



CONCEPTS OF INTERNAL LOAD AND EXTERNAL LOAD APPLIED TO SPORT

Here is where your
presentation begins

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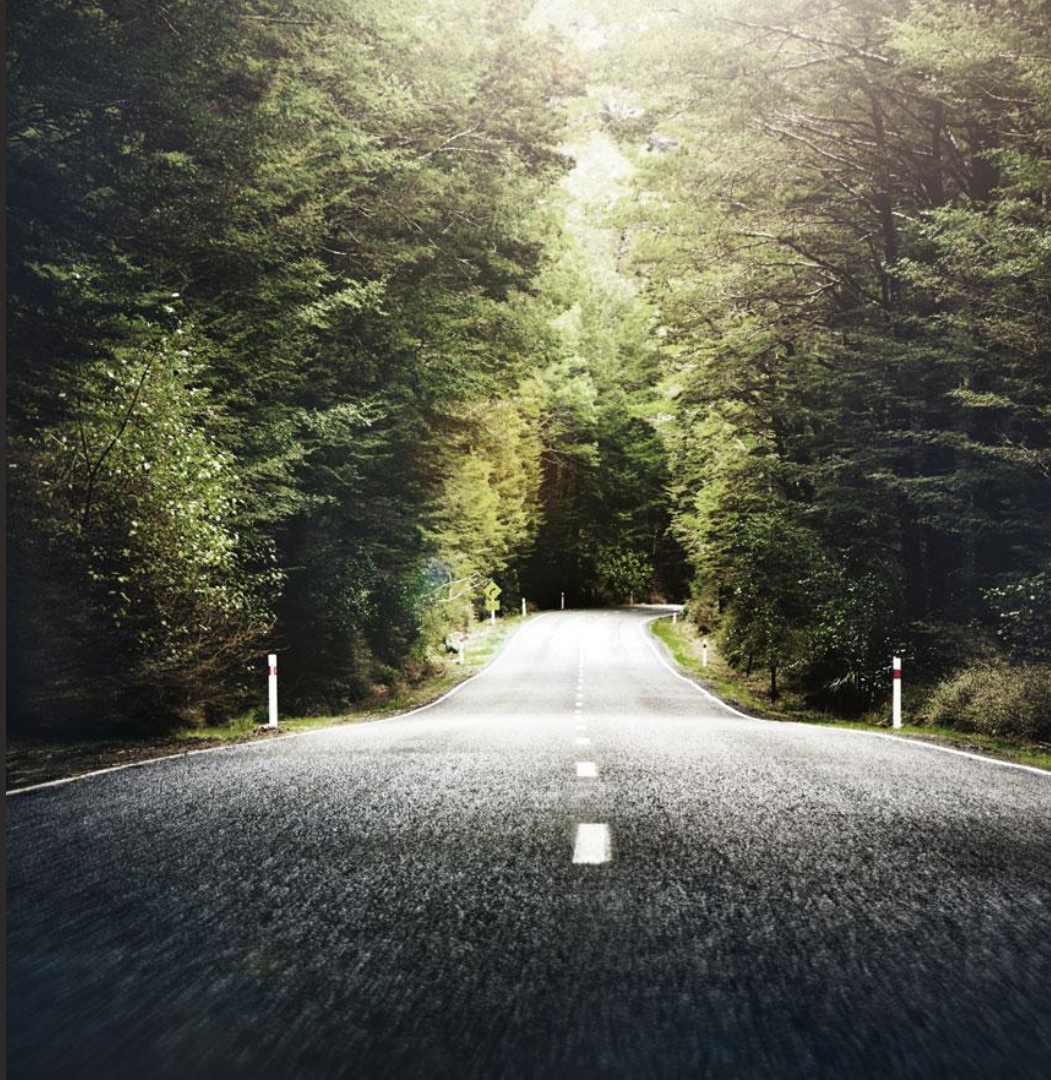
TEAM

2

WHY?

3

WHAT?



WHOA!

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For many years teamwork and the contribution of knowledge has been a fundamental aspect. Sports Performance Area. Team Sports.

TEAM!

Xavier Reche. R3endurance
Phd. Milos Mallol

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compete = train = optimize

We need stimuli that modify stability.



