NATIONAL YOUTH SPORTS INSTITUTE

SPORT SCIENCE WORKSHOPS
Preparation & Recovery

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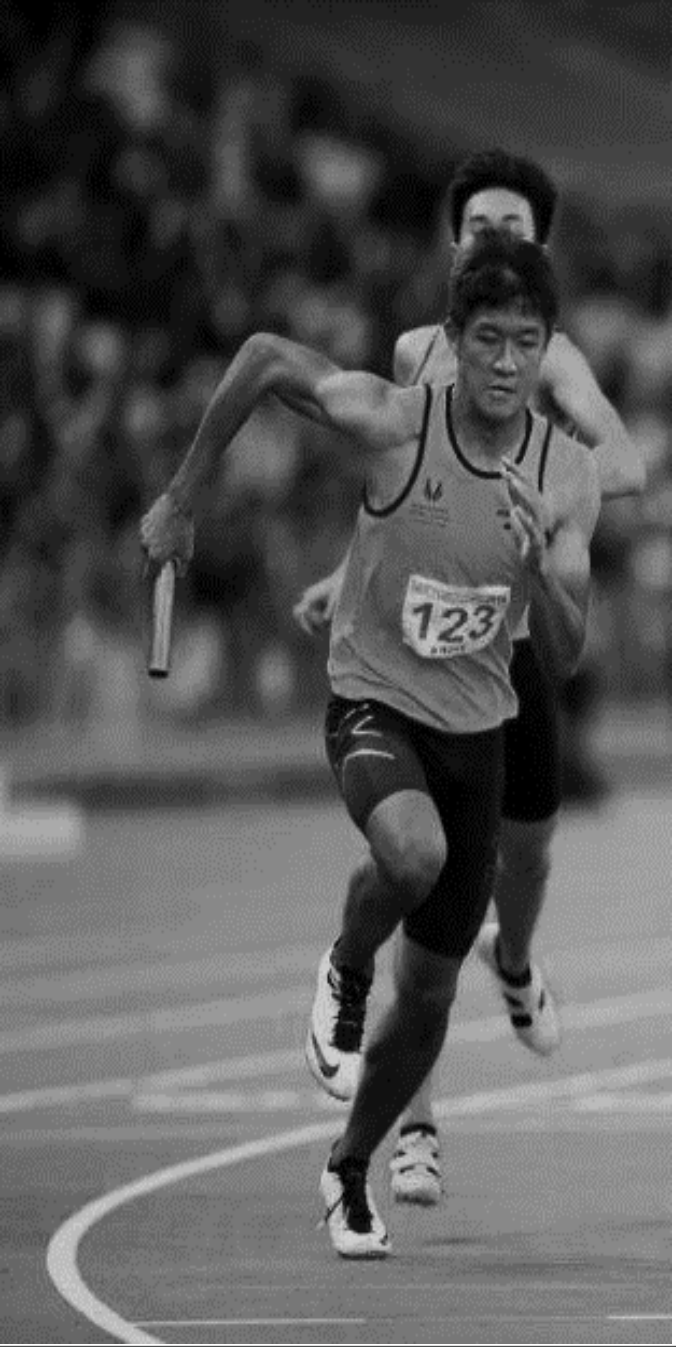


Today's Workshop

1. PERIODISATION & TAPERING
2. SLEEP
3. SUPPLEMENTARY RECOVERY MODALITIES

BUENOS AIRES 2018
YOUTH OLYMPIC GAMES
YOG DNA

TOKYO 2020

TRAIN BETTER

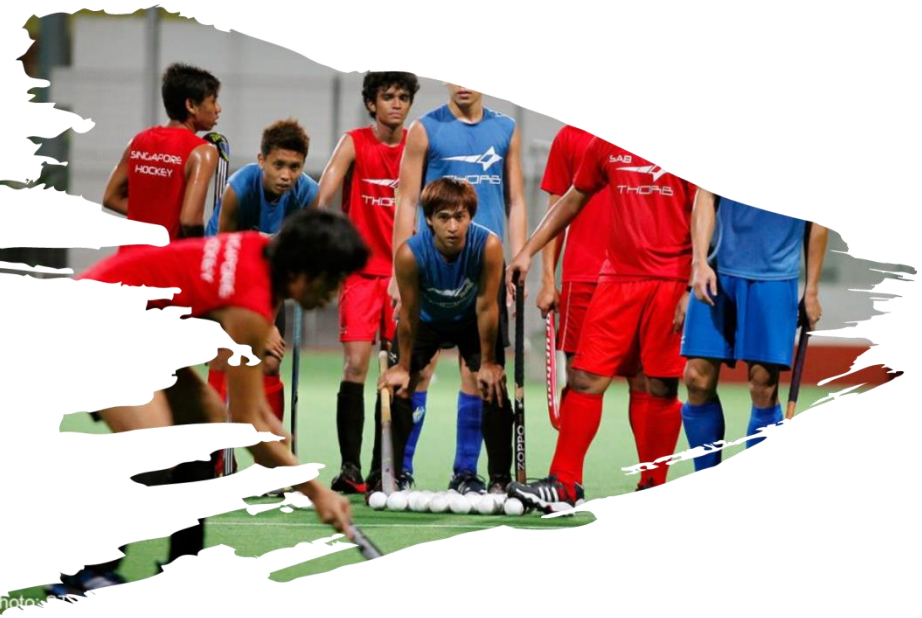
EAT BETTER

REST BETTER

Part 1

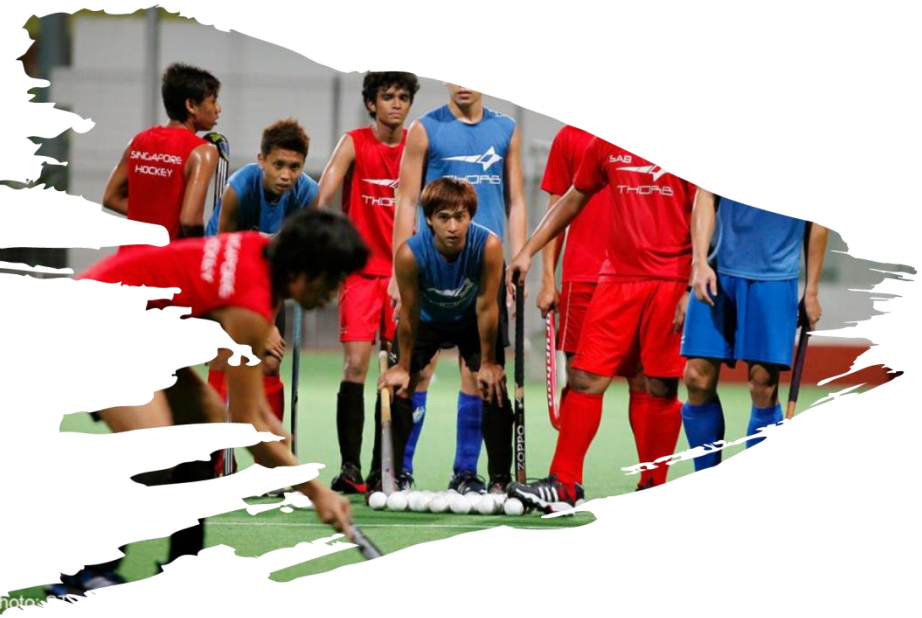
Periodisation

Periodization-What?



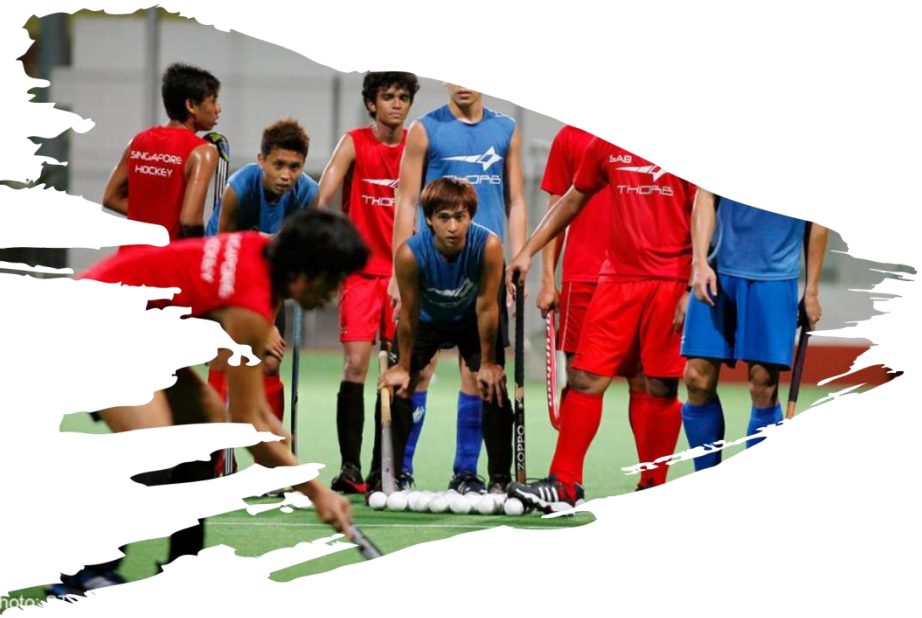
- Practical and theoretical planning paradigm
- The **organization** of training **variables into a yearly training plan**

Periodization-What?



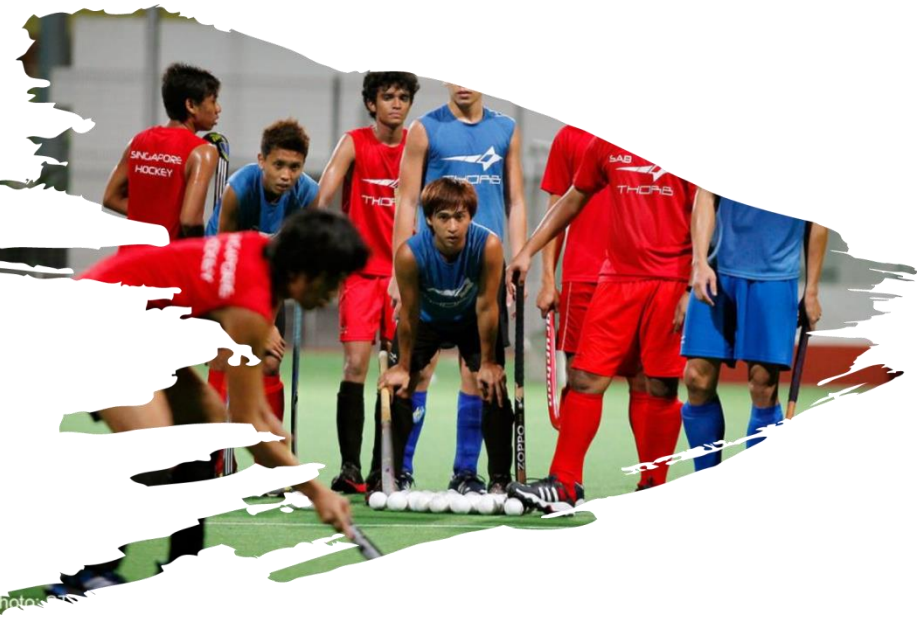
- Division of training year into smaller blocks to **help athletes peak for key competitions** and manage performance in a long season

Periodization-What?



- Athlete-centric
  - Needs of athlete
  - Developmental status
  - Athlete's strengths and weaknesses

Periodization-Why?



Adaptation

=

overload

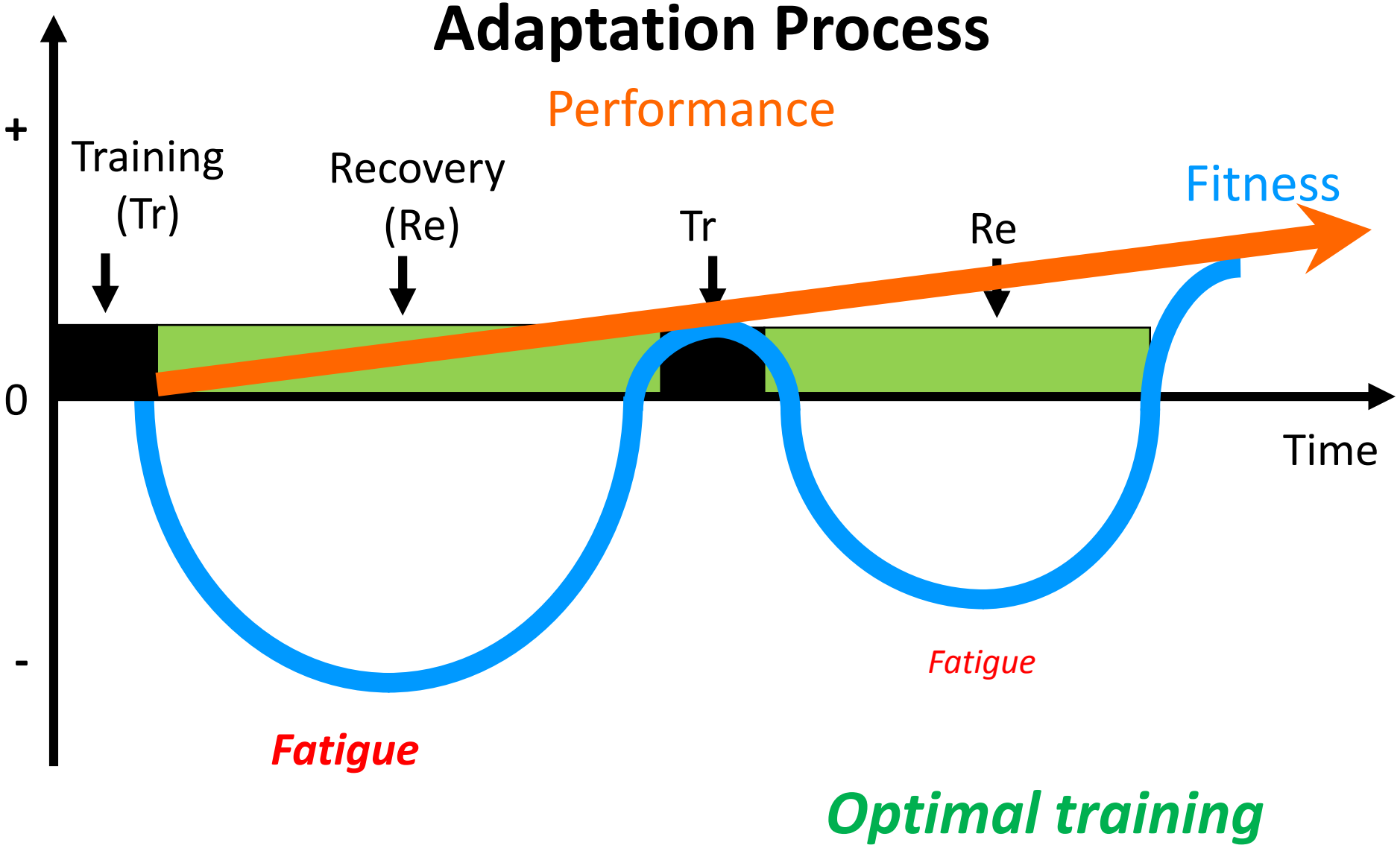
+

recovery

+

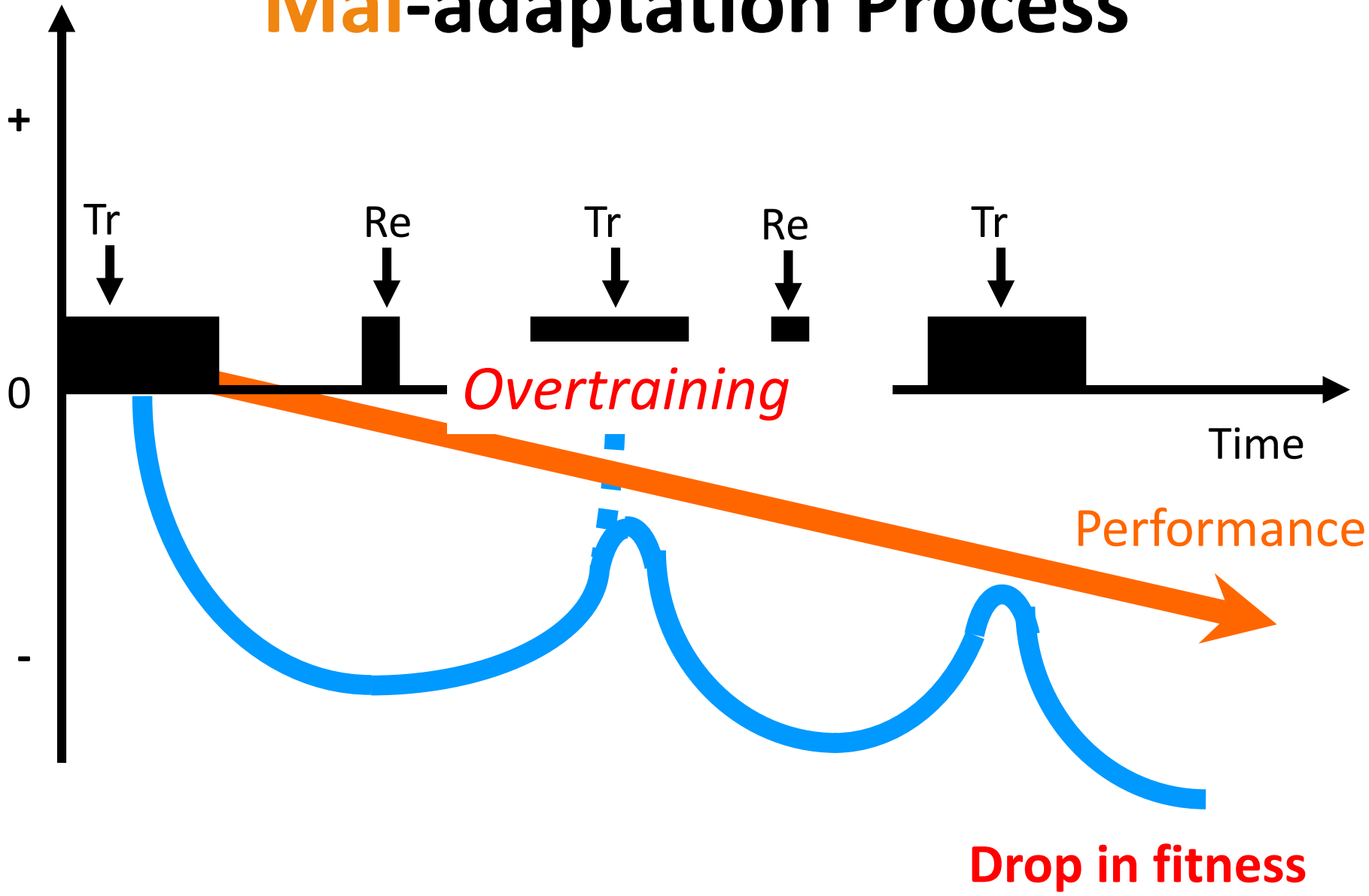
peaking

Principles of Training: Adaptation Process

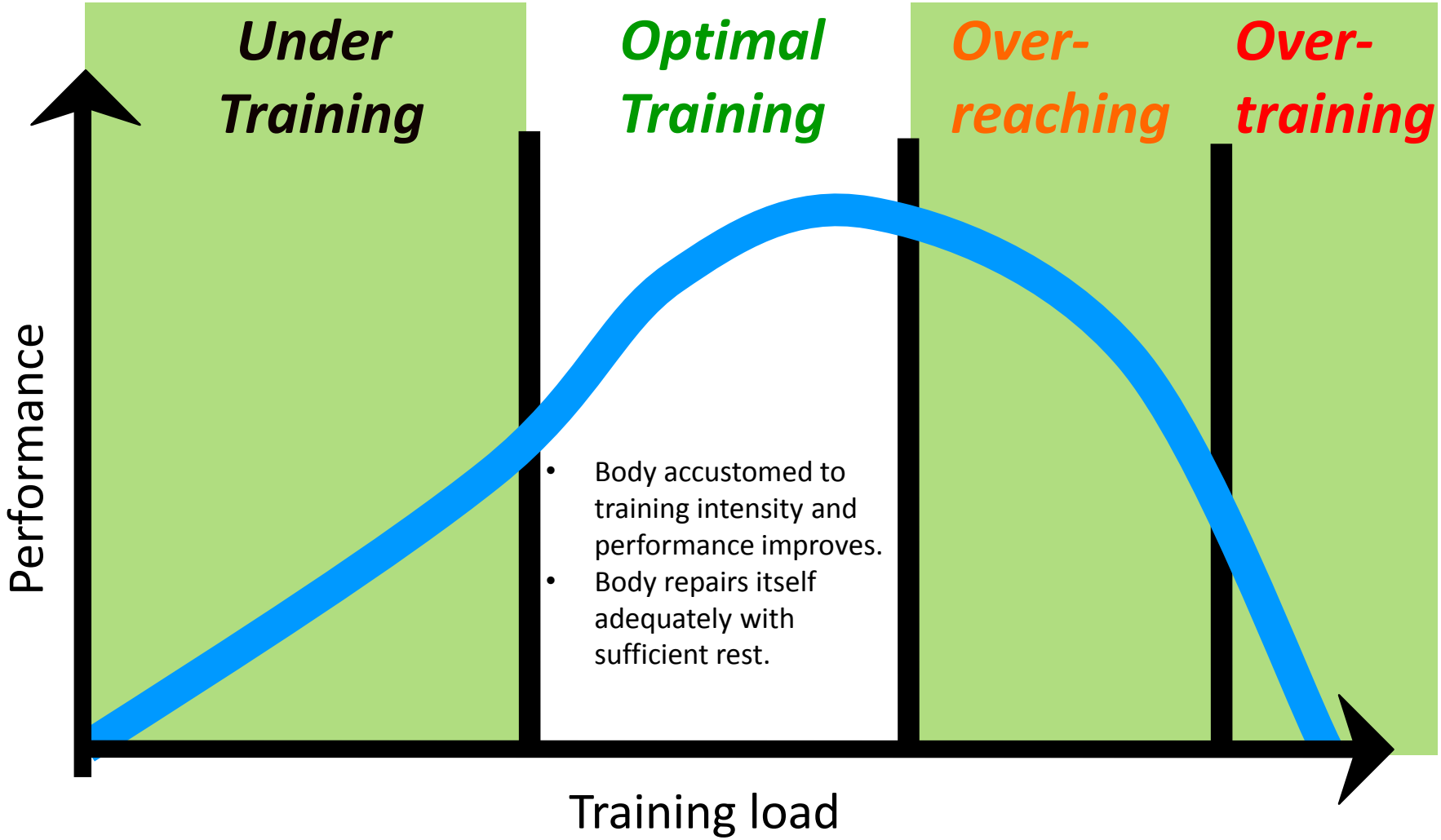


Optimal training

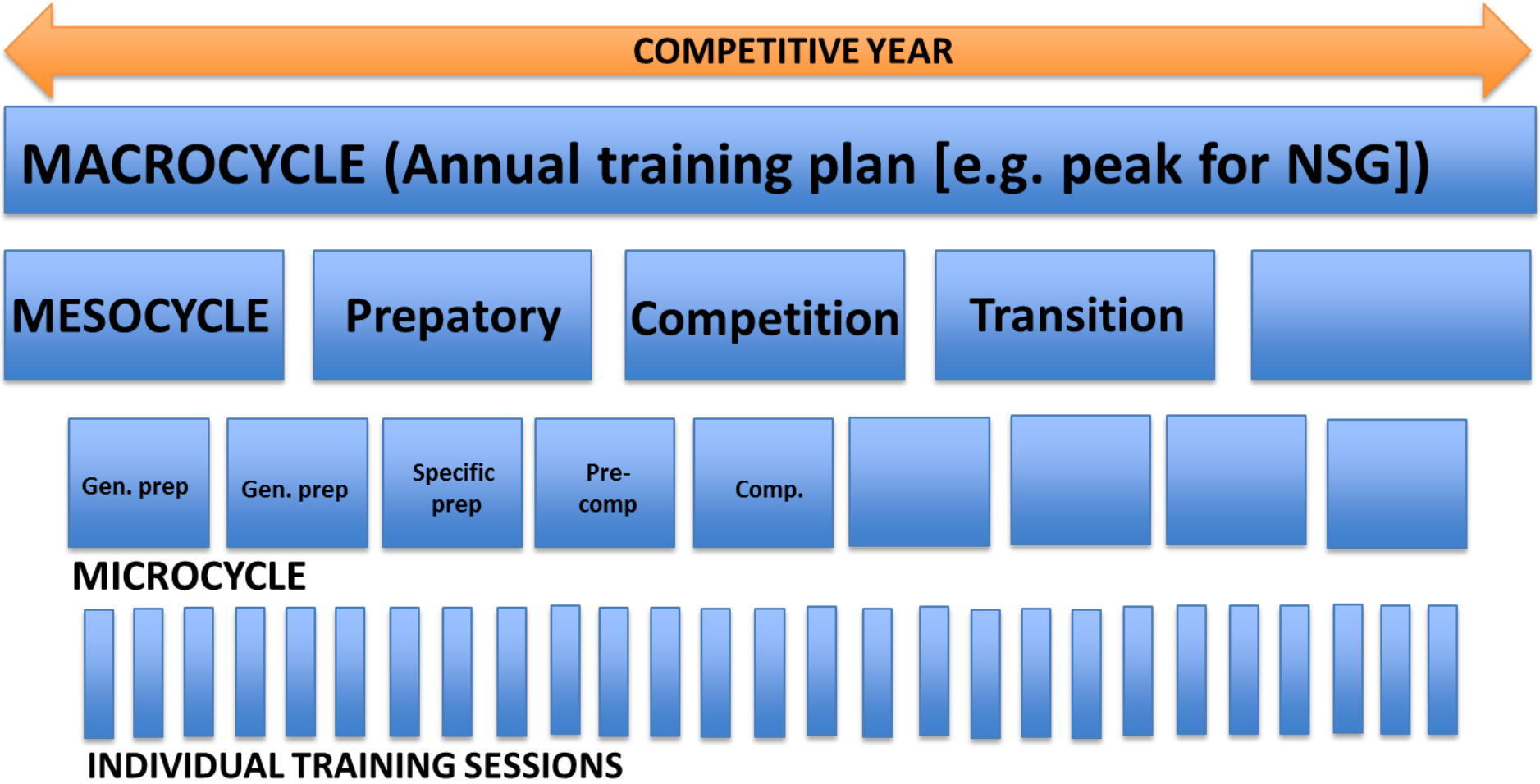
Mal-adaptation Process



Adaptation & Recovery



General Framework of Periodisation



General Framework of Periodisation

Long term plan (e.g. 4 year Olympic cycle)

Yearly plan

Season plan

Weekly plan

Daily plan


BEGIN
WITH THE
END
IN MIND
START
HERE

Annual training plan	*Year 1*	*Year 2*	*Year 3*	*Year 4*
Academic year	Freshman	Sophomore	Junior	Senior
Level	Foundation development	Continued development	Performance development	Peak performance
Goals	Develop key generic movement patterns associated with football	Develop key combinations of movements associated with football	Develop key movement patterns associated with football, along with the ability to read and react to football-specific stimuli	Optimize movement ability in soccer-specific situations
Period	Preparatory	Preparatory	Preparation to competition	Preparation to competition
Major periodization phases	General preparatory	General to specific preparatory	General to specific preparatory to pre-competitive and competitive	General to specific preparatory to pre-competitive and competitive

Source: adapted from Jeffreys, 2008.

General Framework of Periodisation

Achieving peak performance?

Maintaining peak performance?

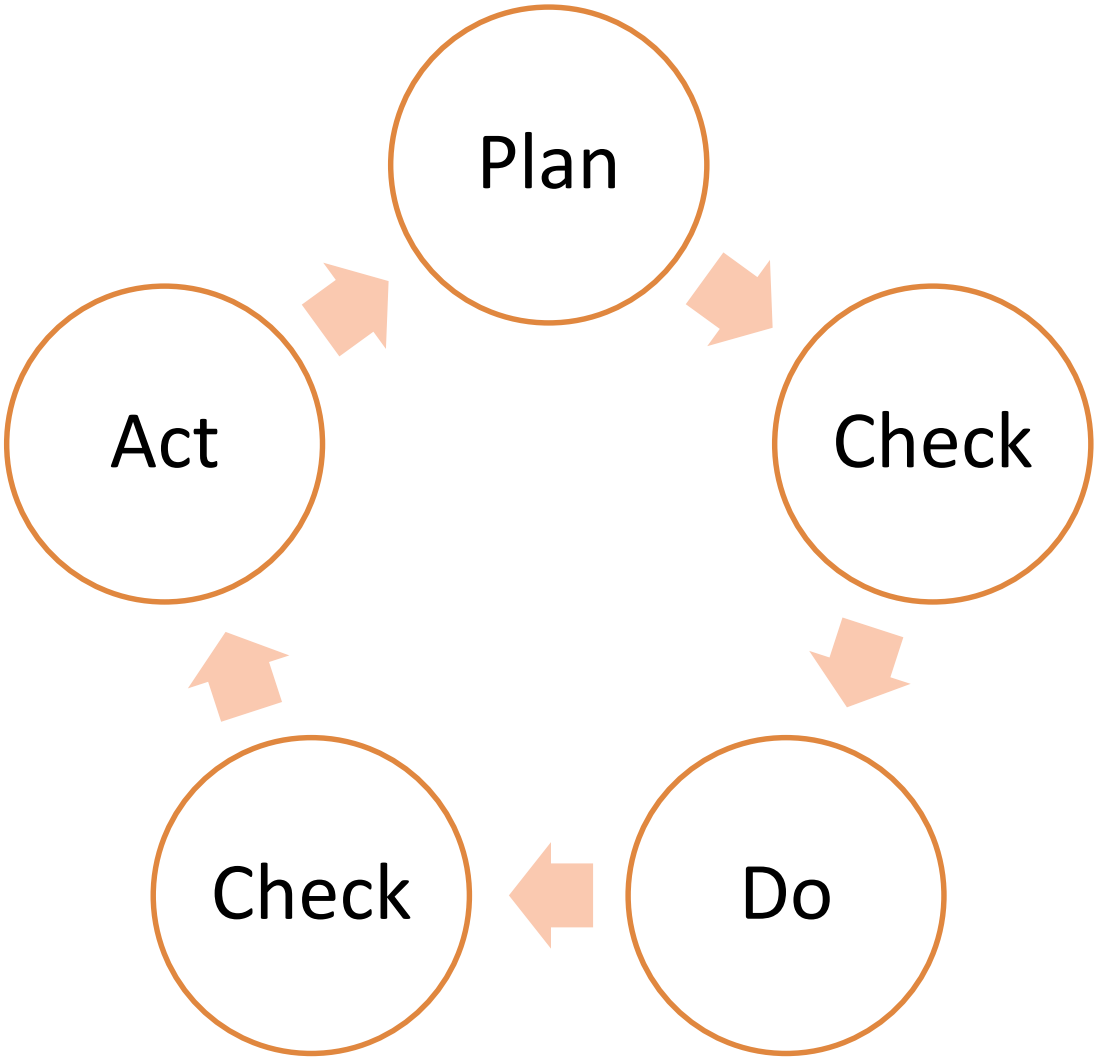
Transiting after peak performance?

Key considerations

- Growth & Development
- Relative Age Effect (RAE)

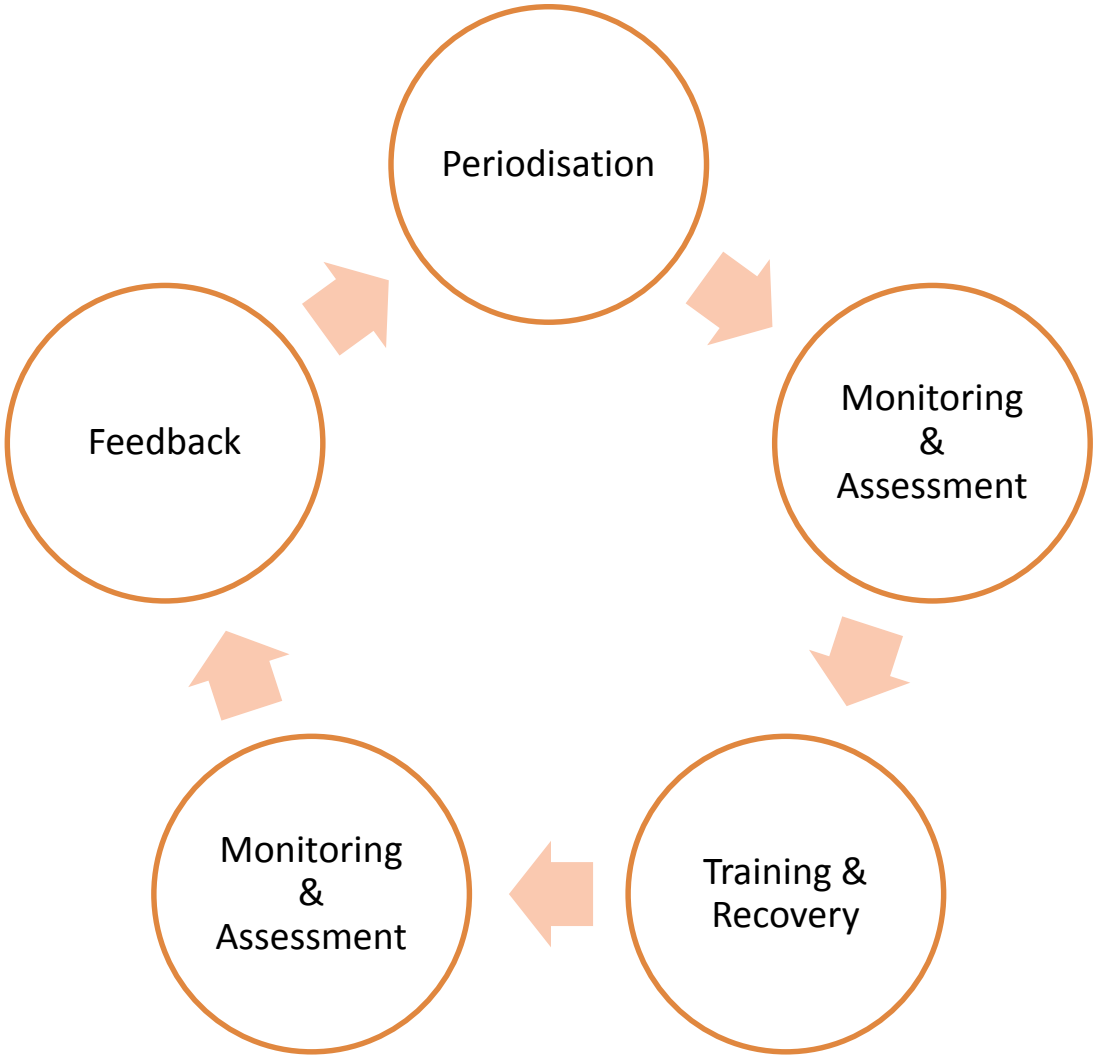
Periodization-How?

