

Menopause Health Matters

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Menopause Matters

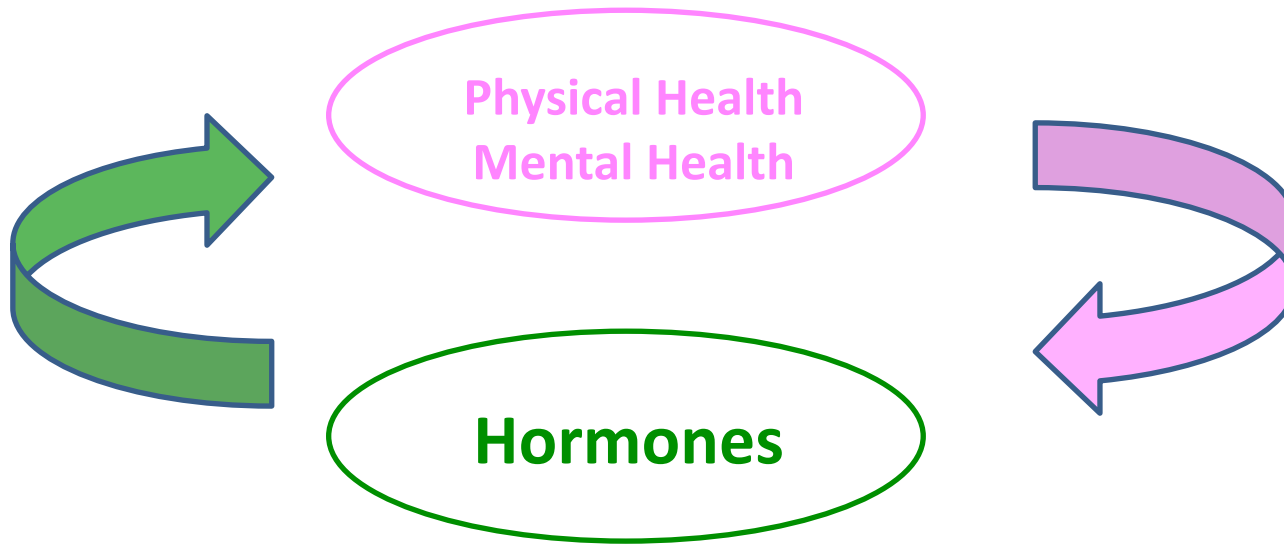
Menopause Health considerations, including musculoskeletal matters

- Hormone
- Female hormone odyssey
- All change for hormones
- Menopause or REDs?
- Strategies to navigate menopause and beyond

Hormone

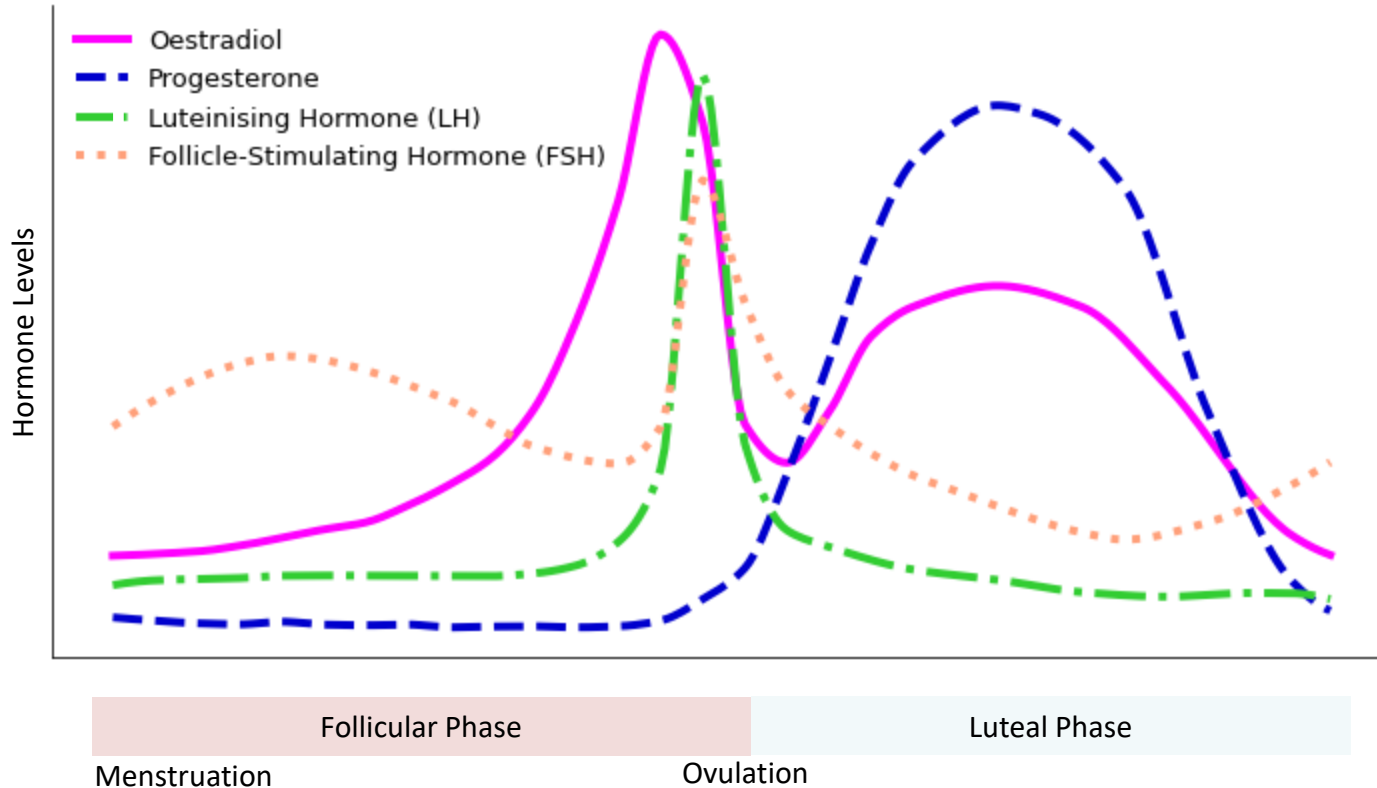
ὁρμῶν (hormon)

“Setting in motion”



Ἄρμη (Horme)

Goddess of effort, energy, and action

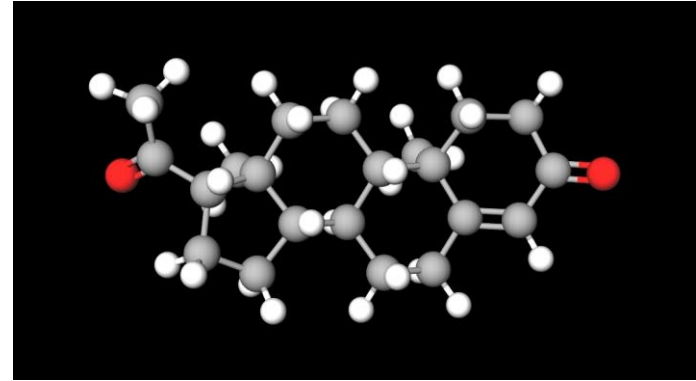
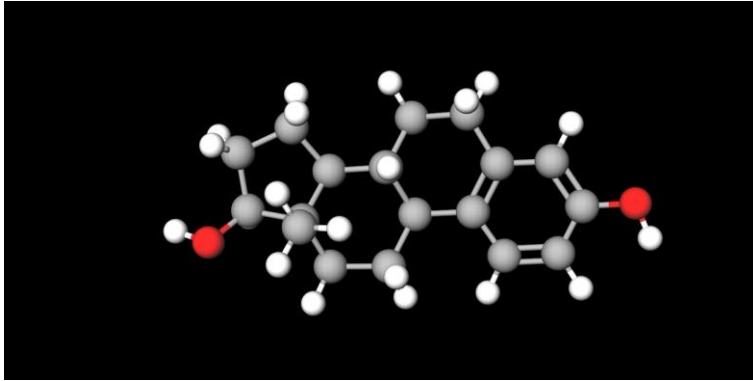


Every woman is different

Hormones, Health and Human Potential. Keay 2022

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What's so good about female hormones?



