



# WOMEN IN CANOE SPORT

Long-term athlete development and specificity of physical preparation in women

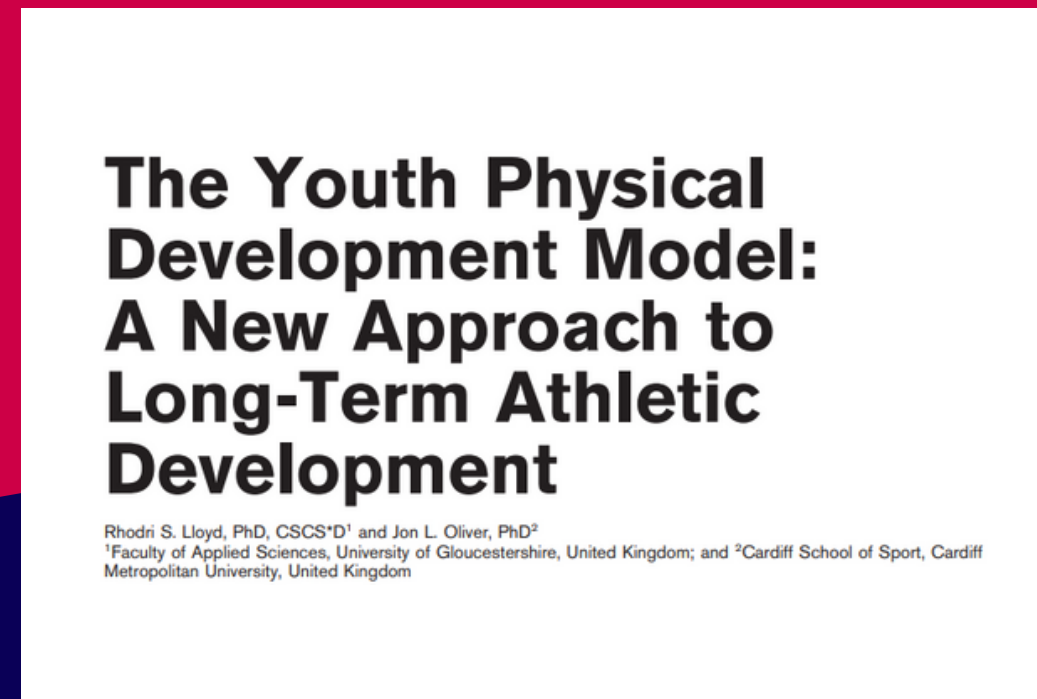
**Matej Vajda**

# What is Long-term athlete development?



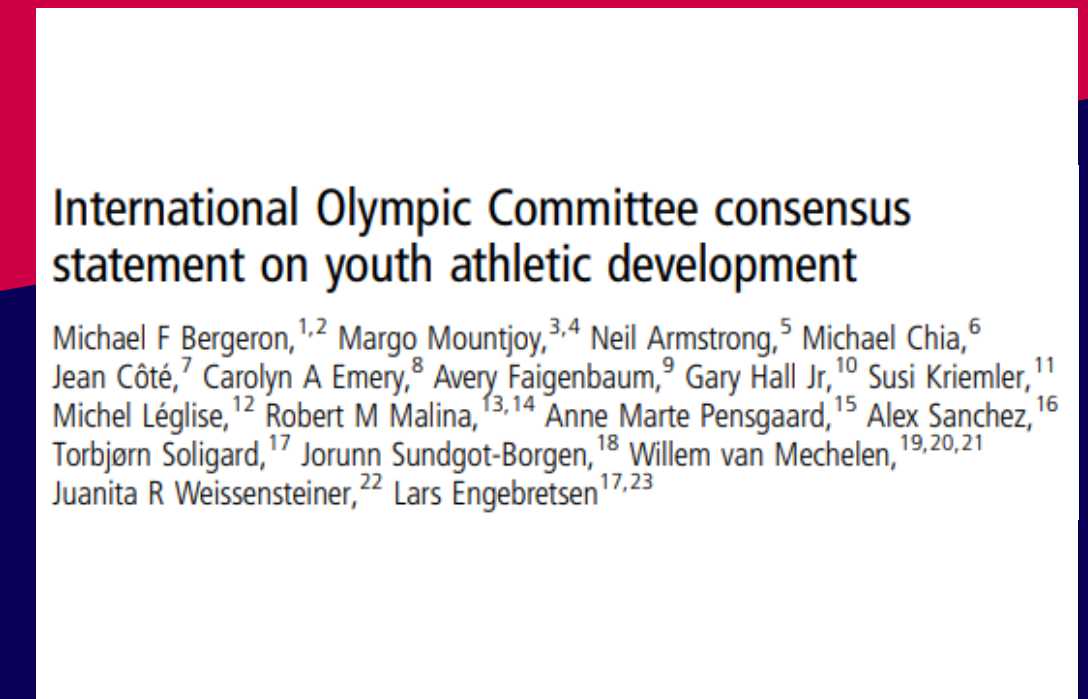
Long-term Athlete  
Development

LTAD  
CANADA



The Youth Physical  
Development Model

YPDM  
UK



IOC CS on youth athletic  
development

Consensus statement  
IOC



## POPULATION

Create healthy and active population



## SPORT

Maximalize performance of elite athletes

**WHAT I WANT TO REACH?**

**WHAT I WANT TO DO?**

**HOW DOES IT CHANGE?  
AM I ON THE RIGHT WAY?**

**AGE GROUP  
10 - 15 YEARS**

**WHAT I WANT TO REACH?**

SET THE GOALS

**WHAT I WANT TO DO?**

TRAINING PROGRAM

**HOW DOES IT CHANGE?  
AM I ON THE RIGHT WAY?**

TESTING

**AGE GROUP  
10 - 15 YEARS**



# GOALS IN AGE GROUP 10 - 15

1. POSITIVE RELATIONSHIP WITH THE SPORTS

2. PHYSICAL LITERACY

3. POSTURE AND FLEXIBILITY

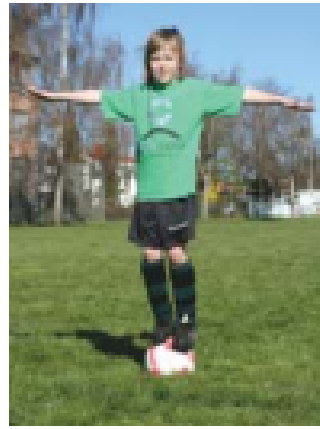
4. PHYSICAL FITNESS: GENERAL AND SPECIFIC

5. COMPETITIVENESS

# PHYSICAL LITERACY



Agility



Balance



Co-ordination



Speed



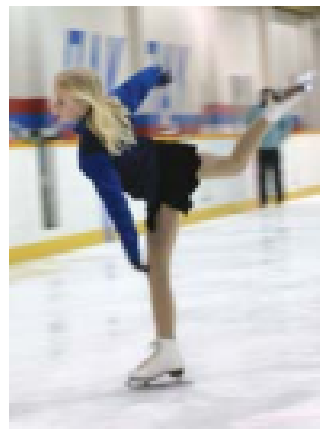
Jumping



Climbing



Walking



Skating



Hopping



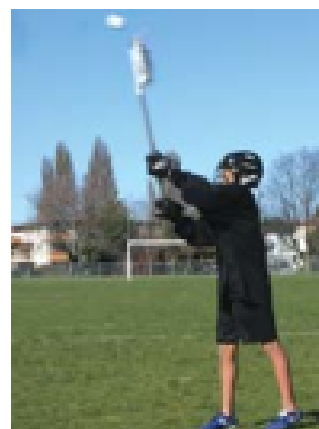
Swimming



Skipping



Balance



Throwing



Dribbling



Kicking



Throwing

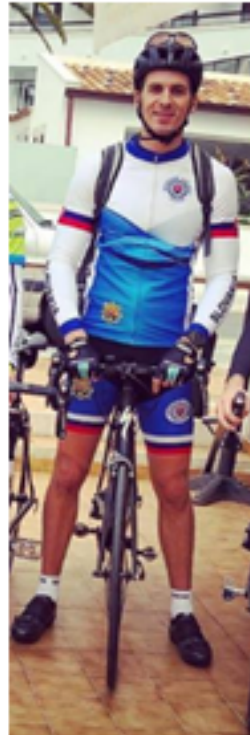
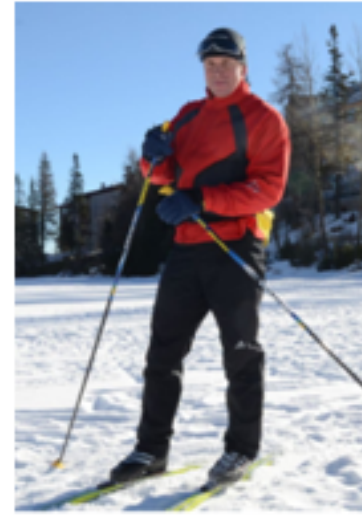


