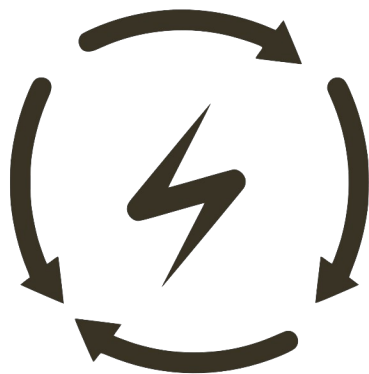


**Prevalence of major risk  
factors of the RED-S in  
elite Russian women's  
football**

**Ryzhenko Artem**  
**Head of the Spartak Moscow women's team**  
**medical department**

Madrid 2024





**01**

**Definition of RED-S**

**02**

**Symptoms**

**03**

**Diagnosis**

**04**

**Treatment and  
prophylactics**

**05**

**RED-S in Russian Women's Football**

**CONTENT**

# WHAT IS RED-S?

Relative energy deficiency in sport (RED-S) describes a syndrome that affects multiple bodily systems and functions in both recreational and elite athletes. It is fundamentally, an imbalance between energy intake and exercise-related energy expenditure, leading to globally impaired physiological function as a result of low energy availability. RED-S developed from the 'female athlete triad', describing a relationship between low energy availability (with or without eating disorder), amenorrhea (menstrual dysfunction) and low bone mineral density (Mountjoy et al., 2014).



100%  
BATTERY



LOW  
BATTERY

**RED-S is disbalance between energy intake and outtake**

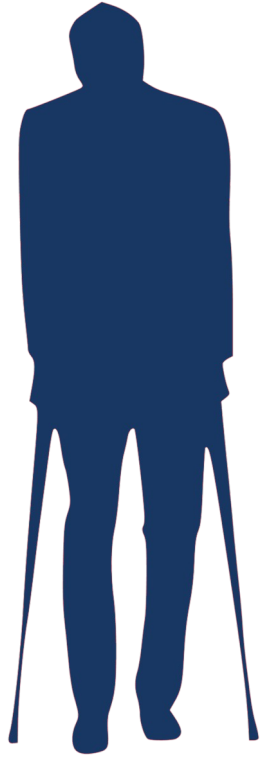
# WHERE IT COMES FROM?

## INCREASED ENERGY CONSUMPTION

- Increasing the amount and/or intensity of training
- Additional training sessions
- Tough calendar
- Transfer to a higher level team
- Training camp
- Recovering from injury
- Frustration about your fitness
- *Pressure from coaching staff and/or environment*
- Change of training schedule or lack of consistency

- Tough dietary restrictions
- No modification of the ration to accommodate changes in the training process
- Limited ration (lack of variety and micronutrients)
- Depression
- Gastrointestinal and endocrine diseases
- Lack of fiber
- Eating disorders
- *Pressure from coaching staff and/or environment*
- **Misconceptions and lack of knowledge**

