QOL.

Immunization prescription

228. Hepatitis B vaccination is indicated for all unvaccinated

adults at risk for HBV infection and all adults seeking protection from HBV infection including post-exposure prophylaxis. Pre-vaccination screening in general population has not been found to be cost-effective in India (Level B).

229. The expert group of Association of Physicians of India recommends vaccination of the entire community at risk during an outbreak situation (Grade B).

230. Two doses of varicella vaccine are strongly recommended in adults at increased risk for exposure of varicella (Grade B).

Pharmacotherapy

Complementary and alternative therapies

231. Non-hormonal prescription agents may relieve VMS, but have their own side effects. These can be considered when HRT is contraindicated or not desired.^[137] (Grade A).

232. Complementary and alternative treatments should be advised with caution as the data is still insufficient, especially in moderate to severe VMS (Grade A).

233. Awareness should be created regarding the phytoestrogens and lycopene rich foods in the Indian diet.^[138] (Grade C).

234. It is recommended to validate the effects of locally used herbs in the Indian context, according to modern medicine and prescribe them rationally using clinical research tools and well-designed and documented RCTs. Whilst prescribing or recommending herbs, it would be essential to fully inform the women that very little human data is available on the usefulness of these formulations and side-effects of the herbs have not been studied. It is important to read labels to determine isoflavone content and to warn them that in India, there are no regulations to ensure the content or quality of such products (Grade C).

HT

Terminology

235. HT covers therapies including estrogens, progestogens, combined therapies, androgens, and tibolone.

236. Terminology used in HT: HT, ET; Estrogen progesterone therapy (EPT), EPT; and androgen therapy (AT).

237. Three indications for post-menopausal HT, which have constantly withstood the test of time, derived from the results of various clinical trials are the beneficial effect of estrogens on symptom relief, urogenital atrophy, and bone.

Patient characteristics that may be favorable for estrogen/androgen combination

238. Surgical menopause continued VMS despite estrogen replacement, decreased wellbeing despite estrogen

replacement, and acquired sexual desire dysfunction.

Indications for HT

239. The most effective treatment for VMS is HT (Grade A).
240. Progesterones or Low dose oral contraceptive pills can be used in the menopause transition phase for relief of symptoms (Grade A).
241. Vaginal ET is most effective in the treatment of urogenital atrophy. Low dose vaginal preparations are as effective as systemic therapy. Some women on oral ET may require additional local therapy (Grade A).
242. Recurrent attacks of atrophic vaginitis require the use of the smallest effective dose over a period of time. After control of acute symptoms, the dose of local estrogen can be tapered for long-term maintenance therapy. Treatment may be continued indefinitely, although safety data from studies do not go beyond 1 year (Grade C).
243. Recurrent urinary tract in this age after ruling out other causes may benefit from the local application of ET (Grade A).
244. Progesterone supplement for endometrial protection is not needed along with the use of vaginal estrogen (Grade C).
245. Endometrial surveillance is not necessary in low risk asymptomatic woman. Unscheduled bleeding should be investigated by an ultrasound and endometrial biopsy (Grade A).
246. EPT/ET may be used for prevention and treatment of osteoporosis in the early post-menopause in symptomatic women unless there is a contra-indication. ET/EPT prevents all osteoporotic fractures even in low risk population, it increases lumbar spine BMD up to 7.6% and femoral neck BMD up to 4.5% over 3 years. It reduces the risk of spine, hip, and other osteoporotic fractures by 33-40% (Grade A).
247. HT should not be started solely for bone protection after 10 years of menopause. Extended use of HT in women with reduced bone mass is an option after considering the risk benefit analysis compared to the other available therapies for osteoporosis. The bone protective effect is lost after stopping HT (Grade B).
248. HT should be offered to women with POF or early menopause (and it can be recommended until the age of natural menopause (Grade C).
249. Estrogen can be prescribed to enhance mood in women with depressive symptoms. The effect appears to be greater for perimenopausal symptomatic women than for post-menopausal women (Grade A).

Possible benefits

250. HT (conjugated equine estrogens±medroxyprogesterone) was associated with a decrease in the risk for type 2 diabetes (Grade B).

