



STRUCTURED TRAINING: THE COADJUVANT TRAINING

PhD Roger Font Ribas

Graduate in Sport Sciences

Master in High Performance Team Sports

Master's Degree in Sports Rehabilitation

Strength and Conditioning Coach Dinamo de Bucuresti and Romanian Men National Team



@lab_esport

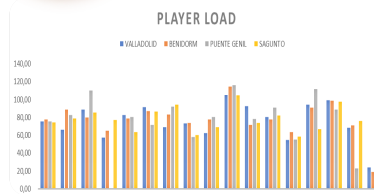


labesport



INEFC **Byomedic SYSTEM**
Barcelona

RETAN MÀSTER OFICIAL EN
Rendiment esportiu:
tecnificació i alt nivell



ROGER FONT RIBAS



TecnoCampus
Escola Superior de Ciències de la Salut



Centro adscrito a:
UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH



Blanquerna
UNIVERSITAT RAMON LLULL

Facultat de Ciències de la Salut

ESCUELAS UNIVERSITARIAS GIMBERNAT-CANTABRIA



GUIDE

1.- INTRODUCTION - CONTEXTUALISATION

2.- OBJECTIVES CONDITIONAL WORK

3.- CONDITIONAL MODEL

4.- STRENGTH WORK

5.- METABOLIC WORK

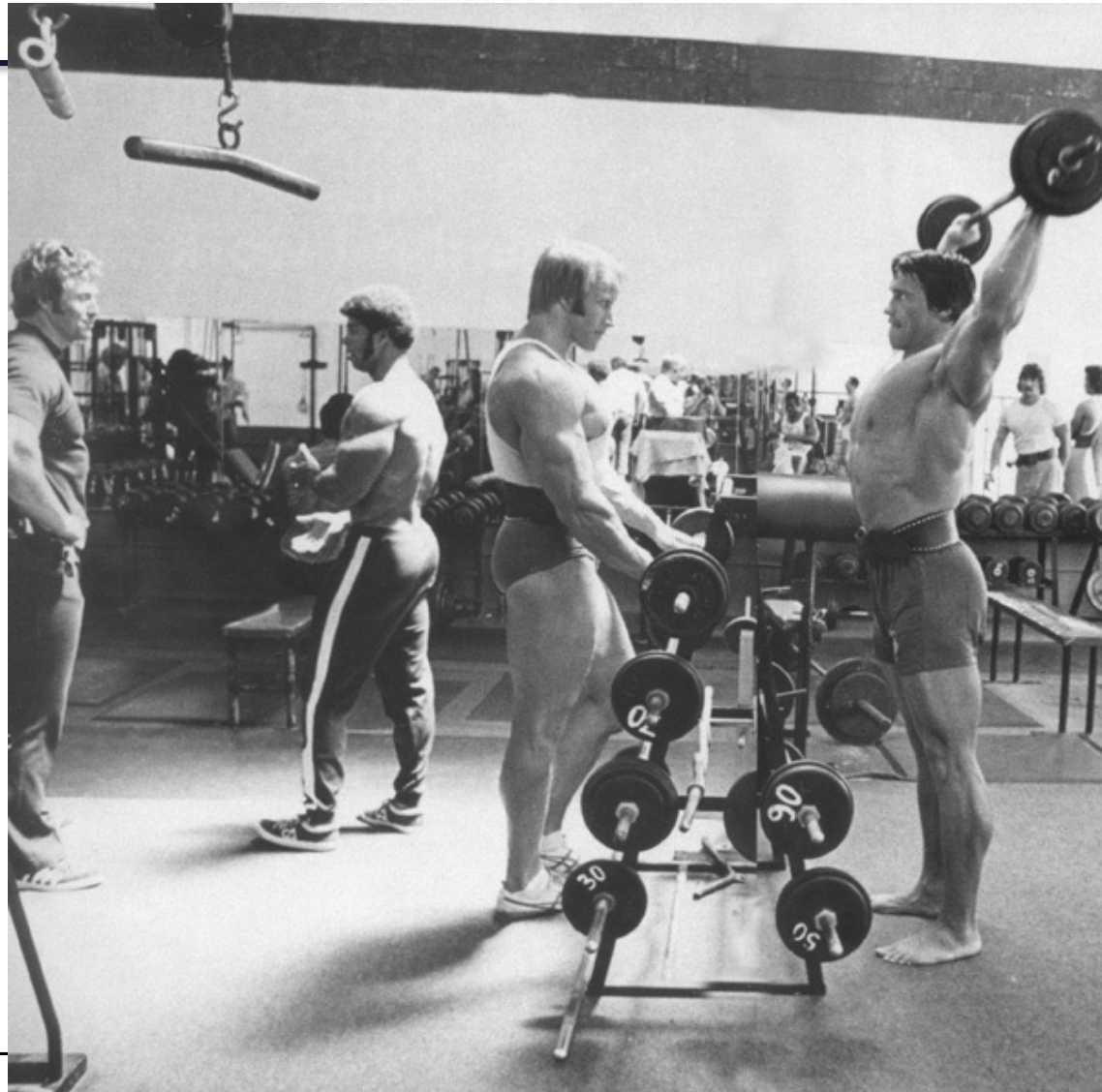




INTRODUCTION



INTRODUCTION



INTRODUCTION



INTRODUCTION



INTRODUCTION



INTRODUCTION



INTRODUCTION



ALL-STAR TEAM

MEN'S EHF EURO 2022
#WATCHGAMESSEEMORE



Position	Player Name	Country
LW	MILOS VUJOVIC	Serbia
LP	JOHANNES GOLLA	Germany
RW	ALEIX GOMEZ	Spain
LB	MIKKEL HANSEN	Denmark
RB	MATHIAS GIDSEL	Denmark
CB	LUC STEINS	Netherlands
MVP	JIM GOTTFRIDSSON	Sweden
DEF	OSCAR BERGENDAHL	Sweden
GK	VIKTOR HALLGRIMSSON	Iceland

PRESENTED BY



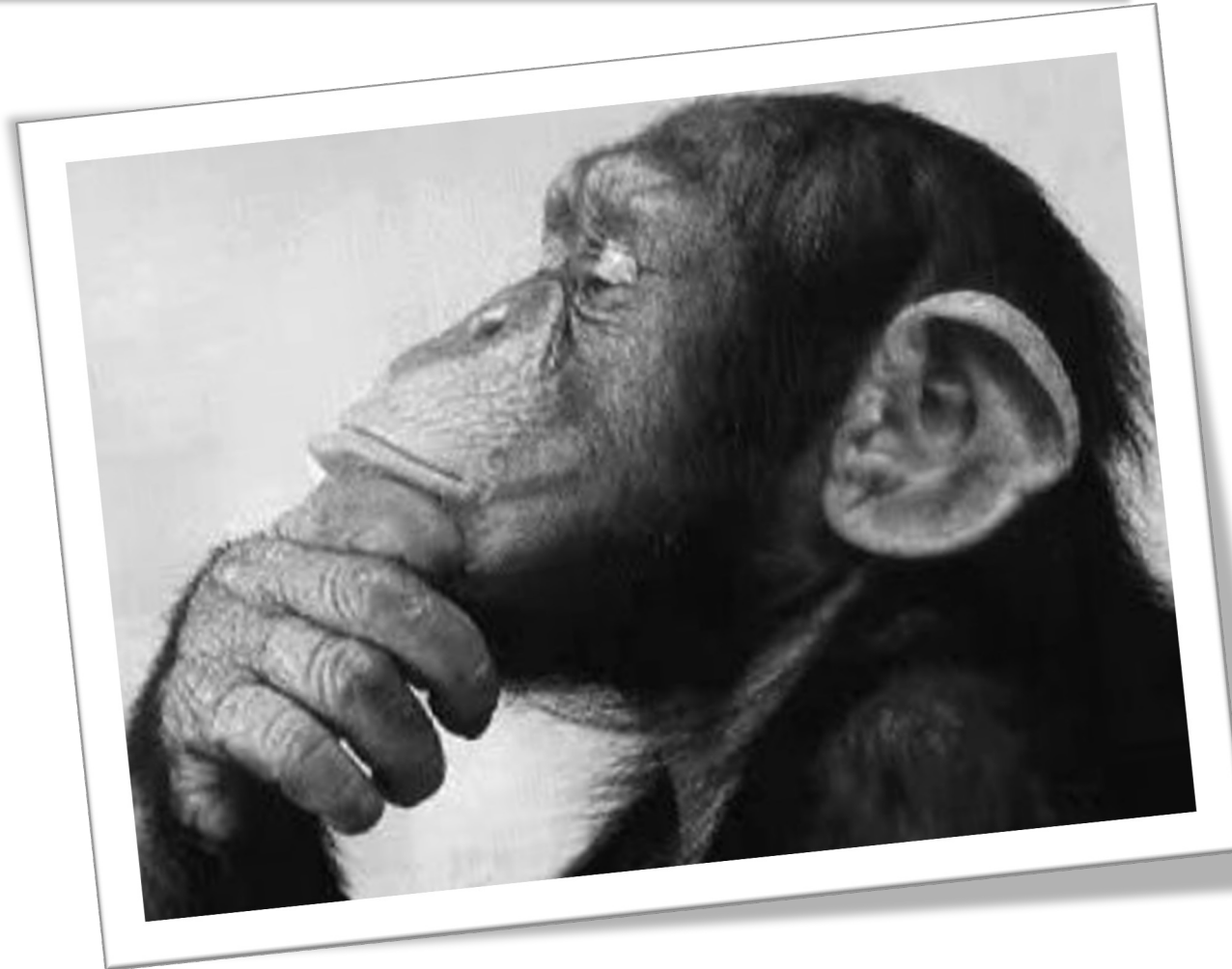
INTRODUCTION



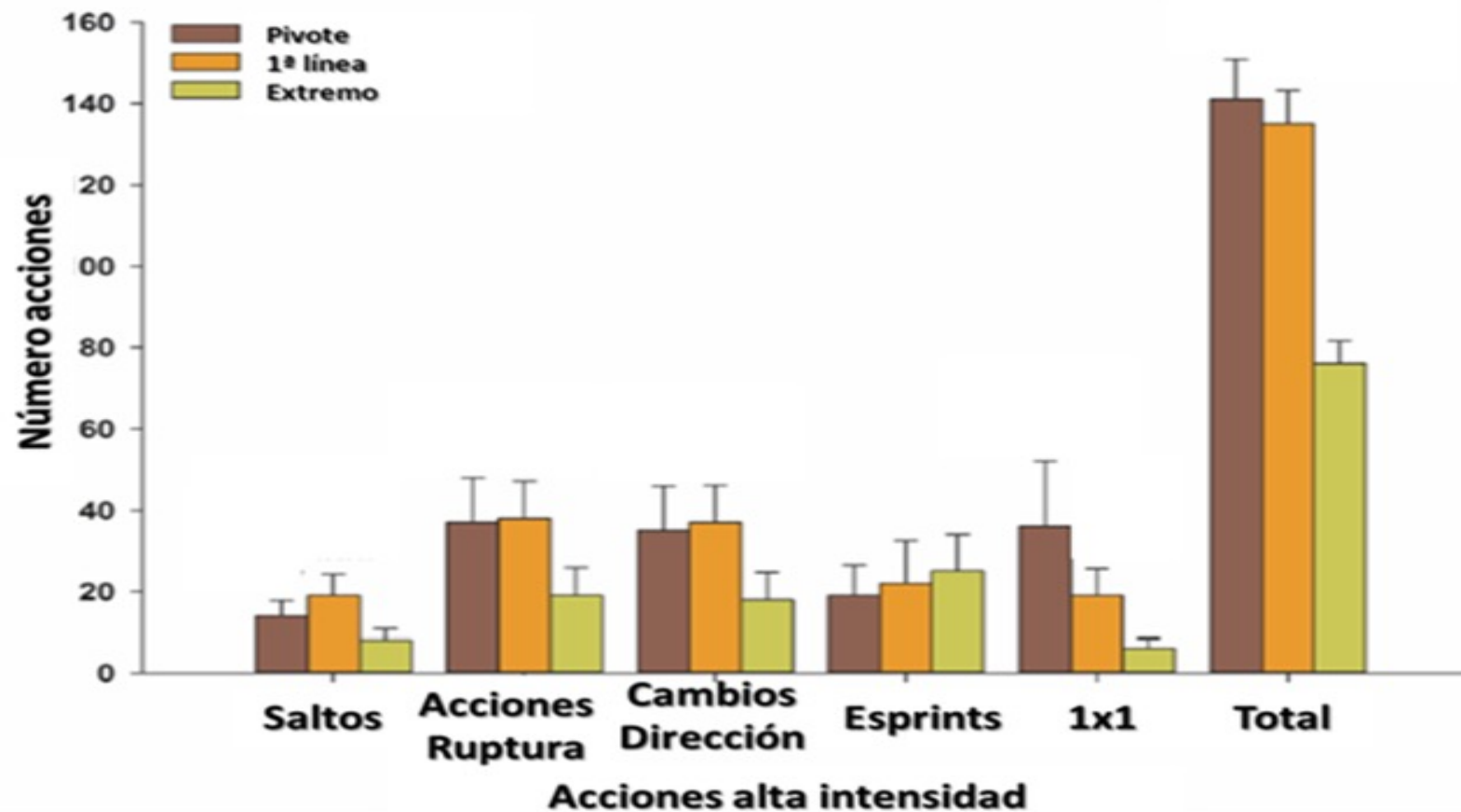
	Luig et al 2008	Michalsik et al 2014	Póvoas et al 2014	Sporis et al 2010
WINGS		3.641±501	4.234±520	
BACKS		3.765±532	4.964±642	
PIVOTS		3.295±495	3.910±507	
ALL	2.929±1.404	3.627±568		4.790