Oestrogen and progesterone female sex steroids important for:

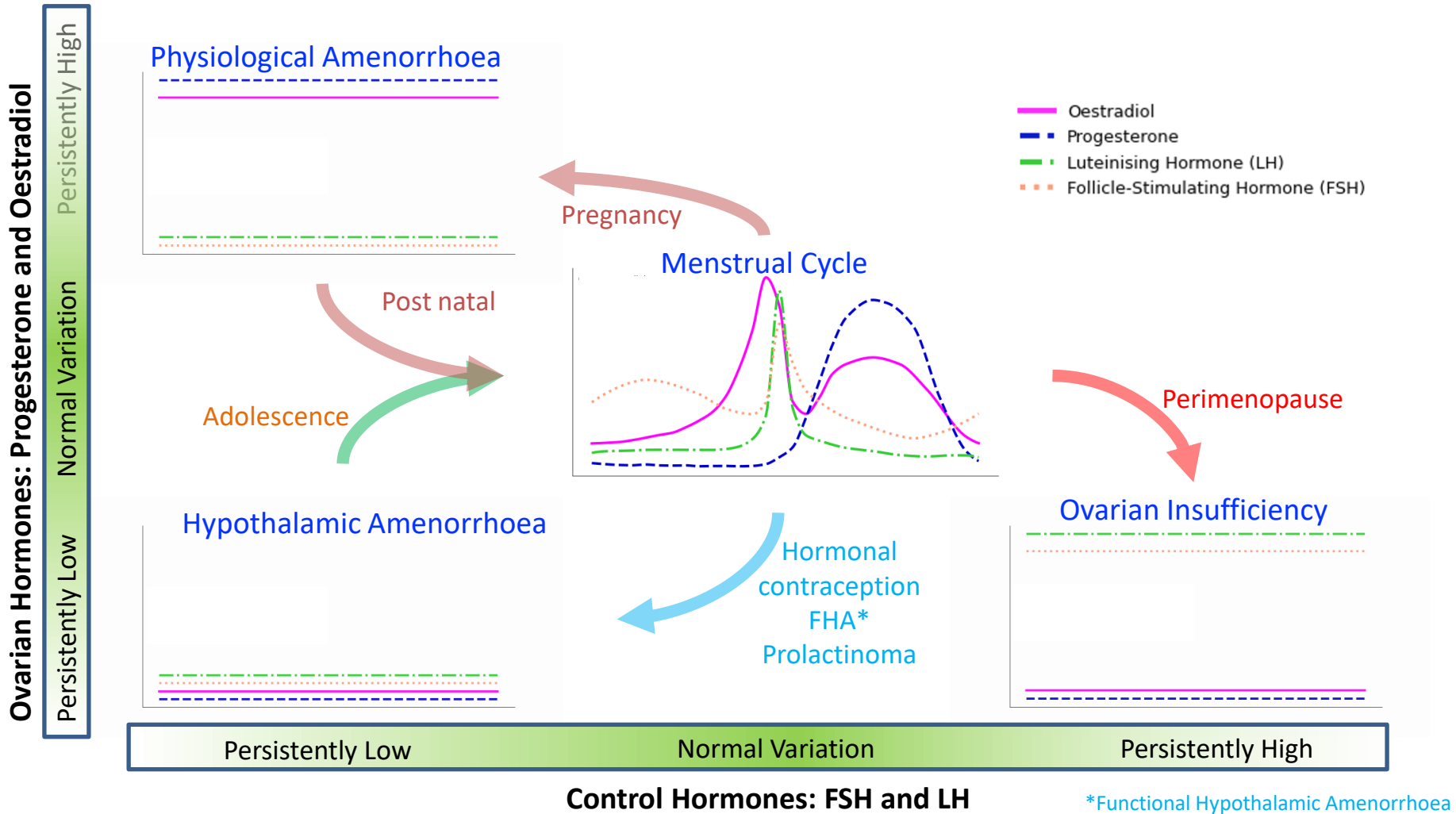
- Bone and soft tissue health: increased bone AND soft tissue injury risk (*Med & Sc in Sports & Exercise 2017*)
- Cardiovascular health: adverse lipid profile, endothelial dysfunction, autonomic dysfunction blood pressure and heart rate (*J Cl Invest 2014*)
- Neurological function: neurotransmitters and neuromuscular control and cognitive function (*Melin et al, Med Sc Spots & Exercise 2017*)
- Response to exercise: cardiovascular and musculoskeletal (*Proc Nutr Soc*)

Menopause Matters

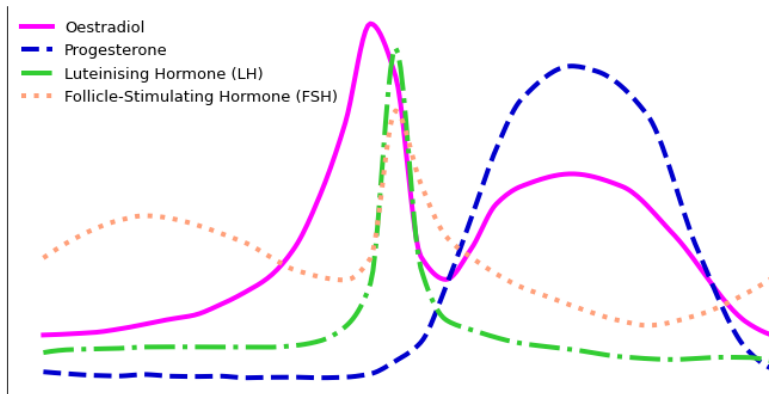
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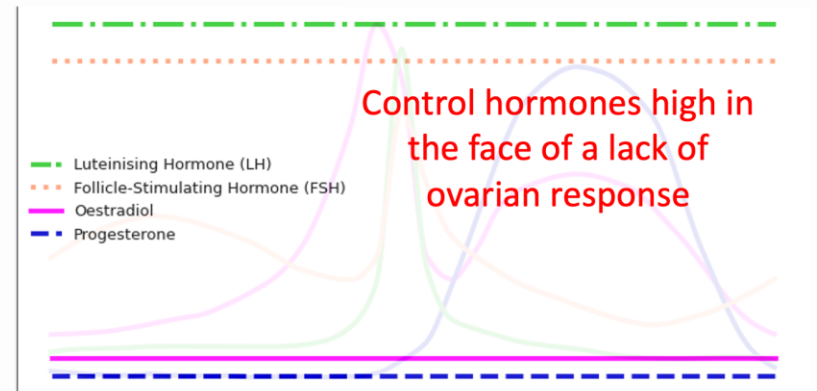
Female Hormone Odyssey



Changes in Female Hormones



Reproductive years



Menopause

Ovarian Responsiveness

- **Peri menopause** from age around 40 years ovaries become less responsive
 - Produce less female hormones in a more erratic manner
 - Anovulatory cycles
- **Menopause** when ovaries do not respond.
 - Lack of any menstrual periods 12 months
 - Retrospective diagnosis
 - Average age 51 years (range 45-55 years)
 - Consequences: quality of life and health



Why is this an important population to consider?

- All women will experience menopause
- Increased life expectancy: up to third life in menopausal status
- Reduced ovarian hormones
 - Reduced quality of life
 - Increased risk cardiometabolic disease
 - Increased risk of osteoporosis
- Significant for individual and society and economy as a whole
- Increasing numbers of master athletes
- Lifestyle and medical approaches can help



Hamoda H, Moger S. Looking at HRT in perspective *BMJ Editorial* 2022

What are the challenges?

