

ISOKINETIC MEDICAL GROUP

FIFA | MEDICAL CENTRE OF EXCELLENCE

Medicina e Sport 4.0

Evoluzione della tecnologia a supporto della prevenzione e della riabilitazione avanzata

Fabrizio Tencone, MD
Isokinetic Medical Group, Torino

Torino, 19 novembre 2026

La mia esperienza medica



Dal 1993 a giugno 2016

- medico sociale Juventus dal 1995 al 2002
- più di 400 partite in panchina
- coordinatore area medica Juventus dal 2010 ad 2016



Dal 2003 ad oggi

- direttore Isokinetic Medical Group, Torino
- FIFA Centre of Excellence
- più di 7.000 pazienti riabilitati

ISOKINETIC
MEDICAL GROUP

INTRODUCING THE ISOKINETIC MEDICAL GROUP

Isokinetic is an International Medical Group active in field of Sports Medicine and Orthopaedic Reahbilitation with 10 Centres, recognised as FIFA Medical Centres of Excellence.

ISOKINETIC

FIFA | MEDICAL CENTRE OF EXCELLENCE

A network of centres recognised as FIFA Medical Centres of Excellence.



1987 FOUNDATION

10 CENTRES

1 CAMPUS

1 INTERNATIONAL YEARLY CONFERENCE

200 PEOPLE WORKING TOGETHER

16.000 PATIENTS PER YEAR

250K HEALTH SERVICES PER YEAR

SALUS SCIENTIA SPORT
EDUCATION RESEARCH DEPARTMENT
ISOKINETIC

17.311
pazienti

71.079
prestazioni mediche

205
stage formativi offerti a studenti da 58 Università

172.214
prestazioni riabilitative

43
partecipazioni a congressi scientifici nazionali e internazionali

25
pubblicazioni scientifiche su libri e riviste scientifiche internazionali

2.160
partecipanti alla 32° edizione dell'Isokinetic Conference di Madrid

80
nazioni rappresentate

2025



ISOKINETIC

BILANCIO DI SOSTENIBILITÀ

2025



ISOKINETIC CAMPUS

BUILDING THE FUTURE OF SPORTS MEDICINE

ISOKINETIC





2500 partecipanti
85 Paesi
600 speakers e chairs
102 sessioni scientifiche

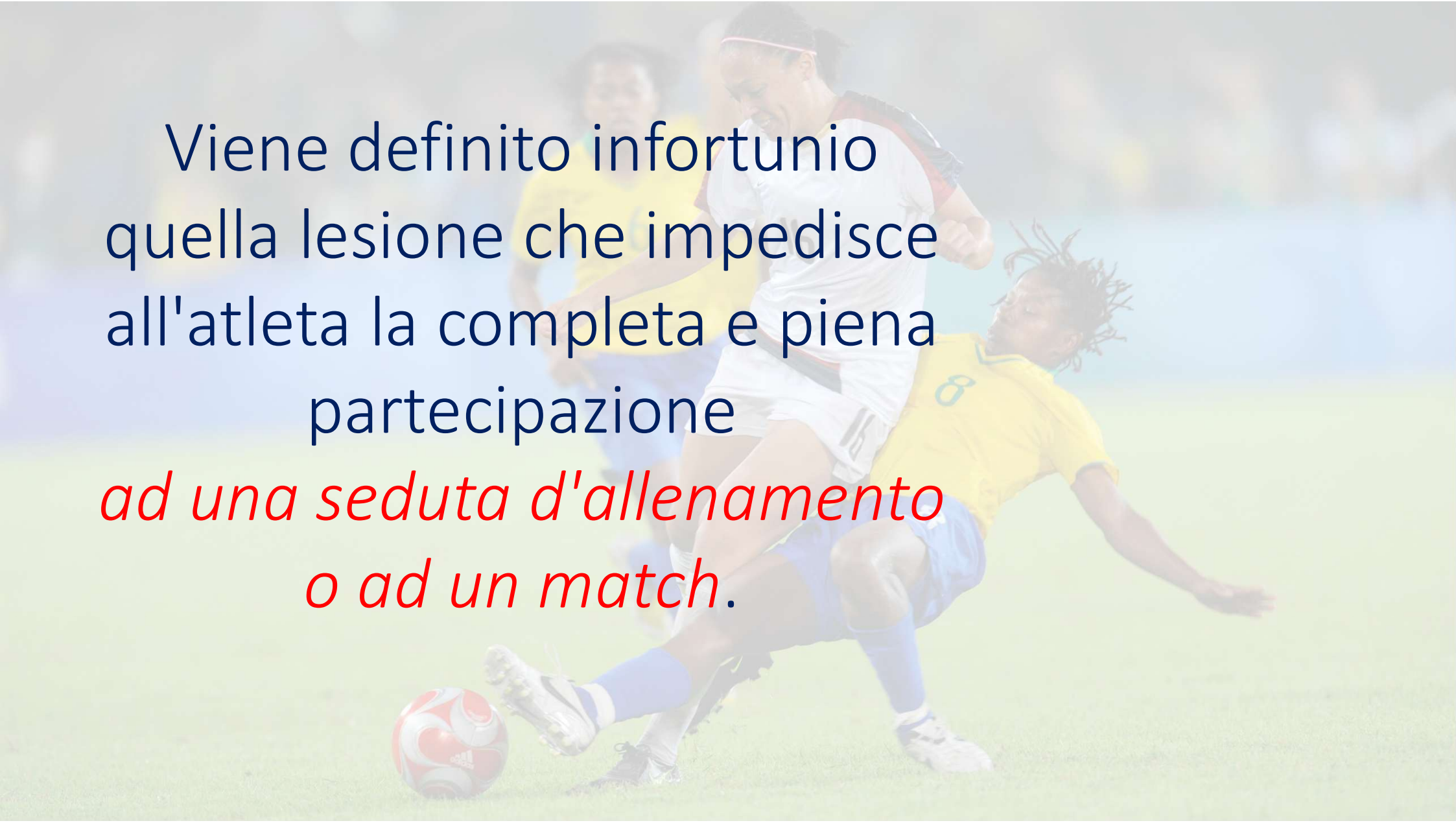

ISOKINETIC
MEDICAL GROUP
FOOTBALL MEDICINE
REACH THE TOP
24th, 25th & 26th April 2027 - Allianz Mico - MILAN
FIFA MEDICAL CENTRE OF EXCELLENCE
XXXIV ISOKINETIC CONFERENCE
Milano arriviamo!

Gli infortuni sportivi

Che cosa sappiamo?

Cos’è un infortunio sportivo?





Viene definito infortunio
quella lesione che impedisce
all'atleta la completa e piena
partecipazione
ad una seduta d'allenamento
o ad un match.


