

Sharon Madigan

Nutrition, Menstrual Cycle & the Female Athlete



Please use mentimeter to ask a question

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Women in Sport Coaching Conference

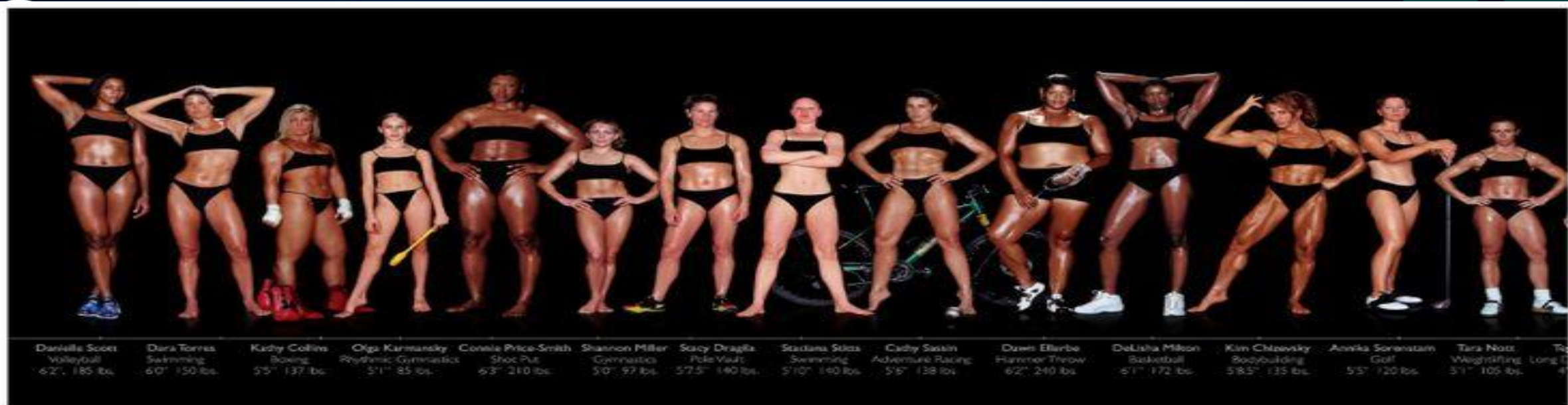
Sharon Madigan RD, PhD, SENr
Head of Performance Nutrition SII
Lead Scientist Team Ireland 2024

#WomenInSportIRE



Nutrition Issues for female athletes

- Fuelling performance
 - Under-fuelling, low CHO, inadequate protein
 - Over emphasis on some nutrients v others
- Micronutrient intakes
 - Iron, calcium, vitamin D
- Specific clinical conditions that may affect performance
 - IBS, PMS (issues with MC)
 - Bone Health
 - Lack of menstrual cycle



Mary 23 years

September

- Boxes 6 times a week
- Restricts carbohydrates (making weight) at times and then binges
- Increases training load as she is now part of HP team

November

- Training increases to 20 hours / a week

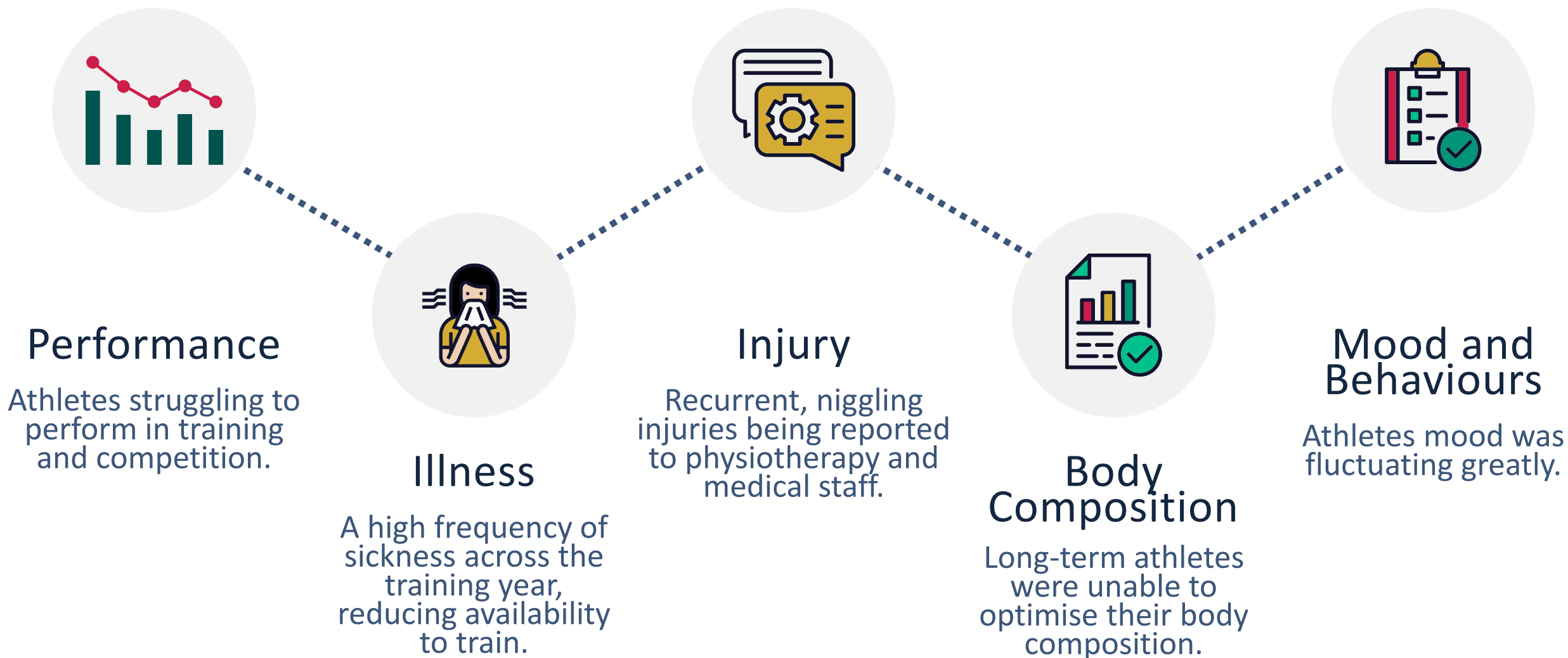
December

- Frequent stomach pains and cramps
- Feels tired, lack of energy in training, especially mid to late week

