RUNNERS 4ALL | European Students Run

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Co-funded by the European Union

The female athlete

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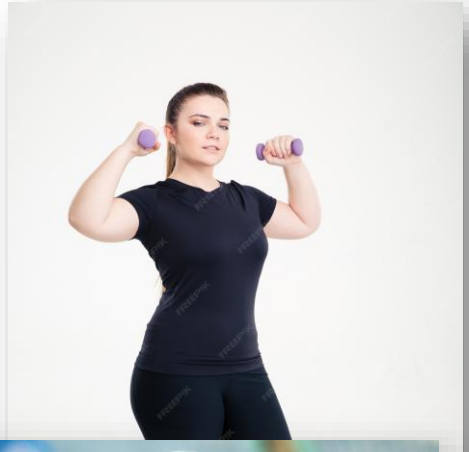
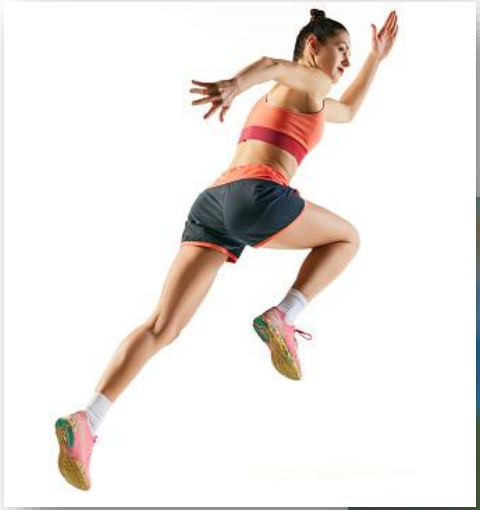
IOC Diploma in Sports Nutrition

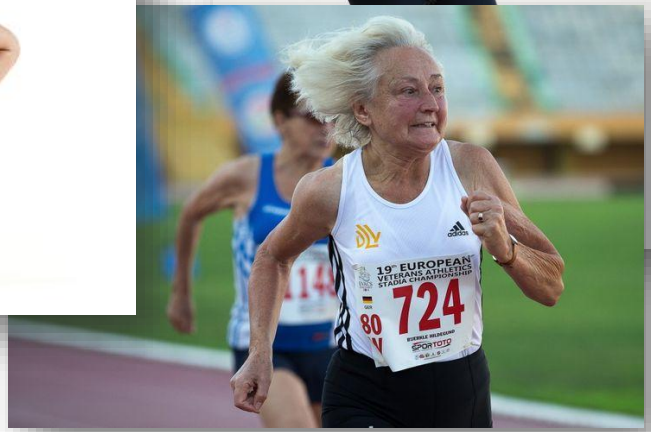
Health, Performance & Prevention

Do women need a tailored approach?

How to stay healthy, strong, and injury-free?