Ogni sport ha i suoi infortuni specifici



Gli infortuni costano caro

Gli infortuni costano caro …



Salute



Vittoria

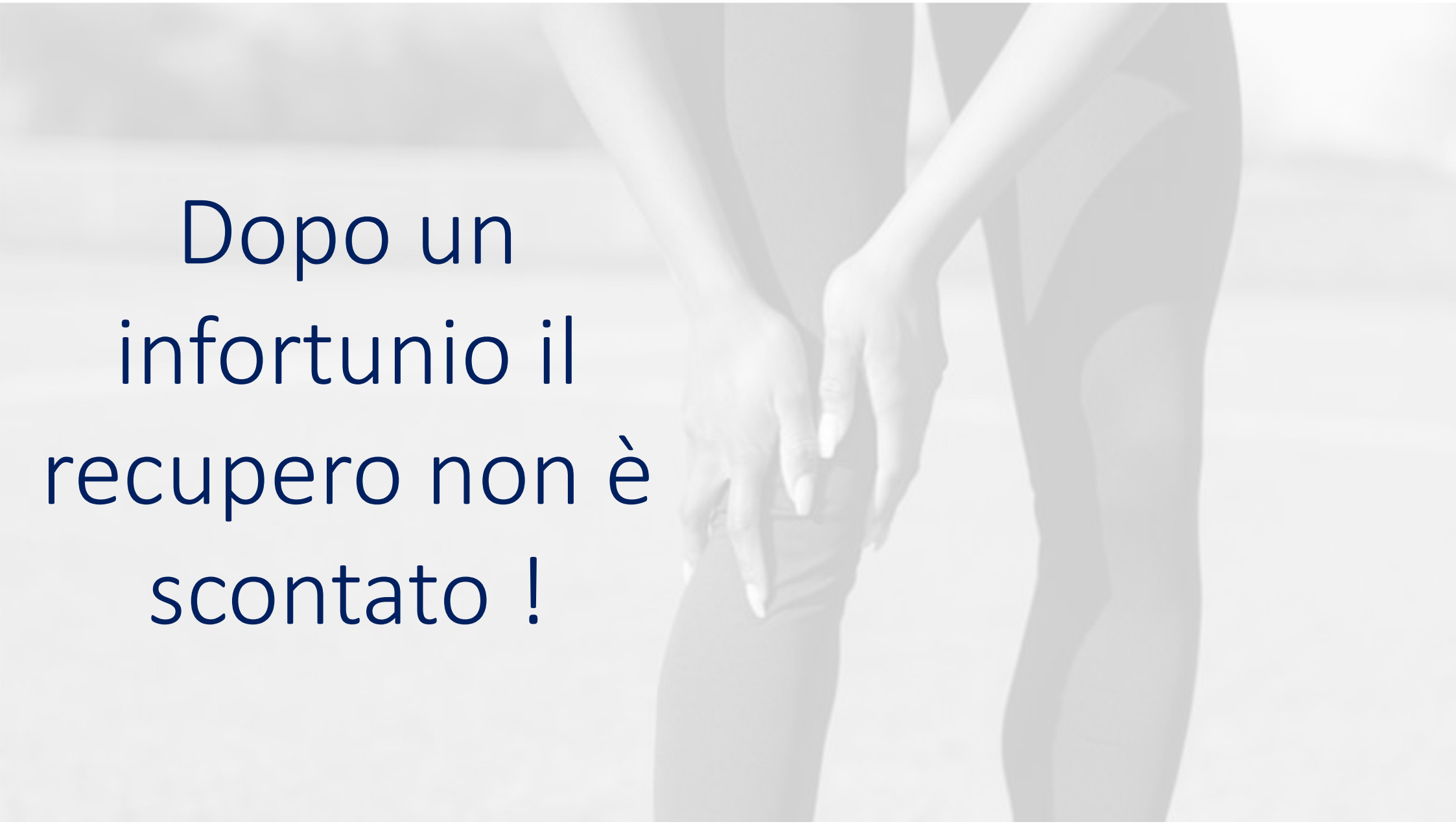


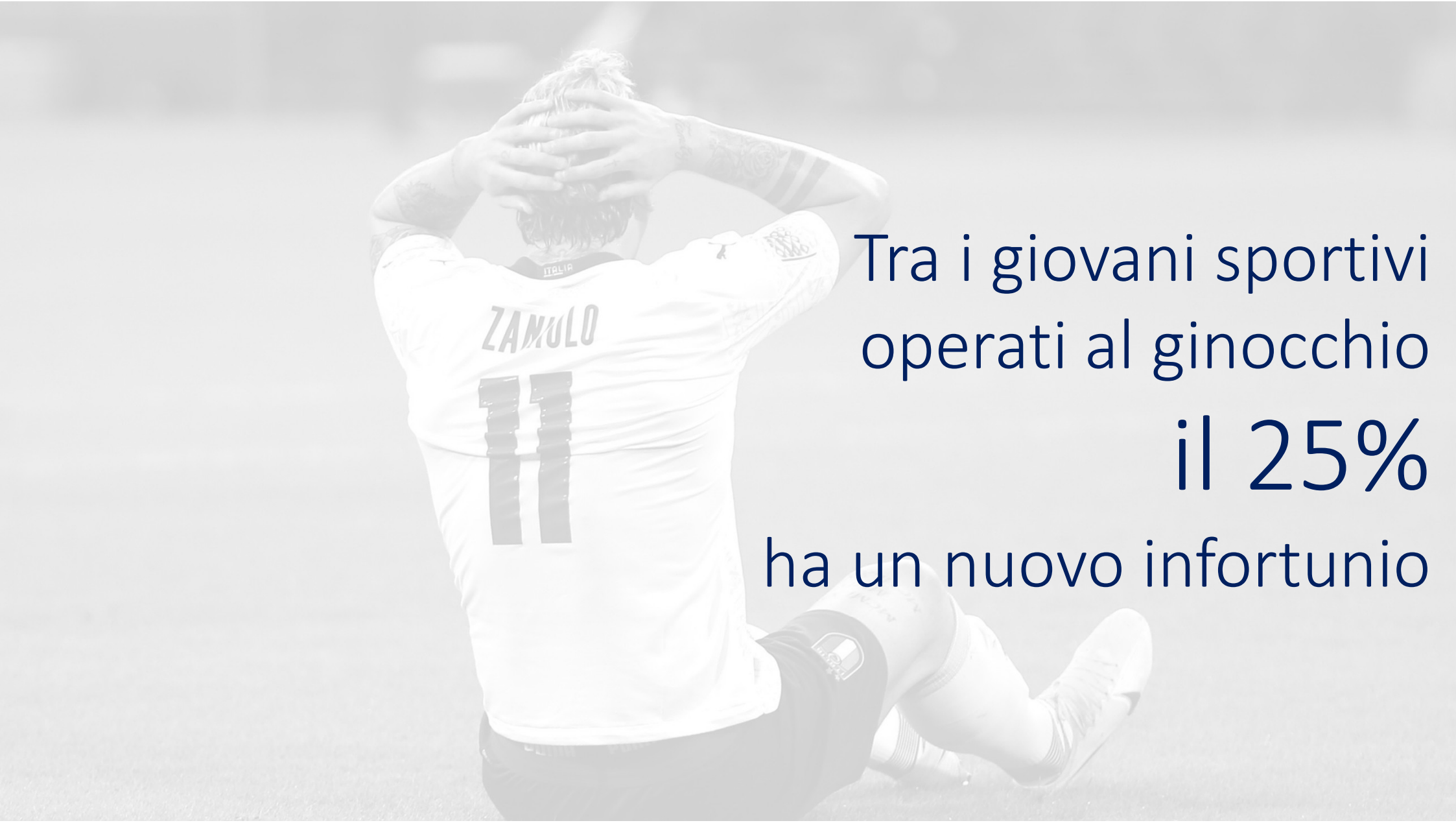
Costi

Gli infortuni sportivi sono molto costosi



… per la salute dell’atleta


Dopo un
infortunio il
recupero non è
scontato !



Tra i giovani sportivi
operati al ginocchio

il 25%

ha un nuovo infortunio

Gli infortuni sportivi sono molto costosi



… per la vittoria



Impatto sul successo

Solitamente il 12-14% dei giocatori di una squadra in UCL non sono disponibili per infortunio, con variazioni che vanno dal 4% al 23%.

Una frequenza di infortuni più bassa è corralata con un successo maggiore nelle competizioni.