PCDCA Cycle



Training plan

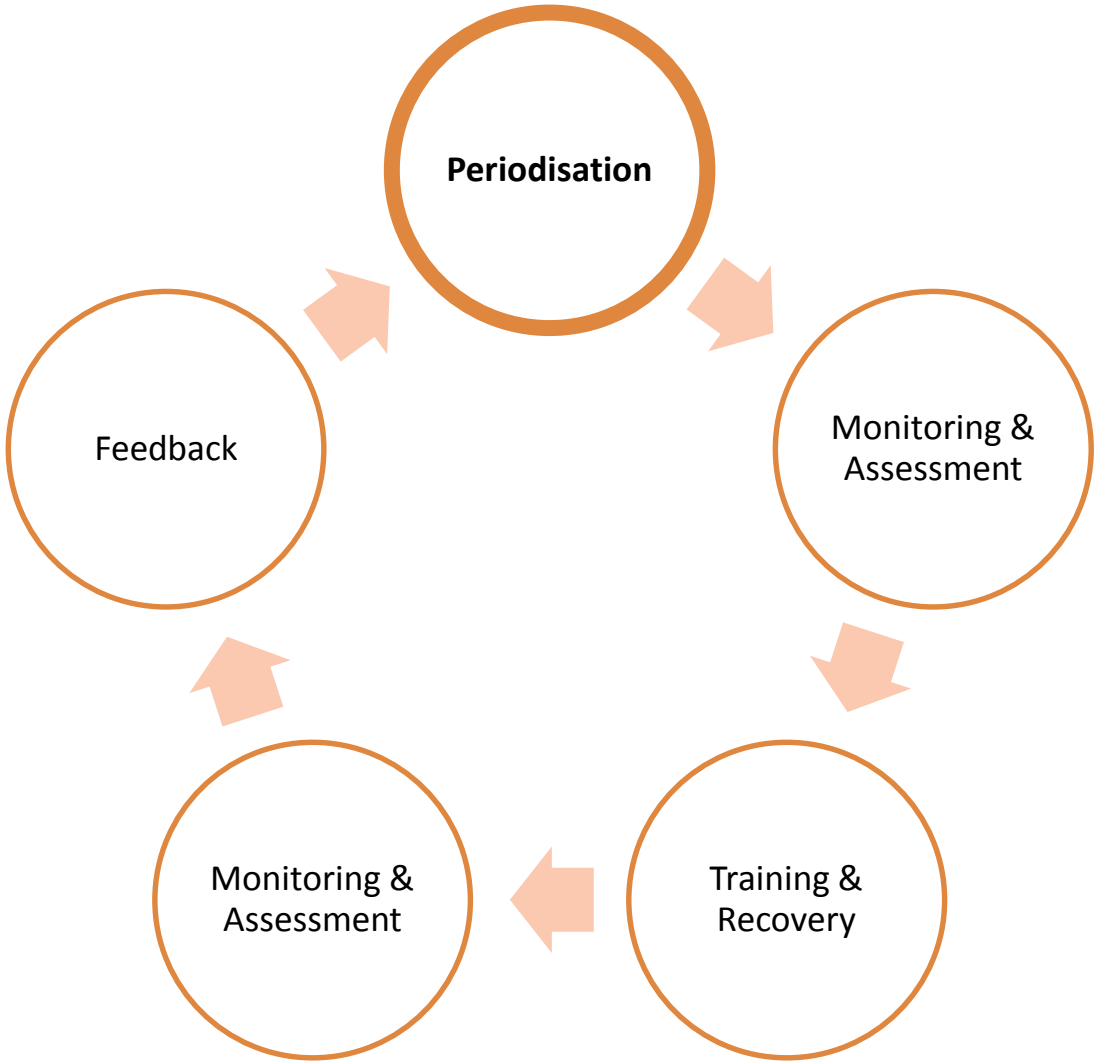
Periodization-How?



Periodization-How?

Consider:

- Objective
- Athlete/Team targets



Different goals/considerations

- Academic goals
  - PSLE/O'/A' Levels
- Regular
- Fun/Enjoyable
- Appropriately challenging
- Varied
- Safe
- Biological changes
  - Performance variability

- Academic goals
- Regular
- Post-pubertal
  - Significantly lesser performance variability
- **Sustained world-class success**

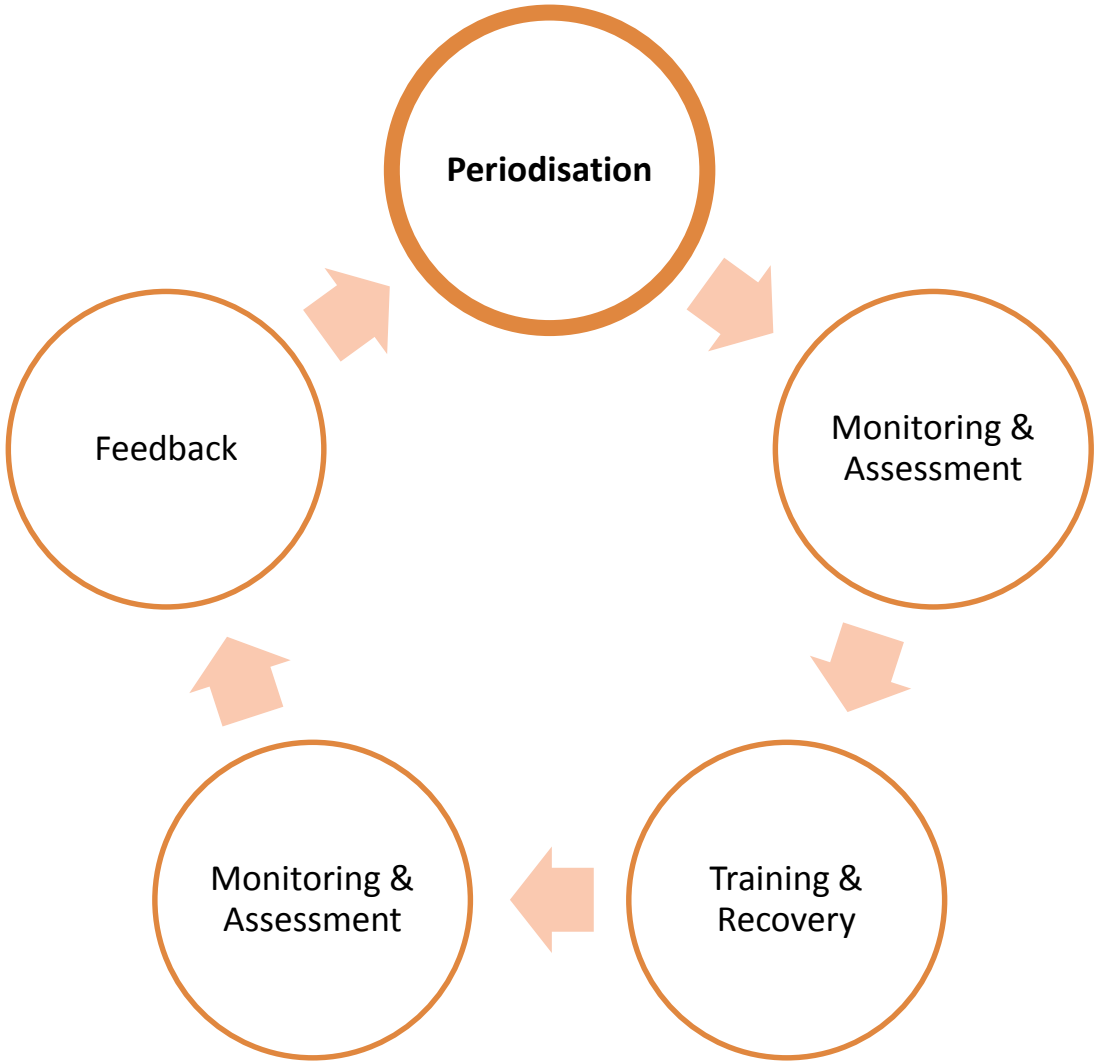
Different goals/considerations

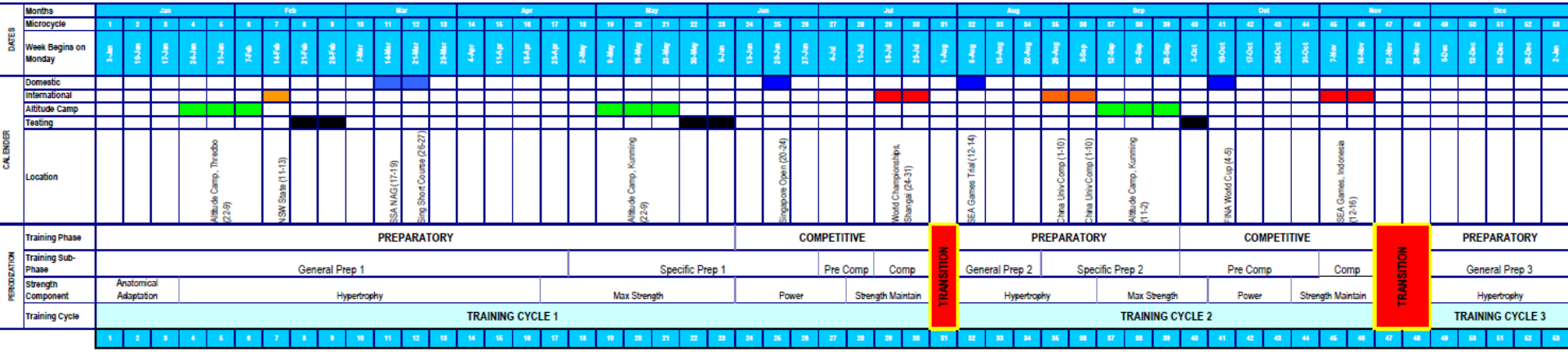
Shouldn’t periodisation / training plans be different?

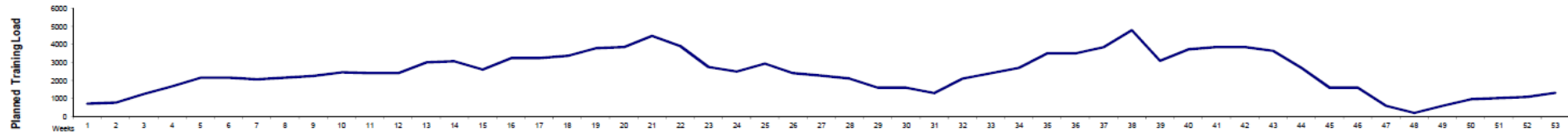
Periodization-How?

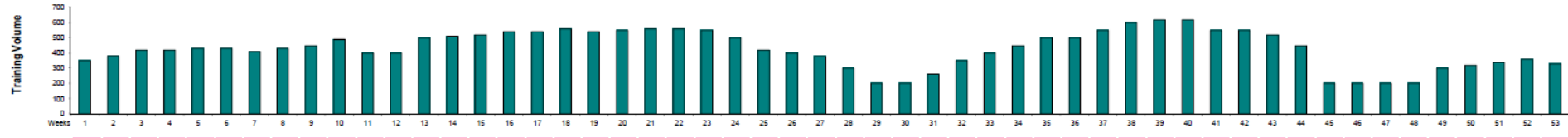
Consider:

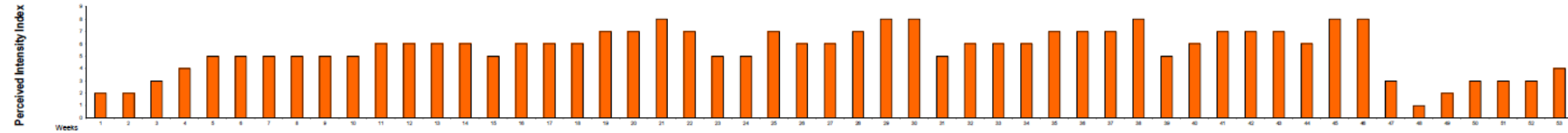
- Objective
- Athlete/Team targets
- Competitions




DATES
CALENDER
PERIODIZATION
Months
Microcycle
Week Begins on Monday
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Domestic
International
Altitude Camp
Testing
Location
Altitude Camp, Thredbo (2-9)
NSW State (11-13)
SSA NAG (17-19)
Sing Short Course (26-27)
Altitude Camp, Kunming (2-9)
Singapore Open (20-24)
World Championships, Shangai (24-31)
SEA Games Trial (12-14)
China Univ Comp (1-10)
China Univ Comp (1-10)
Altitude Camp, Kunming (11-2)
FINA World Cup (4-5)
SEA Games, Indonesia (12-16)
Training Phase
PREPARATORY
COMPETITIVE
TRANSITION
PREPARATORY
COMPETITIVE
TRANSITION
PREPARATORY
Training Sub-Phase
General Prep 1
Specific Prep 1
Pre Comp
Comp
General Prep 2
Specific Prep 2
Pre Comp
Comp
General Prep 3
Strength Component
Anatomical Adaptation
Hypertrophy
Max Strength
Power
Strength Maintain
Hypertrophy
Max Strength
Power
Strength Maintain
Hypertrophy
Training Cycle
TRAINING CYCLE 1
TRAINING CYCLE 2
TRAINING CYCLE 3


Planned Training Load
Weeks


Actual Load
Training Volume
Weeks


Perceived Intensity Index
Weeks

TRIMP Value

Periodization-How?

Consider:

- **Evidence**
- **Needs analysis**
  - Sport/Position
  - Athlete
- Manpower
- Time to competition
- Facilities
- Budget

Periodization-How?

Document:

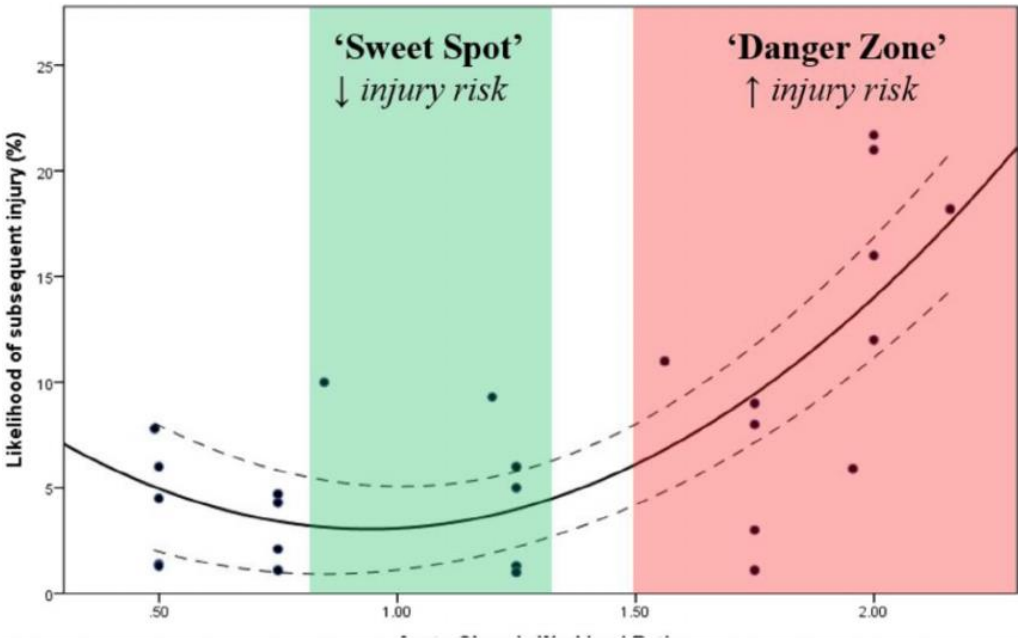
- Training load
- Results
- Changes
- Athletes' wellness
  - Perceived stress
  - Fatigue
  - Soreness
  - Sleep quality

Athlete preparation

- Training should periodically aim to mimic the demands of the game
- Overly low or high training loads pre-dispose athletes to greater injury risks

Monitor & Adjust

- Training load
  - Session RPE x training duration (min)
    - Arbitrary units
  - Within 20 min following cessation of session
- Perceived ratings of wellness
  (7-point likert scale)
  - Overall fatigue
  - Sleep quality
  - Delayed onset muscle soreness



Keep it fun

Fun ≠ Ineffective

- Small sided games as effective as interval training in maintaining aerobic fitness over 8 weeks
  - 3 bouts x 4 mins
- Athlete rated SSG as more Fun/Enjoyable

- Arcos et al., 2016

Table 1. Small-sided Games training program.

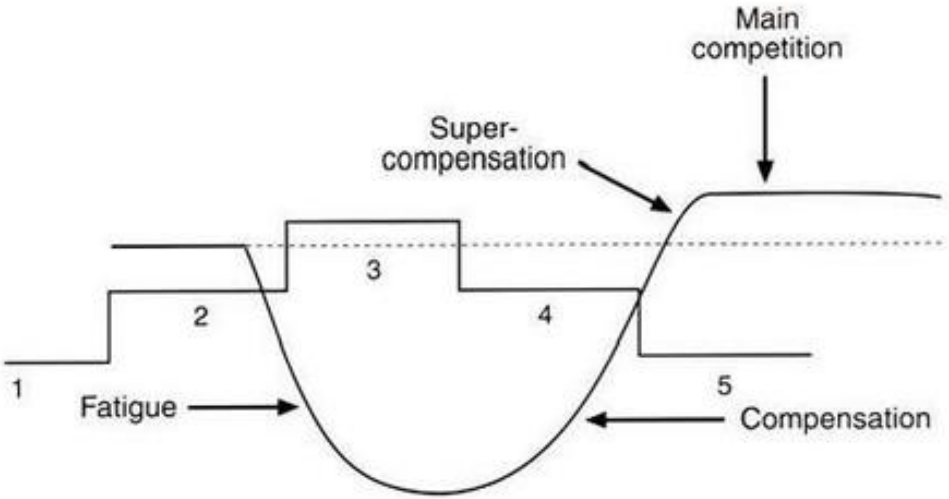
W	S	Format	Goals	Touches
1	*1*	(4 vs 4) + $2F_{off}$	2 mini-goal	no restriction / F: 2 touches
	2	(4+G) vs (4+G) + $2F_{off}$	2 official	no restriction / F: 2 touches
2	*1*	(4 vs 4) + $2F_{off}/1F_{in}$	2 mini-goal	3 touches / F: 2 touches
	2	(4+G) vs (4+G) + $2F_{off}$	2 official	3 touches / F: 2 touches
3	*1*	(4+G) vs (4+G) + $2F_{off}/1F_{in}$	2 official	3 touches / F: 2 touches
4	*1*	(4 vs 4) +$1F_{in}$	4 mini-goal	no restriction
	2	(4+G) vs (4+G) + $1F_{in}$	2 official	no restriction
5	*1*	(3 vs 3) + $1F_{in}$	4 mini-goal	no restriction
	2	(4+G) vs (4+G) + $2F_{off}$	2 official	no restriction
6	*1*	(4 vs 4) + $1F_{in}$	4 mini-goal	no restriction
	2	(4+G) vs (4+G)	2 official	no restriction

W = Week; S = Session; G = Goalkeeper; F = Floater; F_{off} = Floater off field; F_{in} = Floater in the field

- Arcos et al., 2016

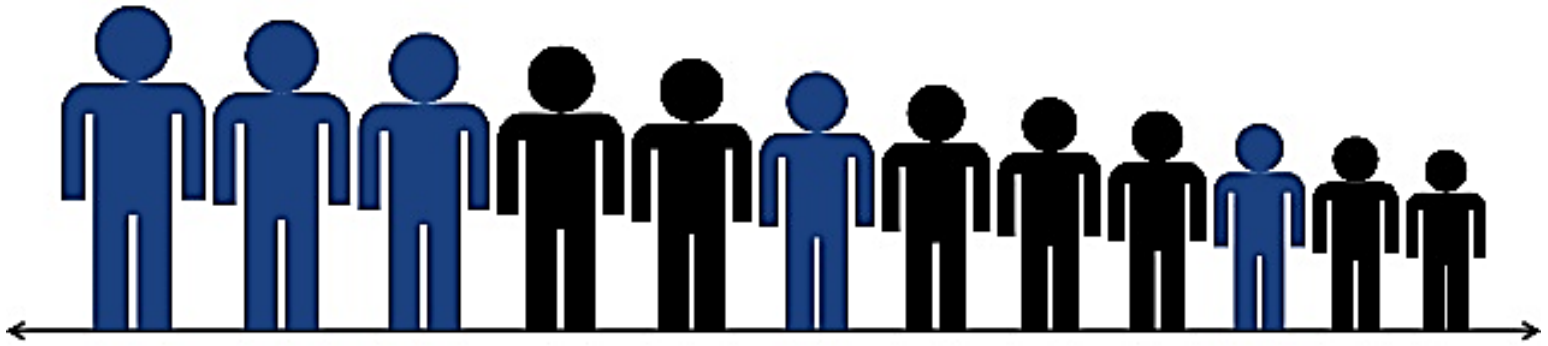
Tapering

- Based on the concept of super-compensation
- Maintenance of intensity
- Reduction in volume/frequency
- Adjustments are generally dependent on sporting calendar
  - Team sports vs. Individual sport
  - 1-day to several weeks
- Considerations for training availability in youth athletes
  - Are they training enough to require a taper



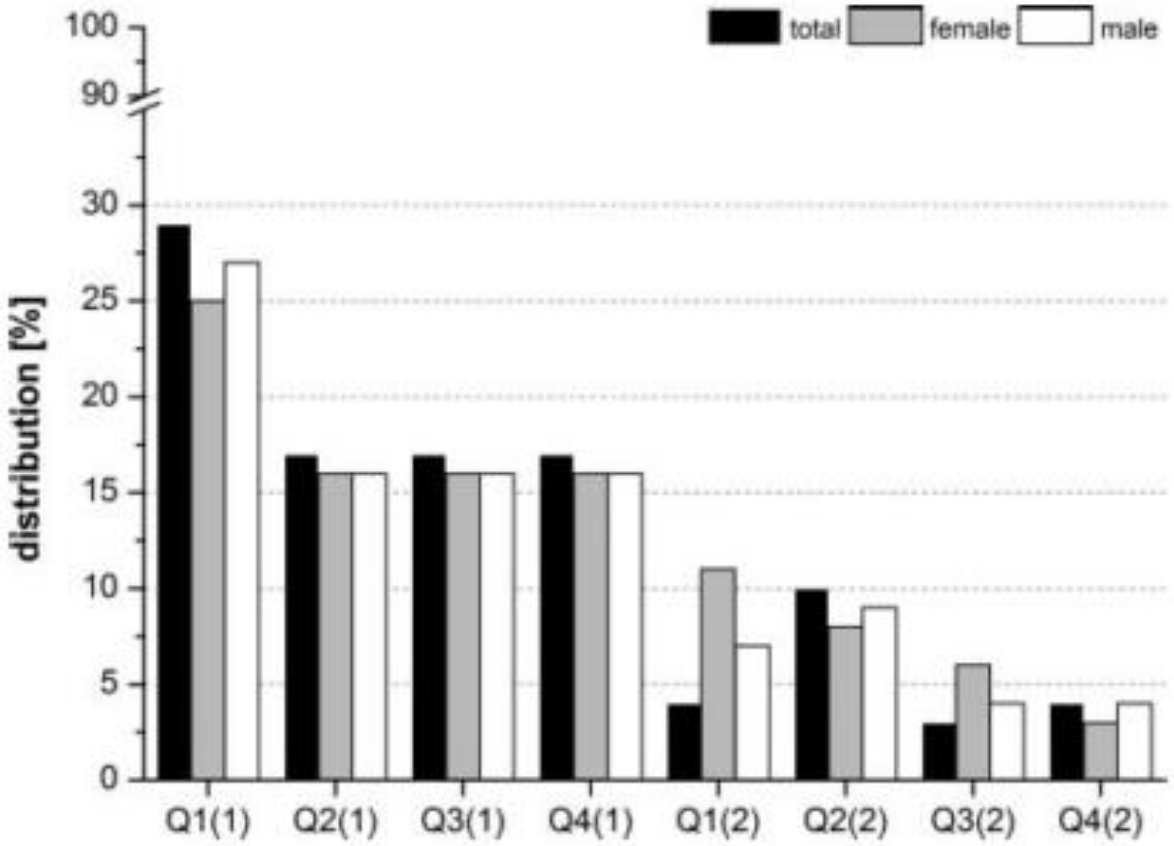

CHANGE
AHEAD

Relative Age Effect



Relative Age Effect

Relative Age Effect



igure 3 Quartile distribution of all medal winners according to sex.

Overcoming RAE in training

- RAE affects
  - Perception of athletes' ability
  - Perception of 'trainability'
  - Selection into team/squad
  - **Response/adaptability /recovery to training stimulus**

(Mann & Ginneken., 2016)

Overcoming RAE in training

- Solutions?
  - Age-ordered shirt numbering
  - Colour-banded jerseys
    - Jan-Mar: 75-85
    - Apr-Jun: 55-65
    - Jul-Sep: 35-45
    - Oct-Dec: 15-25

(Mann & Ginneken., 2016)

Different rates of growth

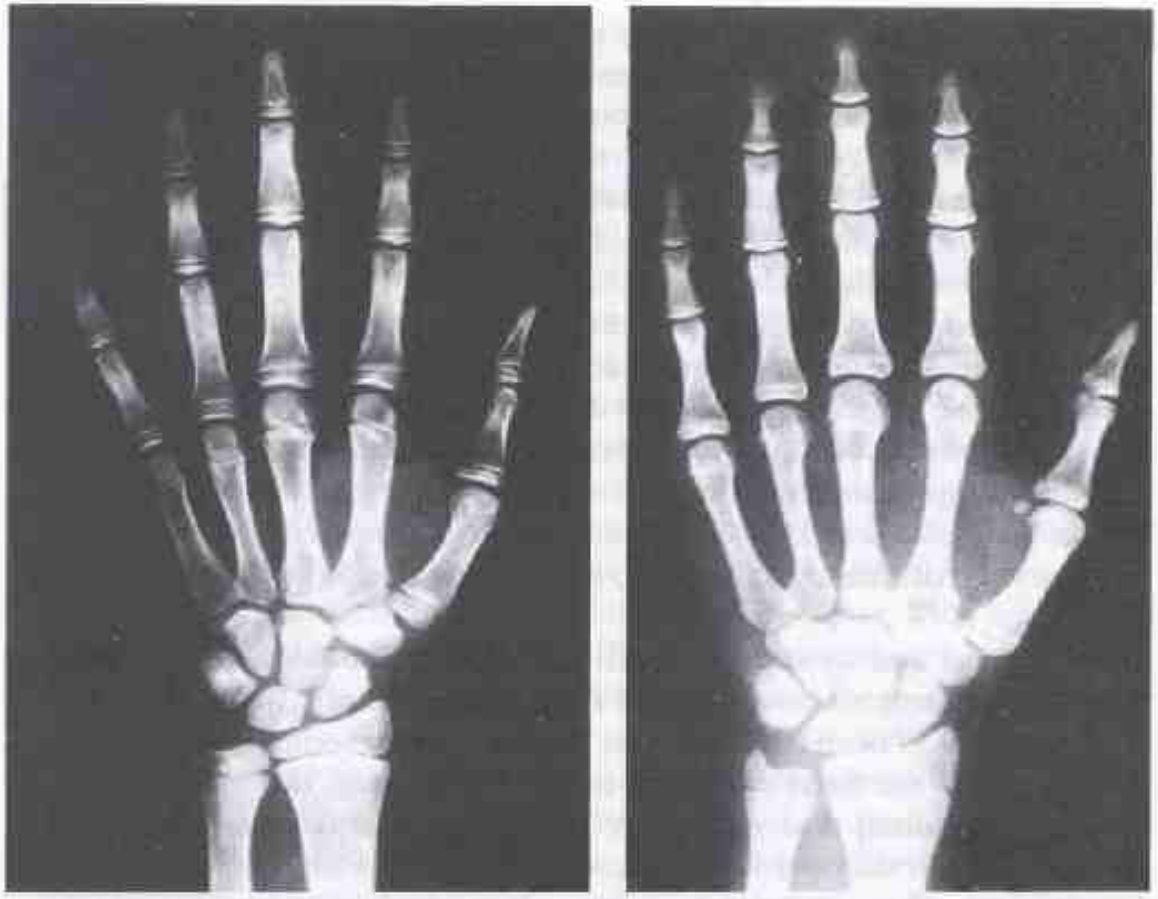
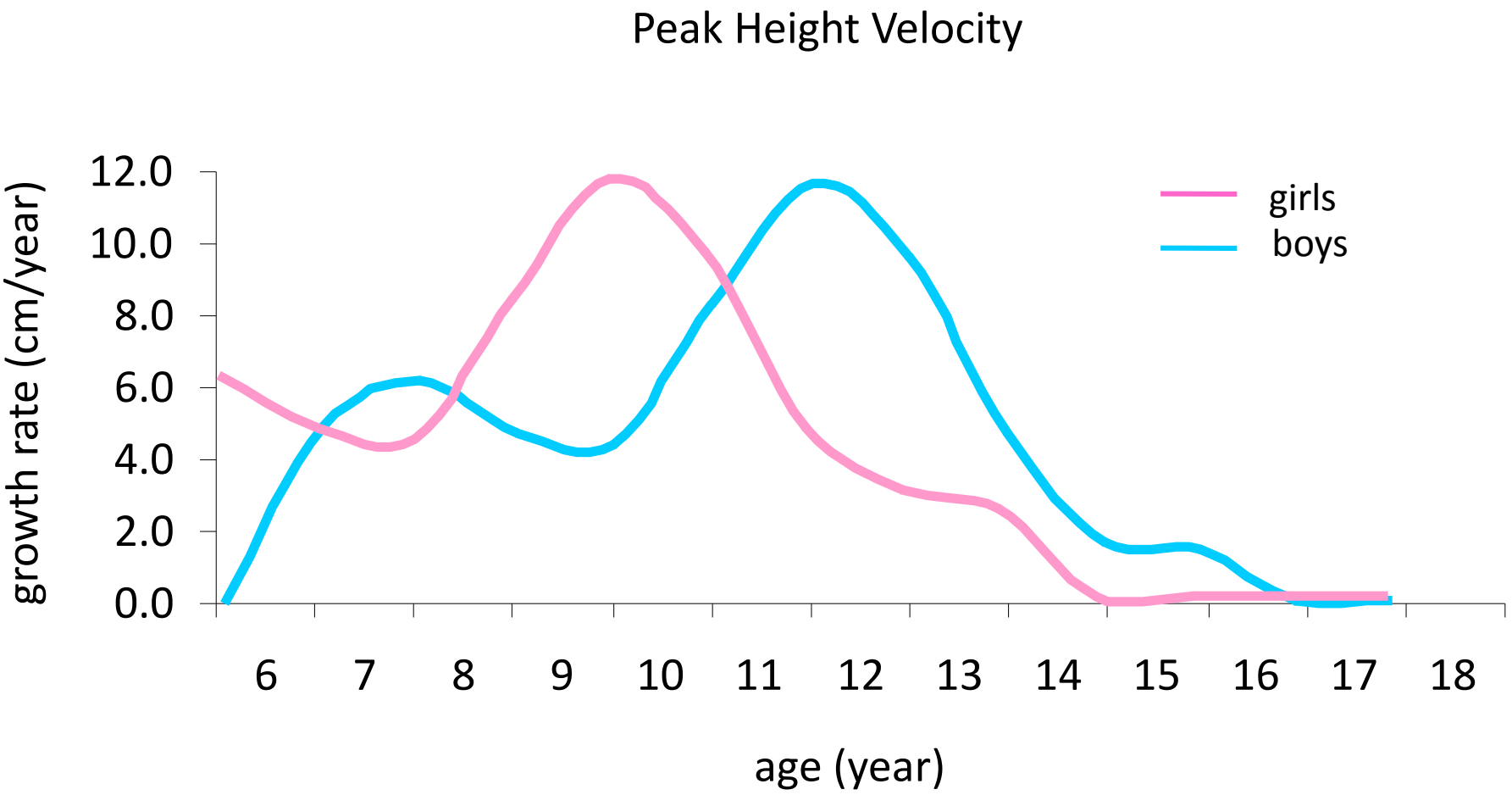
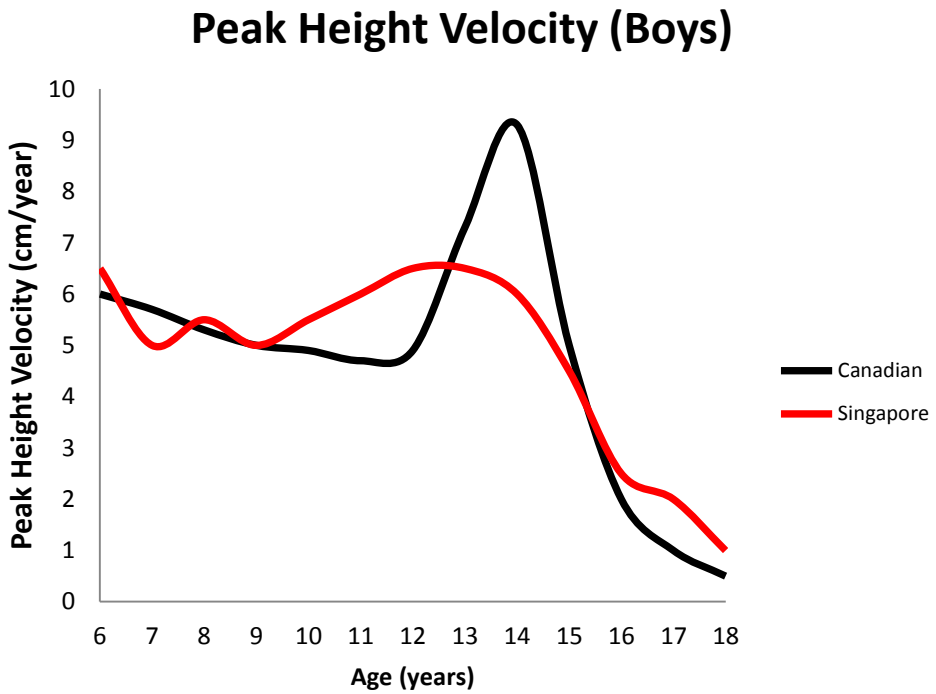


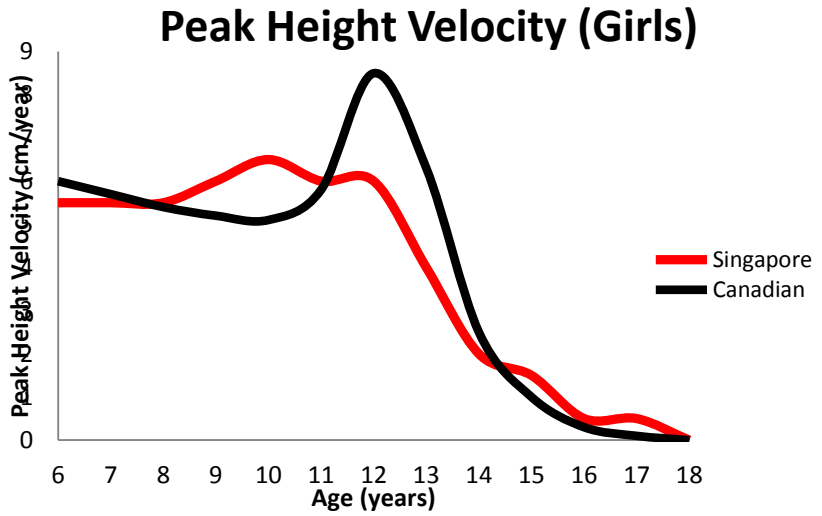
Figure 29 Radiographs of two boys both aged 14·0 years: (*left*) bone age 12·0 'years'; (*right*) bone age 16·0 'years'

Biological vs. Chronological Age

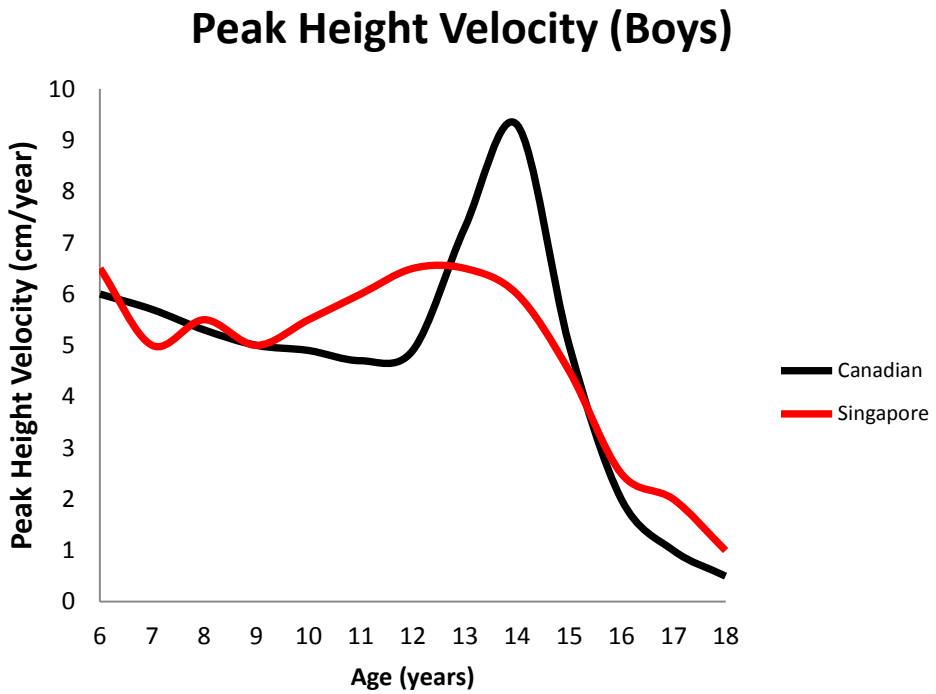


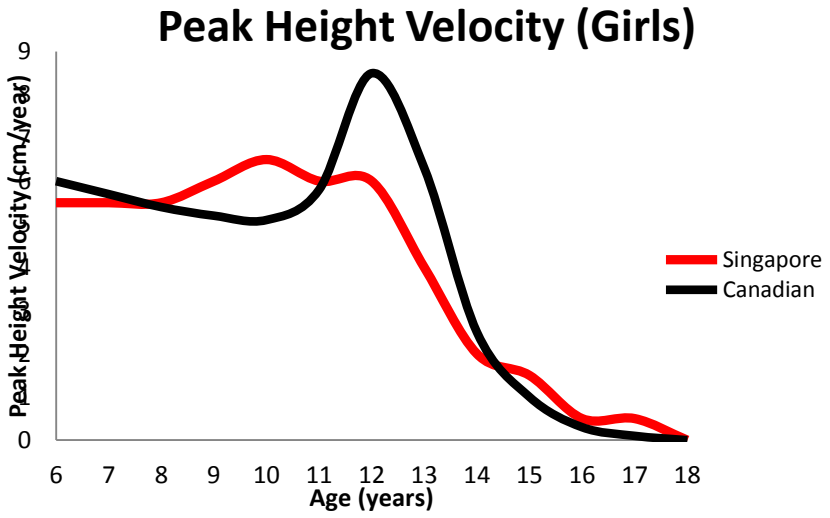
Earlier onset of PHV in Singaporean youth





Reduced peak height increment in Singaporean youth





The Influence of Maturation on Sprint Performance in Boys over a 21-Month Period

ROBERT W. MEYERS[1], JON L. OLIVER[1,2], MICHAEL G. HUGHES[1], RHODRI S. LLOYD[1,2], and JOHN B. CRONIN[2,3]

[1]Youth Physical Development Unit, Cardiff School of Sport, Cardiff Metropolitan University, Cardiff, UNITED KINGDOM; [2]Sports Performance Research Institute, AUT University, Auckland, NEW ZEALAND; and [3]School of Exercise, Biomedical and Health Science, Edith Cowan University, Perth, AUSTRALIA

- Rate of sprint performance improvement dependent on period of peak height velocity (PHV)
- Smaller increases in max. sprint speed for those that did not experience growth 'spurt' when compared to those that did
  - 5.6 vs. 10.4 % improvement in 30m sprint times

Meyers et al., 2016

When does peak performance occur in sport?

