

Firstbeat's approach to load and performance management in elite sports

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PROFESSIONAL SPORTS

More than **23 000** professional athletes and **1000** teams worldwide use Firstbeat solutions to improve performance.

1000+

elite teams

26

national teams

25%

of Champions League
soccer teams

100+

NCAA programs

>50%

of all NHL teams



We help every individual reach their health and performance potential with science-backed confidence.

ANALYTICS FOR ELITE SPORTS



OPTIMIZE PERFORMANCE

Offer personalized training advice based on what works best for each player.



REDUCE INJURIES

Manage training loads and recovery together with data to minimize injury risks.



FAST-TRACK PLAYER DEVELOPMENT

Teach players how to listen to their bodies and help them achieve their full potential

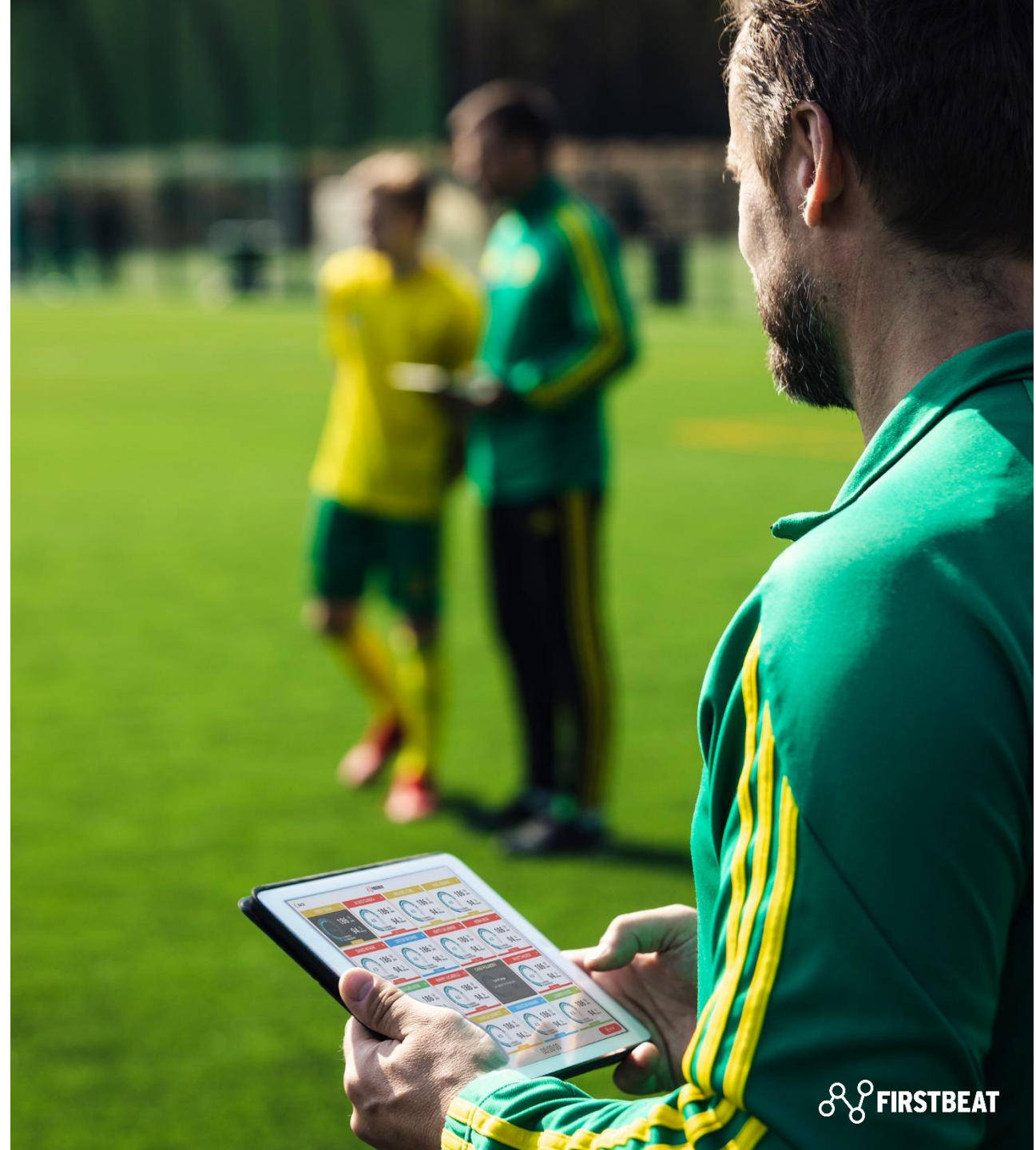
DRIVING FACTORS

- Effortless data collection
- Deliver processed data with easy access to all stakeholders



Effortless data collection: Firstbeat Sports Sensor and Live App

15 May 2019



BRINGING FOCUS AND MOBILITY TO COACHING

Firstbeat Sports Sensor (BLE)

- 12-hour built-in memory
- Embedded processor for load calculations
- RR-I detection and 9D acceleration sensors
- Updateable firmware

Firstbeat Sports Live app (ipad)

- Real-time display for intensity and cumulative load
- Max. range 200m (BLE)
- Wireless data upload and memory upload
- Automatic sync to cloud



BENEFITS

EASY AND EFFORTLESS

- Free yourself from a receiver and laptop and focus on coaching
- Players simply put on the Sensor and go
- Automised data upload process saves you time

SIMULTANEOUS REAL-TIME MONITORING

- Multiple coaches can access the app simultaneously using multiple iPads
- Collect data from different locations and player groups at the same time. E.g. rehab group in the gym, and main team session

BENEFITS

COLLECT DATA EVERYWHERE

- Global compatibility
- Easily collect data even when the S&C coach or sports scientist is not present. E.g. During road trips