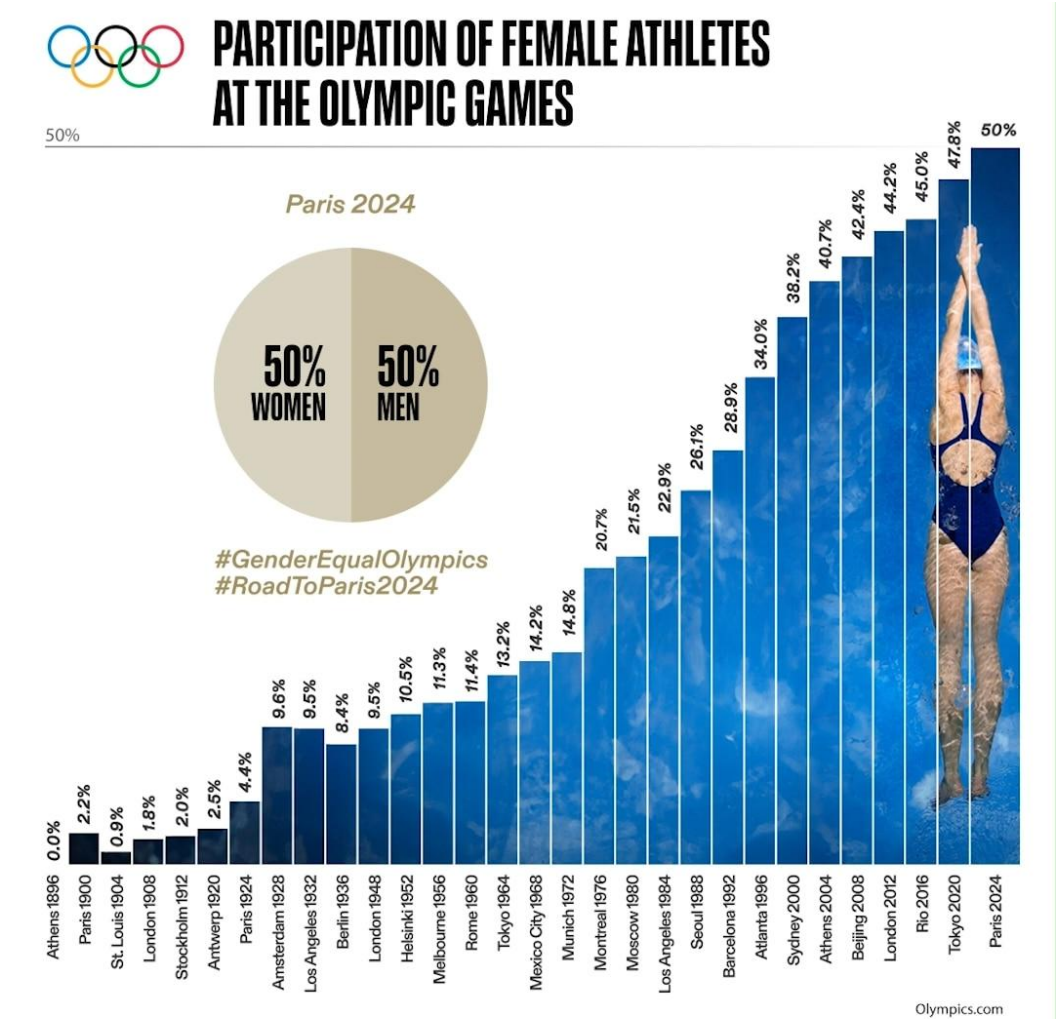






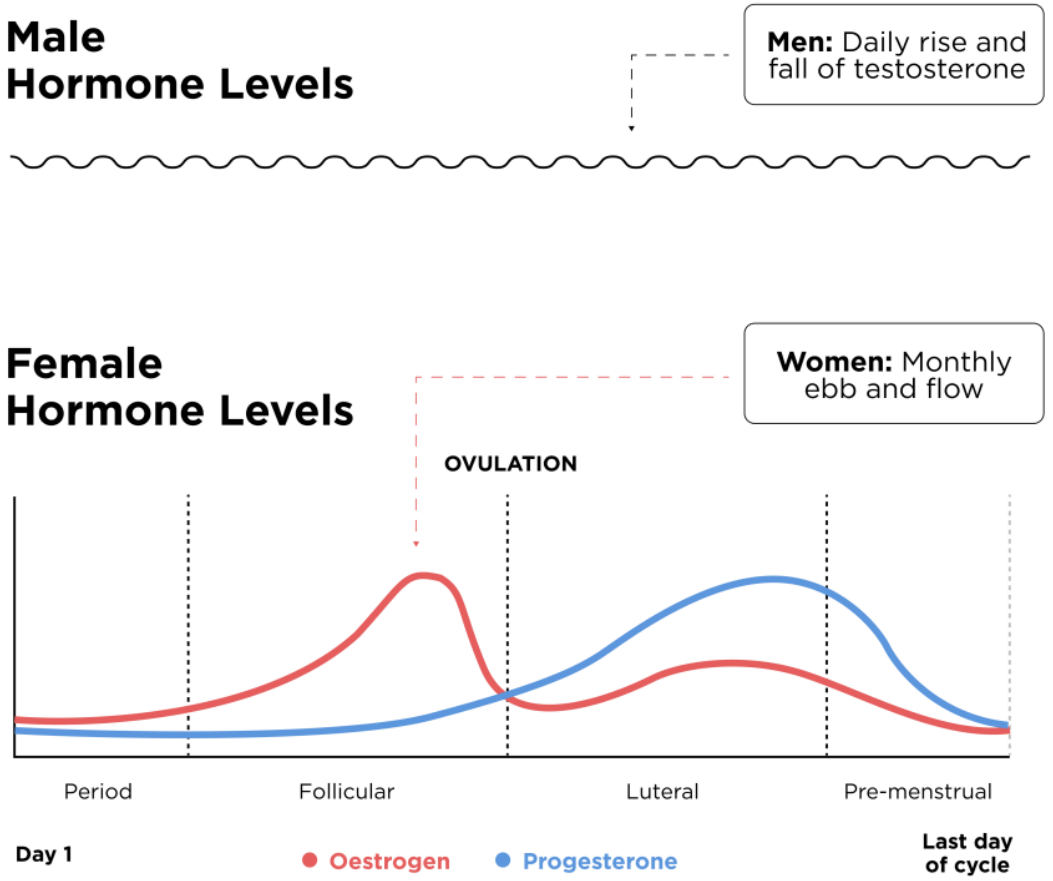
Female sports participation –

A story of success!



However, women are not “small men”

Female physiology ≠ male physiology



Female athlete health specifics

Hormonal differences (estrogen, menstrual cycle)

Higher risk of:

Knee ACL injuries

Stress fractures

Iron deficiency

Relative energy deficiency in sports (REDs)

Unique considerations:

Menstrual health and menopause

Pelvic floor

Energy availability

Why is exercise great for women?

Physical benefits:	↑ cardiovascular health
	↑ bone density
	↑ metabolic health
Mental benefits:	↓ depression & anxiety
	↑ well-being and resilience
Why running?	accessible, low cost
	strong evidence for health benefits

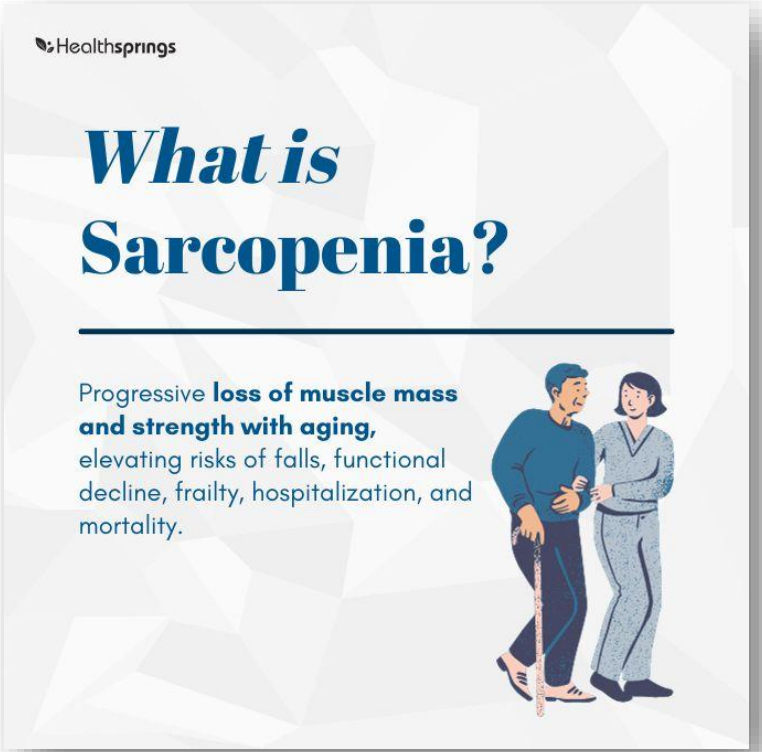
There are major benefits of adding strength/resistance and skill exercises to running!