Event type, sport and study	Event	Event duration[a]	Men[b]		Women[b]	
			Age of peak	90 % CL	Age of peak	90 % CL
Explosive/sprint						
Athletics						
Berthelot et al. [25]	Sprints[c]	10–50 s	25.8	?	25.7	?
Hollings et al. [5]	Sprints, hurdles[d]	10–55 s	25.2 ± 2.3	0.3	25.7 ± 2.4	0.3
	Jumps[e]	5 s	25.8 ± 2.1	0.3	25.6 ± 2.7	0.4
	Throws[f]	1–5 s	28.0 ± 2.5	0.4	26.7 ± 3.3	0.6
Tilinger et al. [26]	Sprints[g]	10–20 s	24.5	?	–	–
	Jumps[h]	5 s	24	?	–	–
	Throws[i]	1 s	26.5	?	–	–
Swimming						
Allen et al. [4]	50–100 m all Olympic events	21–65 s	25.0 ± 1.9	0.3	23.3 ± 2.8	0.6
Berthelot et al. [25]	50–100 m free	21–54 s	22.4	?	22.8	?
Sokolovas [3]	50–100 m all Olympic events	21–65 s	23.1 ± 2.6	0.6	21.3 ± 4.1	1
Wolfrum et al. [19]	50–100 m breast	27–65 s	26–27		22–23	
	50–100 m free	21–54 s	28–29		24–27	

(Allen & Hopkins., 2015)

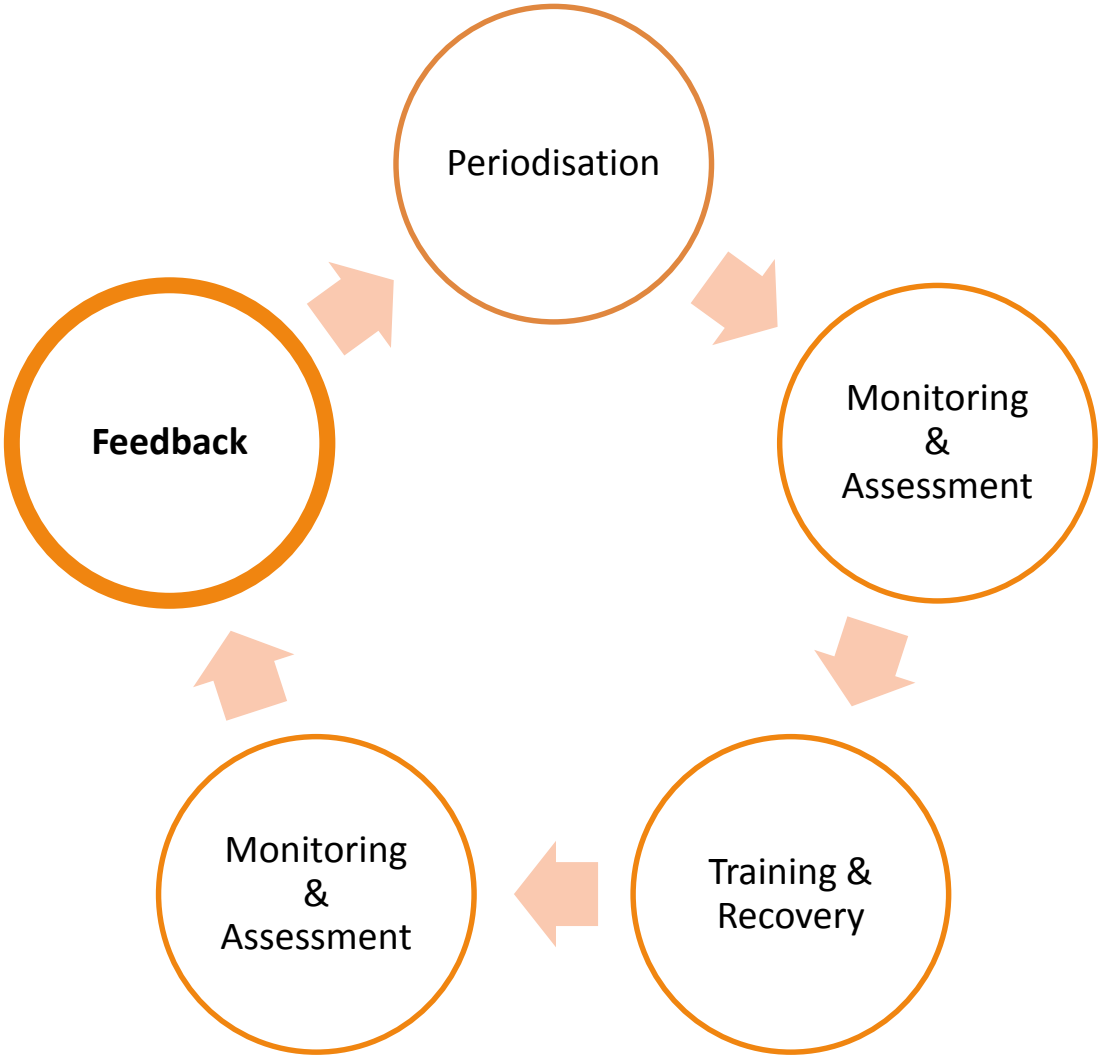
Event type, sport and study	Event	Event duration[a]	Men[b]		Women[b]	
			Age of peak	90 % CL	Age of peak	90 % CL
Cycling						
Anderson [24]	Cyclo-cross	1 h	30.2	?	–	–
Shoak et al. [12]	Ultra-distance	27–29 h	38	1.8	39	2.5
Swimming						
Allen et al. [4]	200–1500 m all Olympic events	0.03–0.25 h	23.6 ± 1.9	0.3	22.1 ± 2.0	0.3
Berthelot et al. [25]	200–1500 m free	0.03–0.25 h	20.4	?	20	?
Sokolovas [3]	200–1500 m all Olympic events	0.03–0.25 h	21.7 ± 2.5	0.5	19.8 ± 3.1	0.6
Wolfrum et al. [19]	200 m breast	0.04 h	20–21		22–23	?
	200 m free	0.03 h	22–23		22–23	?
Triathlon						
Malcata et al. [20]	Olympic-distance	1.8–2.1 h	27.6 ± 2.1	0.6	27.1 ± 3.6	1.1
Rüst et al. [15]	Ironman	8–9 h	32 ± 3	0.4	34 ± 4	0.5
Mixed						
Ice hockey						
Brander et al. [17]		1 h	27–29		–	–

(Allen & Hopkins., 2015)

Periodization-How?

Review:

- Was the periodisation plan successful?
- Implications on competition performance?

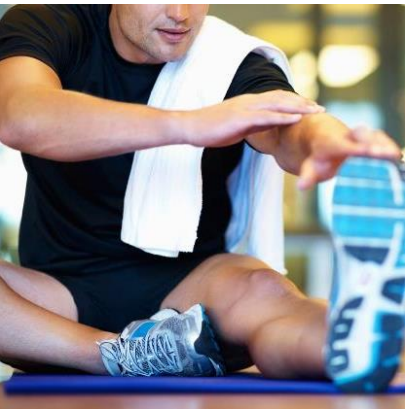


RECOVERY

?


Training only accounts for 30% of the improvements in performance
(Hellard et al., 2005)

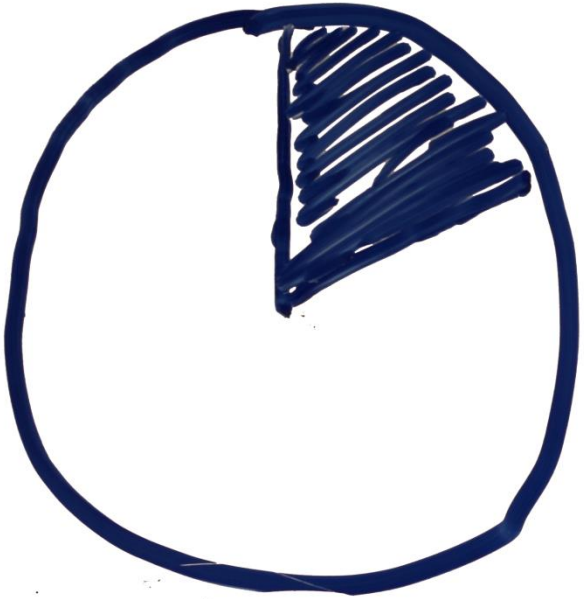

Adaptations that occur between training sessions play a key role in performance changes
(Hellard et al., 2005)



The fundamentals

Nutrition. Exercise. Water. Sleep.

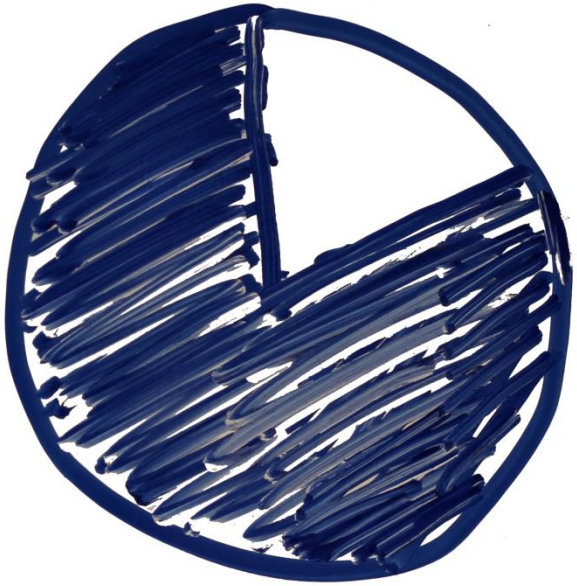
INPUTS



20%

=

OUTPUTS



80%

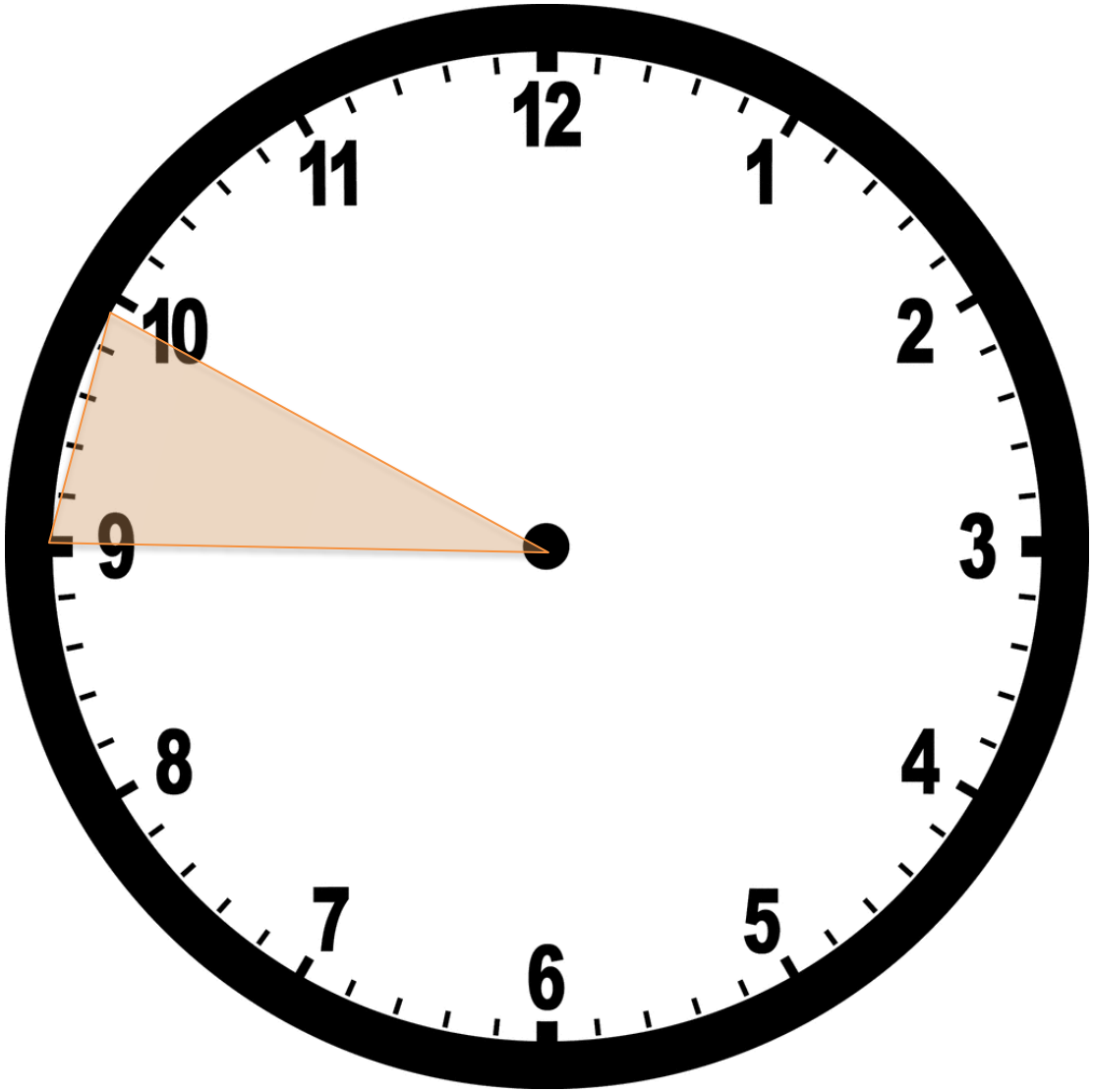
Optimal training plan =

Part 2

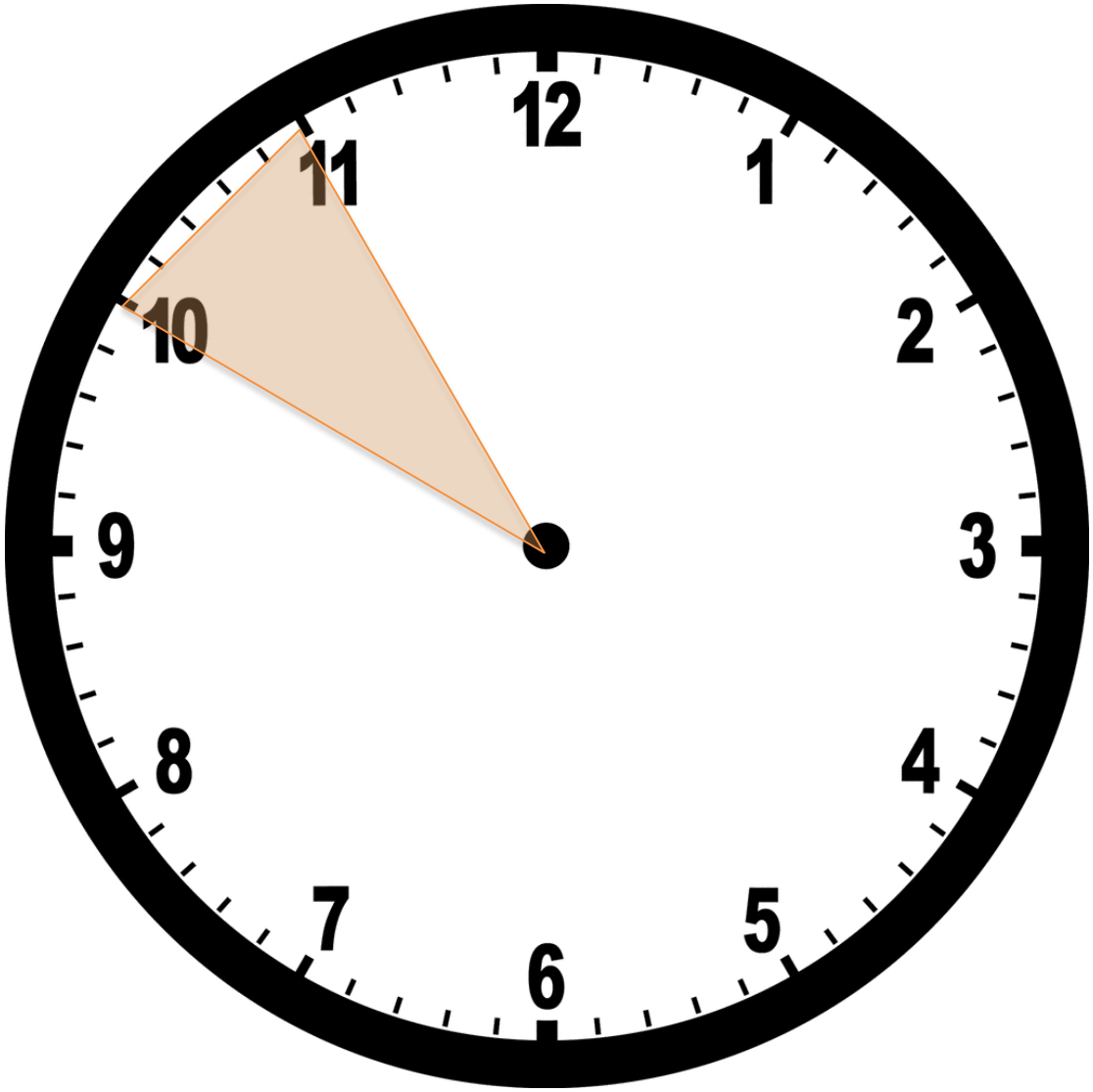
Sleep

Activity

What time did you **sleep** last night?



What time did you **sleep** last night?



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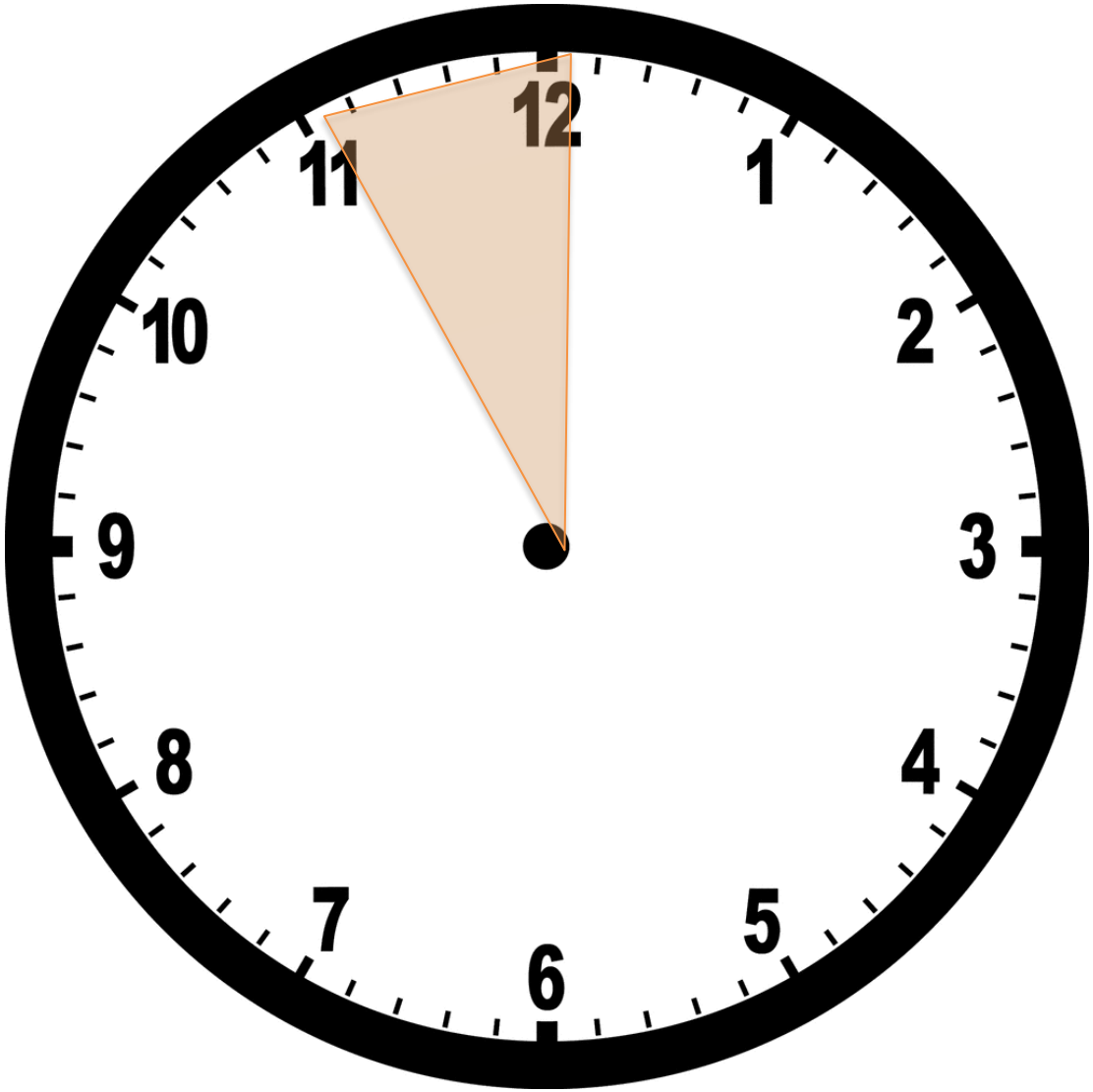
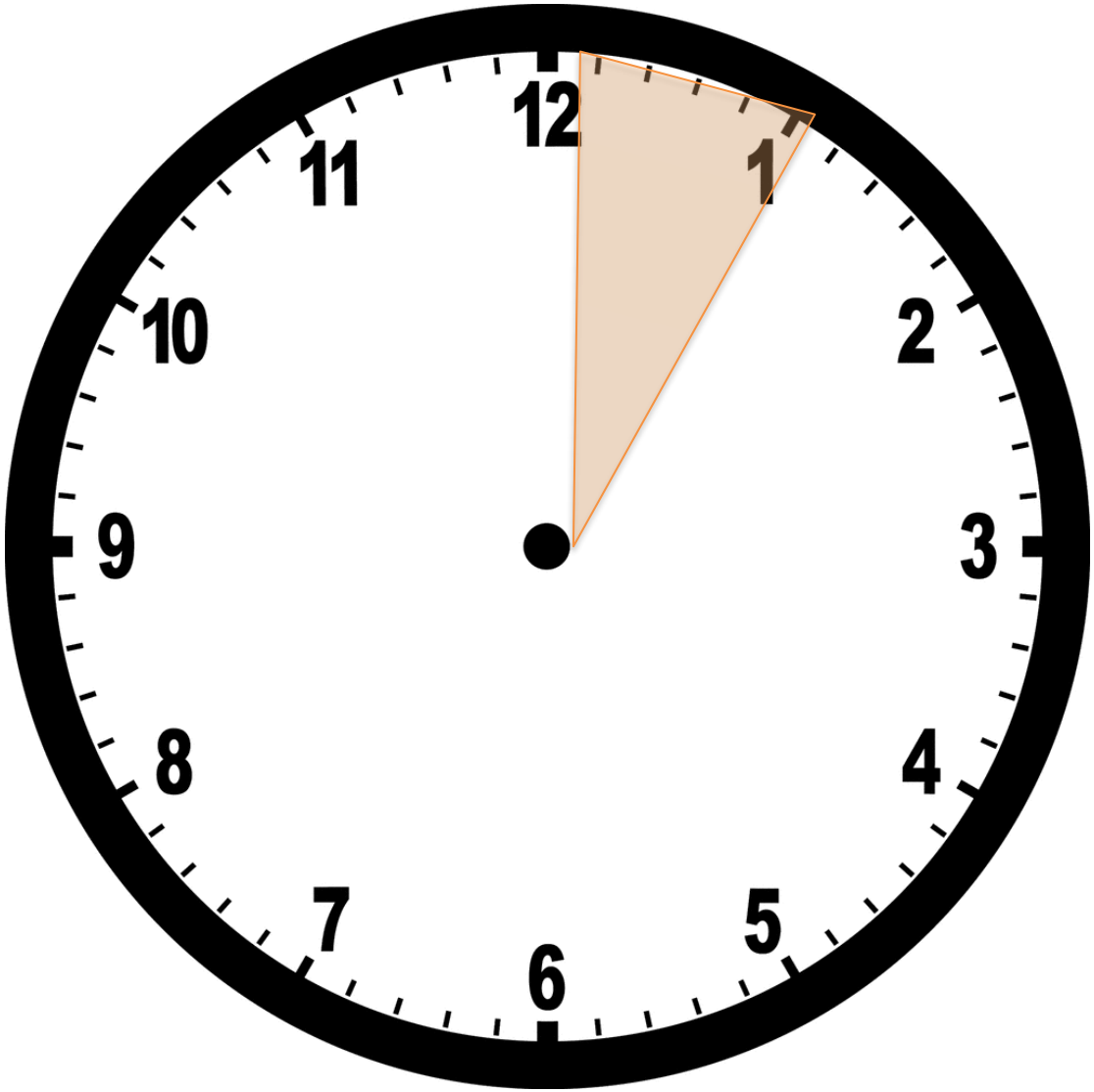
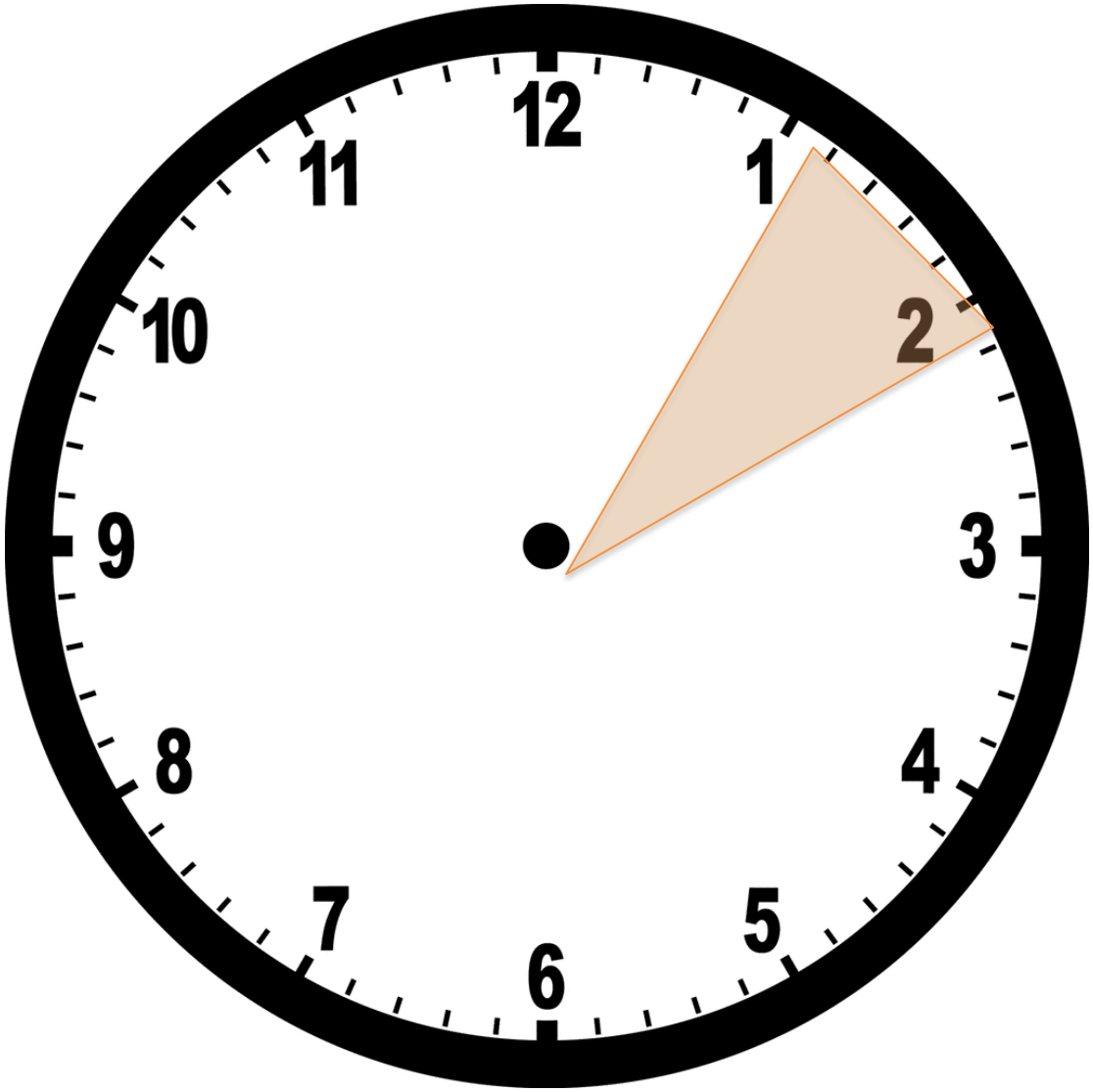


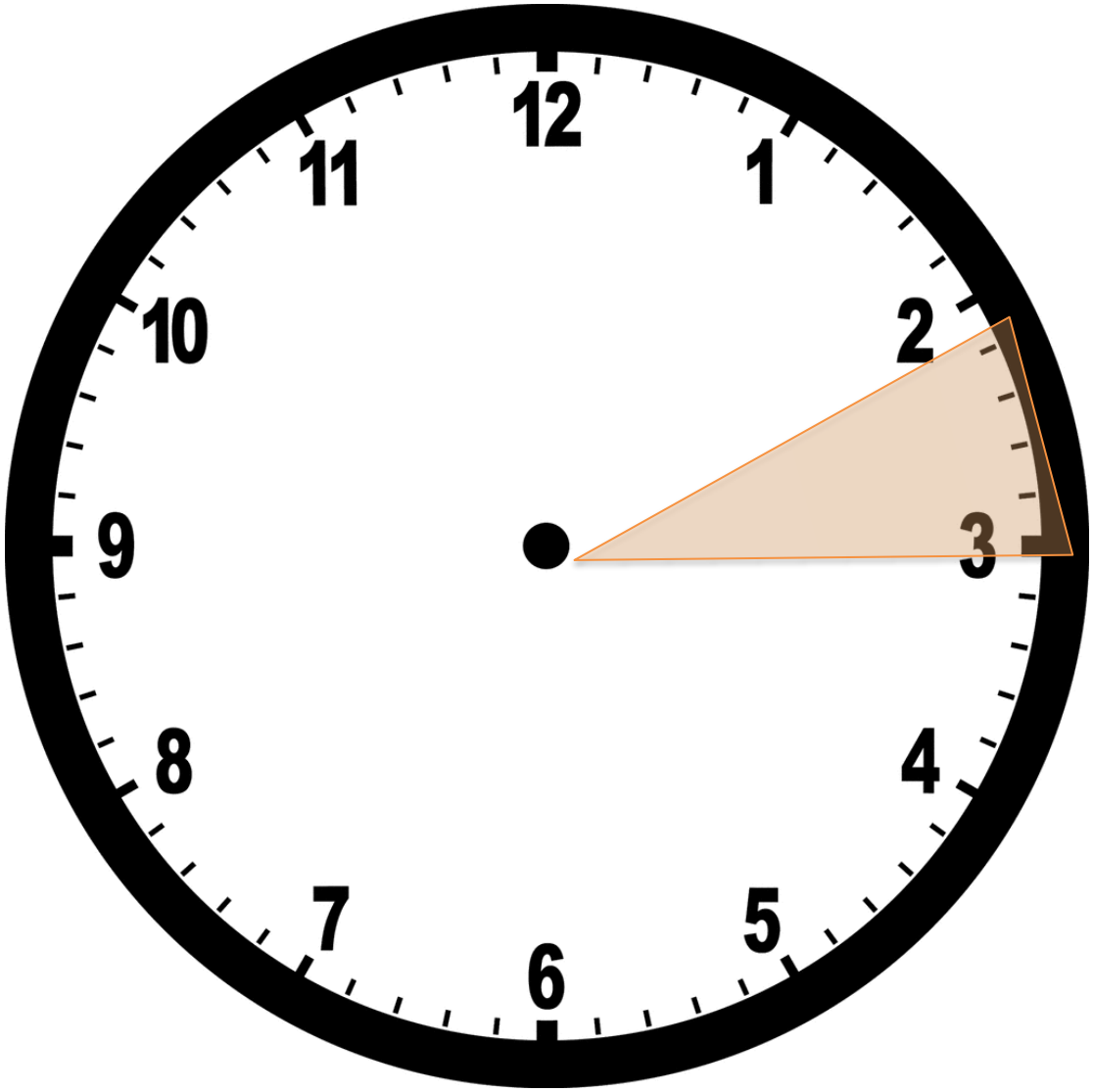
What time did you **sleep** last night?



