



ThermoHuman

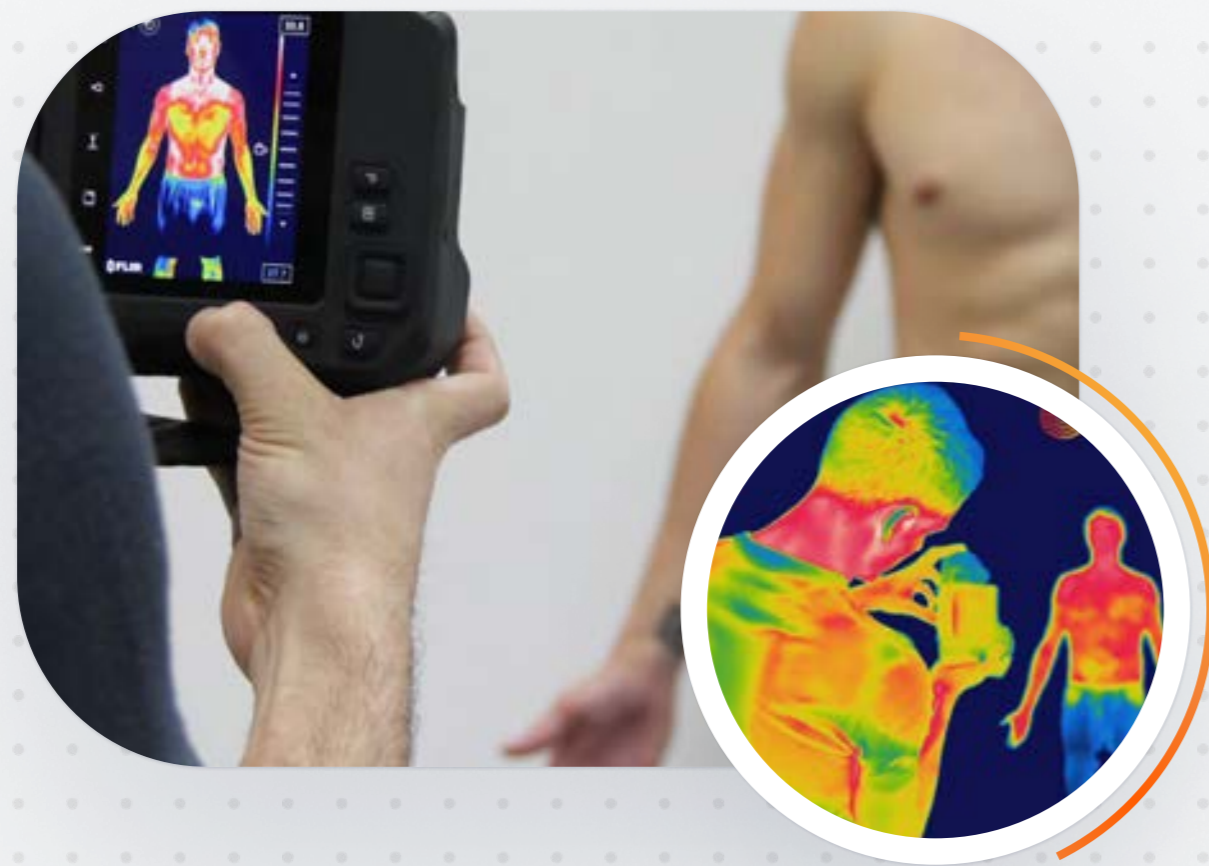
PERFORMANCE

T h e r m o g r a p h y i n S p o r t



I n f r a r e d t h e r m o g r a p h y

WHO ARE WE?



We are the **world-leading company in thermography** applied to sports and health.



Our system helps professionals to **manage injury risk and recovery.**



Since 2009 we gather scientific and working experience with **teams from 48 countries.**

PROBLEM



PERFORMANCE



INJURIES

(Malone et al., 2016)



HIGH TRAINING LOADS

HOW TO MEASURE THEM?