Hitting

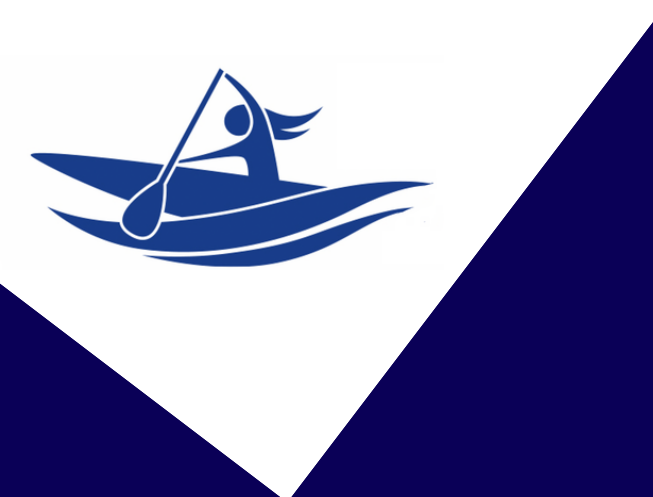


Catching

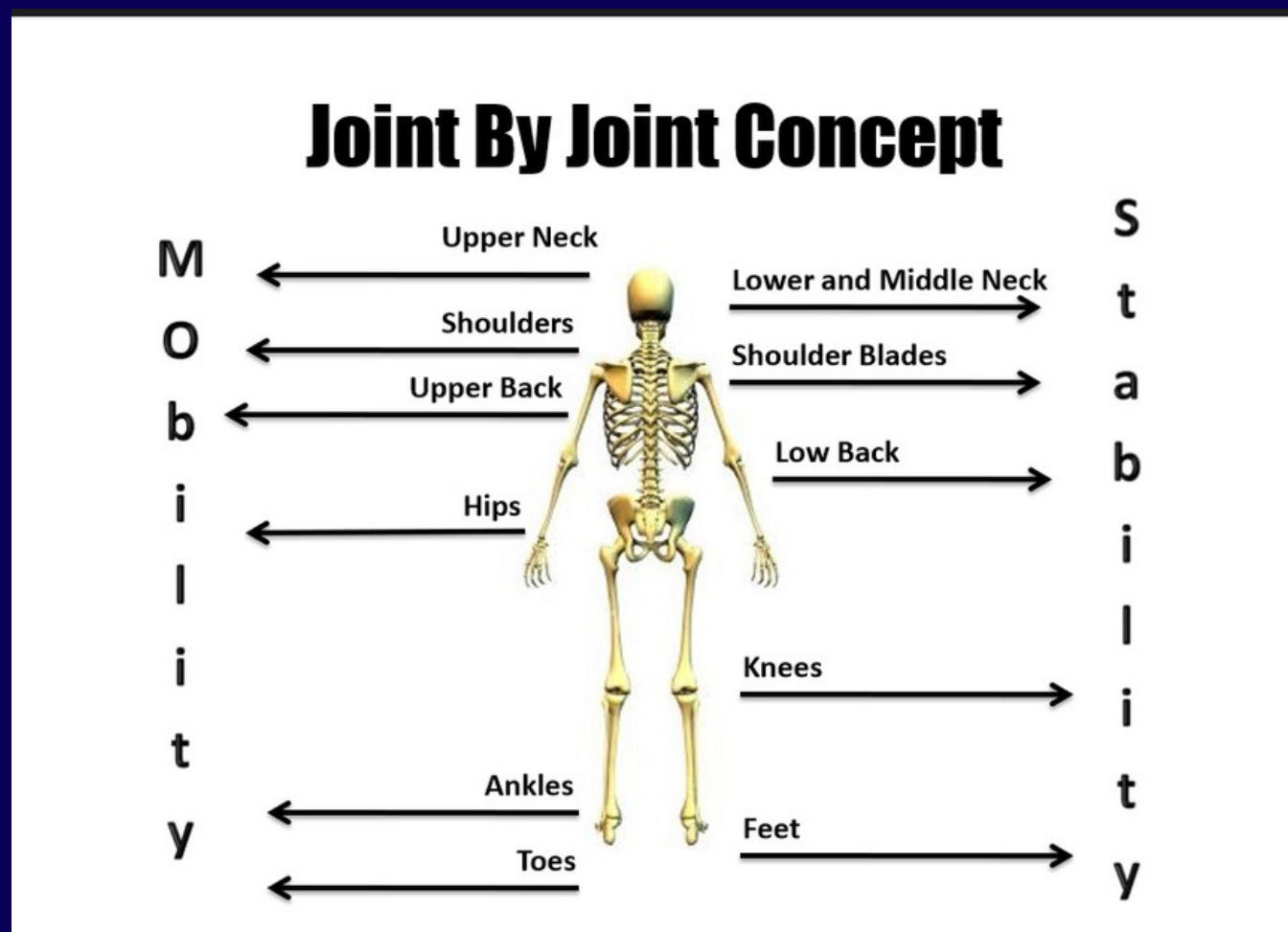
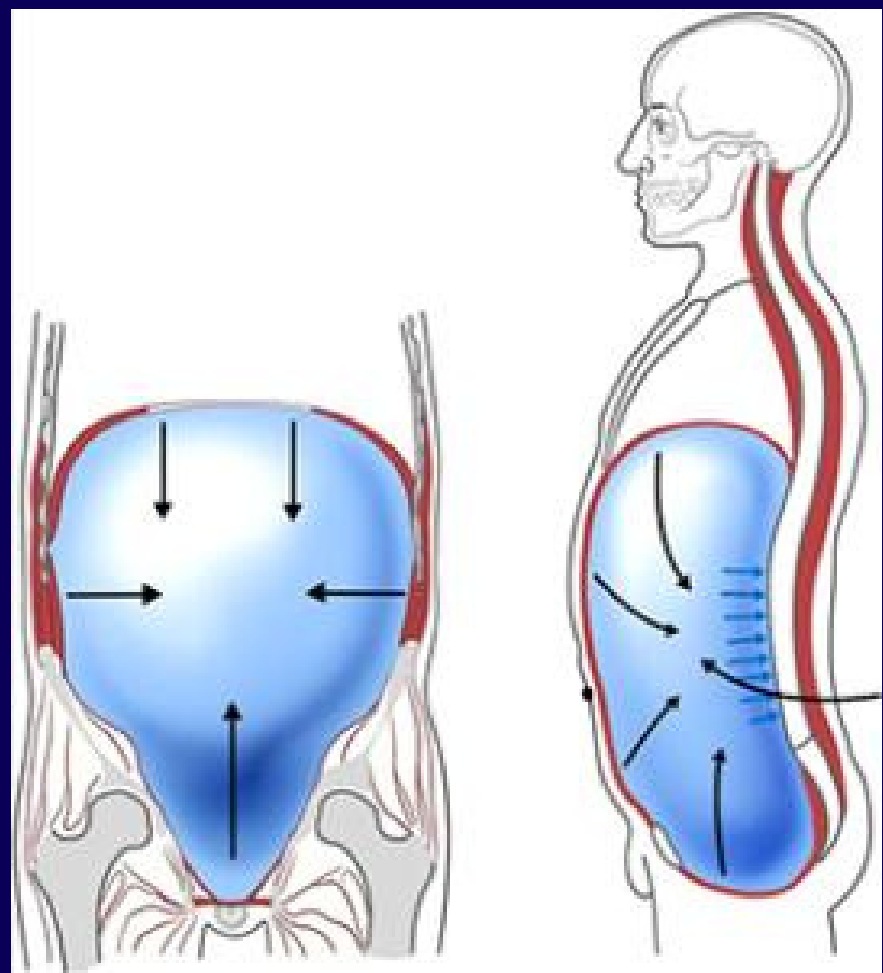
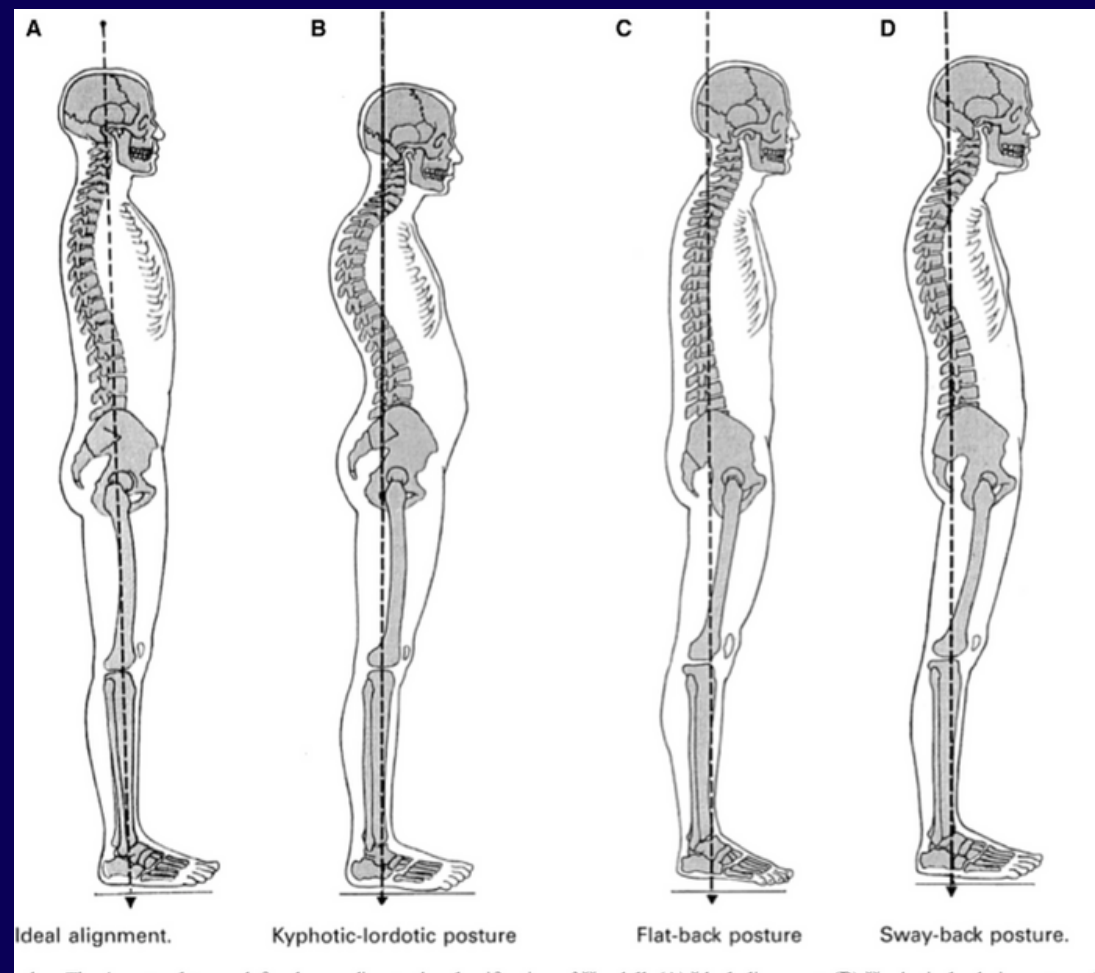
# ELITE ATHLETES







