A systematic review and meta-analysis were carried out. PubMed, EMBASE and Cochrane databases were searched for eligible studies from 1st of January of 1990 to 9th of October of 2018. Eligible studies enrolled women older than 18 years with PCOS, which should be diagnosed according to the Rotterdam Consensus, the Androgen Excess Society, the National Institutes of Health Consensus or the International Classification of Diseases. The studies were grouped according to patient mean BMI: <27 kg/m² or ≥27 kg/m². The results were pooled as mean difference (MD), standardized MD (SMD) and hazard ratio (HR).

OUTCOMES: Overall, 921 studies were retrieved, and 31 duplicated studies were removed. After screening the titles and abstracts, 80 studies were eligible for full text reading. Of those, 23 studies remained for qualitative synthesis. With the exception of one study, all studies were considered high quality based on the Newcastle-Ottawa scale (NOS; score ≥6). Meta-analysis was performed in 21 studies, with a total of 31 383 women with PCOS and 102 797 controls. Women with PCOS with BMI <27 kg/m² had lower BMD of the total femur (MD, -0.04; 95% CI, -0.07 to 0.00; I² = 31%; P = 0.22) and spine (MD, -0.07; 95% CI, -0.13 to -0.01; I² = 70%; P < 0.01) when compared with the control group, whereas for women with BMI ≥27 kg/m² no difference was observed (femur: MD, 0.02; 95% CI, -0.02 to 0.05; I² = 20%; P = 0.29; spine: MD, 0.02; 95% CI, -0.06 to 0.05; I² = 0%; P = 0.84). Osteocalcin was remarkably reduced in women with PCOS with BMI <27 kg/m² (SMD, -2.68; 95% CI, -4.70 to -0.67; I² = 98%; P < 0.01), but in women with BMI ≥27 kg/m², there were no differences between PCOS and controls. Few studies (n = 3) addressed the incidence of bone fractures in women with PCOS. The HR for total bone fractures did not identify differences between women with PCOS and controls. WIDER IMPLICATIONS: On the basis of the available evidence, it is possible to assume that PCOS in women with BMI <27 kg/m² is associated with reduced BMD in the spine and femur, and decreased bone formation, as manifested by lower levels of circulating osteocalcin. These findings suggest that bone parameters in PCOS may be linked, to some extent, to adiposity. These studies included premenopausal women, who have already achieved peak bone mass. Hence, further prospective studies are necessary to clarify the existence of increased risk of fractures in women with PCOS.

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**Bisphosphonates and mortality: confounding in observational studies?**
Bergman J1, Nordström A2,3, Hommel A4, Kivipelto M5,6,7, Nordström P8.
Numerous observational studies suggest that bisphosphonates reduce mortality. This study showed that bisphosphonate use is associated with lower mortality within days of treatment, although the association was not significant until the second week. Such an early association is consistent with confounding, although an early treatment effect cannot be ruled out. INTRODUCTION: The purpose of this study was to examine whether confounding explains why numerous observational studies show that bisphosphonate use is associated with lower mortality. To this end, we examined how soon after treatment initiation a lower mortality rate can be observed. We hypothesized that, due to confounding, the association would be observed immediately. METHODS: This was a retrospective cohort study of hip fracture patients discharged from Swedish hospitals between 1 July 2006 and 31 December 2015. The data covered 260,574 hip fracture patients and were obtained from the Swedish Hip Fracture Register and national registers. Of the 260,574 patients, 49,765 met all eligibility criteria and 10,178 were pair matched (bisphosphonate users to controls) using time-dependent propensity scores. The matching variables were age, sex, diagnoses, prescription medications, type of hip fracture, type of surgical procedure, known or suspected dementia, and physical functioning status. RESULTS: Over a median follow-up of 2.8 years, 2922 of the 10,178 matched patients died. The mortality rate was 7.9 deaths per 100 person-years in bisphosphonate users and 9.4 deaths in controls, which corresponded to a 15% lower mortality rate in bisphosphonate users (hazard ratio 0.85, 95% confidence interval 0.79-0.91). The risk of death was lower in bisphosphonate users from day 6 of treatment, although the association was not significant until the second week. CONCLUSION: Bisphosphonate use was associated with lower mortality within days of treatment initiation. This finding is consistent with confounding, although an early treatment effect cannot be ruled out.

**Risk-Reducing Bilateral Salpingo-Oophorectomy for BRCA Mutation Carriers and Hormonal Replacement Therapy: If It Should Rain, Better a Drizzle than a Storm.**
Women carrying a BRCA mutation have an increased risk of developing breast and ovarian cancer. The most effective strategy to reduce this risk is the bilateral salpingo-oophorectomy (RRBSO) recommended between age 35 and 40 and between age 40 and 45 years for women carriers of BRCA1 and BRCA2 mutations, respectively. Consequently, most BRCA mutation carriers undergo this procedure prior to a natural menopause and develop an anticipated lack of hormones. This condition has a detrimental impact on various systems, affecting both the quality of life and longevity; in particular, women carrying BRCA1 mutation, who are likely to have surgery earlier as compared to BRCA2. Hormonal replacement therapy (HRT) is the only effective strategy able to significantly compensate the hormonal deprivation and counteract menopausal symptoms, both in spontaneous and surgical menopause. Although recent evidence suggests that HRT does not diminish the protective effect of RRBSO in BRCA mutation carriers, concerns regarding the safety of estrogen and progesterone intake reduce the use in this setting. Furthermore, there is strong data demonstrating that the use of estrogen alone after RRBSO does not increase the risk of breast cancer among women with a BRCA1 mutation. The additional progesterone intake, mandatory for protection of the endometrium during HRT, warrants further studies. However, when hysterectomy is performed at the time of RRBSO, the indication of progesterone addition decays and consequently its potential effect on breast cancer risk. Similarly, in patients conserving the uterus but undergoing risk-reducing mastectomy, the addition of progesterone should not raise significant concerns for breast cancer risk anymore. Therefore, BRCA mutation carriers require careful counselling about the scenarios following their RRBSO, menopausal symptoms or the fear associated with HRT use.