March

- No progress in gym
- Period disappears
- Getting more and more tired and getting sick more frequently

REDS: Practitioner Observations



Subjects=900

**SCORE OF
≥8 = AT
RISK**

LEAF-Q

Menstrual function

Contraceptive use

Injuries

GI function

Q. Does your menstruation change when exercise intensity increases?

Q. How many days were you absent from training/competition due to injuries?

**Sensitivity
(78%) &
Specificity
(90%)**

Melin A, Tornberg A, Skouby S et al. (2014) *Br J Sports Med.* 7, 540-5.

Results:



International
162



Provincial/county
155



Competitive in Sport
at club level
281



Recreational
235



SPORT
IRELAND
COACHING

Women in Sport Coaching Conference Underfuelling

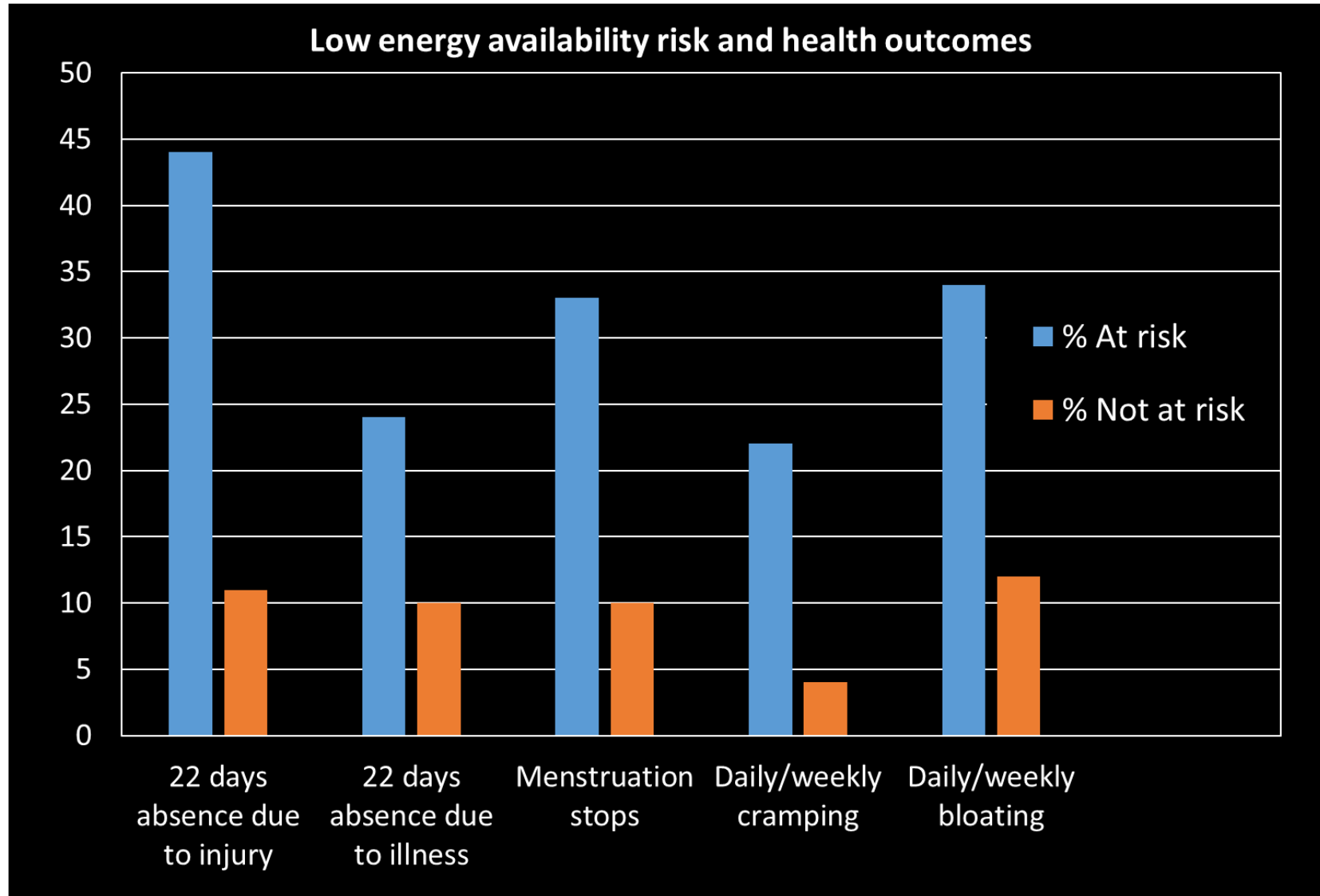


Highlights

- 40% at risk of LEA
- Those at risk more than 3x likely to miss 22 days of training due to illness
- The higher the level the more likely you are to have an injury (almost 2x).