Gli infortuni sportivi sono molto costosi

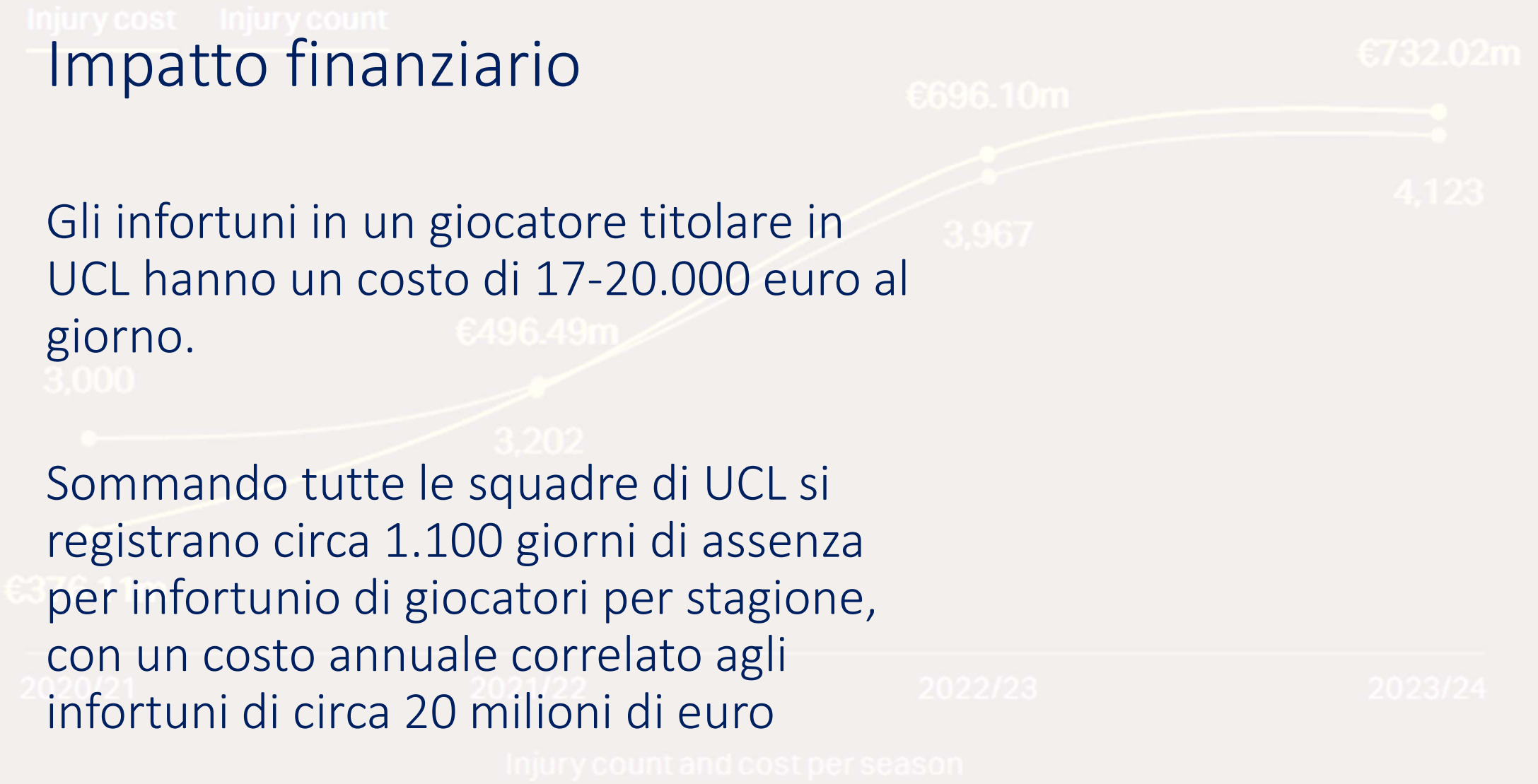


… per i costi veri e propri

Impatto finanziario

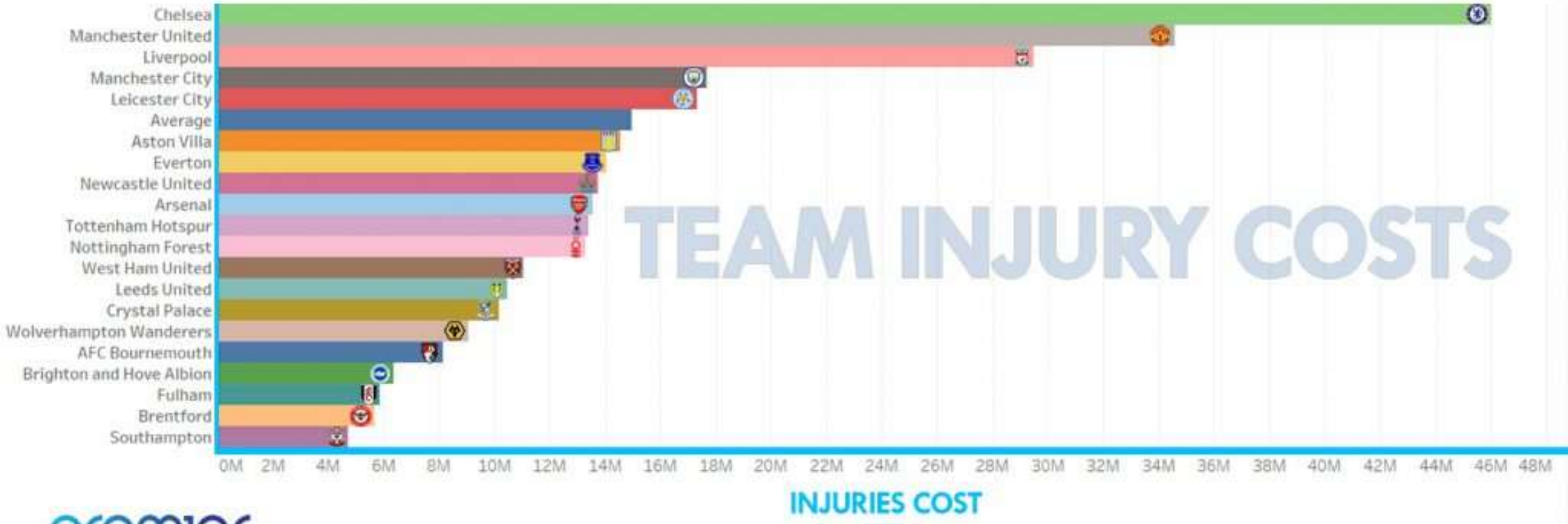
Gli infortuni in un giocatore titolare in UCL hanno un costo di 17-20.000 euro al giorno.

Sommando tutte le squadre di UCL si registrano circa 1.100 giorni di assenza per infortunio di giocatori per stagione, con un costo annuale correlato agli infortuni di circa 20 milioni di euro



Premier League 2022-2023

300 milioni di sterline



premier INJURIES

https://analyticsfc.co.uk

Gli infortuni sportivi

Che risultati stiamo ottenendo?



25 anni di studi UEFA



Le distorsioni di caviglia sono diminuite



Gli infortuni muscolari non sono in diminuzione