Consequences of declining ovarian hormone levels

- **Typical symptoms** (Menopause Practice Standards by the British Menopause Society July 2022)
 - Irregular cycles (shortened) and nature of menstruation
 - Labile mood
 - Hot flushes
 - “Brain fog” cognitive impairment
 - New onset headaches
 - Joint/muscle aches (not injury)
 - Urinary issues
 - Sexual dysfunction



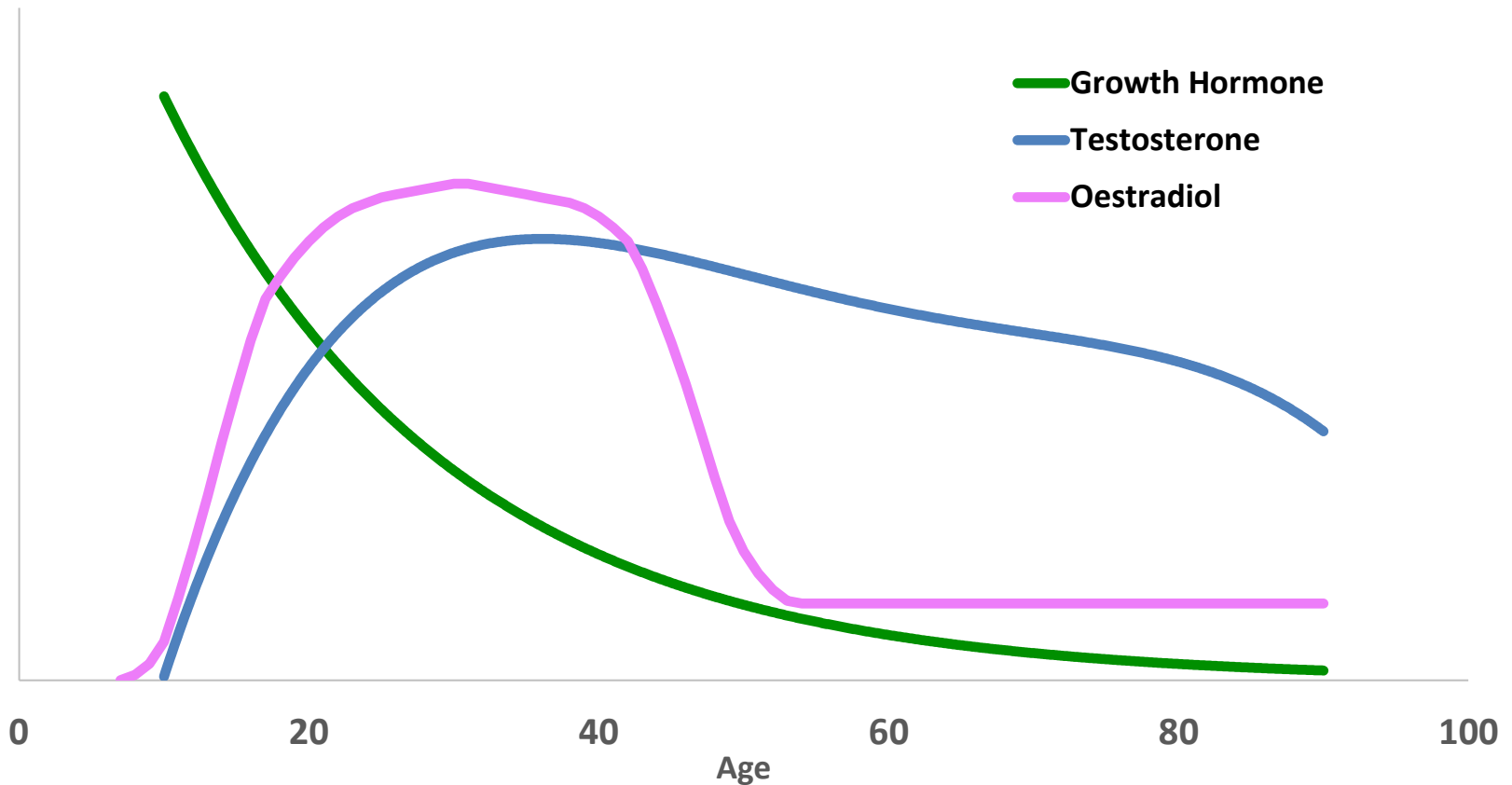
What are the challenges?

Consequences of declining ovarian hormone levels

- **Potential health consequences** ([Management of the Menopause, sixth edition, British Menopause Society](#))
 - Cardiovascular health
 - Cholesterol profile
 - Reactivity endothelial lining of arteries
 - Autonomic control
 - Metabolic health
 - Decreasing insulin sensitivity
 - Decreasing leptin sensitivity
 - Body composition
 - Decline in muscle mass: risk sarcopenia
 - Increase in visceral fat deposition
 - Bone health
 - Decreasing bone mineral density
 - Risk osteoporosis



Decline of Hormones with Age



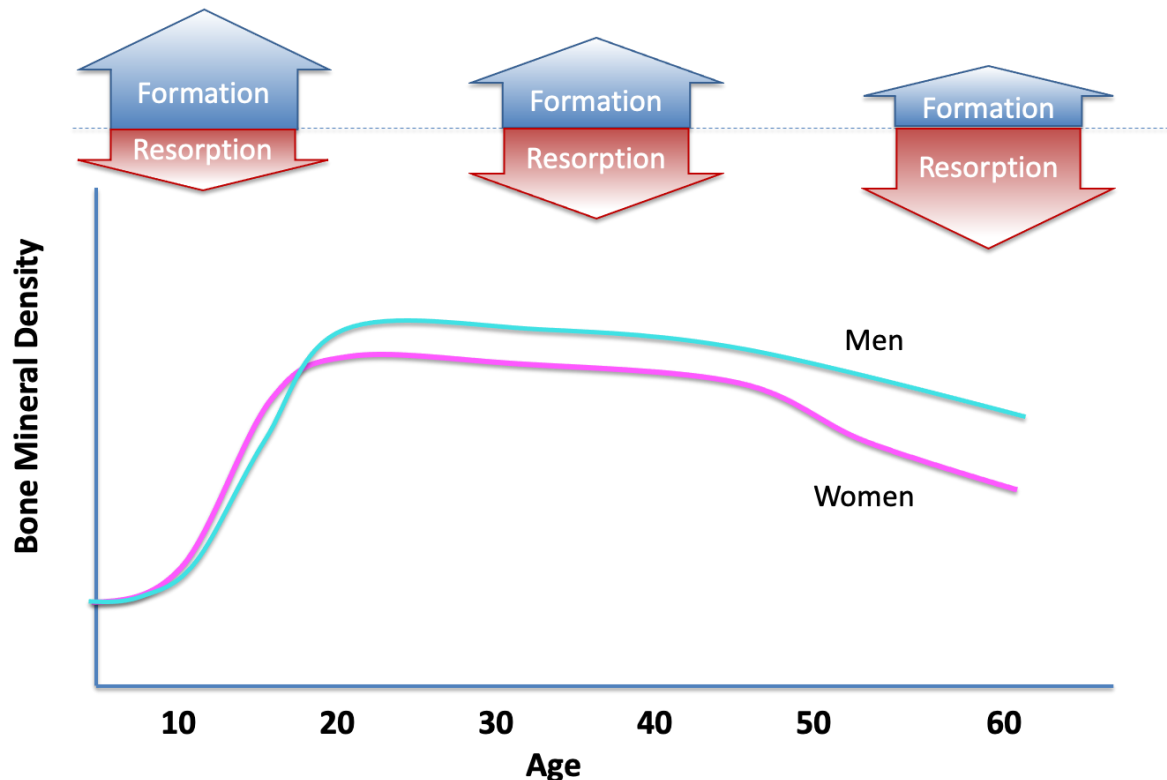
Consequences of declining hormone levels on MSK system 1

- **Muscle**
 - Reduced levels anabolic hormones
 - Loss muscle mass and function: sarcopenia
 - Muscle protein breakdown > muscle protein synthesis = sarcopenia
- **Quality of collagen**
 - Reduced oestradiol levels
 - Tendons and ligaments