251. HT decreases the abdominal obesity (Grade B).
252. Estrogens may have a protective effect on osteoarthritis (Grade B).
253. Estrogen benefits verbal memory over the short period when initiated soon after surgical menopause (Grade B).
254. HT reduces the neovascular macular lesions (Grade C).
255. HT in the early menopausal period improves QOL by its effects on vasomotor and urogenital symptoms, improvement on sleep, and mood (Grade B).

HT use in disease

256. All preparations including low dose, non-oral routes of estrogen are effective in symptom control and in preserving bone mass. In women with hypertriglyceridemia, obesity, glucose intolerance, history of deep vein thrombosis, and tobacco users, non-oral route should be the preferred (Grade B).
257. Women who have general risk of breast cancer can be prescribed HT according to their need after a detailed history, examination, and counseling. They should be provided information about breast cancer risk with HT as per evidence.
258. Women who are at high-risk of breast cancer also can be prescribed HT after risk benefit analysis.
259. HT does not appear to influence the clinical pattern of benign breast disease in a post-menopausal woman (Grade C).
260. Use of HT in breast cancer survivors is debatable. It is recommended to use non-hormonal therapies.
261. Women with cervix, ovary, and EC endometrial cancer can be given HT if needed.
262. (HT) Hormone Therapy given to women below the age of 60 or within 10 years of menopause, the risks are rare. The tables below two elaborate the benefits and risks in terms that can be easily communicated during counseling.
263. Classification of frequency of drug reactions according to WHO and CIOMS – The Council for International Organizations of Medical Sciences
Very common > 1/10; common (frequent) >1/100 and < 1/10; uncommon (infrequent) >1/1,000 and < 1/100; rare > 1/10,000 and < 1/1,000; and very rare < 1/10,000.
264. Harms
265. Based on WHI: Number of excess events on HT versus placebo per 10,000 women per year of HT Use between the age group of 50 years and 59 years (R: Grade A) [Table 15].
266. Benefits
Based on WHI: Number of less events on estrogen versus placebo per 10,000 women per year of HT use between the age group of 50 years and 59 years (R: Grade A) [Table 16].

Table 15: Based on WHI: number of excess events on HT vs. placebo per 10,000 women per year of HT use between the age group of 50–59 years (R: Grade A)

| Disease | Estrogen | WHO/CIOMS definition of risk | Estrogen+ progesterone | WHO/CIOMS definition of risk |
|---------------|----------|------------------------------|------------------------|------------------------------|
| VTE | 4 | Rare <1/10,000 and <1/1,00 | 11 | Rare >1/10,000 and <1/1000 |
| Stroke | 1 | Rare >1/10,000 and <1/1,000 | 4 | Rare >1/10,000 and <1/1,000 |
| Breast cancer | | | 5 | Rare >1/10,000 and <1/1,000 |
| CVD | | | 5 | Rare >1/10,000 and <1/1,000 |

WHO: World Health Organization; VTE: Venous thromboembolism, CVD: Cardiovascular disease

Table 16: Based on WHI: number of less events on estrogen vs. placebo per 10,000 women per year of HT use between the age group of 50-59 years (R: Grade A)

| Disease | Number of less events with estrogens |
|----------------------------------|--------------------------------------|
| Myocardial infarction | 12 |
| Breast cancer | 8 |
| Number of less events with E/E+P | |
| Total deaths | 10 |
| Adverse events | 18 |
| Fractures | 5 |
| Colorectal cancer | 6 |

E: Estrogen; P: Progesterone

Absolute contraindications of HT

267. Active endometrial and gynecological hormone dependent cancers, active breast cancer, estrogen progesterone receptor positive cancers, known or suspected pregnancy, undiagnosed, abnormal vaginal bleeding, severe active liver disease with impaired/abnormal liver function, estrogen dependent venous thrombosis, and inherent increased risk of thromboembolism.

Precautions

268. Progesterone in adequate dose should be supplemented along with oral estrogens in women with uterus (Grade A).
269. Estrogen alone is given in hysterectomized women (Grade A).
270. Progesterone supplement for endometrial protection is not needed along with the use of vaginal estrogen (Grade C).
271. Endometrial surveillance is not necessary in low risk asymptomatic woman. Unscheduled bleeding should be investigated by an ultrasound and endometrial biopsy (Grade A).
272. Pre-HT work-up and an annual follow-up are essential when prescribing HT. The dose and duration of use of HT should be individualized and a risk-benefit assessment carried out annually. A full gynecological assessment is mandatory prior to starting HT and at regular intervals thereafter. Self-breast examination is advised monthly

and CBE at least annually. Mammogram/US, where available should be carried out 1-3 yearly if the initial mammogram is normal (Grade C).