Resistance training

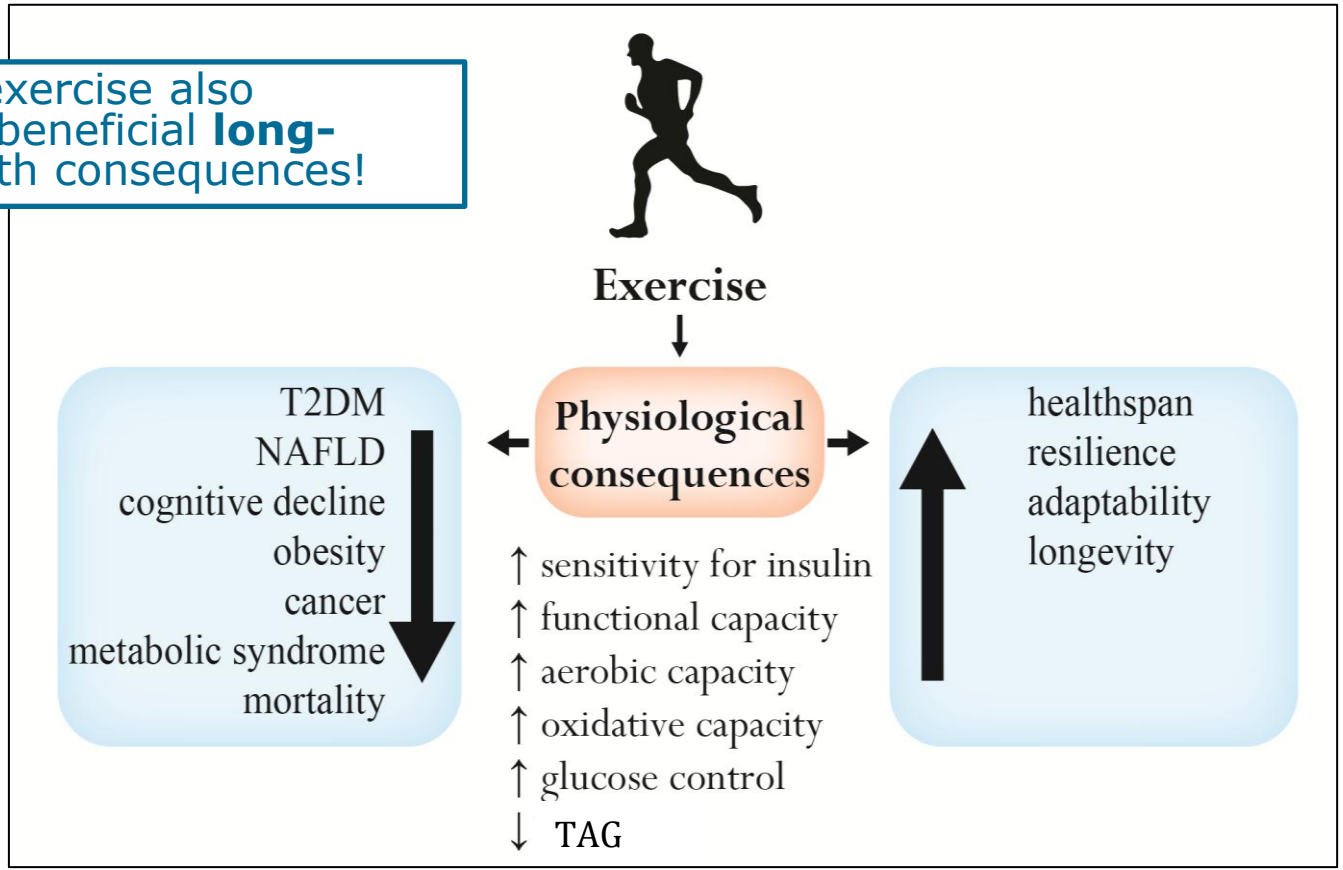
- ↑ muscle mass and strength (sarcopenia prevention)
- ↑ bone strength (osteoporosis prevention)
- ↓ injury risk