EXTERNAL LOAD

GPS

INTERNAL LOAD

INFRARED THERMOGRAPHY



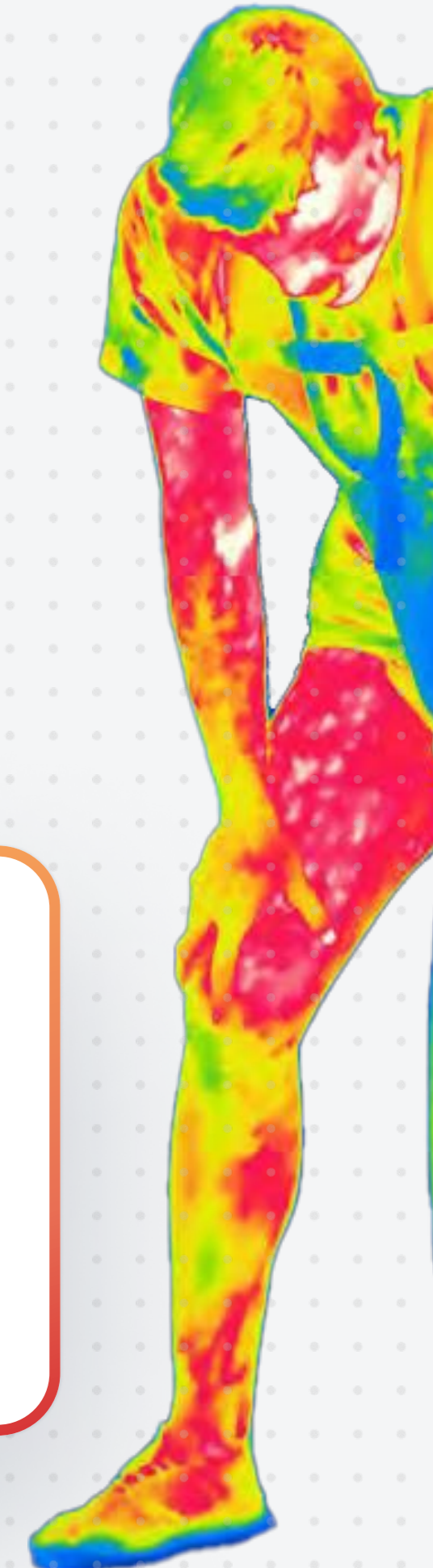
NON-INVASIVE



FAST



OBJECTIVE

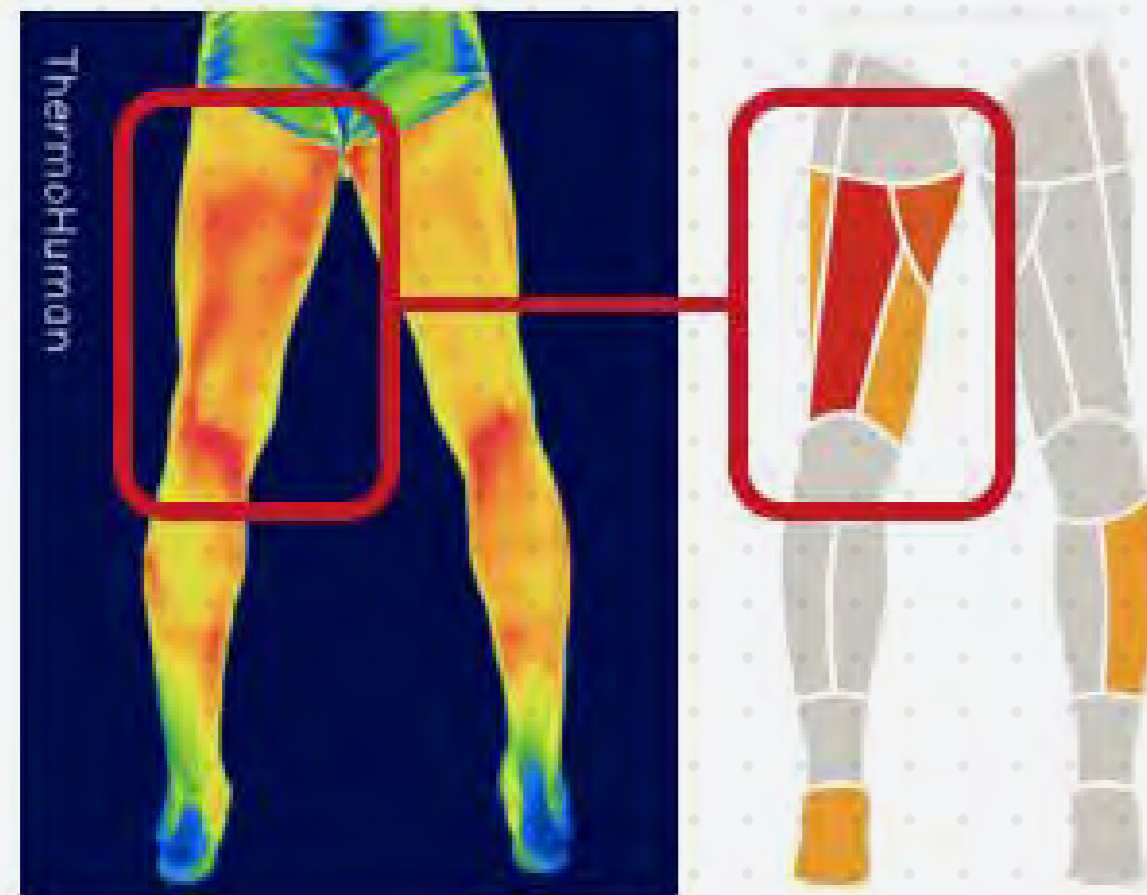


MAIN APPLICATIONS

OF THERMOGRAPHY IN SPORTS.

Asymmetry

Detecting regions at **risk to prevent** potential injuries.



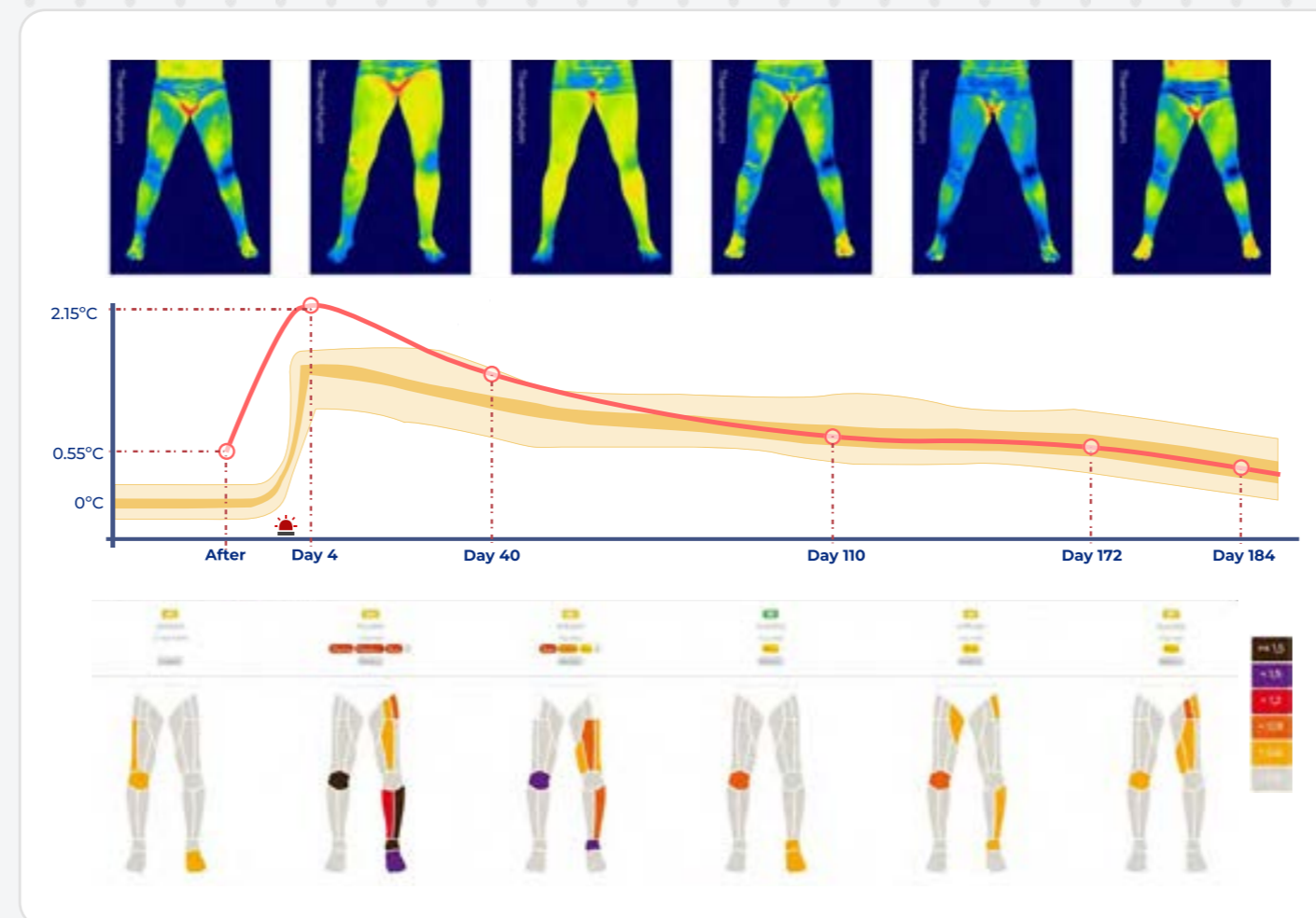
Abnormal pattern in the hamstring

TREATMENT

Gómez-Carmona et al. (2020)
& Côte et al. (2019)

RTP

Monitoring training and injury recovery with the aim of **objective decision-making**.



ACL Return-to-play process

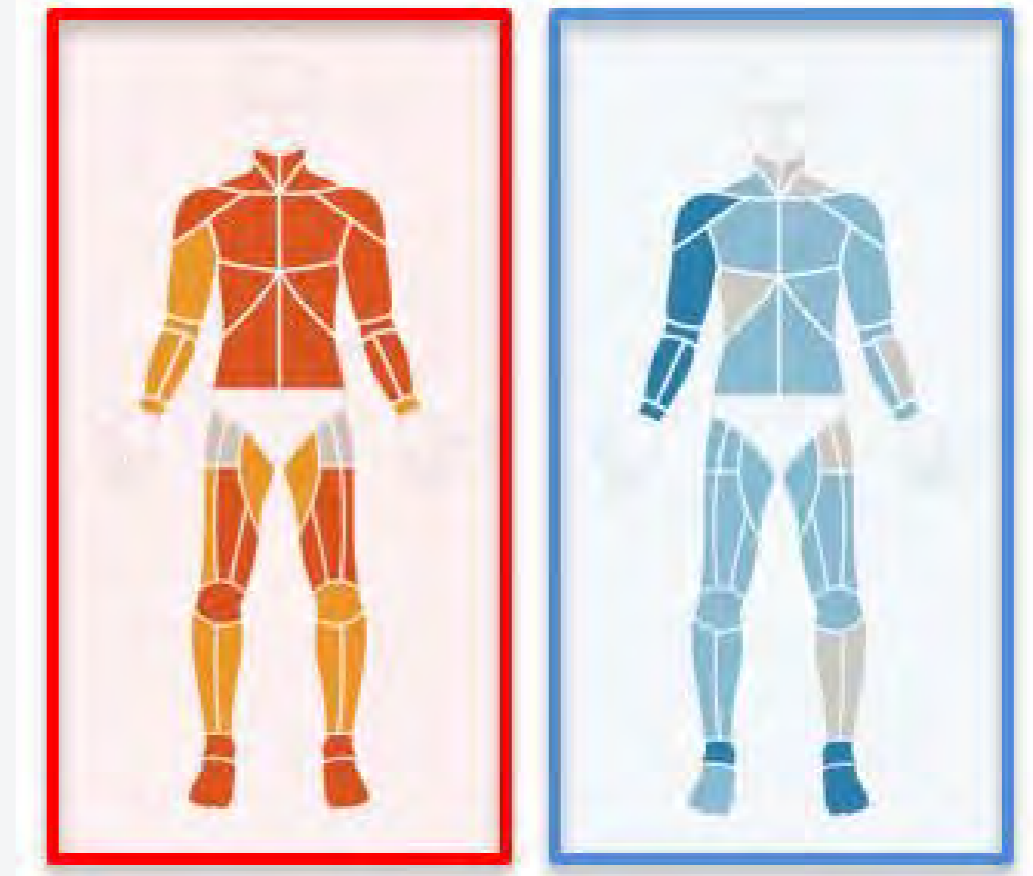
MONITORING

Fernández-Cuevas et al. (2020)

Fatigue

Identifying **patterns** according to the type of **fatigue** to individualize recovery strategies.