Increased injury risk and slow recovery

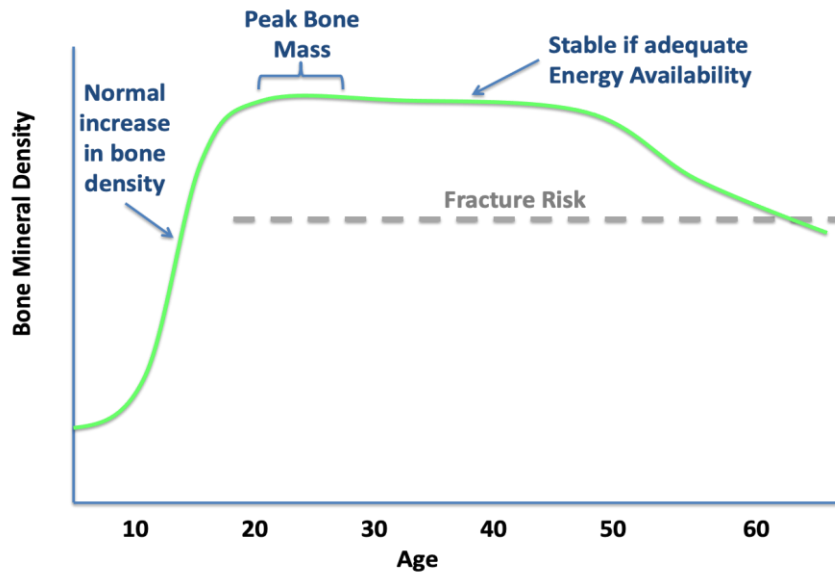
Consequences of declining hormone levels on MSK system 2

- **Bone health**
 - Resorption > formation
 - Osteoporosis the “silent killer”