Apply a stimulus and take advantage of the modification

All types of training or non-training modify the initial state of our system



red light

Knowing that there may be a warning sign ensures that when there is not, we are driving correctly.



INTRODUCTION

In the world of sports training, it is essential to plan and monitor the training load in order to maximize performance. The concepts of internal load and external load have gained prominence in both scientific literature and professional practice.

Load control is the process of monitoring the amount and intensity of training, as well as the recovery status of athletes.



What is **load control**?

It is the process of monitoring the amount and intensity of training, as well as the recovery status of the athletes.



Optimizing sports performance:

load control can help athletes improve their sports performance by ensuring they receive the right amount of training. Training that is too intense can lead to overtraining, but training that is too light will not provide enough stimulation to improve performance. Load control can help coaches find the right balance between training and recovery, so that athletes can reach their maximum potential.



How **load control**?

- Set training goals.
- Vary the intensity of training.
- Provide enough rest and recovery.
- Listen to the athletes.

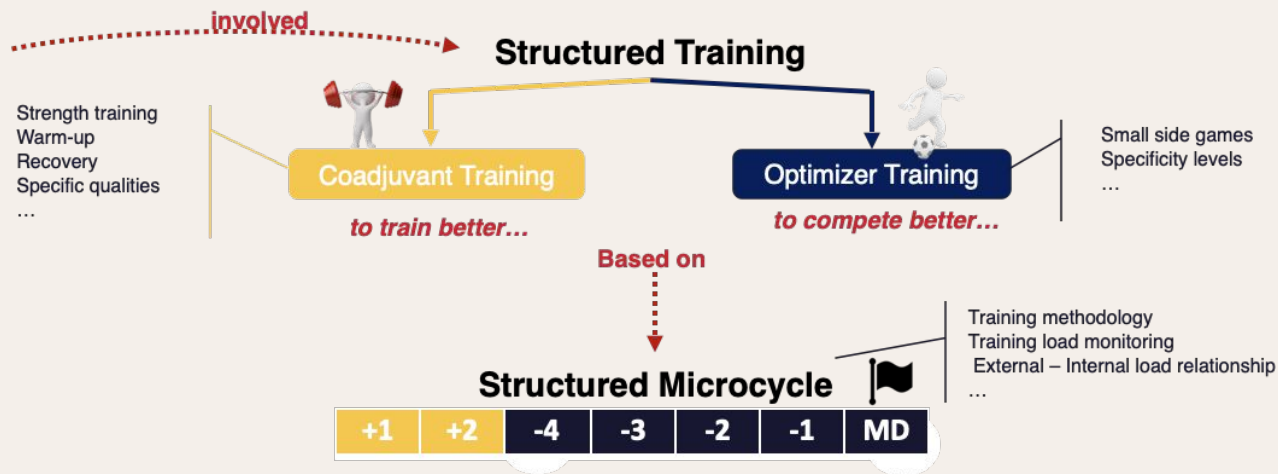
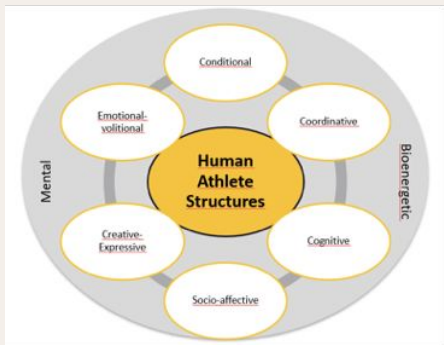
TRAINING LOAD MONITORING