## DECREASED ENERGY INTAKE

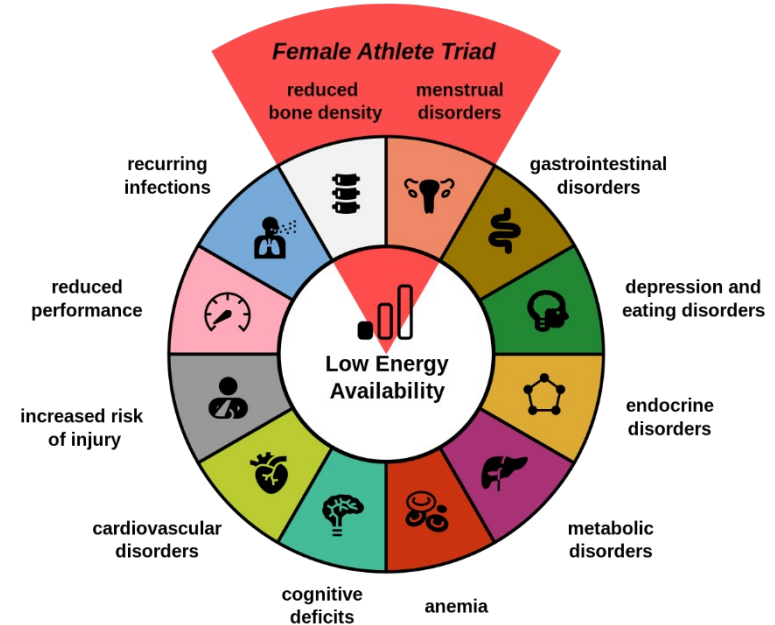


!! All of the above  
factors can intertwine,  
be the cause of each  
other, exist  
simultaneously,  
accelerating processes  
of development more  
symptoms !!!!

# SYMPTOMS OF RED-S

## Relative Energy Deficiency in Sport (RED-S)

- Eating disorder
- Persistent fatigue
- Hair loss
- Cold hands and feet
- Dry skin
- Noticeable weight loss
- Increased RTP time (e.g., bruises that take a long time to heal)
- Increased frequency of bone fractures
- Irregularly cycle or complete stopping of menstruation



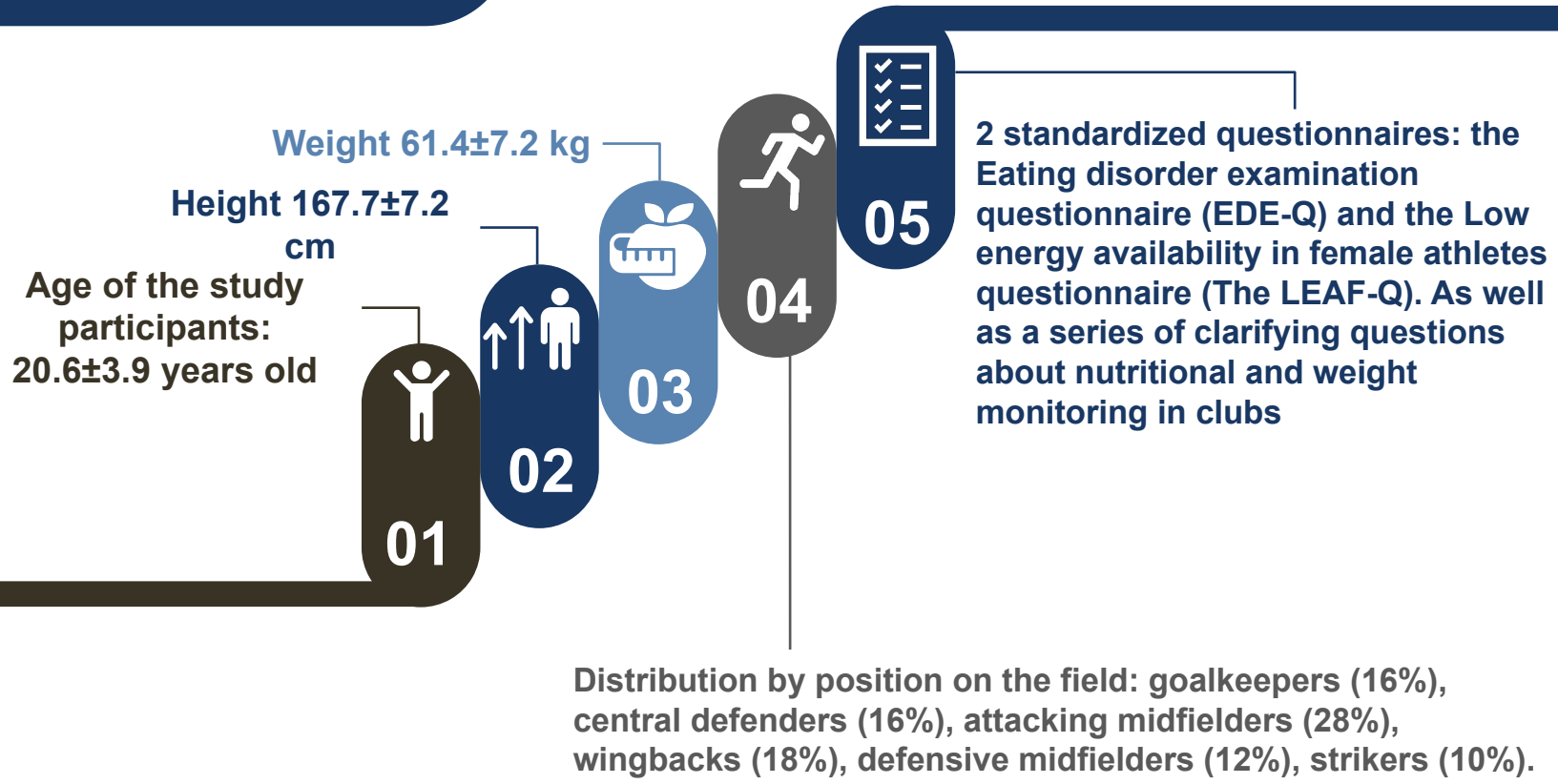
Female athletes suffering from this condition may also suffer from low confidence and depression.