# POSTURE, MOBILITY AND FLEXIBILITY



# PHYSICAL FITNESS: GENERAL AND SPECIFIC

## LTAD

## EARLY SPECIALISATION

### POTENCIÁLNE RIZIKÁ A BENEFITY PREDČASNEJ ŠPORTOVEJ ŠPECIALIZÁCIE

Málo času  
na priateľov

Zhoršenie psycho-  
sociálneho zdravia a  
rozvoja

Rodinný  
stres a  
napätie

Zhoršenie  
prospechu  
v škole

Vyhorenie  
a odchod  
zo športu

Zvýšené riziko  
zranení

Zhoršenie celkového  
rozvoja športovca

Málo rozvinutá  
neuromuskulárna  
koordinácia

Zníženie  
potešenia  
zo športu

Vysoké  
náklady

Predčasná športová špecializácia nie je  
podmienka na úspech vo vrcholovom športe ...



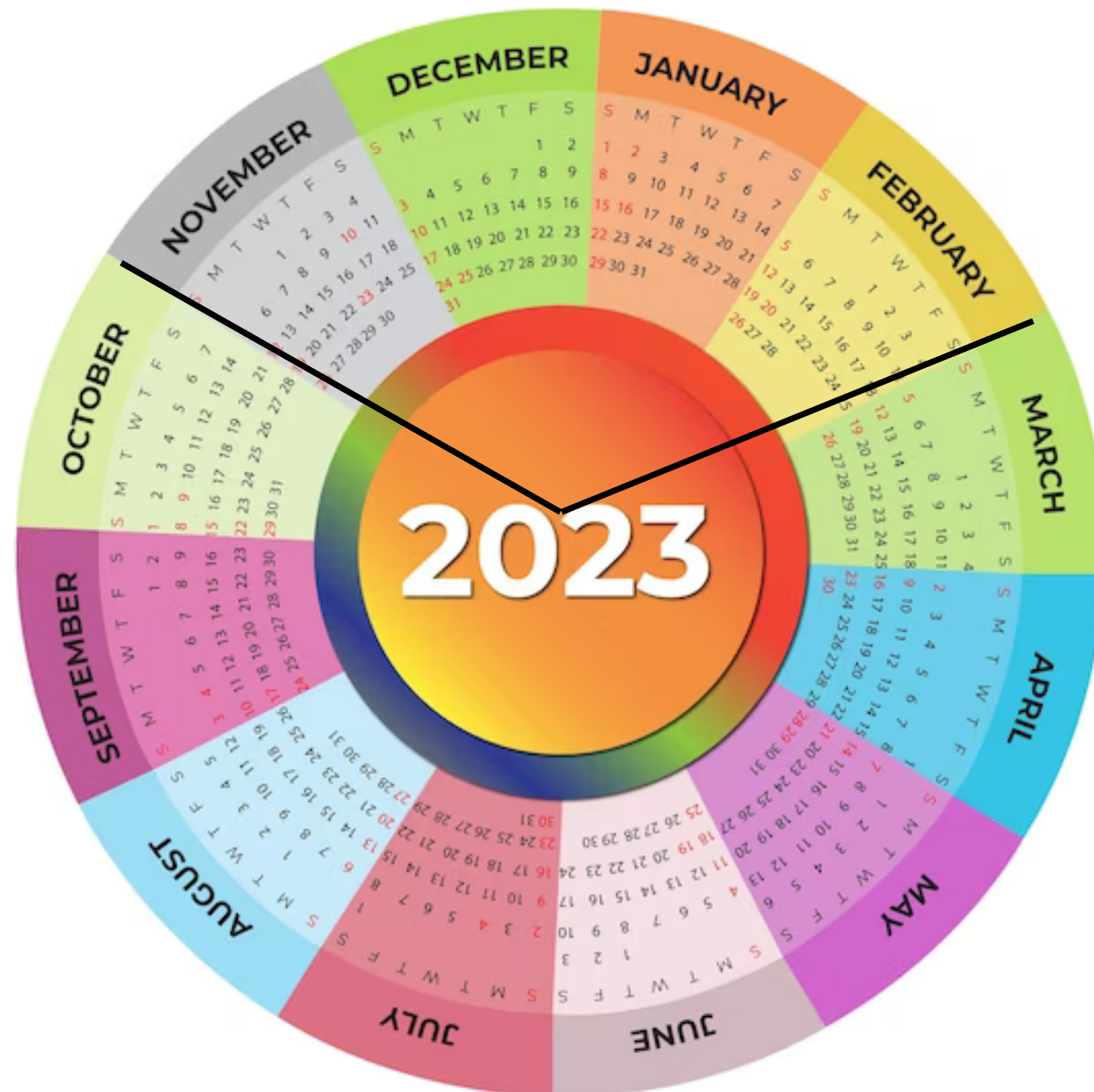
... má zväčša negatívny vplyv na fyzické a  
psychické zdravie mladých športovcov.  
Zmenšuje priestor na neštruktúrovanú  
voľnú hru, ktorá má mnoho výhod.

LaPrade, Robert F et al. "AOSSM Early Sport Specialization Consensus Statement." *Orthopaedic journal of sports medicine* vol. 4,4 2325967116644241. 28 Apr. 2016. doi:10.1177/2325967116644241

Bean, Corliss N et al. "Understanding how organized youth sport maybe harming individual players within the family unit: a literature review." *International journal of environmental research and public health* vol. 11,1010226-68. 1 Oct. 2014. doi:10.3390/ijerph111010226

**POZOR: predčasná špecializácia!** Jednostranný fyzický, technický a taktický rozvoj zvyšuje pravdepodobnosť výskytu zranení a syndrómu vyhorenia.

# PHYSICAL FITNESS: GENERAL AND SPECIFIC



**STRENGTH AND  
CONDITIONING**

**THE PRINCIPLE OF TRAINING:**

# STRENGTH AND CONDITIONING

## THE PRINCIPLE OF TRAINING:

### Osobní trenér tatranského typu



# STRENGTH AND CONDITIONING

## THE PRINCIPLE OF TRAINING:

- PROPORTIONALITY
- CONTINUITY
- CONSISTENCY

# STRENGTH AND CONDITIONING

## THE PRINCIPLE OF TRAINING:

- PROPORTIONALITY
- CONTINUITY
- CONSISTENCY

### WHAT IS THE GOAL?

- TO PERFORM OPTIMAL TECHNIQUE
- INJURY PREVENTION - OVERUSED/ACUTE
- HEALTHY GROWN

# STRENGTH AND CONDITIONING

## RECOMMENDATIONS

- LEARN PROPER TECHNIQUE
- USE PROGRESSION/REGRESSION SYSTEM
- COMBINATION OF UNILATERAL/BILATERAL EXERCISES
- LEGS ARE ALSO IMPORTANT



## 1. POSITIVE RELATIONSHIP WITH THE SPORTS

= 100% ATTENDANCE AND DO ADDITIONAL ACTIVITIES

## 2. PHYSICAL LITERACY

= KNOW HOW TO RUN, SWIM, BIKE, CROSS-COUNTRY SKI...