Neuromuscular / skill training

- movement control
- ↓ ACL & overuse injuries

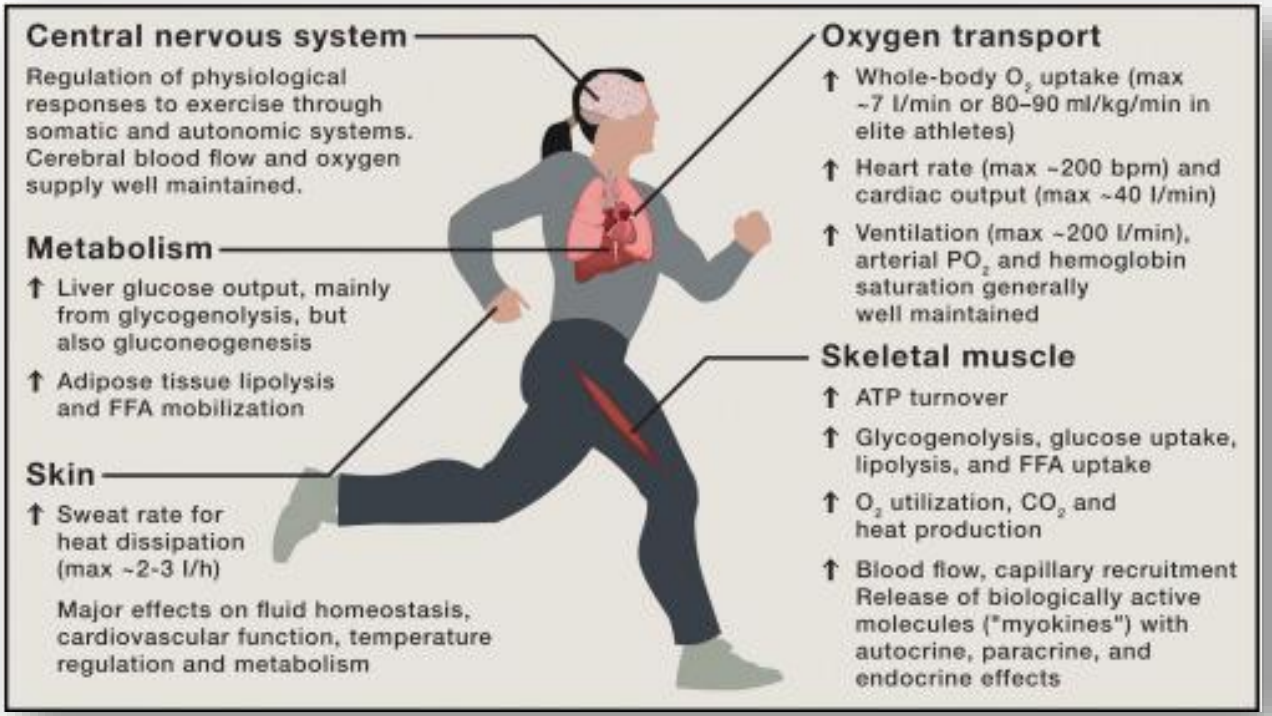


Regular exercise also promotes beneficial **long-term** health consequences!



Bouchard C, et al. Medicine & Science in Sports & Exercise, 1994

Exercise (especially at higher intensity) presents a physiological challenge (stress) for our whole body!



Key focus points to promote maximal health (and performance) benefits (and to prevent unwanted consequences)?

Managing training load

- Quality training program to prevent overtraining and overload/overuse injuries

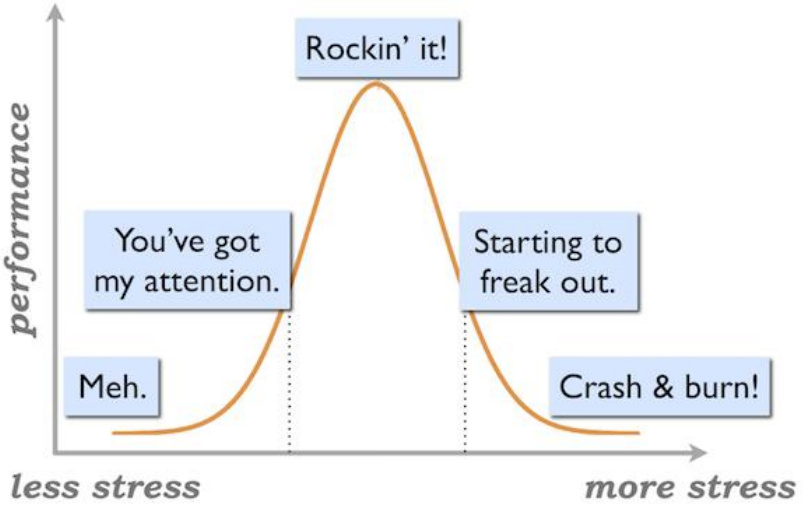
Sufficient rest, sleep and relaxation

- To promote health and recovery

Optimized nutritional and hydration strategy

- To optimize exercise and prevent nutrition-related health issues

Injury prevention (warm up, strength, mobility and stretching exercises)



[Good stress, bad stress: Finding your sweet spot - Precision Nutrition]

Common health issues in female runners

Iron deficiency

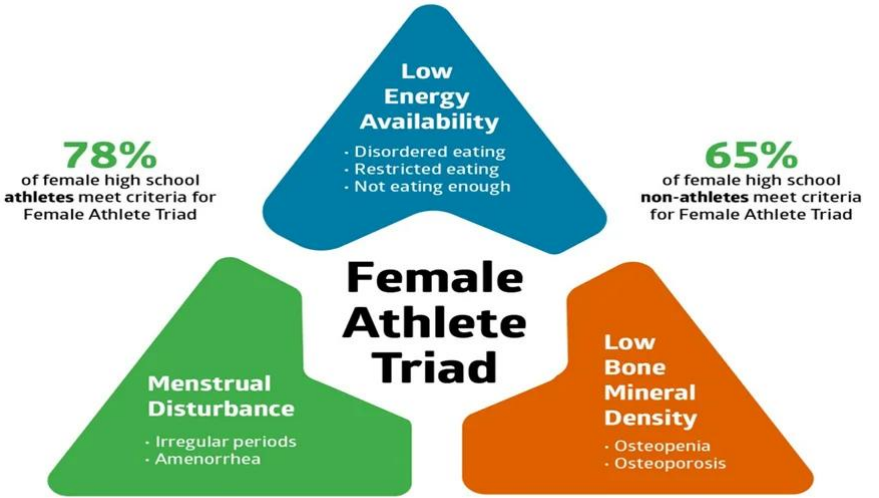
Low Energy Availability (LEA) / REDs

Stress fractures

Menstrual disturbances

Higher injury risk (bone + ligament)