PRACTICAL APPLICATION OF LOAD CONTROL

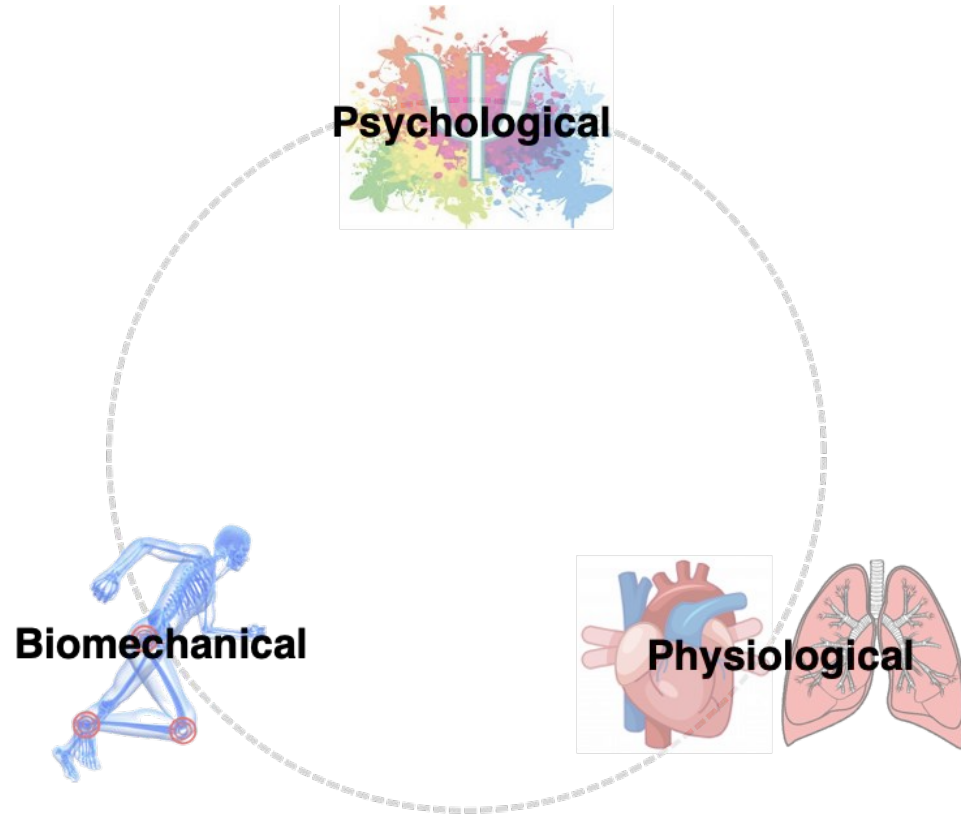
Any load monitoring and control process must be based on a meticulous analysis of the training methodology applied, as well as on the peculiarities of the planning and programming. It is essential to understand the differentiating characteristics of the **club's or coach's proposal.**



TRAINING LOAD MONITORING



Player status



Adaptations/responses

Season - Long-term assessments - long-term player responses

Month(s) - Mid-term assessments - mid-term player responses

Microcycle - Short-term assessments - short-term player responses

Day - Daily assessments - daily player responses

LONG-TERM DECISIONS

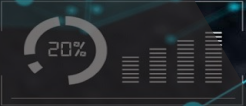
QUICK DECISIONS



Training Load Monitoring:

EXTERNAL + INTERNAL

EXTERNAL LOAD



“Objective measures of the work performed by the athlete during training or competition”

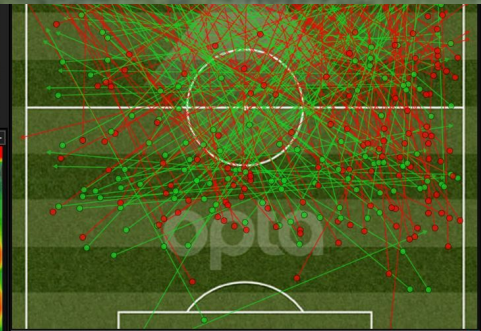
¿What athlete does?