## 3. POSTURE AND FLEXIBILITY

= GOOD POSTURE, MOBILITY AND FLEXIBILITY WITHOUT  
LIMITATION

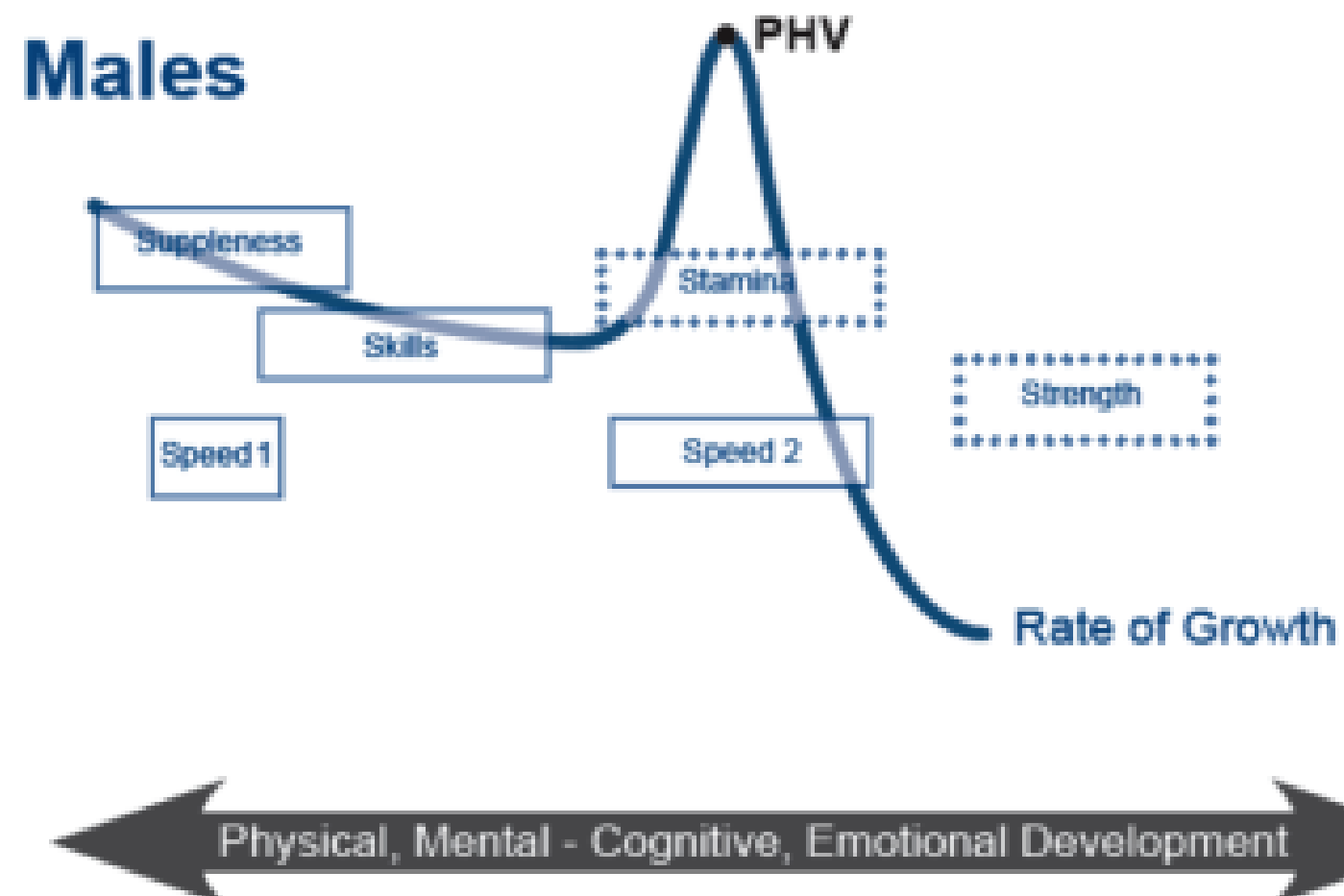
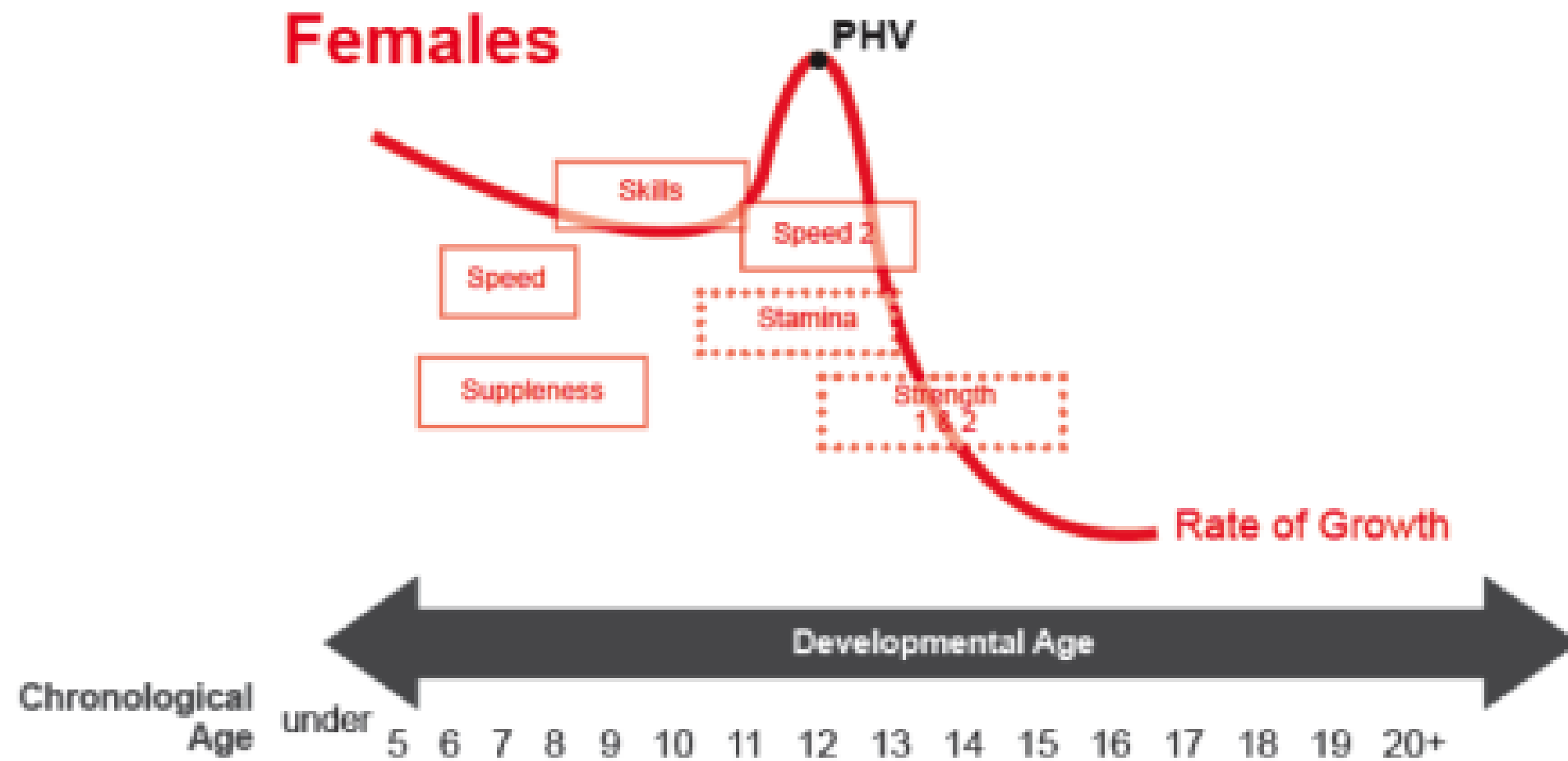
## 4. PHYSICAL FITNESS GENERAL AND SPECIFIC