Luig et al 2008, Michalsik et al 2014, Póvas et al 2014, Sporis et al 2010

INTRODUCTION



INTRODUCTION

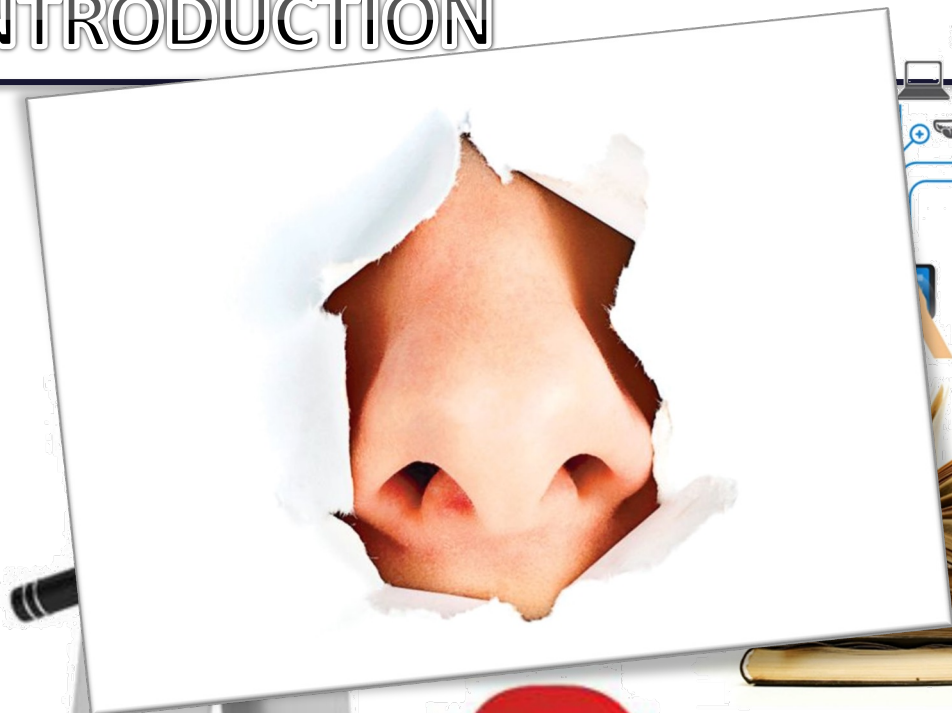


Fuente: Adaptación de Karcher & Buchheit (2014) Sports Med

INTRODUCTION

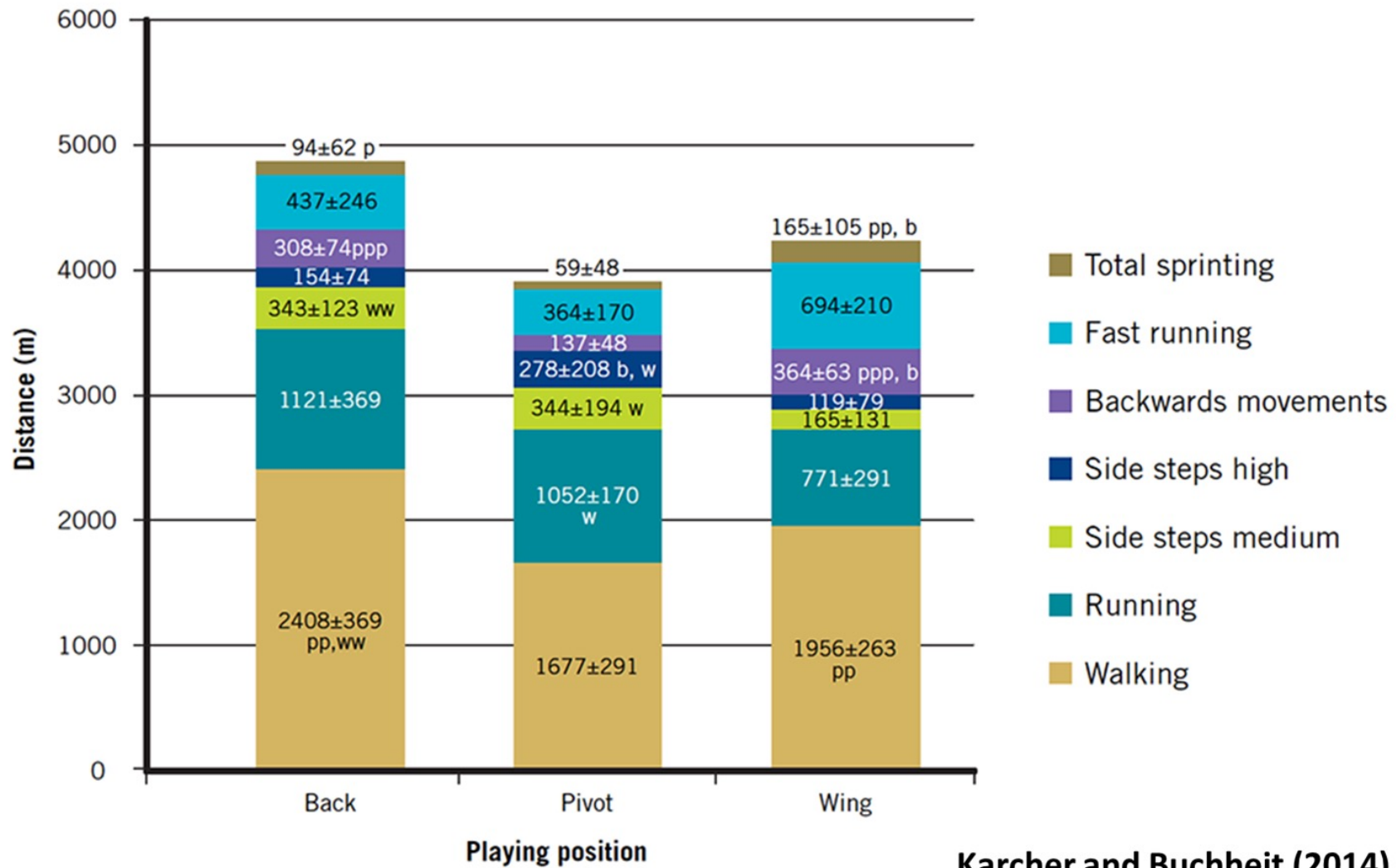


INTRODUCTION

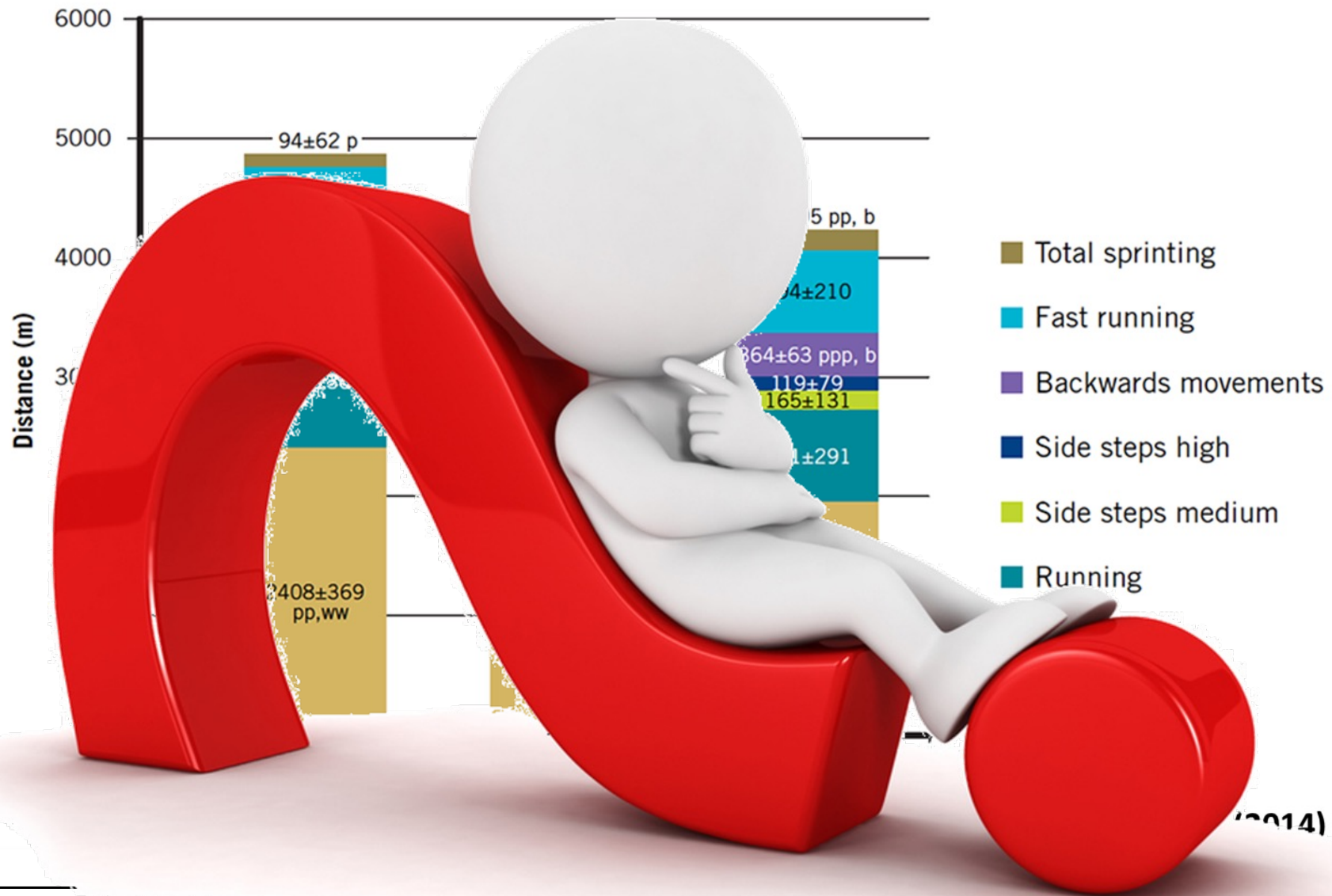


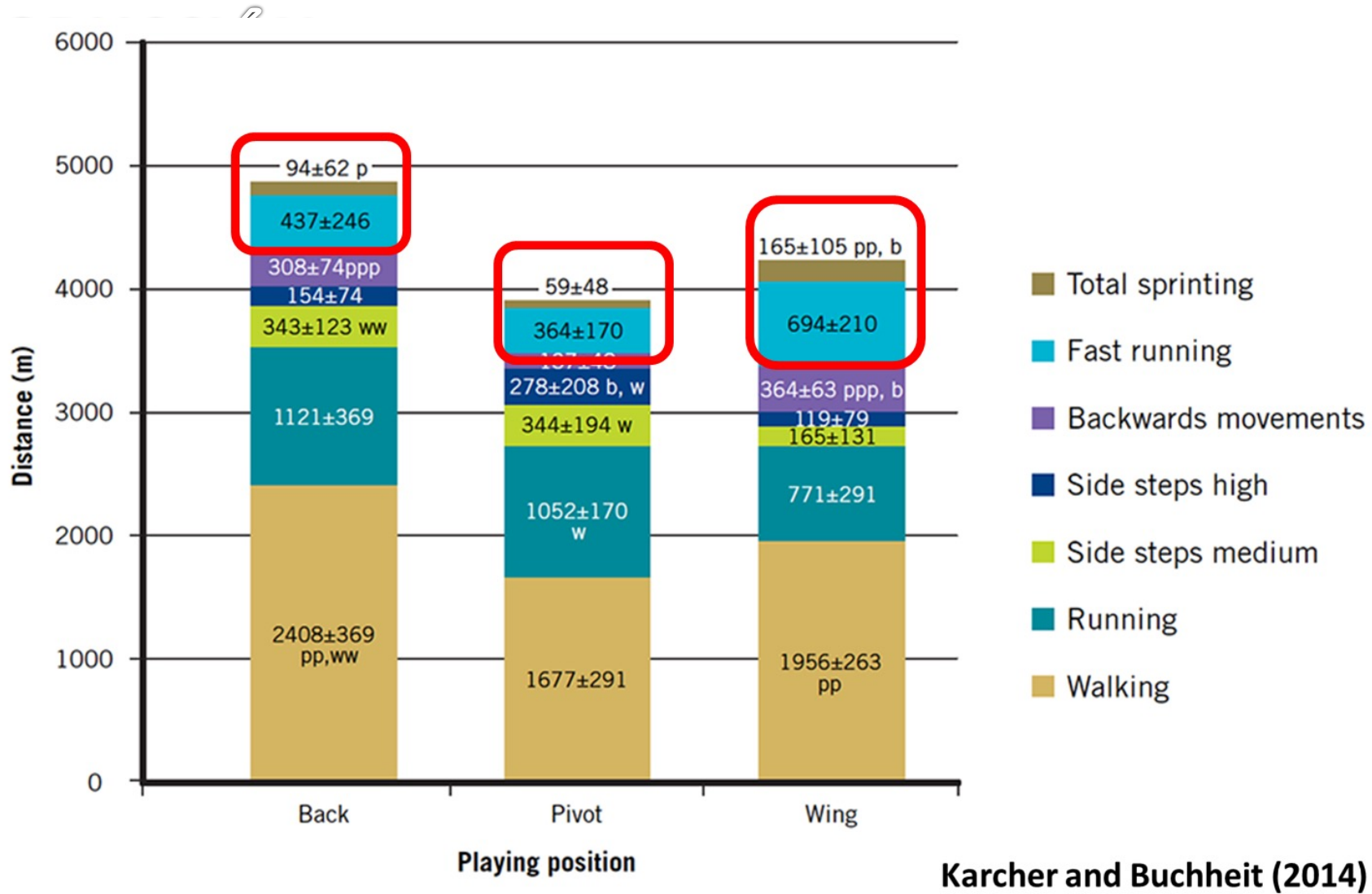
Pie 1,84%
Pediatría Apofisitis 2,10%

INTRC



INTRC





INTRODUCTION

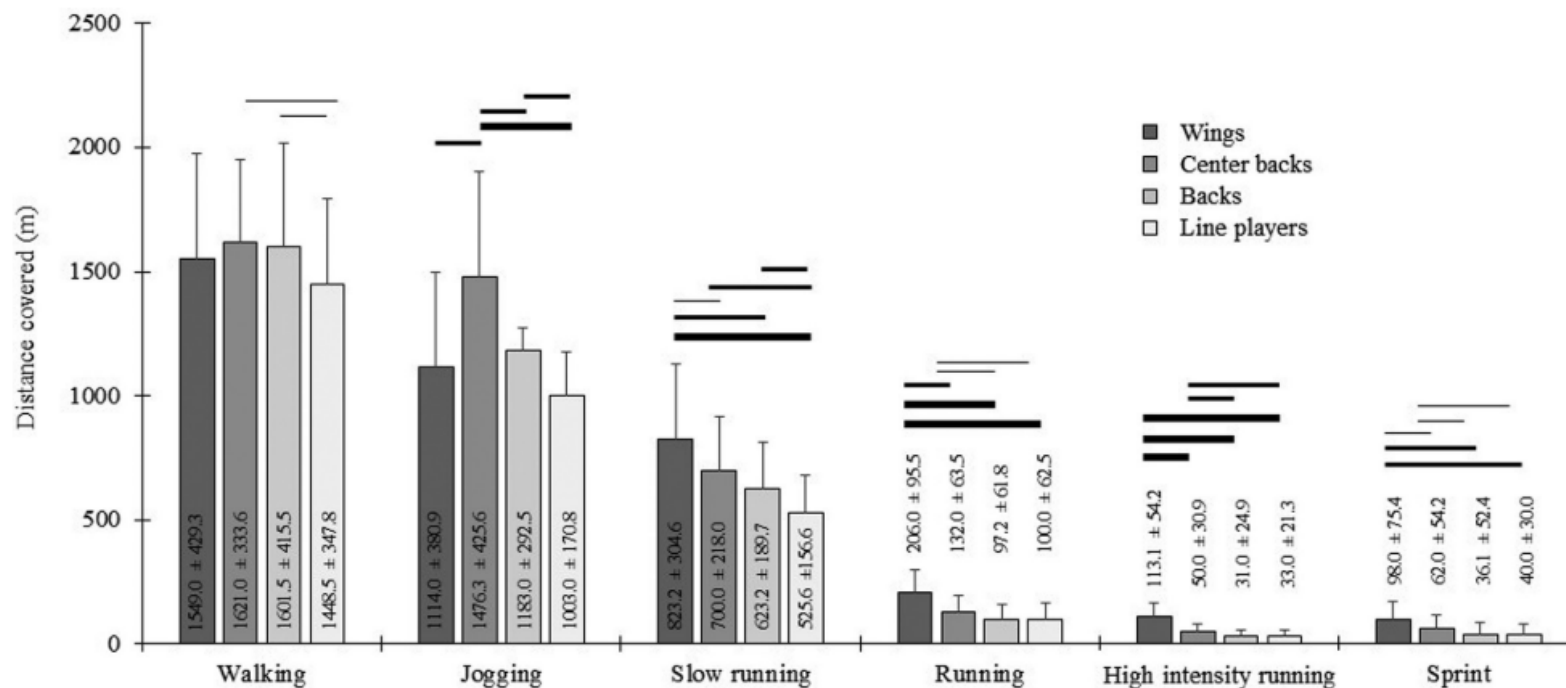
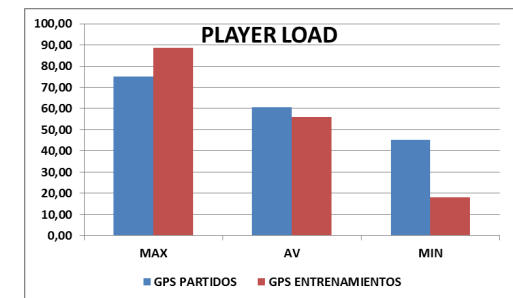
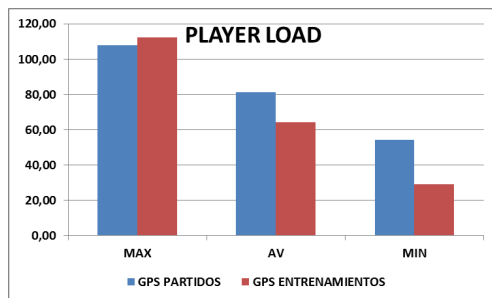
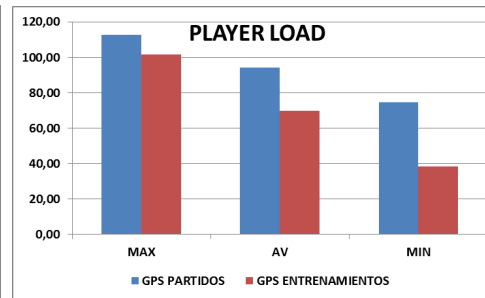
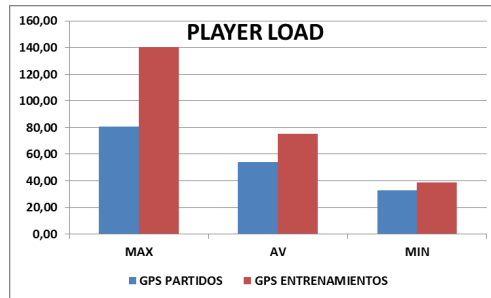


FIG. 1. Distance covered at different speeds according to each playing position. Speed criteria: walking ($0\text{--}1.7\text{ m}\cdot\text{s}^{-1}$), jogging ($1.8\text{--}3.3\text{ m}\cdot\text{s}^{-1}$), slow running ($3.4\text{--}5.0\text{ m}\cdot\text{s}^{-1}$), running ($5.1\text{--}5.8\text{ m}\cdot\text{s}^{-1}$), high-intensity