👉 Often interconnected (not isolated problems)



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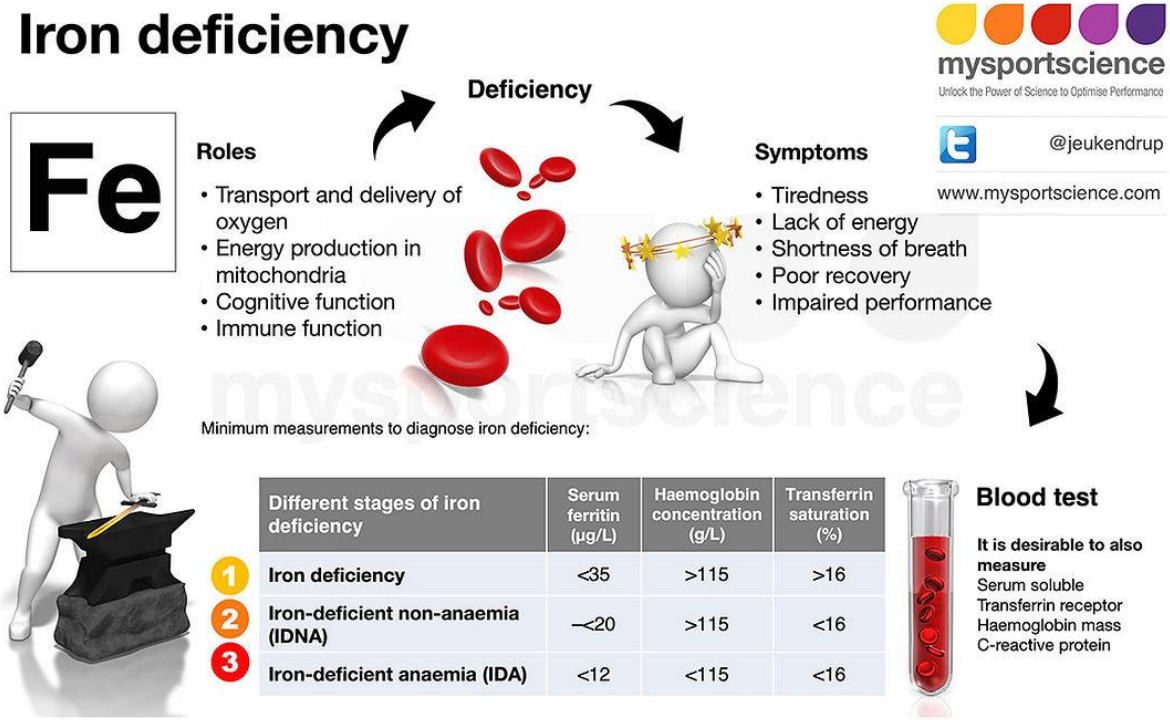
Iron deficiency

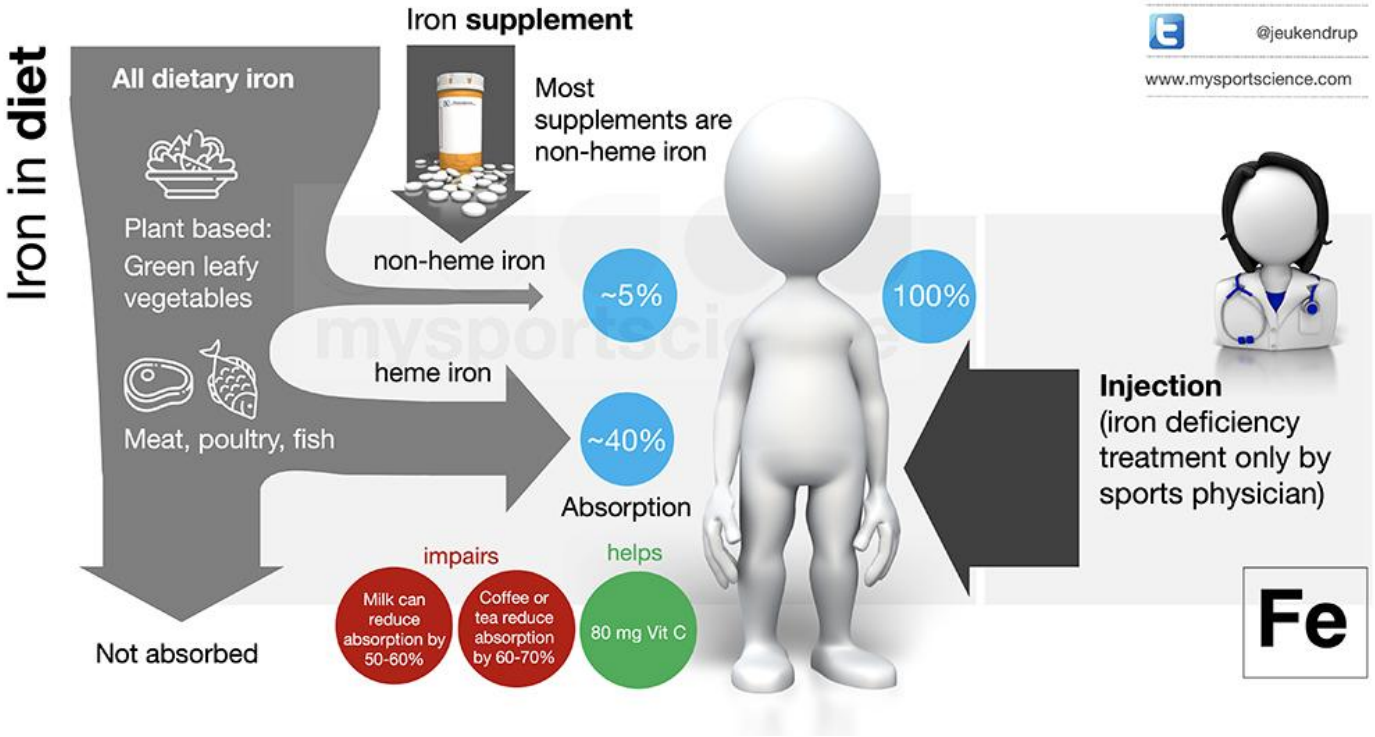
Iron deficiency is more common among female runners