Duration of use

273. Premature menopause-HT can be prescribed up to the natural age of menopause; further continuation of therapy is a shared decision between the woman and the physician according to the indication and the need (Grade C).
274. Natural menopause: Safety data of EPT therapy with CEE+MPA is 3-5 years with ET safety data for use is 7 years of treatment with 4 years follow-up. Role of extended use of HT is a shared decision between the woman and the physician and may be considered in cases of recurrence of symptoms after stopping therapy, in cases of management of osteoporosis when other therapies are contraindicated (Grade A).
275. Stopping HT: May be abrupt or the dose and duration may be tapered off gradually (Grade C).

Potency and non-oral routes

276. Minimum effective dose is the principle to be followed while prescribing HT. The potency needed by the woman may change over time. After starting standard dose therapy, dose can be lowered and maintained accordingly. Low dose and ultralow dose therapy are effective in relieving symptoms and increasing bone mass.
277. Transdermal estrogen has a neutral effect on triglycerides, CRP, and sex hormone binding globulin and is preferable for use in women with hypertriglyceridemia, obesity, glucose intolerance, high-risk of deep vein thrombosis, and tobacco users.

HT and CVD

278. HT should not be prescribed for primary or secondary prevention of CVD. However, healthy women within 10 years of menopause tend to have a lower risk.
279. HT increases VTE risk by 2-fold (Grade A).
280. Standard dose oral HT increased stroke risk by about one third in generally healthy post-menopausal women (Grade B). Low dose ET may not increase the risk of stroke (Grade C).

HT and breast cancer**Estrogen alone**

281. Estrogen alone increases percentage mammographic density, not as much as estrogen and progesterone together (Level A).
282. Estrogen increases the risk of breast cancer after more than 5 years of use, particularly in recently post-menopausal women (Level B).
283. The precise duration of exposure needed to exert this effect is not clear, but a linear model suggests a 3% relative increase per year of exposure in thin women and a lesser risk in obese women (Level C).
284. The attributable or excess risk for 5 years usage is 0/1000 to 2.59/1000 (Level C). It falls under the rare category.
285. Increased risk dissipates within 5 years of discontinuing the HT (Level B).
286. Use of estrogen for less than 5 years may reduce the risk especially in women who start HT many years after menopause (Level B).
287. Tumors in HT used women are usually ER positive and lobular type (Level C).

Estrogen + progesterone (E + P)

288. E+P increase percentage mammographic density significantly (Level A).
289. E+P particularly with synthetic progesterones increase the risk of invasive breast cancer within 3-5 years of initiation and increases progressively beyond that time (Level B).
290. Emerging data from 2 independent studies report that progesterone (micronized progesterone/dydrogesterone) with estrogen does not increase the risk if given for less than 5 years (Level C).
291. The risk returns to approximately that of non-users within 3 years of cessation (Level B).

Androgens

292. Available data is of low quality and conflicting regarding the risk of breast cancer relating to use of androgens (Level D).
293. Prospective randomized double-blind trials are needed (Level D).

Tibolone

294. It reduces the risk of breast cancer in post-menopausal women (Grade B).
295. It increases the risk of breast cancer recurrences.

Raloxifene

296. It decreases the risk of development of breast cancer.

Maximum benefits, minimum side-effects of HT can be achieved by judicious use

297. Age of initiation: Ideally therapy begins within 10 years

of menopause or below 60 years of age – “window of opportunity.”

298. Low dose: Use of low-dose estrogen with low-dose progestin when appropriate.
299. Route of administration: Transdermal administration has reduced risk of blood clotting (VTE risk) compared to oral administration.
300. Progestin: Side-effect profile of various progestins may play a clinical role in selecting the optimum treatment regimen. Natural progesterone is a choice.
301. Tissue selective estrogen complex (TSEC): Newer formulations of combination therapy of estrogen and selective estrogen receptor modulators are soon to be available.