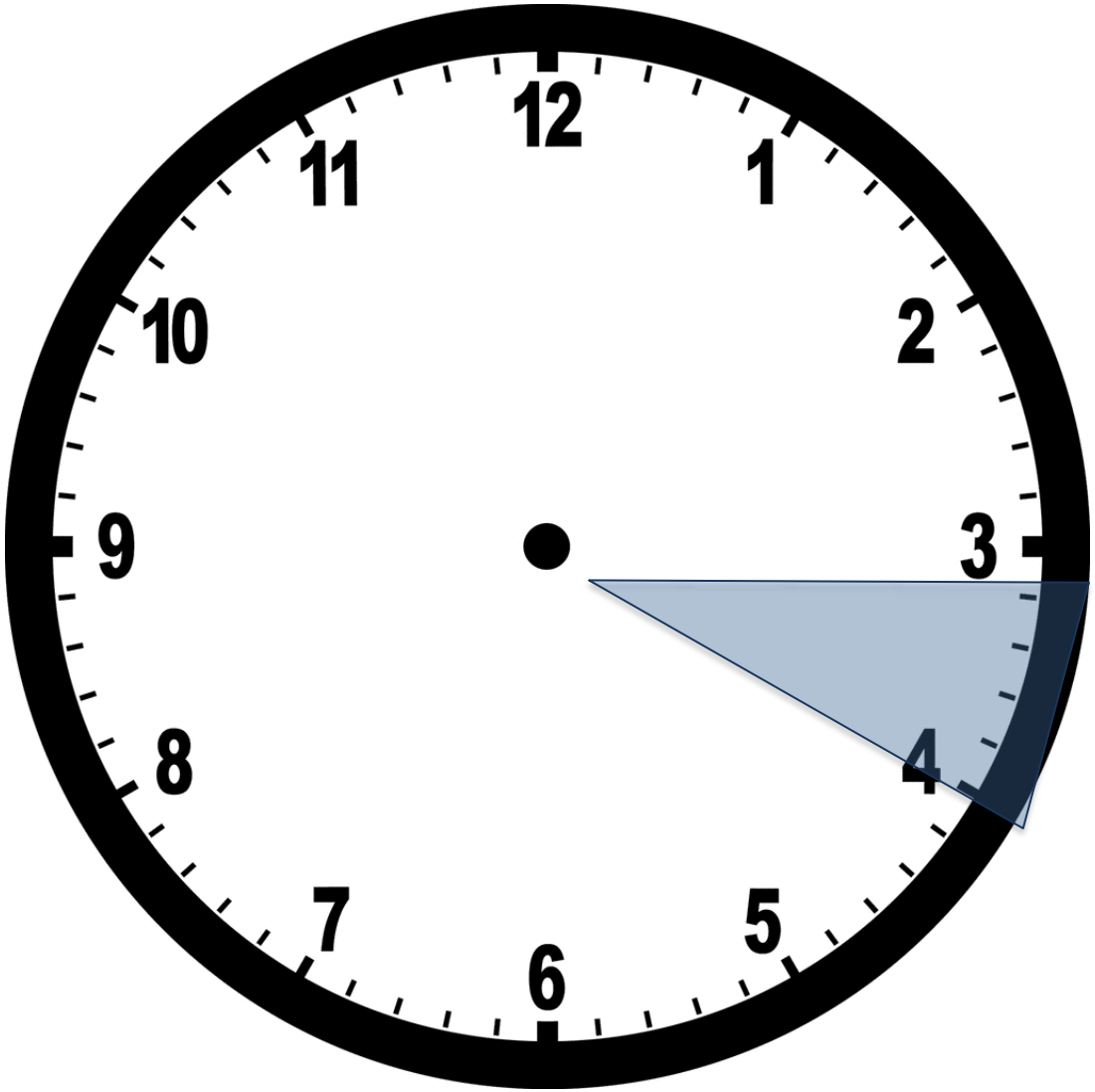
What time did you **sleep** last night?



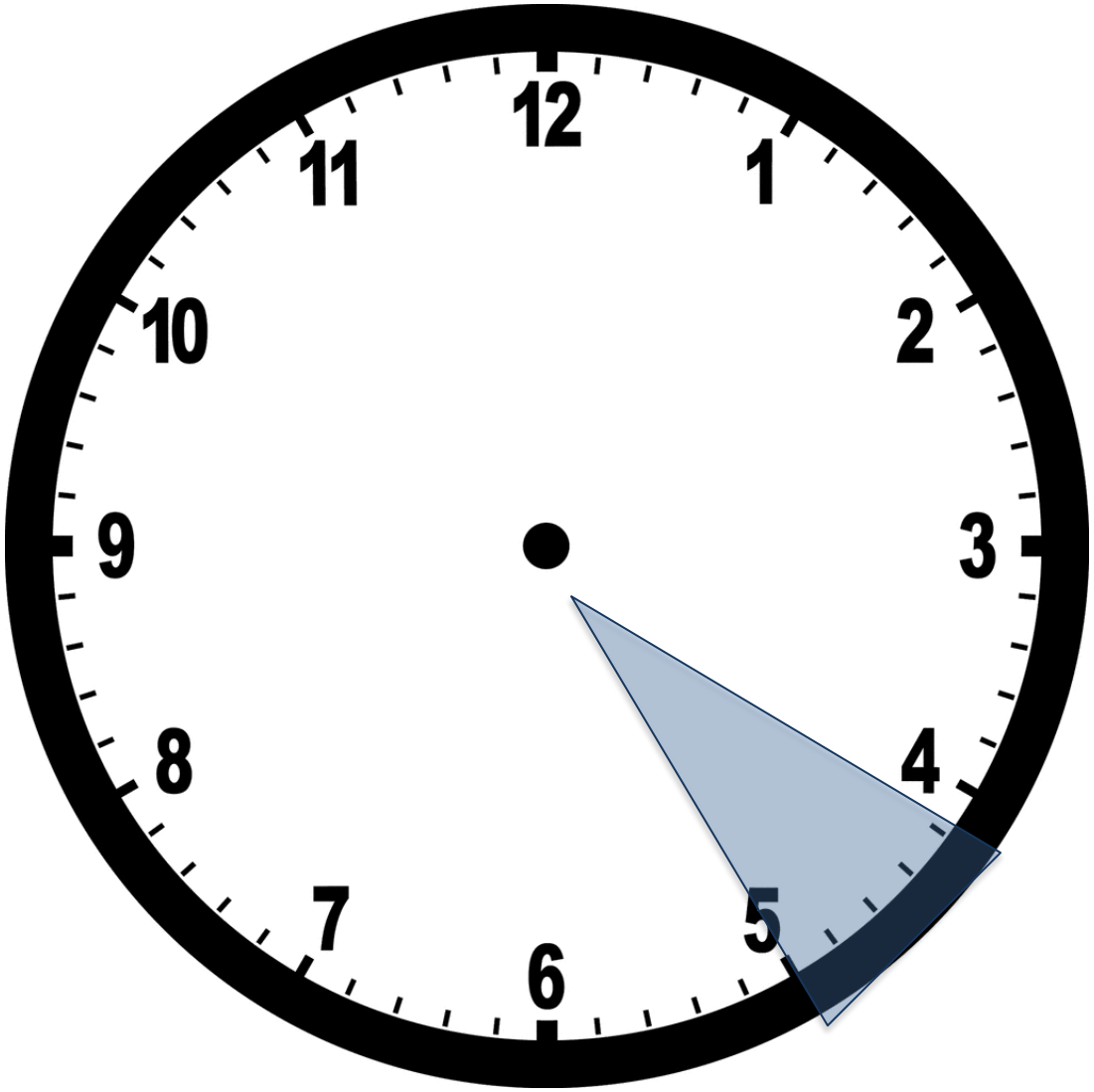
What time did you **sleep** last night?



What time did you **wake up** this morning?



What time did you **wake up** this morning?



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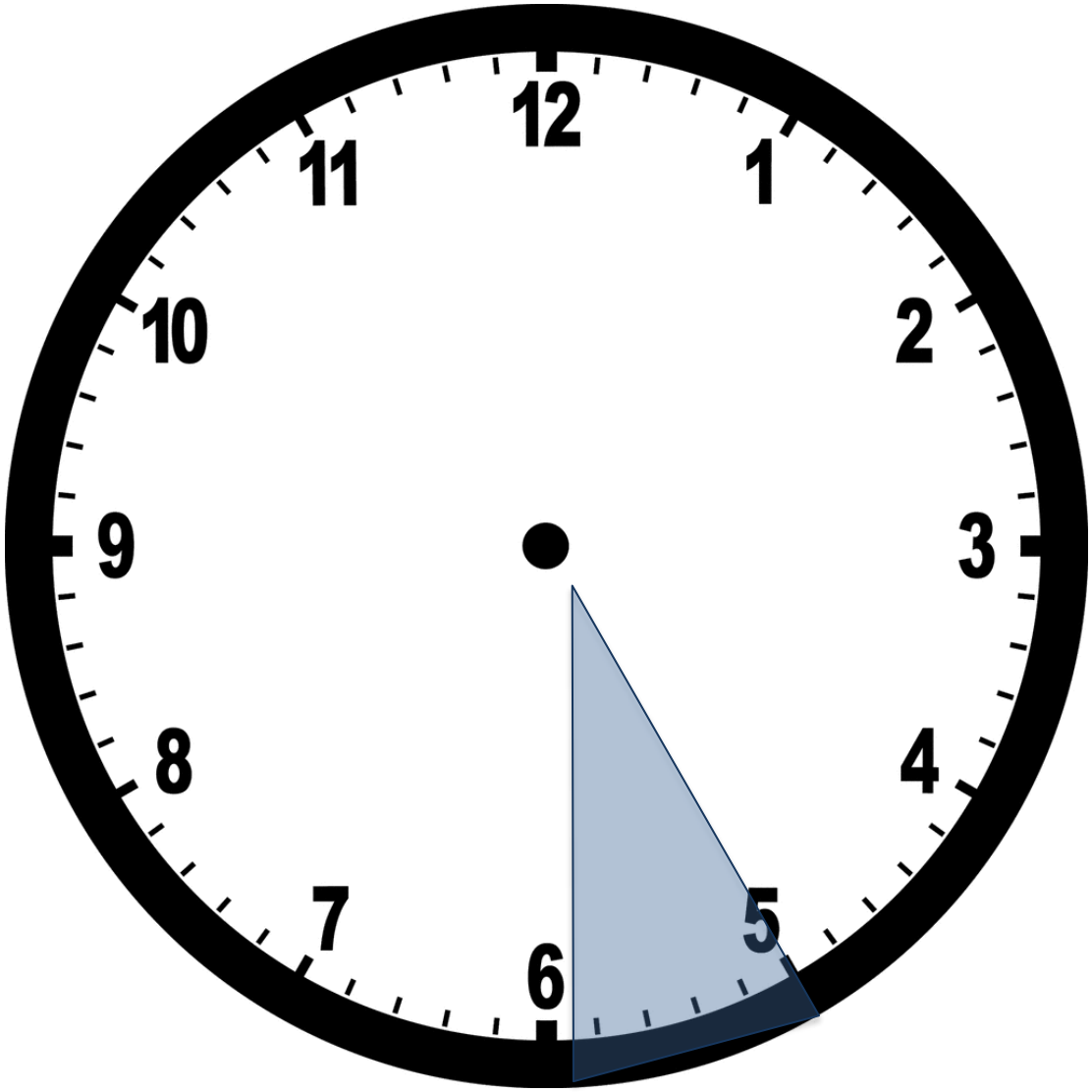
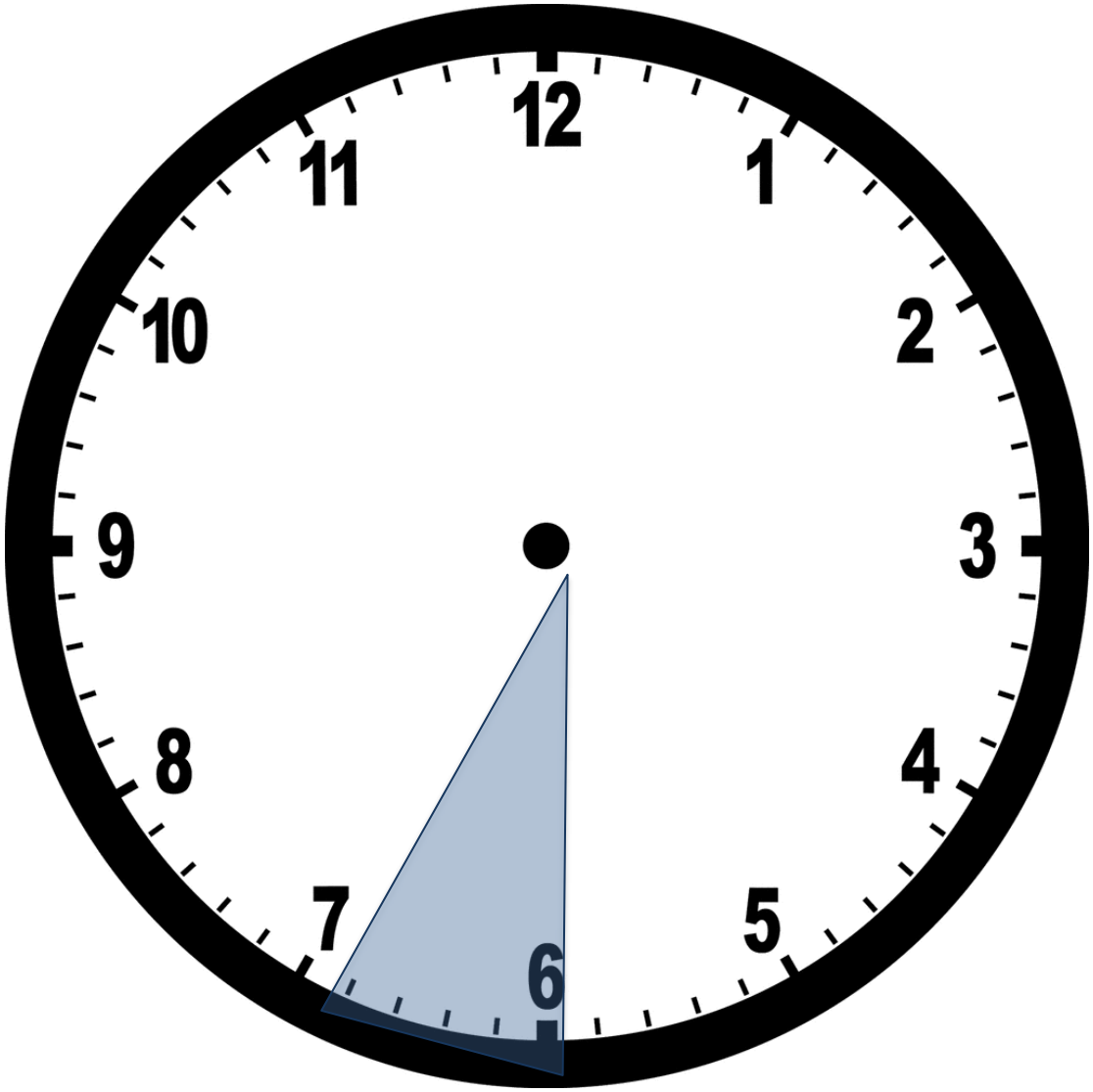
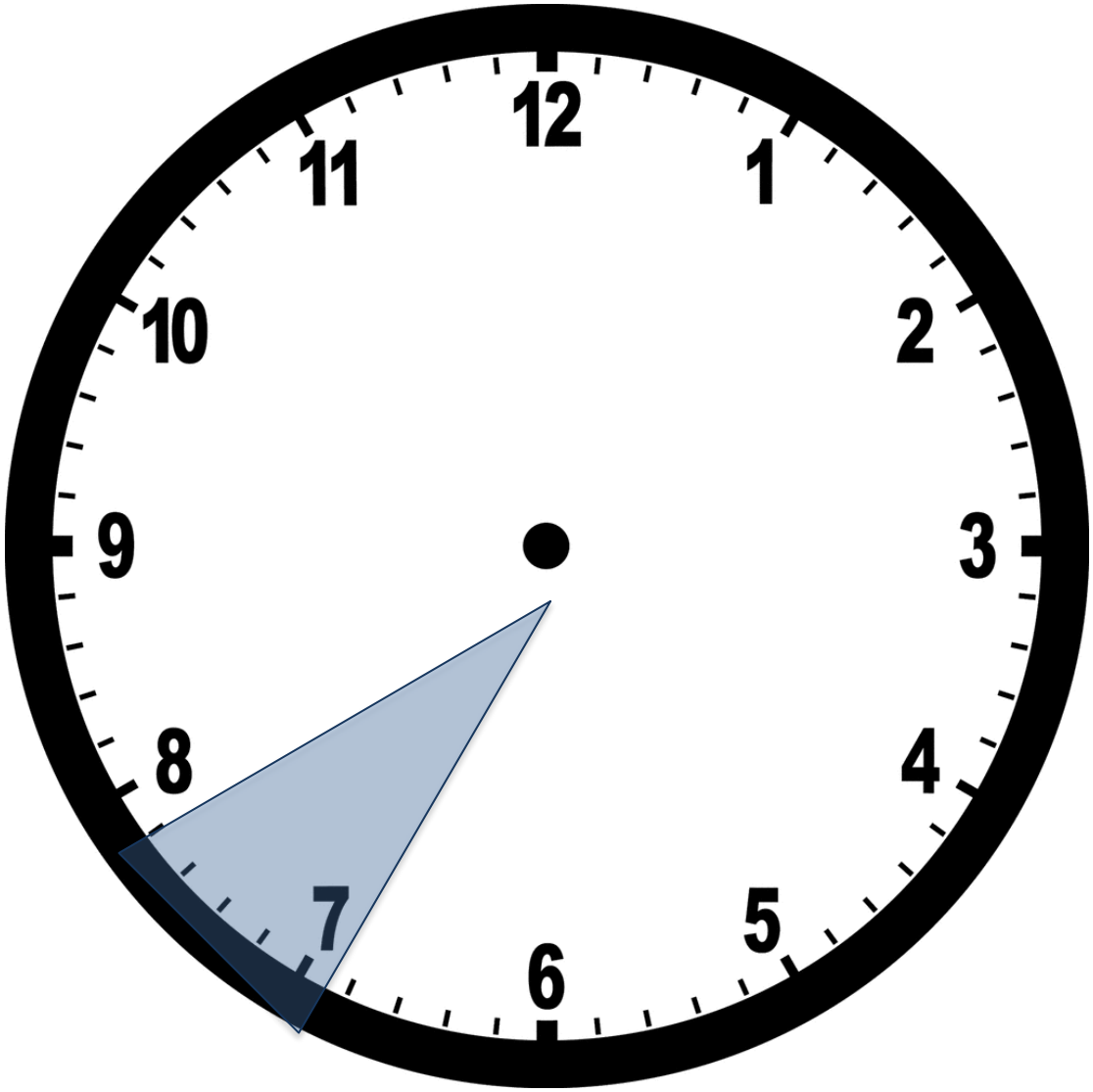


What time did you **wake up** this morning?



What time did you **wake up** this morning?



Part 2

Sleep

890 Elite athletes were asked to rate recovery modalities most important to their recovery

(Venter, 2012)

Sleep was perceived as the most important recovery factor compared to other common modalities

(Venter, 2012)

Why sleep?

- Restoration of physical functioning and health
- Energy conservation
- Brain plasticity

Sleep for health

2.94 times more likely to develop a cold with < 7 hours of sleep vs. ≥ 8 hours of sleep

Sleep for health

Sleep loss of 2-8% (10-38 mins) was associated with **3.9 times** the risk of developing a cold

Sleep for health

Illnesses (cold, flu, gastroenteritis and other infections diseases) are **more frequent in adolescents with shorter sleep**

(Orzech et al., 2013)

Sleep for health

Illnesses occurred **after periods of shorter sleep**

(Orzech et al., 2013)

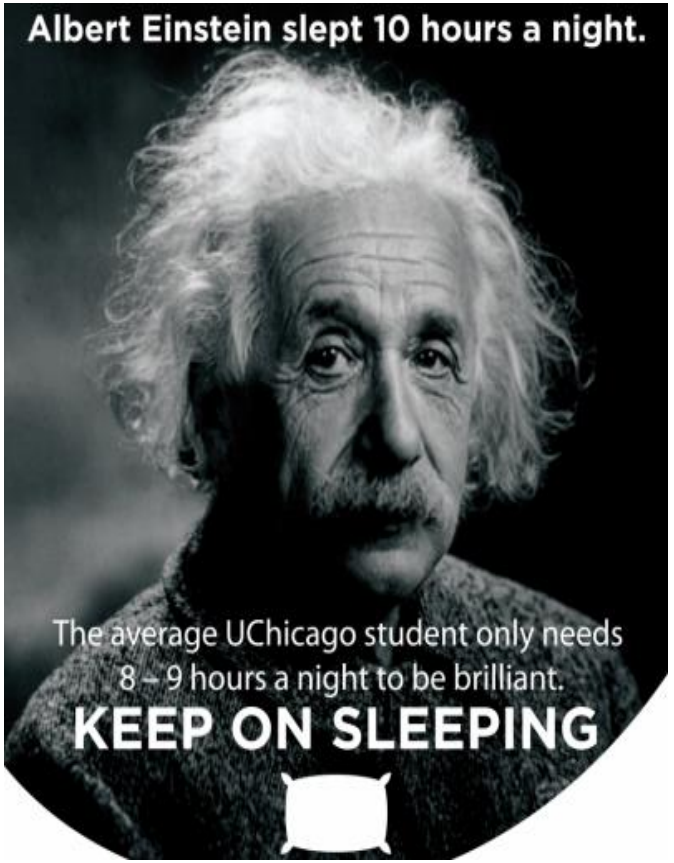
"Sleep is the most effective cognitive enhancer we have."

—Russell Foster, Ph.D., F.R.S., Professor of Circadian Neurosciences, Head of the Nuffield Laboratory of Ophthalmology, Director of the Sleep and Circadian Neuroscience Institute, University of Oxford.

Sleep for cognition

Insufficient sleep impacts:

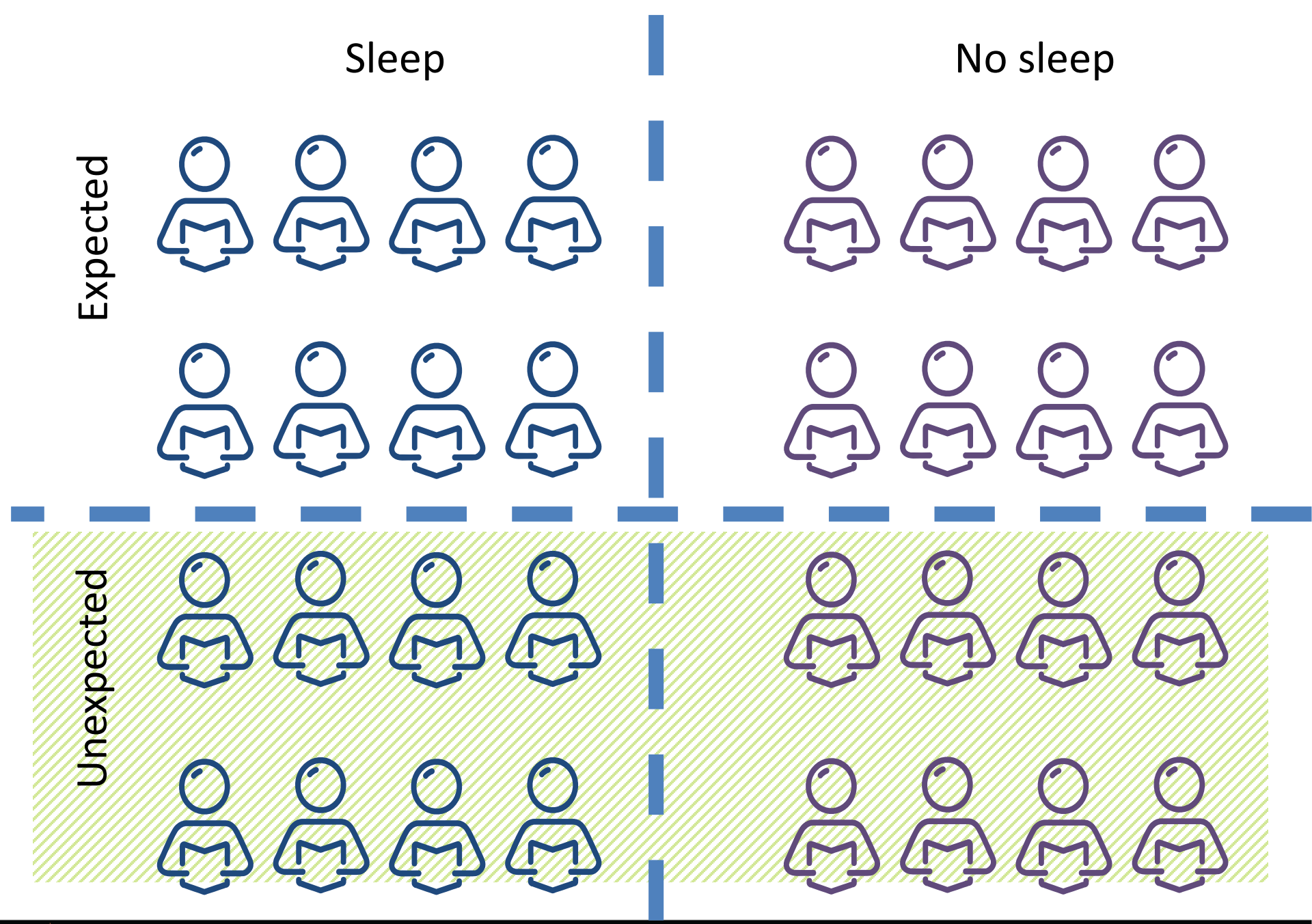
- Learning and memory consolidation
  (Diekelmann & Born, 2010; M. P. Walker & R. Stickgold, 2006)
- Creativity
  (Cai, Mednick, Harrison, Kanady, & Mednick, 2009)
- Abstract thinking
  (Curcio et al., 2006)
- Motor learning
  (Tamaki et al., 2013)
- Academic performance
  (Fredriksen, Rhodes, Reddy, & Way, 2004)

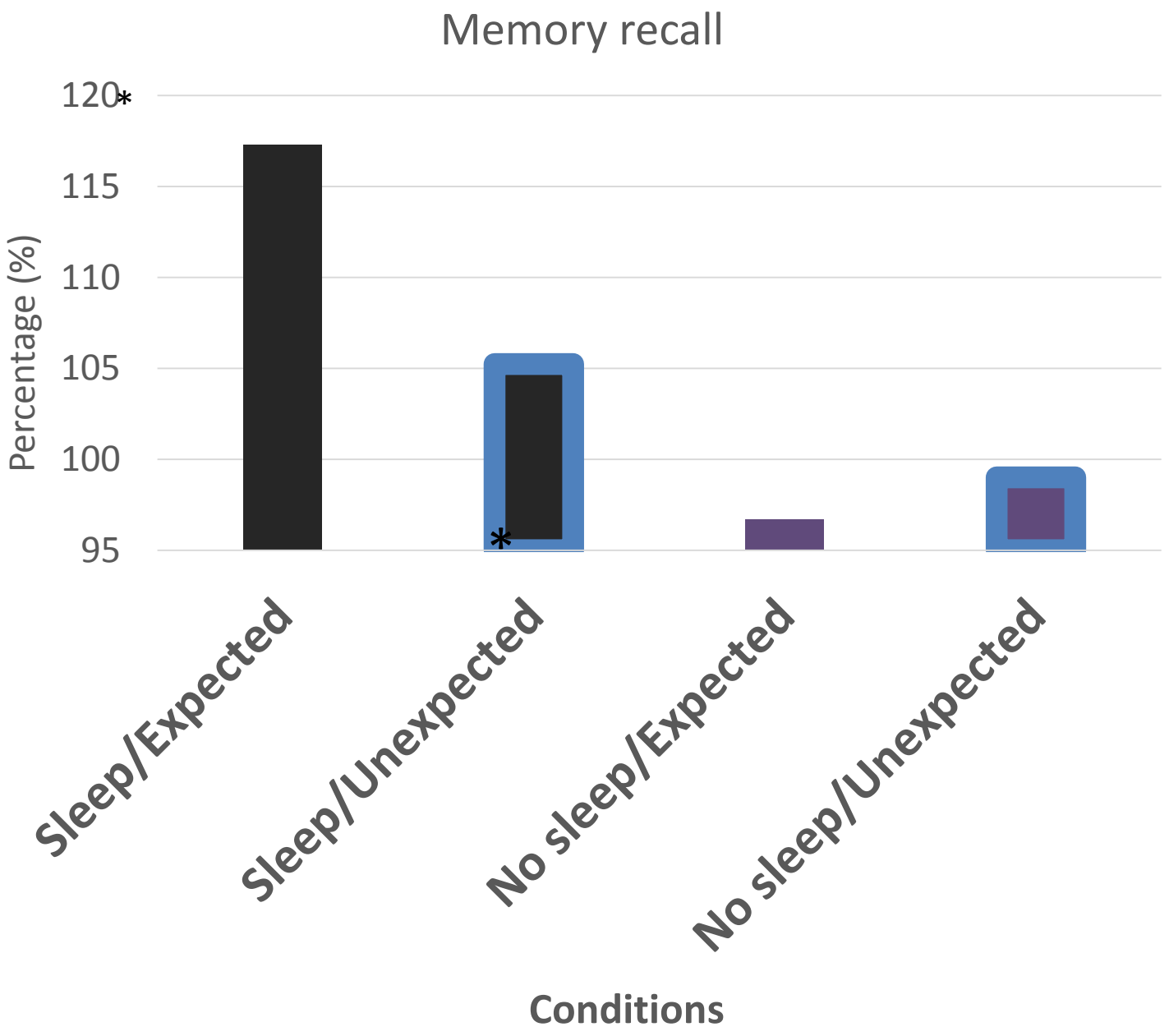


Can sleep improve academic performance?

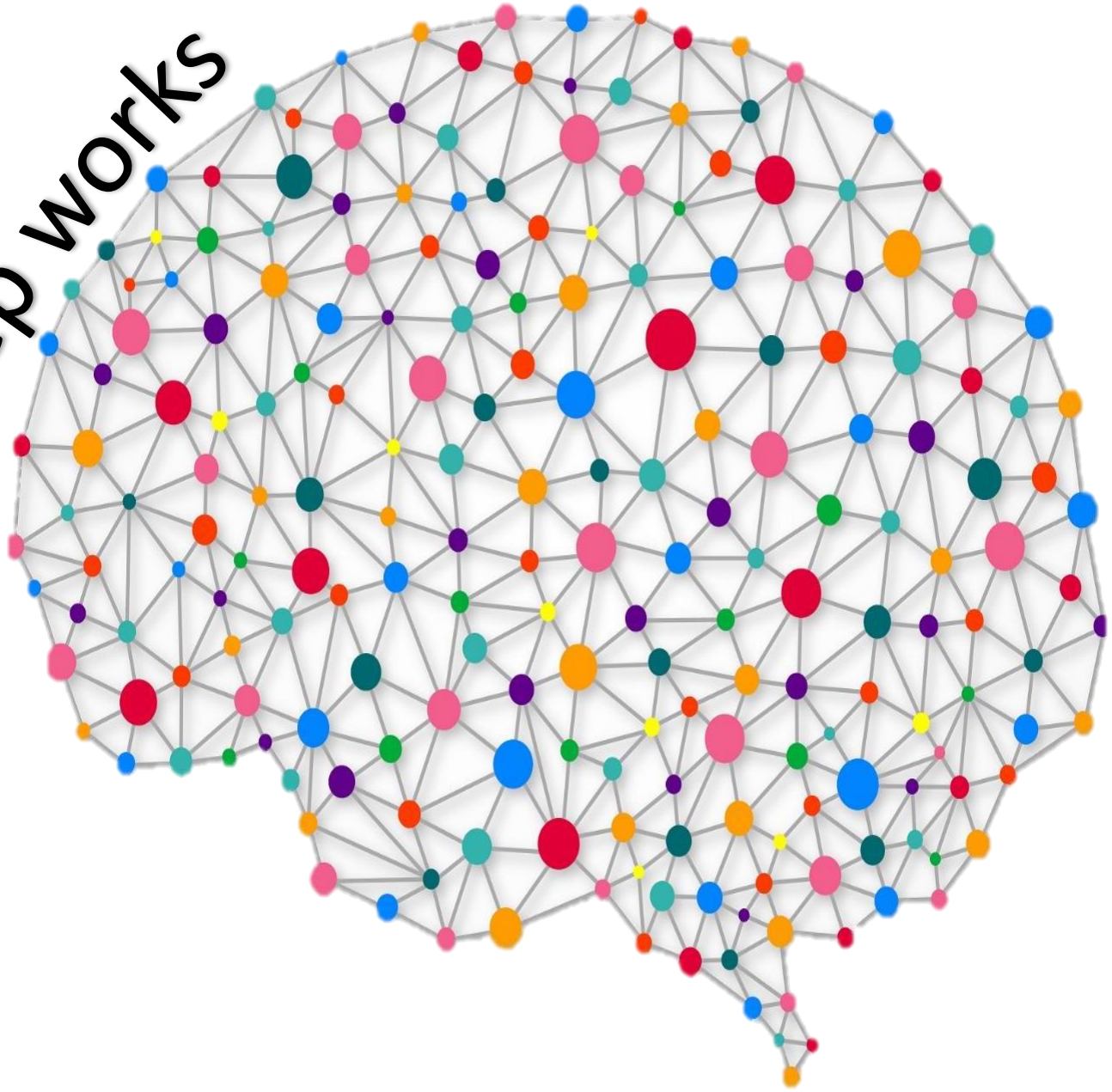
Sleep

No sleep

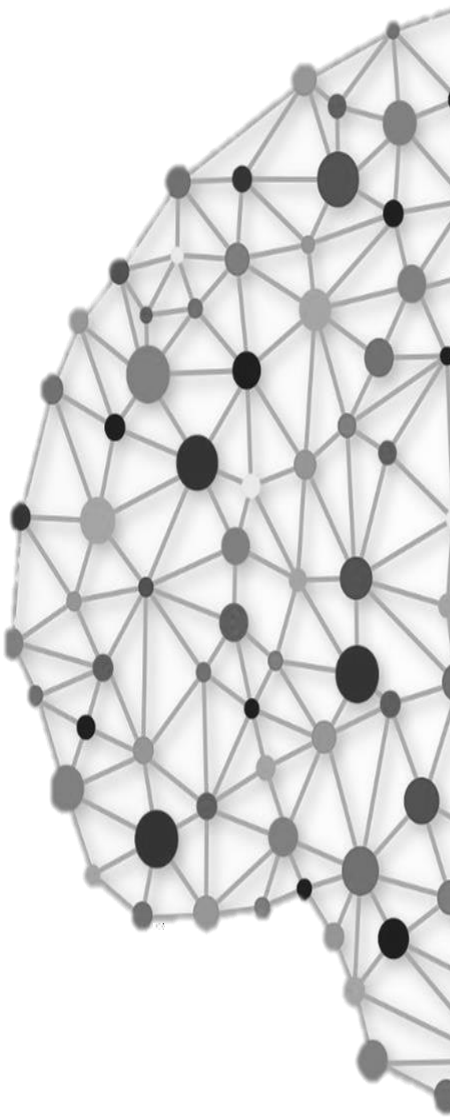

Sleep
No sleep
Expected
Unexpected


Memory recall
120
115
110
105
100
95
Percentage (%)
*
*
Sleep/Expected
Sleep/Unexpected
No sleep/Expected
No sleep/Unexpected
Conditions