LOCAL FATIGUE CENTRAL FATIGUE

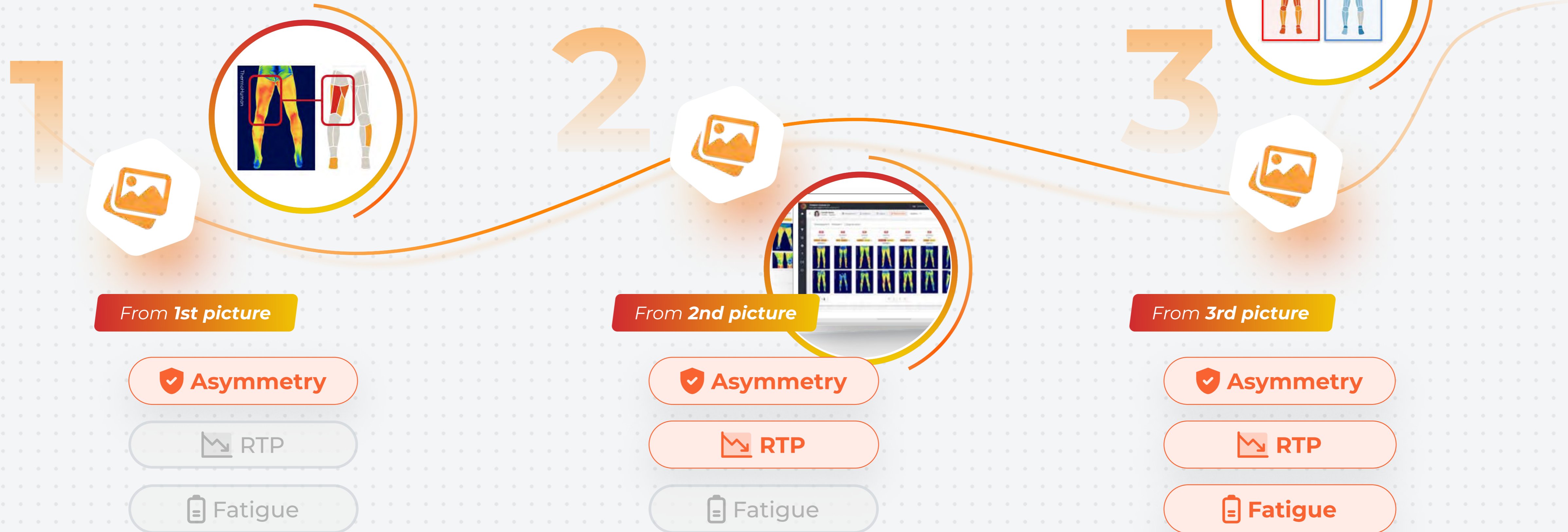


Post-competition fatigue

RECOVERY STRATEGIES

Thorpe (2021)

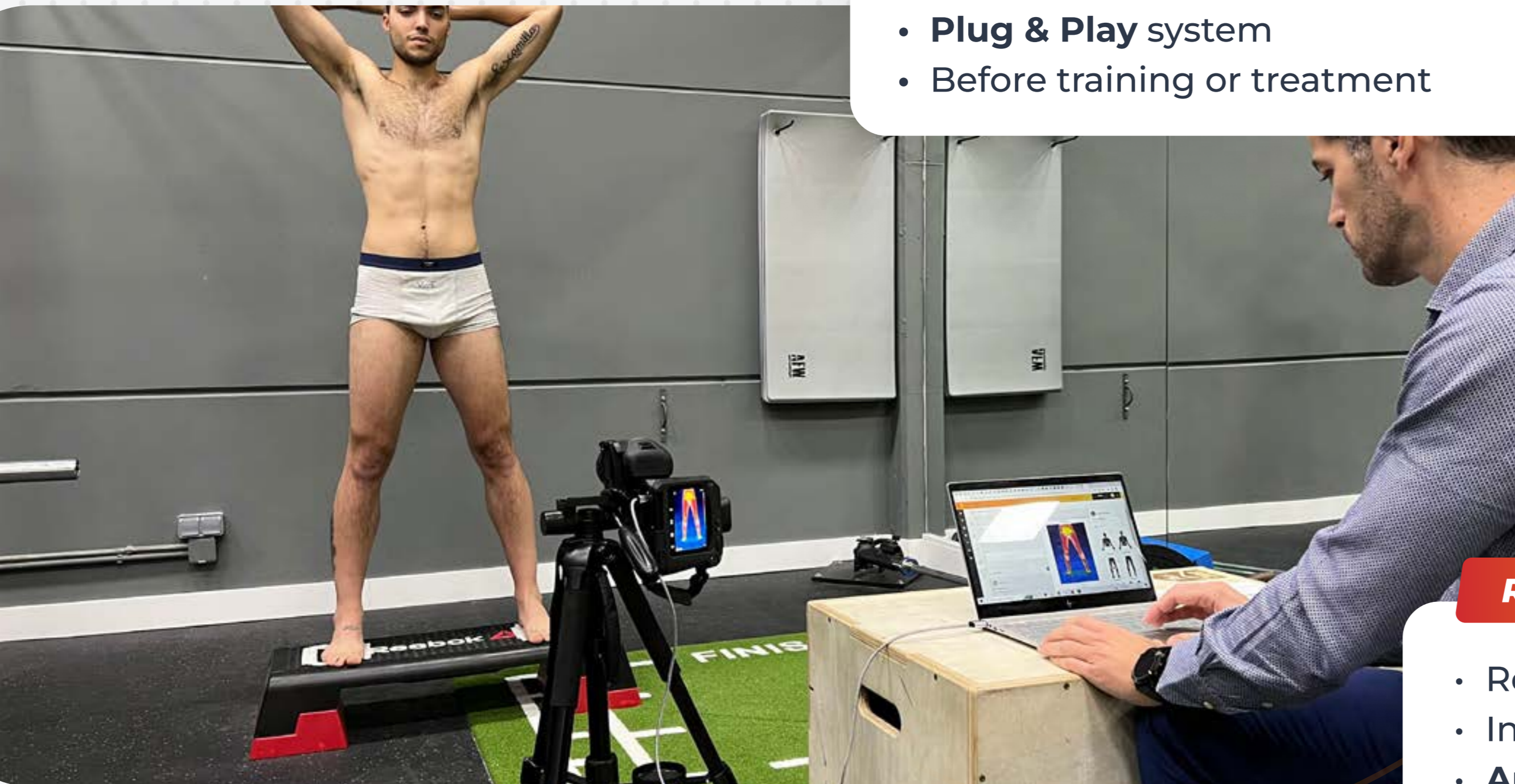
SOLUTION



HOW DOES IT WORK?