Gli infortuni al legamento crociato anteriore stanno aumentando !



Ne abbiamo fatta di strada da quei tempi, da quando ero un giovanotto,

ma tanta, tantissima c’è ne ancora da fare!



Gli infortuni sportivi

Nuove tecnologie

New trends in Sports Medicine

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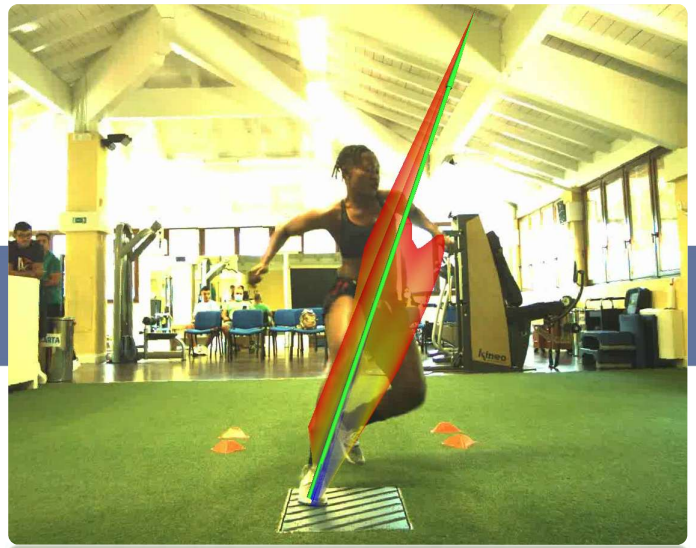
Biomechanical and **Neurocognitive** factors in ACL injuries



How to tackle **Biomechanical aspects** in Functional Recovery



How to tackle **Neurocognitive aspects** in Functional Recovery



We will use ACL injuries as an example

Comprehension of Biomechanics

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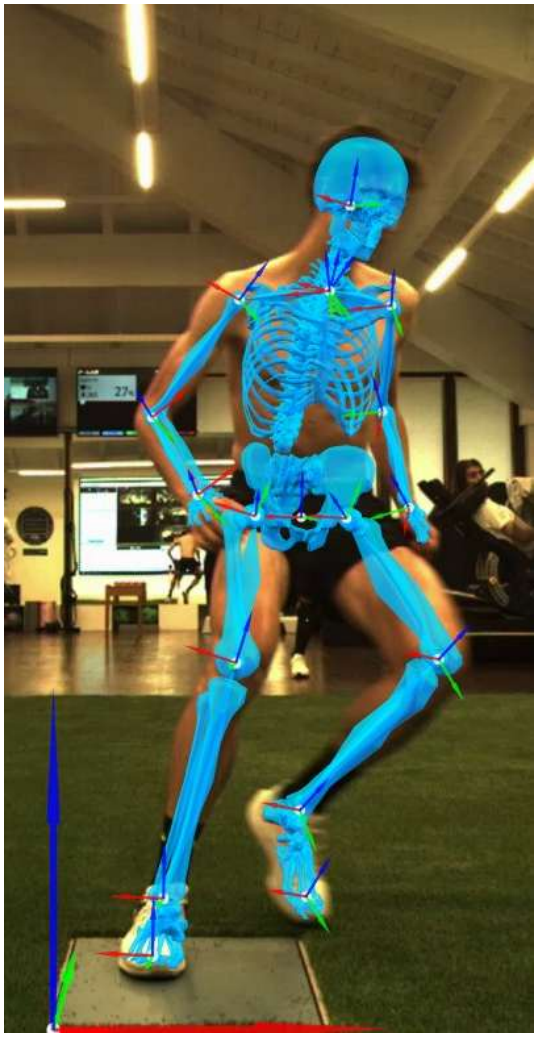
KINEMATICS at IC