Because none of the first symptoms may be serious enough to seek medical attention, they can remain undetected for long time

The background is a deep blue with a fine, woven texture. Overlaid on this are several large, semi-transparent geometric shapes, including triangles and polygons, in varying shades of blue and white, creating a layered, architectural effect.

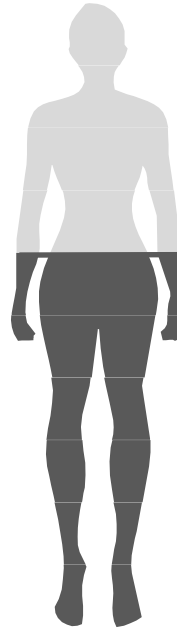
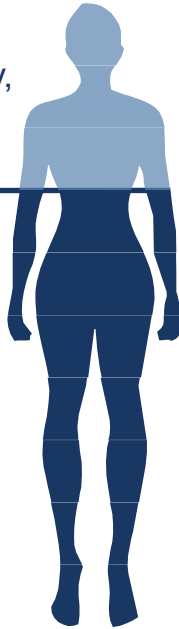
# **RED-S IN RUSSIAN WOMEN'S FOOTBALL**

# STUDY CRITERIA



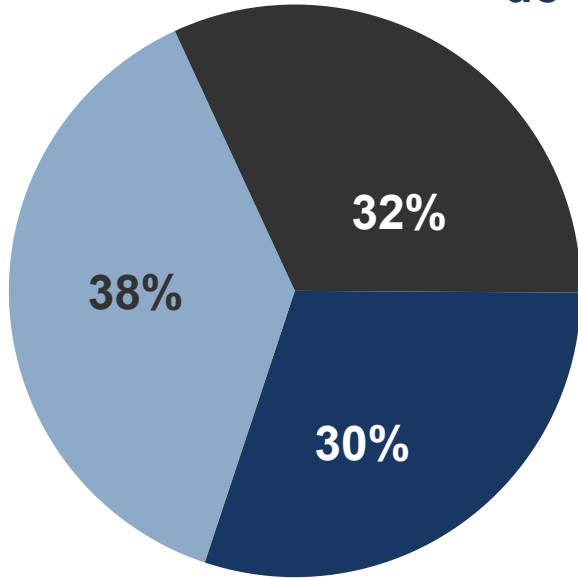
## AWARENESS AND CONTROL

**56%** female athletes answered that they receive all necessary supplements and medicines in the club, however, in the next question only 26% answered that they take medicines and supplements on a regular basis, according to the doctor's instructions. 48% use them independently and irregularly, and another 26% do not take them at all.