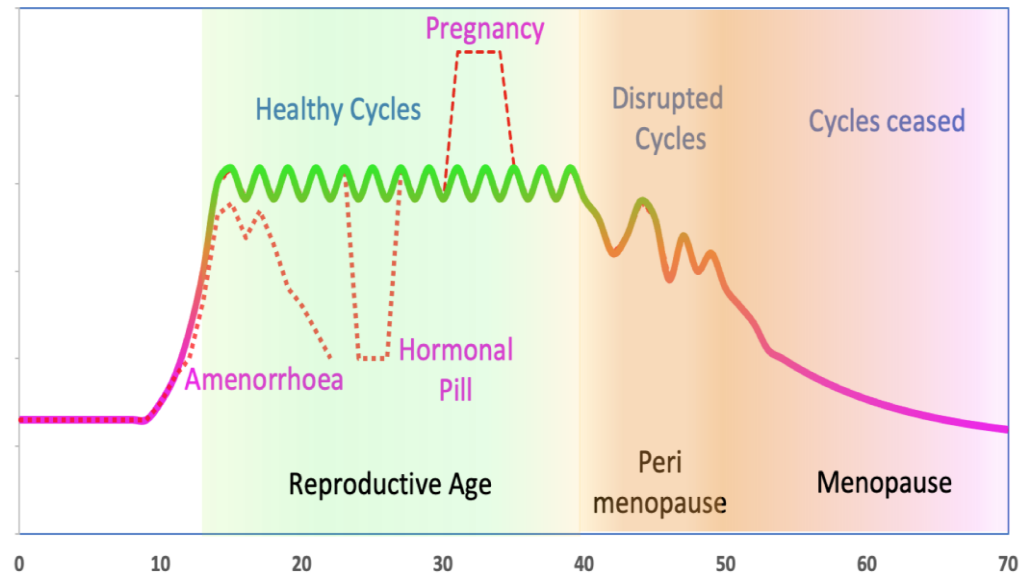


Bone and oestradiol

Bone Mineral Density over Lifespan

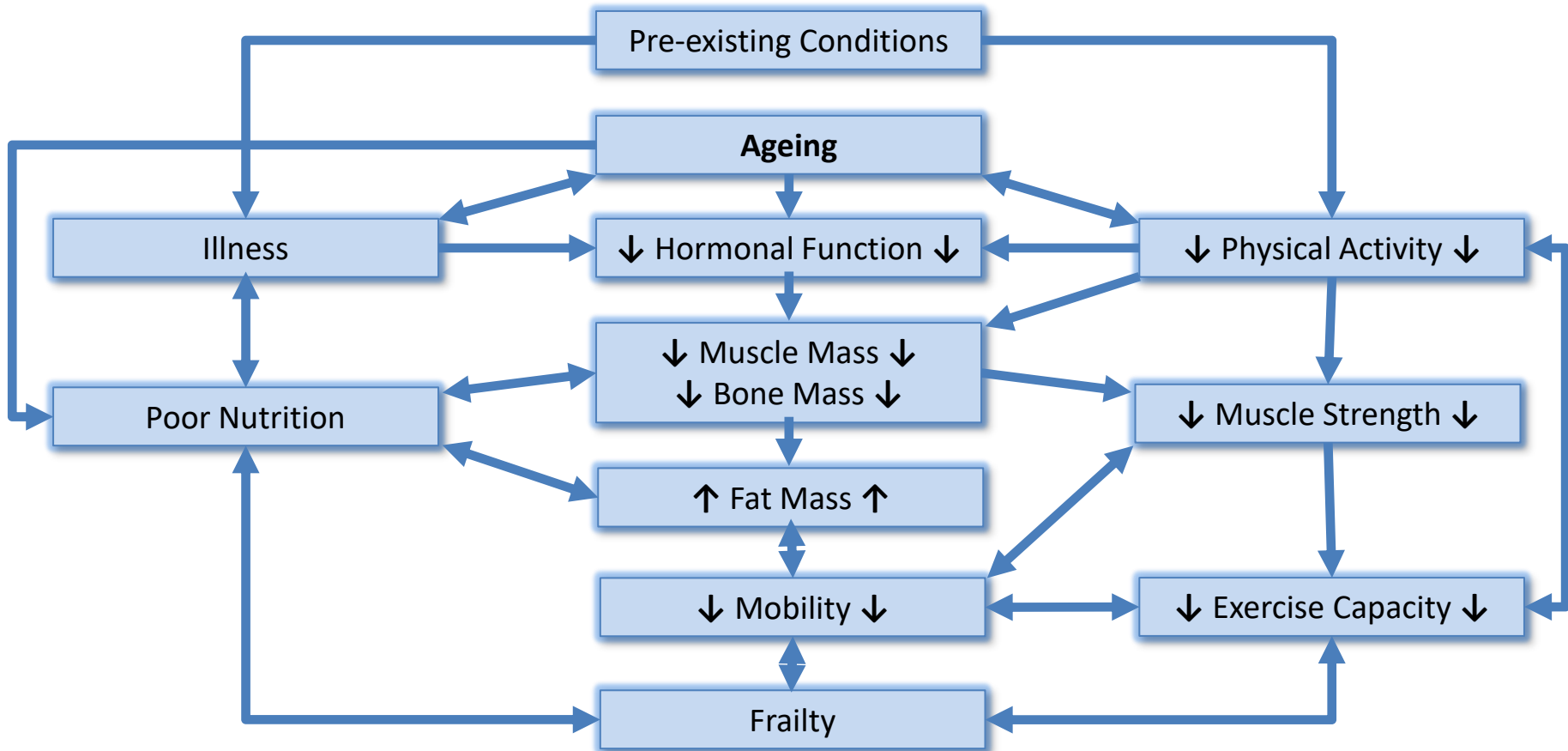


Variation of Oestradiol over Lifespan



Hormones, Health and Human Potential. Keay 2022

Model of Ageing, Hormones and Physical Function



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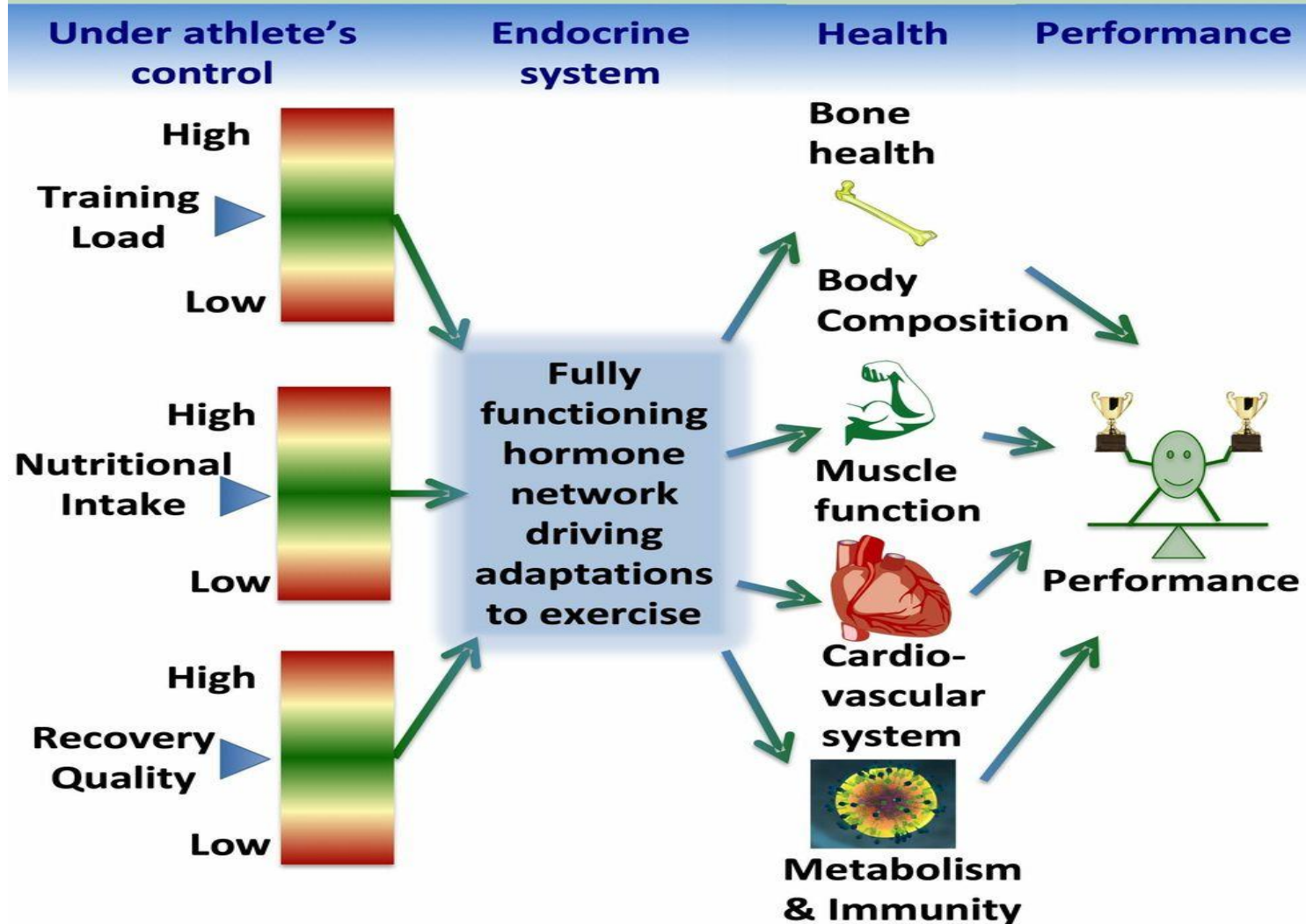
Perimenopause/menopause v low energy availability

Masters athletes/exercisers

Similar presentation/symptoms

- Change menstrual cycle, including amenorrhoea
- Poor sleep and recovery
- Reduced training response
- Low mood
- Increased risk soft tissue and bone injury

Energy Availability Consequences Health and Performance



Adequate Energy Availability maintains a fully functional hormone network to drive positive adaptations to training, leading to positive health and performance outcomes