CONTINUOUS LOAD CALCULATION

- Sensor's in-built memory and embedded processor mean load calculations continue even when 'out of range'
- Cumulative variables are always up to date and ready for post analysis

BENEFITS

UNRIVALED REAL-TIME DATA

- Access the most comprehensive real-time training load analytics whilst moving around practice
- The only player monitoring solution to provide Aerobic and Anaerobic Training Effect and TRIMP/min data in real time

SUUNTO MOVESENSE TECHNOLOGY

- A future proof solution lets you benefit from functionality updates

TECHNICAL SPECS

FIRSTBEAT SPORTS SENSOR

Memory: approx. 12-18 hours

Battery duration: approx. 160 hours

Weight: 10g inc. battery

Connectivity: BLE compatible devices.
Firstbeat Sports Live app

IP class: Water resistant 30m / 100ft

Sensors: 9-axis motion sensor and ECG
based RR-I detection

Swim and shock proof

SPORTS LIVE APP

Hardware: iPad with Bluetooth 4.0 and
IOS version 11 and later

Real-time display: HR, %HRmax, EPOC,
Aerobic TE, Anaerobic TE, Trimp,
Trimp/min

Data downloads: Mass download from
40+ Sensors. Max range 20m.

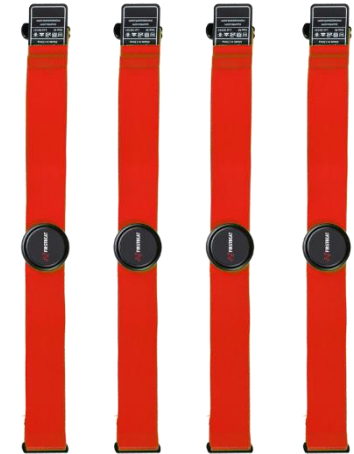
Range: 200m

**Max. Number of monitored
participants:** 40

Languages: English, Spanish, German,
Finnish, French, Portuguese (Brazil)

INCLUDED IN THE PACK

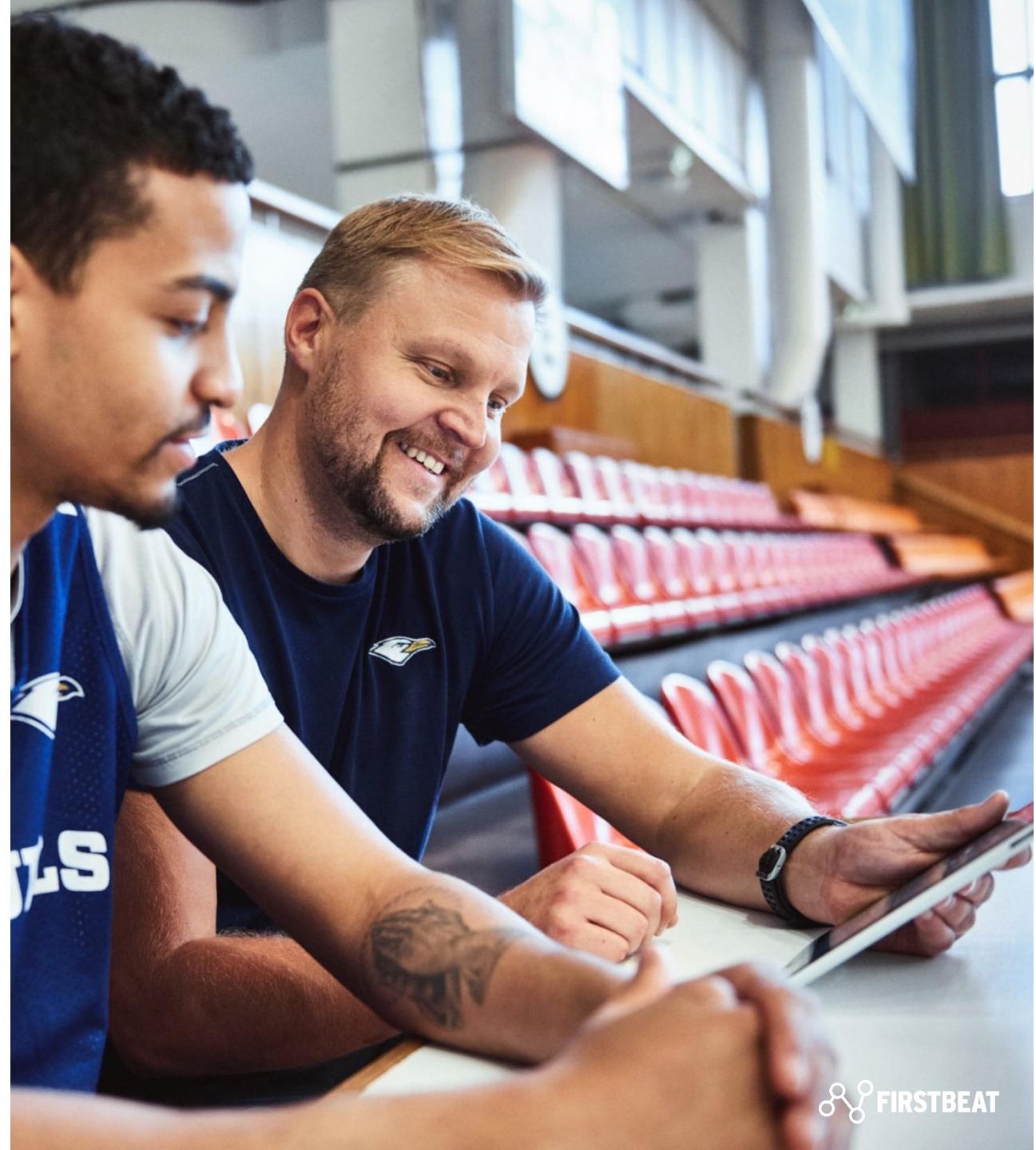
- Firstbeat Sports Sensors
- EVA case to store and transport Sensors
- Textile straps and additional replacement straps
- Washing bag
- Team bag