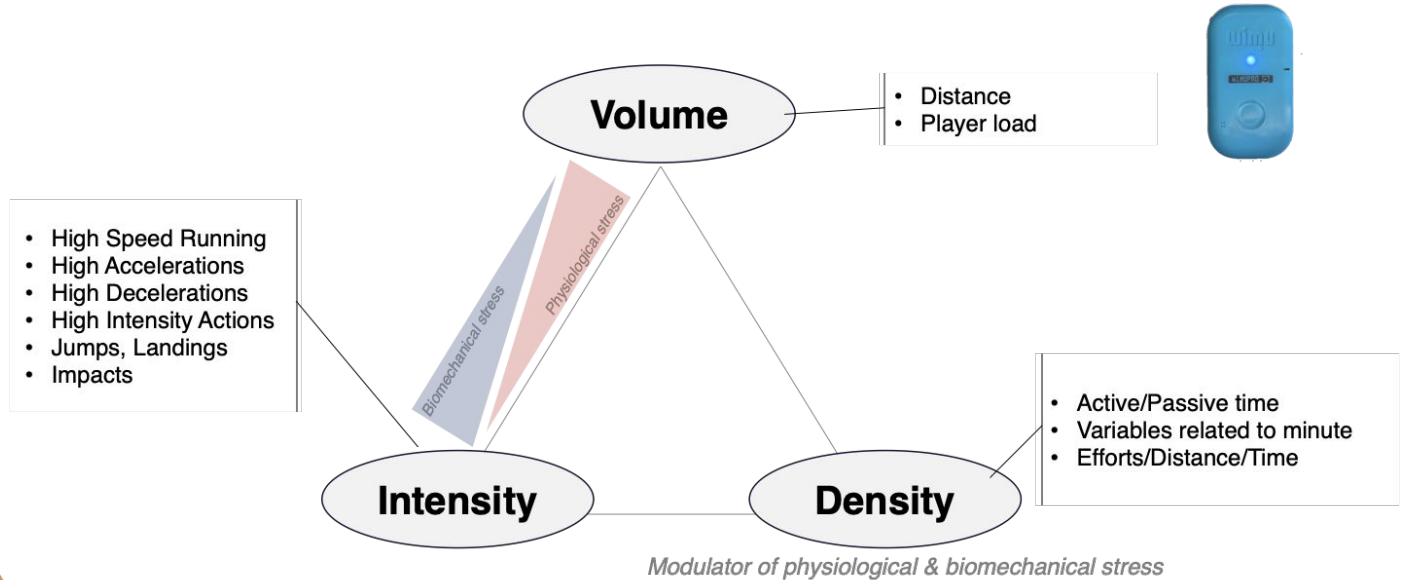


UEFA ELITE

- SEARCH
- ALL x DAVID BECKHAM
- PLAYER NAME
- DAVID BECKHAM (267)
- TEAM NAME
- GALAXY (232)
- LEAGUE
- SAN DIEGO (15)
- POSITION NAME
- DEFENDER (160)
- DEFENDER (107)
- POSITION NAME
- MAJOR LEAGUE SOCCER (217)
- CONCACAF CHAMPIONS LEAGUE (23)
- LIGUE 1 (15)
- WORLD FOOTBALL CHALLENGE (12)
- PLAYER NAME
- DAVID BECKHAM (267)
- TEAM NAME
- GALAXY-PORTLAND TIMBERS (15)
- GALAXY-NEW YORK RED BULLS (14)
- GALAXY-FC DALLAS (13)
- GALAXY-REAL SALT LAKE (13)
- PORTLAND TIMBERS-LA GALAXY (13)
- GALAXY-SAN JOSE EARTHQUAKES (12)
- GALAXY-HANCOCK WHITECAPS (12)
- NEW YORK RED BULLS-LA GALAXY (10)
- ATLANTA SOUNDERS FC-LA GALAXY (9)
- ATLANTA FC-LA GALAXY (9)



Variables: What we measure?



(Reche X not publi.)