**36%** of the interviewed female athletes were taking any medication at the time of the study. **Only 54% of them were taking medication prescribed by a doctor**

**Does the coaching staff explain to you how to develop your diet and what nutrition supplements you should use? And if they do, do they explain why?**



No

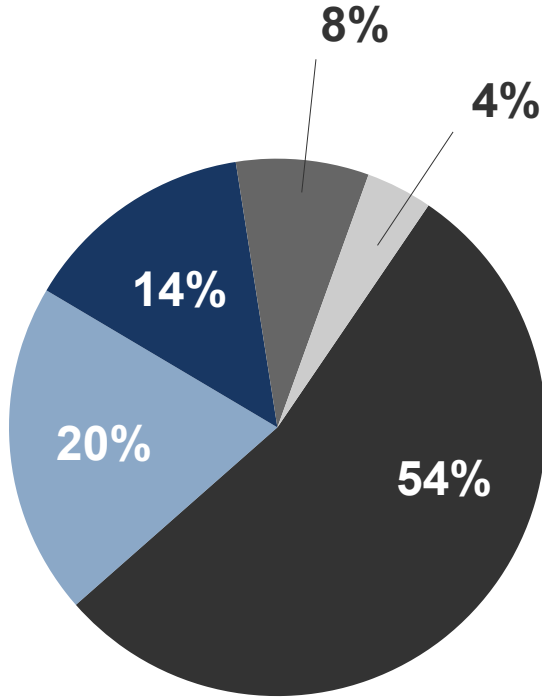


Yes, in detail and on a regular basis



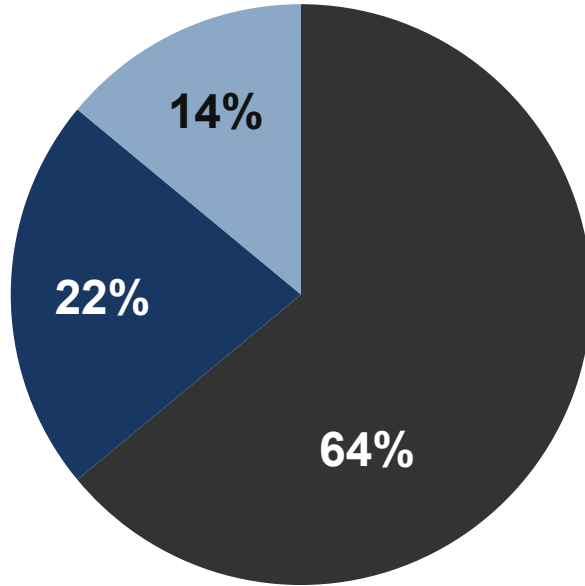
Sometimes, or if you ask

## Are you watching your eating habits?



- No
- On its own no, but during away games and training camps the menu is controlled by the club
- Yeah, on my own
- Yes, I'm acting on the recommendations from the club personnel
- Yes, on my own and also consult with specialists

## Does your club have sanctions for overweight?



- No
- Yes
- Yes and for body fat % too

# EATING DISORDER EXAMINATION QUESTIONNAIRE (EDE-Q)

*The questions only apply to the last 4 weeks (28 days) and only one answer is required per answer. There are a total of 28 questions. 4 subscales. To obtain a score for a particular subscale, the scores for the corresponding items are added together and the sum is divided by the total number of items. To obtain a total score, the scores of each subscale are summed and the sum obtained is divided by the number of subscales (by 4).*

*3 or more points scored in the Restriction subscale and 1 or more points scored in other subscales indicate low energy availability.*

**Ограничение (Restraint)**

**Пищевое беспокойство (Eating Concern)**

**Беспокойство о форме (Shape Concern)**

**Беспокойство о массе тела (Weight Concern)**

*Вопросы относятся только к последним 4 неделям (28 дням), и на каждый ответ требуется дать только один ответ.*

*Пожалуйста, обведите соответствующую цифру справа. Помните, что вопросы относятся только к последним 4 неделям (28 дней).*