How sleep works

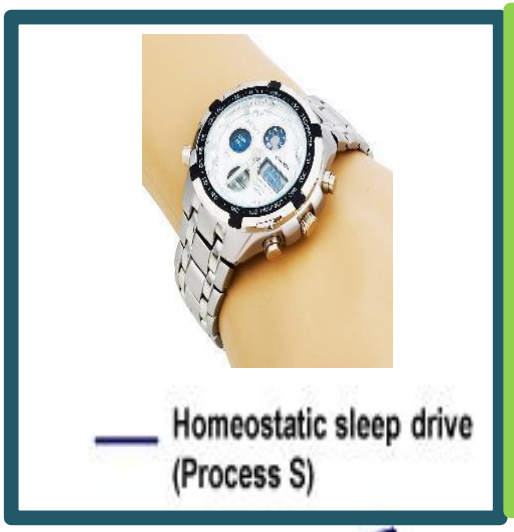


How sleep works (very briefly)

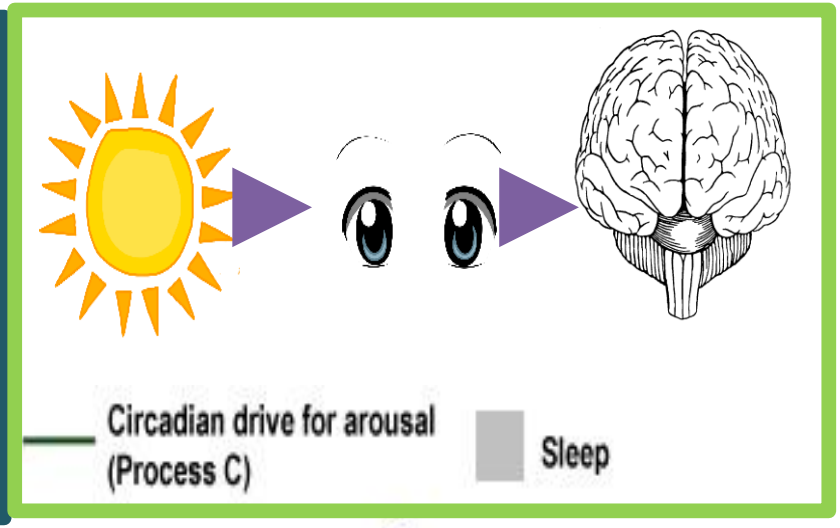


- Neurotransmitters in various parts of the brain control whether we are sleep or awake
- A **2-Process Model** works in harmony to control sleep and wakefulness
  - **Circadian** alerting system (Process C)
  - **Homeostatic** sleep drive (Process S)

2 Processes

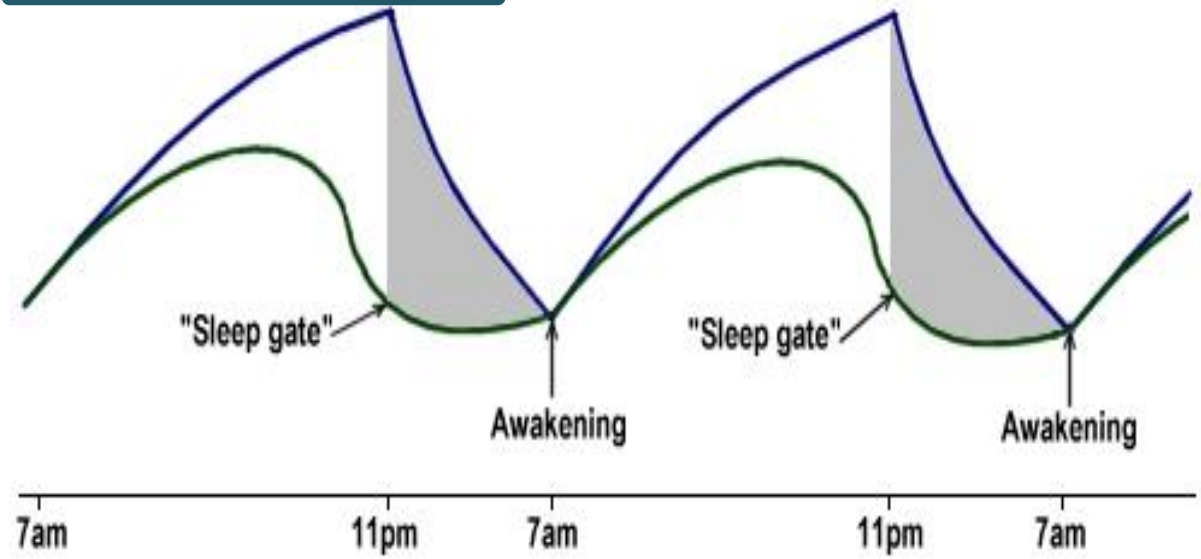


Homeostatic sleep drive
(Process S)

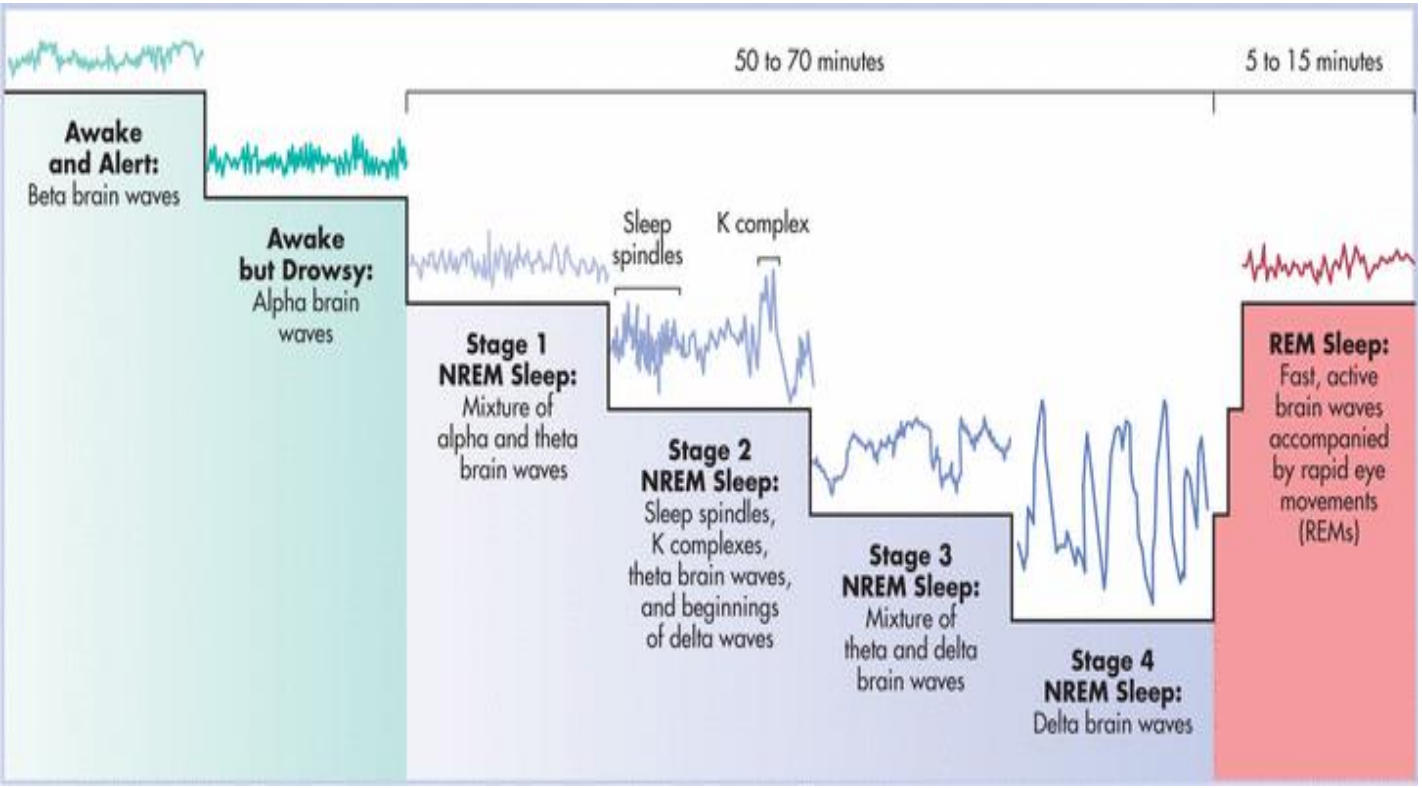


Circadian drive for arousal
(Process C)

Sleep

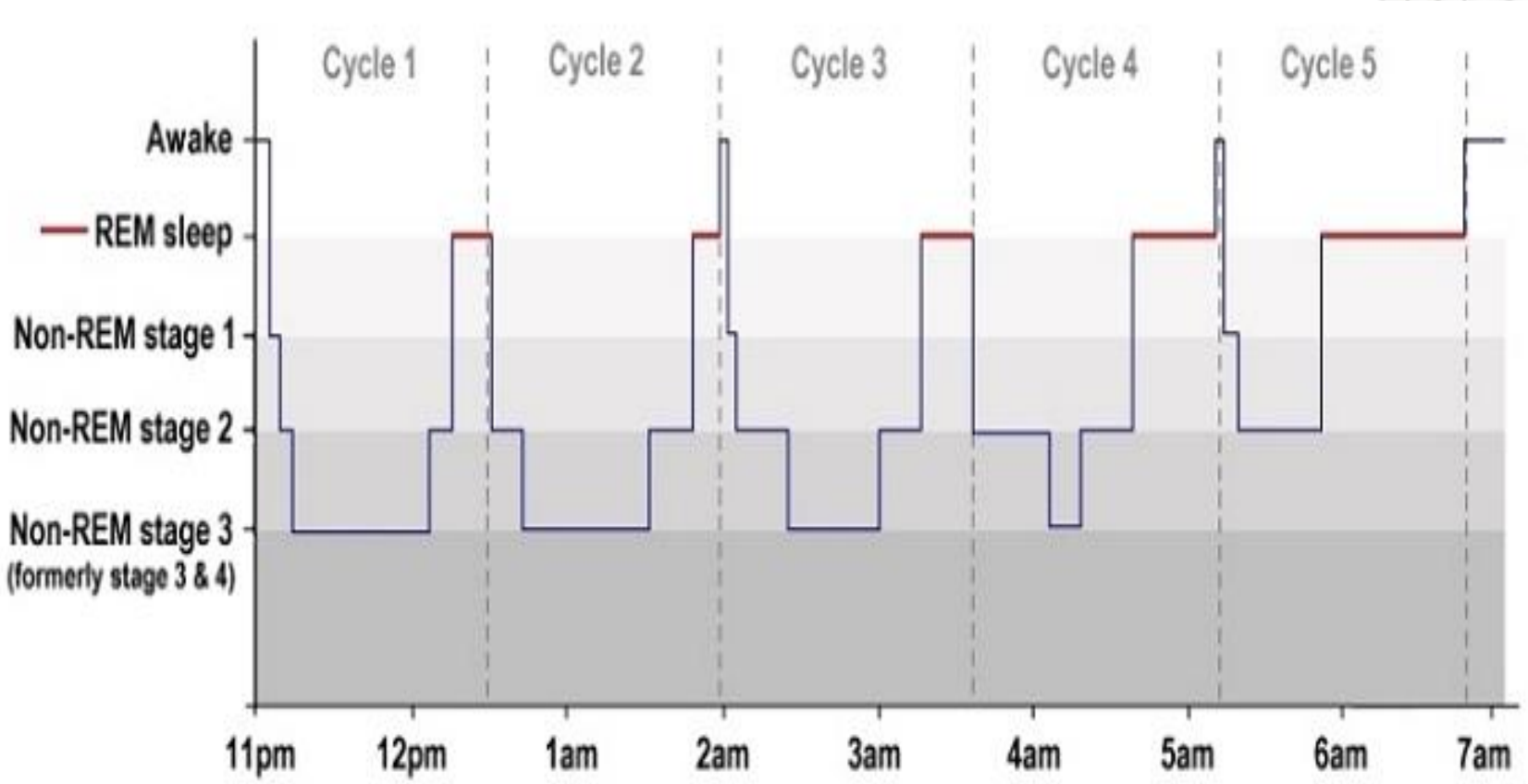


Sleep stages & sleep cycles



Sleep cycles last 90 minutes on average

Sleep stages & sleep cycles

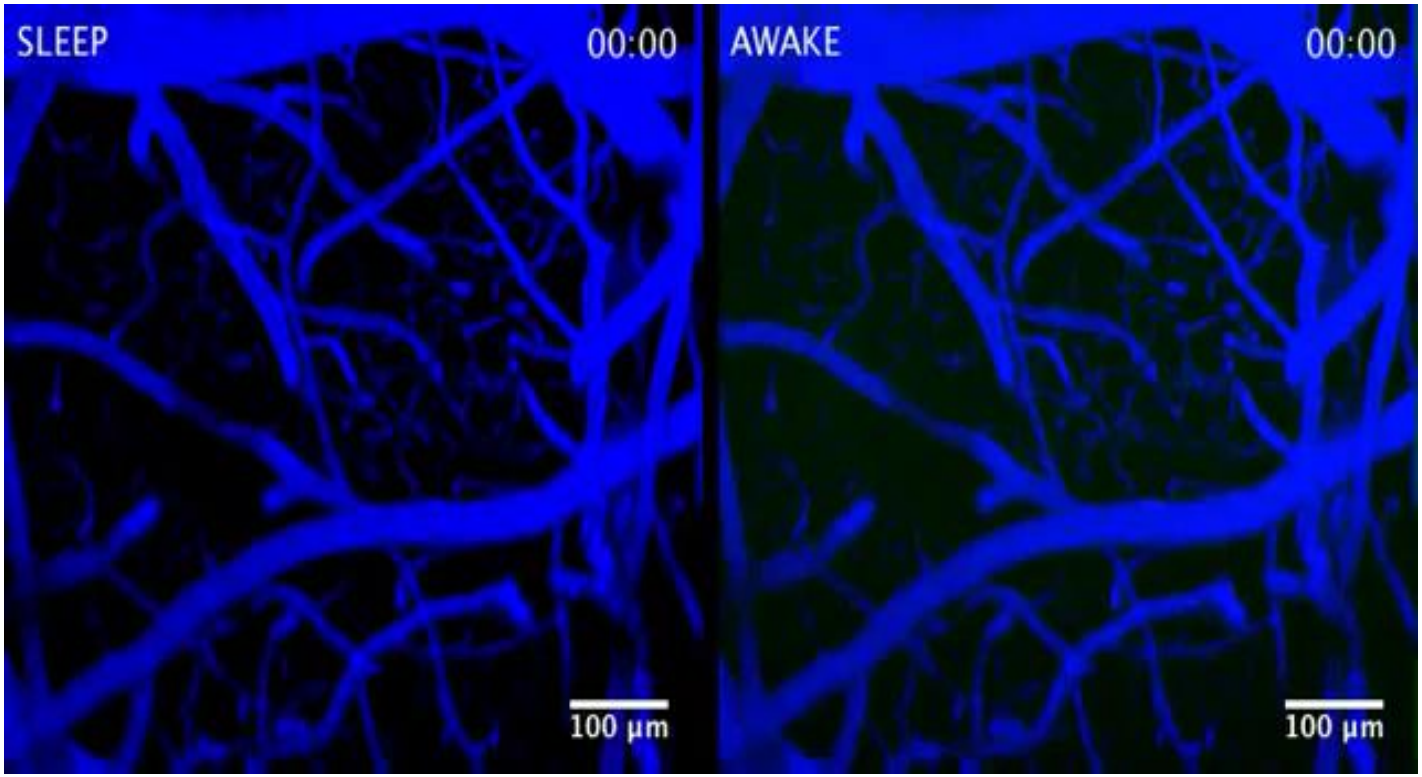


Stage 1 (Light): 5%, Stage 2 (Light): 45%, , Stage 3 (Deep): 25%, REM: 25%

Did you know sleep literally **cleans** the brain

Asleep brain

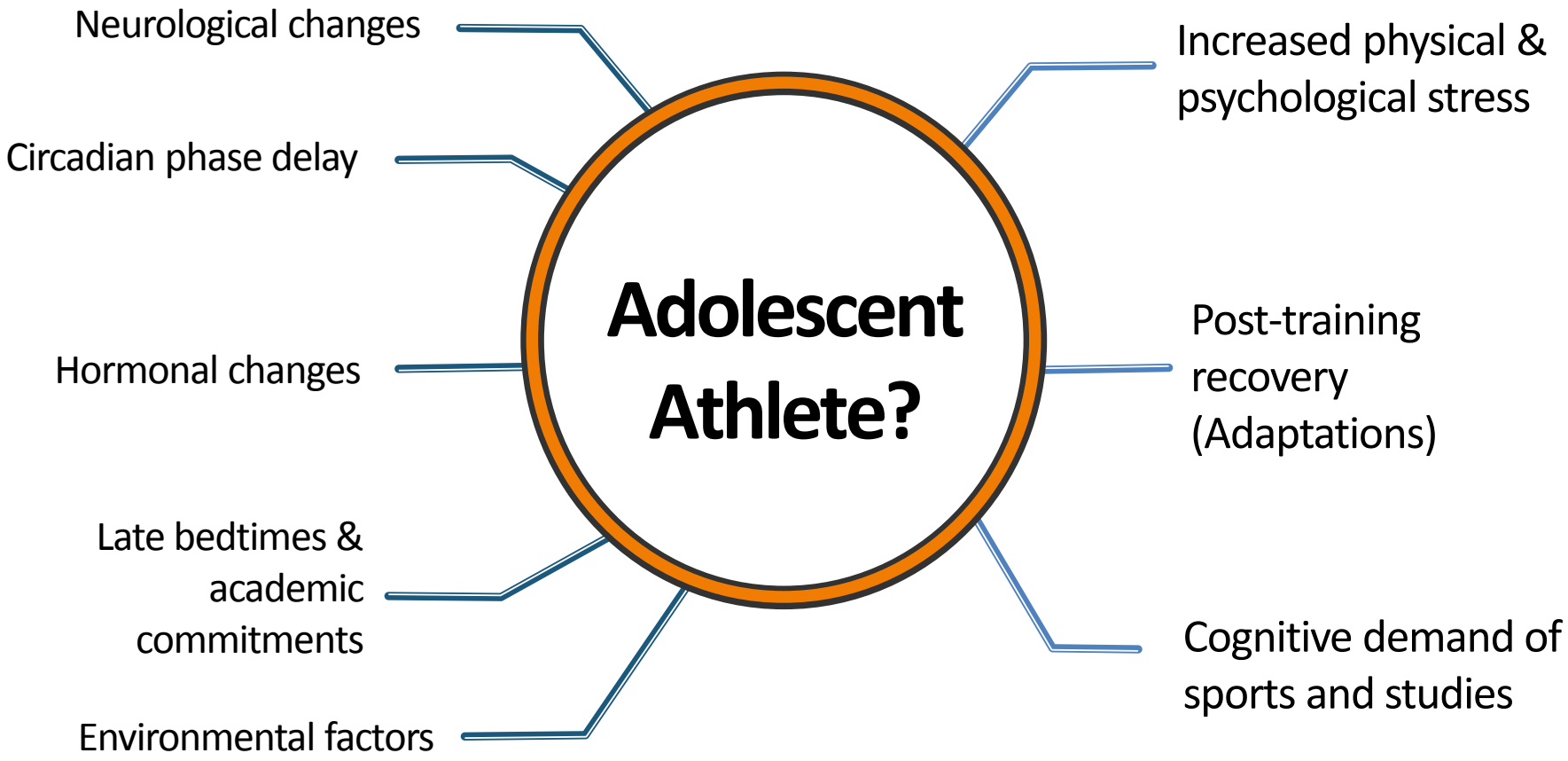
Awake brain

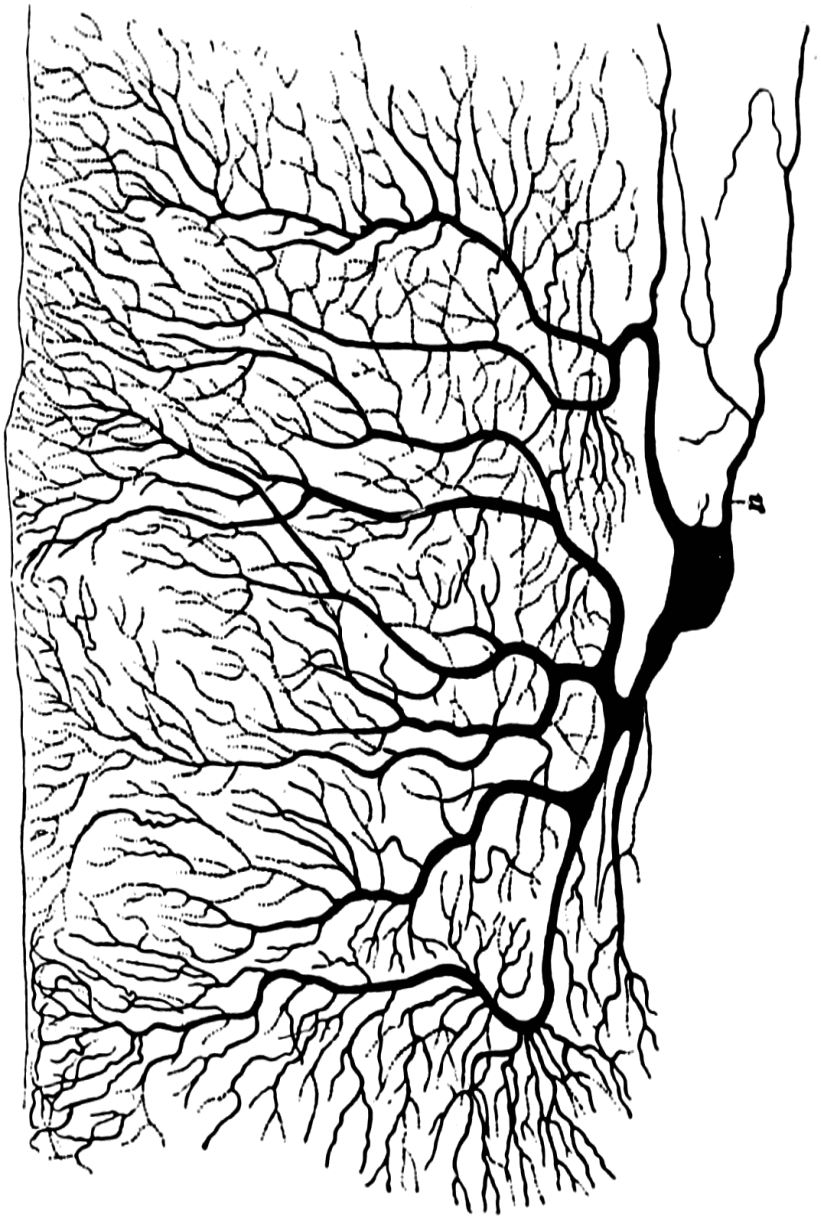


How much sleep do youth athletes need?

Primary school:
9 – 11 hours

Secondary school/JC:
8 – 10 hours


Neurological changes
Circadian phase delay
Hormonal changes
Late bedtimes & academic commitments
Environmental factors
Adolescent Athlete?
Increased physical & psychological stress
Post-training recovery (Adaptations)
Cognitive demand of sports and studies



Synaptic pruning

Reduced deep sleep

Reduced waking brain metabolic rate

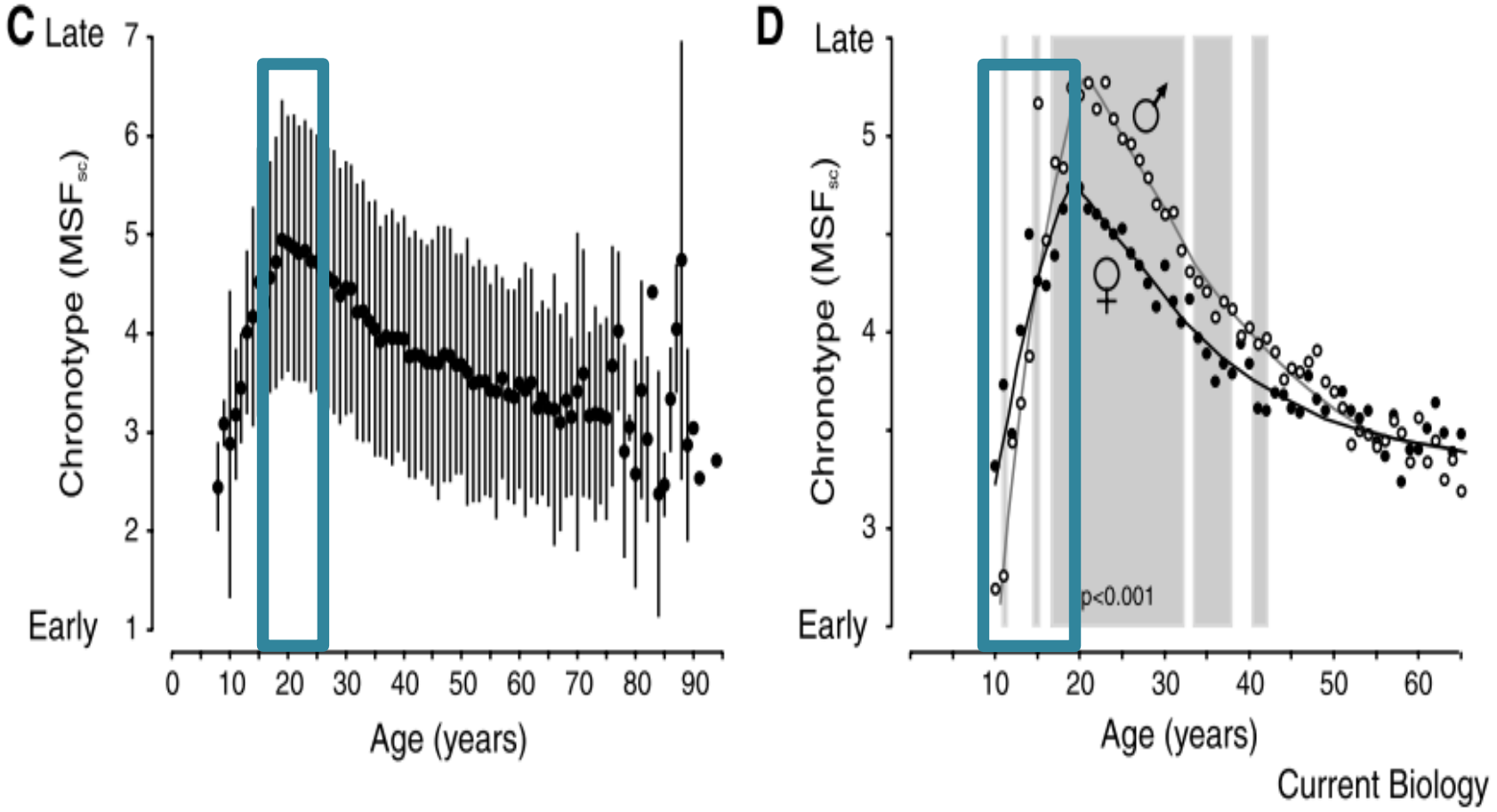
Increased daytime sleepiness occurs **independent of prior sleep** duration

Slower accumulation for sleep need

Later sleep times

(Ian G. Campbell & Feinberg, 2009; I. G. Campbell, Higgins, Trinidad, Richardson, & Feinberg, 2007; Feinberg & Campbell, 2010, 2013)

n=25,000



(Roenneberg et al., 2004)

Melatonin is regulated by circadian rhythm and influences “drive” to sleep

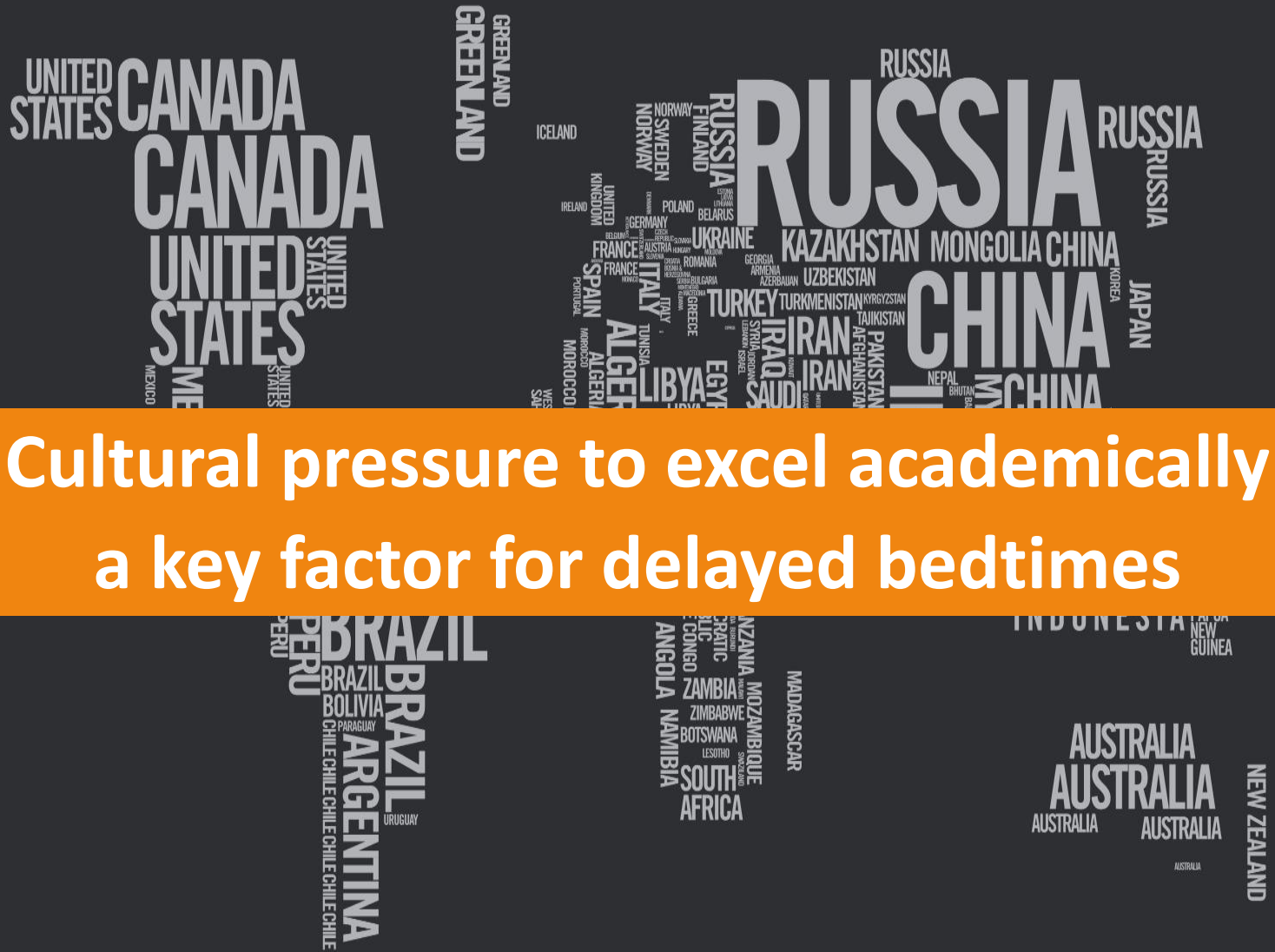
Adolescents have later melatonin onsets highlighting their **delayed circadian systems**

Asian youth sleep later than counterparts in North America and Europe

(Gradisar, Gardner, & Dohnt, 2011)

Asians had higher rates for daytime sleepiness

(Gradisar, Gardner, & Dohnt, 2011)



Cultural pressure to excel academically a key factor for delayed bedtimes

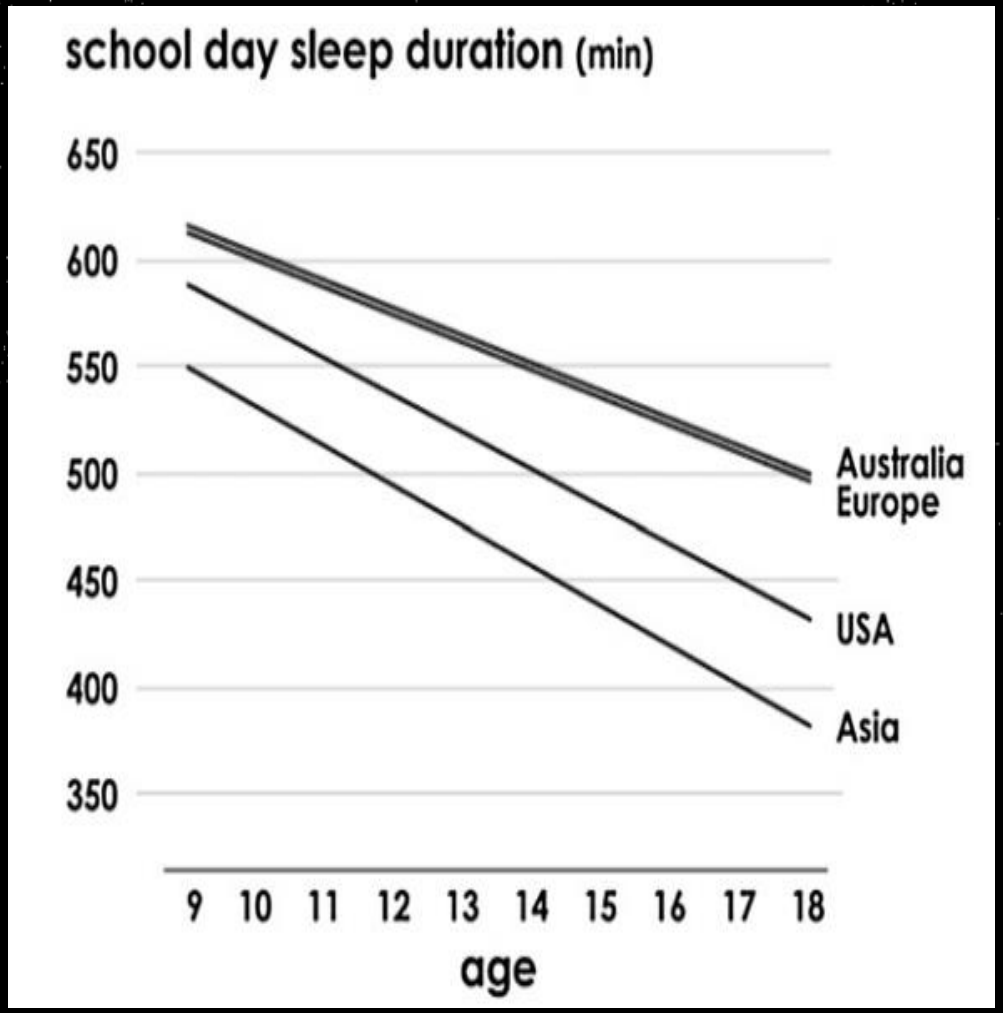
(Gradisar, Gardner, & Dohnt, 2011)