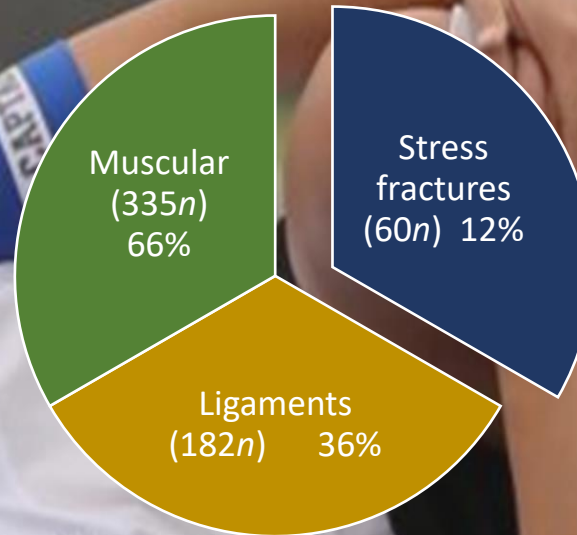
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Health Risks which are impacting training

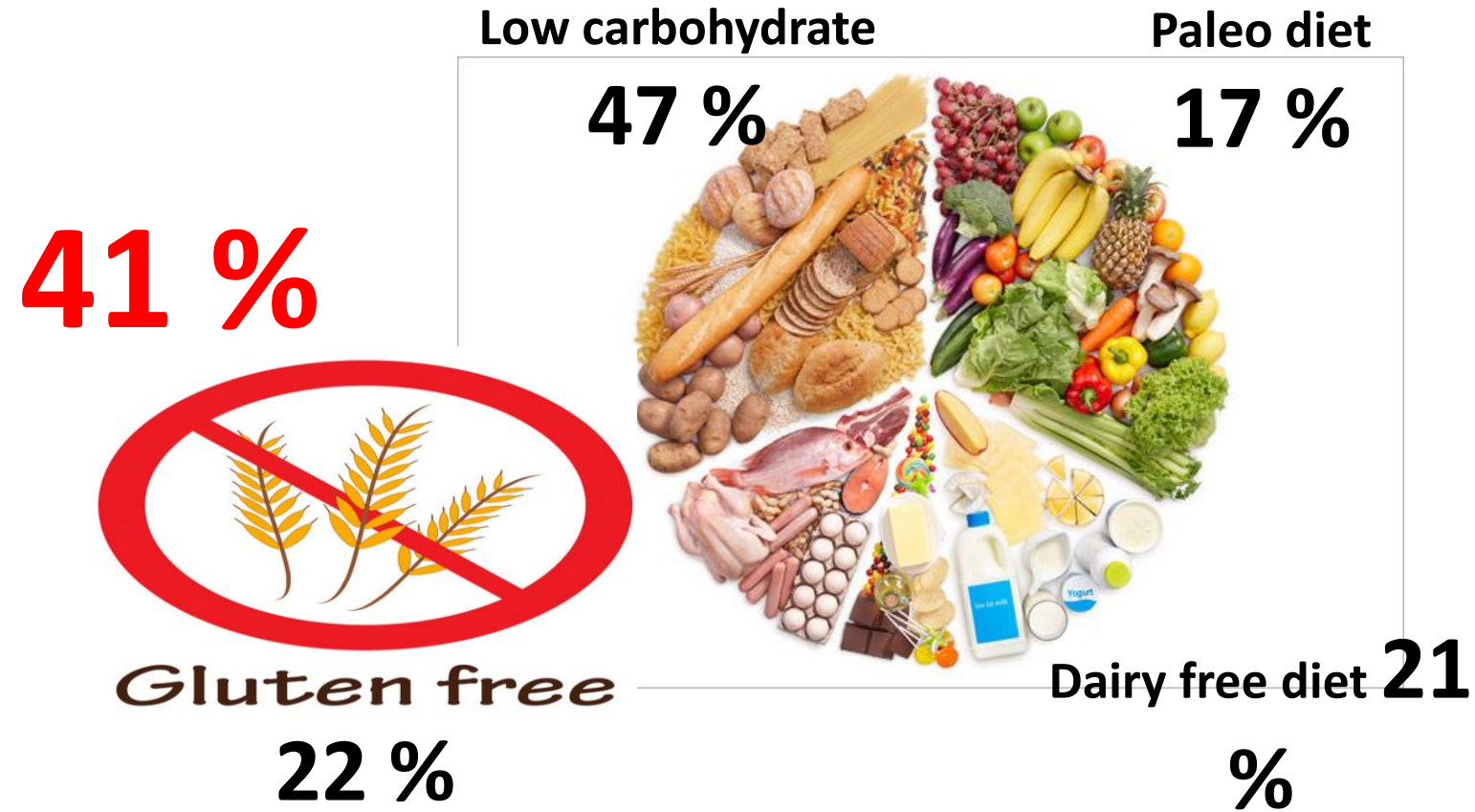


Types of Injuries reported:

LEA risk (46*n*) vs not at risk (14*n*)



Dietary patterns of participants




The Athlete-Coach Research



Article

Athletes' and Coaches' Perceptions of Nutritional Advice: Eating More Food for Health and Performance

Danielle M. Logue 1,* , Laura Mahony 1, Clare A. Corish 2 Grainne , David Tobin 1, Ronan Doherty 1, O'Higgins 1 and Sharon M. Madigan 1

- ¹ Sport Ireland Institute, Sports Campus Ireland, Abbotstown, D15 PN0N Dublin, Ireland; lmahony@instituteofsport.ie (L.M.); dtobin@instituteofsport.ie (D.T.); ronan.doherty@lyit.ie (R.D.); gohiggins@instituteofsport.ie (G.O.); smadigan@instituteofsport.ie (S.M.M.)
 - ² Physiotherapy and Sports Science, School of Public Health, University College Dublin, D04 V1W8 Dublin, Ireland; clare.corish@ucd.ie
 - ³ Sports Lab North West, Letterkenny Institute of Technology, F92 FC93 Letterkenny, Ireland
- * Correspondence: danielle.logue@ucdconnect.ie; Tel.: +353-86-730-6607

Having athletes who are healthy to train everyday consistently, is for me, the biggest beneficial part of this (Coach)

There is a lot more quality coming from each session. I wasn't going through the motions as much. It was more quality and focused, I guess. You just have the energy available (Athlete)

Worry about weight gain I think I was a bit scared because I didn't think I needed to eat more. I thought that I was eating a lot and was worried that I'd put on weight (P10 – Athlete)

Qualitative piece of work on athletes and coaches perceptions to 'eating more'.

Involved full Performance Nutrition Team.