Key reasons:

- Iron loss during menstrual cycle
- High iron utilization and loss in running
- Nutritional deficits (poor carbohydrate and iron intakes)

Iron is poorly absorbed



Those at risk or with symptoms of iron deficiency → **blood tests should be evaluated by a physician and appropriate therapy prescribed**

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Relative energy deficiency in sports (REDs)

An upgrade from the female athlete triad!!

Relative energy deficiency in sports (REDs)

A syndrome of impaired physiological and/or psychological functioning experienced by female and male athletes that is caused by exposure to problematic (prolonged and/or severe) low energy availability (LEA).

The detrimental outcomes include, but are not limited to:

- decreases in energy metabolism,
- reproductive function,
- musculoskeletal health,
- immunity,
- glycogen synthesis and
- cardiovascular and haematological health,

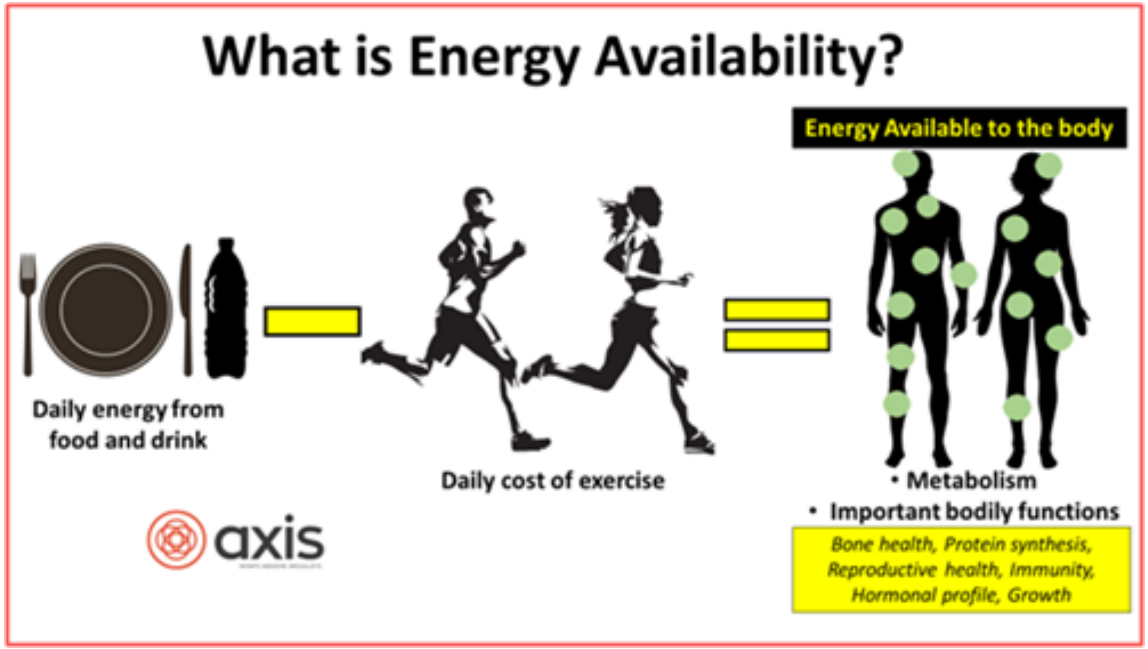
which can all individually and synergistically lead to impaired well-being, increased injury risk and decreased sports performance.

Mountjoy, Margo, et al. "2023 International Olympic Committee's (IOC) consensus statement on Relative Energy Deficiency in Sport (REDs)." *British Journal of Sports Medicine* 57.17 (2023): 1073-1097.

Red flags for REDs

Mood swings (irritability, depression, nausea...)	**Common and long-term illnesses**	**Missed menstruation (primary/secondary amenorrhea)**
Excessive fatigue	**Stress fractures, frequent injuries**	**Weight loss or binge eating/eating disorders**

REDs occurs due to problematic **LOW energy availability (LEA)**



LEA is any **mismatch between dietary energy intake** and **energy expended in exercise** that leaves the body's total energy needs unmet, that is, there is **inadequate energy to support the functions required by the body to maintain optimal health and performance**.

Mountjoy, Margo, et al. "International Olympic Committee (IOC) consensus statement on relative energy deficiency in sport (RED-S): 2018 update." *International journal of sport nutrition and exercise metabolism* 28.4 (2018): 316-331.

What happens in the state of LEA?