10.8 HRS

9.1 HRS

7.5 HRS

5.8 HRS



40-60 mins less than North Americans

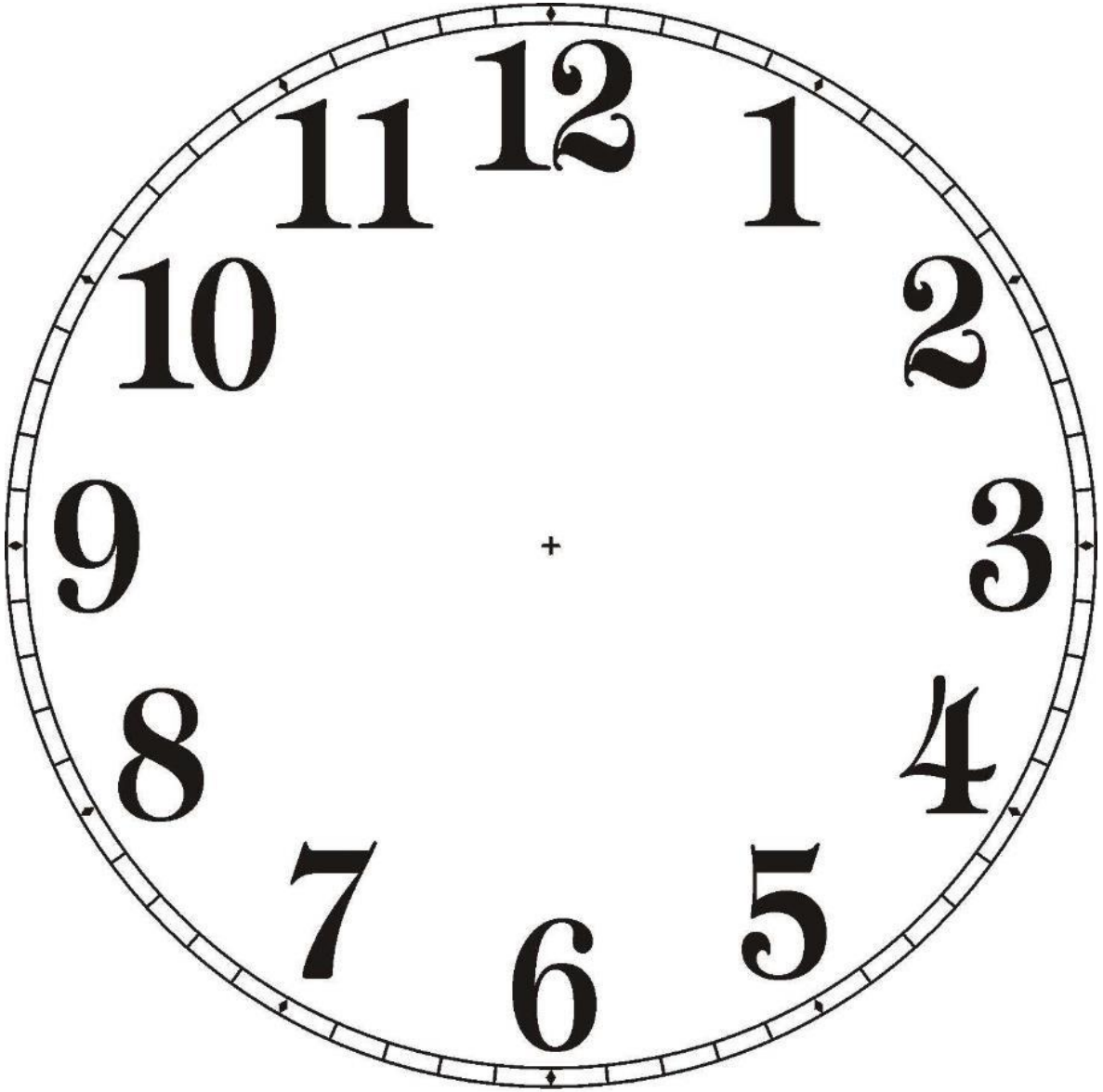
60-120 mins less than Europeans

(Olds, Blunden, Petkov, & Forchino, 2010)

Activity

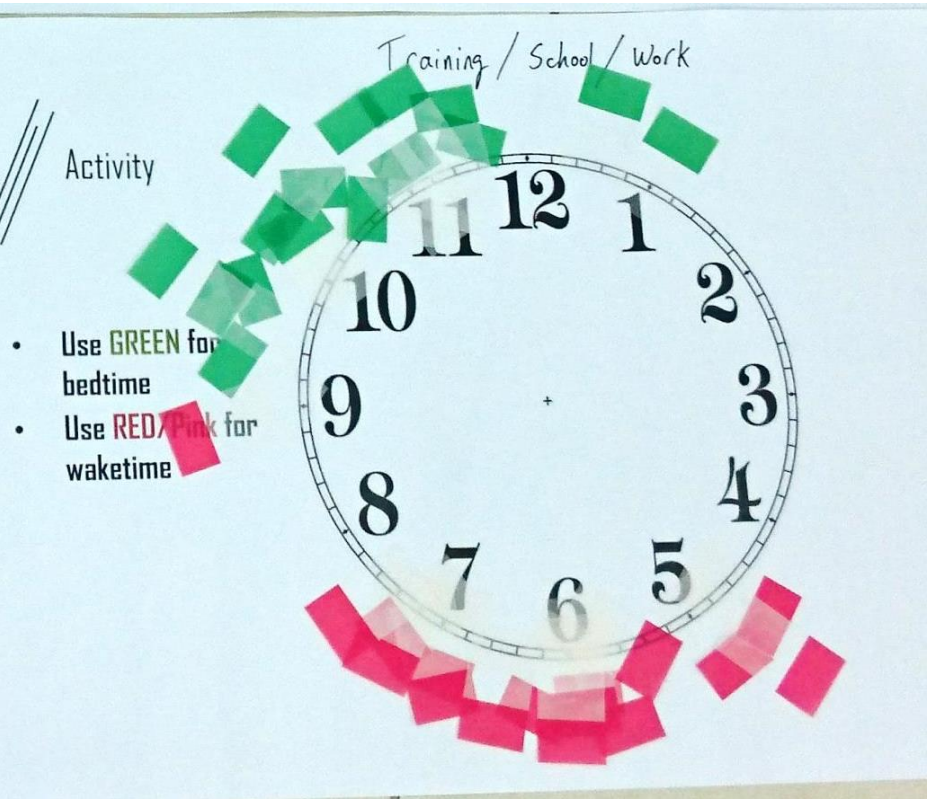
Activity

- Use **GREEN** for bedtime
- Use **RED**/**PINK** for waketime

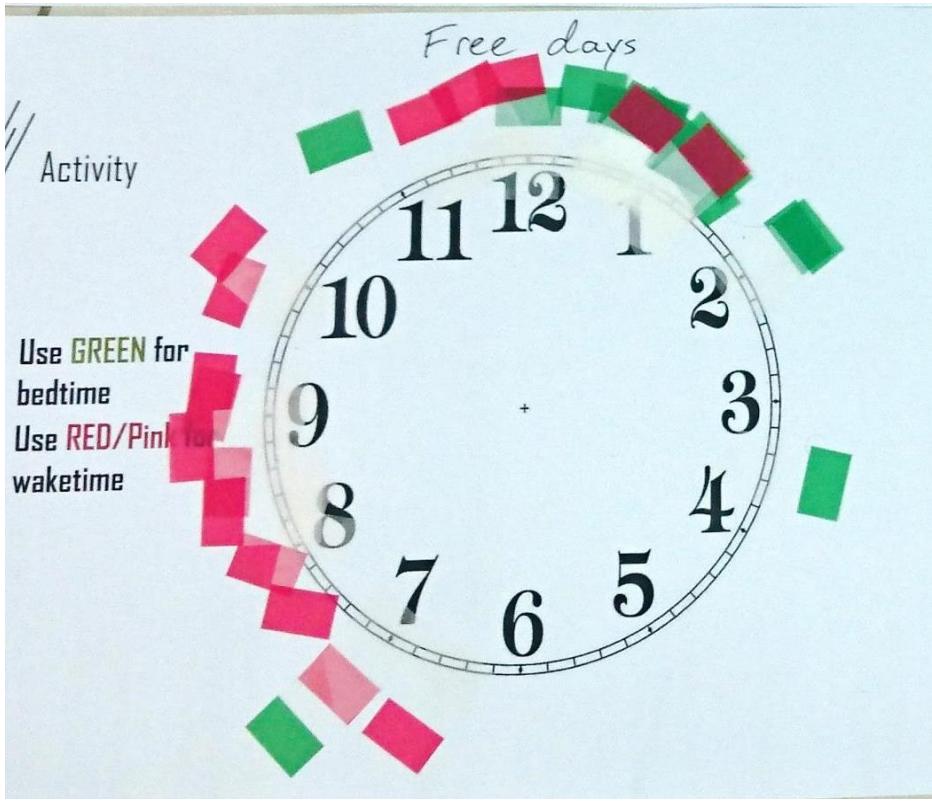


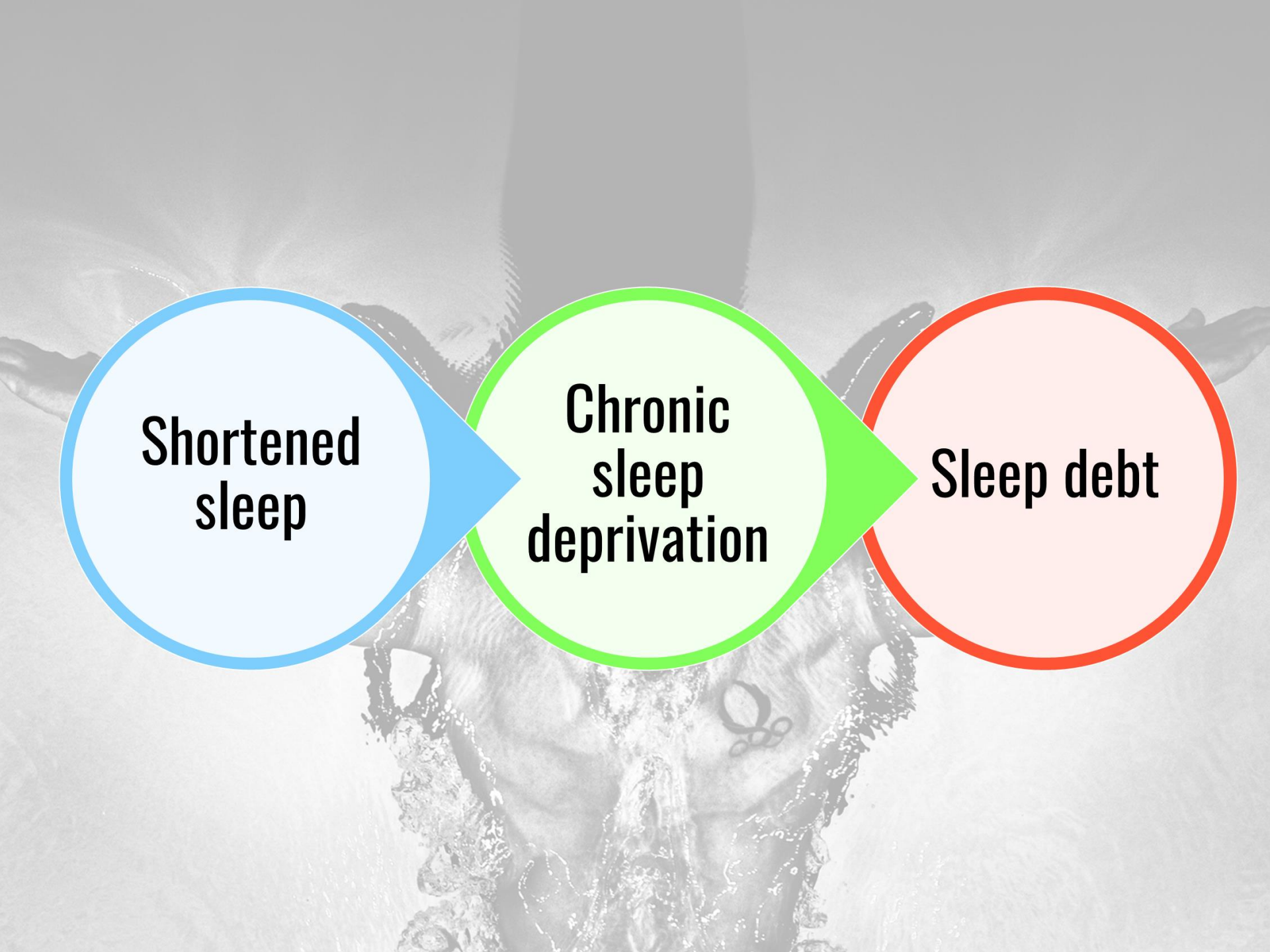
International Youth Sailors

Sleep on training/school/work days



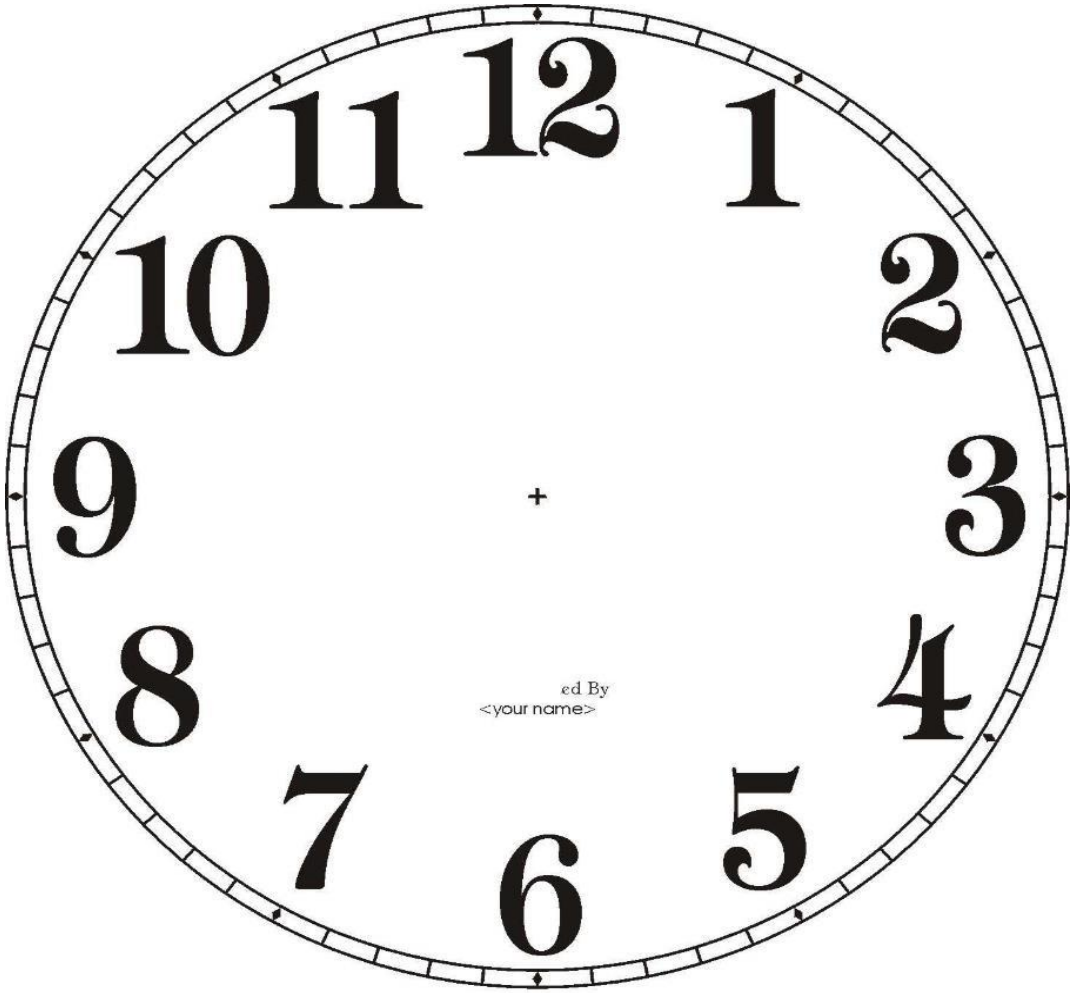
Sleep on training/school/work days




Shortened sleep
Chronic sleep deprivation
Sleep debt

Amount of sleep you should be getting - **Amount of sleep you actually get** = **Sleep Debt**

Remember this?

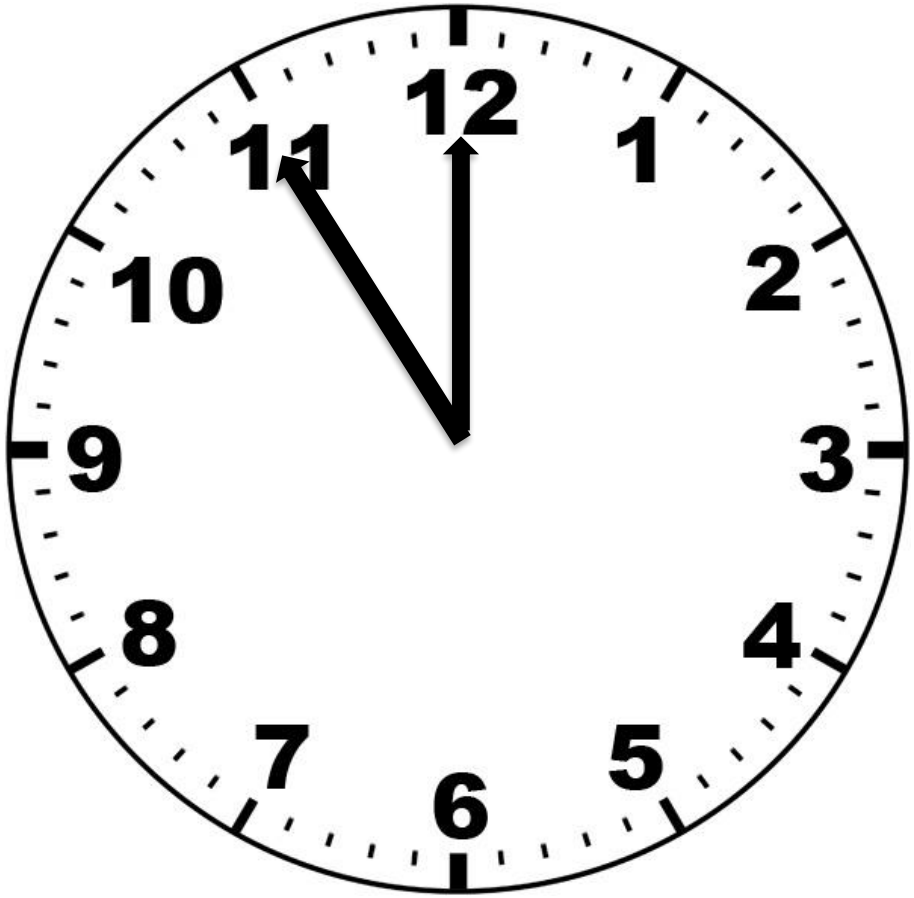


Sleep debt

8 hours of sleep

Ideal bedtime & waketime:

11 p.m. – 7 a.m.



Sleep debt

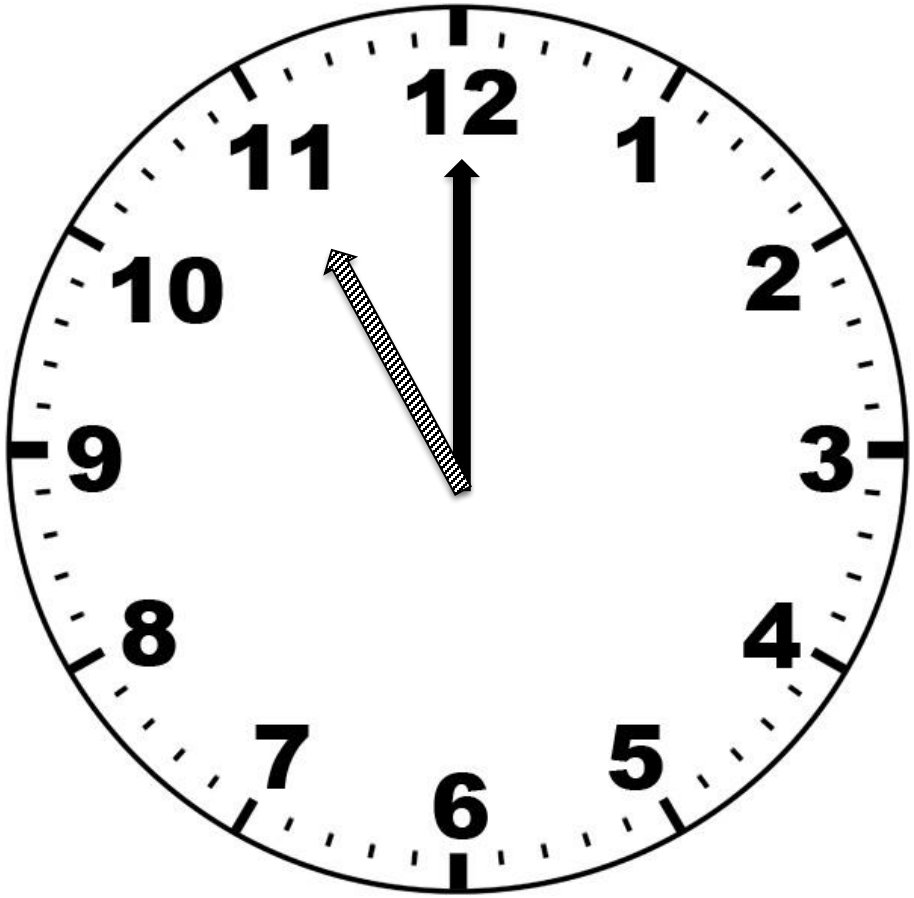
8 hours of sleep

Ideal bedtime & waketime:

11 p.m. – 7 a.m.

Reality:

11 p.m. – 5 a.m.



Sleep debt

8 hours of sleep

Ideal bedtime & waketime:

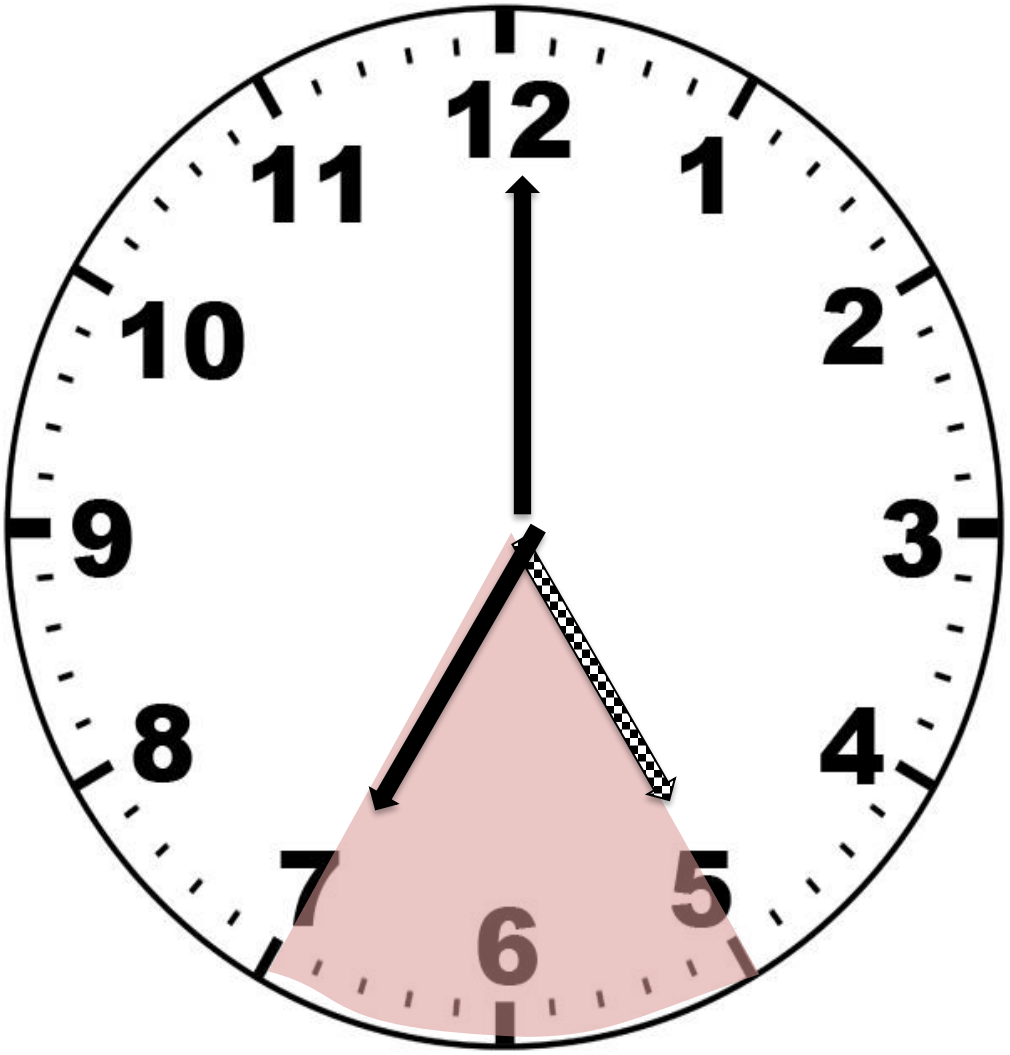
11 p.m. – 7 a.m.

Reality:

11 p.m. – 5 a.m.

-Sleep debt over 5 weekday nights

- 5 x 2 hours = 10 hours (debt)



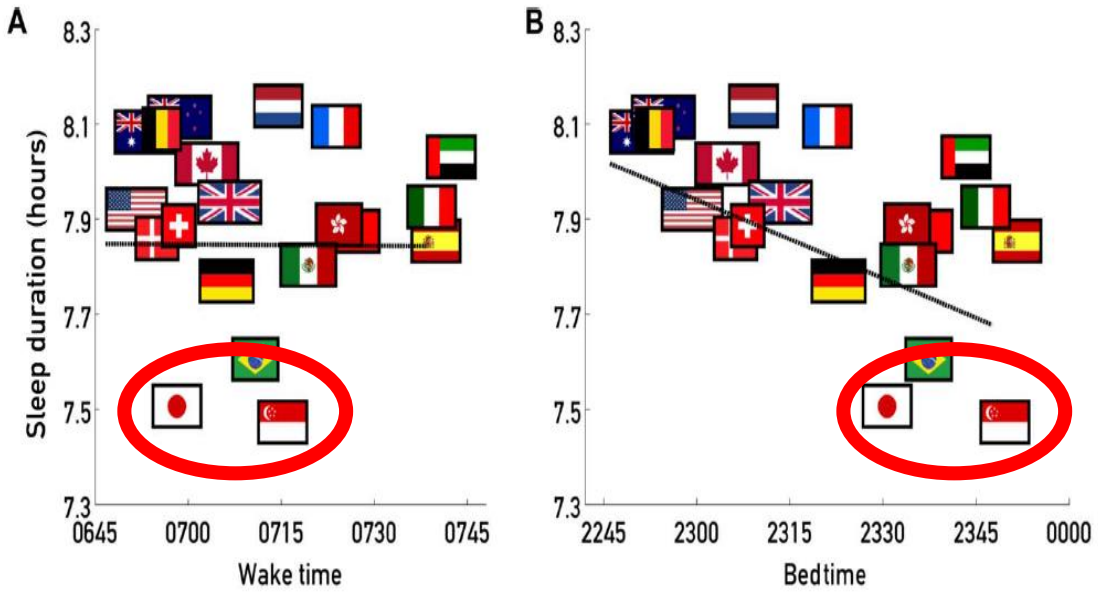
The need to consider context & culture

RESEARCH ARTICLE

SLEEP RESEARCH

A global quantification of "normal" sleep schedules using smartphone data

Olivia J. Walch,[1] Amy Cochran,[1] Daniel B. Forger[1,2]*



(Walch, Cochran, & Forger, 2016)

Effects of light exposure have a greater effect on adolescents

(Crowley, 2015)

Sleep characteristics of athletes

- **Fixed training/competition schedules**
- **Competition anxiety**
- **Overly intense training**
- **Jet lag**

(Fullagar, Skorski, et al., 2015; Killer et al., 2015)

Sleep characteristics of elite athletes

(Erlacher et al., 2011)

76% slept worse before competitions

43% woke up earlier in the morning

(Venter, 2012)

75% slept between **6-8 hrs.**

11% slept less than **6hrs**. on WE

(Leeder et al., 2012)

Athletes

TIB: 8 hr 36 mins

Efficiency: 80.6%

Actual sleep: 6 hr 55 min

Non-athletes

TIB: 8 hr 7 mins

Efficiency: 88.7%

Actual sleep: 7 hr 11 min

(Lastella et al., 2014)

Individual sports

Bedtime: 22:27 hrs

Waketime: 06:42 hrs

TIB: 8.2 hrs

Actual sleep: 6.5 hrs

Team sports

Bedtime: 23:24 hrs

Waketime: 07:56 hrs

TIB: 8.5 hrs

Actual sleep: 7 hrs


FEEL ITS FURY
GEORGE CLOONEY
A WOLFGANG PETERSEN Film
MARK WAHLBERG
THE PERFECT STORM

Effects of poor/insufficient sleep

- Physiological functioning
- Cognition
- Academic performance
- Immunity & health
- Psychological well-being
- Hormonal regulation
- Mood and behaviour
- Increased injury risk


What happens
when athletes
don't get
enough sleep?

Physiological responses to sleep loss include:

- ↑ heart rate
- ↑ lactate following sub and max exercise
- ↑ perceived effort
- ↑ stress hormones during training
- ↑ pro-inflammatory markers
  - Poorer metabolism

(Fullagar et al., 2014)

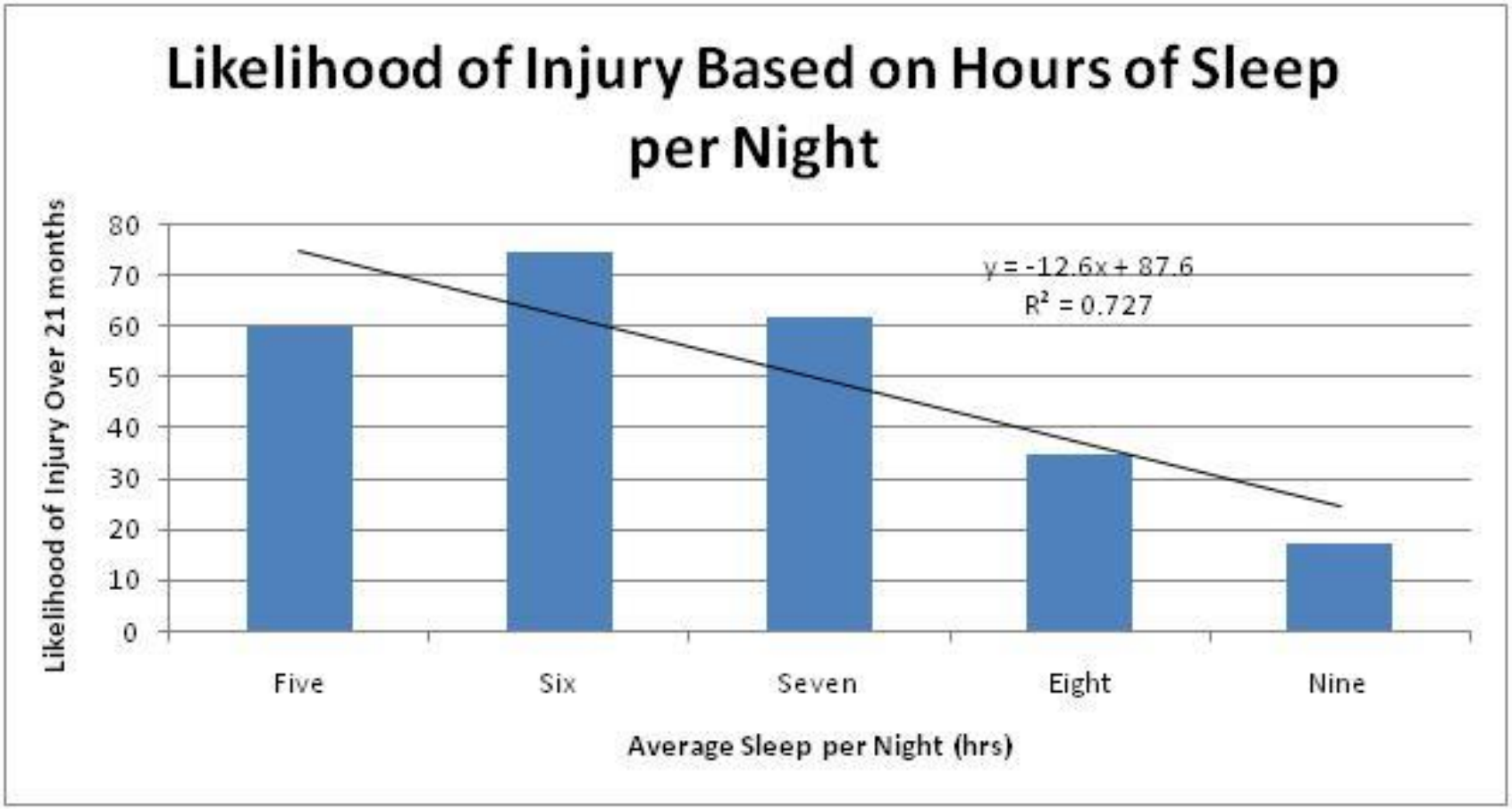
Effects on cognition:

- ↑ reaction time
- ↓ motor learning ability
- ↓ skill acquisition
- ↓ vigilance
- ↓ decision making

(Fullagar et al., 2014)

Increased risk of sports injuries in adolescent-athletes

Adolescents that slept <8 hours were **nearly 2 times** more likely to have an injury


Likelihood of Injury Based on Hours of Sleep per Night
Likelihood of Injury Over 21 months
80
70
60
50
40
30
20
10
0
y = -12.6x + 87.6
R² = 0.727
Five
Six
Seven
Eight
Nine
Average Sleep per Night (hrs)

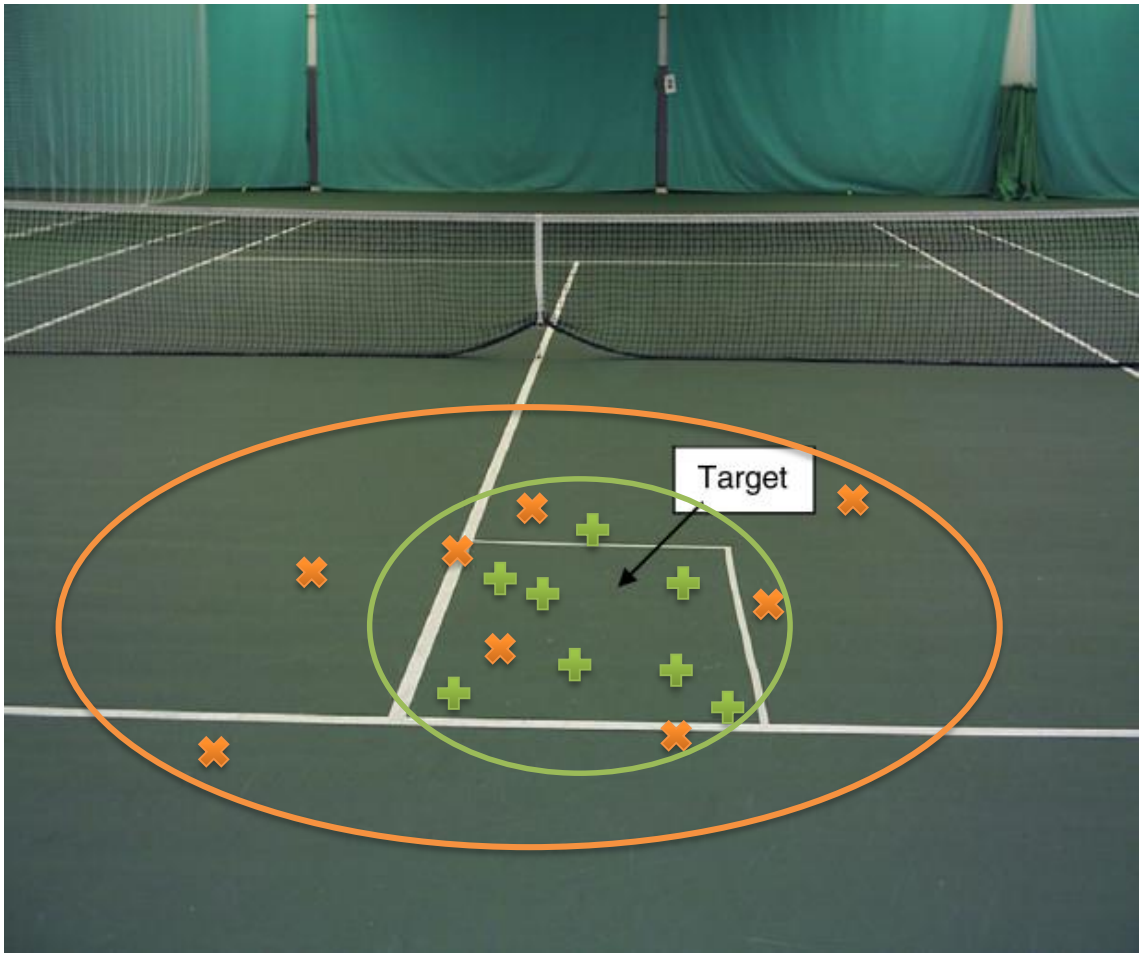
What happens when athletes get extra sleep?