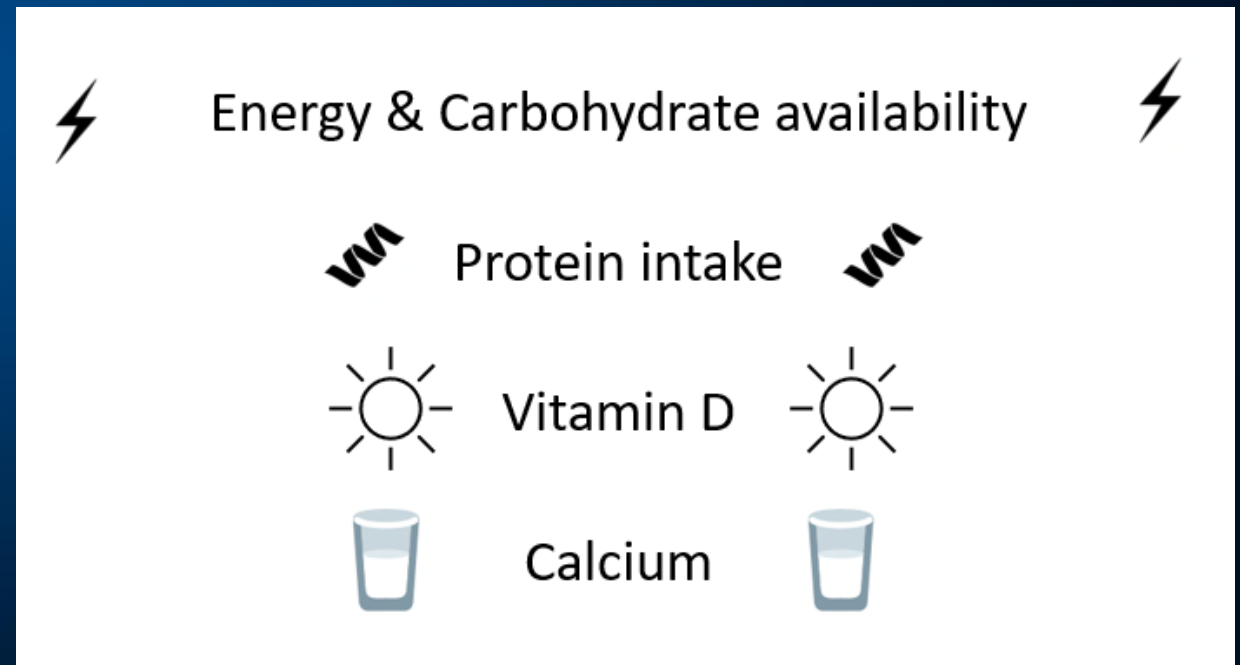
Published in 2021.

Outcomes used in coach education from January.

Supports the focus of catering provision in SII Kitchen.

Bone Health

- Bone is a nutritionally modulated tissue – key considerations for athletes (Sale and Elliott-Sale 2019)





Elon Musk 

@elonmusk

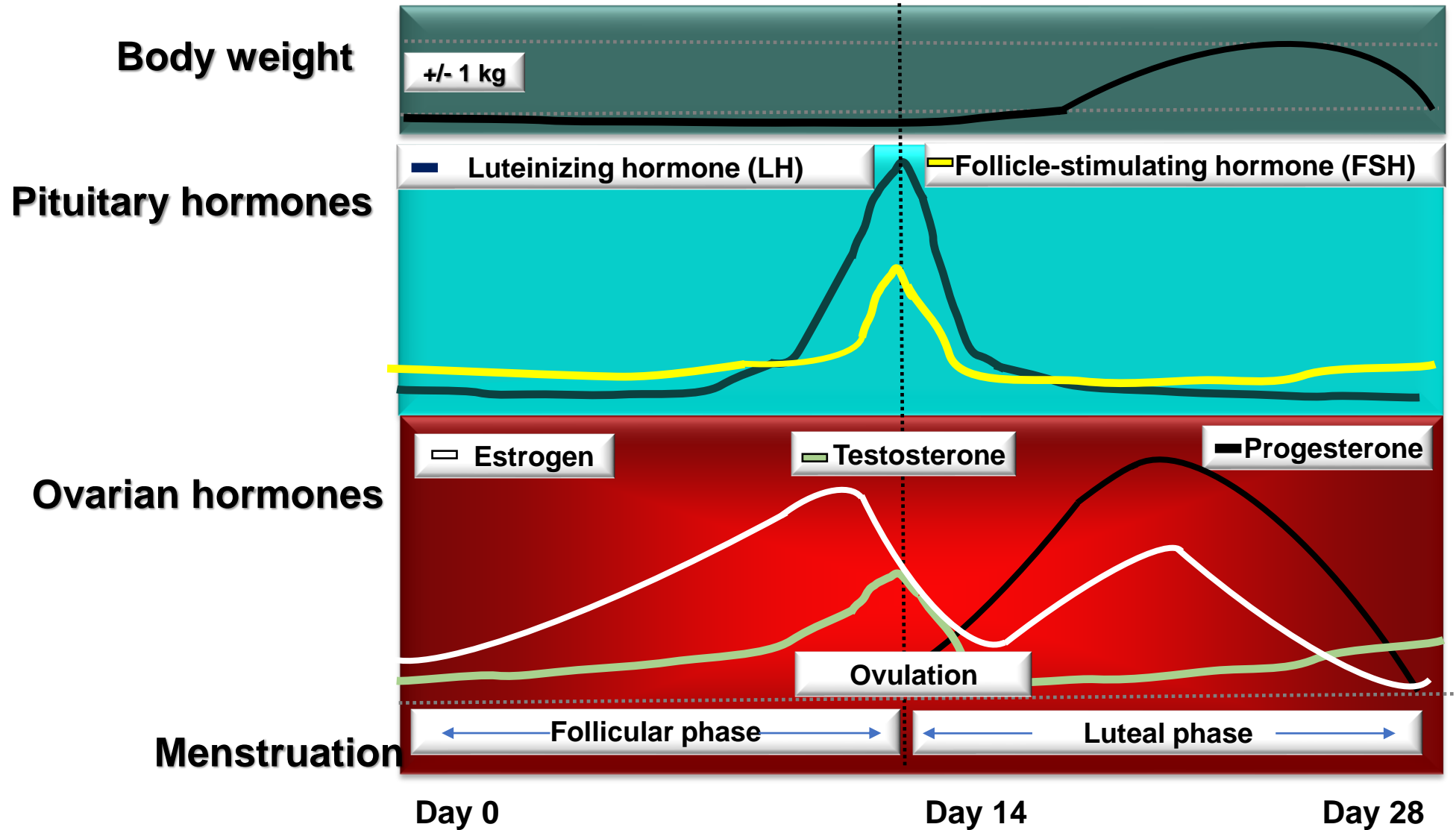


Finally, the truth that carbs are amazing can be said on this platform!