The body **conserves energy** by reducing expenditure on processes that are not essential for short-term survival:

- **cellular activity (regeneration!),**
- **thermoregulation,**
- **immunity,**
- **growth,**
- **reproduction**

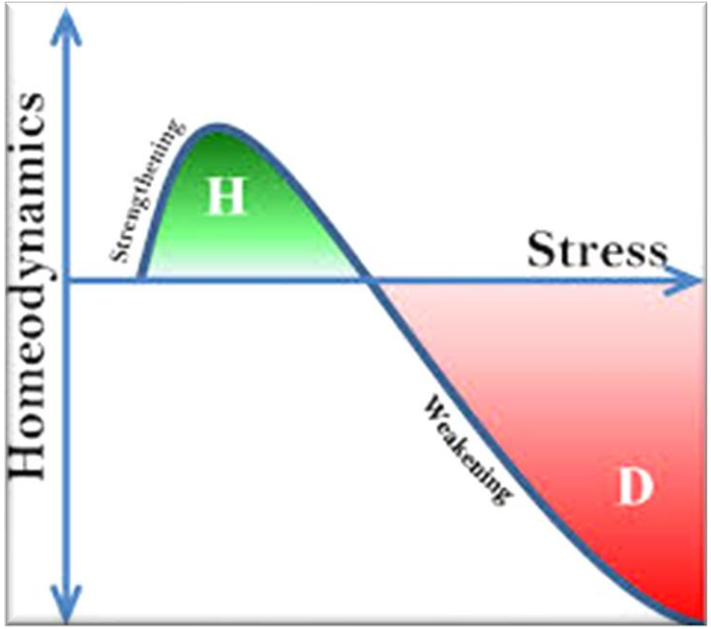
to **compensate for the negative energy availabilty**!

Mountjoy, Margo, et al. "International Olympic Committee (IOC) consensus statement on relative energy deficiency in sport (RED-S): 2018 update." *International journal of sport nutrition and exercise metabolism* 28.4 (2018): 316-331.

Why does it happen?

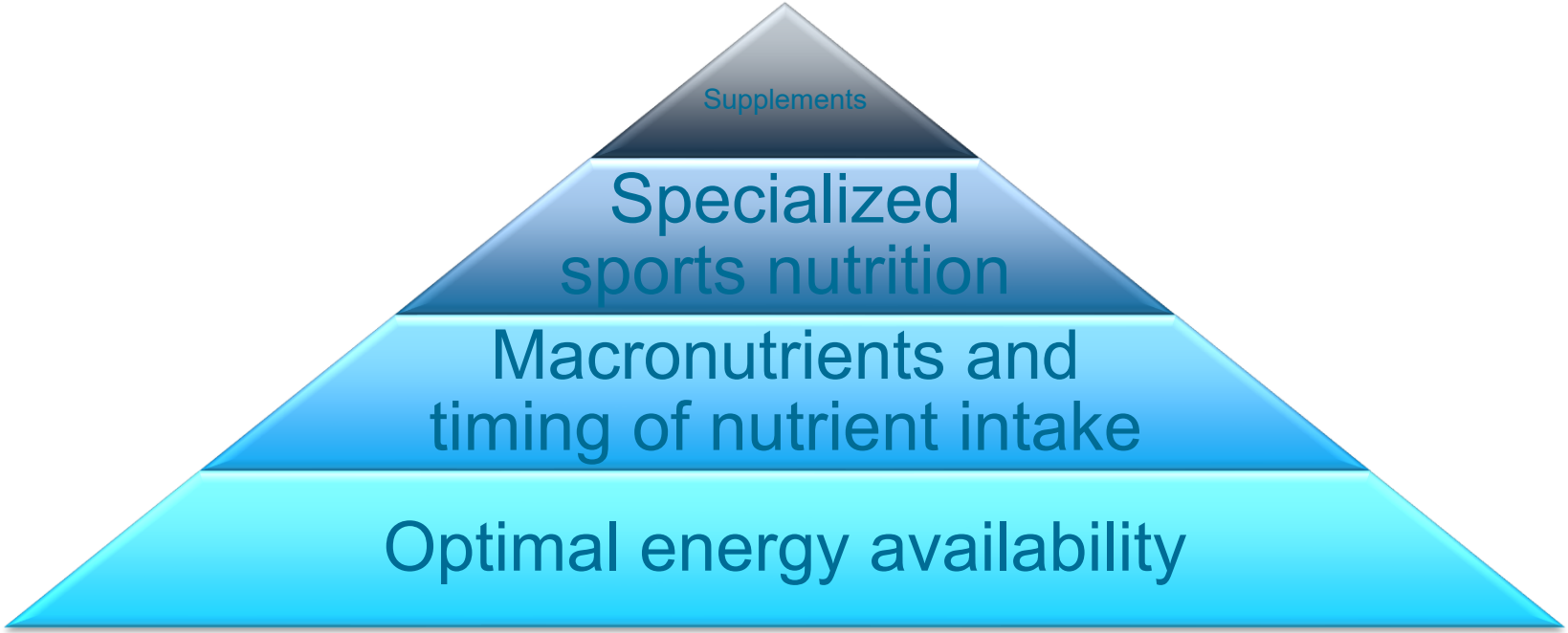
LEA as a result of:

- Extremely **high energy expenditure** during training
- Achieving the weight "necessary" for sports
- **Diets and desires for slimness**…
- Lack of knowledge (misinformation!)
- **Logistical/practical challenges?** (inappropriate meals during work/school hours, rush...)