AVAILABLE DURING SUMMER 2019

Processed data: Firstbeat analytics

15 May 2019



FIRSTBEAT METRICS



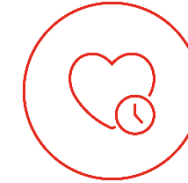
Training
Impulse



EPOC



Heart rate (bpm)



Quick recovery



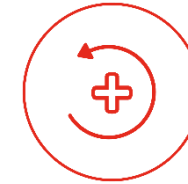
Trimp/
min



Aerobic
Training Effect



Heart rate
(%HRmax)



Overnight recovery



Acute
training load



Anaerobic
Training Effect



Time in zones



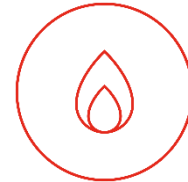
Sleep time



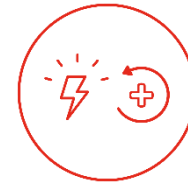
Chronic
training load



VO2max
(ml/kg/min)



Energy
Expenditure (kcal)

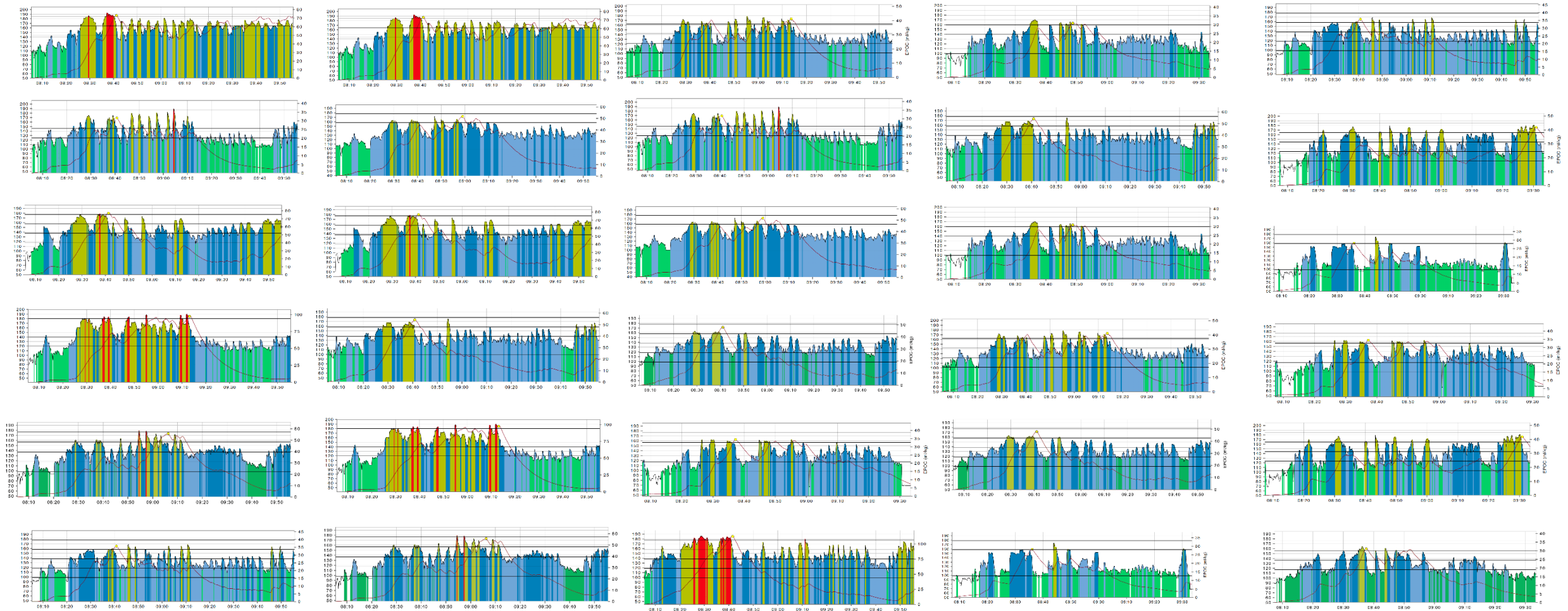


Stress and recovery
balance

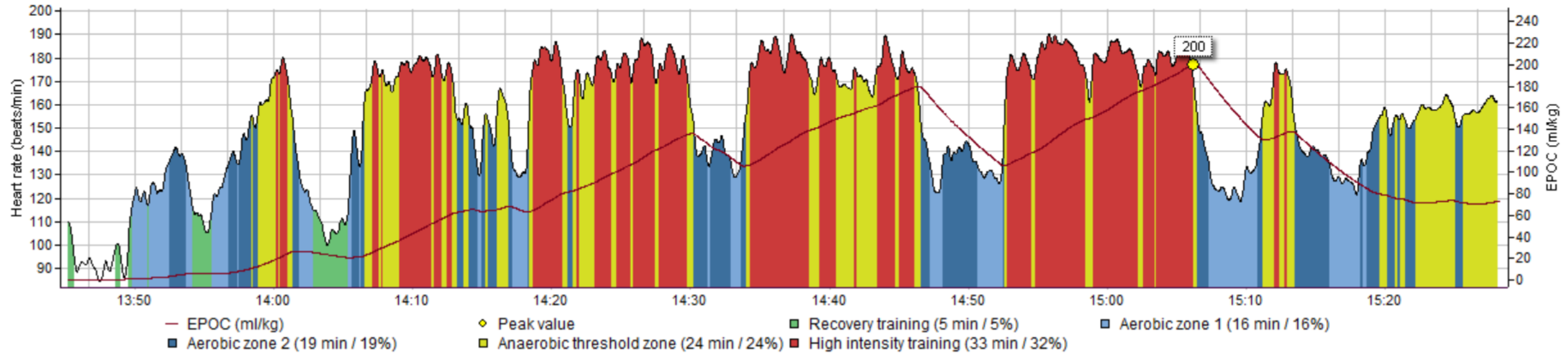


Acute:Chronic
Workload ratio

WHY LOAD QUANTIFICATION IS NEEDED?