#FreeSpeech

6:35 PM · Oct 29, 2022 · Twitter for iPhone

The menstrual cycle



- The phases of the menstrual cycle
- Sex hormones and physiological function
- Menstrual disorders
- The menstrual cycle phases and performance
- Oral contraceptives and performance



Sex hormones and physiological function?

Aerobic capacity

Anaerobic capacity

Strength and power generation

Psycho motor-skills
Eye-hand-coordination

Sensory motor-skills
Reaction time

Sensory perception
Pain threshold

Brain function

Mood
Alertness
Cognitive ability



• **Performance**

Muscular function

Injury frequency
Ligament elasticity
Lumbar spine pain

Metabolism

Body temperature
Thermogenesis
Resting-O₂ expenditure
Substrate metabolism
Acid-base balance

Cardiovascular

Heart frequency and rhythm
Stroke volume
Blood pressure
Blood volume
Vascular function
Sympatico activity

Respiration

Ventilation

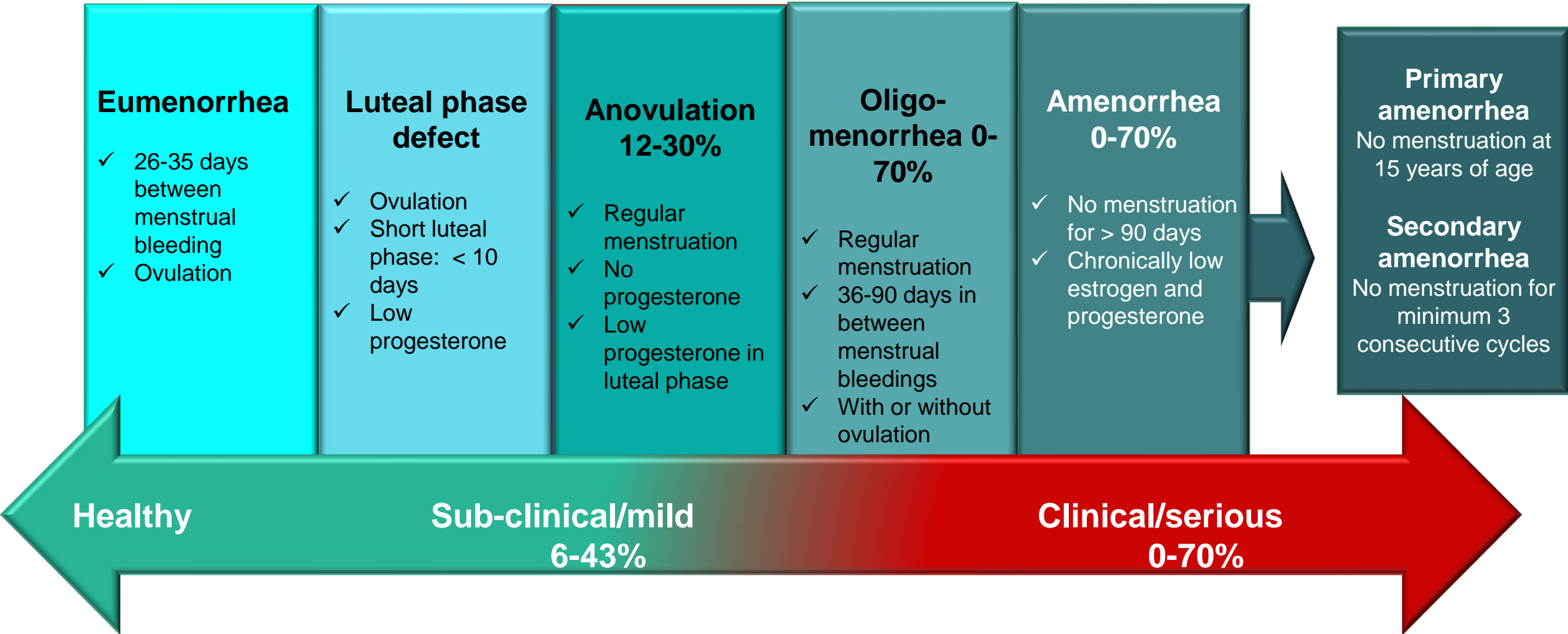
Regular cycle

- Reduced injury risk
- Improved bone health
- Optimal recovery
- Improved reaction
- Improved blood flow
- Higher intensity, endurance and strength
- Improved muscle mass
- Less gut issues and cramping overall

- The phases of the menstrual cycle
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Menstrual disorders related to energy deficiency



How to get you period back?

- ✓ Increased energy availability (increased energy intake and/or reduced energy need, training goes down)



How long does it for the period to return?

Nutrients 2014, 6, 3018-3039; doi:10.3390/nu6083018

OPEN ACCESS

nutrients

ISSN 2072-6643

www.mdpi.com/journal/nutrients

Article

Dietary Intervention Restored Menses in Female Athletes with Exercise-Associated Menstrual Dysfunction with Limited Impact on Bone and Muscle Health

Lynn Cialdella-Kam¹, Cheryl L. Cook² and Melinda M. Manore^{3,*}

The time required to resume menstruation depends to a large extent on **the starting point** (previous eating habits, duration of the menstrual disorder, metabolic condition etc.)