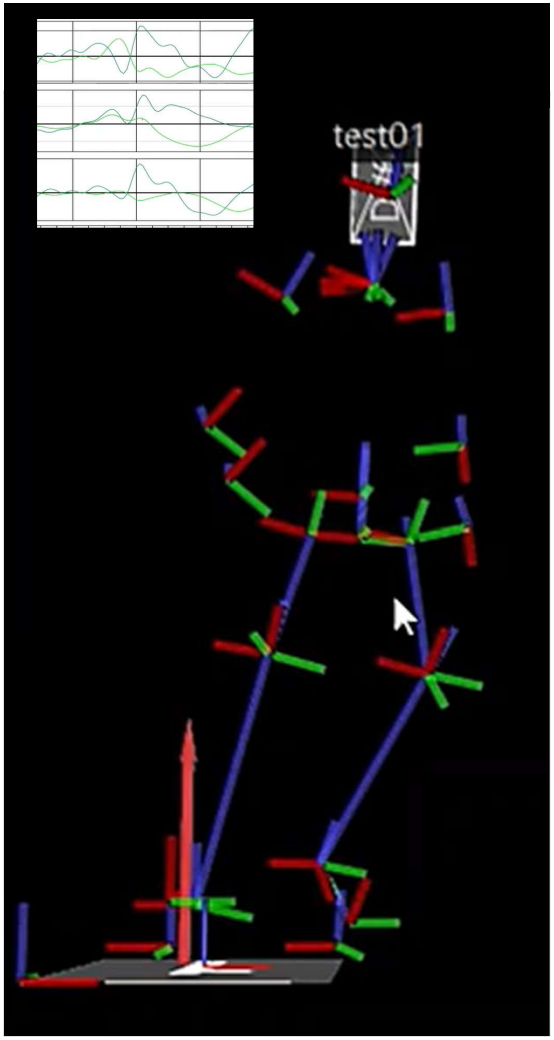
GROUND FORCE REACTIONS



3D KINEMATICS



MOMENTS



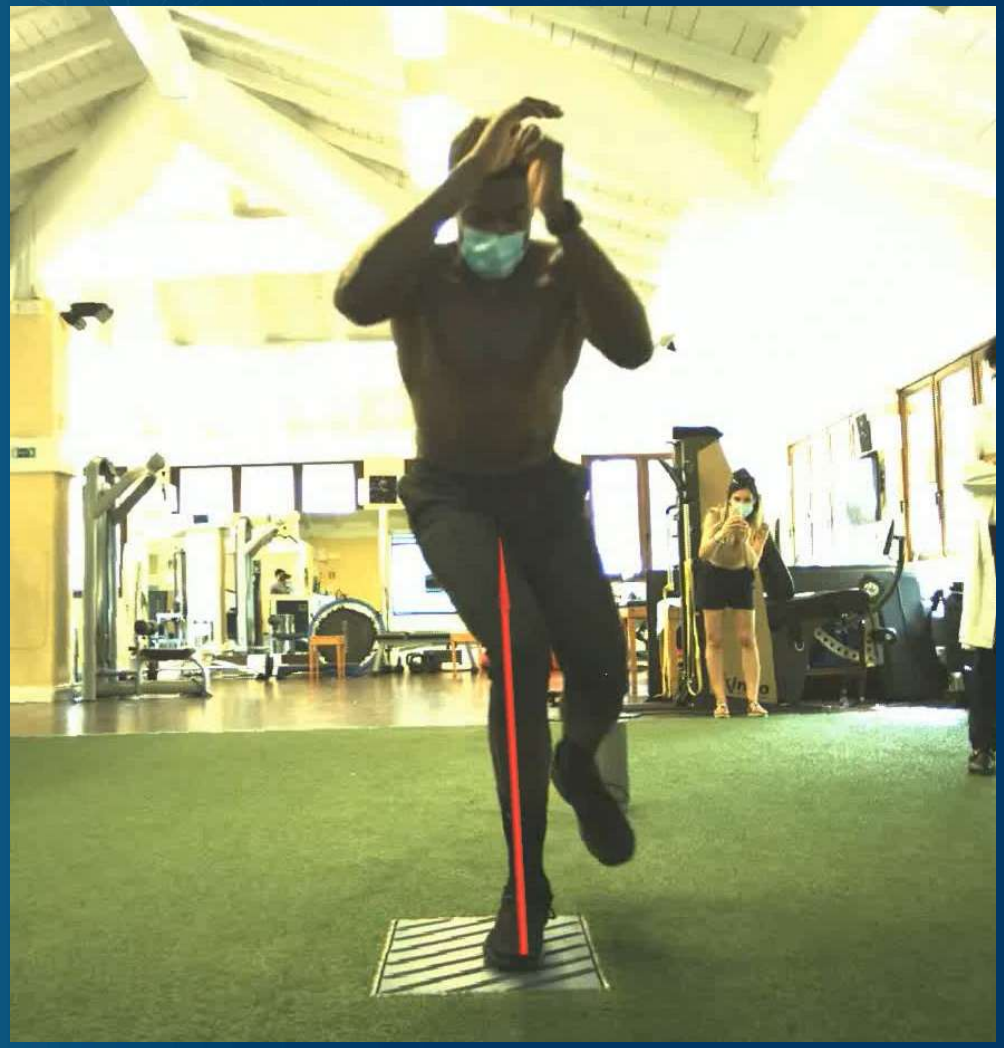
Whole Body Kinematics





Kinematics


LBA
SERIE A
EUROSPORT
PATERNO
DAO
FORST




FORSI

Valutazione biomeccanica: Test di Analisi del Movimento (MAT)

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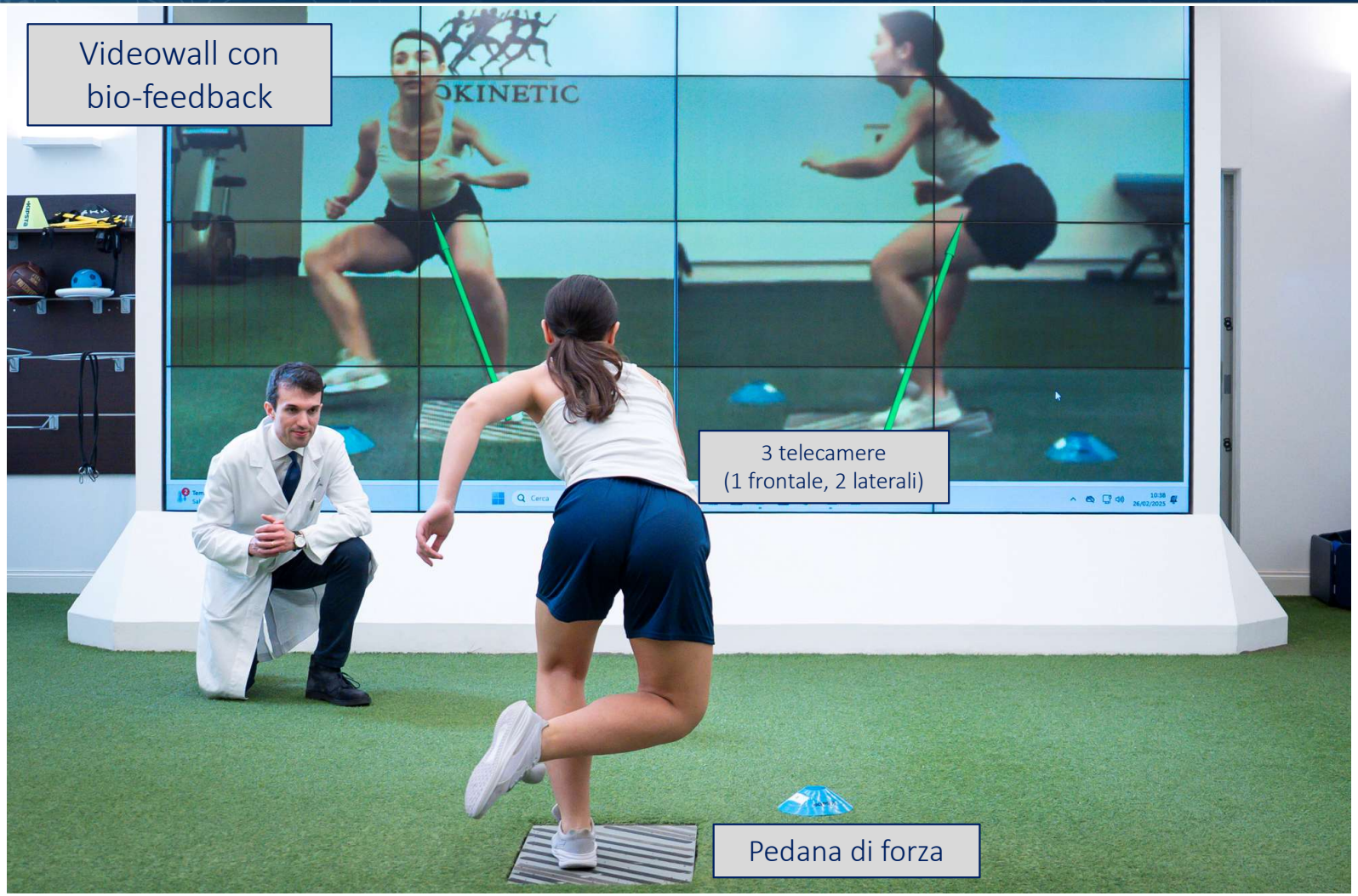