HEART RATE-BASED TRAINING INSIGHTS



TRAINING EFFECT



56%

AEROBIC

44%

ANAEROBIC

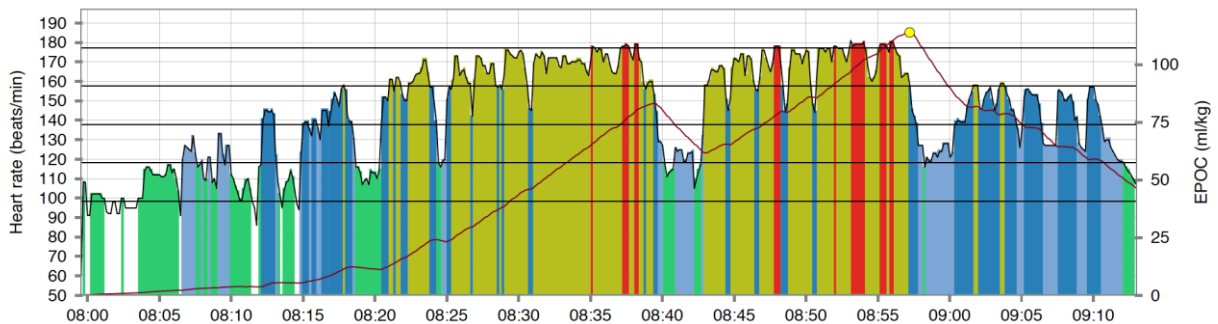
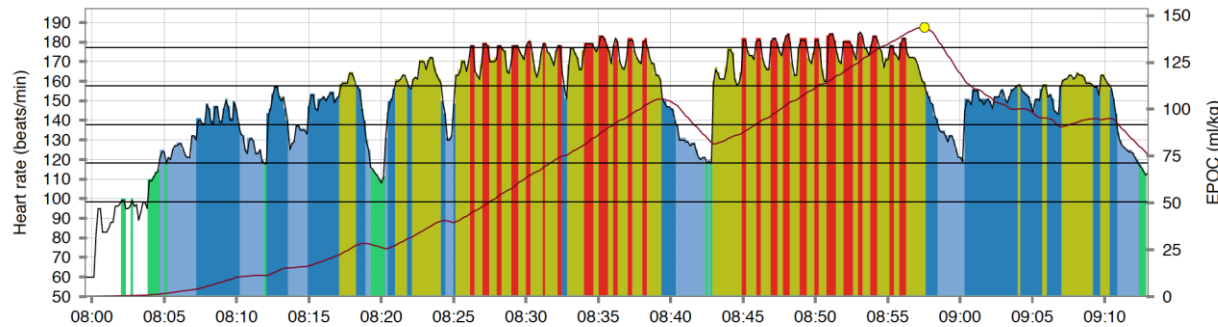
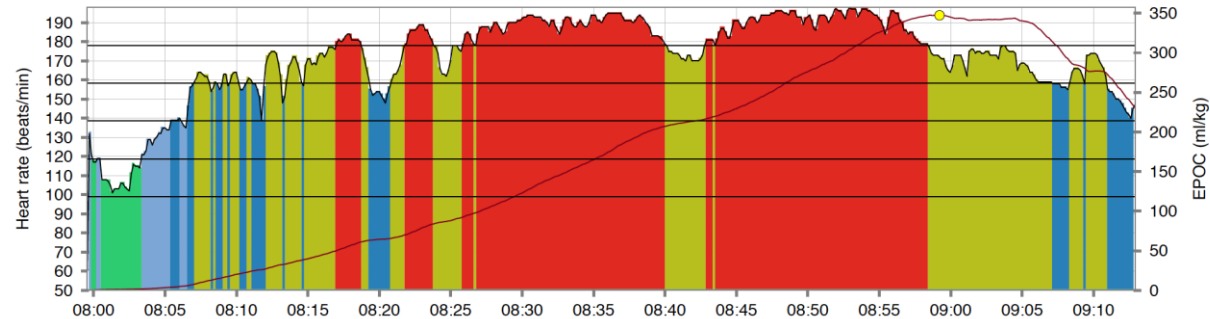
HIGHLY IMPROVING

This workout sharply improved your aerobic fitness and had also considerable impact on your anaerobic fitness.

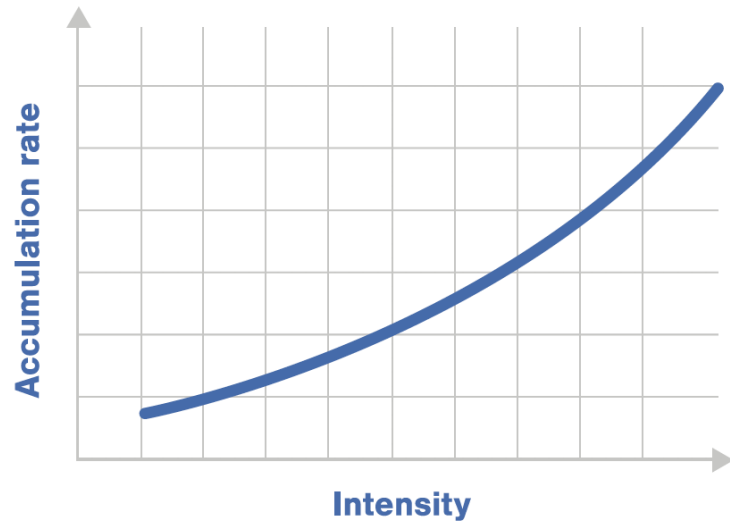


In this context, anaerobic fitness means your abilities to perform repeated short-term maximal work and aerobic fitness means to perform prolonged submaximal work.