= SUFFICIENT LEVEL OF PHYSICAL FITNESS

## 5. COMPETITIVENESS

= WINNING ATTITUDE, READINESS AND TEAM SPIRIT

**AGE GROUP  
10 - 15 YEARS**



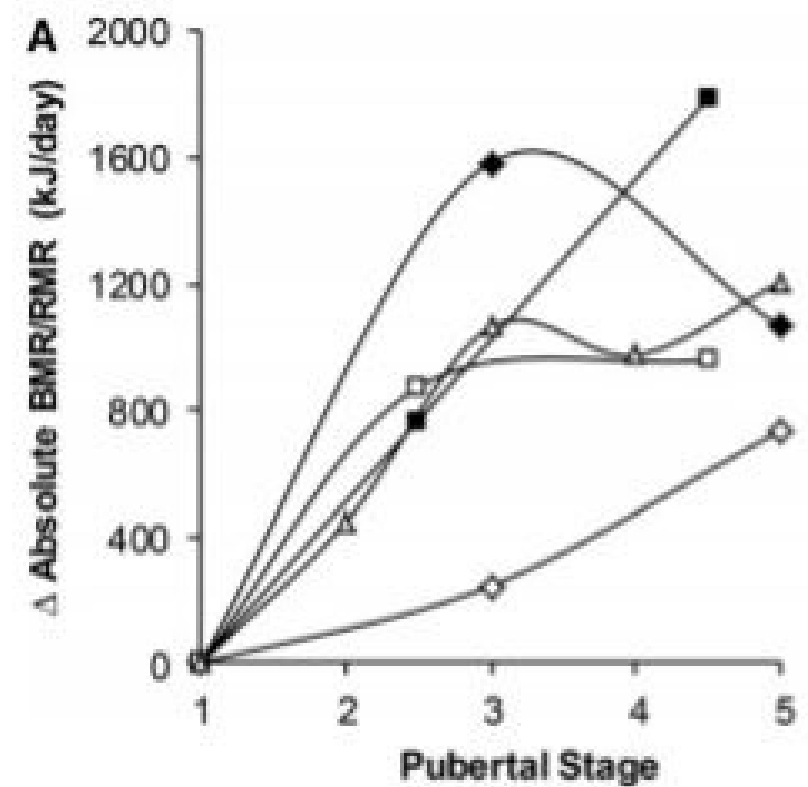
1. HUNGRY

2. TIRED

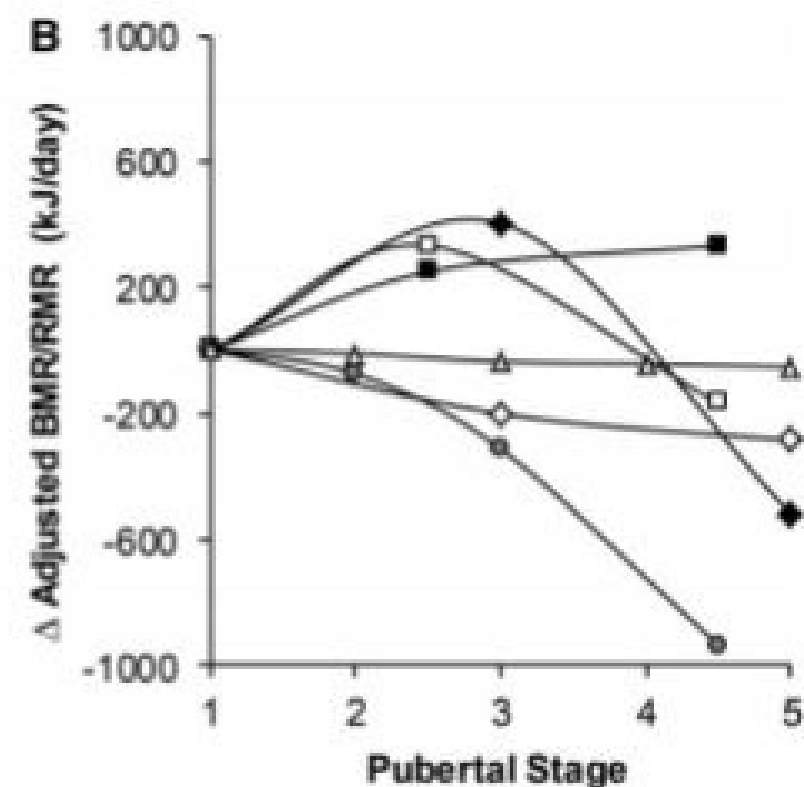
3. WORST RECOVERY/REGENERATION

4. BAD MOOD

5. REDUCTION IN PERFORMANCE

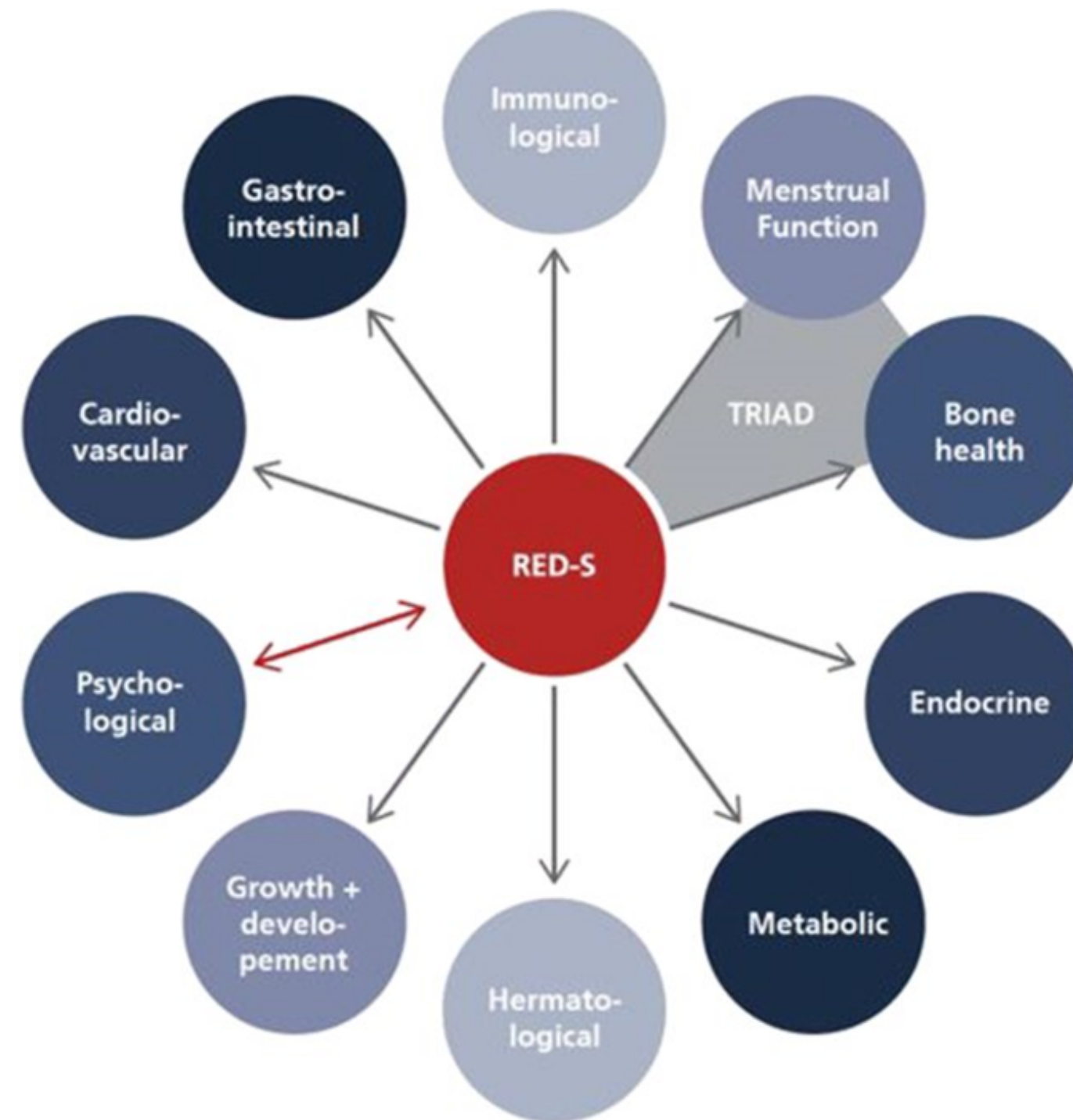


◆ Bitar et al., 1999 (M) (31)  
■ Molnar & Schutz, 1997 (M) (36)  
● Sun et al., 2001 (M&F) (43)



◇ Bitar et al., 1999 (F) (31)  
□ Molnar & Schutz, 1997 (F) (36)  
△ Wong et al., 1999 (F) (44)

# RELATIVE ENERGY DEFICIENCY



# PHV

Peak Height Velocity (PHV) is the maximum rate of growth that occurs during the pubertal growth spurt. This too is a key indicator required for the optimal timing of training. On average PHV occurs at about aged 12 for girls and about 14 for boys however it may occur as much as 2 years earlier or later.

Children usually grow at about 5-6 cm/year before puberty, this increases to about 9-10 cm/year during the growth spurt, which lasts anything from 1.5 – 5 years. (Menarche occurs in girls approximately 6 to 18 months after PHV. Girls rarely grow more than 5 cm after the menarche has occurred.)

Average growth rates during adolescence:

Boys	Girls
Year 1 = 6 cm / year	Year 1 = 5 cm / year
Year 2 = 9 cm / year	Year 2 = 7 cm / year
Year 3 = 6 cm / year	Year 3 = 5 cm / year
Year 4 = 3 cm / year	Year 4 = 3 cm / year
Year 5 = 2 cm / year	Year 5 = 1 cm / year
Year 6 = 1 cm / year	

BCU Long Term  
Paddler Development  
Pathway



Source: BCU Long term Paddler Development pathway Edition © British Canoe Union, 2004.

## BIO BANDING

- THE PERCENTAGE OF PREDICTED ADULT HEIGHT
- THE MATURITY OFFSET.

1. PRE-PUBERTAL (<85% OF PAH)
2. EARLY PUBERTAL (>85-90% OF PAH)
3. MID-PUBERTAL (90-95% OF PAH)
4. LATE PUBERTAL (>95% OF PAH)

# GOALS IN AGE GROUP 16 - 23

## AGE GROUP 16 - 23 YEARS

1. FOCUS AND PRIORITIES

2. MENTAL RESISTANCE

3. POSTURE AND FLEXIBILITY

= GOOD POSTURE, MOBILITY AND FLEXIBILITY WITHOUT LIMITATION

4. PHYSICAL FITNESS GENERAL AND SPECIFIC

= SUFFICIENT LEVEL OF PHYSICAL FITNESS

5. COMPETITIVENESS

= WINNING ATTITUDE, READINESS AND TEAM SPIRIT



**ATTENTION:** THIS STAGE MAKES SIGNIFICANT DEMANDS ON THE PSYCHOLOGICAL SIDE OF THE YOUTH.

**MENTAL PREPARATION:** BECOMES A PART OF THE TRAINING PROCESS AND FORMS MENTAL RESISTANCE, THE ABILITY TO HANDLE SUCCESS AND FAILURE, COMPETITIVE CONDITIONS AND THE LIKE.