Allenare il cervello

Della Villa et al. KSSTA 2021

Di Paolo et al KSSTA 2021

Di Paolo et al Sport Health 2022

Di Paolo et al The Knee 2023

Di Paolo et al The Knee 2024


DECELERATION



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BARÇA INNOVATION HUB

Integrating Genomics and Epigenomics in Modern Football Medicine

Dr. Gil Rodas MD, PhD

FC Barcelona Medical Department and Barça Innovation Hub FC Barcelona.
Sports Medicine Unit, Hospital Clinic and Sant Joan de Déu
Associate Clinic Professor of the University of Barcelona
Spanish Olympic Committee Medical Commission

Cos’è l’epigenetica ?

L’epigenetica ha determinato il crollo della convinzione che il nostro destino biologico sia determinato esclusivamente dai geni. In realtà siamo noi che influenziamo il comportamento delle nostre cellule attraverso:

- lo stile di vita
- l’alimentazione
- le emozioni ed i pensieri.

In estrema sintesi, gli effetti epigenetici sono la conseguenza delle abitudini sulla espressione dei nostri geni.

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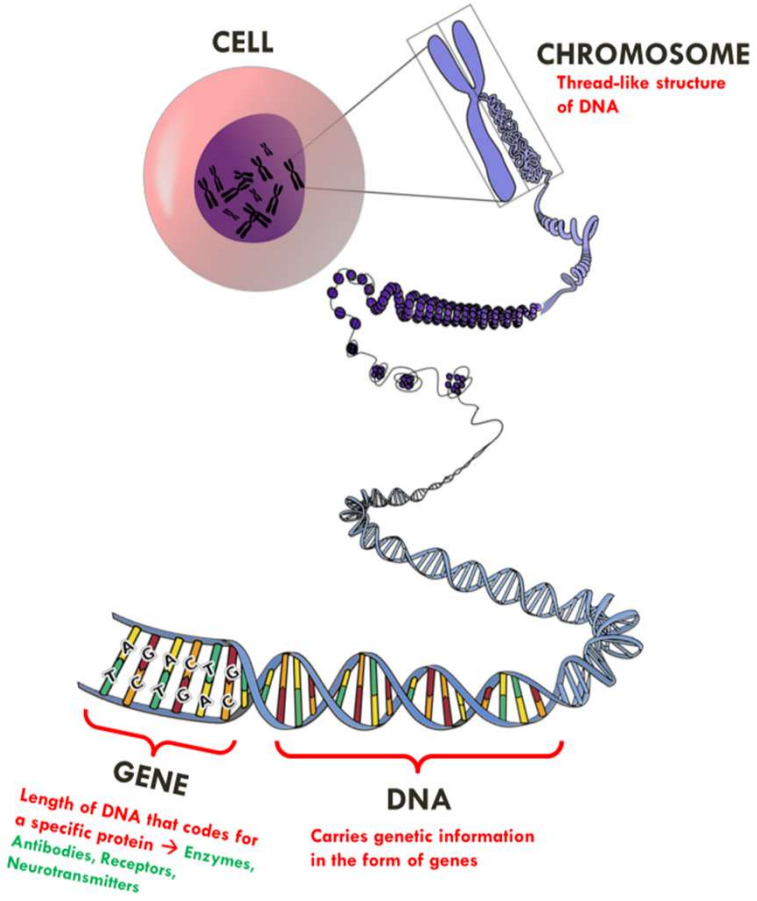
Some players are more injury-prone. Could genetics help explain why?



Genetic Markers of Injury Susceptibility

Genes	Polymorphisms	Unfavorable Genotype
COL5A1	**rs12722**	**TT**
COL1A1	rs1800012	Allele T
COL12A1	rs970547	Allele G
IL6	rs1800795	CC
CKMM	rs8111989	GA
ACTN3	**rs1815739**	**XX**