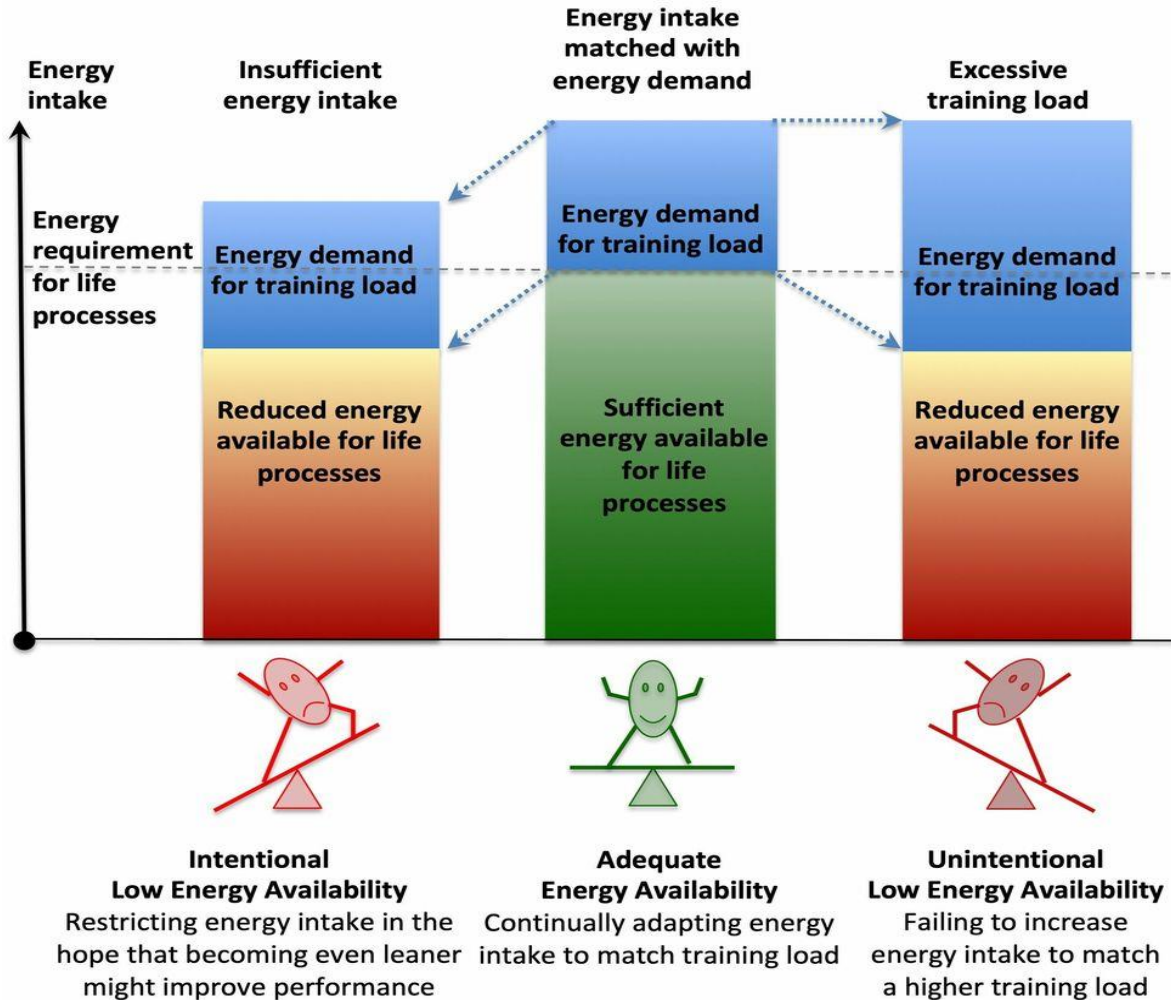
Dr Nicky Keay: nickykeayfitness.com

Nicola Keay, and Gavin Francis Br J Sports Med doi:10.1136/bjsports-2019-100611

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Energy Availability Concept

Matching Energy Intake with Energy Demand



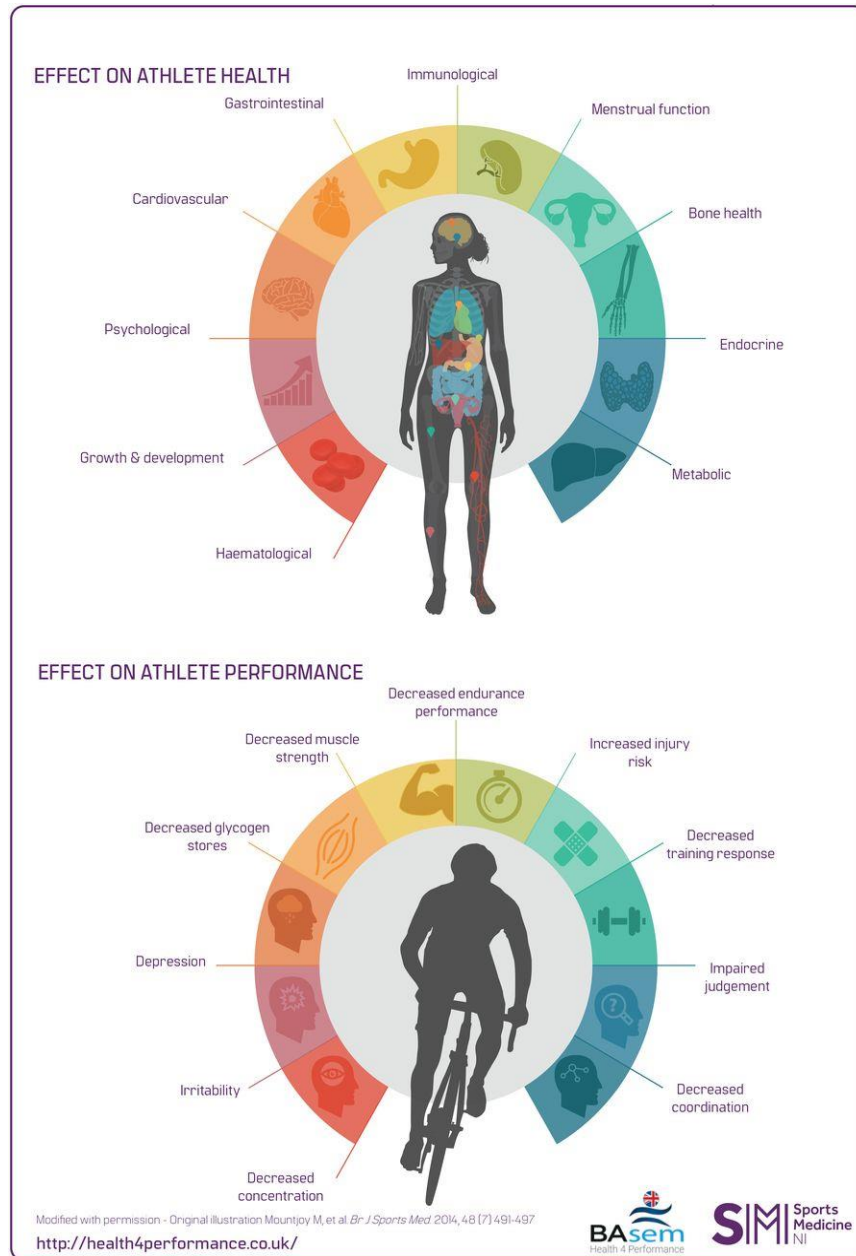
Low Energy Availability forces the body to trigger hormonal responses that adversely affect normal life processes, leading to negative health and performance consequences

Dr Nicky Keay: nickykeayfitness.com

Nicola Keay, and Gavin Francis Br J Sports Med doi:10.1136/bjsports-2019-100611

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Significance of relative energy deficiency in sport (REDs)



Bare Bones

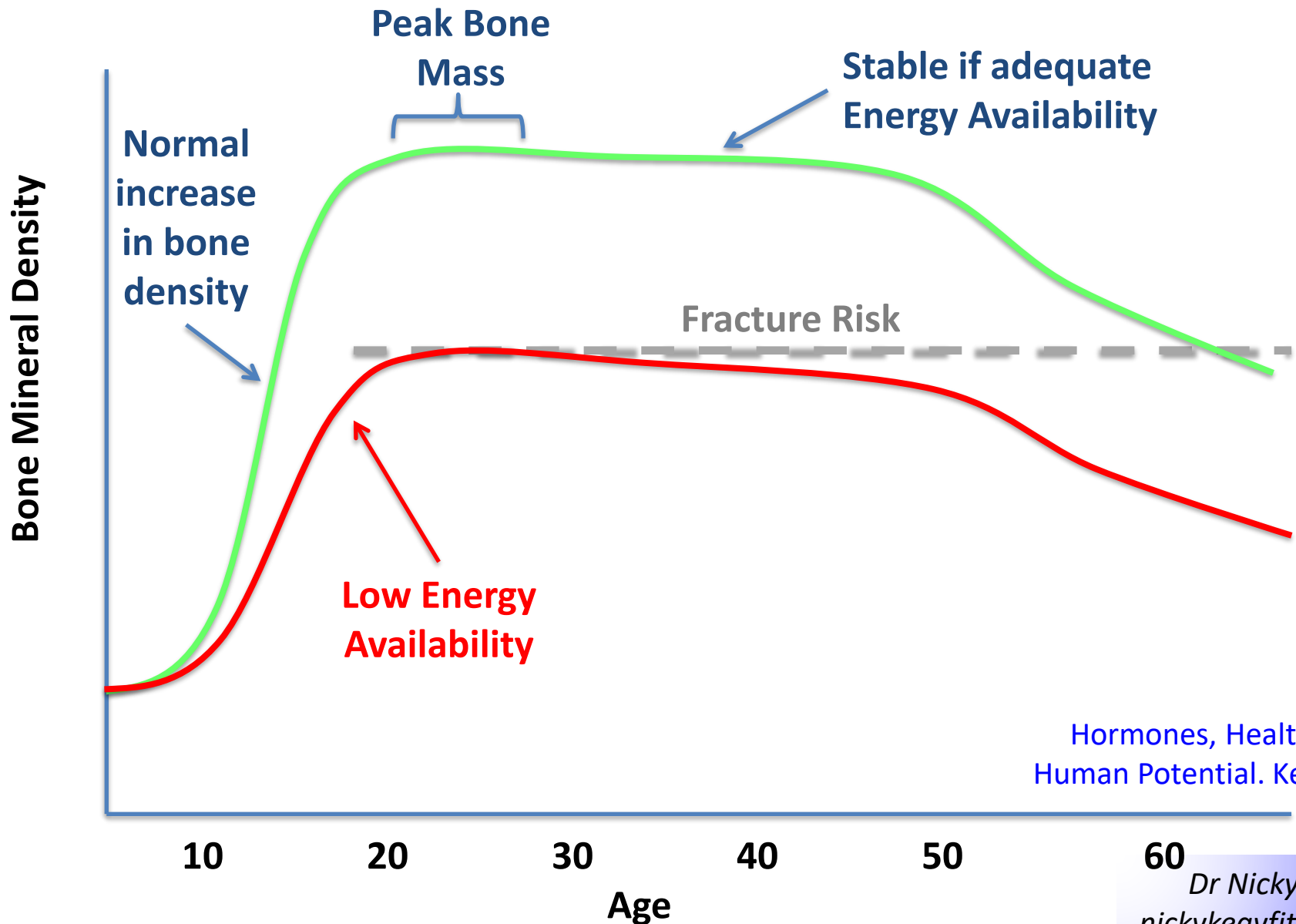
Paradoxical effect of exercise on bone health

- Positive, osteogenic effect of exercise
- Bone turnover first system impacted by LEA (Loucks, JBMR)



Make no bones about it (Keay, BJSM 2018)

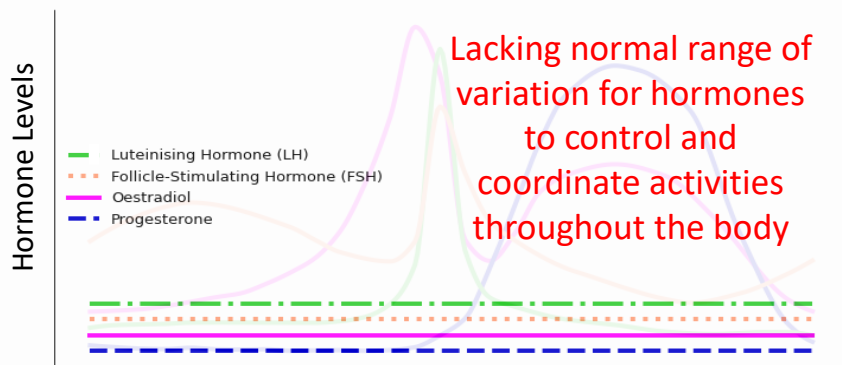
Importance of Oestradiol for Bone Health