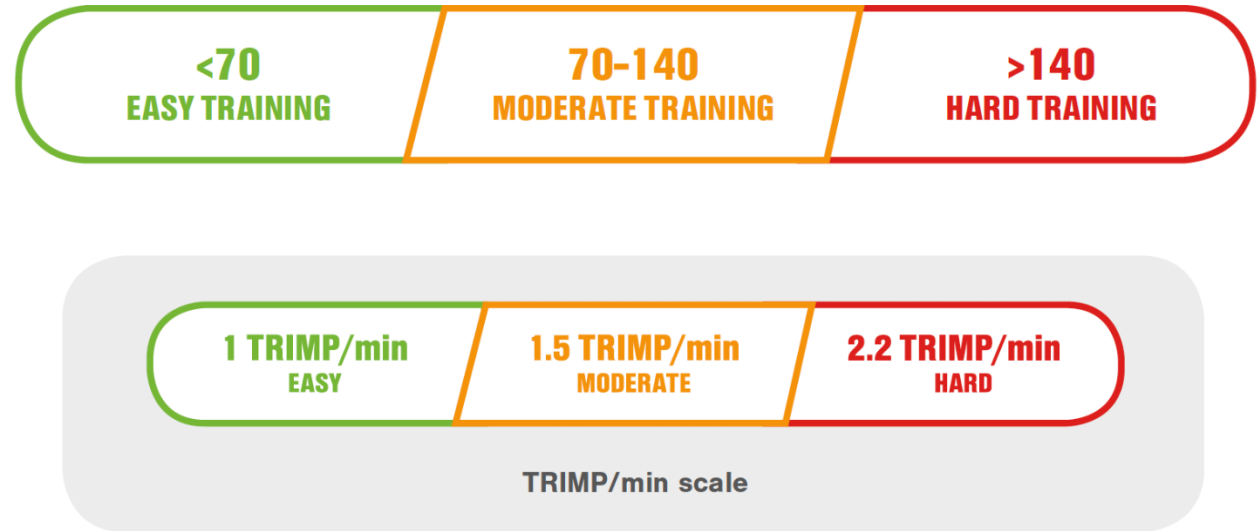
EXAMPLE: IDENTIFYING INDIVIDUAL RESPONSES



TRIMP (TRAINING IMPULSE)



TRIMP accumulation rate models lactate accumulation rate increasing exponentially to intensity

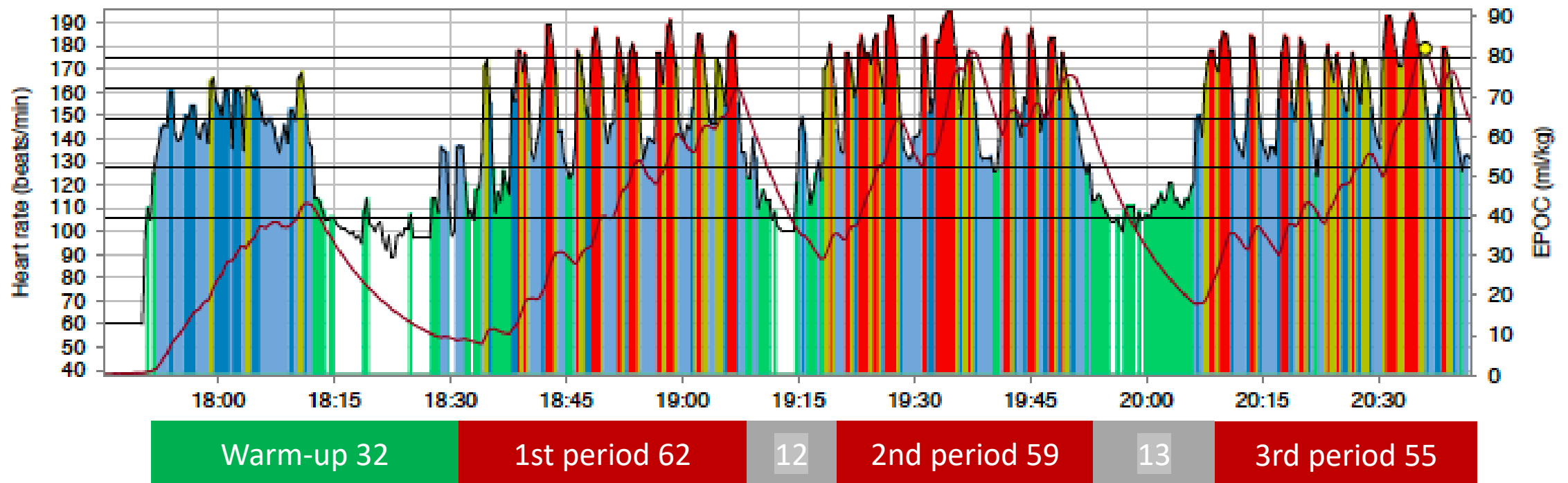


$$TRIMP = T \times \left[\frac{(HR_{ex} - HR_{rest})}{(HR_{max} - HR_{rest})} \right] \times 0.64e^{1.92 \left[\frac{(HR_{ex} - HR_{rest})}{(HR_{max} - HR_{rest})} \right]}$$

Where:

