Metformin as Anti-Aging Therapy: Is It for Everyone?
Soukas AA1, Hao H2, Wu L3.
Metformin is the most widely prescribed oral hypoglycemic medication for type 2 diabetes worldwide. Metformin also retards aging in model organisms and reduces the incidence of aging-related diseases such as neurodegenerative disease and cancer in humans. In spite of its widespread use, the mechanisms by which metformin exerts favorable effects on aging remain largely unknown. Further, not all individuals prescribed metformin derive the same benefit and some develop side effects. Before metformin finds its way to mainstay therapy for anti-aging, a more granular understanding of the effects of the drug in humans is needed. This review provides an overview of recent findings from metformin studies in aging and longevity and discusses the use of metformin to combat aging and aging-related diseases.

Recognition and management of adults with Turner syndrome: From the transition of adolescence through the senior years.
Lin AE1, Prakash SK2, Andersen NH3, Viuff MH4, Levitsky LL5, Rivera-Davila M6, Crenshaw ML7, et al.
Turner syndrome is recognized now as a syndrome familiar not only to pediatricians and pediatric specialists, medical geneticists, adult endocrinologists, and cardiologists, but also increasingly to primary care providers, internal medicine specialists, obstetricians, and reproductive medicine specialists. In addition, the care of women with Turner syndrome may involve social services, and various educational and neuropsychologic therapies. This article focuses on the recognition and management of Turner syndrome from adolescents in transition, through adulthood, and into another transition as older women. It can be viewed as an interpretation of recent international guidelines, complementary to those recommendations, and in some instances, an update. An attempt was made to provide an international perspective. Finally, the women and families who live with Turner syndrome and who inspired several sections, are themselves part of the broad readership that may benefit from this review.

Gender Differences in Cardiac Hypertrophy.
Wu J1, Dai F2, Li C2, Zou Y3.
Cardiac hypertrophy is an adaptive response to abnormal physiological and pathological stimuli, which can be classified into concentric and eccentric hypertrophy, induced by pressure overload or volume overload, respectively. In both physiological and pathological scenarios, females generally show a more favorable form of hypertrophy compared with their male counterparts. However once established, cardiac hypertrophy is a stronger risk factor for heart failure in females. Pre-menopausal women are better protected against cardiac hypertrophy compared with men, but this protection is abolished following menopause and is partially restored after estrogen replacement therapy. Estrogen exerts its protection by counteracting pro-hypertrophy signaling pathways, whereas androgen mostly plays an opposite role in cardiac hypertrophy. We here summarize the progress in the understanding of sexual dimorphisms in cardiac hypertrophy and highlight recent breakthroughs in the regulatory role of sex hormones and their intricate molecular networks, in order to shed light on gender-oriented therapeutic efficacy for pathological hypertrophy.

Secular trends in major osteoporotic fractures among 50+ adults in Denmark between 1995 and 2010.
Abtahi S1,2,3, Driessen JHM1,2,3,4, Vestergaard P5,6, van den Bergh J4,7,8,9, Boonen A2,7, et al.
We investigated the incidence trend in all major osteoporotic fractures for the whole country of Denmark between 1995 and 2010. Hip and other osteoporotic fractures declined for the general population and especially among women. But, we observed some increasing trend among men which needs more attention. PURPOSE: The trend in osteoporotic fractures is varied across the globe, and there is no updated information in the case of Denmark for all major osteoporotic fractures (MOF). Thus, we investigated the incidence rates (IRs) of MOF among 50+ adults in Denmark over the period 1995-2010. METHODS: A series of cross-sectional analyses was done using the Danish National Health Service Register. Participants were 50+ adults in the full country Denmark with a MOF between 1995 and 2010. Gender- specific IRs of MOF per 10,000 person years (PYs) were estimated, in addition to IRs of individual fracture sites (hip, vertebrae, humerus, and radius/ulna), and women-to-men IR ratios for MOF. RESULTS: A general decline was observed in IRs of MOF for the whole population (from 169.8 per 10,000 PYs in 1995, to 148.0 in 2010), which was more pronounced among women. Thirty-one and nineteen percent of decline was observed in hip fracture rates among women and men, respectively. The trend in clinical vertebral fracture was slightly decreasing for women and increasing for men. The women-to-men rate ratio of MOF decreased noticeably from 2.93 to 2.72 during study period. CONCLUSIONS: We observed declining trends in MOF and hip fracture for both sexes. However, a lower rate of decrease of hip fracture and an increasing trend in vertebral fracture was noticed among men. Considering our observations and the major economic burden that accompanies this devastating disease, more attention should be paid to MOF, especially in men.


**The effect of hormone replacement therapy on cognitive function in postmenopausal women: An RCT.**

Moradi F1, Jahanian Sadatmahalleh S1, Ziaei S1.