running ($5.9\text{--}6.7\text{ m}\cdot\text{s}^{-1}$), sprint ($> 6.7\text{ m}\cdot\text{s}^{-1}$). The thickness of the lines represents the magnitude of the difference (effect size) — stands for a large, — for a moderate and — for a small difference. Only effect sizes with a substantial probability of difference ($> 75\%$) are shown.

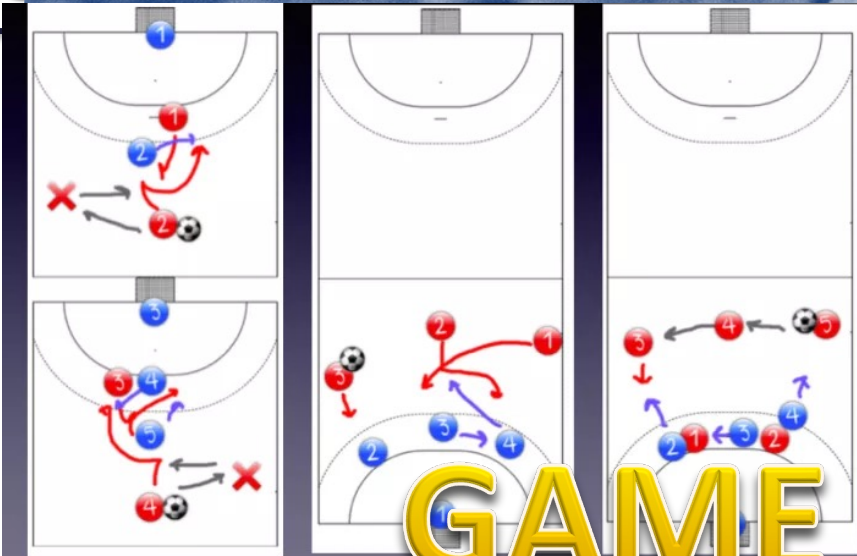
INTRODUCTION



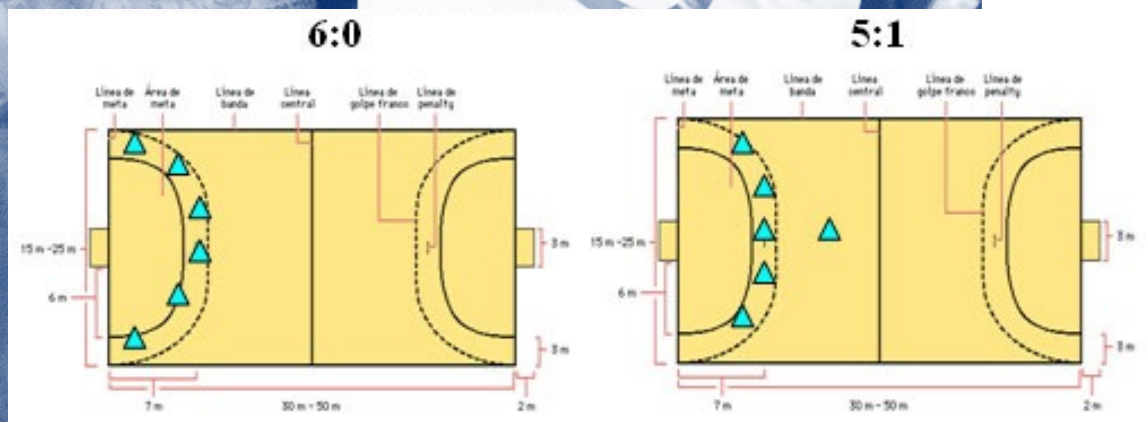
INTRODUCTION



INTRO



GAME MODEL



INTRODUCTION



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OBJECTIVES



OBJECTIVES



1.- INJURY PREVENTION





1.- INJURY PREVENTION

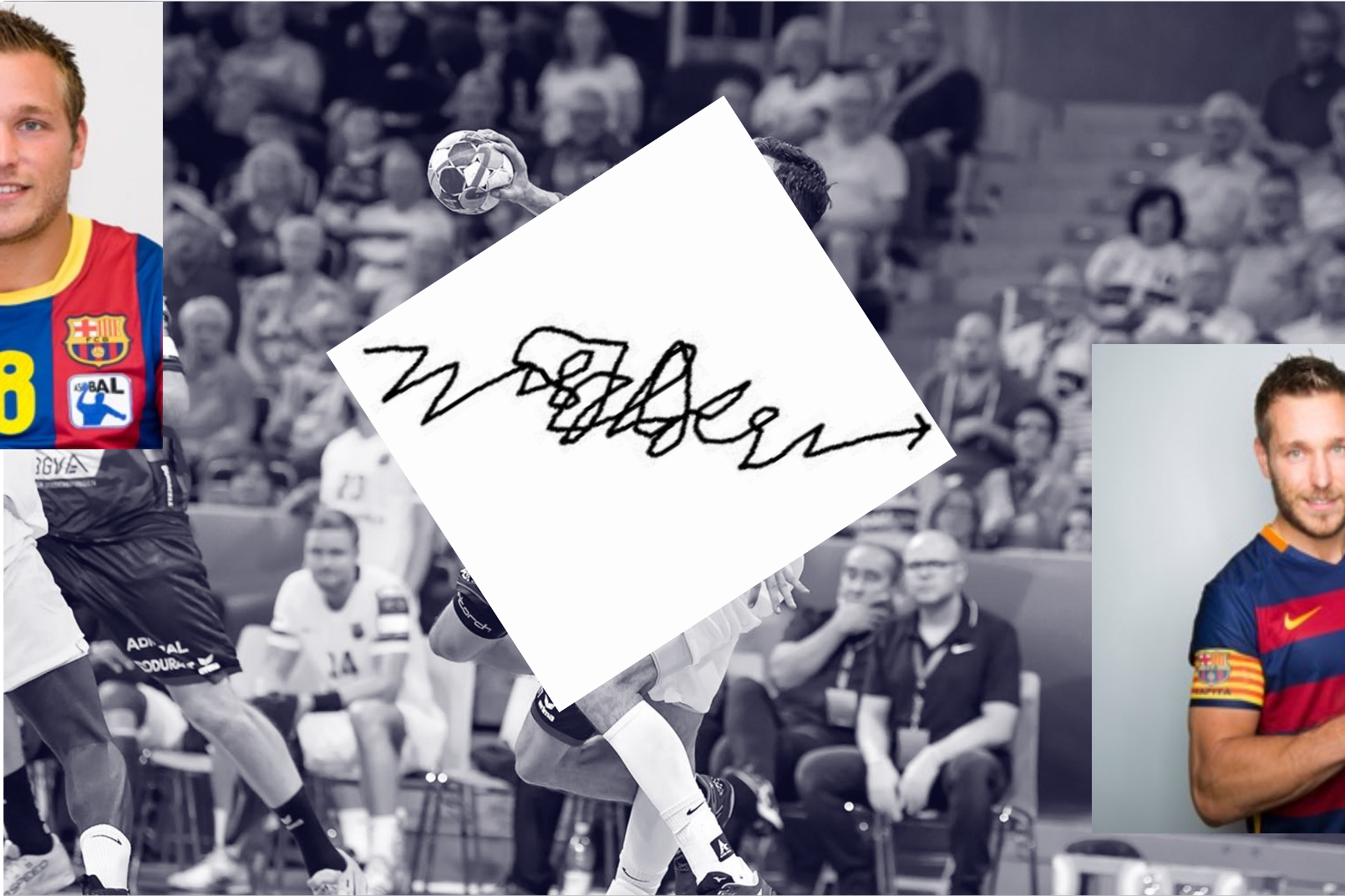
2.- PERFORMANCE



1.- INJURY PREVENTION

2.- PERFORMANCE

3.- CHANGE THE STRUCTURE





1.- INJURY PREVENTION

2.- PERFORMANCE

3.- CHANGE THE STRUCTURE

**4.- MAINTAIN OPTIMUM FITNESS WHEN IT
COMES TO**

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Training in Team Sports: Structured Training in the FCB