**WHAT I WANT TO REACH?**

SET THE GOALS

**WHAT I WANT TO DO?**

TRAINING PROGRAM

**WHAT I REALLY DO?**

TRAINING DIARY

**HOW DOES IT CHANGE?  
AM I ON THE RIGHT WAY?**

TESTING



**AGE GROUP  
16 - 23 YEARS**



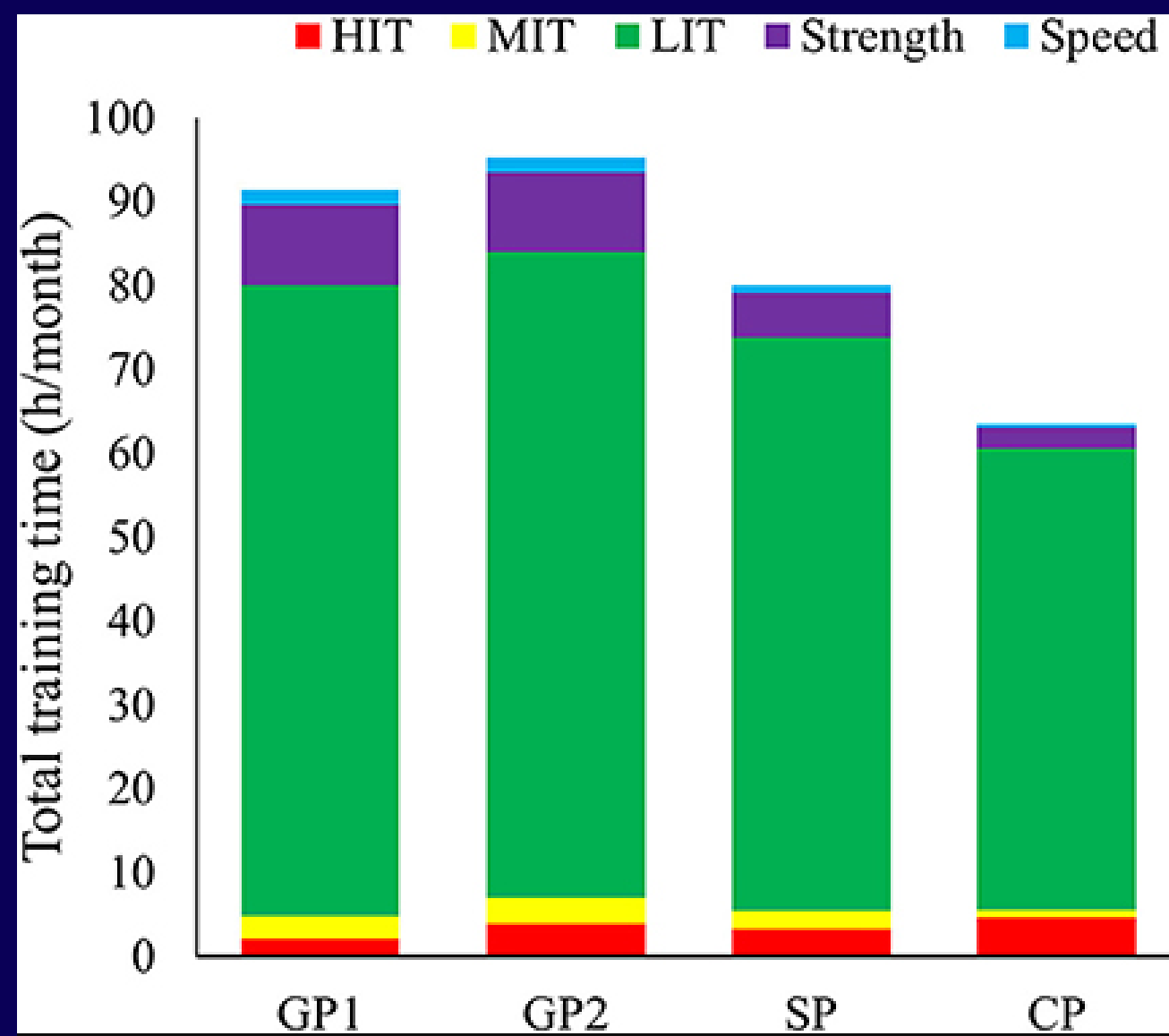
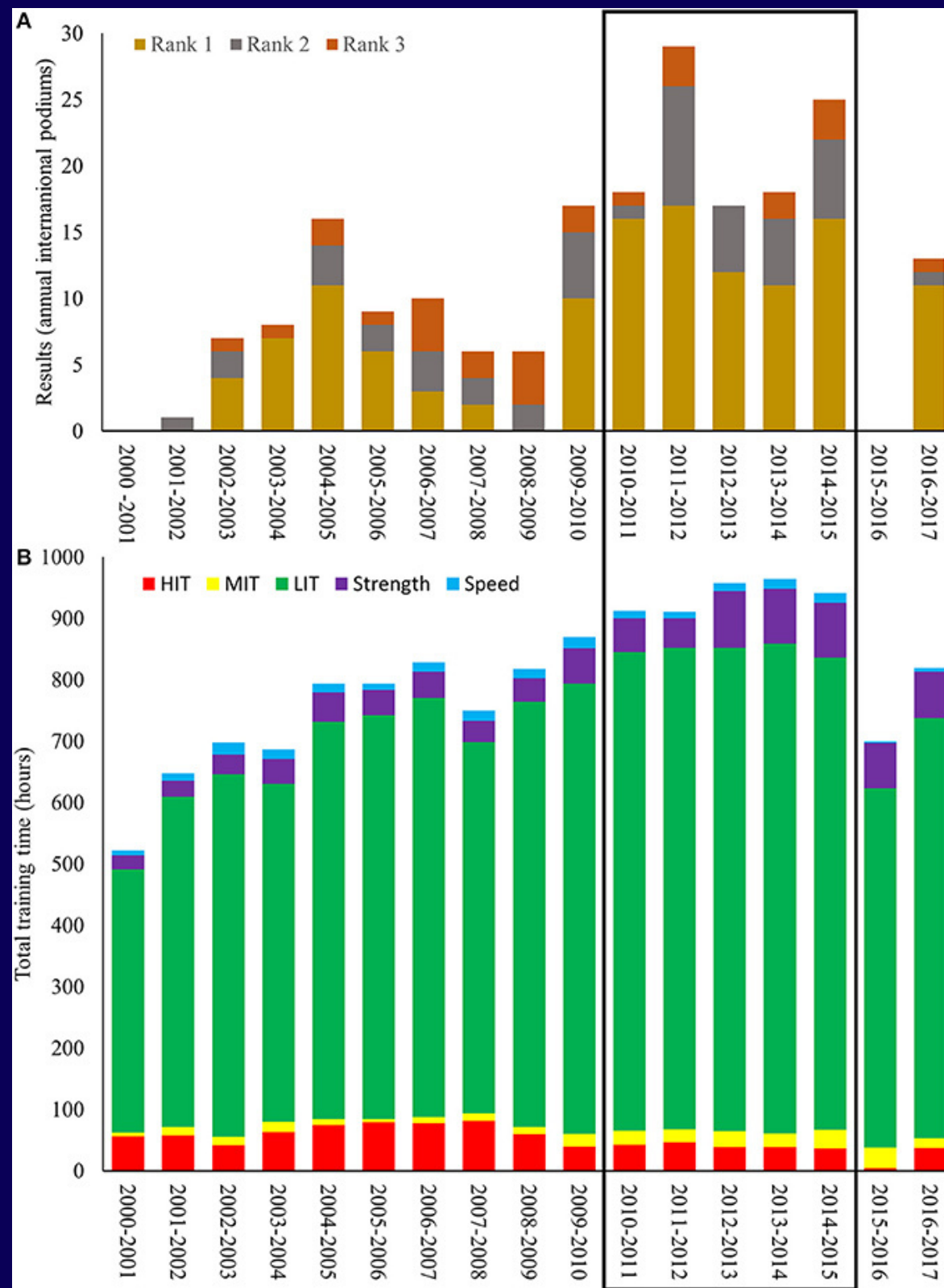
# WHAT I REALLY DO?