**Low-Fat Dietary Pattern and Cancer Mortality in the Women's Health Initiative (WHI) Randomized Controlled Trial.**
Chlebowski RT1, Anderson GL2, Manson JE3, Prentice RL2, Aragaki AK2, Snetselaar L4, Beresford SAA5, et al.
Background: In the Women's Health Initiative Dietary Modification trial, a low-fat dietary pattern reduced deaths after breast cancer. Mortality from other cancer sites has not been reported. Methods: A low-fat dietary pattern influence on deaths from and after site-specific cancers was examined during 8.5 years (median) of dietary intervention and
Subclinical hypothyroidism in pregnancy.
Toloza FJK1,2, Abedzadeh-Anaraki S1, Maraka S1,2,3.
PURPOSE OF REVIEW: Subclinical hypothyroidism (SCH) is a common diagnosis among women of reproductive age. The importance of sufficient maternal thyroid supply during pregnancy is well known. Nevertheless, the effects of SCH during pregnancy and the efficacy of its treatment on maternofetal outcomes are not well established. This review discusses the recent evidence on SCH in pregnancy and how this evidence is reflected in current clinical care.
RECENT FINDINGS: Recent observational studies have found a positive association between SCH during pregnancy and adverse maternal, neonatal and offspring outcomes, mainly thyroid peroxidase autoantibody positive women. Although interventional studies have shown a benefit of levothyroxine (LT4) treatment on selected pregnancy outcomes, there was no effect on offspring neurodevelopment. SUMMARY: Current evidence strengthens the association between SCH with both maternofetal and offspring adverse outcomes. An earlier and more individualized diagnostic assessment taking into consideration predictors of thyroid dysfunction and major risk factors for complications could result in better management of SCH during pregnancy. The effectiveness of LT4 on improving maternofetal and long-term offspring outcomes is still not fully elucidated.
Safety and efficacy of testosterone for women: a systematic review and meta-analysis of randomised controlled trial data.
Islam RM1, Bell RJ1, Green S2, Page MJ2, Davis SR3.

BACKGROUND: The benefits and risks of testosterone treatment for women with diminished sexual wellbeing remain controversial. We did a systematic review and meta-analysis to assess potential benefits and risks of testosterone for women.

METHODS: We searched MEDLINE, Embase, the Cochrane Central Register of Controlled Trials, and Web of Science for blinded, randomised controlled trials of testosterone treatment of at least 12 weeks’ duration completed between Jan 1, 1990, and Dec 10, 2018. We also searched drug registration applications to the European Medicine Agency and the US Food and Drug Administration to identify any unpublished data. Primary outcomes were the effects of testosterone on sexual function, cardiometabolic variables, cognitive measures, and musculoskeletal health. This study is registered with the International Prospective Register of Systematic Reviews (PROSPERO), number CRD42018104073.

FINDINGS: Our search strategy retrieved 46 reports of 36 randomised controlled trials comprising 8480 participants. Our meta-analysis showed that, compared with placebo or a comparator (eg, oestrogen, with or without progestogen), testosterone significantly increased sexual function, including satisfactory sexual event frequency (mean difference 0.85, 95% CI 0.52 to 1.18), sexual desire (standardised mean difference 0.36, 95% CI 0.22 to 0.50), pleasure (mean difference 6.86, 95% CI 5.19 to 8.52), arousal (standardised mean difference 0.28, 95% CI 0.21 to 0.35), orgasm (standardised mean difference 0.25, 95% CI 0.18 to 0.32), responsiveness (standardised mean difference 0.28, 95% CI 0.21 to 0.35), and self-image (mean difference 5.64, 95% CI 4.03 to 7.26), and reduced sexual concerns (mean difference 8.99, 95% CI 6.90 to 11.08) and distress (standardised mean difference -0.27, 95% CI -0.36 to -0.17) in postmenopausal women. A significant rise in the amount of LDL-cholesterol, and reductions in the amounts of total cholesterol, HDL-cholesterol, and triglycerides, were seen with testosterone administered orally, but not when administered non-orally (eg, by transdermal patch or cream). An overall increase in weight was recorded with testosterone treatment. No effects of testosterone were reported for body composition, musculoskeletal variables, or cognitive measures, although the number of women who contributed data for these outcomes was small. Testosterone was associated with a significantly greater likelihood of reporting acne and hair growth, but no serious adverse events were recorded. INTERPRETATION: Testosterone is effective for postmenopausal women with low sexual desire causing distress, with administration via non-oral routes (eg, transdermal application) preferred because of a neutral lipid profile. The effects of testosterone on individual wellbeing and musculoskeletal and cognitive health, as well as long-term safety, warrant further investigation.