J. R. Tarragó¹, Marcel·lí Massafret-Marimón²,
Francisco Seirul-lo¹ and Francesc Cos^{2,3*}

¹Futbol Club Barcelona, Spain, ²National Institute of Physical Education of Catalonia (INEFC), Barcelona Centre, University of Barcelona, Spain, ³New York City Football Club, United States of America

Entrenamiento en deportes de equipo: el entrenamiento estructurado en el FCB

J. R. Tarragó¹, Marcel·lí Massafret-Marimón²,
Francisco Seirul-lo¹ y Francesc Cos^{2,3*}

¹Futbol Club Barcelona, España, ²Instituto Nacional de Educación Física de Cataluña (INEFC) - Centro de Barcelona, Universidad de Barcelona, España, ³New York City Football Club, Estados Unidos de América

Training in Team Sports: Coadjuvant Training in the FCB

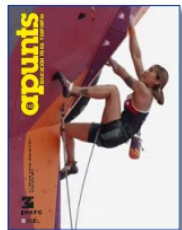
Antonio Gómez¹, Eric Roqueta¹, Joan Ramon Tarragó¹,
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Antonio Gómez¹, Eric Roqueta¹, Joan Ramon Tarragó¹,
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¹Futbol Club Barcelona, España, ²Instituto Nacional de Educación Física de Cataluña (INEFC) - Centro de Barcelona, Universidad de Barcelona, España, ³New York City Football Club, Estados Unidos de América



OPEN ACCESS

Entrenamiento en deportes de equipo: el entrenamiento optimizador en el Fútbol Club Barcelona

Edu Pons Alcalá¹, Andrés Martín García², Marc Guitart Trench²,
Isaac Guerrero Hernández³, Joan Ramón Tarragó i Costa⁴,
Francisco Seirul-lo Vargas⁵ y Francesc Cos Morera^{6*}

¹Preparador físico primero equipo Fútbol Club Barcelona

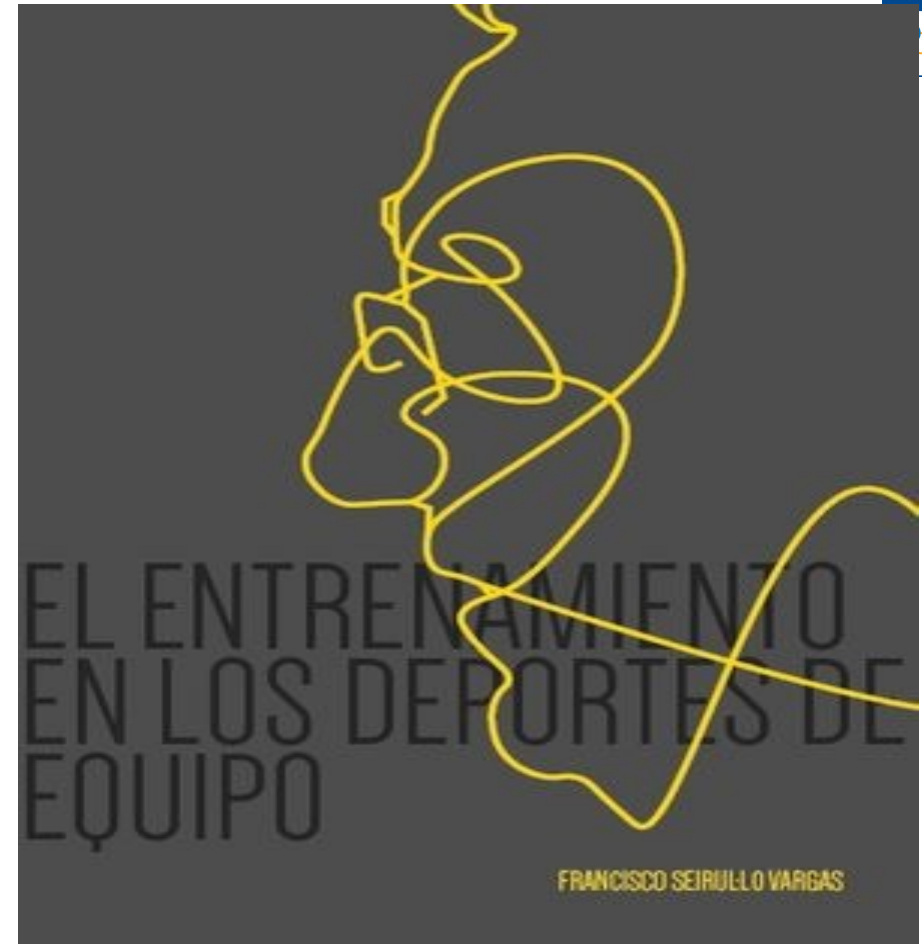
²Preparador físico Fútbol Club Barcelona

³Director adjunto Metodología Fútbol Club Barcelona

⁴Director de Rendimiento Deportivo Fútbol Club Barcelona

⁵Director de Metodología FC Barcelona

⁶Manchester City Football Club 1.er equipo, Reino Unido; Instituto Nacional de Educación Física de Cataluña (INEFC)-Universidad de Barcelona, España.





OPTIMISE



VARIABILITY



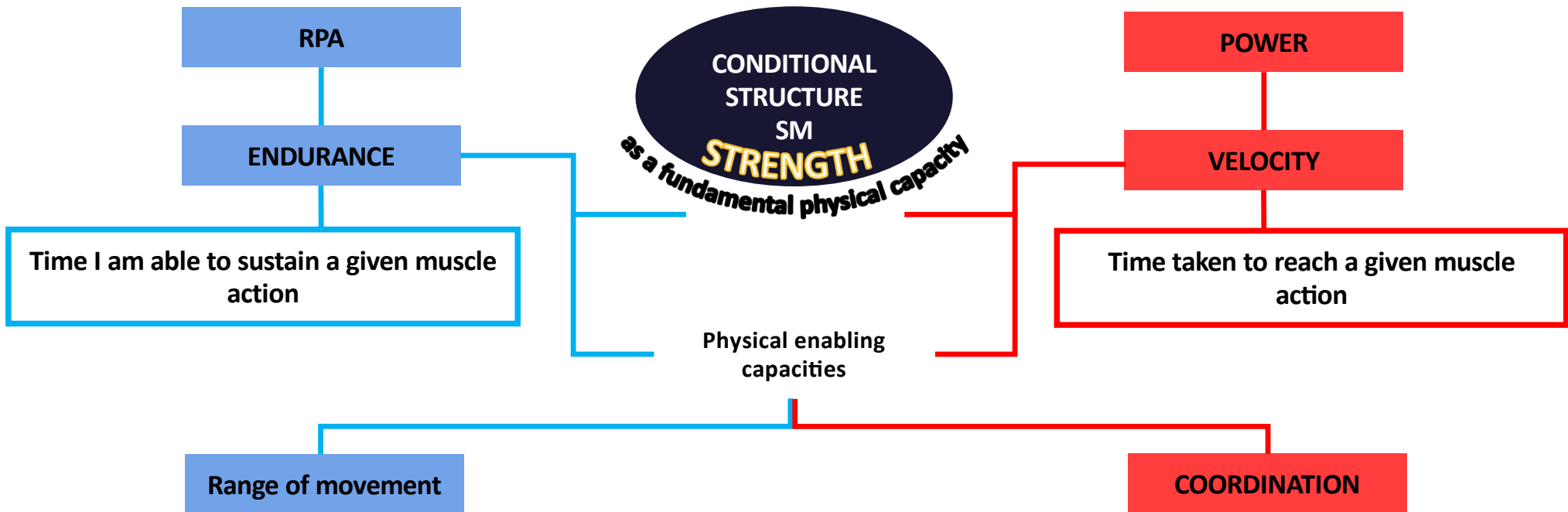
SPECIFICITY



BEFORE YOU START...



“ALL IS STRENGTH”



El entrenamiento en los deportes de equipo. Seirul-lo (2017)

STRUCTURED TRAINING MODELS



COADYUVANT TRAINING

- PREVENTION
- STRUCTURAL
- RECOVERY
- SPECIFIC SKILLS

OPTIMISER TRAINING

- PLANIFICATION
- DESING OF SIMULATING SITUATIONS
- DESING MICROCYCLE
- NEXT MATCH

ASSESSMENT AND CONTROL

ELEMENTS AND ENVIRONMENT



GYM

COURT

From the player to training

From the team to compete

STRUCTURED TRAINING MODELS



COADYUVANT TRAINING

- PREVENTION
- STRUCTURAL
- RECOVERY
- SPECIFIC SKILLS

OPTIMISER TRAINING

- PLANIFICATION
- DESING OF SIMULATING SITUATIONS
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- NEXT MATCH

ASSESSMENT AND CONTROL

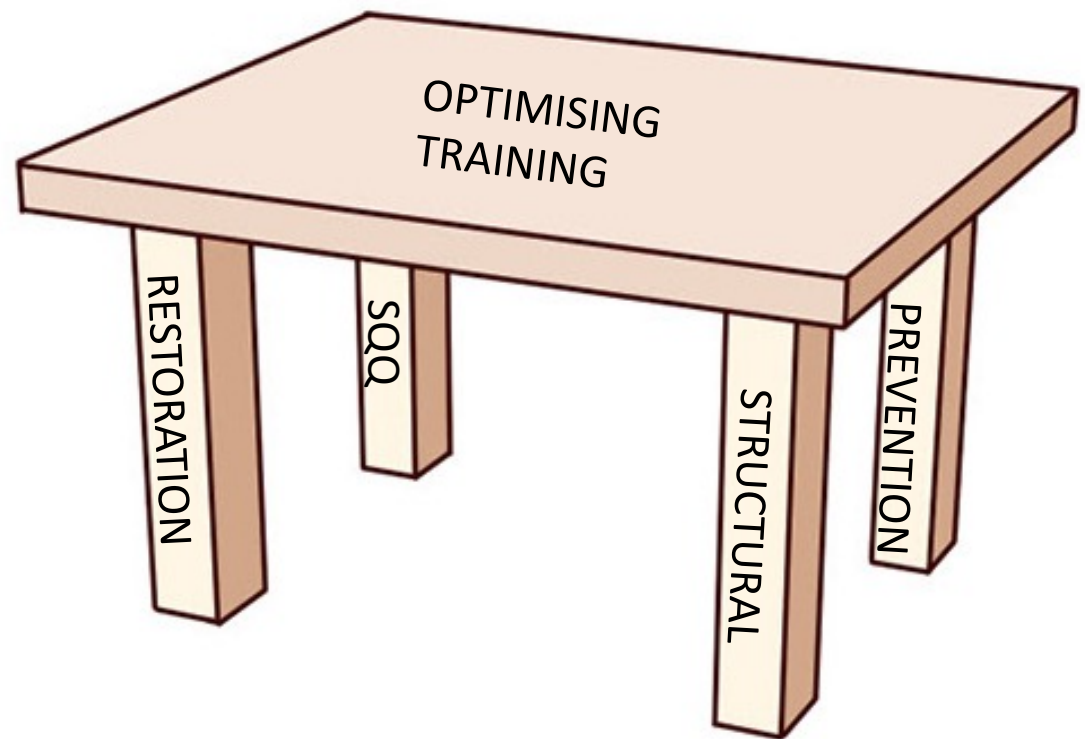
ELEMENTS AND ENVIRONMENT



From the player to training

From the team to compete

Structured Training Metaphor



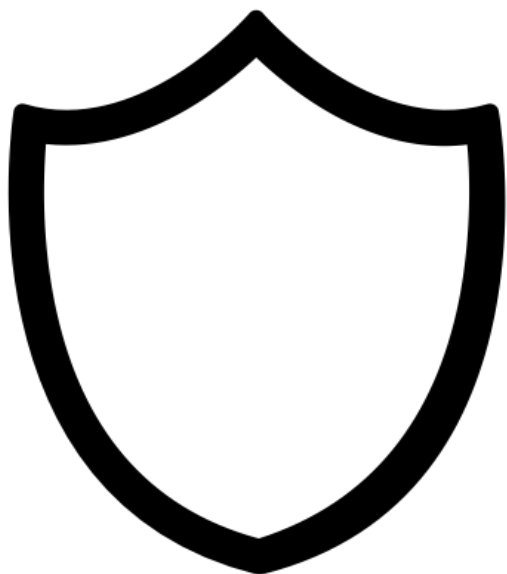
KEY IDEAS



[...] In other words, the **CT** first of all **prepares for training** and then, using elements and environments that are not specific to the game in part or in full, helps **to optimise structures and systems** that enable the athlete to achieve the desired performance..