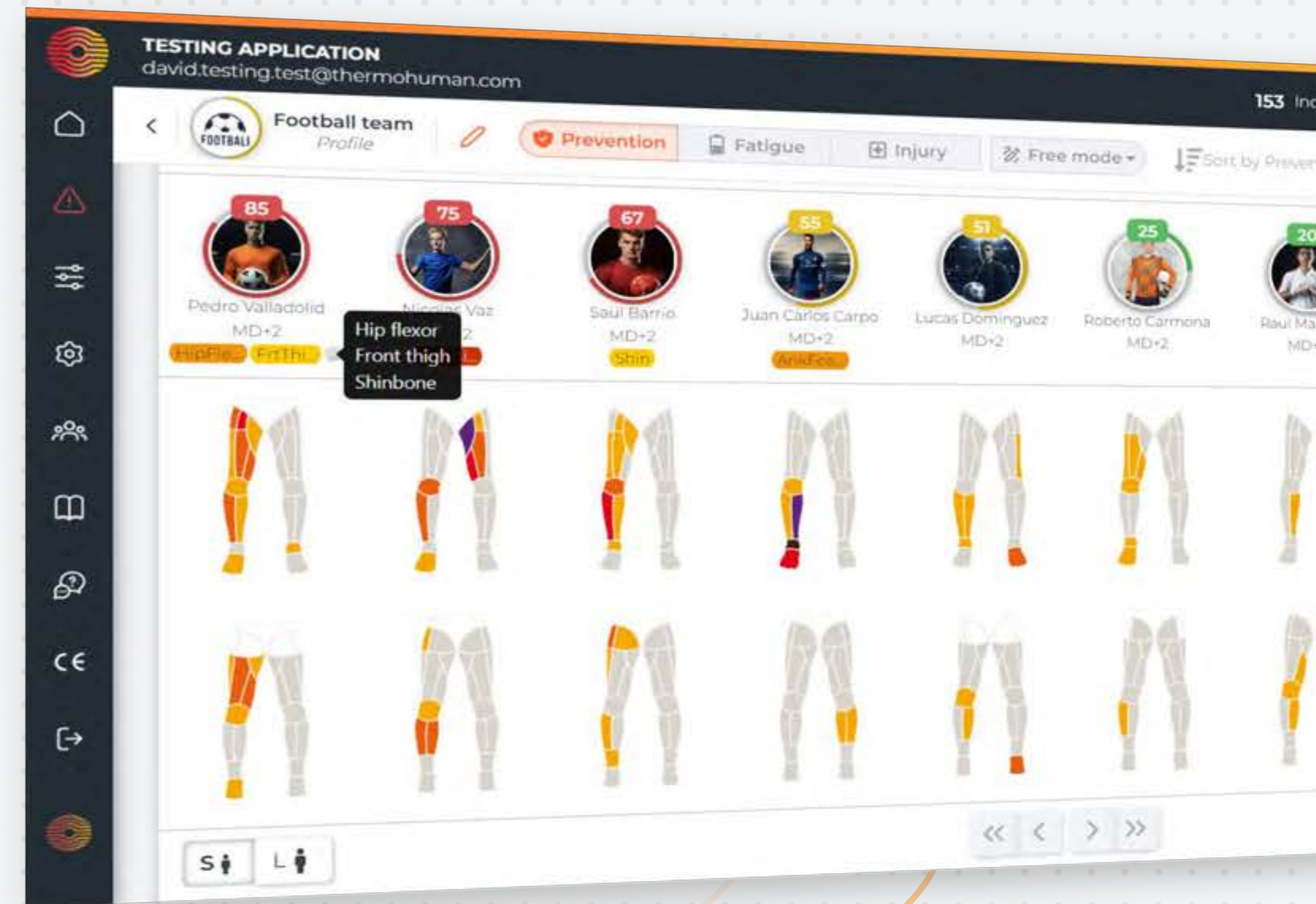
DATA COLLECTION

- Non-invasive picture
- Plug & Play system
- Before training or treatment



REPORTS IN 30"

- Report ready in **30"** per player
- Information for **Athletic / Performance dept**
- **Automatic metrics and alarms** to identify players with higher risk



IMPLEMENTATION



Minimum recommendation of **1 picture per week** (MD+1 or MD+2)

MD-3

MD-2

MD-1



MD+1

MD+2

MD+3

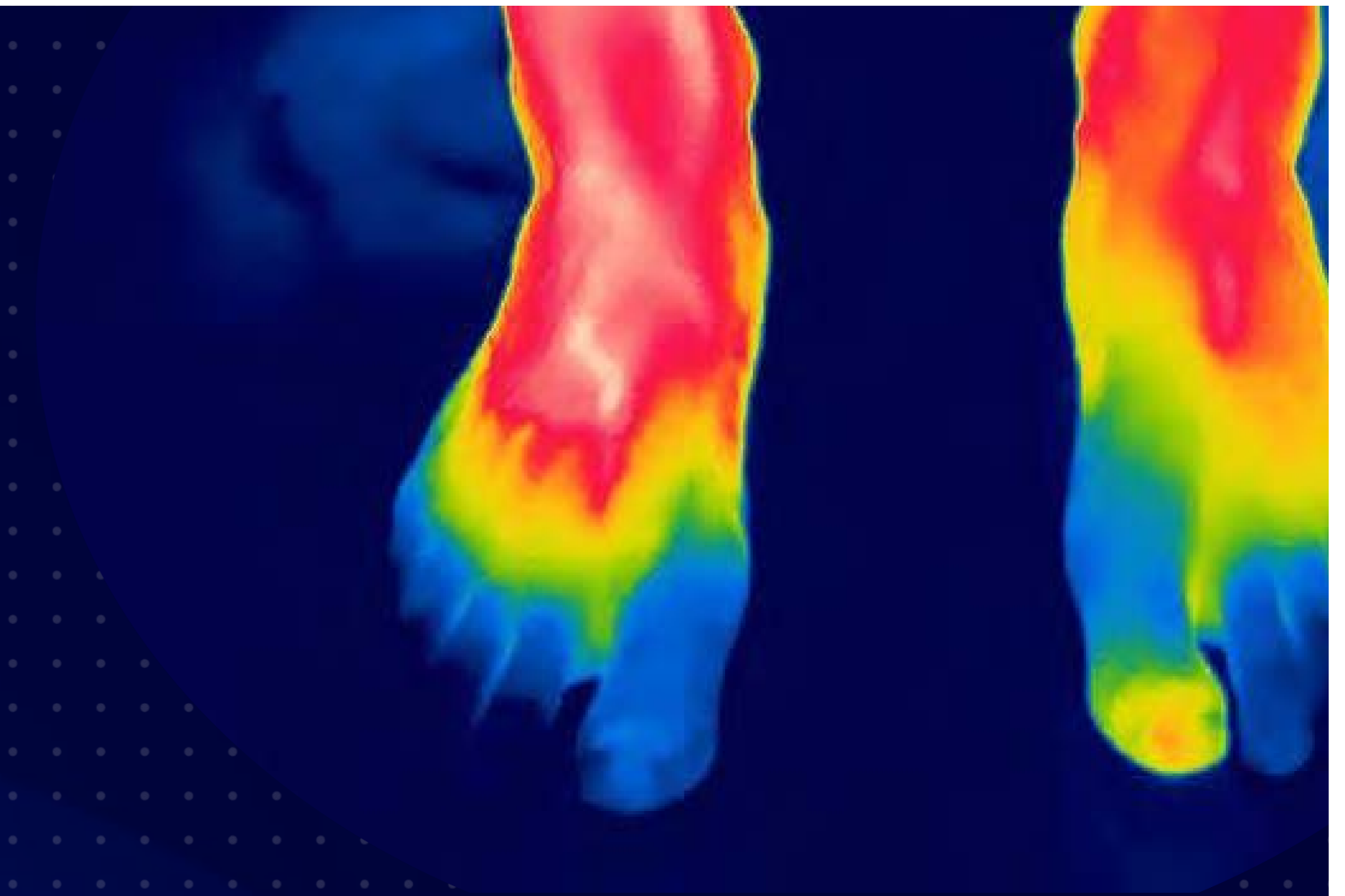
Match day or week's highest intensity training session