Вопросы 1-12								
	Как часто за последние 28 дней...	Ни разу	1-5 дней	6-12 дней	13-15 дней	16-22 дня	23-27 дней	Каждый день
1	Вы пробовали сознательно ограничить количество еды, которую употребляете в пищу, чтобы изменить массу тела или фигуру (независимо от того, удалось это или нет)?	0	1	2	3	4	5	6
2	Вы совершенно ничего не ели длительное время (8 часов дневного времени и более) для того, чтобы повлиять на свою массу тела и фигуру?	0	1	2	3	4	5	6

# EATING DISORDER EXAMINATION QUESTIONNAIRE (EDE-Q)

	Restraint	Eating Concern	Shape Concern	Weight Concern
Average	1,68	0,70	<b>1,73</b>	<b>1,44</b>
Standard deviation	1,09	0,42	0,90	0,75

The highest average score in the subgroup "Concern about shape" was when answering the question "Desire to have a completely flat stomach" ( $3.28 \pm 2.76$  points out of 6), **that means that 13-15 days out of 28 female soccer players have that desire. And it's on average(!)**. Based on these results, even the average score is higher than 1 point in 2 out of 4 subgroups, which reliably indicates an increased risk of low energy availability in the interviewees due to concerns about shape and body weight.

# Low energy availability in female athletes questionnaire (LEAF-Q)

There are 3 large sections in this questionnaire:

Traumatism

Gastrointestinal tract

Menstrual function

The answers (symptoms) received are converted into scores and summarized, each section has its own borderline:  $\geq 2$  for gastrointestinal symptoms,  $\geq 2$  for trauma and  $\geq 4$  for menstrual dysfunction.

A total score of  $\geq 8$  indicates low energy availability right now

*Personal data of athletes, except for age and anthropometry were not collected for more honest answers and study accuracy*

Опросник по низкой доступности энергии среди женщин-спортсменок/Low energy availability in female athletes questionnaire (The LEAF-Q)<sup>1</sup>