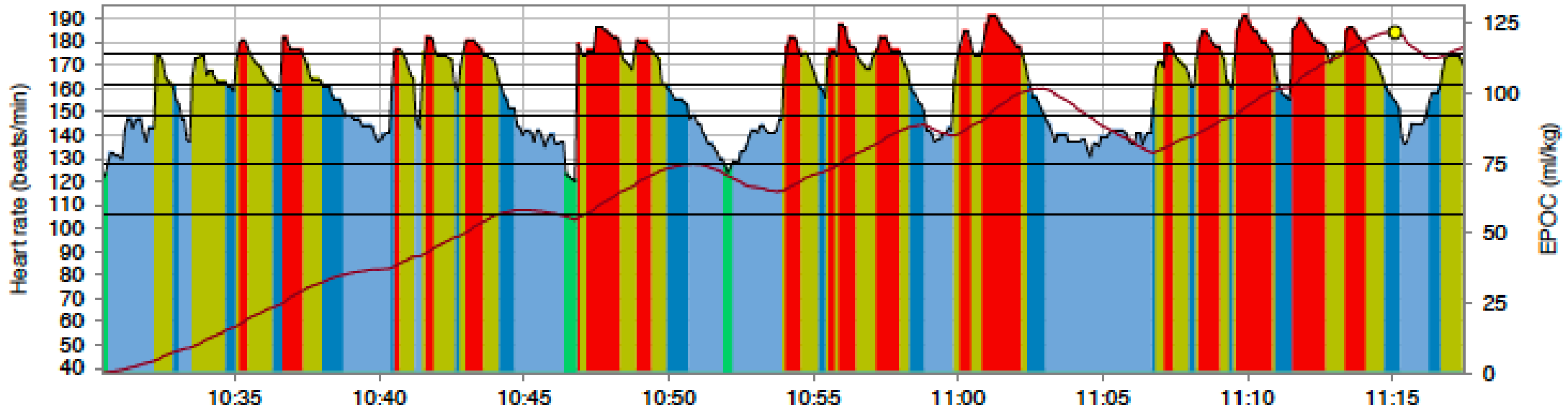
T duration of the workout
HR_{ex} heart rate during workout
HR_{rest} resting heart rate
HR_{max} maximal heart rate
e ~ 2,718

TRIMP ACCUMULATION IN GAME



- TOTAL **TRIMP 233** (175min) => 1.3 TRIMP/min
- TRIMP in 1-3 periods: 176 (105min) => **1.7 TRIMP/min**

EXAMPLE: GAME SPECIFIC PRACTICE



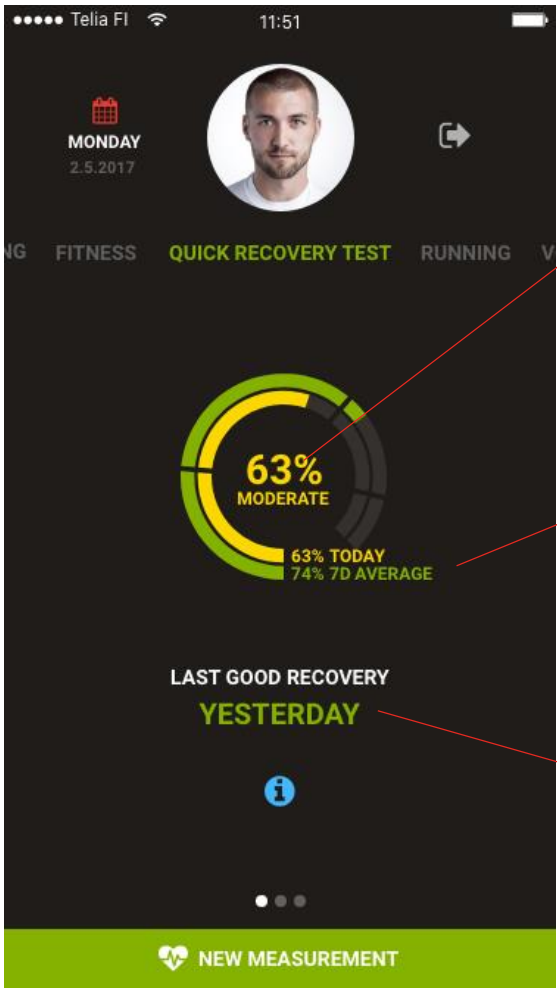
TRIMP 108 (47min) => 2.3 TRIMP/min

Intensity and effort needs to match. Adjustments are done with recovery breaks and training duration

KEY APPLICATIONS:

- Know how much specific sessions and drills are affecting TRIMP accumulation => training planning
- Observe in real time individual responses: Finish the session earlier or extend recovery periods