- Readiness to compete
- Follow-up on complicated cases

 **Asymmetry**

 **Fatigue**





INJURY PREVENTION EXAMPLE

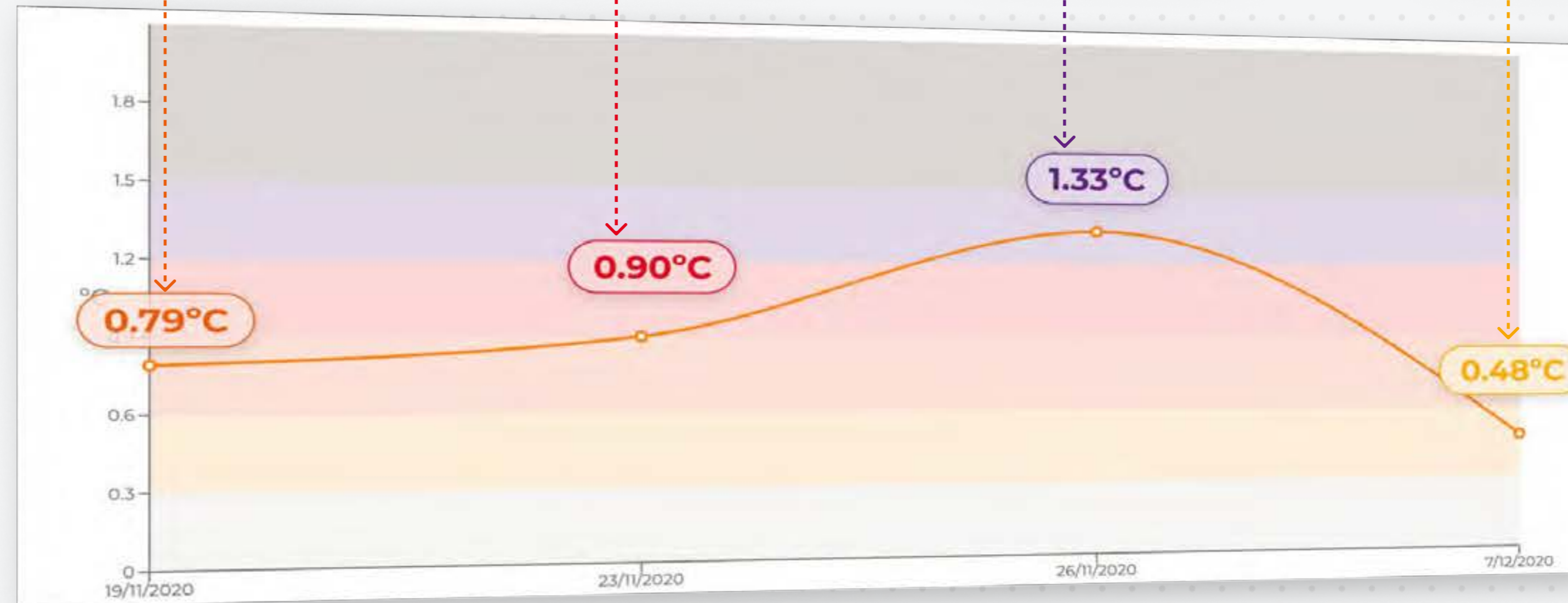
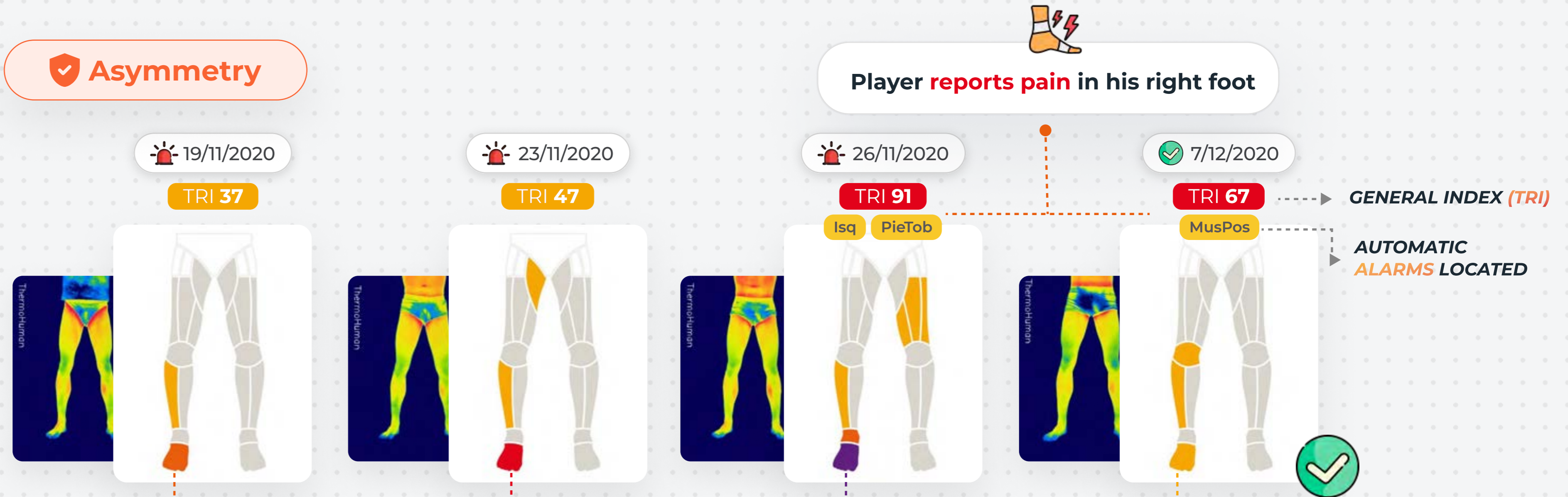
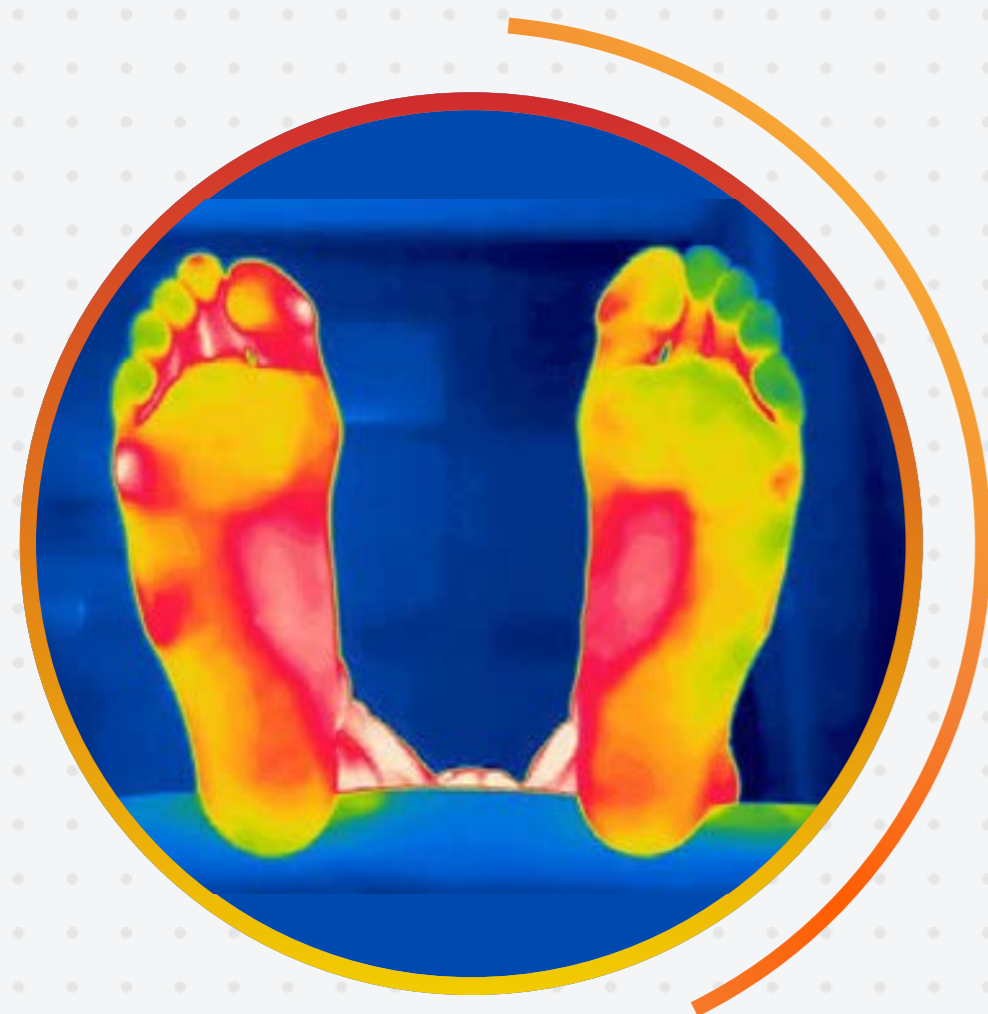
POTENTIAL 5TH METATARSAL **FOOT INJURY**