Sleep extension (6.6 to 8.5 hrs.)

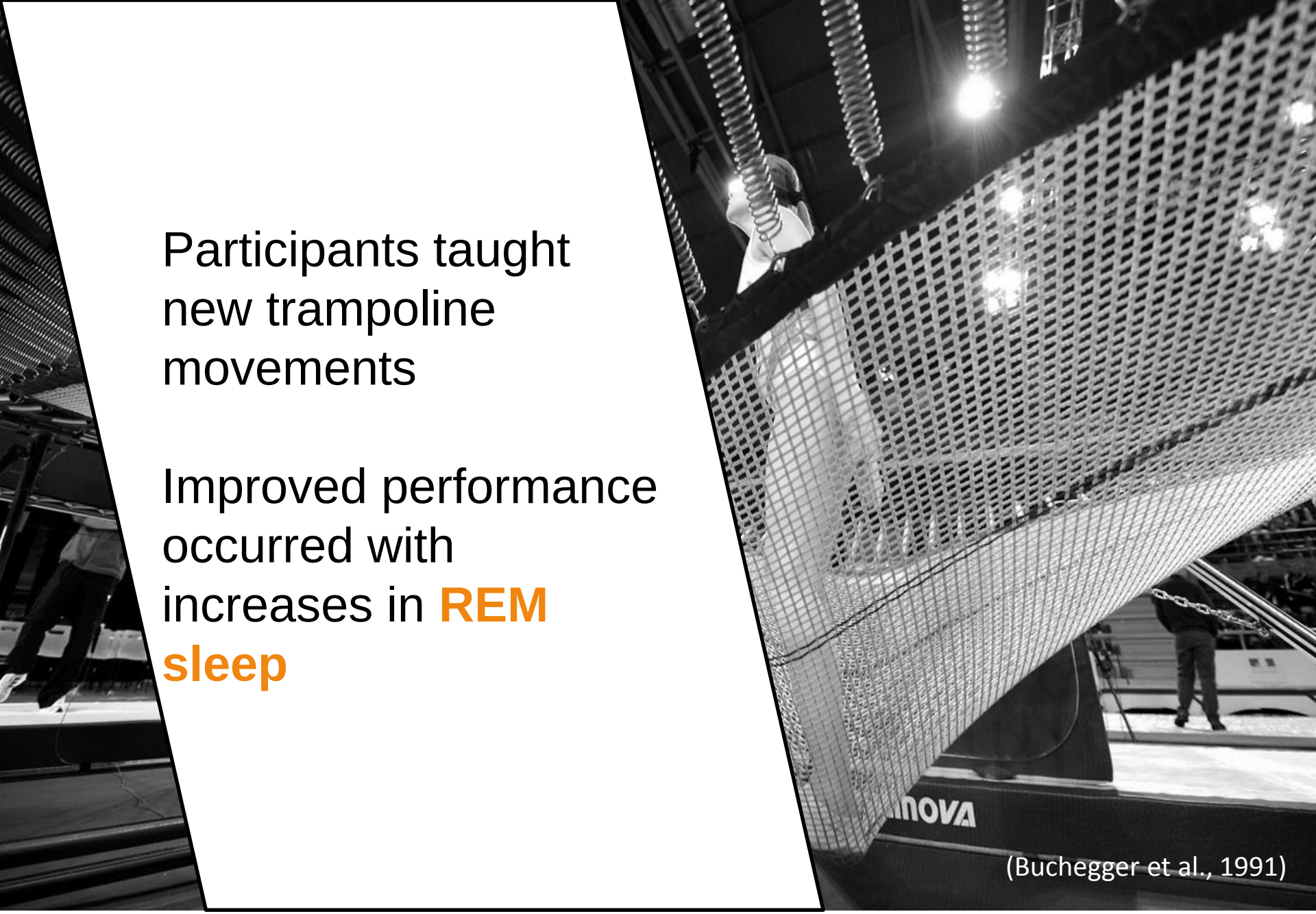
- Faster sprint times
- Improved accuracy

Sleep and Tennis performance

Less sleep than usual



Normal amount of sleep

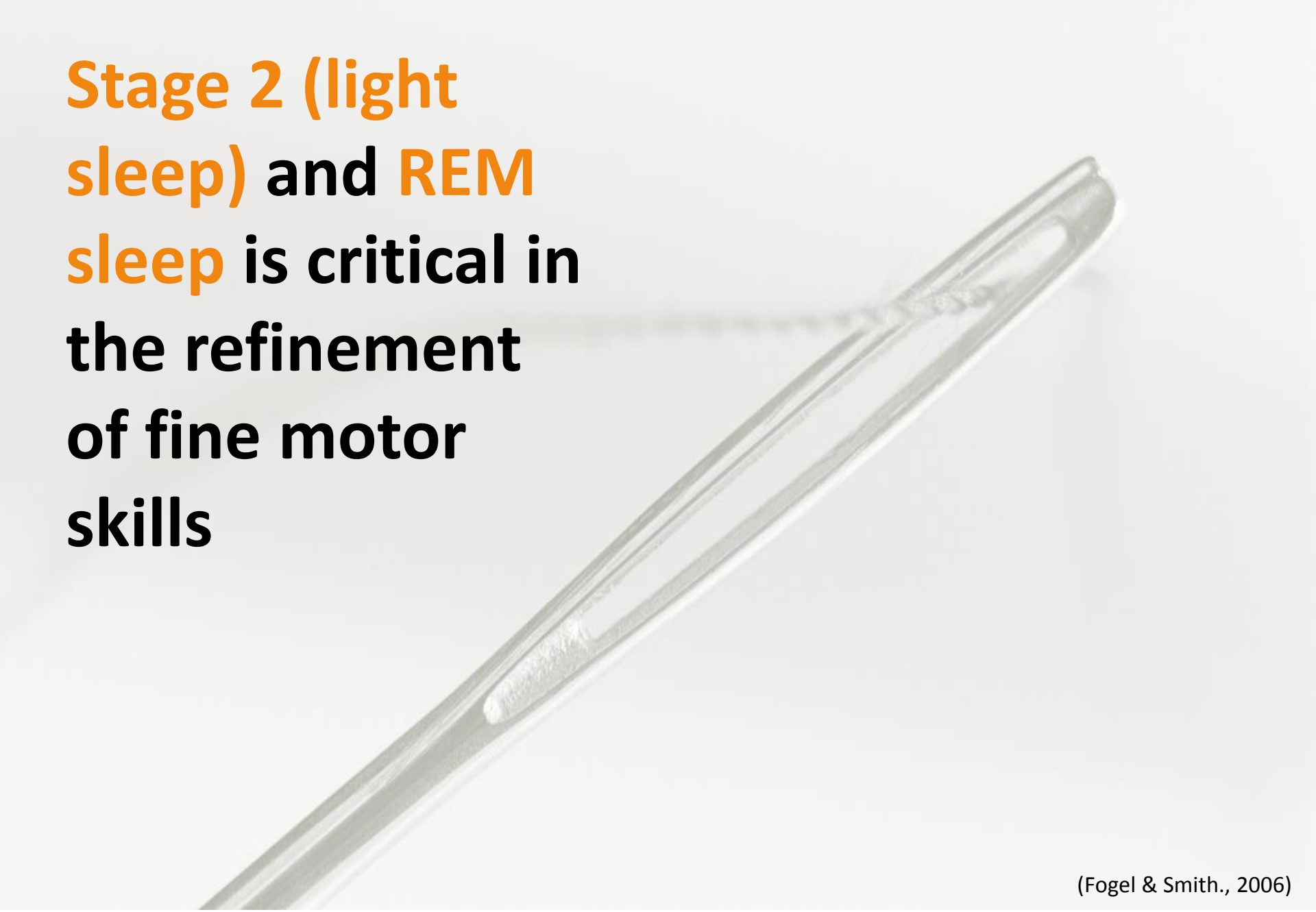


Participants taught new trampoline movements

Improved performance occurred with increases in **REM sleep**

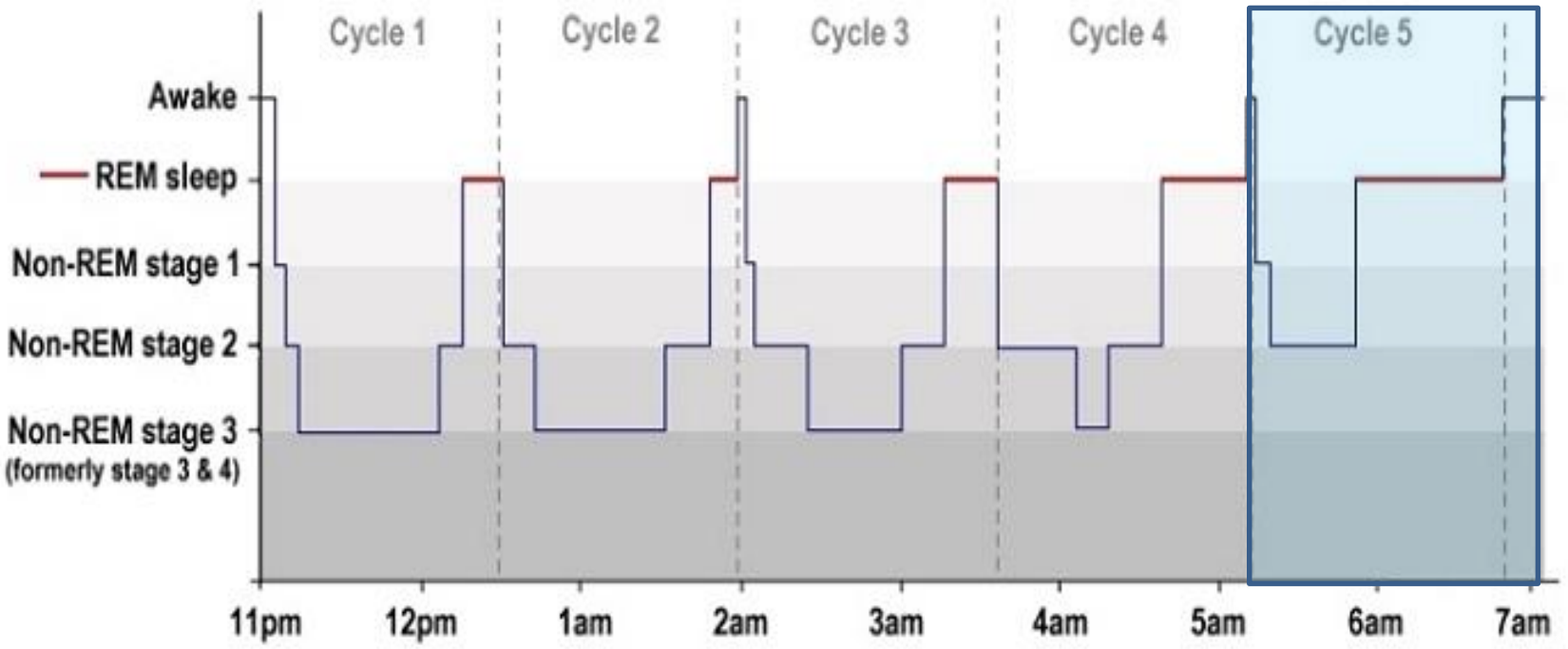
(Buchegger et al., 1991)

Stage 2 (light sleep) and REM sleep is critical in the refinement of fine motor skills



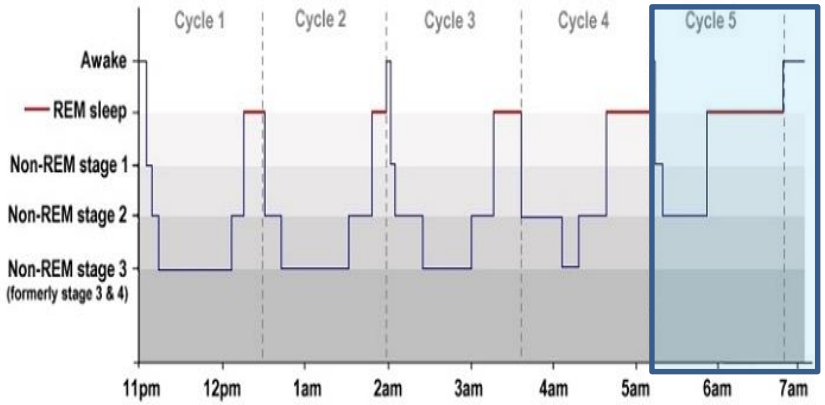
(Fogel & Smith., 2006)

Sleep stages & sleep cycles



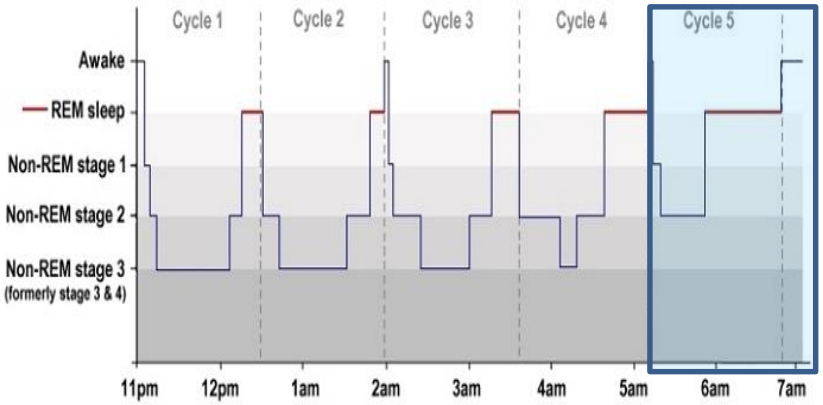
There is a larger proportion of stage 2 and REM sleep at the end of the night

Sleep stages & sleep cycles

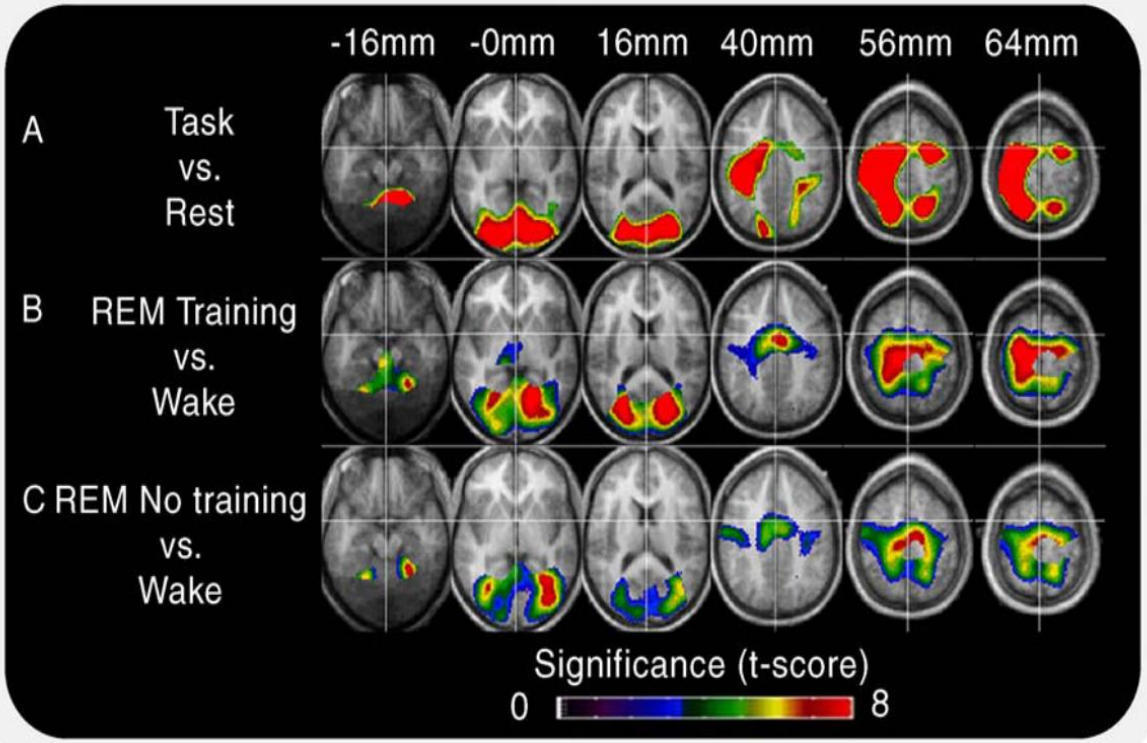


Adolescents potentially lose later stages of sleep with the most amount of stage 2 & REM sleep

Sleep stages & sleep cycles



'Offline' consolidation of learning and skill acquisition from previous practice diminished

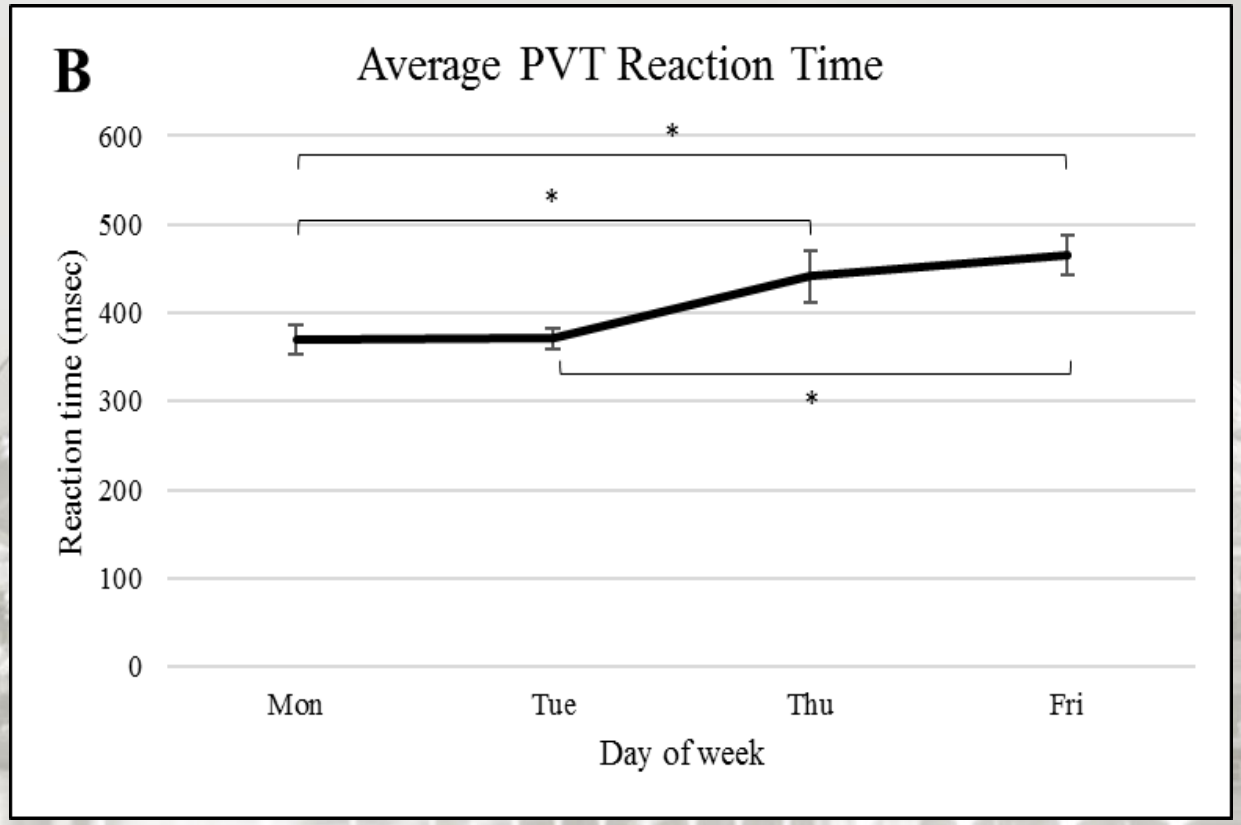


Brain regions involved in learning of a new motor skill re-activates during REM sleep

(Maquet et al., 2000)

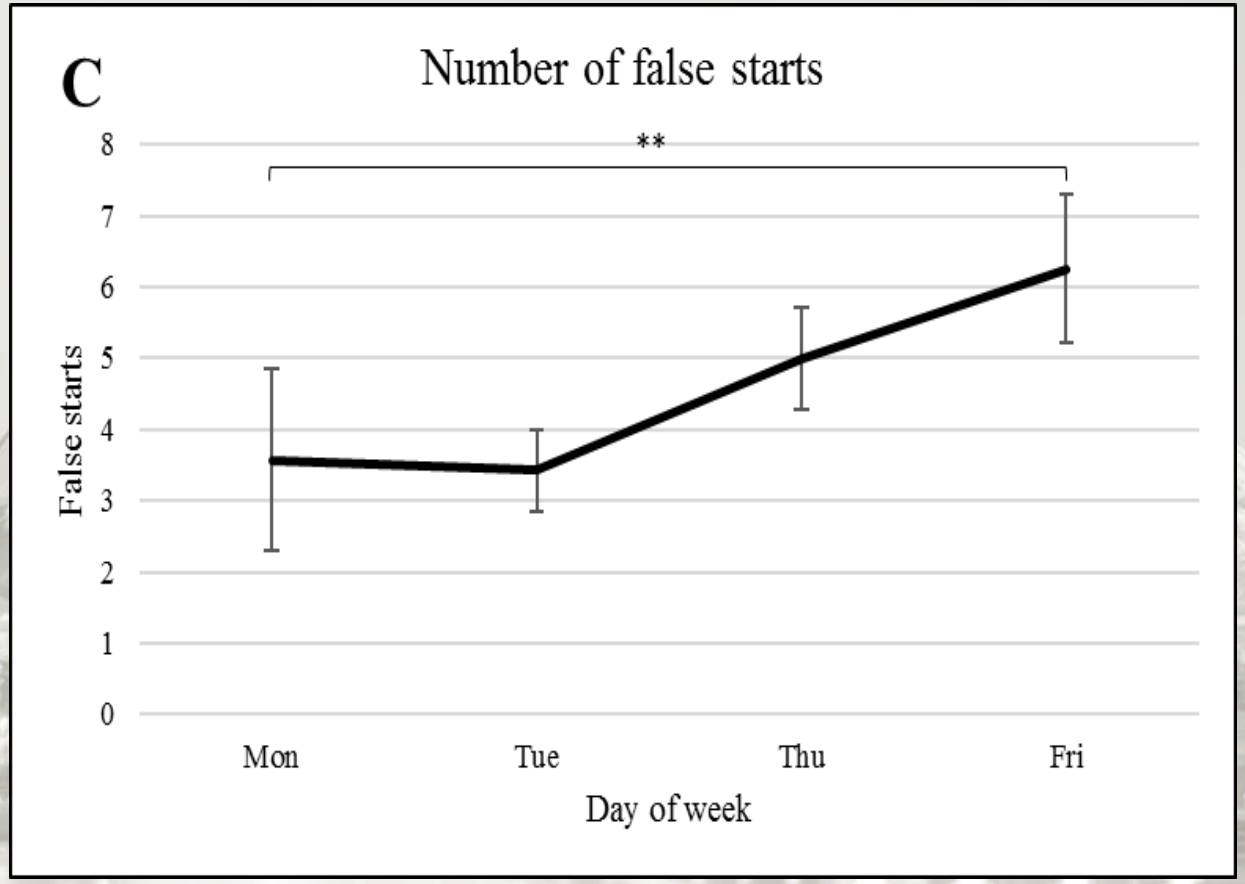
What are the effects of sleep debt on adolescent-athletes?

Average reaction time



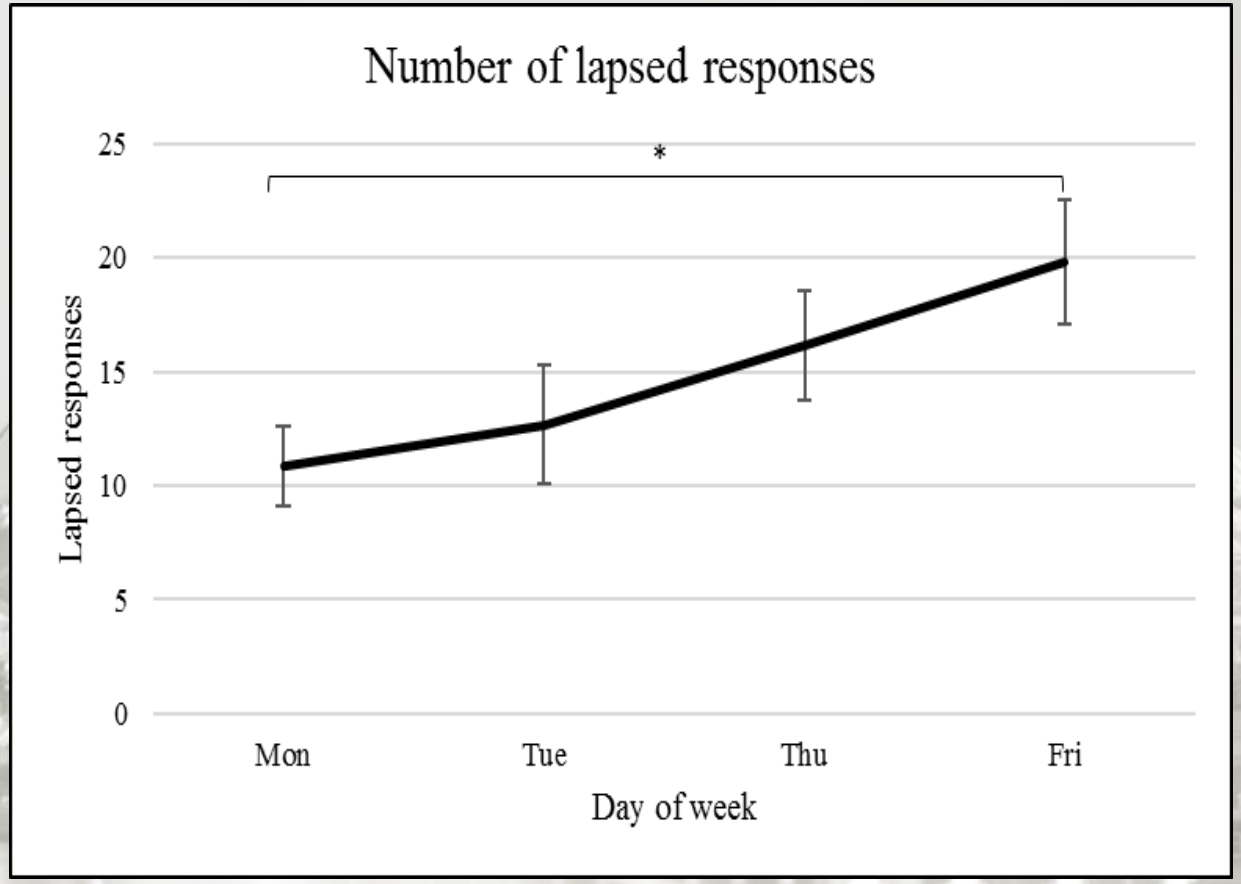
(Suppiah et al., 2016)

False starts (<100 msec)



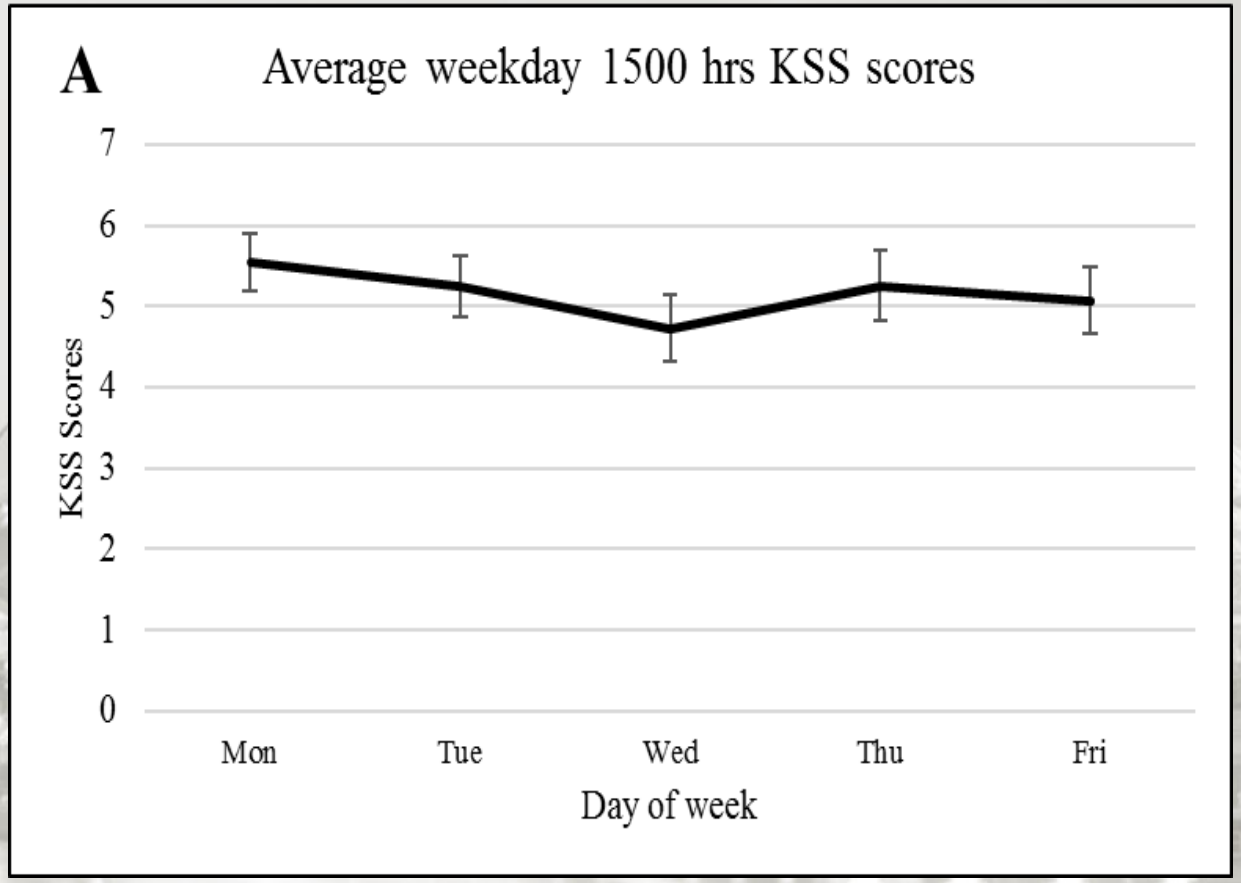
(Suppiah et al., 2016)

Lapsed responses (>500 msec)



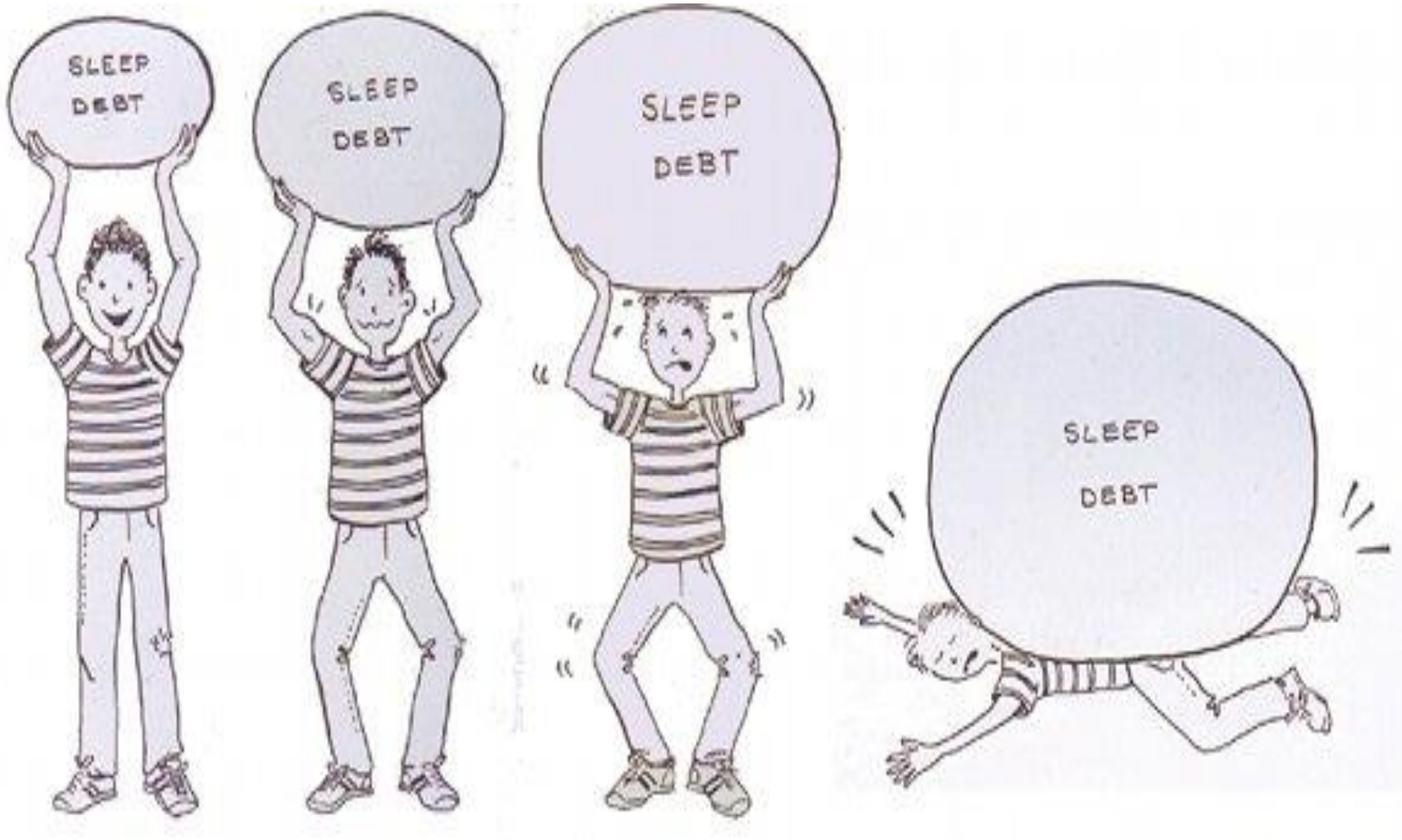
(Suppiah et al., 2016)

Subjective sleepiness



(Suppiah et al., 2016)

Chronic sleep restriction (sleep debt) results in poorer performance by the end of the week


SLEEP
DEBT
SLEEP
DEBT
SLEEP
DEBT
SLEEP
DEBT

Dr. Christopher Winter

Medical Director, Martha Jefferson Hospital Sleep Medicine Center, sleep medicine, neurology specialist

GET UPDATES FROM DR. CHRISTOPHER WINTER

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Why Is the NBA Treating Sleep Like a Performance-Enhancing Substance?