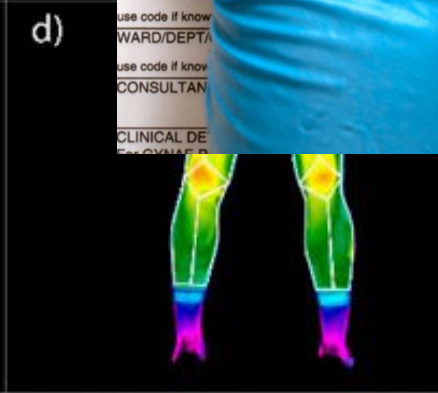
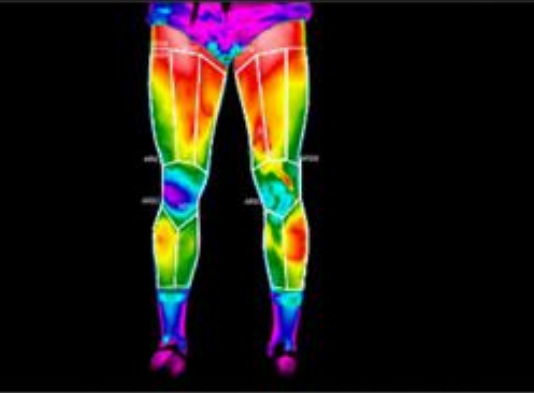
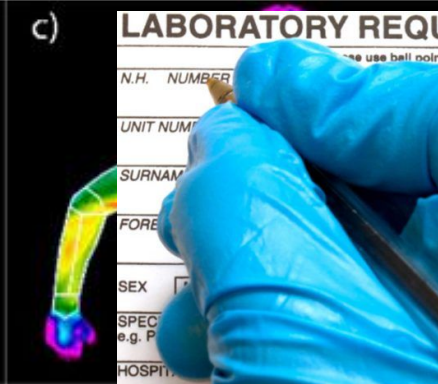
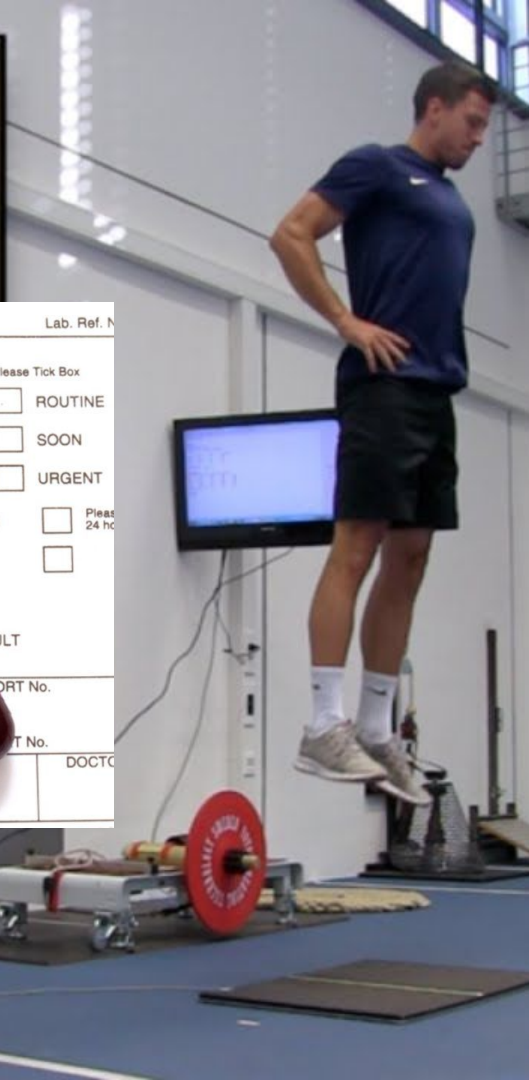
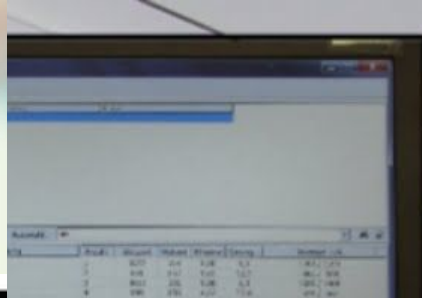
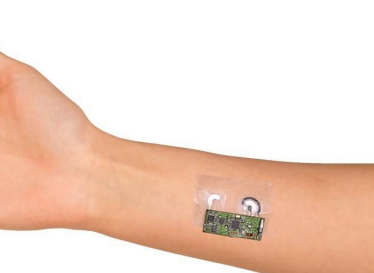
INTERNAL LOAD



“Athlete’s response to the relative physiological, psychological and biomechanical stressors imposed during training or competition”

¿What athlete feels?





c)

LABORATORY REQUEST

HISTOLOGY / CYTOLOGY

Lab. Ref. N

N.H. NUMBER

use ball point pen

INVESTIGATIONS

Please Tick Box

ROUTINE

SOON

URGENT

UNIT NUM

SURNAM

FORE

SEX

SPEC

e.g. P

HOSPIT

use code if know

WARD/DEPTA

use code if know

CONSULTAN

CLINICAL DE

URC

UTIL

1 P

NE

RESULT

Pleas

24 hc

PORT No.