**2.6 ± 2.2 months
to first bleeding**

RESEARCH ARTICLE

Open Access

Nine-month nutritional intervention improves restoration of menses in young female athletes and ballet dancers

Karolina Łagowska^{1*}, Karina Kapczuk² and Jan Jeszka¹

> Int J Sport Nutr Exerc Metab. 2012 Apr;22(2):98-108. doi: 10.1123/ijsnem.22.2.98.

Restoration of menses with nonpharmacologic therapy in college athletes with menstrual disturbances: a 5-year retrospective study

Julie C Arends¹, Min-Yuen C Cheung, Michelle T Barrack, Aurelia Nattiv

Affiliations + expand

PMID: 22465870 DOI: 10.1123/ijsnem.22.2.98

**15.6 ± 2.6 months
to first bleeding**

- The phases of the menstrual cycle
- Sex hormones and physiological function
- Menstrual disorders
- The menstrual cycle phases and performance
- Oral contraceptives and performance



The menstrual cycle phases & performance

Sports Medicine

<https://doi.org/10.1007/s40279-020-01319-3>

SYSTEMATIC REVIEW

The Effects of Menstrual Cycle Phase on Exercise Performance in Eumenorrheic Women: A Systematic Review and Meta-analysis

Kelly Lee McNulty¹  · Kirsty Jayne Elliott-Sale²  · Eimear Dolan³  · Paul Alan Swinton⁴  · Paul A. Stuart Goodall¹  · Kevin Thomas¹  · Kirsty Marie Hicks¹ 

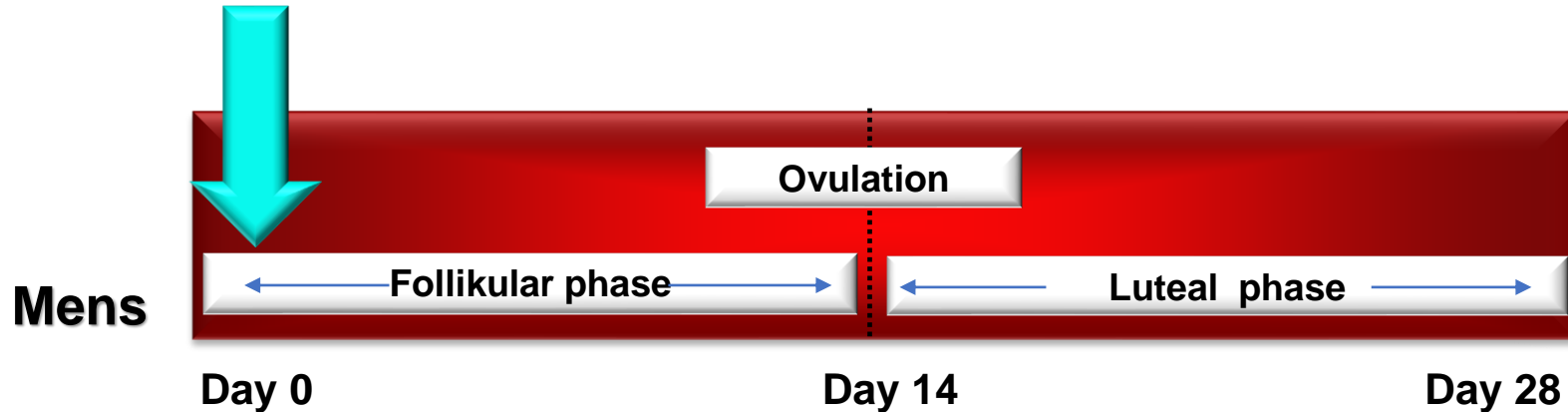
Conclusion The results from this systematic review and meta-analysis indicate that exercise performance might be trivially reduced during the early follicular phase of the MC, compared to all other phases. Due to the trivial effect size, the large between-study variation and the number of poor-quality studies included in this review, general guidelines on exercise performance across the MC cannot be formed; rather, it is recommended that a personalised approach should be taken based on each individual's response to exercise performance across the MC.

Performance may be reduced in the early follicular phase (early in bleed). Large study variations indicates that study design, participant characteristics and choice of outcomes may influence the results.

= a personal approach should be taken based on the individual's response to exercise performance across the menstrual cycle

Know when your dates are

- If you experience that your performance is affected by menstrual phase
- Plan hard training sessions outside the early follicular phase



MENSTRUATION
CALENDAR

-
- The phases of the menstrual cycle
- Sex hormones and physiological function
- Menstrual disorders
- The menstrual cycle phases and performance
- Oral contraceptives and performance