QUICK RECOVERY TEST



Readiness



Indicates momentary stress.
You may have slept poorly

You are in a relaxed state
and ready to be pushed hard

Recovery



You are dealing with some
load accumulation

You are well recovered and
handling the current Training
Load

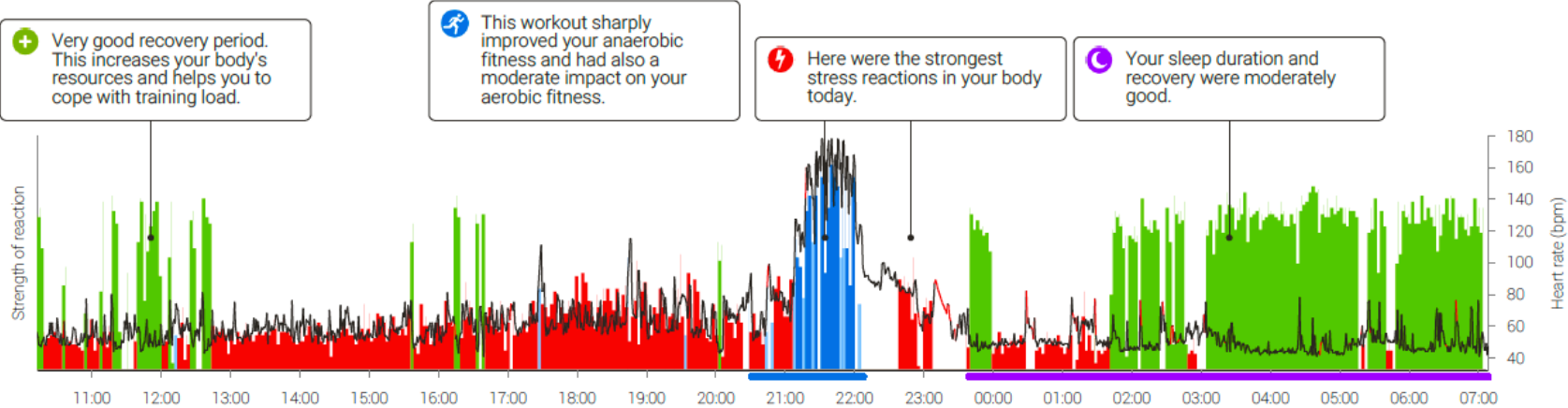
Risk of
accumulated
fatigue



You are at increased risk
of accumulating fatigue.
Continue to monitor

Less than 1 week since "good"
recovery. Continue as normal

24/7 ATHLETE

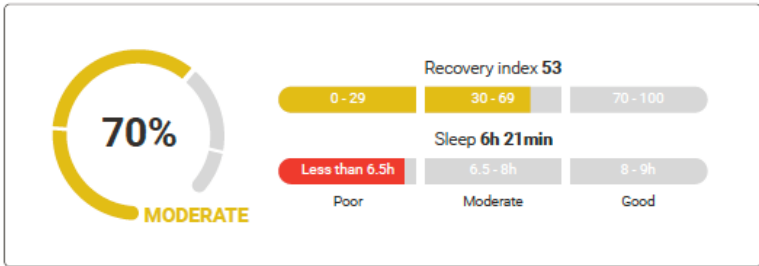


- Stress reaction** means an elevated activation level in the body. The reaction can be positive or negative.
- Recovery** means a calming down of the body. Important recovery periods include sleep and peaceful moments during the day.
- Exercise** means activities when intensity is over 40% of person's maximal capacity.
- Light physical activity** means daily activities when intensity is elevated from resting level.