 **Asymmetry**

Asymmetry



POTENTIAL
5TH METATARSAL
FOOT INJURY
ASYMMETRIES

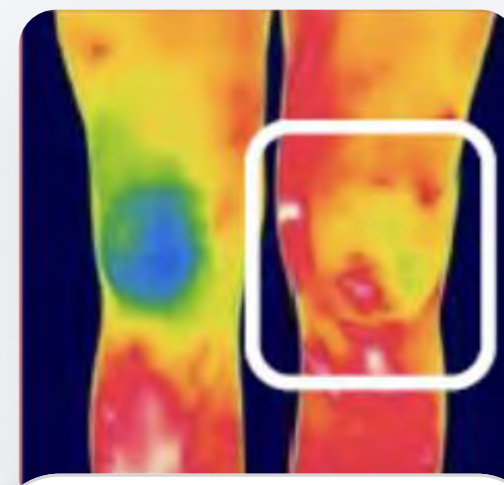


CHARTS AND DATA
FOR OBJECTIVE
MONITORING

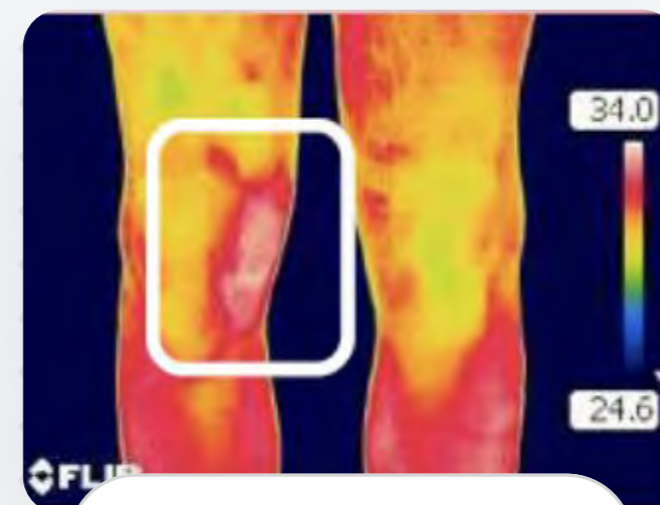
FOOT ASYMMETRY EVOLUTION

DIAGNOSIS SUPPORT EXAMPLES

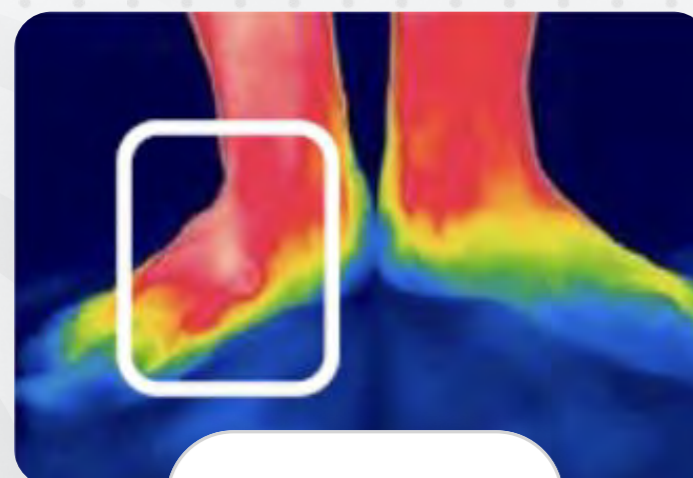
BASED ON THERMAL RESPONSES



Meniscus



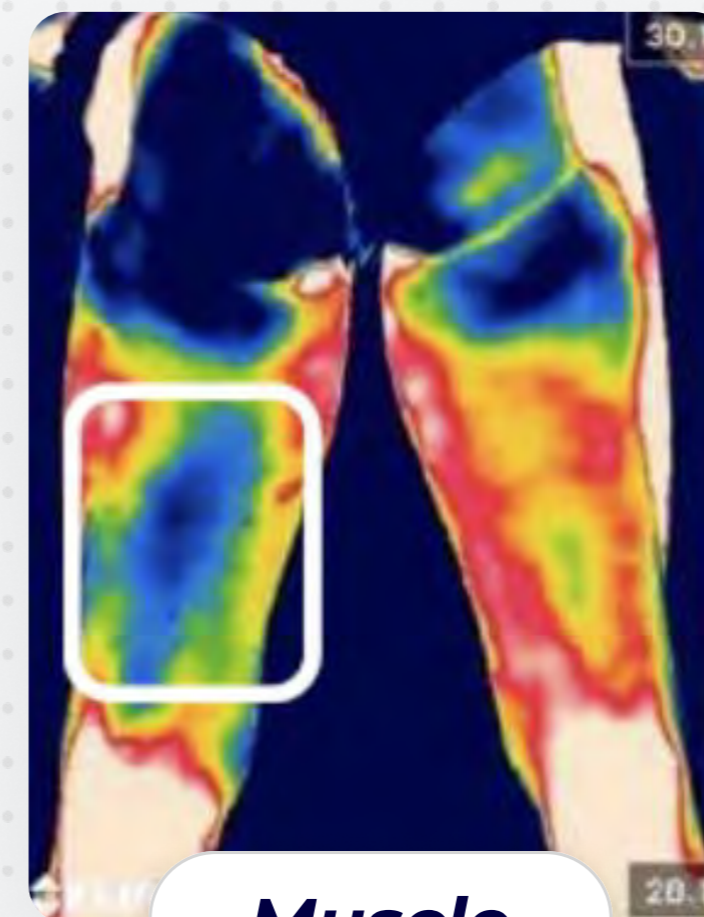