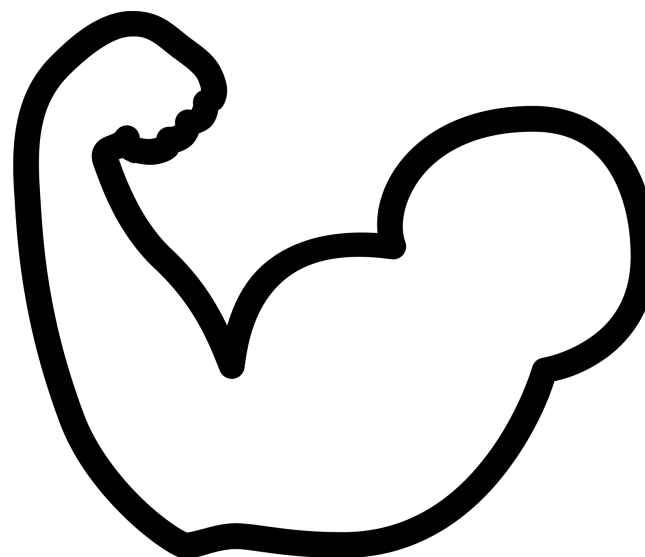
Gómez et al., (2019)

PROTECTION



PREVENTION

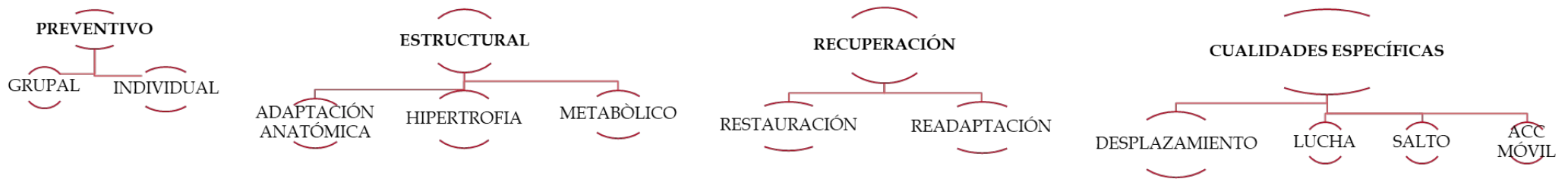
PERFORMANCE



OPTIMISE



PILLARS AND SYSTEMS OF COADJUVANT STRENGTH TRAINING



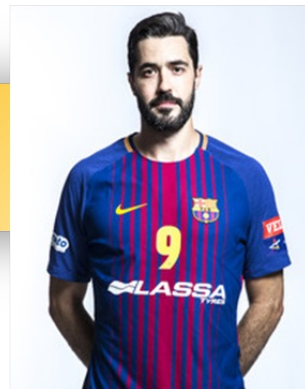
FOOTBALL



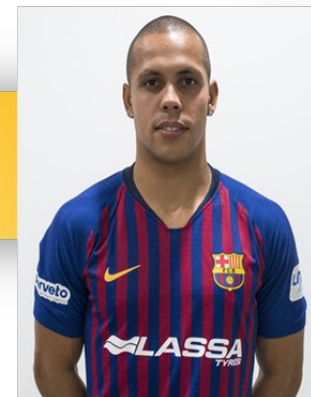
BASKETBALL



HANDBALL



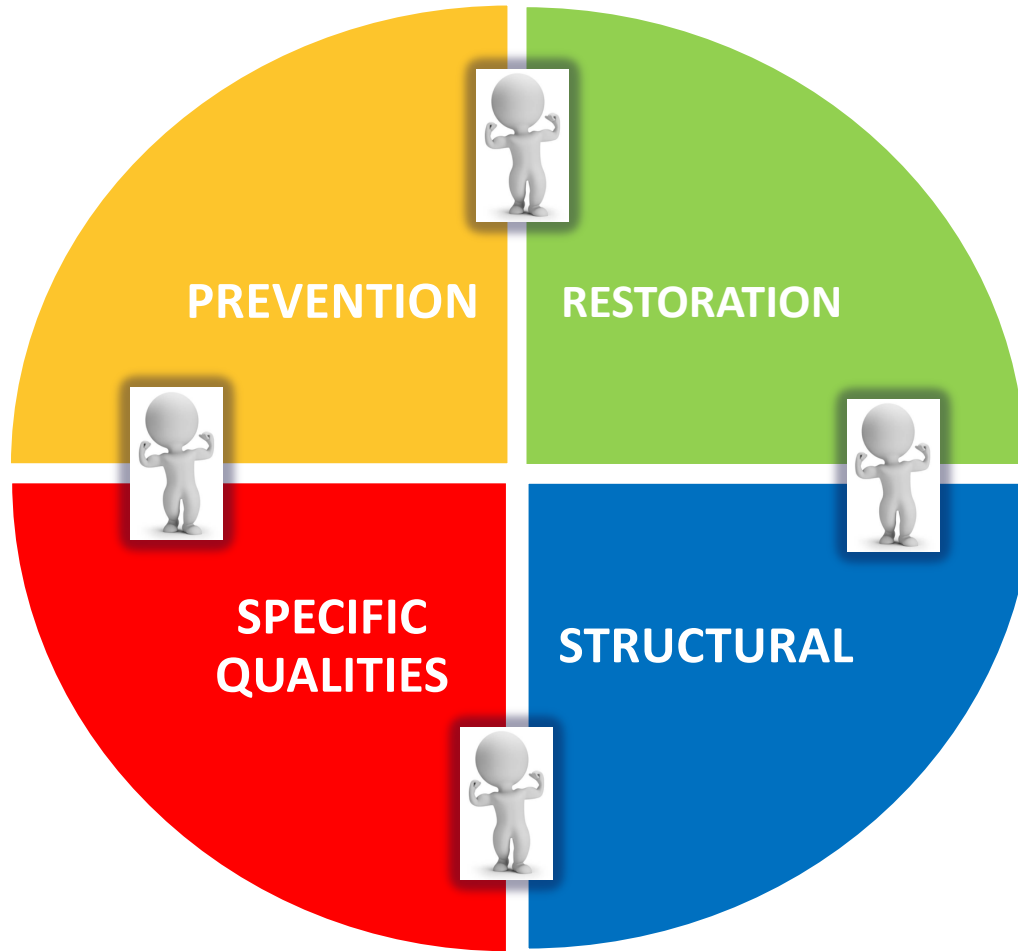
FUT-SAL



HOCKEY



SYSTEMS INTEGRATING COADJUVANT TRAINING



SYSTEMS INTEGRATING COADJUVANT TRAINING



Sport Discipline Age Gender



Specific practice time over lifetime



MATERIAL ARE FC BARCELONA

STRUCTURAL

Morphological modification
anthropometric variables

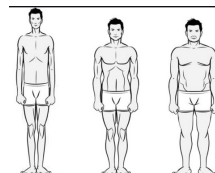
practice
different
manifestations
Strength

- Achieve an optimal composition between lean mass, especially muscle mass, and body fat mass by increasing HD performance.



- To condition joints and soft tissues to withstand high intensity and high specificity loads on a variety of playing surfaces.

- Identify the needs of the individual morphotype.





SYSTEMS INTEGRATING COADJUVANT TRAINING



ESTRUCTURAL

Anatomical Adaptation

Functional to provide sufficient mobility and adequate joint stability, optimising functionality and balancing strength and strength endurance performance (m. agonists and antagonists)

Metabolic

Applied hypertrophy



Increase % muscle mass needs individual needs sport speciality demarcation

Optimal hypertrophy explosive strength demonstrations specific techniques



HIIT
Reducing fat mass
increase metabolic rate effect
EPOC (Excess Post exercise Oxygen Consumption)

COADJUVANT TRAINING

STRUCTURAL

OPTIMISER TRAINING



COADJUVANT TRAINING

STRUCTURAL

OPTIMISER TRAINING

ANATOMICAL ADAPTATION

Functional. Giving joint mobility and stability

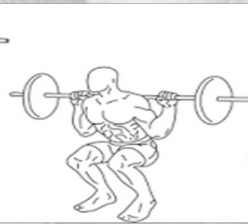
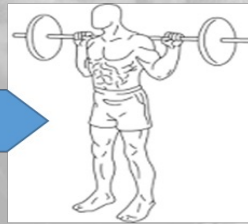
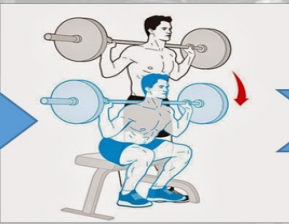
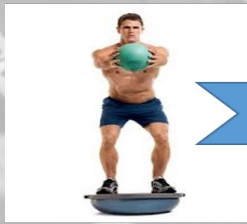
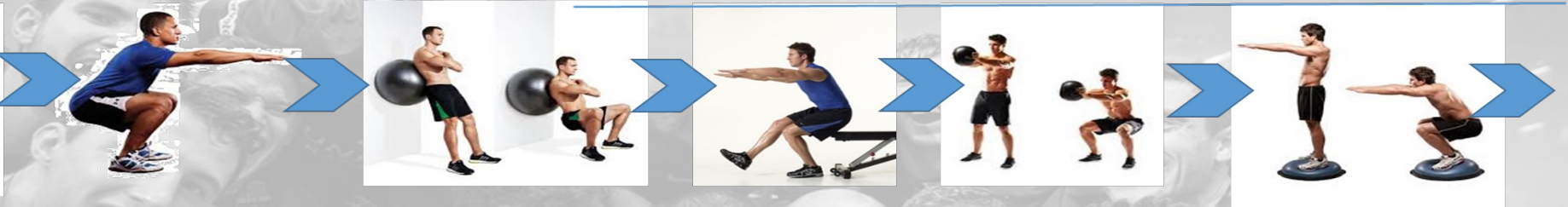
APPLIED HYPERTROPHY

Increasing body mass

METABOLIC

HIIT, body mass reduction





+ Asimètric Squat





Lluita
Desplaçament

PREPARACIÓ FÍSICA FC BARCELONA

INFANTIL

FC BARCELONA HANDBOL FORMATIU

TEMPORADA 1718

FR11

FORÇA

MICROCICLE

OBJECTIU

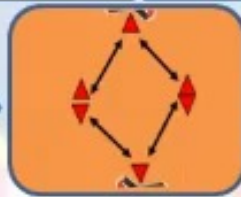
ESTRUCTURAL - F. RESIS

RUTINA

11



PRESS BANCA ASIMETRIC



CONTACTE 1x1



CORE DINAMIC

Fem 2x10 repeticions (treball per parelles)
Fem una filera 2 vegades seguides i canvi



SQUAT 1 CAMA



PLIOMETRIA BAIXA FORA



PROPIO BOSU PASSANT PILOTA



PULLOVER FITBALL



XUT GOMA



ROTACIÓ GOMA

COMPENSA

ESPECIFIC

DIRGIT

GENERAL



ROMÂNIA



SYSTEMS INTEGRATING COADJUVANT TRAINING

PREVENTION

Anticipation, correction, adjustment, protection

Internal and external factors

Risk of overload



Risk of injury

Primary - group



Injury casuistry sport modality

Secondary - individual



Individual needs Injury history

Balance and musculotendinous predisposition to sport-specific executions.

Prioritise stabilisation as an indispensable element and facilitator of sensorimotor action.

Musculotendinous adaptation to high intensity actions, especially to eccentric and unforeseen manifestations (imbalances, blows, landings, decelerations, etc.). Increasing the efficiency of the coordination capacities that are the basis of specific techniques.

COADJUVANT TRAINING

**STRUCTURAL
PREVENTION**

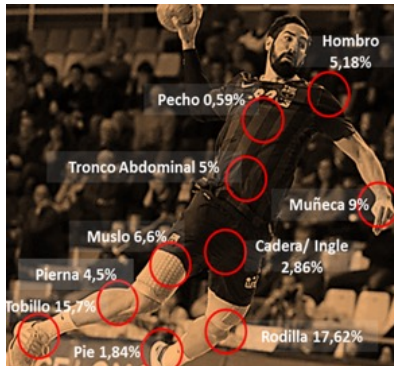
OPTIMISER TRAINING

PREVENTION CLASSIFICATION



PRIMARY

GROUP PREVENTION
Based on the casuistry
sports injuries



HANDBALL

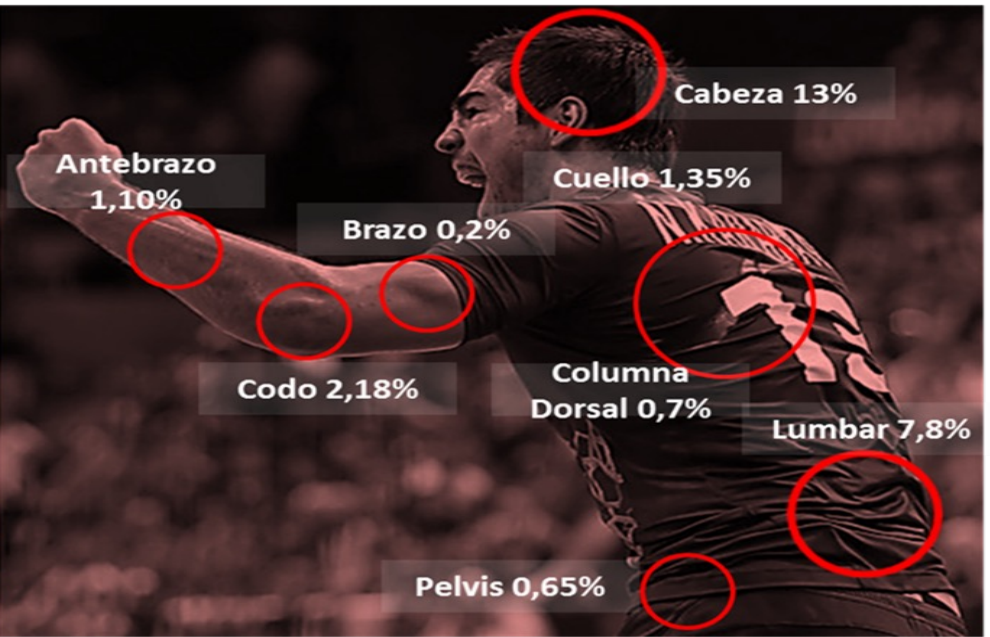
Ankle
Knee
Lumbar
Shoulder



SECONDARY

INDIVIDUAL PREVENTION
Injury History
FMS
Y-Balance
CMJ Bilat. / CMJ Unilat.