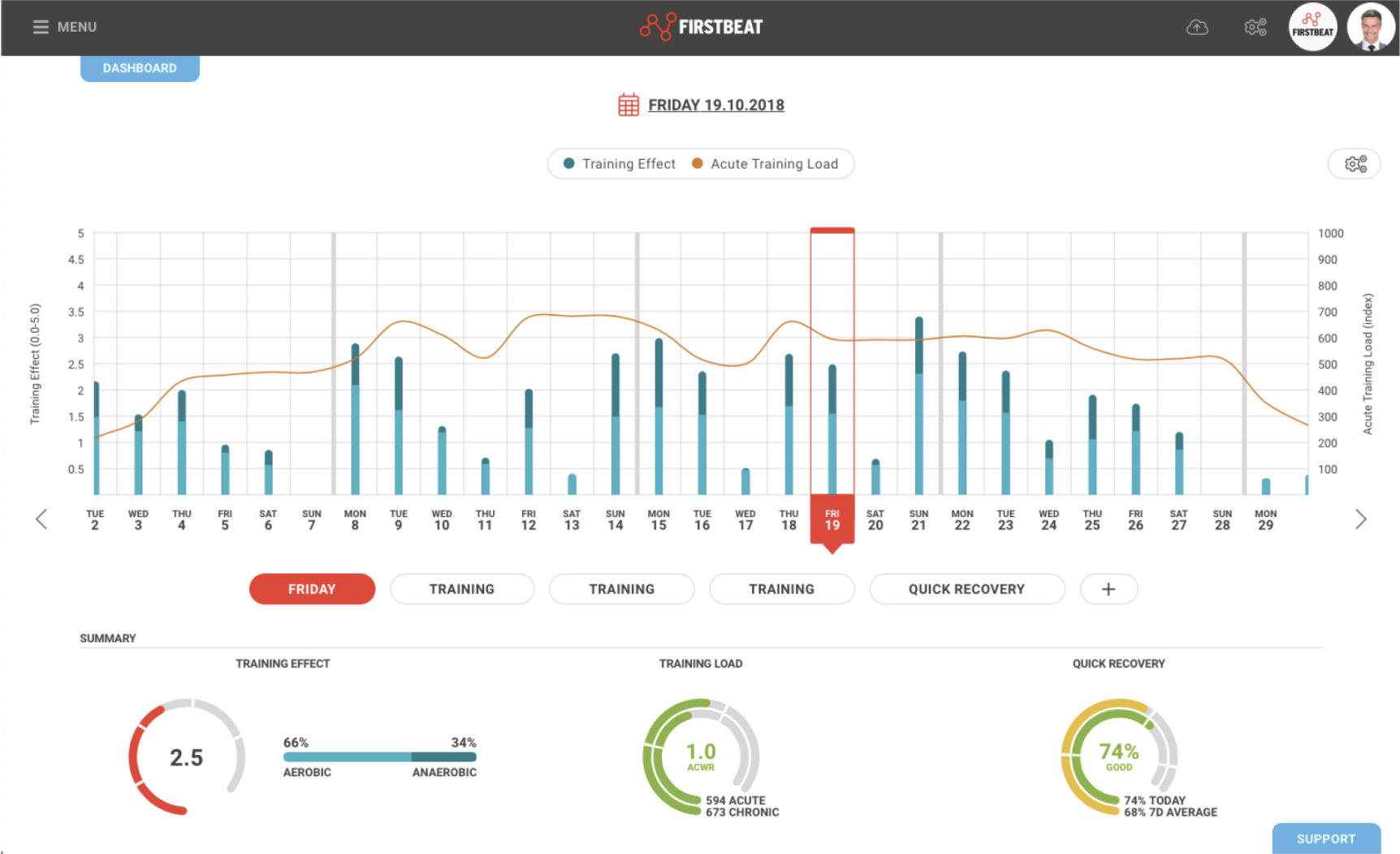
24H STRESS & RECOVERY BALANCE



OVERNIGHT RECOVERY



EASY ACCESS FOR COACHES AND PLAYERS

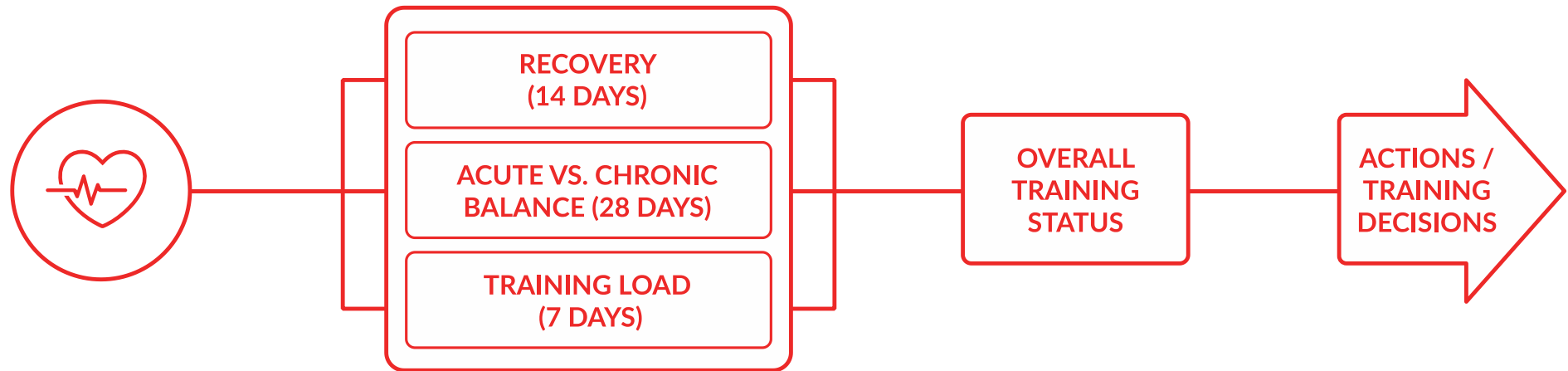


TRAINING STATUS ANALYSIS COMBINES ALL AVAILABLE INFORMATION TO ASSESS THE TRAINING BALANCE

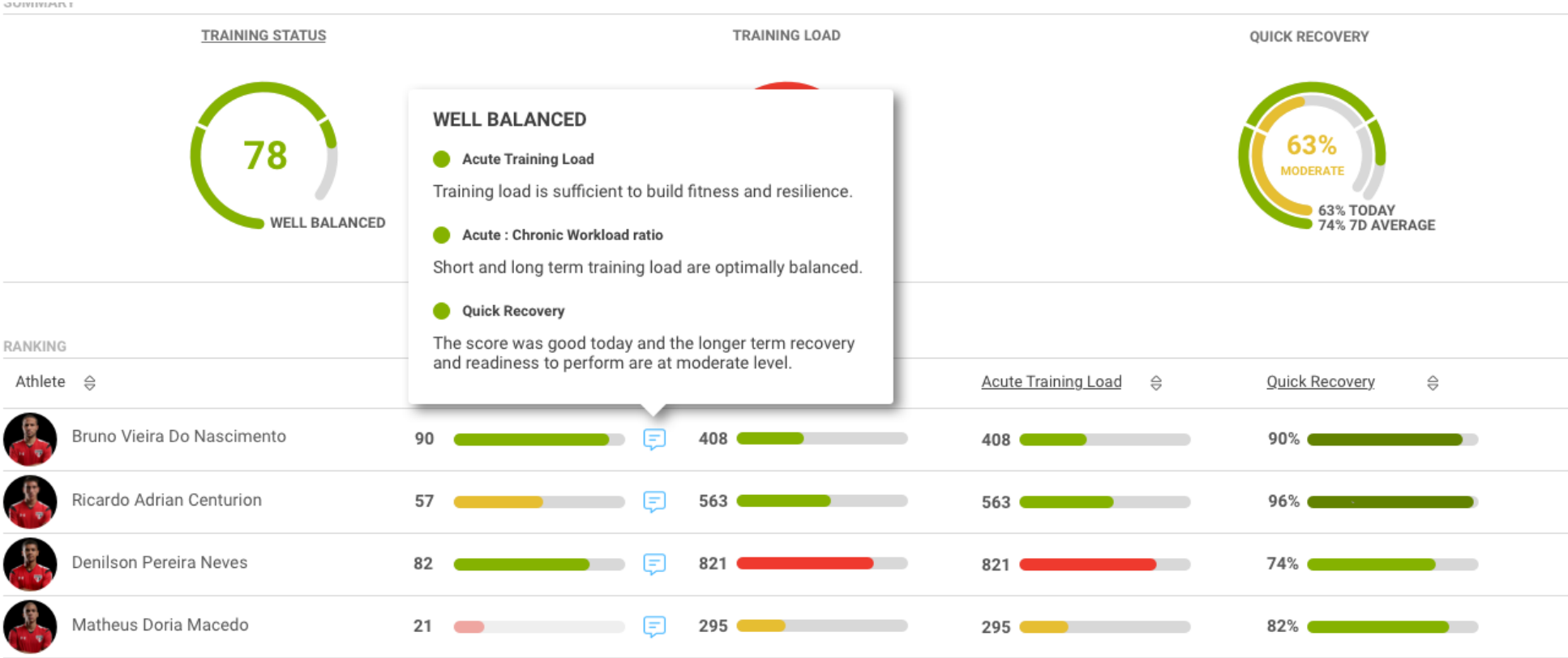
MEASUREMENTS

ANALYSIS

FEEDBACK



TRAINING STATUS IN DASHBOARD VIEW



SPORTS LIVE

Real-time information from training sessions

- Aerobic TE
- Anaerobic TE
- TRIMP
- TRIMP/min
- Time in HIT
- Heart rate (bpm, %Hrmax)
- Color coded HR zones



Thank you!