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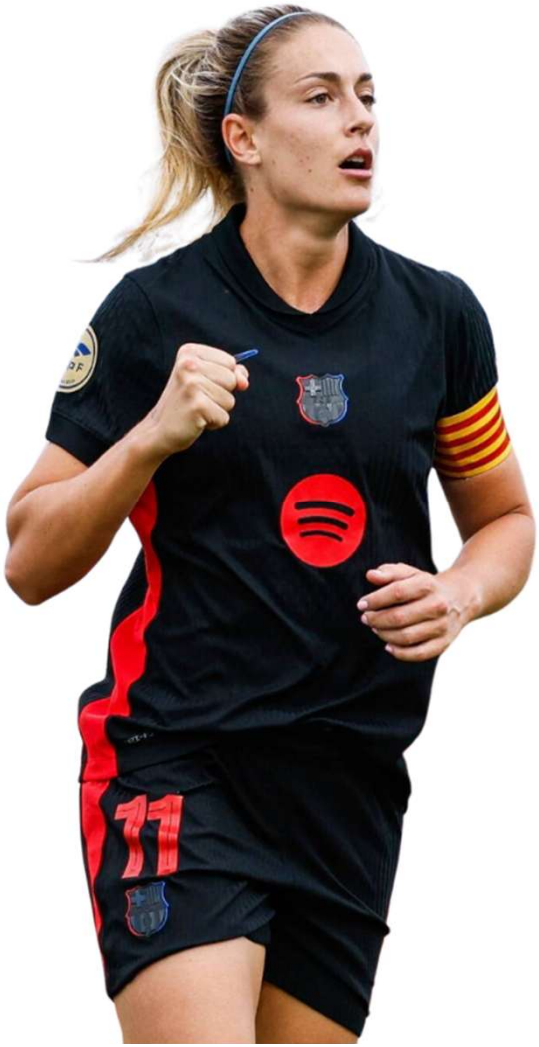
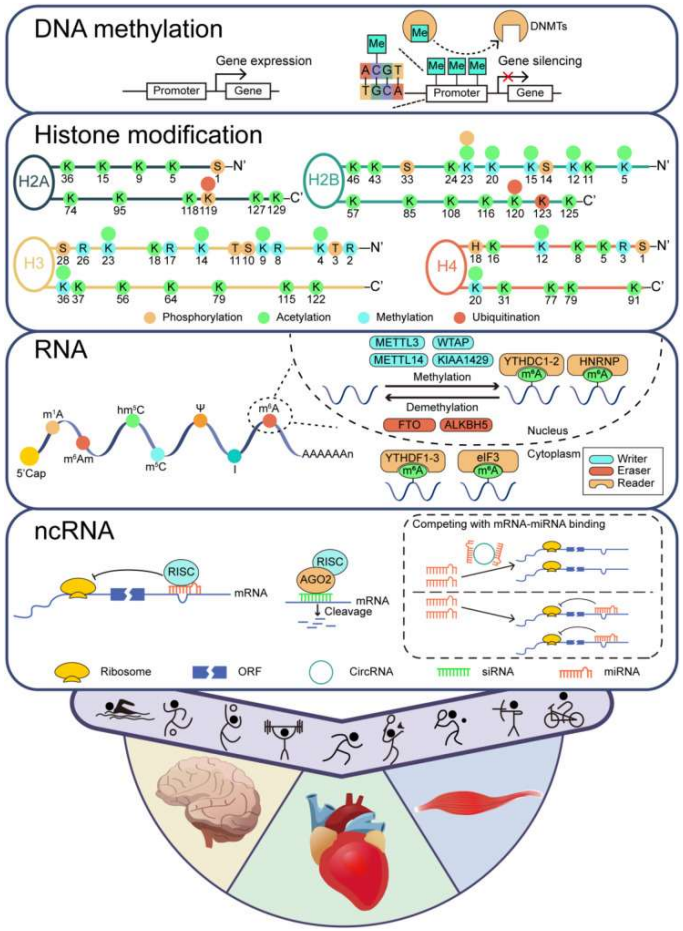


And what about epigenetics?

Epigenetic

We can study it by DNA methylome, Histone modifications, RNA methylation, etc.

Exercise induces epigenetic modifications in skeletal muscle, brain and heart.



Acute exercise, or chronic exercise induces hypomethylation (or hypermethylation) of key metabolic (or structural/matrix) gene promotors in human skeletal muscle

Zheng X, Liu X, Guo Y, Lv Y, Lin C, Wang D, Wang S, Liu Y, Hu X. Physical exercise and epigenetic modifications in skeletal muscle, brain, and heart. Epigenetics Chromatin. **2025**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Could you use this information for decision making…

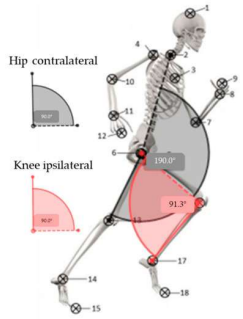
Neurocognitive status

Transcriptome, Proteomics y Metabolomics

Genetic susceptibility

External Load (GPS Data)

Biomechanics analysis



Hormonal Information (Menstrual cycle)

Imaging biomarkers Radiomics

Rodas G, Gonzales RJ. Sportomics: Futbol Club Barcelona's approach to personalized injury prevention. Apunts Sports Med, **2024**

MADEOFGENES

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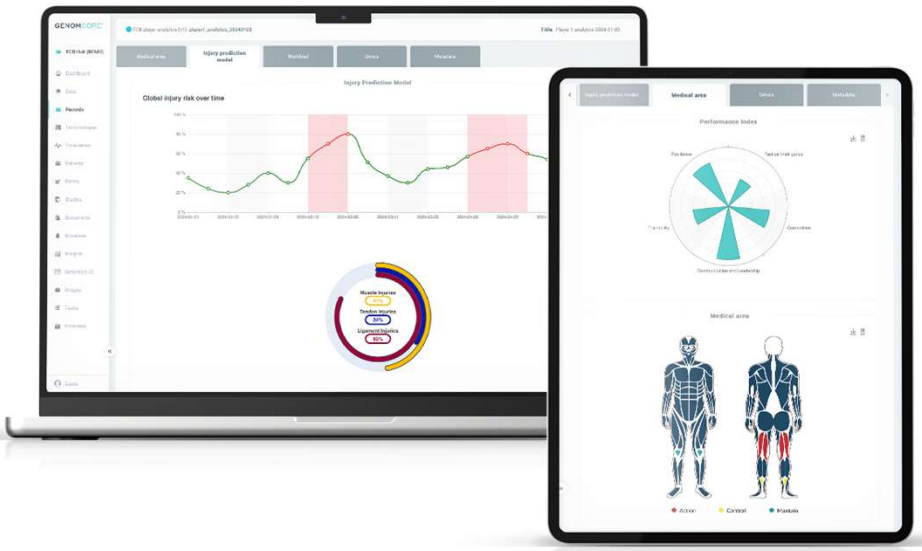
BIMS | Biomedical Information Management System for Sports

PHYSIOLOGICAL & ENVIRONMENTAL *External Load*

- EHR Clinical Data
- Medical Imaging
- Devices (GPS)
- Physical Conditioning
- Nutrition & Supplementation
- Sports Psychology

MOLECULAR & OMICS *Internal Load*

- Blood Analysis
- Genomics
- Metabolomics
- Proteomics
- Epigenomics
- Transcriptomics



TACTICAL & STRATEGIC ANALYSIS *Intelligence*

- Alerts
- Dashboards
- Monitoring
- AI-Driven Insights
- Machine Learning
- Virtual Agent

ISO 27001 Certified · ISO 27017 Certified · ISO 27018 Certified · ens

HEALTH DATA SPACE

- Structured Database
- Centralized Repository
- GDPR, Secure Data Management
- Professional and User Portals

…to create **an avatar (digital twin)** of each one of our players, to be able to create simulations of situations and estimate:

- **physical performance** and,
- **injuries during the season**.