% LESIONES POR LOCALIZACIÓN EN BALONMANO



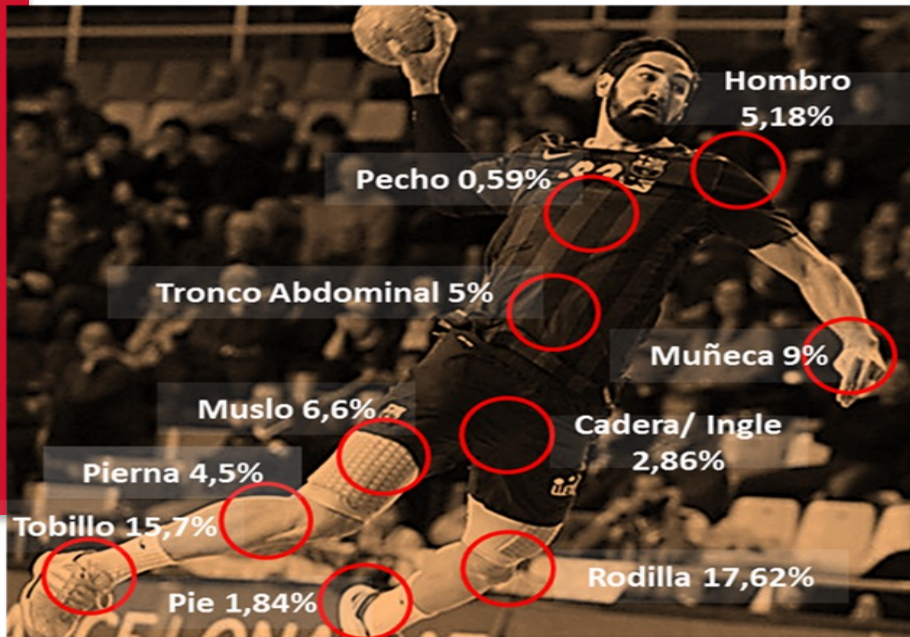
Pediátrica Apofisitis 2,10%

Congénita 0,4%

Localización Inespecífica 0,4%

Fuente: Langevoort et al (2007), Mónaco et al (2013), Olssen et al (2006)

% LESIONES POR LOCALIZACIÓN EN BALONMANO



Pediátrica Apofisitis 2,10%

Congénita 0,4%

Localización Inespecífica 0,4%

Fuente: Langevoort et al (2007), Mónaco et al (2013), Olssen et al (2006)





WHEN WE DO
PREVENTION?



EVERY DAY



BEFORE THE ACTIVATION



DURING THE ACTIVATION



STRENGTH PROGRAMS

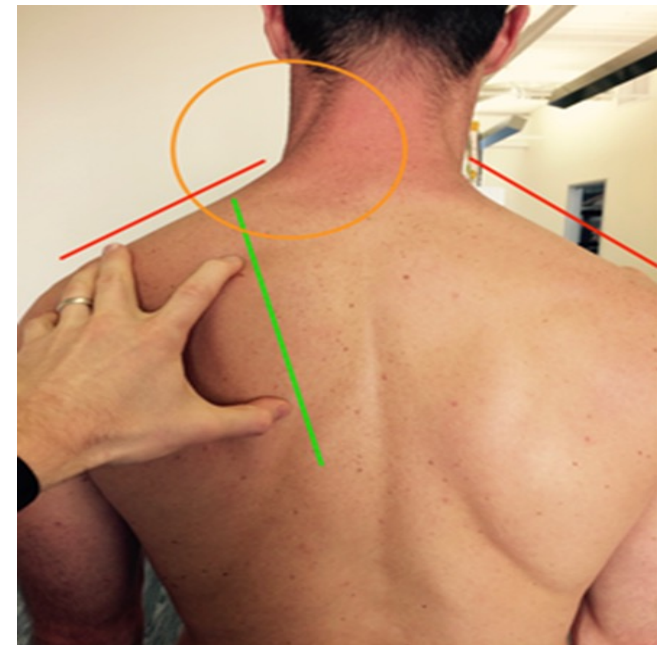


AT THE END OF THE SESSION

COADJUVANT TRAINING

**STRUCTURAL
PREVENTION
DEFICIT**

OPTIMISER TRAINING



COADJUVANT TRAINING

**STRUCTURAL
PREVENTION
DEFICIT
RETURN TO PLAY**

OPTIMISER TRAINING

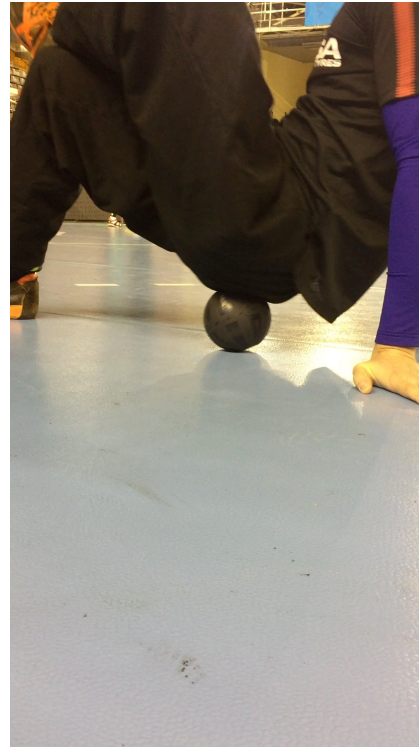


SYSTEMS INTEGRATING COADJUVANT TRAINING



RESTORATION

Optimise means of recovery



After intense training and competition sessions

Restoration of pre-activity bioenergetic and functional values.

Support for individual biophysiology.

Differentiated at different times of sporting life

In the different structures of the HD



MATERIAL ARE FC BARCELONA

SYSTEMS INTEGRATING COADJUVANT TRAININGTE



SPECIFIC QUALITIES

Development and optimisation of strength demonstrations.
Greater degree of effectiveness and specific neuromuscular efficiency.

*Jump
Displacement
Fighting
Ball action*



"Content" the specific technical skill (with all its variations)



Organisation of the exercises according to the degree of similarity to competitive practice to the competitive practice, based on the general orientation and the different levels of approach.

Training format prescription of 3 types of chained exercises

Fundamental exercise → complementary or compensatory exercise → application exercise.



El entrenamiento en los deportes de equipo. Seirul-lo (2017)

CLUSTERS- REP
POTENCIA

VARIABILIDAD

RESISTENCIA
ACOMODADA

al movimiento

MOVIMIENTO

3D

IMPREDECIBLE

PERTURBACIONES



El entrenamiento en los deportes de equipo. Seirul-lo (2017)



FORÇA I CORE

8 ejercicios 36 minutos 495 MOVES 187 kcal

1 - Ejercicio libre - Sentadilla y salto



30 seg x 30 seg
30 seg x 30 seg
30 seg x 30 seg
30 seg x 30 seg

2 - Ejercicio libre - Skipping - en el sitio



30 seg x 30 seg
30 seg x 30 seg
30 seg x 30 seg
30 seg x 30 seg

3 - Ejercicio libre - Salto - desplantes



30 seg x 30 seg
30 seg x 30 seg
30 seg x 30 seg
30 seg x 30 seg

4 - Ejercicio libre - Posición del cocodrilo



20 seg x 60 seg
20 seg x 60 seg
20 seg x 60 seg
20 seg x 60 seg

5 - Ejercicio libre - Plancha lateral con torsión



45 seg x 45 seg
45 seg x 45 seg
45 seg x 45 seg

6 - Ejercicio libre - Cuerpo extendido



45 seg x 45 seg
45 seg x 45 seg
45 seg x 45 seg

7 - Ejercicio libre - Flexión de rodillas en puente



15 rep x 45 seg
15 rep x 45 seg
15 rep x 45 seg

8 - Ejercicio libre - Cuadrupedia - levantar pierna y brazo contrario



20 seg x 30 seg
20 seg x 30 seg
20 seg x 30 seg

FIGHT





FIGHT

JUMP



FIGHT

JUMP

SHOT

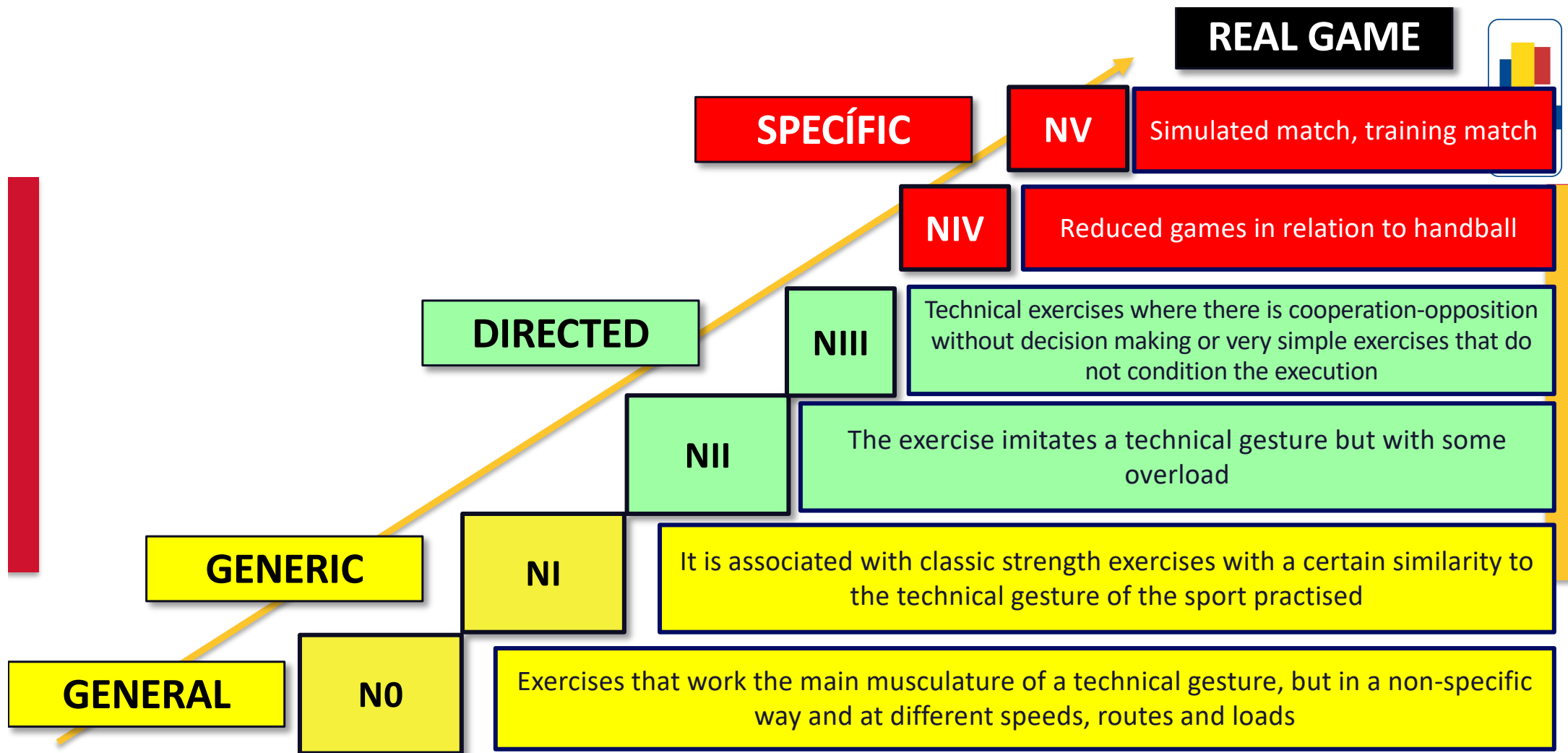


FIGHT

JUMP

SHOT

DISPLACEMENT

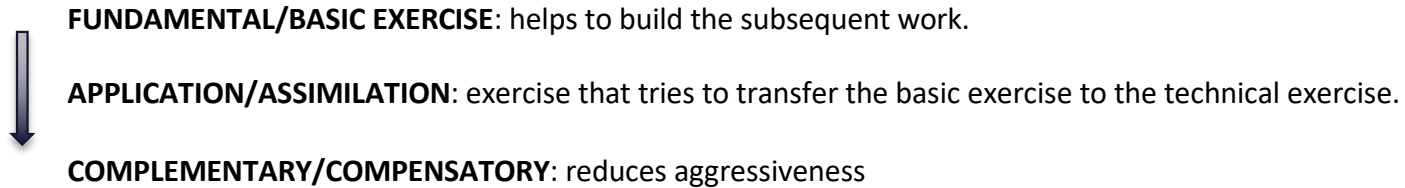


SC TRAINING FORMAT

Tous (1999)

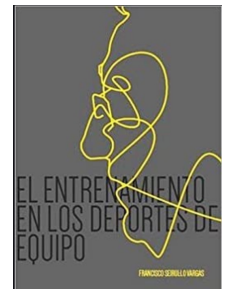
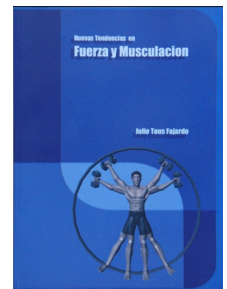
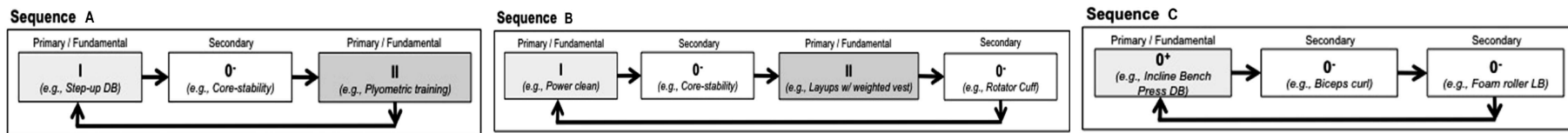
He cites in the methodology of strength work from sports training, a method he calls: **GENERAL-DIRECTED-SPECIFIC**
 Developed earlier by Seirul.lo

Construction of a motor chain for strength work.