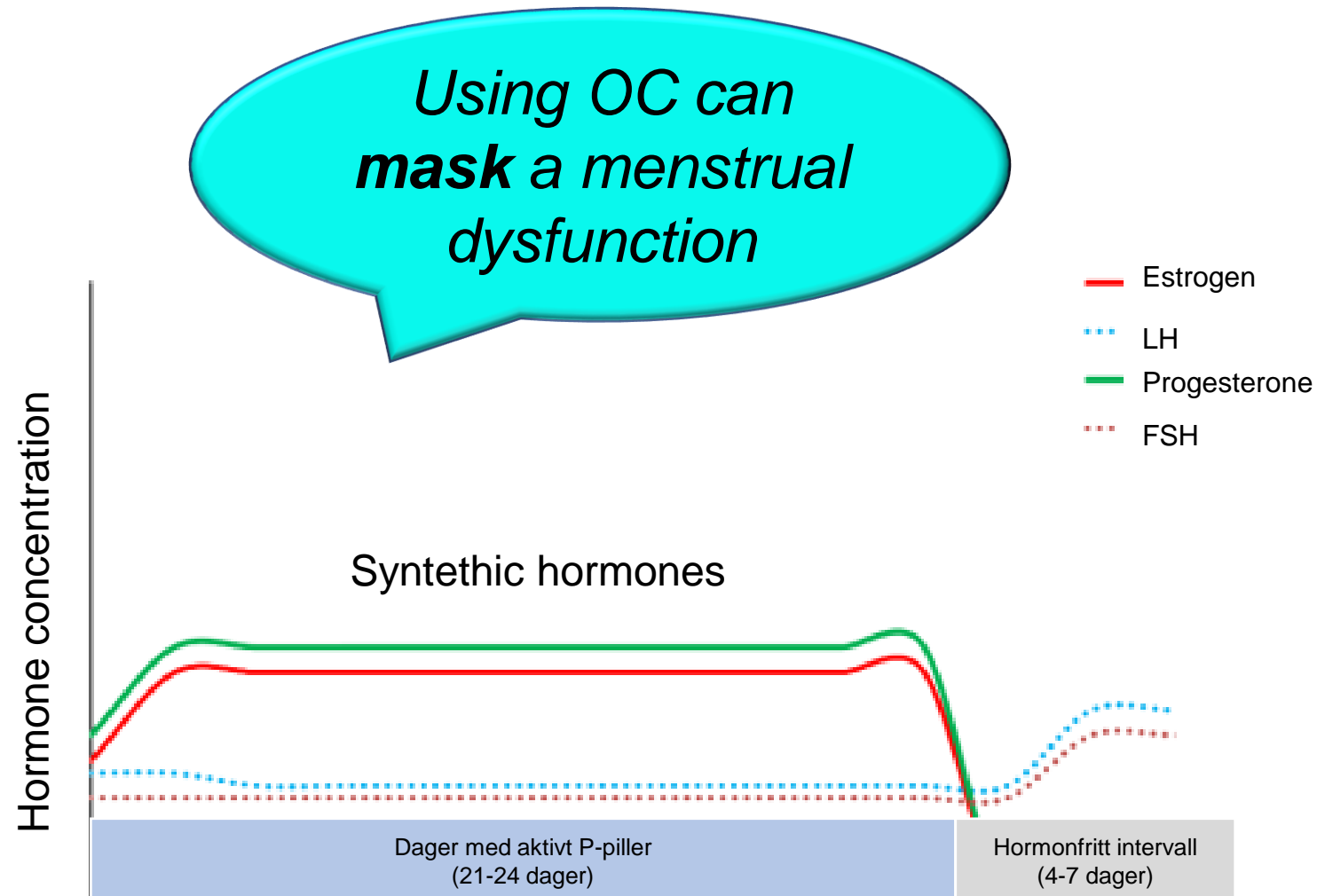


Oral contraceptives to resume menses?

Oral contraceptives to avoid any performance decline in the follicular phase?



OC: hormonal profile is similar to the follicular phase



Oral contraceptives and performance

Sports Medicine

<https://doi.org/10.1007/s40279-020-01317-5>

SYSTEMATIC REVIEW

*Individual approach based on
how the athlete's
performance is affected by
the OC use*

The Effects of Oral Contraceptives on Exercise Performance in Women: A Systematic Review and Meta-analysis

Kirsty J. Elliott-Sale¹  · Kelly L. McNulty²  · Paul Ansdell²  · Stuart Goodall²  · Kirsty M. Hicks²  ·
Kevin Thomas²  · Paul A. Swinton³  · Eimear Dolan⁴ 

Conclusions OCP use might result in slightly inferior exercise performance on average when compared to naturally menstruating women, although any group-level effect is most likely to be trivial. Practically, as effects tended to be trivial and variable across studies, the current evidence does not warrant general guidance on OCP use compared with non-use. Therefore, when exercise performance is a priority, an individualised approach might be more appropriate. The analysis also indicated that exercise performance was consistent across the OCP cycle.

MC

- A regular menstrual cycle is an important health indicator for an athlete and forms the best conditions for optimal performance
- Some athletes experience that they perform better outside the early follicular phase → adjust training plan to cycle
- Oral contraceptive pills should not be used to treat a menstrual disorder related to relative energy deficiency



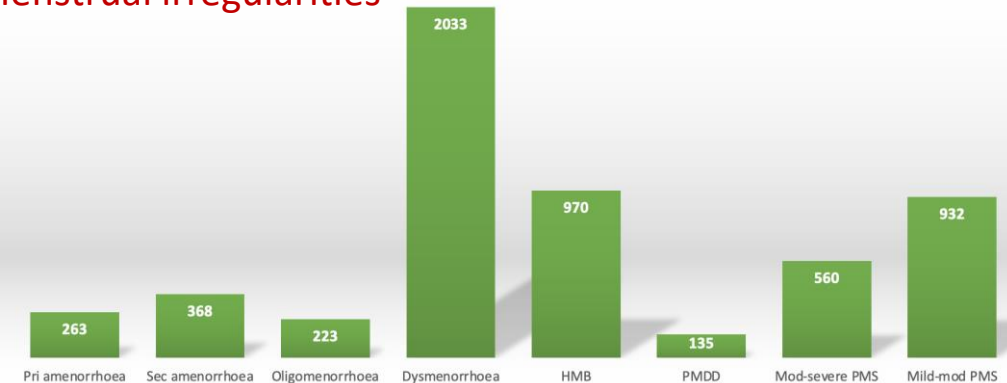
31 countries

2190 participants

101 different sporting activities



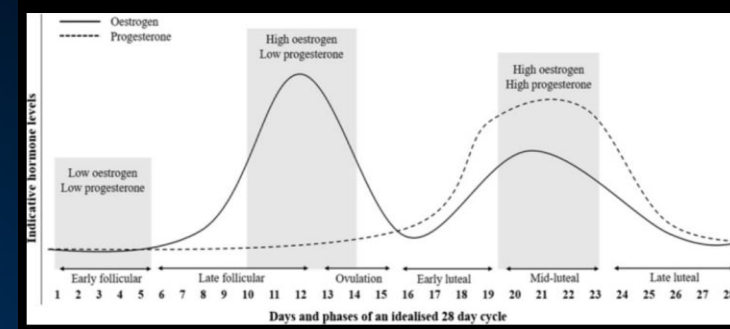
Menstrual irregularities



- Cycle:
 - 1689 (77.1%) = regular cycle
- Menstrual concerns:
 - 854 (39%) = did not have 'normal' menstruation
 - 481 (22.0%) = their periods worry them a lot
 - 667 (30.5%) = something wrong with their periods
 - 1016 (46.4%) = "overwhelmed or unable to cope" in the premenstrual phase
 - 923 (42.1%) = "withdraw or hide" when they have their menses
- Pre-menstrual symptoms:
 - 'physical sxms'
 - 'fatigue/ lack of energy'
 - 'over-eating/ food cravings'
- HMB/ primary dysmenorrhea/ PMDD/ mod-severe PMS = higher interference of their menstrual cycle on training and competition
- HMB/ severe primary dysmenorrhoea/ mod-severe PMS/ mild-mod PMS = miss more training days during menses
- High interference: 'competitions' – 30.5%; 'attending training' – 21.6%