**Background:** During the reproductive age, the human brain becomes a target for gonadal steroid hormones. Estrogens influence neural function through effects on neurons and affects indirectly the oxidative stress, inflammation, the cerebral vascular and the immune system. Objective: To evaluate the effect of the traditional hormone replacement therapy (HRT) on the cognitive function in postmenopausal women. Materials and Methods: In this randomized clinical trial, 140 postmenopausal women, from November 2014 to February 2015, were included. Women were randomly divided into two groups. Each woman in the case group took traditional HRT (0.625mg conjugated equine estrogens+2.5mg medroxyprogesterone acetate daily) plus one Cal+D tablet (500 mg calcium+200 IU vitamin D) daily for four months. Women in the control group received only one Cal+D tablet (500 mg calcium+200 IU vitamin D) daily for four months period. The Montreal Cognitive Assessment (MoCA) and Green Climacteric Scale (GCS) questionnaires filled out after the intervention and compared between the two groups. Results: The mean points of the MoCA after the intervention indicate that all MoCA domains except for the orientation improved in the case group. There was a significant difference in the memory domain after the treatment between the two groups. MoCA domains and GCS were negatively correlated after the intervention (r=−0.235, p=0.006). Conclusion: The HRT has affected some of the MoCA factors. The effects of HRT on cognitive function should be studied in a large prospective study in a group of women in their early and late menopausal ages with periodic assessment of their cognitive function during these follow-up years.


**Hormonal Replacement Therapy in Menopausal Women with History of Endometriosis: A Review of Literature.**

Zanello M1, Borghese G2, Manzara F1, Degli Esposti E1, Moro E1, Raimondo D1, Abdullahi LO1, Hormonal replacement therapy (HRT) is effective in treating the symptoms of menopause. Endometriosis is defined as the presence of functional endometrial tissue outside the uterine cavity with a tendency towards invasion and infiltration. Being an estrogen-dependent disease, it tends to regress after menopause. Nevertheless, it affects up to 2.2% of postmenopausal women. Conclusive data are not available in the literature on the appropriateness of HRT in women with endometriosis or a past history of the disease. The hypothesis that exogenous estrogen stimulation could reactivate endometriotic foci has been proposed. The aim of this state-of-the-art review was to revise the current literature about endometriosis in perimenopause and menopause and to investigate the possible role of HRT in this setting of patients. An electronic databases search (MEDLINE, Scopus, ClinicalTrials.gov, EMBASE, ScienceDirect, the Cochrane Library at the CENTRAL Register of Controlled Trials, Scielo) was performed, with the date range of
Reduced Bone Loss Is Associated With Reduced Mortality Risk in Subjects Exposed to Nitrogen Bisphosphonates: A Mediation Analysis.

Bliuc D1,2, Tran T1,2, van Geel T3, Adachi JD4, Berger C5, van den Bergh J6,7, Eisman JA1,3,8,9,2, et al.

Bisphosphonates, potent antiresorptive agents, have been found to be associated with mortality reduction. Accelerated bone loss is, in itself, an independent predictor of mortality risk, but the relationship between bisphosphonates, bone loss, and mortality is unknown. This study aimed to determine whether the association between bisphosphonates and mortality is mediated by a reduction in the rate of bone loss. Participants from the population-based Canadian Multicentre Osteoporosis Study were followed prospectively between 1996 and 2011. Comorbidities and lifestyle factors were collected at baseline and bone mineral density (BMD) at baseline and at years 3 (for those aged 40 to 60 years), 5, and 10. Rate of bone loss was calculated using linear regression. Information on medication use was obtained yearly. Bisphosphonate users grouped into nitrogen bisphosphonates (nBP; alendronate or risedronate) and etidronate and non-users (NoRx) were matched by propensity score, including all baseline factors as well as time of treatment. Cox's proportional hazards models, unadjusted and adjusted for annual rate of bone loss, were used to determine the association between nBP and etidronate versus NoRx. For the treatment groups with significant mortality risk reduction, the percent of mortality reduction mediated by a reduction in the rate of bone loss was estimated using a causal mediation analysis. There were 271 pairs of nBP and matched NoRx and 327 pairs of etidronate and matched NoRx. nBP but not etidronate use was associated with significant mortality risk reduction (hazard ratios [HR] = 0.61 [95% confidence interval 0.39-0.96] and 1.35 [95% CI 0.86-2.11] for nBP and etidronate, respectively). Rapid bone loss was associated with more than 2-fold increased mortality risk compared with no loss. Mediation analysis indicated...
that 39% (95% CI 7%-84%) of the nBP association with mortality was related to a reduction in the rate of bone loss. This finding provides an insight into the mechanism of the relationship between nBP and survival benefit in osteoporotic patients.