Shelling Torres (2016)

They present formats with 3 or 4 exercises (basic or complementary only) in different sequences.

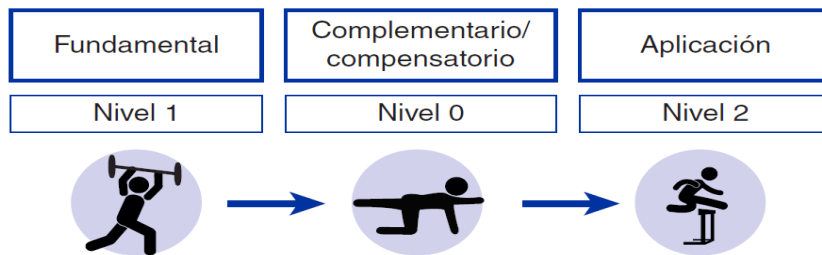


SC TRAINING FORMAT

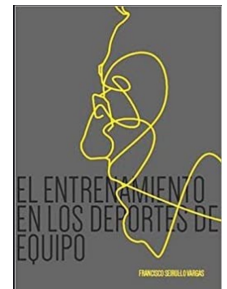
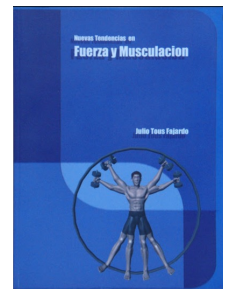
Training format prescription of 3 types of chained exercises

Fundamental exercise → Complementary or compensatory exercise → application exercise.

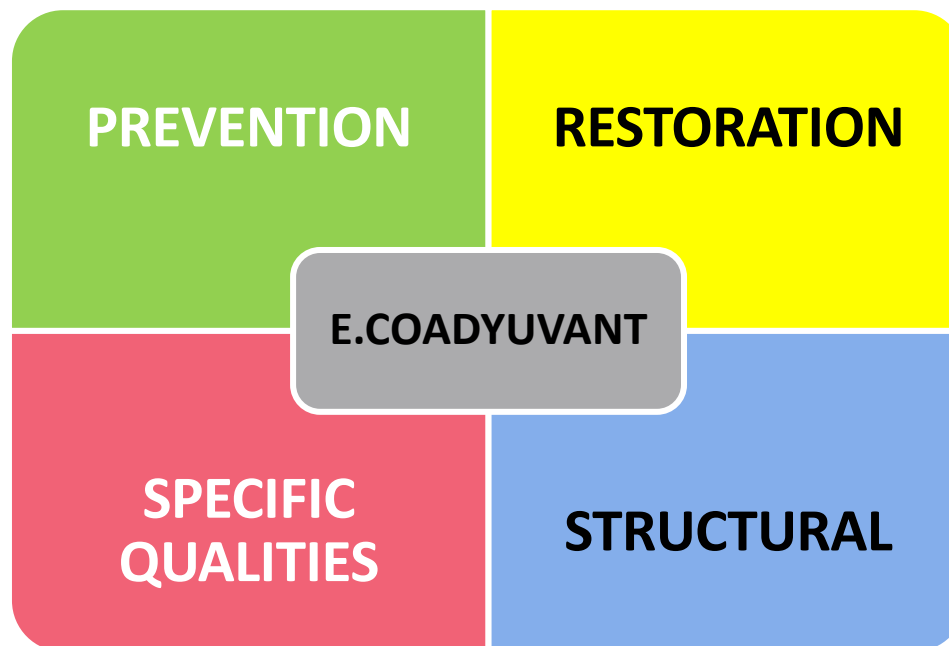
Ejemplo de fuerza para el salto



Ejemplo de fuerza para el desplazamiento



*It allows us to
maximise HD potentialities from a systemic perspective*



***PROTECTS
THE HEALTH***

***FACILITATES
OPTIMISATION TRAINING***

***CONTRIBUTES
OPTIMISES STRUCTURES***

FACILITATES INDIVIDUALISATION

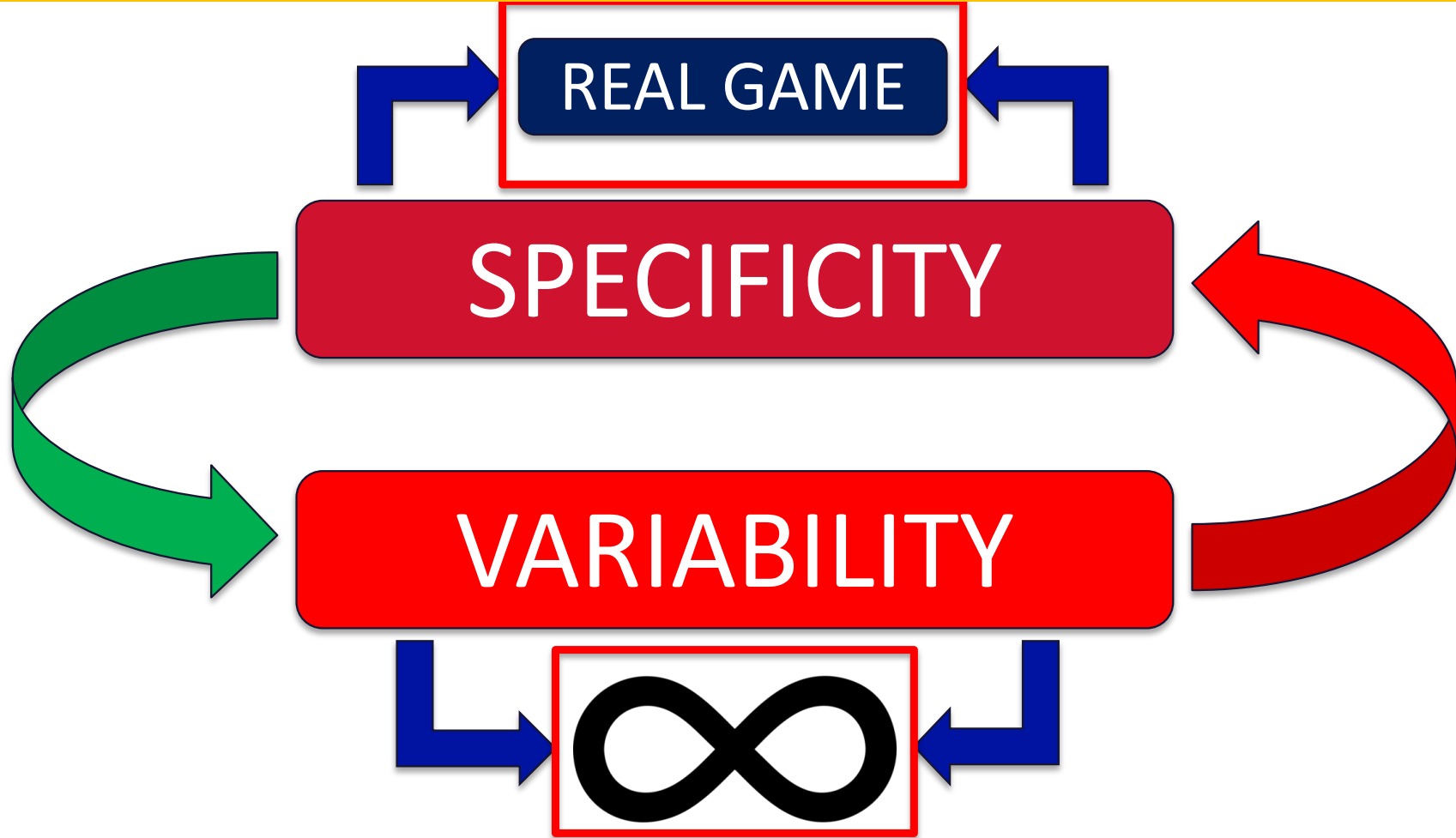
COADJUVANT TRAINING

**STRUCTURAL
PREVENTION
DEFICIT
RETURN TO PLAY
GENERAL**

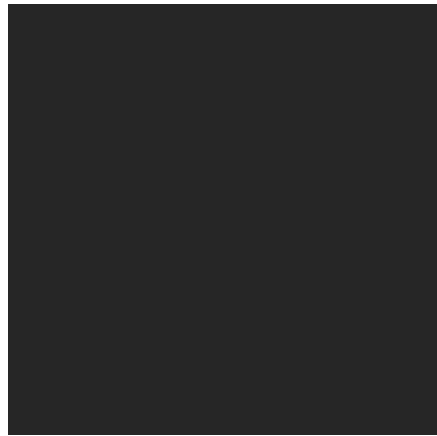
OPTIMISER TRAINING



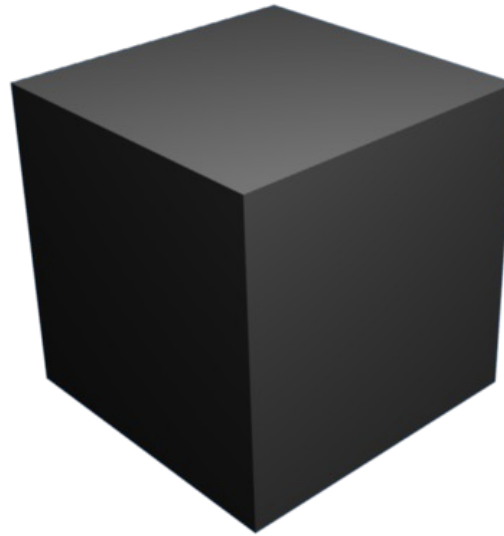
OPTIMISER TRAINING



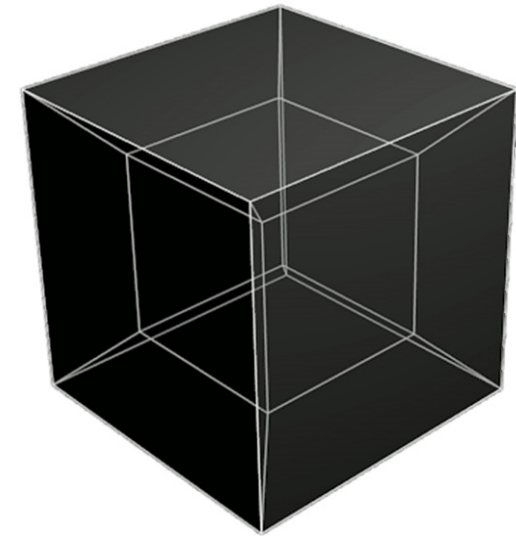
Training in two dimensions (2D)



2D UNIVERS



3D UNIVERS



4D UNIVERS





Maximum Strength/ Structural

1950



2020

Original Research

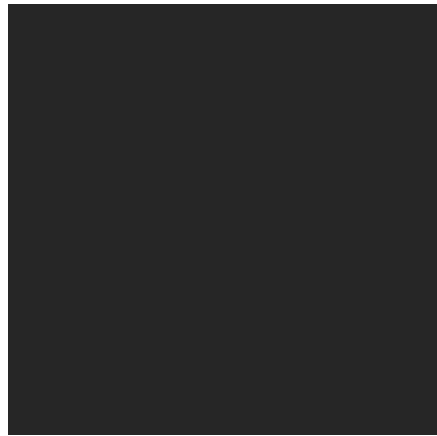
The Journal of Strength and Conditioning Research™

Barbell Squat Relative Strength as an Identifier for Lower Extremity Injury in Collegiate Athletes

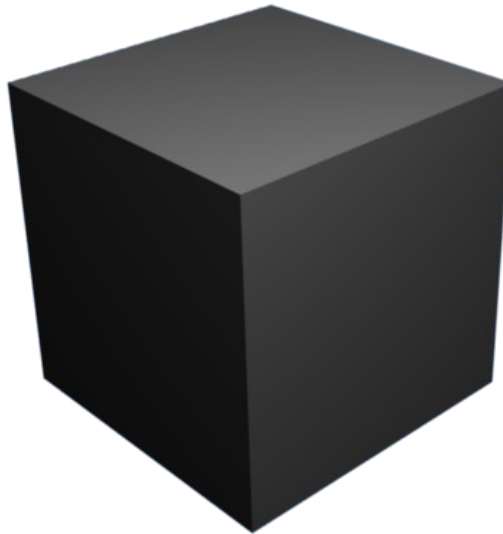
Marcus J. Case, Duane V. Knudson, and Darcy L. Downey

Department of Health and Human Performance, Texas State University, San Marcos, Texas

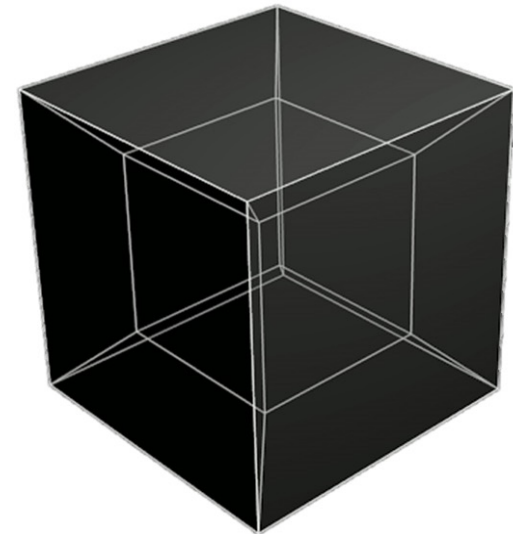
Training in three dimensions (3D)



2D UNIVERS



3D UNIVERS

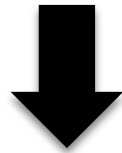


4D UNIVERS



CONSTRUCTION OF THE THREE-DIMENSIONAL UNIVERSE OF THE ATHLETE

" Force without control is useless " Pirelli



Coordinative strength

- 1** Motor Control
- 2** Application of force
- 3** Optimum momentum



KEY IDEAS



In team sports, the pattern of recruitment is changeable but...