Tibolone

302. Tibolone is a selective tissue estrogenic activity regulator. It is a synthetic steroid compound, which has estrogenic, progestogenic, and androgenic properties. It has an estrogenic effect on bone, inhibiting bone resorption by reducing osteoclastic activity.
303. Tibolone is approved in 90 countries to treat menopausal symptoms and in 45 countries to prevent osteoporosis. Tibolone is effective in treating VMS and improves urogenital atrophy (Grade A).
304. It improves mood and libido (Grade B).
305. Tibolone is prescribed in a single daily dose of 2.5 mg orally. A lower dose of 1.25 mg has been found to be equally effective for most indications, including osteoporosis. It should be prescribed 1 year after amenorrhea (Grade A).
306. Tibolone reduces the risk of vertebral and non-vertebral fracture in older osteoporotic women. Tibolone prevents bone loss and is as effective as standard doses of conventional post-menopausal HT. Tibolone increases lumbar spine and total hip BMD to a statistically significantly greater extent than raloxifene (Grade A).
307. It does not increase the risk of VTE and CVD events (Grade B).
308. It does not induce endometrial hyperplasia or carcinoma in post-menopausal women (Grade A).
309. Tibolone may be preferable to HRT in symptomatic menopausal women with mammographically dense breast tissue (Grade A).
310. Tibolone may be used as add back therapy with GnRH analogs for VMS and to maintain BMD (Grade B).
311. Tibolone may be used in women with myomas and endometriosis.
312. Tibolone should not be used in breast cancer survivors as it increases the recurrence risk (Grade A).
313. It reduces the risk of breast cancer in post-menopausal

women (Level B).

314. Tibolone should be used with caution in women over 60 years and should not be used in those who have strong risk factors for stroke (Grade A).

Selective estrogen receptor modulators

315. Selective estrogen receptor modulators, e.g. raloxifene at 60 mg daily improve and preserve bone density at the spine (2.6%) and hip (2.1%) after 4 years with a simultaneous reduction by 76% in the risk of invasive breast cancer.

Antifracture efficacy on the hip is lacking (Grade A).

316. Raloxifene has been shown to be beneficial in reducing new vertebral fracture risk by 69% in post-menopausal women with osteoporosis and 47% in postmenopausal women with osteopenia over 3 years (Grade A).

317. Raloxifene can be used as therapy for the prevention and treatment of osteoporosis especially for women with an increased risk of breast cancer (Grade A).

318. Raloxifene and estrogen are associated with a similar increased risk of VTE (Grade A). Other side-effects include hot flushes, which are more likely in the perimenopausal period, and leg cramps.

SECTION VI

Economics of menopause management

319. Indian health-care system is one of the most privatized systems where government spends much less and individual has to pay for health insurance.

320. Insurance may be described as a social device to reduce or eliminate the risk of life and property. Under the plan of insurance, many people associate themselves by sharing risk, attached to individual insurance plan that covers only health-care costs and is called health insurance.

321. It is indeed very important to enroll in any of the good health insurance schemes for a secure future. Health-care insurance provides a cushion against medical emergencies. Most companies stop enrolment after 65-70 years of age.^[139]

322. Menopause management is associated with significant direct and indirect costs.

323. Direct costs include physician's visits, specialist's visit and traditional pharmacotherapy or alternative and complimentary medicines modality.

324. Indirect costs include laboratory testing, management of adverse events, loss of productivity at home and at work, and treatment of associated medical disorders.

325. Rates prevailing in different regions of India are compared and the preliminary cost (without medication) is found to a range between Rs. 5,800 and Rs. 8,400.

326. Various oral estrogen and tibolone preparations are

available in Indian market, cost of which ranges from Rs. 40 to Rs. 990.

327. Local and transdermal estrogen preparations are scarce in Indian market, cost of which ranges from Rs. 134 to Rs. 658.

328. Various oral and non-oral progesterone preparations are available in Indian market, cost of which ranges from Rs. 10 to Rs. 820.

329. Various groups of molecules are available for prevention and treatment of osteopenia and osteoporosis. Cost of therapy varies according to the indication whether they are prescribed for prevention or treatment of osteopenia or osteoporosis.

330. Alternative and complimentary medications are usually not considered to be part of mainstream medicine, but are popularly available in Indian market, cost of which ranges from Rs. 42 to Rs. 473.

331. Menopause is a time of significant changes, which often have a negative impact on QOL. However, it is possible to live well with menopause. Adopting a healthy life-style is cost-effective.

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