Опросник для женщин-спортсменок

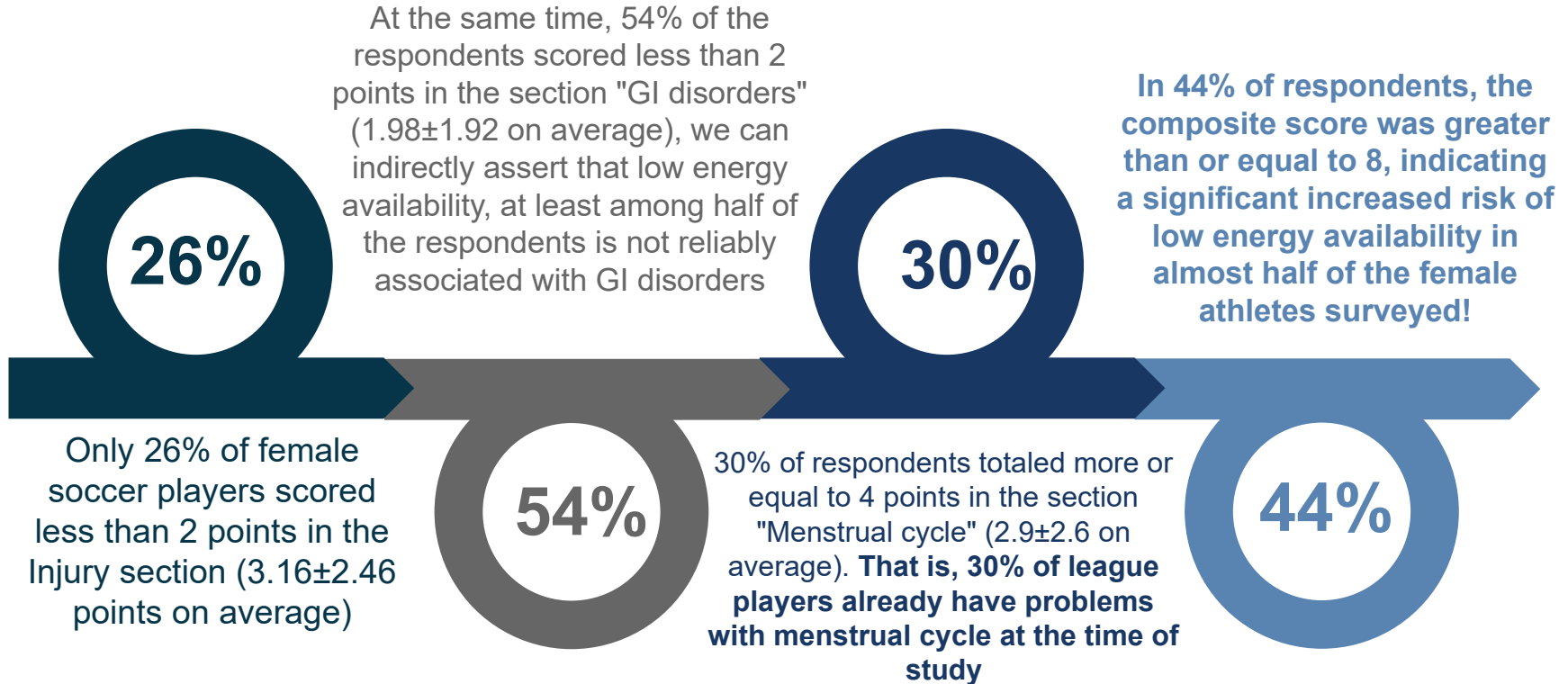
1. Имя \_\_\_\_\_
2. Адрес \_\_\_\_\_
3. E-mail \_\_\_\_\_
4. Телефон \_\_\_\_\_
5. Образование \_\_\_\_\_
6. Возраст (лет) \_\_\_\_\_
7. Рост \_\_\_\_\_ см
8. Масса тела \_\_\_\_\_ кг
9. Ваша наибольшая масса тела при настоящем росте \_\_\_\_\_ кг
10. Ваша наименьшая масса тела при настоящем росте \_\_\_\_\_ кг
11. Вы курите? Да \_\_\_\_\_ Нет \_\_\_\_\_
12. Вы принимаете какую-либо медикаментозную терапию (за исключением оральных контрацептивов) Да \_\_\_\_\_ Нет \_\_\_\_\_
13. Если да, то какие препараты? \_\_\_\_\_
14. Ваше обычное число тренировок (в среднем) — количество часов в неделю и какой вид нагрузки, например бег, плавание, велоспорт, растяжка, спорспецифическая тренировка (по улучшению техники) и т.д. \_\_\_\_\_
15. Комментарии и дополнительная информация о тренировках \_\_\_\_\_

## 1. Травмы

**Выберите ответ, который наиболее максимально описывает вашу ситуацию**

- A. Пропускали ли Вы тренировки или участие в соревнованиях из-за травм в течение последнего года?
- Нет, ни разу.
  - Да, один или два раза.
  - Да, три или четыре раза.
  - Да, пять и более раз
- A1. Если да, то сколько дней Вы пропустили по причине травмы в течение последнего года?
- 1–7 дней.
  - 8–14 дней.
  - 15–21 день.
  - 22 дня и более
- A2. Если да, то какие виды травм Вы получали за последний год? \_\_\_\_\_
- Комментарии или дополнительная информация о Ваших травмах \_\_\_\_\_