“[...] we find unilateral, bilateral, etc. force application vectors that are changeable in direction, sense and magnitude”



Moras, G (2018)

... how we train it?

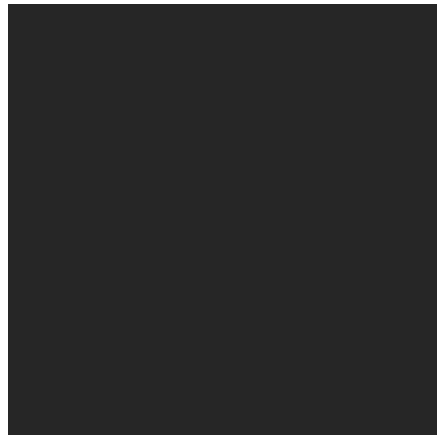


HOW WE APPLY IT IN TRAINING

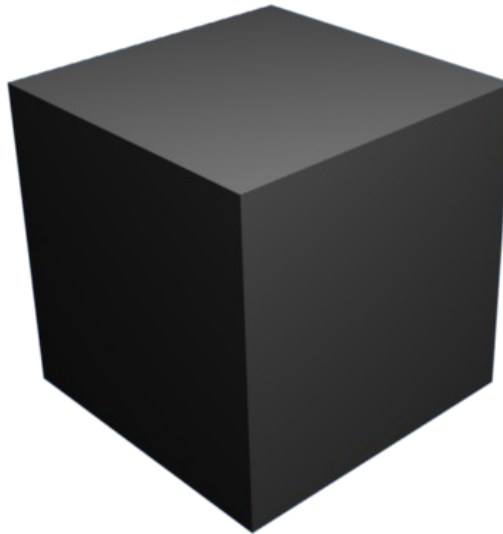
- 1** Variations on the movement proposal
- 2** Change the movement
- 3** Modify the stability conditions of the same



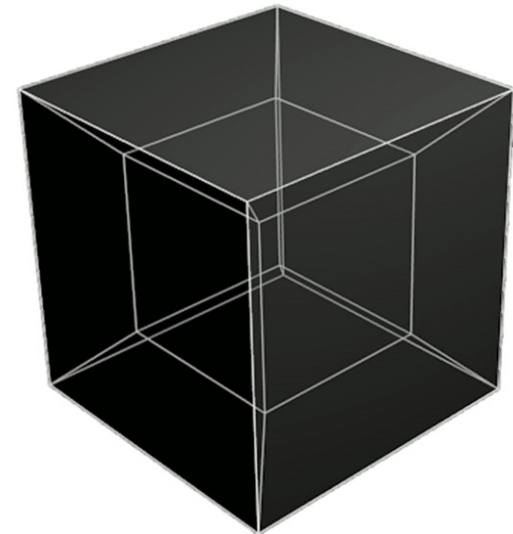
TRAINING IN FOUR DIMENSIONS (4D)



2D UNIVERS



3D UNIVERS



4D UNIVERS



HOW WE APPLY IT TO TRAINING

1 CHANGE THE TYPE OF RESISTANCE



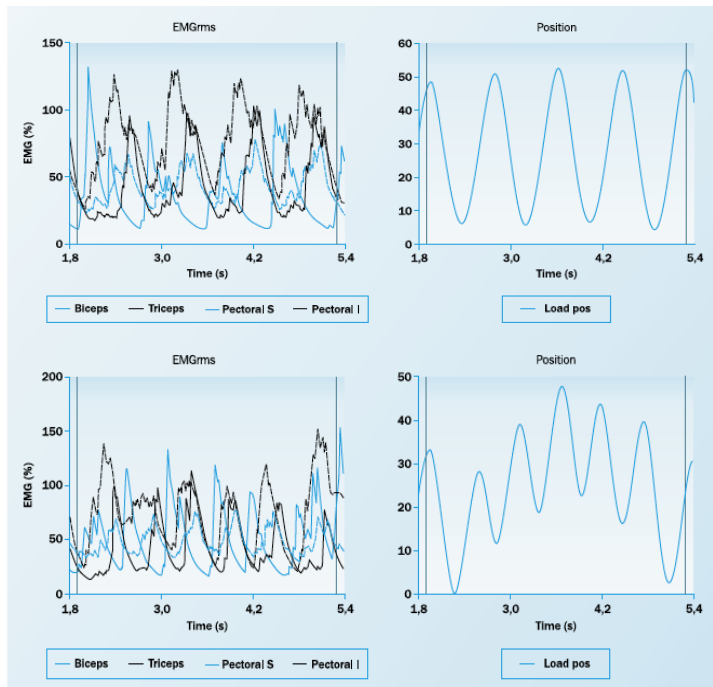
HOW WE APPLY IT TO TRAINING

2 ALTERING THE EXTERNAL LOAD



HOW WE APPLY IT TO TRAINING

3 ALTERING THE BEHAVIOURAL PATTERN OF THE TIME SERIES DISPLACEMENT - TIME



HOW WE APPLY IT TO TRAINING

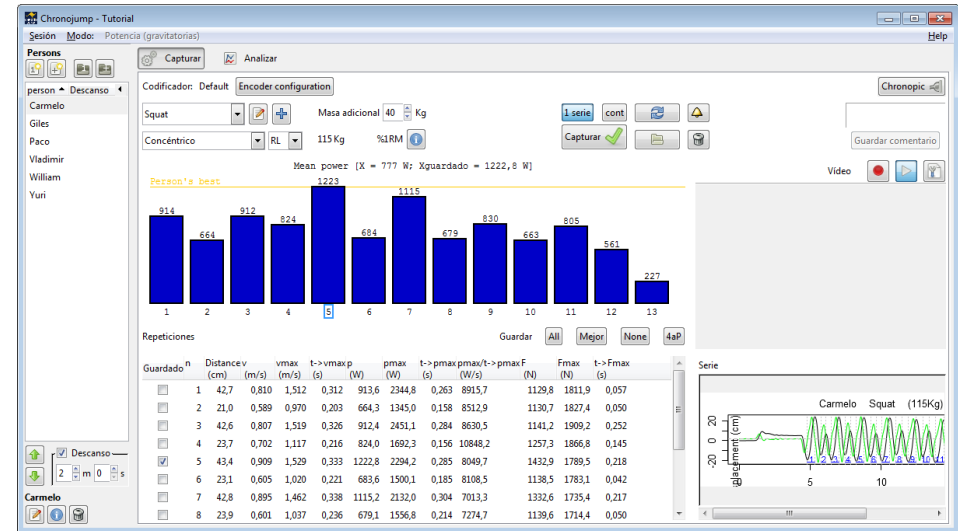
4 USE DISRUPTIVE CONSTRAINTS



HOW WE APPLY IT TO TRAINING



5 OPTIMAL FORCE MANAGEMENT OVER TIME



HOW WE APPLY IT TO TRAINING



6 VIBRATORY STIMULATION



KEY IDEAS

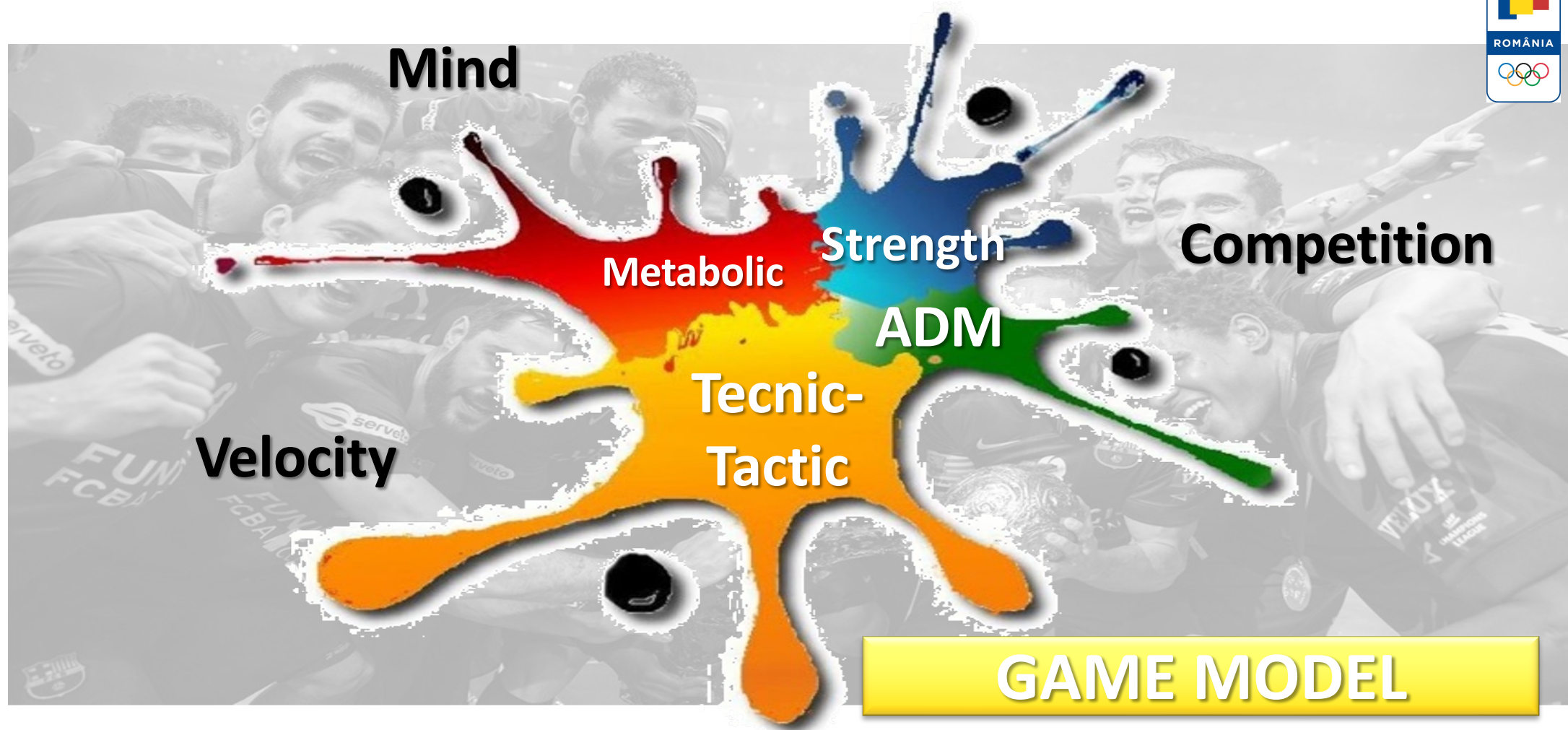
3D



4D



(Moras, 2017)



GUIDE

1.- INTRODUCTION - CONTEXTUALISATION

2.- OBJECTIVES CONDITIONAL WORK

3.- CONDITIONAL MODEL

4.- STRENGTH WORK

5.- METABOLIC WORK





N1



N0-



N2



N1



N1



N1-N2



N0-



GUIDE

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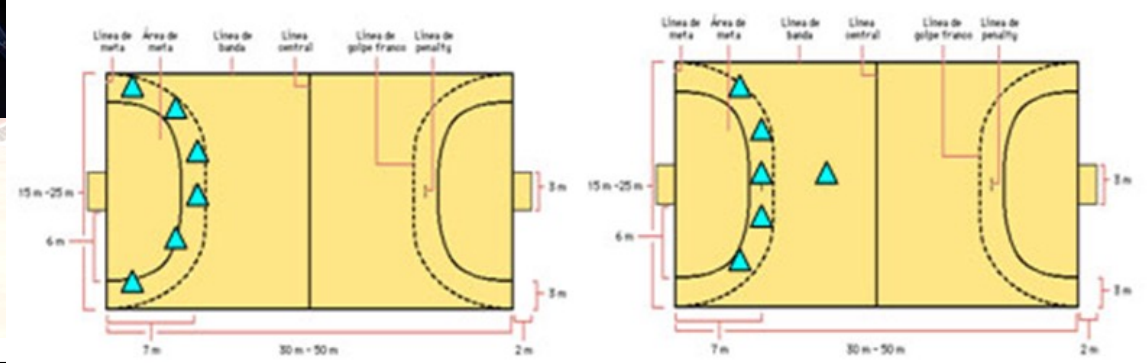


METABOLIC WORK



6:0

5:1



Línea de meta, Área de meta, Línea de banda, Línea central, Línea de golpe franco, Línea de penalti

15 m-25 m, 6 m, 7 m, 30 m-50 m, 2 m, 3 m

Línea de meta, Área de meta, Línea de banda, Línea central, Línea de golpe franco, Línea de penalti

15 m-25 m, 6 m, 7 m, 30 m-50 m, 2 m, 3 m

METABOLIC WORK



METABOLIC WORK





“Think, believe, dream and dare”



@lab_esport



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