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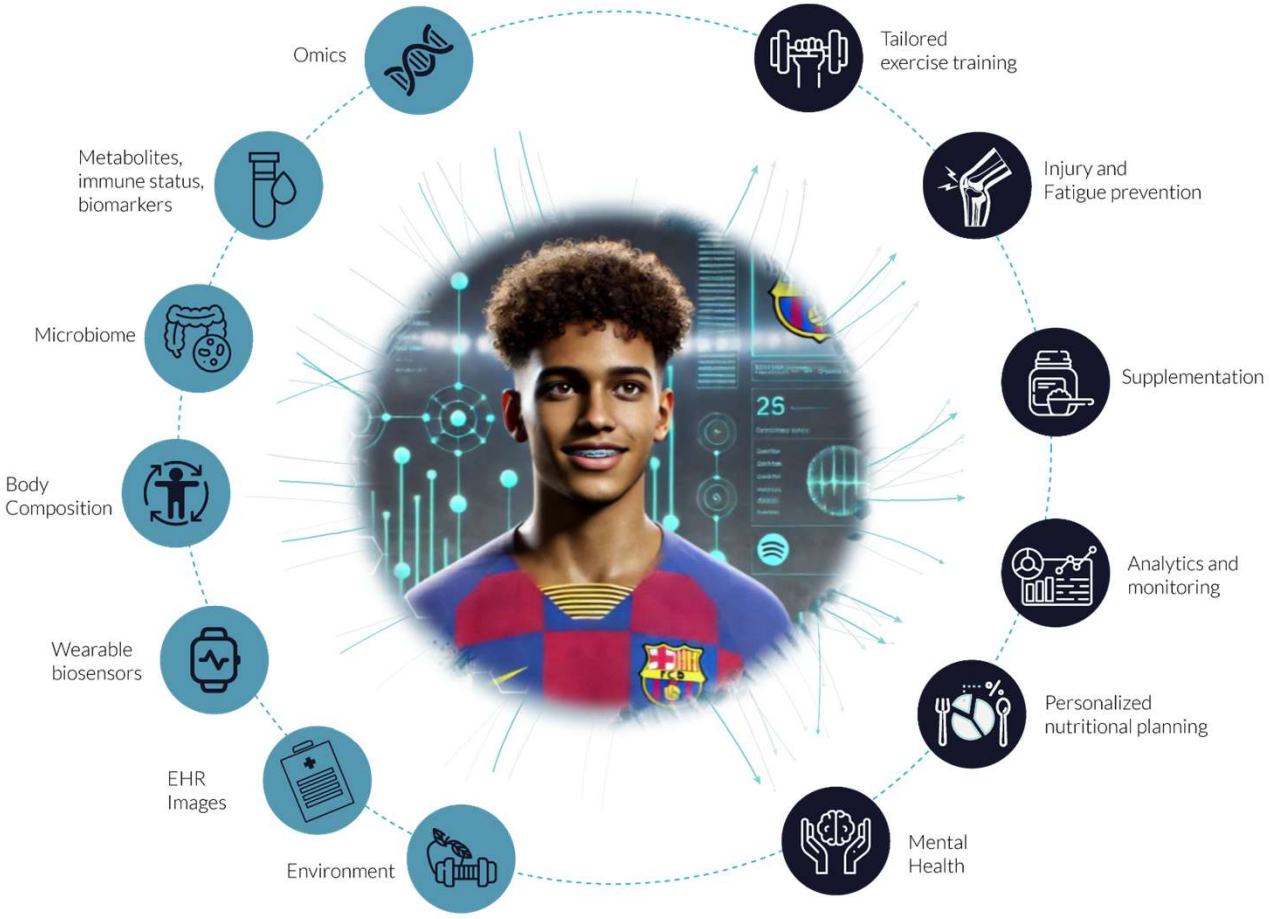
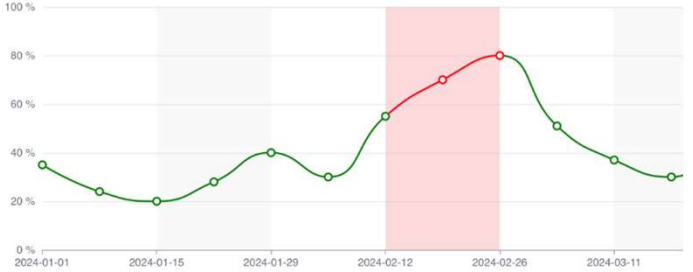
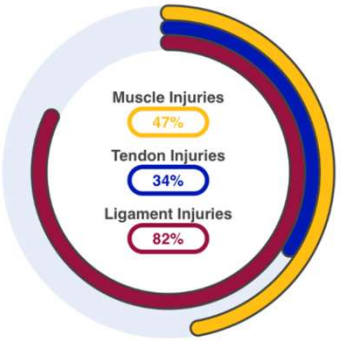
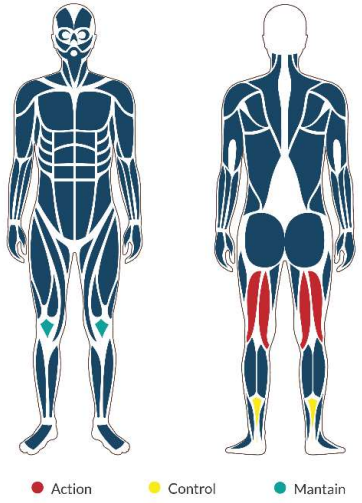
Universal biomedical avatar of the player: Injury Prevention & Peak Performance



Predicted Injury Risk over time

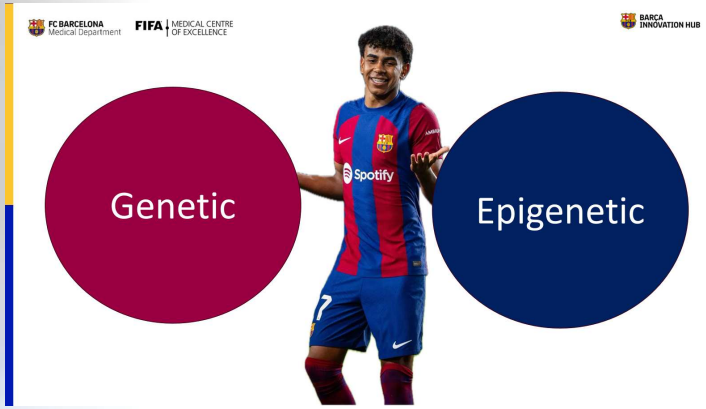








Understanding an athlete's genetic and epigenetic profile may help with personalized prevention strategies





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