# Low energy availability in female athletes questionnaire (LEAF-Q)



# WHEN RED-S IS RED?

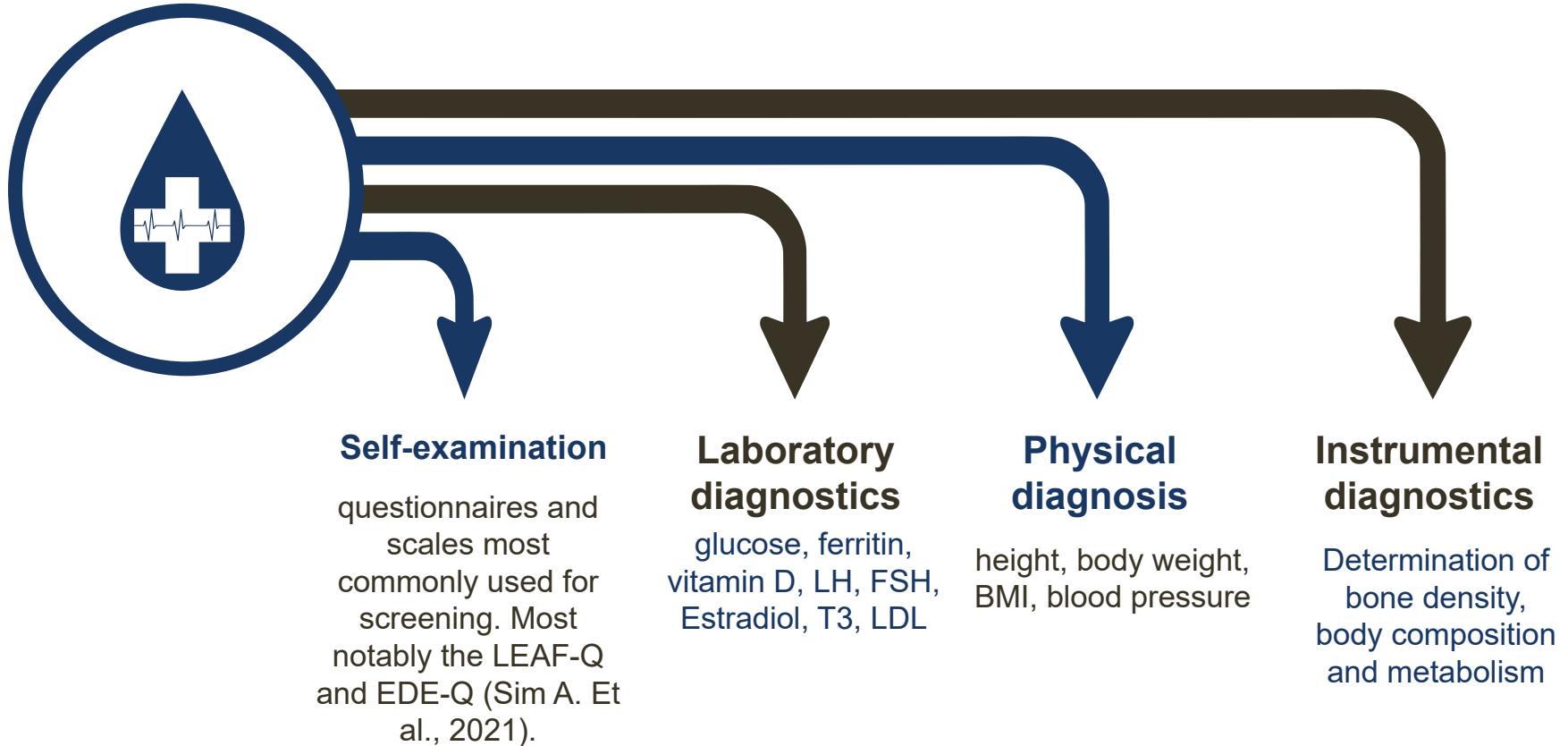
- Irregular or absent menstruation
- Recent rapid weight loss
- Food restrictions
- Stress fractures
- Overuse injuries
- Recurrent, frequent infectious diseases
- Heart disorders

A dozen red flags?! I love them!