<u>Appropriate nutritional strategy</u> supports optimal adaptations to exercise and prevents potential negative consequences

Hierarchy of (sports) nutrition



The prevention basics → following the key sports nutrition recommendations (another lecture)

Regular meals (three main + snack + before and during and after training)

Energy intake adjusted according to daily needs (age, gender, body composition, amount and type of training, other daily activities)

Planning is key, especially during travel and during periods of heavier loads (important competitions, preparations)

Sufficient energy intakes, and especially **strategic macronutrient intakes, around and during physical activity**

Especially important are **carbohydrate** intakes!

- Improve high intensity exercise
- Optimize recovery
- Prevent negative consequences of LEA and low carbohydrate availability

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Exercise and menstrual cycle

Should I train based on menstrual cycle phase?

There are **large differences** in the hypertrophic response to strength training **between individuals** (women but also men).

Men and women respond similarly to resistance training (increases in muscle mass and strength)

Not likely that there are differences in the effects of resistance exercise training within a person,

even though hormones levels may vary during the menstrual cycle.

Training based on cyclical hormonal changes is not an evidence-based approach

mysportscience
Unlock the Power of Science to Optimise Performance
@jeukendrup
www.mysportscience.com

Colenso-Semple et al. Front. Sports Act. Living. 5, 2023

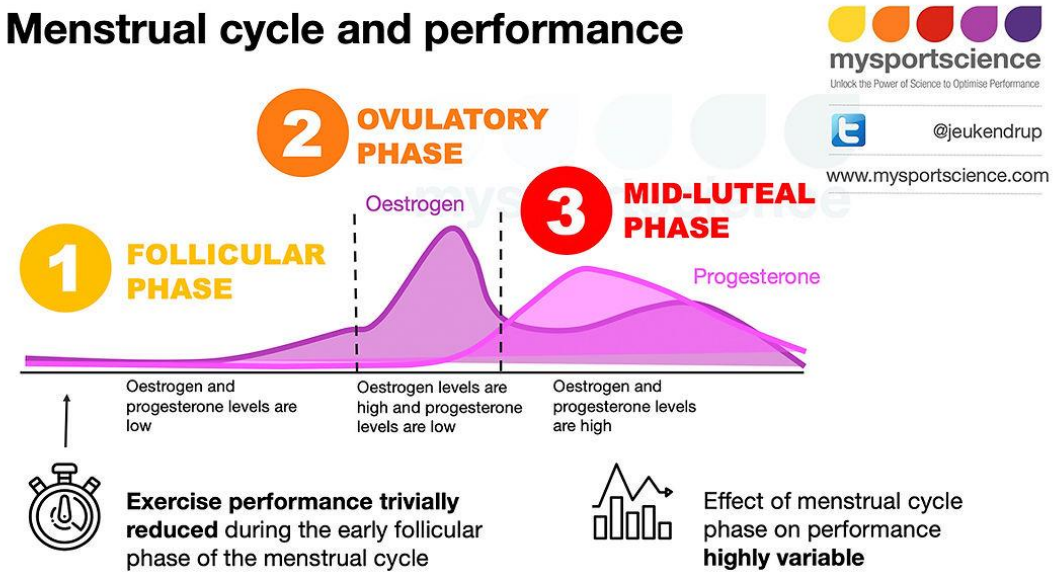
- No strong evidence for adjusting training to menstrual cycle…

👉 But every woman is different → **individualize training**

Can menstrual cycle affect my performance?

- Some may feel:
  - ↓ performance early follicular phase
  - ↑ performance mid-cycle
- The effects are **minimal**
- Sometimes symptomatic pain management (paracetamol, NSAIDs) may be needed for menstrual pain
  - But also exercise can help with pain!

- Essentially… there is nothing stopping you from reaching your goals! ☺



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Challenges that come with age…

Perimenopause / menopause

- **Longer recovery; plan for it.**
  - More rest between hard sessions often improves consistency and reduces complication.
- **Strength becomes the anchor; fight for your muscle!**
  - Prioritize strength work (within ability) to support **muscle, tendon, and bone (osteoporosis and sarcopenia prevention!!)**.
  - Add high quality protein to you diet!
- **Tendons can feel "stiffer".**
  - Warm-ups matter more, progress load more gradually, avoid abrupt jumps in speed/hills.
- **Heat tolerance may shift.**
  - More conservative pacing in the heat, earlier hydration, and cooling strategies can prevent overheating.
- **If symptoms or medical issues progress, get professional support**

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Injury prevention

General principles of injury prevention

Balance	→ training load vs tissue capacity (avoid “too much, too soon”)
Prioritize	→ progressive overload + adequate recovery
Monitor	→ early warning signs (pain, fatigue, performance drop)

Strength training = best injury prevention

2×/week resistance training (full body with emphasis on lower limbs + core)

Runners should focus on:

- **Hip abductors & external rotators**
- **Hamstrings (eccentric work)**
- **Calf–Achilles complex**
- **Pelvic floor exercises**

Include **neuromuscular/landing control training** → ↓ ACL & overuse injuries

Frequent problems with running injuries?

Important to address:

- **Insufficient/improper warm up**
- **Biomechanics & technique**

→Especially:

  - **hip–knee alignment (valgus control)**
  - **running mechanics**

- Consider **footwear & surface variation**

- **Consult an expert!**


Cure
Prevention

Take home messages

Exercise has many potential short- and long-term health benefits!

Most beneficial combination = regular aerobic (running!) + strength exercise

Work on prevention and watch for:

- Iron deficiency
- REDs
- Menstrual changes
- Injury prevention

Fuel properly → perform better → stay healthy and enjoy life (throughout all ages)

Consult an expert when necessary

Listen to your body (especially cycle & recovery)