Posted: 12/02/2012 12:53 pm

By Ralph Ellis | 1 Comment | 6 Jul 2013 22:30

Wimbledon men's final: Andy Murray reveals 12 HOURS of sleep a day is his secret to success

The No 2 seed will face Novak Djokovic later today - but not before putting his feet up in an attempt to feel as fresh as possible

Tweet 37 Like 48 Send

MAVS FIRST TO DIVE INTO FATIGUE ANALYSIS

October 16, 2013 · 2:07PM

POSTED BY:
JEFF CAPLAN

EMAIL JEFF | FOLLOW ON

DALLAS – In the next few days, the Dallas Mavericks will become the first team in the NBA to have their players wear black, digital wristwatches that don't tell time.

The watches will tell when the players are sleeping, and for how long and how deeply they're doing so. The

Studies link fatigue and sleep to MLB performance and career longevity

Bookmark this page | Print

American Academy of Sleep Medicine
Thursday, May 30, 2013

Waking dream: sleep consultants help prepare athletes to chase late-night glory at Rio 2016

14/06/2016 — 10H22

By Denise Mirás

Artificial light and adjusted eating habits among other tactics used by athletics, swimming and volleyball competitors

As at London 2012, athletes such as long jump champion Greg Rutherford will be competing at night in Rio (Photo: Getty Images/Stu Forster)

Tips for better sleep

Tips for better sleep

Use an alarm clock to start your pre-bedtime routine (e.g. 9:00 p.m. bedtime)

8:00 p.m. – No more electronics
8:10 p.m. – Warm shower
8:20 p.m. – Pack school bag
8:30 p.m. – Read book
8:45 p.m. – Lights off

DAILY PRE-SLEEP ROUTINE

Time	Activity
e.g. 9.30 p.m.	Dim lights / No more mobile devices
10.00 p.m.	Warm bath
10.15 p.m.	Music / Dim lights
10.30 p.m.	**Lights off/ Bedtime**
	Aim for a minimum of 8.5 hours in bed

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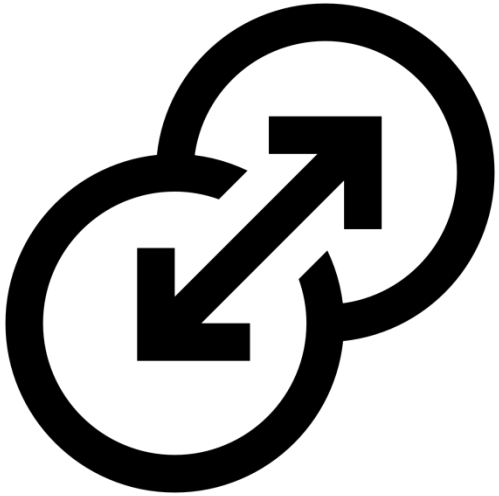
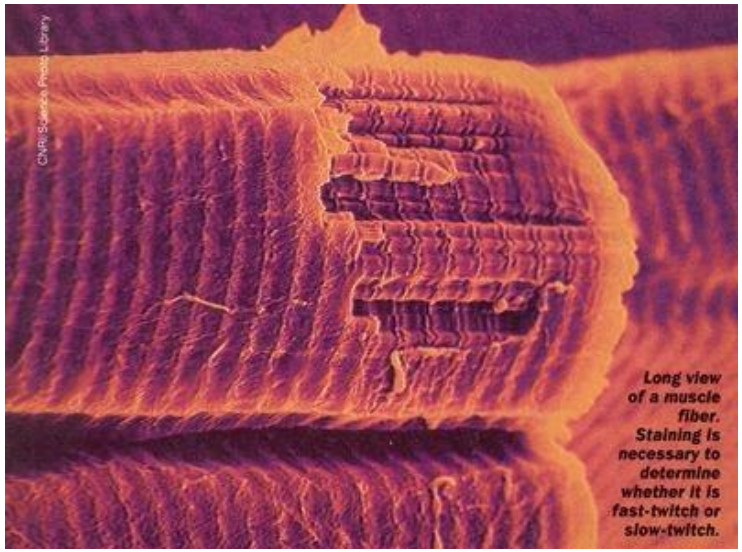
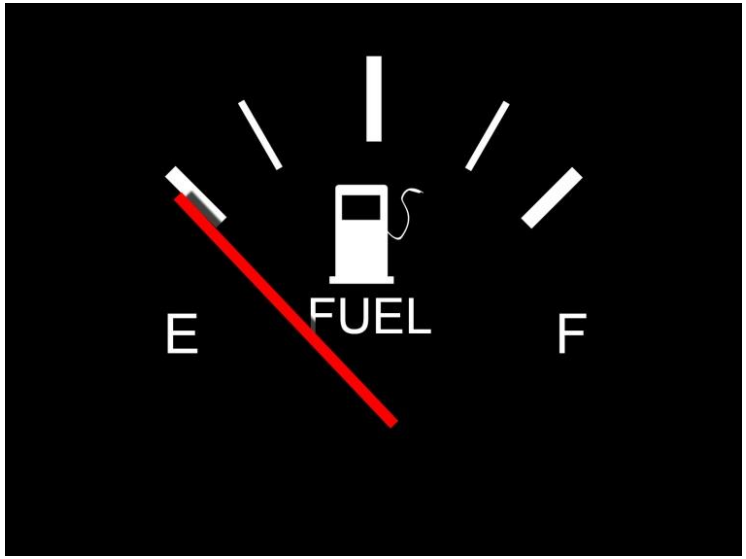
Part 3

Other Recovery Modalities







(Hausswirth & Mujika, 2013)

Let’s not forget mental recovery

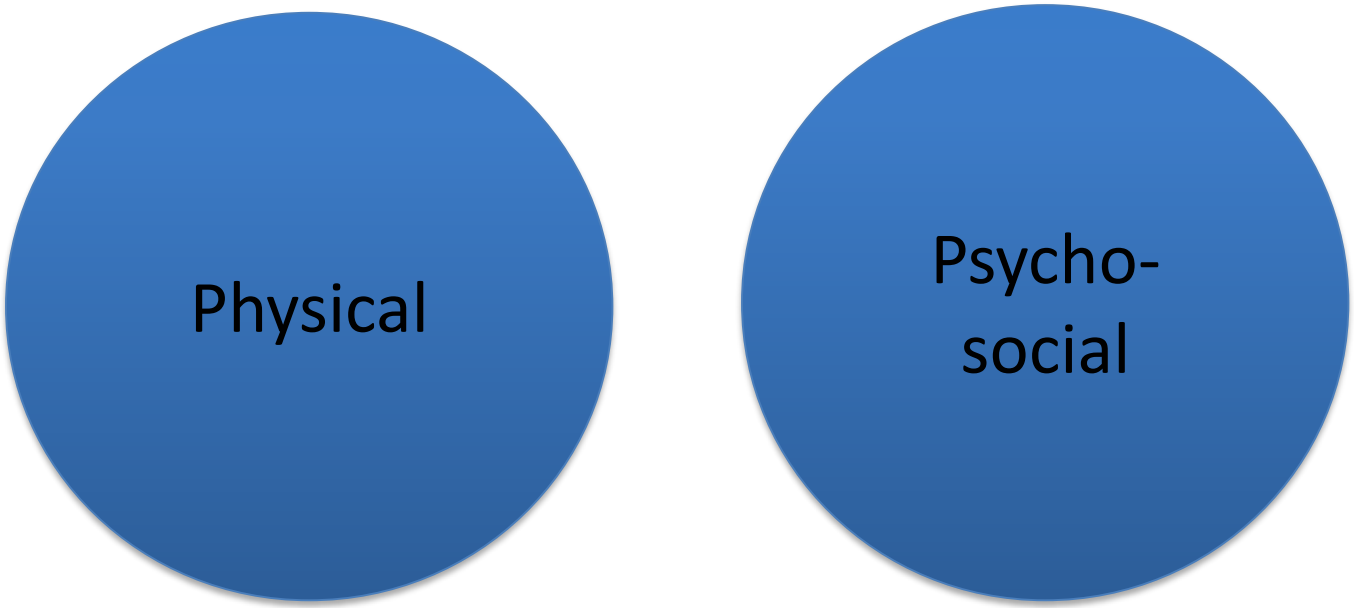
- Mental fatigue can impair sport performance
- Impaired running speed
- Increased perception of difficulty

Let’s not forget mental recovery

- Considerations for the student-athlete
- Can different “mental-load” affect their ability to train?

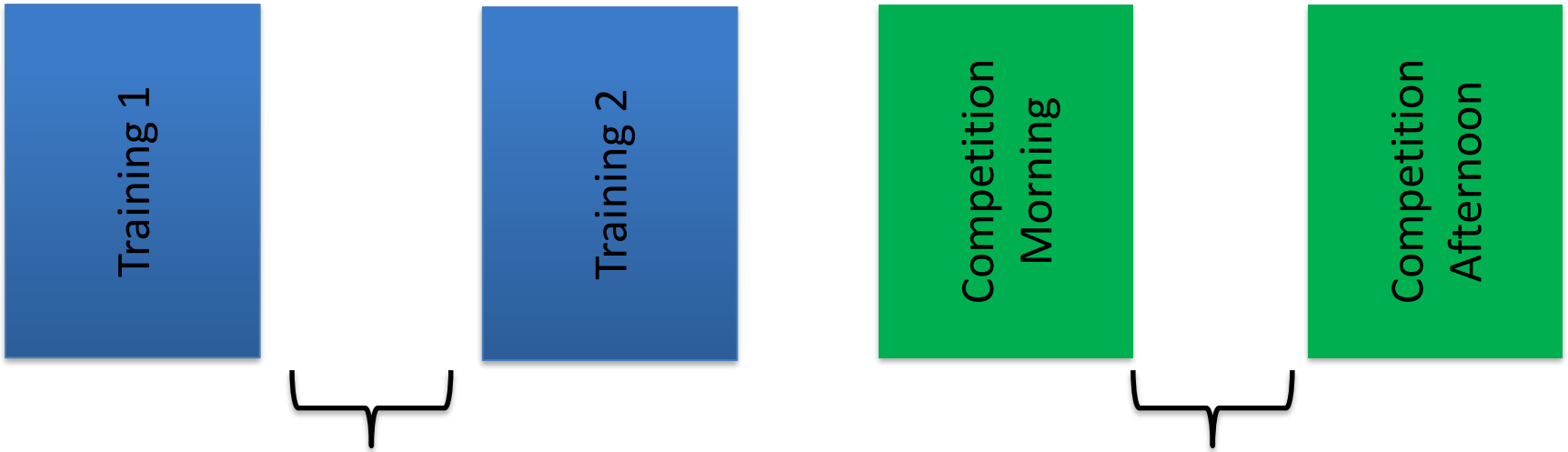
A need to consider recovery

Key elements of recovery



When?

Training recovery occurs between successive **training sessions** or **competitions**




CALENDAR
Training
Competition
Objective of recovery
Evidence (Youth)
Resources

Training or **Competition**

- Some recovery methods may interfere with the normal, positive training adaptations, i.e. inflammation and swelling for muscle repair

Training or **Competition**

- Consider when you need to recover (fast) and why
- Sometimes (i.e. training) you can delay recovery to increase/prolong the stress and therefore adaptation


Objective
Evidence
Resources

Training Load adjustment

Recovery sessions

- Designed to reduce training stress and speed up restoration of muscular function
- Program into training sessions
- Low intensity sessions

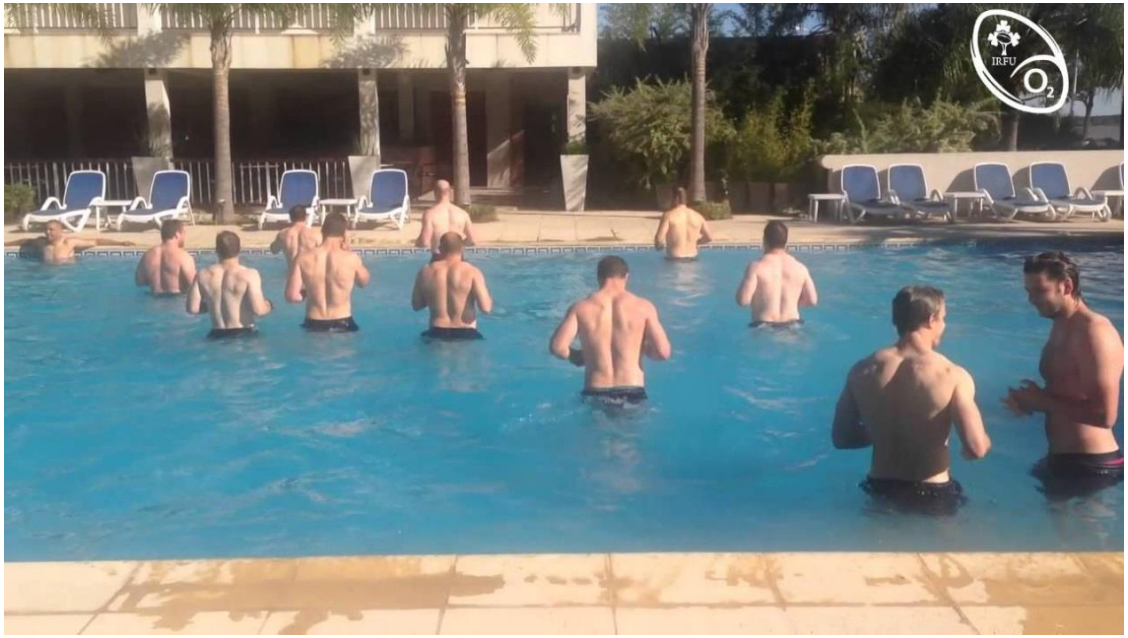
Active Recovery

Part of training session or during the cool-down phase

Very low to low intensity (10 – 20mins)

Day after intense training or competition

Recovery sessions



Stretching

- Evidence level is debatable
- When used by itself, is generally not effective
- Emphasize on dynamic movement/stretching (recovery sessions)

(Sands et al., 2013)

Stretching

- Avoid stretching after high-intensity sessions and strength training
- Avoid for muscles groups experiencing DOMS

Massage

- Very little scientific evidence
- Typically improve perception of recovery
- At youth level, generally not encouraged

(Poppendieck et al. 2016)

Foam rolling

- Lessen decrement in muscle performance
- Reduce DOMS

(Cheatham et al. 2015)

Compression garments

- Perceived recovery and reduction in muscle damage
- Needs to be adapted to athlete size
  - Progressive pressure profile of garment
- Muscle function not supported by research

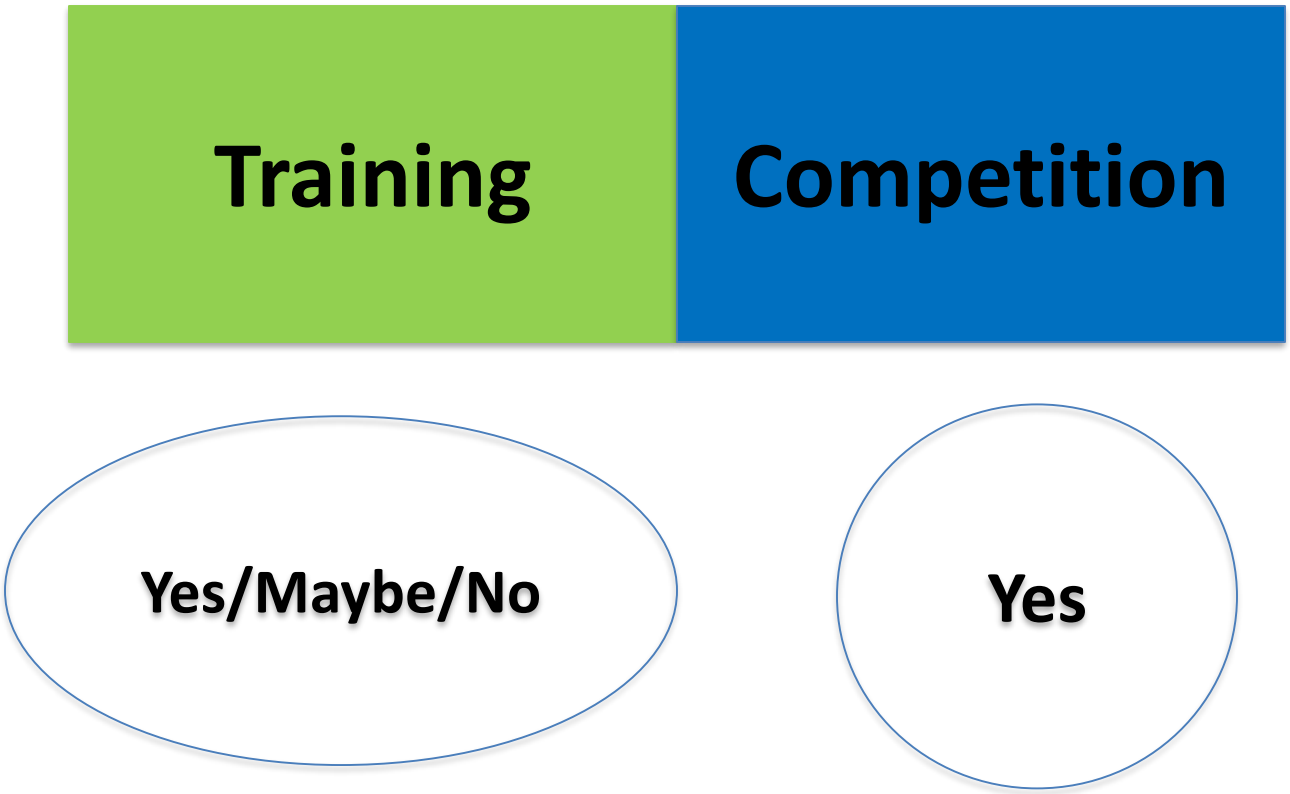
(Hill et al. 2013)

Cold water immersion

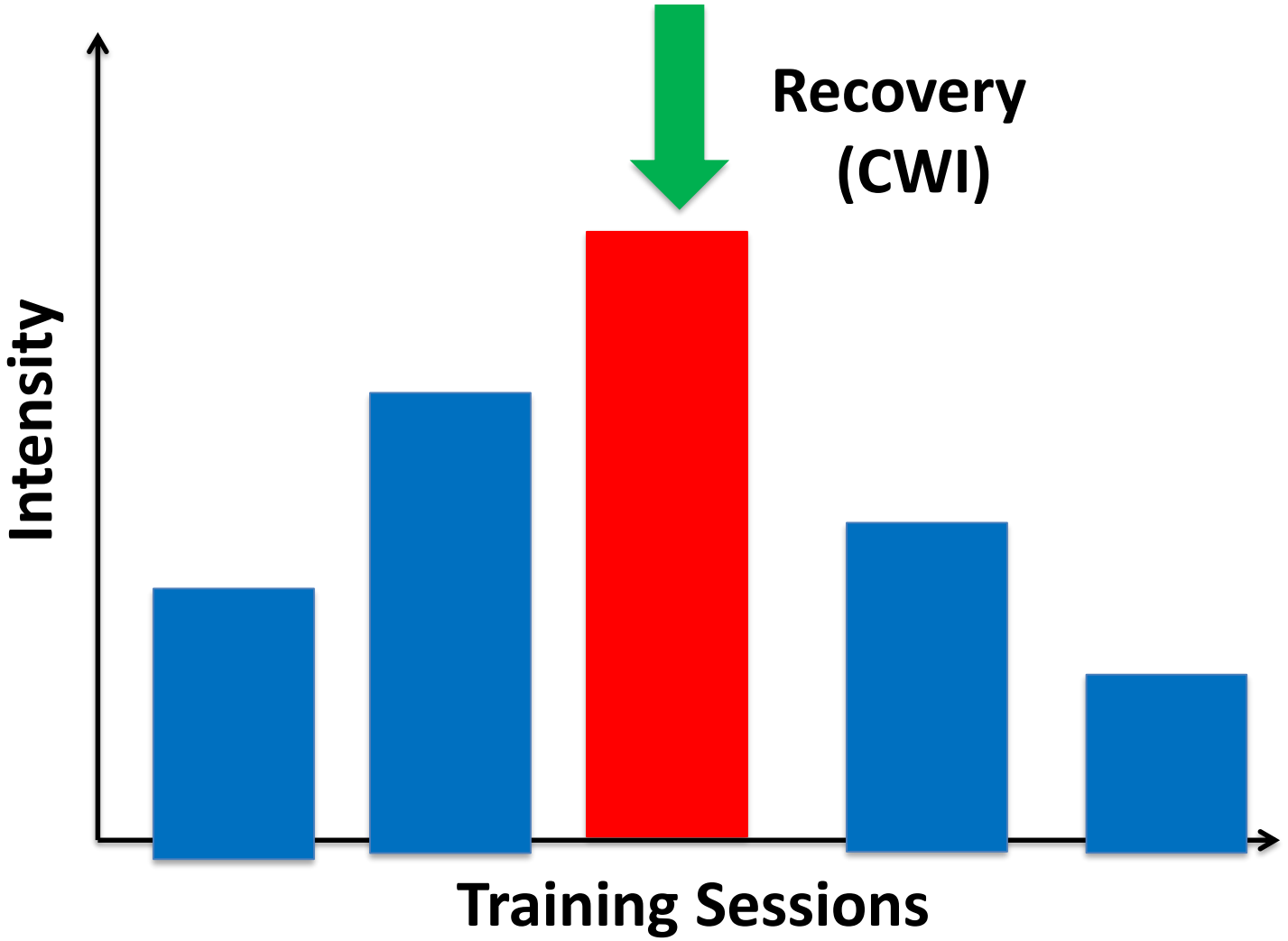
Immersion to water temp. of 10°C-15°C, 8-15 min

- Compressive pressure and cooling of body tissue
- Reduce inflammation
- Performed at hip level or shoulders

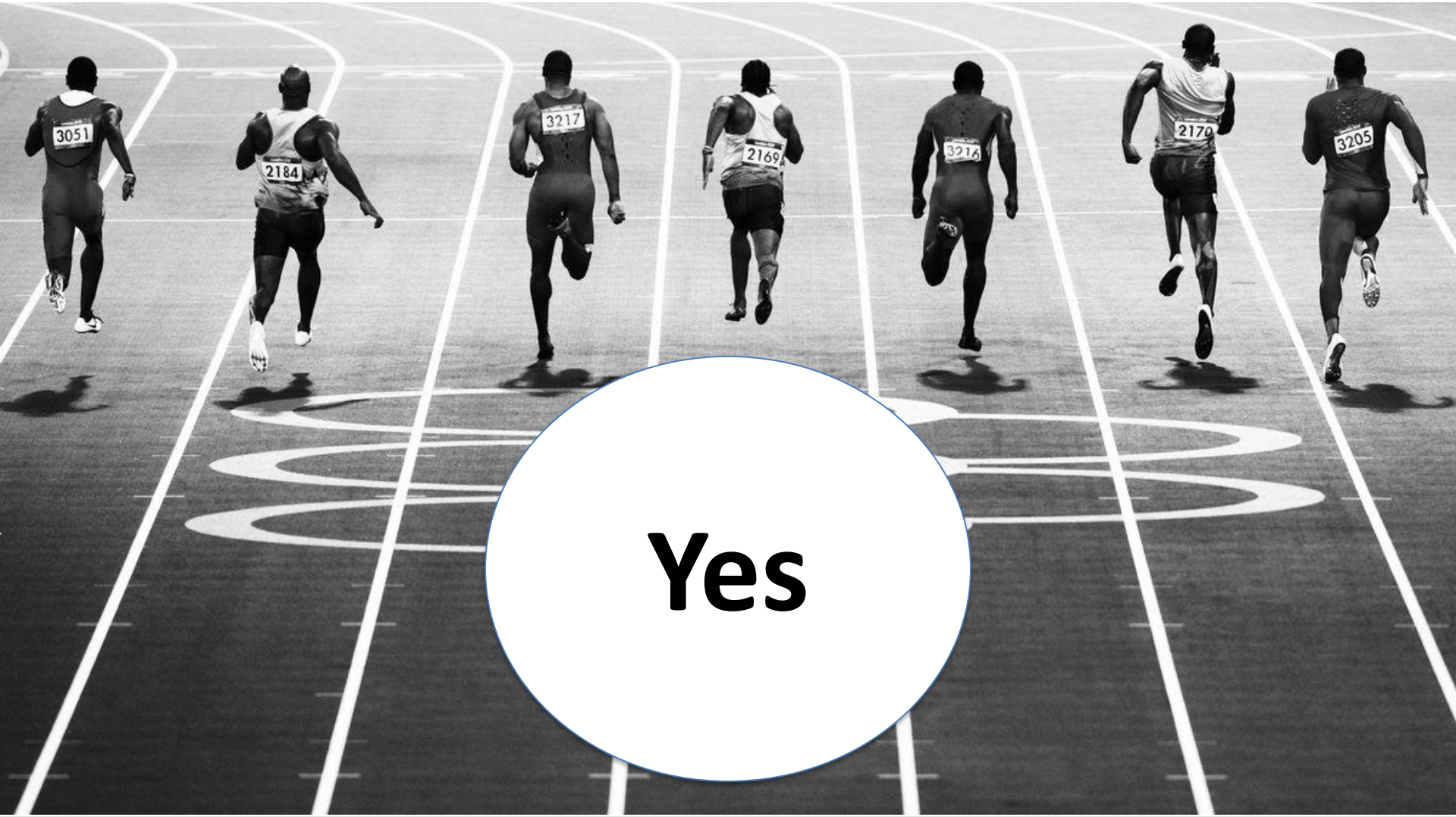
When?



Training

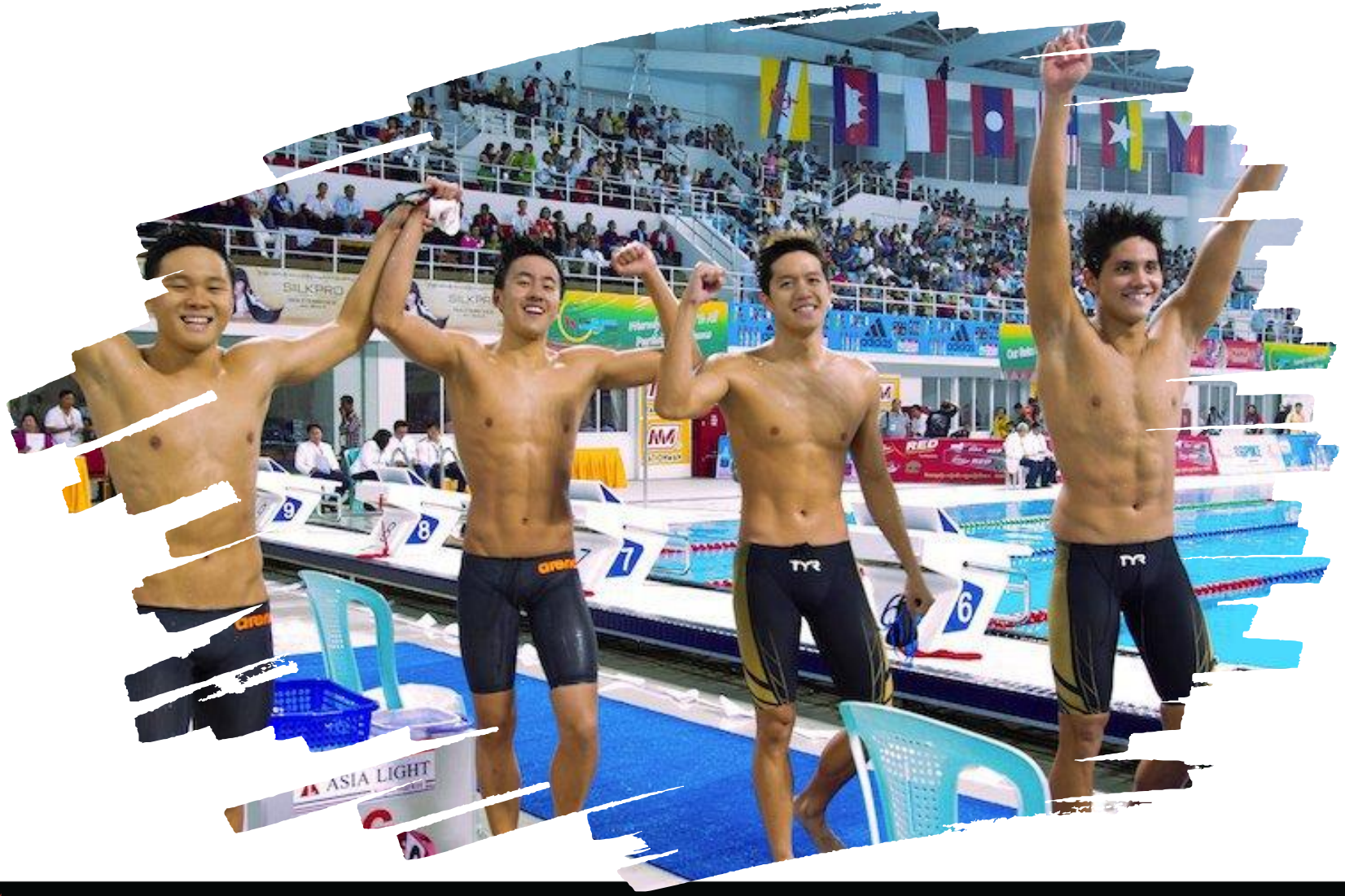


During Competition

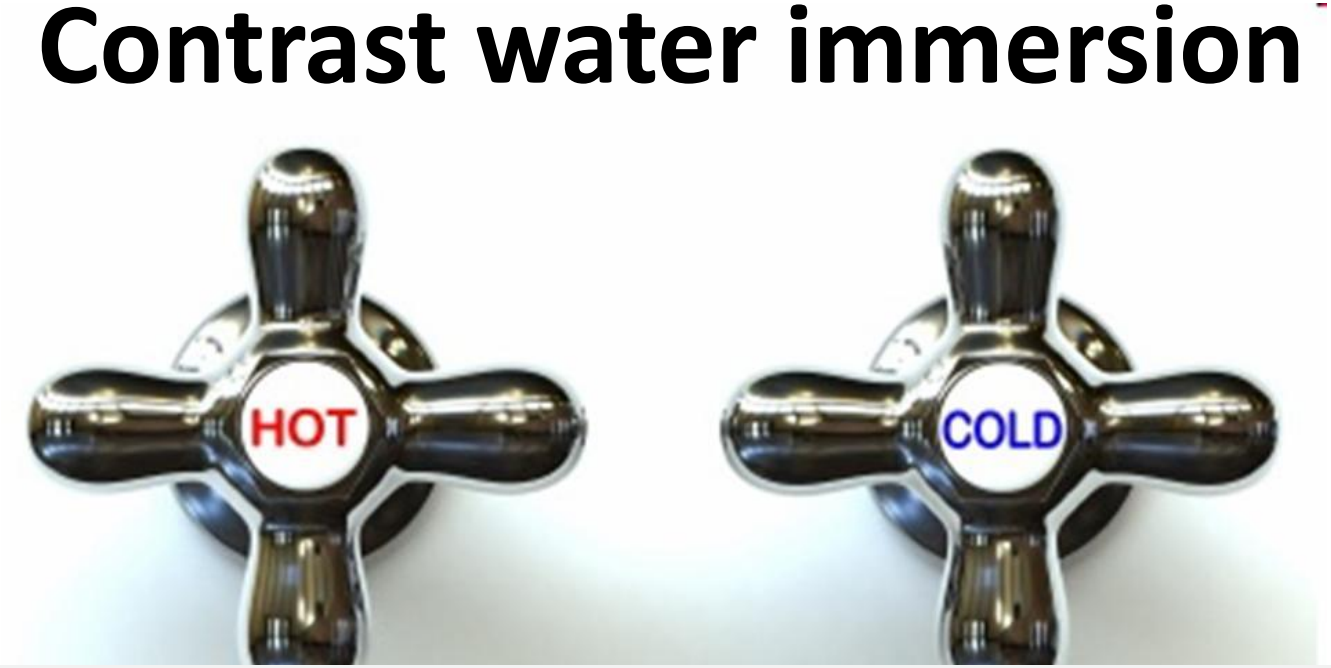


Yes

Evidence unclear with swimmers



Contrast water immersion



Similar or no superior advantage to just using COLD

- Inclusion of hot/warm immersion
- Finish on cold for aggressive recovery, hot for relaxation
- Increase blood flow, improve nutrient delivery and metabolism

Cold Water Immersion for Athletic Recovery: One Size Does Not Fit All

Article *in* International Journal of Sports Physiology and Performance · May 2016

Limited evidence on adolescent population

- Small beneficial effects on physiological, power and endurance factors
- Largely perceived benefits
- **Youth may not tolerate long duration of cold water exposure**

Potential diminishing effects of training gains

- Training adaptation
- Strategy Adaptation
- Individual Variation


SHORT TERM
LONG TERM


IOC

"Develop **healthy, capable and resilient** young athletes, while attaining **widespread, inclusive, sustainable and enjoyable participation and success** for all levels of individual athletic achievement.

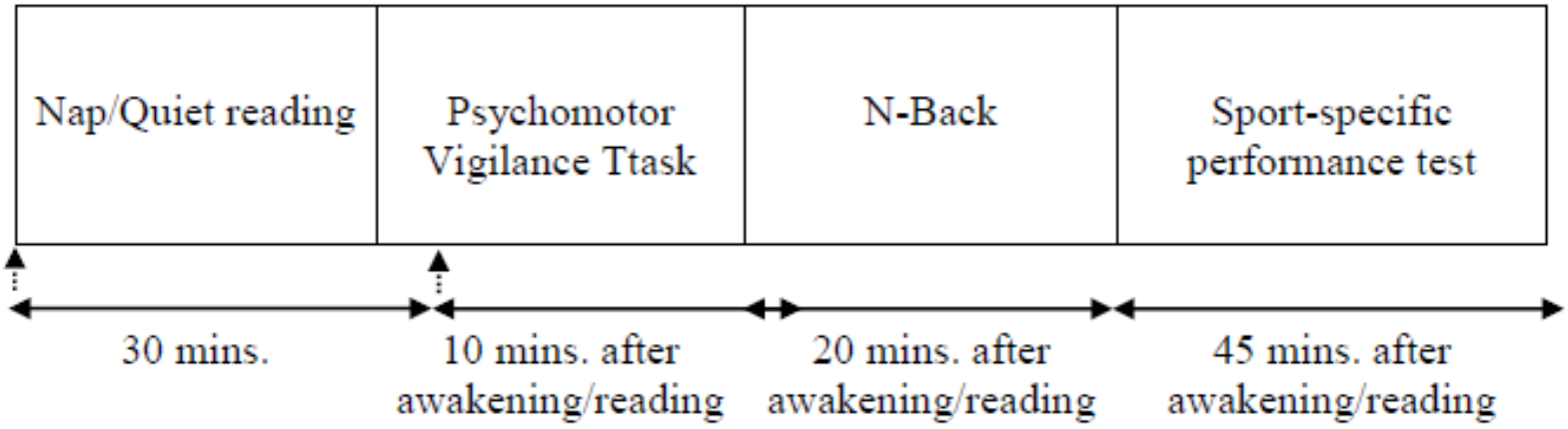
(**Bergeron** et al., 2015)

Summary

- There is a long runway to sporting success
- Athletes of the same age may be at different stages of development
- Recovery is as important as training
- A periodised training programme is varied in intensity, volume and activity-type


Napping?

How does a short nap impact sport performance?



20-m sprint test

20 –shot simulated competition

(Suppiah et al., 2016)

How does a short nap impact sport performance?

- No effect on shooting performance

- Worsened 20-m timings **3.411** (0.143) s vs. **3.385** (0.128) s

(Suppiah et al., 2016)

How does a short nap impact sport performance?

- Naps may have variable effects depending on the performance measure
- Not recommended to use immediately prior to competition unless performance has been assessed
- Try it out