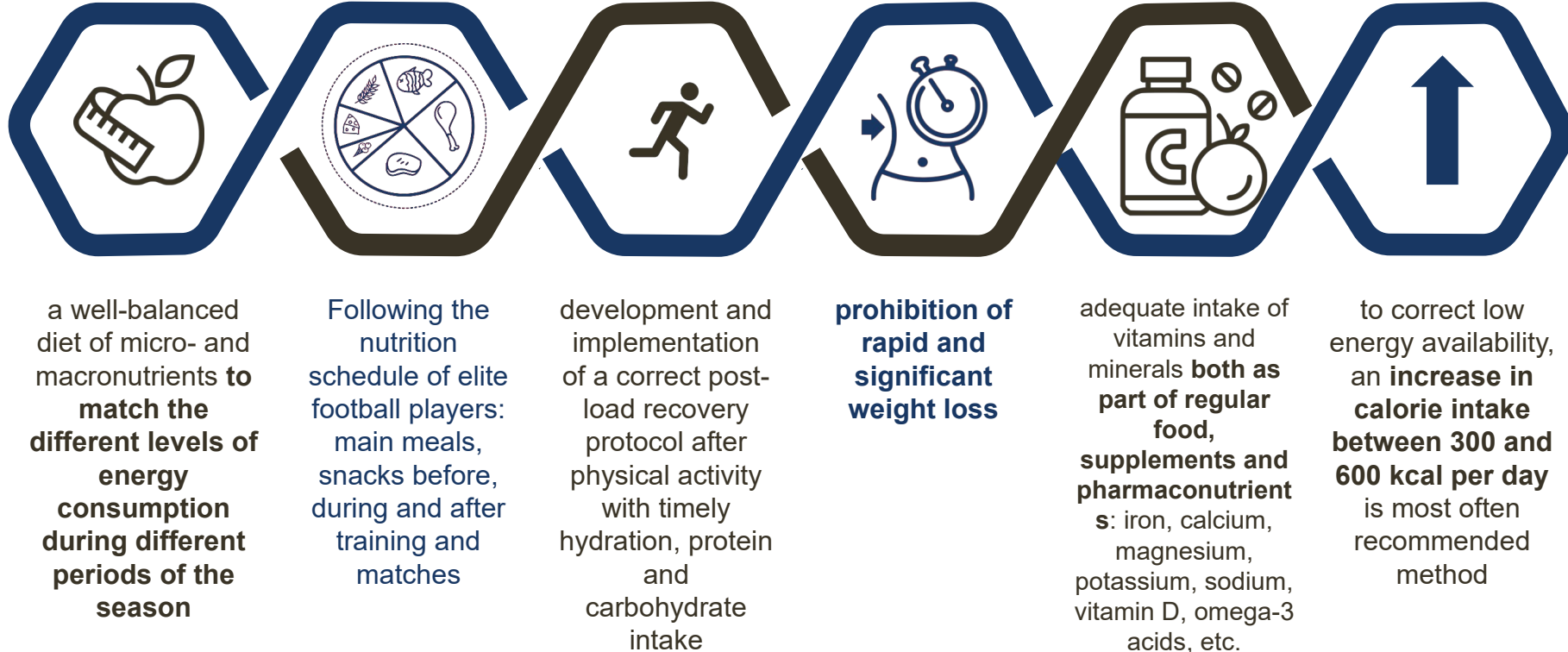
# DIAGNOSTICS

Making the right diagnosis can be very difficult due to unclear signs and non-obvious causes of the disease, so very often RED-S is "hiding" behind a wide group of other diagnosis



The fundamental method of treatment is identify and eliminate the cause of low energy availability

## TREATMENT



## PROPHYLACTICS



First of all, **prevention is awareness**, appropriate and timely treatment of other diseases (especially GI and endocrine system), as well as cooperation between female athletes, medical staff, coaches and environment to identify early signs of RED-S and their correction.

The psychological state of the athlete plays a major role in this, so it is important to reduce the accentuation on weight, fat percentage and fitness.

Correction of nutrition and training should always be done in co-operation with medical staff or profile specialists

# SUMMURY

**Almost half of the interviewed of female athletes are at risk for RED-S.**

And it's combined with a high level of anxiety about shape and weight, with a lack of awareness and control. Not only by the female athletes, but also the coaching staff.

It means **only by raising awareness of this problem** among athletes, coaches and medical staff is it possible to significantly reduce injuries and improve the quality of life for about 40% of the league's female soccer players.



**ISOKINETIC  
MEDICAL GROUP**

**FIFA**

**MEDICAL CENTRE  
OF EXCELLENCE**



**THANK YOU FOR YOUR  
ATTENTION!**



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