## TRAINING DIARY



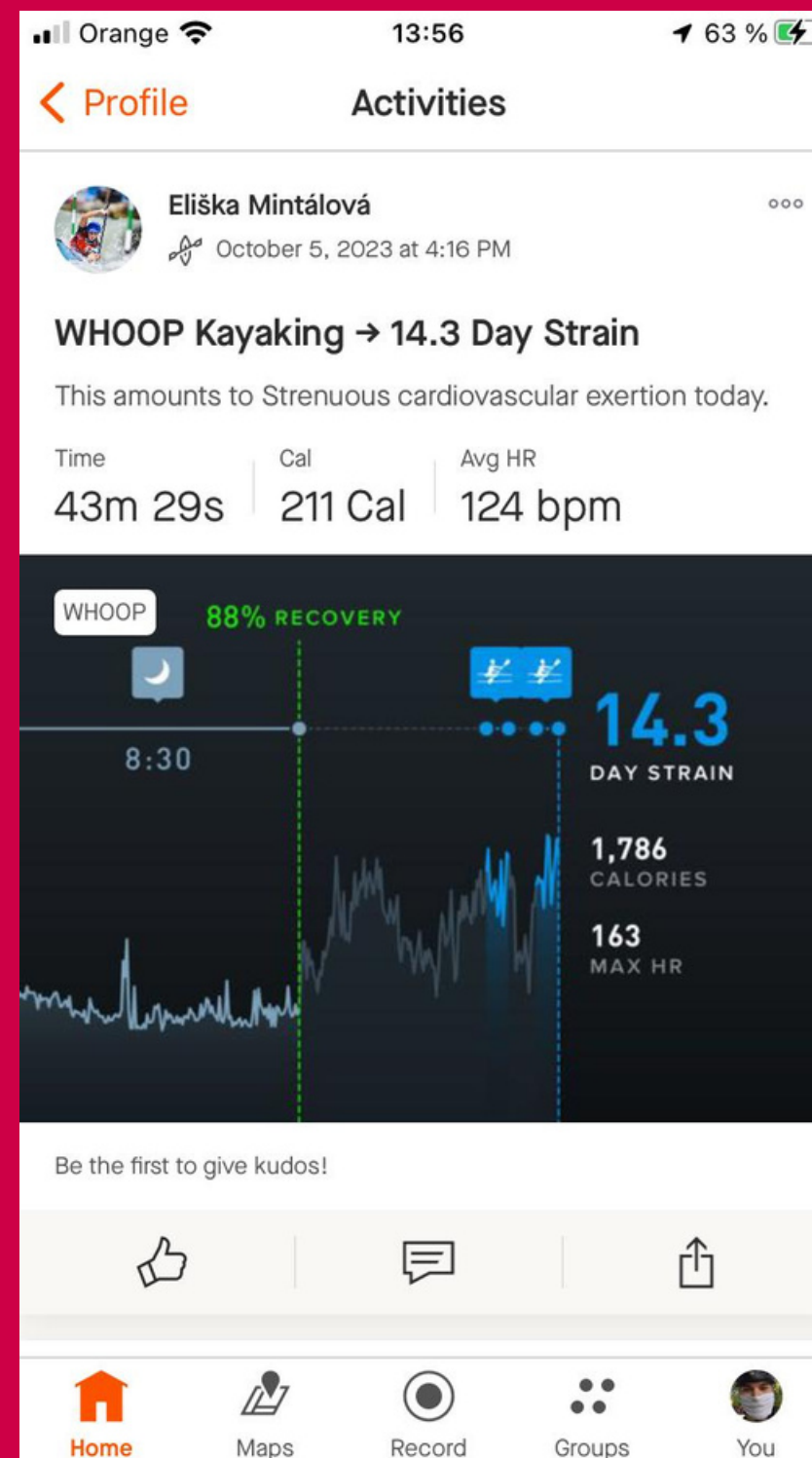
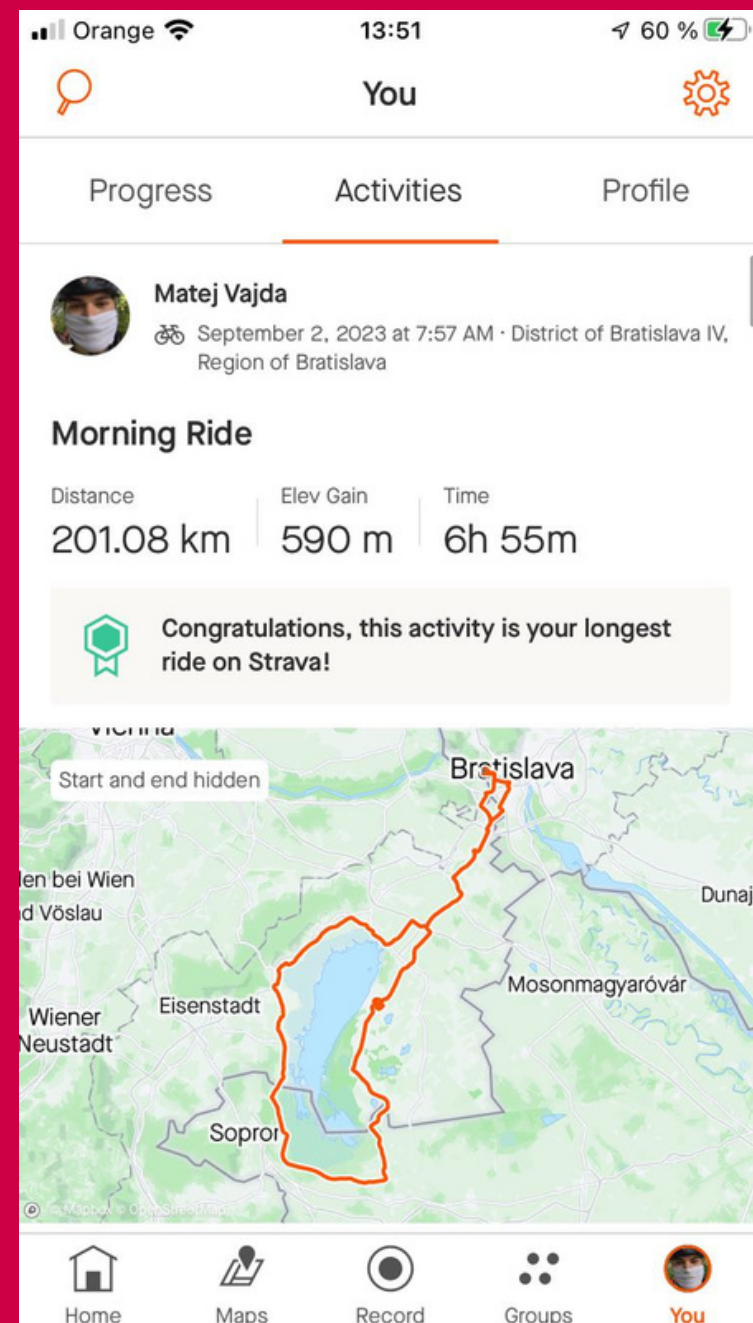
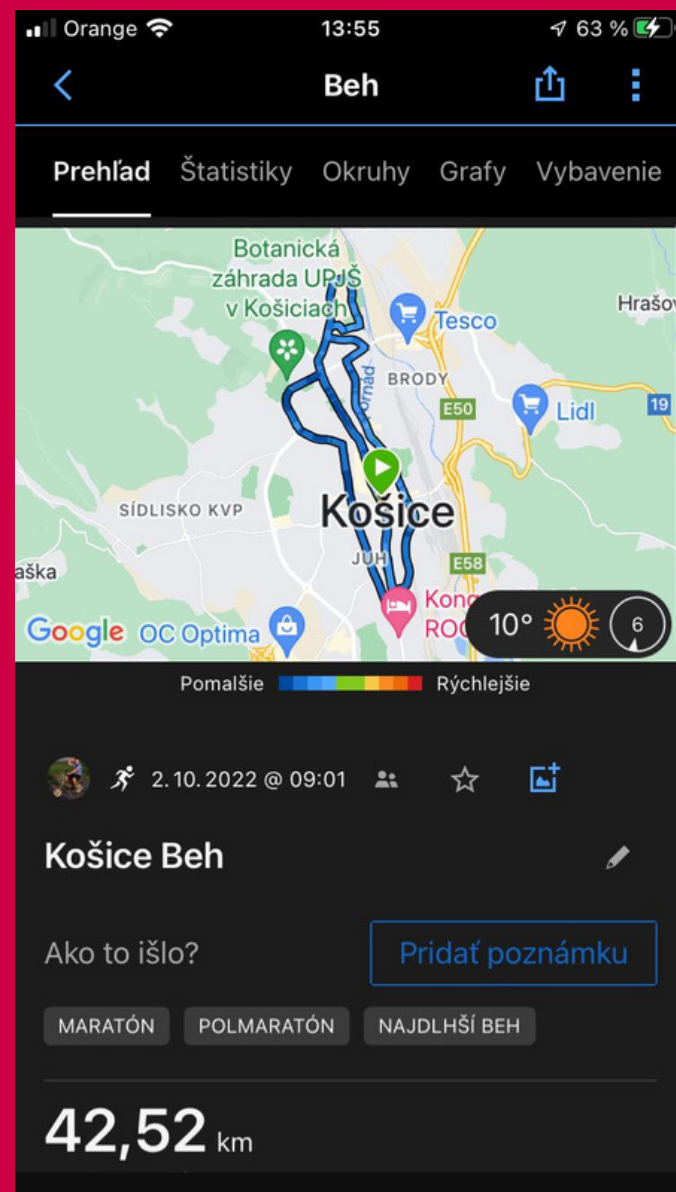
**AGE GROUP**  
**16 - 23 YEARS**