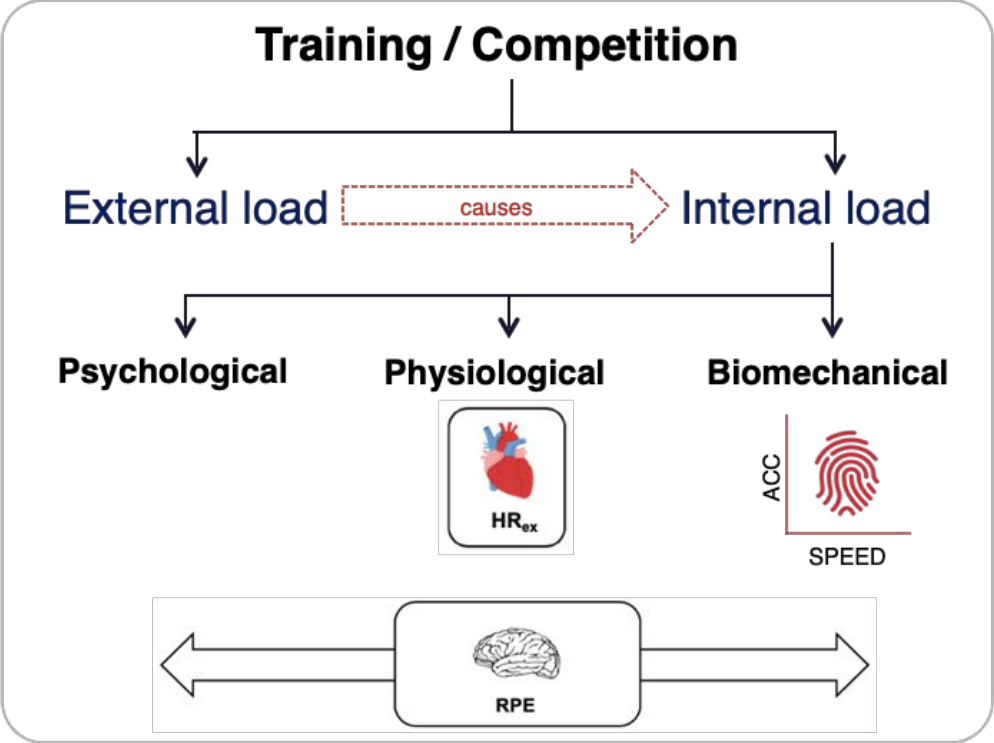
PREVIOUS

DOCTOR'S

DOCTO

BLEEP No. OR EXTENSION

d)



How was your workout? RPE

What is the effort level that has involved the last training session/match?

| Rest | Very, very easy | Easy | Moderate | Somewhat hard | Hard | 6 | Very hard | 8 | 9 | Maximal |
|------|-----------------|------|----------|---------------|------|---|-----------|---|---|---------|
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |

10-point Borg's scale modified by Foster et al., (2001)

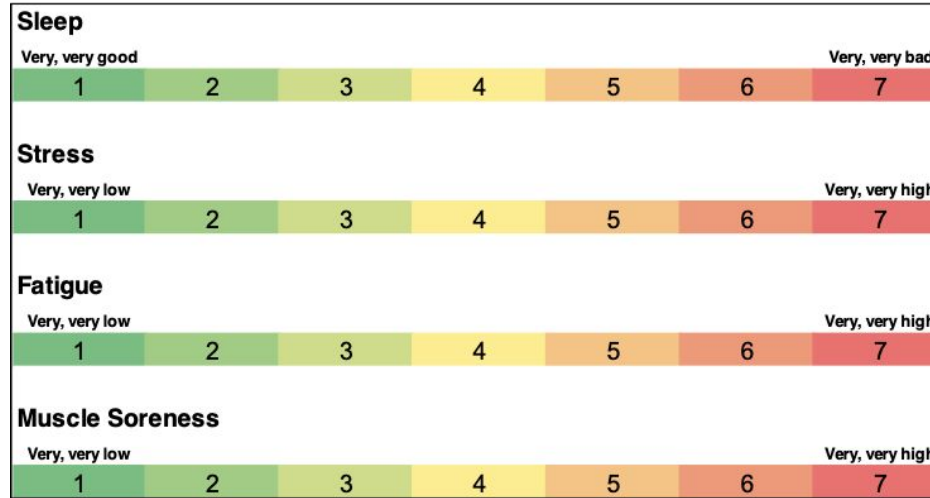
Journal of Strength and Conditioning Research, 2001, 15(1), 109-115
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A New Approach to Monitoring Exercise Training