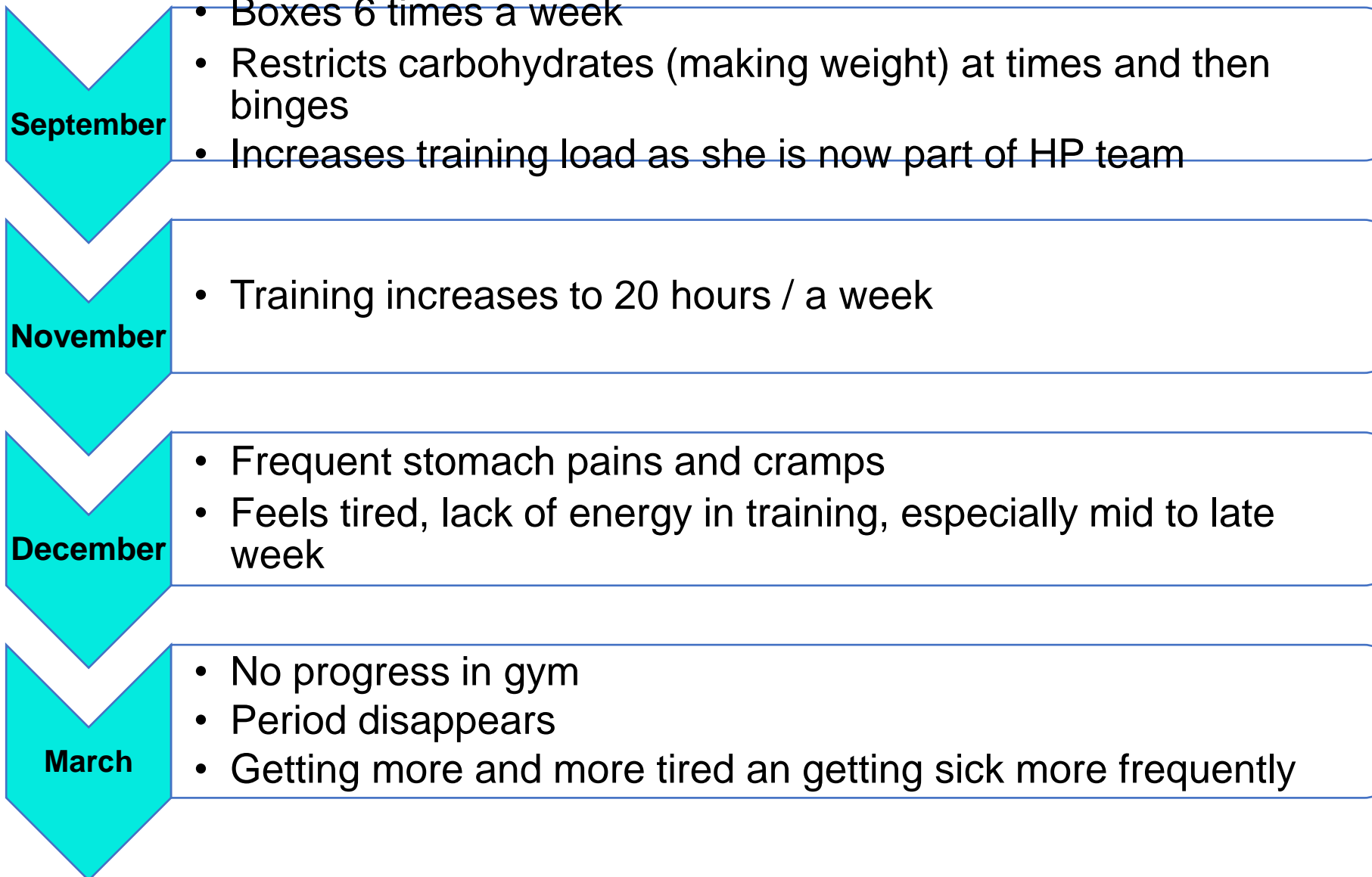
"I used to train through it, and it would take weeks to get my energy back to normal and affected too many other aspects of my life. Part of controlling my ability to consistently train has been to use my cycles, something my coaches (even at the highest level I competed at) never mentioned or tracked or cared about"

Any nutritional guidelines for different stages of the menstrual cycle?



- Hormonal variations throughout the menstrual cycle can influence several physiological systems relevant to weight management in females, inclusive of body composition, how u use fuel, fluid balance.
- The elevation in progesterone (mid cycle) levels during the luteal phase are associated with an increase in core temperature of 0.3-0.7o C, potentially further increasing the risk of heat stress if female athletes are exposed to thermal challenges to support weight loss during this phase of their menstrual cycle
- Might need to drink a little more and cooling at night as sleep can be effected, this ten can impact things like cravings (choc etc) which can have impact on weight
- A personalised approach should be taken based on each individual's response to exercise performance across the MC
- PMS can be helped by omega 3 but we would need to look at increased doses over months not as a quick fix

What about Mary?



What to do: Weekly Training

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
8 am							
10 am	Training light	training		training)		
12pm							
2 pm		training	training			match	
8.30-10.30 pm							

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Thank You
@madigan_sharon

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