Ligament



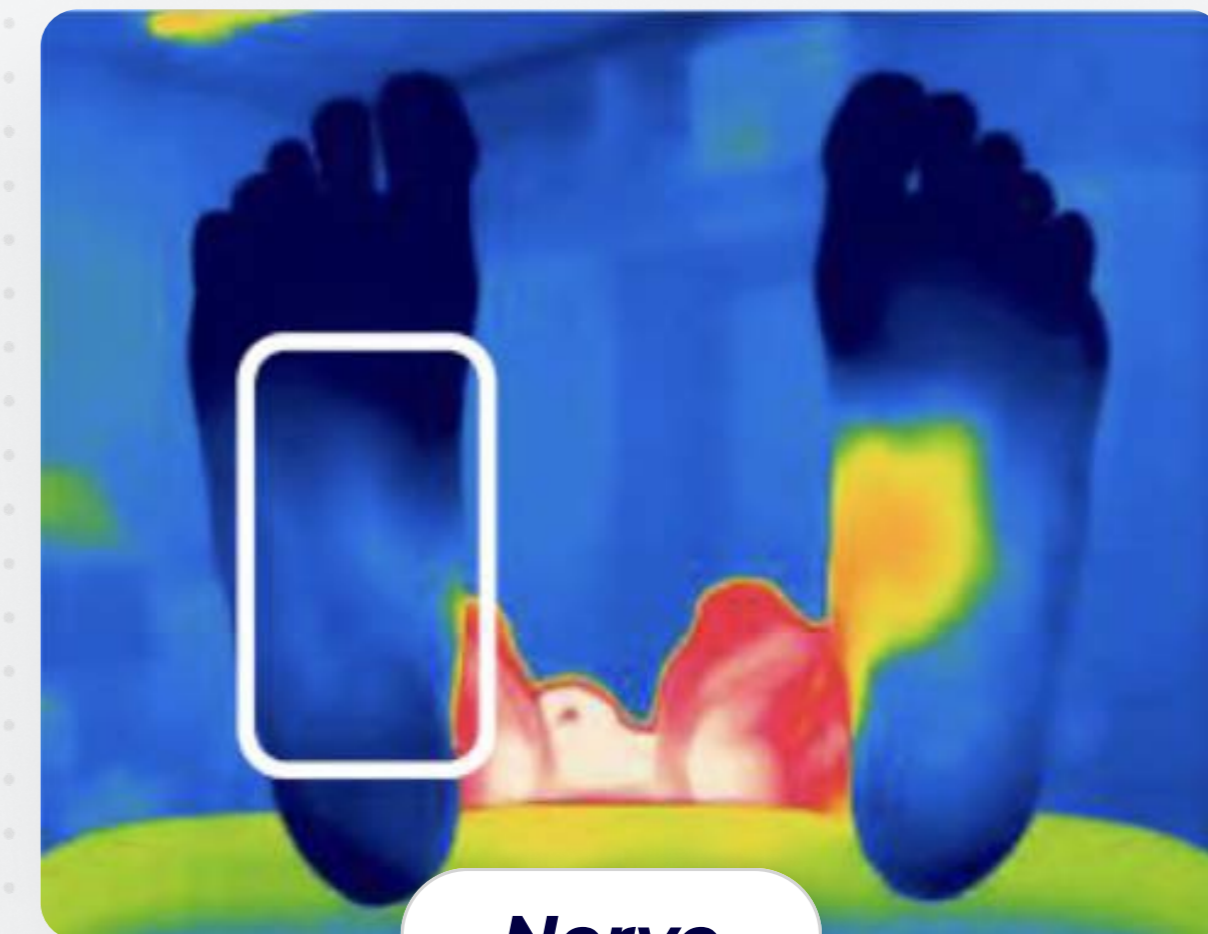
Bone



Fascia



Muscle



Nerve



Sillero-Quintana, M., et al. (2015)

Journal of Clinical Imaging and Health Informatics, 5(6, 1223-1228.)



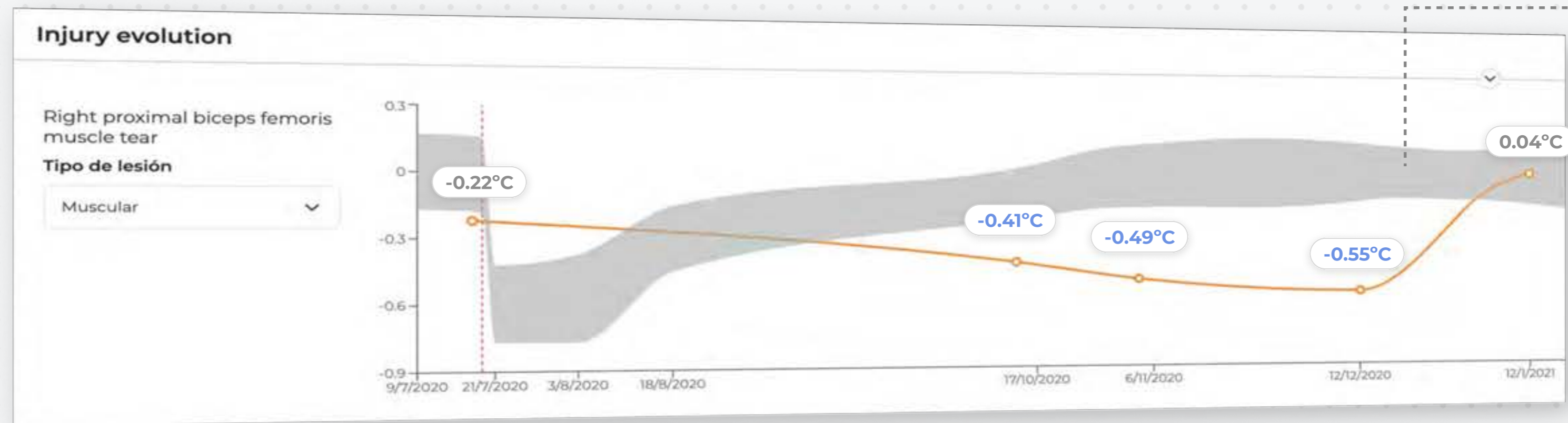
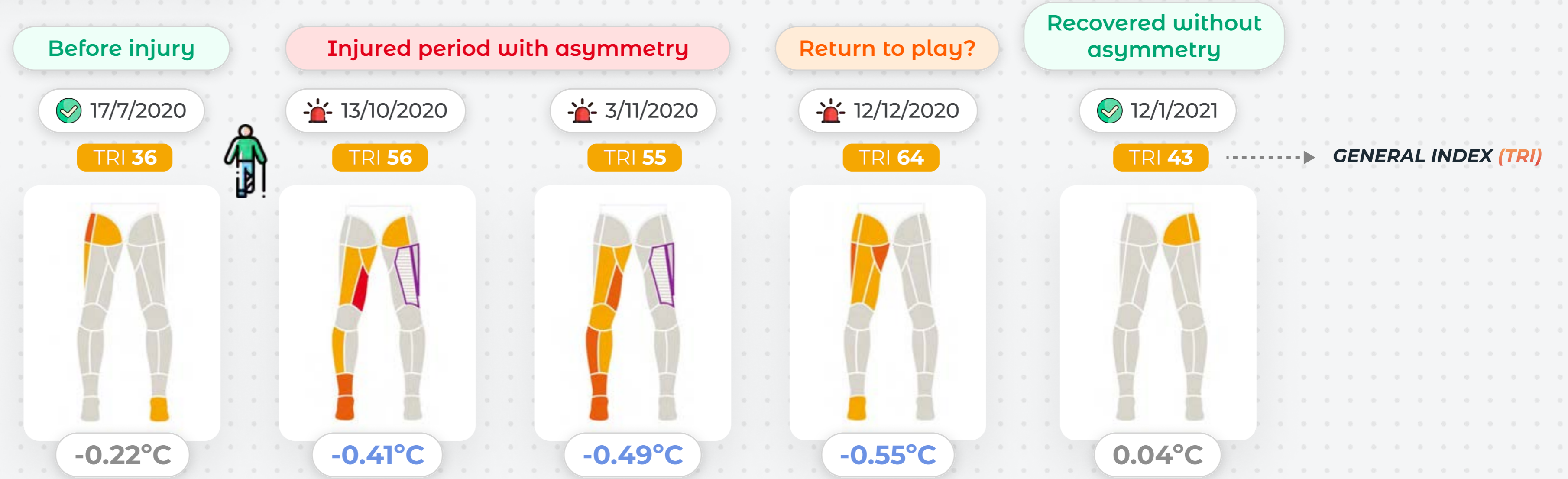
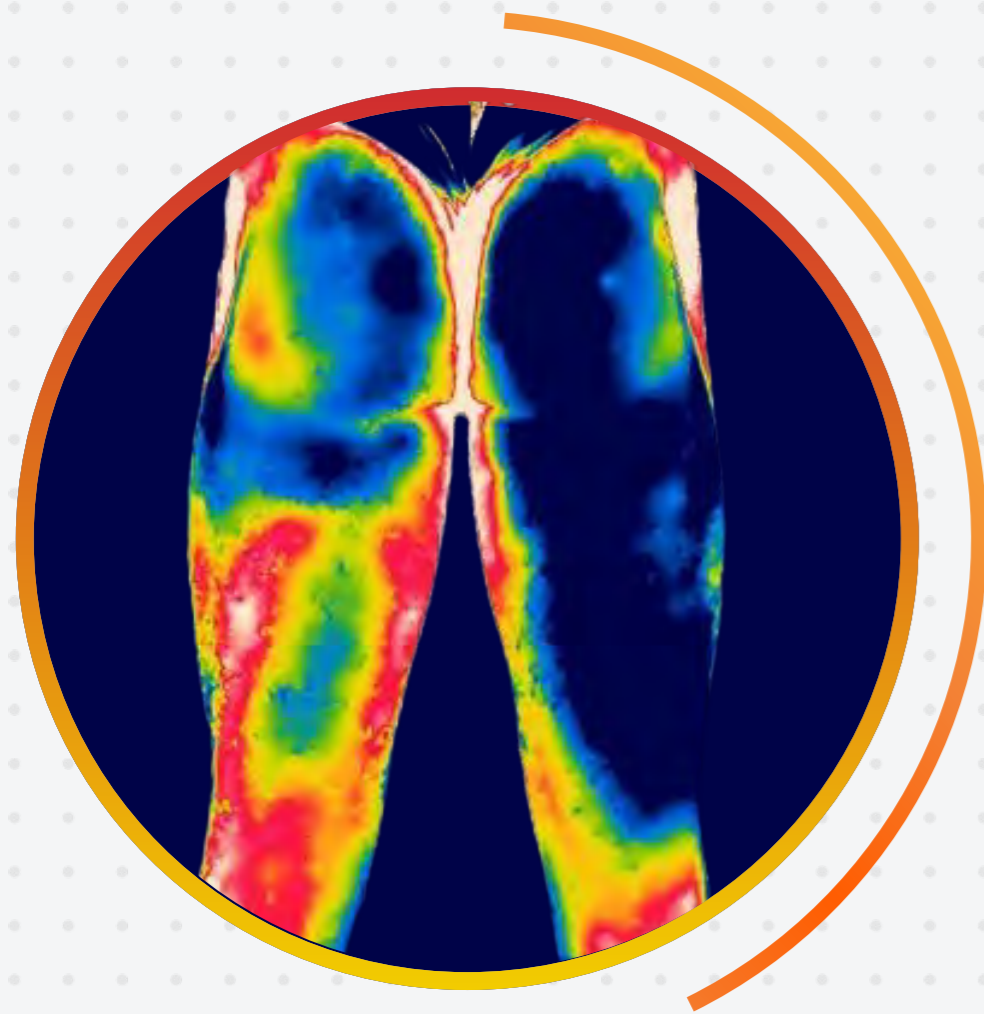
MUSCLE INJURY EXAMPLE