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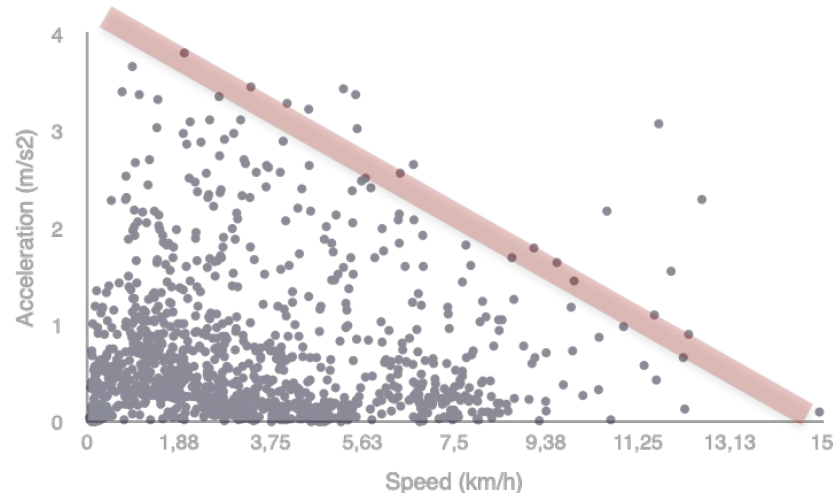
WELLNESS: Hooper psychometric questionnaire



1 to 7-point scale adapted from Hooper et al., *Med Sci Sports Exerc*, 1995
Set your level of Wellness from the last training session/match

Acceleration – Velocity Profile

| Max (m/s ²) | Start SPD |
|-------------------------|-----------|
| 0.24 | 6.23 |
| 0.35 | 6.1 |
| 0.01 | 6.86 |
| 0.35 | 6.34 |
| 0.36 | 6.82 |
| 0.43 | 7.61 |
| 0.04 | 8.26 |
| 0.47 | 7.66 |
| 0.02 | 7.46 |
| 0.36 | 7.5 |
| ... | ... |



(Reche, X., unpublished)

Every acceleration or deceleration has been done at **initial speed**. This profile takes all the accelerations and decelerations to draw **the maximum neuromuscular capacity or outcome** during training or competition

Mid/Long-term: Season

What we want to do?

| | | Pre-season | | Competitive period | | | | | | | | | | Off |
|---------------------|-----------------------------------|------------|-----|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | |
| Physiology | Endurance assessment in lab | X | | | | | | | | | | | | |
| | 30-15 IFT | | X | | | | | X | | | | | | |
| | RCoD | X | | | | | | | | | | | | |
| | Blood biochemical markers (*) | X | | | X | | | X | | | X | | | |
| | Salivary biochemical markers (**) | X | X | X | X | X | X | X | X | X | X | X | X | |
| Biomechanics | Running mechanics in treadmill | X | | | | | | | | | | | | |
| | Sprint mechanics in field | | X | | | X | | | X | | | X | | |
| | Change of direction | | X | | | X | | | X | | | X | | |
| | Centripetal force | | X | | | X | | | X | | | X | | |
| Strength | Jump assessment (***) | X | | | X | | | X | | | X | | | |
| | Crossover/side | X | | X | | X | | X | | X | | X | | |
| | Specific upper body | X | | | X | | | X | | | X | | | |
| Overall | Body composition | X | | | X | | | X | | | X | | | |

Monitoring process

Player profile

FIT PROFILE

- Force – Power – Speed
- Strength assessments
- Running biomechanics
- Change of Direction
- Movement patterns

PHYSIOLOGIC PROFILE

- Biochemical
- Cardiovascular
 - HRV
 - HR rest
 - ECG?
- Energy consumption
 - FATMAX

PLAYER FEATURES

- Weight
- Height
- Body composition



THANKS!

Does anyone have any questions?

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