Hormones, Health and Human Potential. Keay 2022

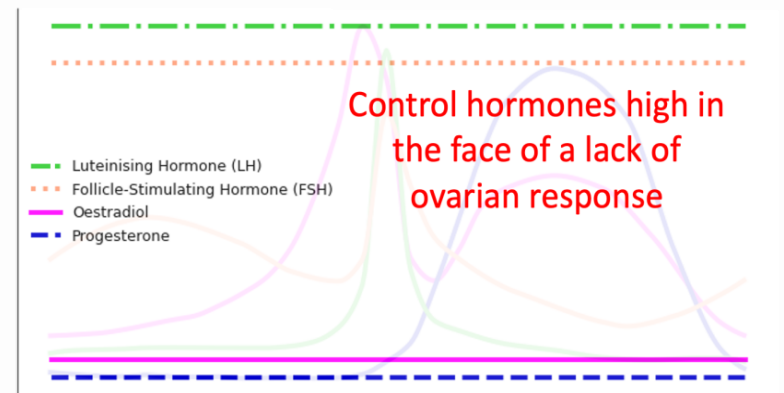
Causes of low levels of ovarian hormones

Lack of hypothalamic control



*Functional hypothalamic amenorrhoea (FHA)
or suppression with hormonal contraception*

Lack of ovarian response



Menopause

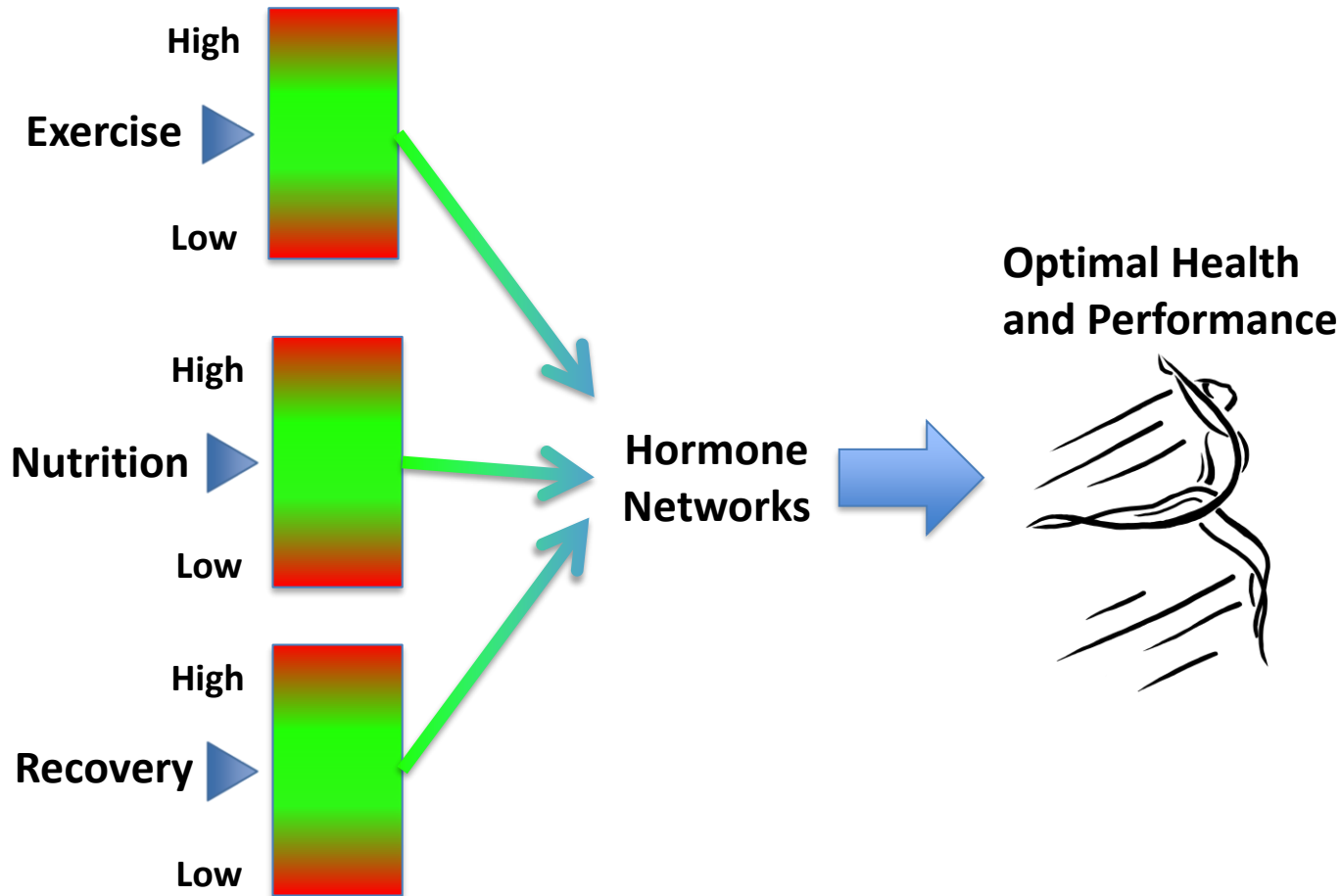
“Hormones, Health and Human Potential” Keay 2022

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Balancing behaviours for hormone health to optimise health and performance



Benefits of lifestyle in face of declining hormones with age

Exercise

- **Symptoms:** temperature regulation “hot flushes” (Bailey et al Exercise training reduces the acute physiological severity of post-menopausal hot flushes. J Physiol 2016)
- **Metabolic health** (Bermingham K et al. Menopause is associated with postprandial metabolism, metabolic health and lifestyle: the ZOE PREDICT study. Preprint Lancet 2022)
- **Body composition** (Mandrup et al Effects of high-intensity exercise training on adipose tissue mass, glucose uptake and protein content in pre- and post-menopausal women. Frontiers in Sports and Active Living 2020)
- **Bone health**
 - **Strength work** (Watson S et al High-intensity resistance and impact training improves bone mineral density and physical function in postmenopausal women with osteopenia and osteoporosis: the LIFTMOR randomized controlled trial JBMR. 2018)
 - **“Strong, Straight, Steady”** Royal Osteoporosis Society
 - Posture
 - Proprioceptive work

Exercise

How much exercise? *(Bull F, Al-Ansari S, Biddle S, et al World Health Organization 2020 guidelines on physical activity and sedentary behaviour British Journal of Sports Medicine)*

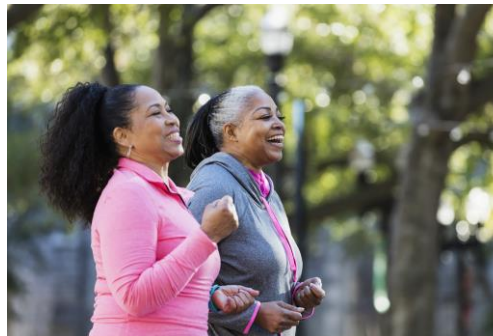
– **CV exercise**

- Moderate exercise 2 and half hours (150-300 mins) per week or
- Intense exercise 75-150 minutes per week

– **Plus strength exercise**

– **Plus reduction sedentary time** 4 hours v 11 hours sitting decreases all-cause mortality *(van der Ploeg H, Chey T, Korda R et al. Sitting Time and All-Cause Mortality Risk in 222 497 Australian Adults. Arch Intern Med. 2012)*

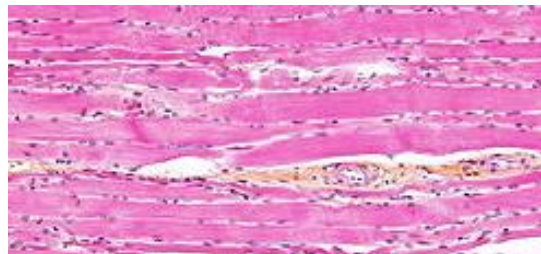
Preventive medicine to reduce risk cardiometabolic disease, cancer and support weight control *(Garcia L et al Non-occupational physical activity and risk of cardiovascular disease, cancer and mortality outcomes: a dose–response meta-analysis of large prospective studies British Journal of Sports Medicine 2023)*