RETURN TO PLAY MONITORING

 RTP



FEMORIS INJURY
HAMSTRING
ASYMMETRIES



THERMAL ASYMMETRY EVOLUTION OF MUSCLE INJURIES BASED ON SCIENTIFIC EVIDENCE

HAMSTRING ASYMMETRY EVOLUTION



POST-EXERCISE RECOVERY

POST-MATCH THERMAL EVALUATION (MD +2)

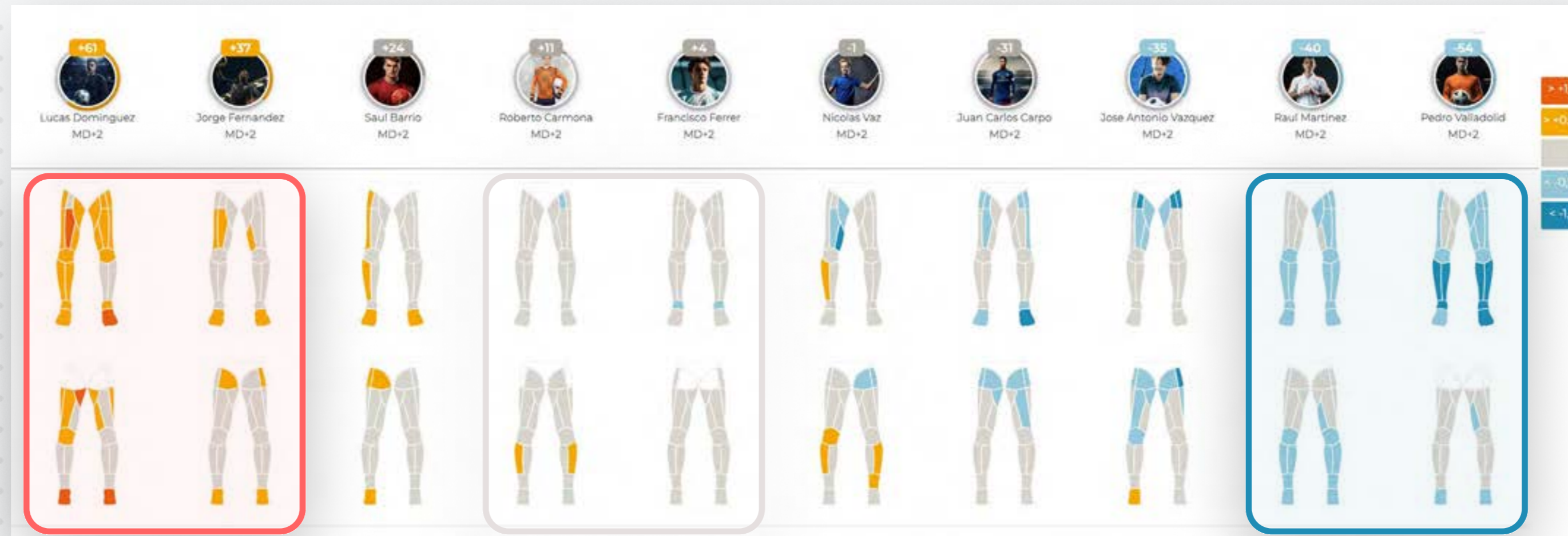
 **Fatigue**



POST-MATCH THERMAL EVALUATION (MD +2)



THERMOGRAPHY & POST-EXERCISE RECOVERY



Based on the paper published by Robin Thorpe

Thorpe RT (2021) Post-exercise Recovery: Cooling and Heating, a Periodized Approach. Front. Sports Act. Living 3:707503. doi: 10.3389/fspor.2021.707503

WARM THERMAL PROFILES

Cooling Strategies

- PHASE CHANGE MATERIAL
- TOPICAL ICING
- COLD WATER IMMERSION
- WHOLE-BODY CRYOTHERAPY

STRUCTURAL DAMAGE
Players significantly warmer than usual (Z-score)

Players with lower thermal variation

Normal training: non-fatigued

METABOLIC DAMAGE
Players significantly colder than usual (Z-score)

COLD THERMAL PROFILES

Heating Strategies

- MICROWAVE DIATHERMY
- SAUNA
- HOT WATER IMMERSION
- STEAM/HEAT SHEETS

PRESENCE OF FATIGUE
IN WARMEST & COOLEST PLAYERS

OUR EXPERIENCE

EUROPE



MEA



AUSTRALIA



ASIA



OUR EXPERIENCE

USA & MEXICO



63 SCIENTIFIC ARTICLES & CLIENTS IN 46 COUNTRIES



SOUTH AMERICA



THERMOHUMAN RENTING OPTIONS*



1. TOP

- ✓ TOP CAMERA
FLIR T530 OR E96
- ✓ STAFF TRAINING
& SUPPORT
- ✓ SOFTWARE
UNLIMITED LICENCE

3.166€ /month

(37.995€/year)

2.

MOST POPULAR

PREMIUM

- ✓ MEDIUM CAMERA
FLIR E76
- ✓ STAFF TRAINING
& SUPPORT
- ✓ SOFTWARE:
UNLIMITED FOR 25 PLAYERS

1.665€ /month

(19.980€/year)

3. BASIC

- ✓ BASIC CAMERA
FLIR E54
- ✓ STAFF TRAINING
- ✓ SOFTWARE
UNLIMITED FOR 11 PLAYERS

832€ /month

(9.980€/year)



*Prices excluding VAT



Thank you For Your Attention

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