# ANALYSES OF HISTORY



# WHAT I REALLY DO?

## TRAINING DIARY



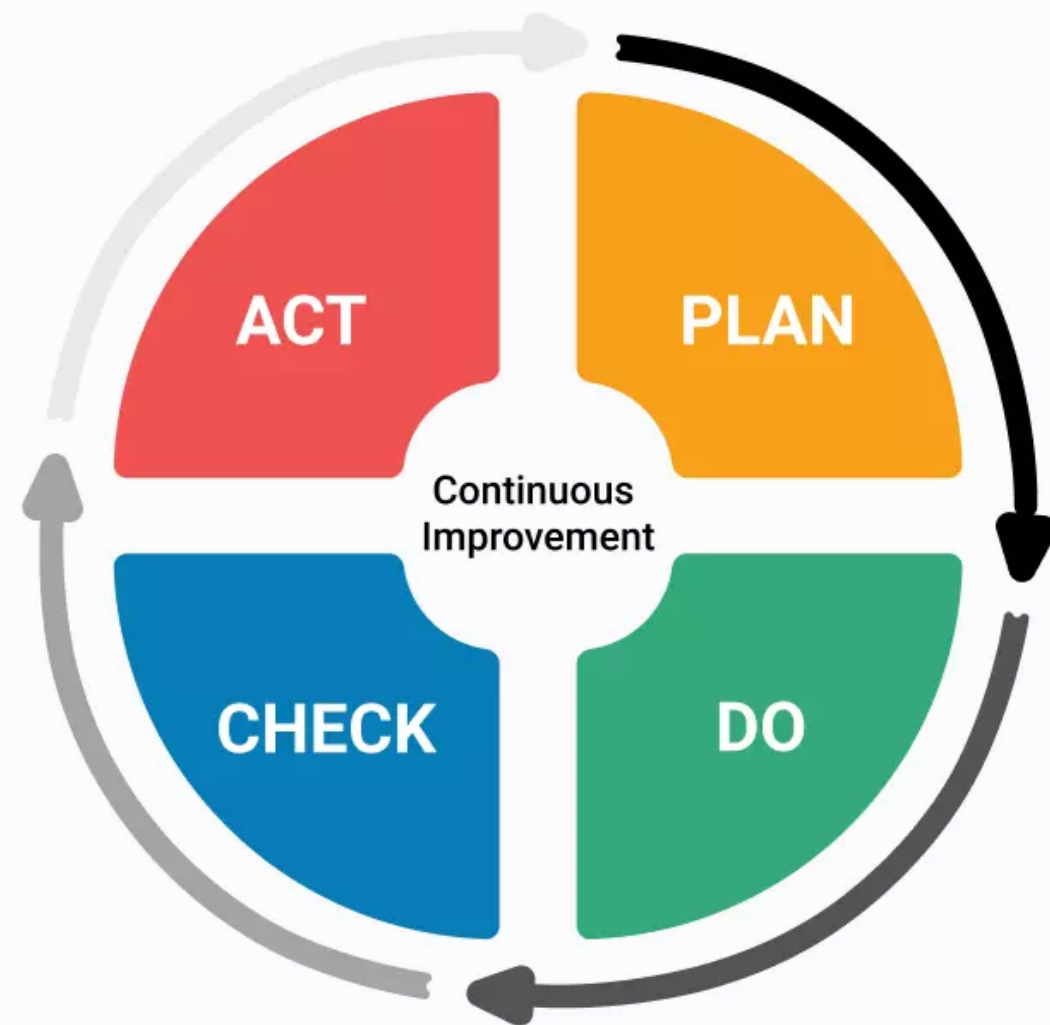
# AGE GROUP 16 - 23 YEARS

# WHY TESTING?



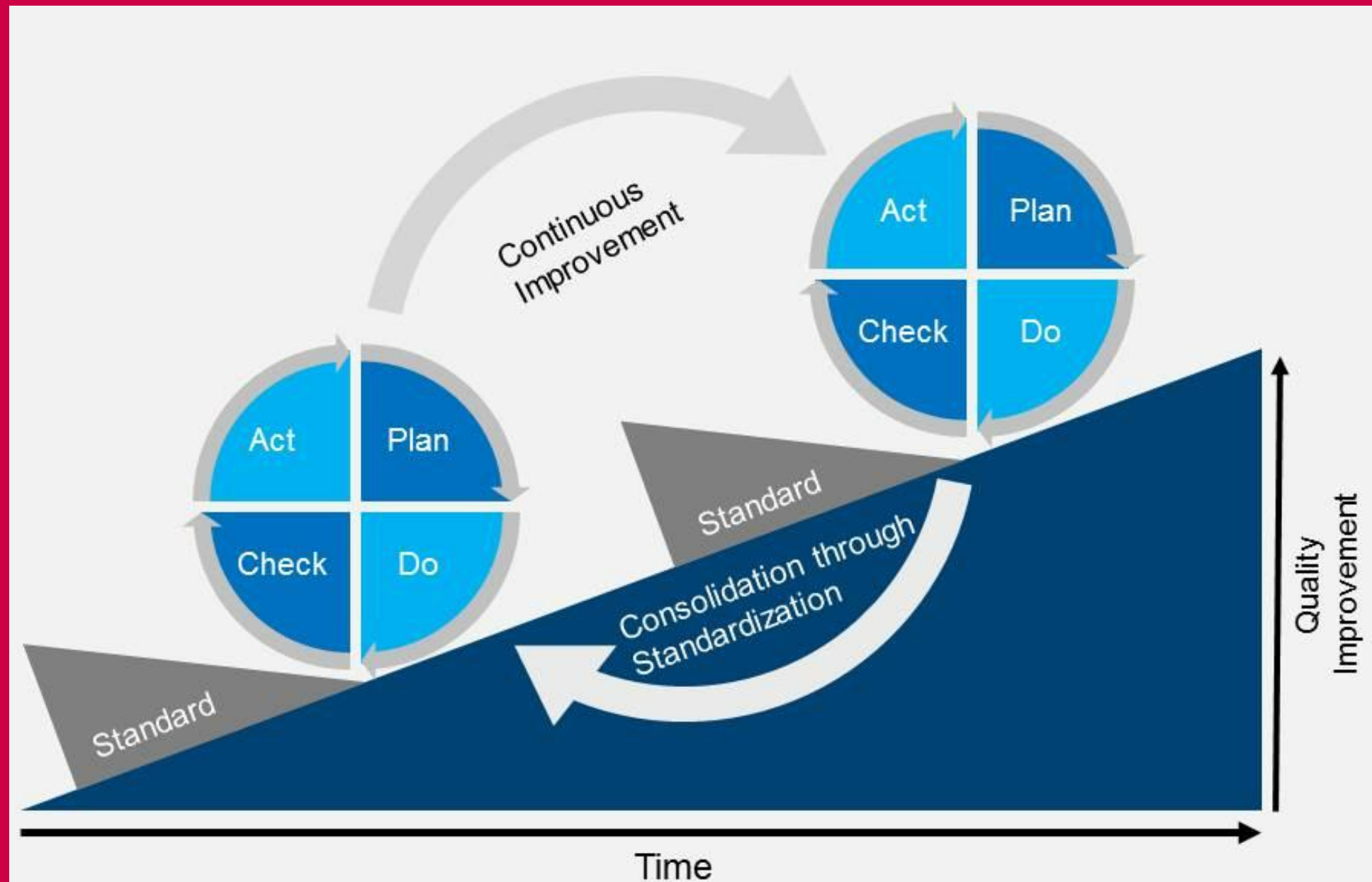


# PDCA - STRATÉGIA





# IMPROVMENT PROCES IN SPORT



# WHY TESTING?



- EVALUATION OF ACTUAL STATE
- IDENTIFICATION OF STRENGTHS AND WEAKNESSES
- EVALUATION OF THE EFFECTIVENESS OF THE TRAINING ACTION
- DISCLOSURE OF POTENTIAL HEALTH RISKS





# TESTING IN CANOE SLALOM

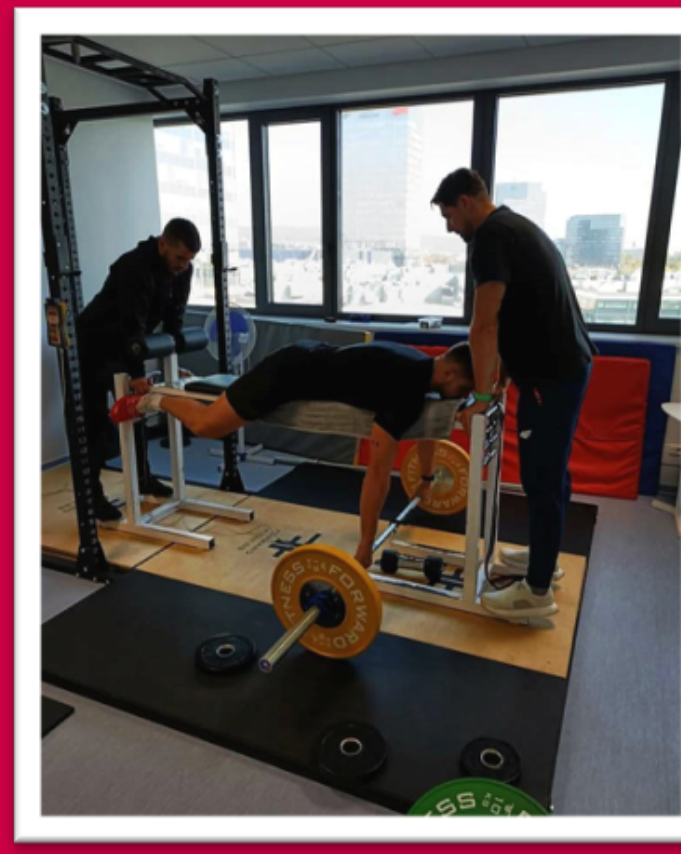
ORIGINAL RESEARCH article

Front. Physiol. 01 November 2023  
Sec. Exercise Physiology  
Volume 14 - 2023 | <https://doi.org/10.3389/fphys.2023.1277057>

This article is part of the Research Topic  
Training and Performance in Canoe Slalom  
[View all Articles >](#)

## Test–retest reliability of four flatwater performance-related tests in canoe slalom athletes

 Matej Vajda<sup>1\*</sup>  Felix Krupa<sup>2</sup>  Jan Busta<sup>3</sup>  Jaylene Pratt<sup>4</sup>





# WOMEN IN CANOE SPORT

Funded by the European Union

“1% BETTER EVERY DAY”