Benefits of lifestyle in face of declining hormones with age

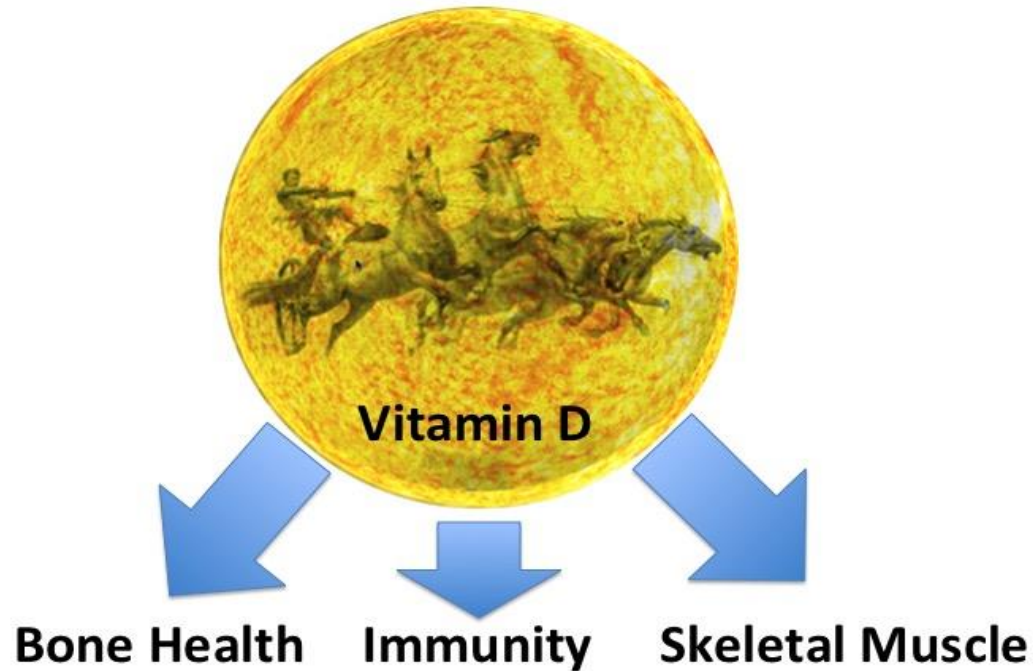
Nutrition

- **Protein intake** prevention sarcopenia ([Traylor A et al. Perspective: Protein Requirements and Optimal Intakes in Aging: Are We Ready to Recommend More Than the Recommended Daily Allowance? Advances in Nutrition, 2018](#))
 - **Timing of protein intake** ([Trommelen J et al Pre-sleep protein ingestion to improve the skeletal muscle adaptive response to exercise training Nutrients 2016](#))
 - Post anabolic stimulus
 - Pre bedtime: casein protein for muscle repair & pre cursor tryptophan for synthesis sleep hormone melatonin



Vitamin D

Steroid Hormone



Benefits of lifestyle in face of declining hormones with age

Sleep

“Chief nourisher in life’s great feast”



- **Hormone:** circadian alignment. Metabolic syndrome alert!
- **Metabolic:** increase insulin and leptin sensitivity (*British Menopause Society*)
- **MSK health** (*Lucassen EA et al Poor sleep quality and later sleep timing are risk factors for osteopenia and sarcopenia in middle-aged men and women: The NEO study PLOS one 2017*)
- **Practicalities:** sleep hygiene and sleep scheduling.
Micronised progesterone (*Prior J et al. Oral micronized progesterone for perimenopausal night sweats and hot flushes a Phase III Canada-wide randomized placebo-controlled 4-month trial. Sci Rep 2023*)

Indications for Hormone Replacement Therapy (HRT)

- **Quality of life**
 - Symptoms

- **Long term Health**

- Primary management of bone health
- Potential beneficial effects on
 - Cardiometabolic health
 - Mental health/cognitive function



Hormone Replacement Therapy (HRT)

“Treat women as individuals, not statistics.”

Professor Janice Rymer, Vice President of the Royal College of Obstetrics and Gynaecology

Priority: quality of life

For those in whom not contra indicated. Risk: benefit ratio

- Decrease overall mortality
- Extra 4 cases breast cancer per 1,000 women 50-59 years with HRT. Same as taking COCP or drinking >2 units per day
- 24 extra cases breast cancer if adverse lifestyle factors
- 7 fewer cases if taking 2+ hours moderately intense exercise per week
- Most effective start HRT asap menopause
- Transdermal oestradiol best metabolic health and micronised progesterone lowest risk breast cancer
- Note testosterone not permissible under WADA regulations

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Hormones Health and Human Potential

A guide to understanding your hormones
to optimise your health and performance



Dr Nicky Keay

Watch this space!

National Menopause education and support network programme UCL

Backed by

British Menopause Society

Royal College Obstetrics and Gynaecology

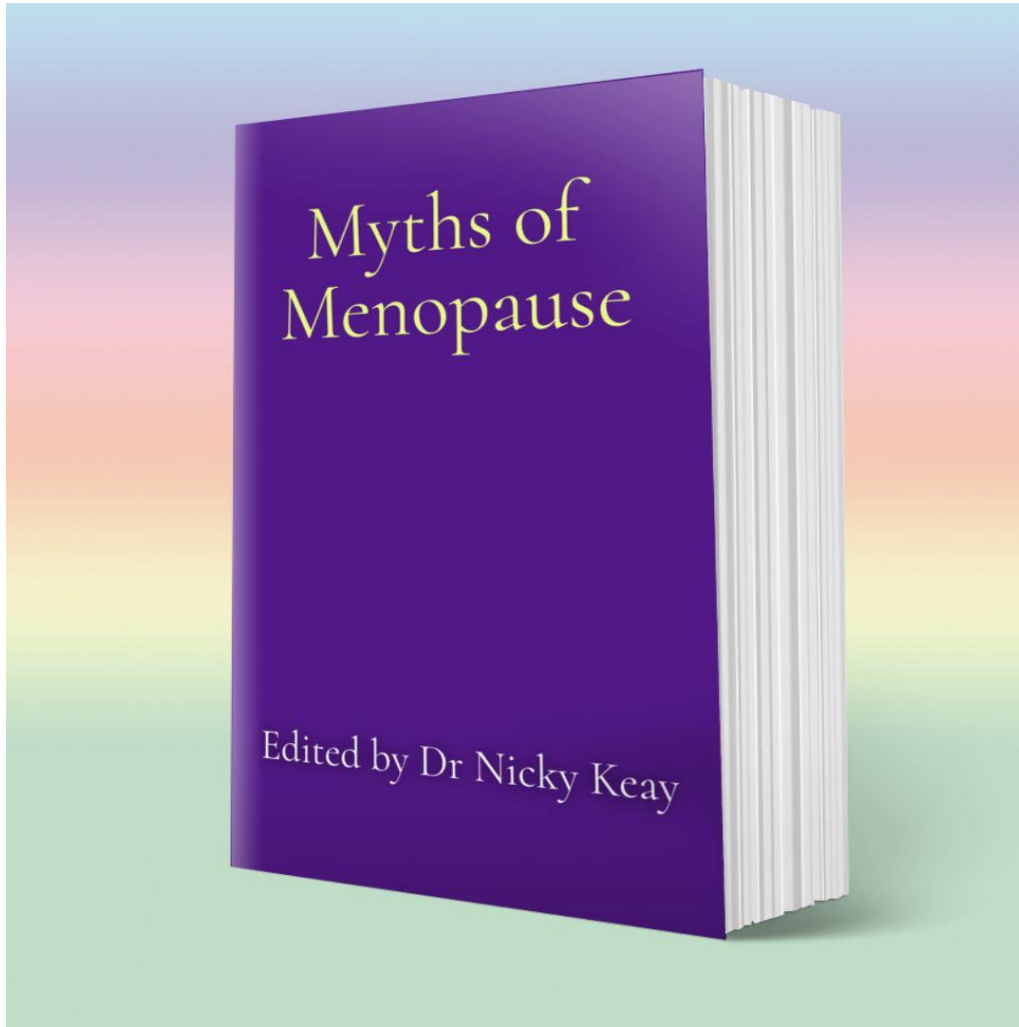
Plans for UK's first menopause education programme
UCL academics

21 August 2023

Experts at UCL have teamed up with leading women's health charities to design a new education and support programme for women across the country experiencing menopause.



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Arriving 2024

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