HIGH PERFORMANCE
SPORT NEW ZEALAND

An Integrated Approach to Athlete Rehabilitation Workshop

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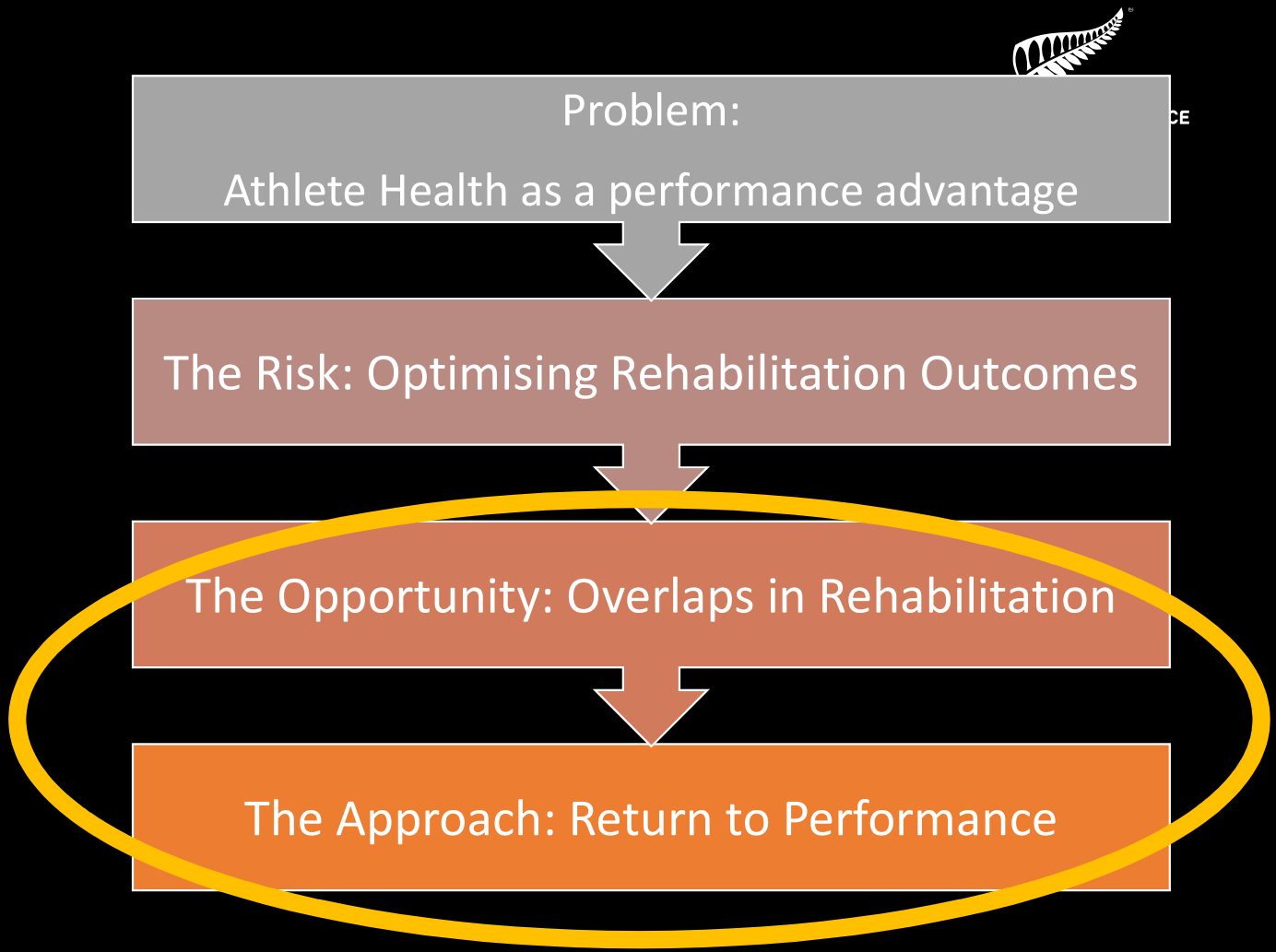
SPRINZ conference 2019

An Integrated Approach to Athlete Rehabilitation



What is the greatest risk factor for Injury?

Previous Injury

Strength

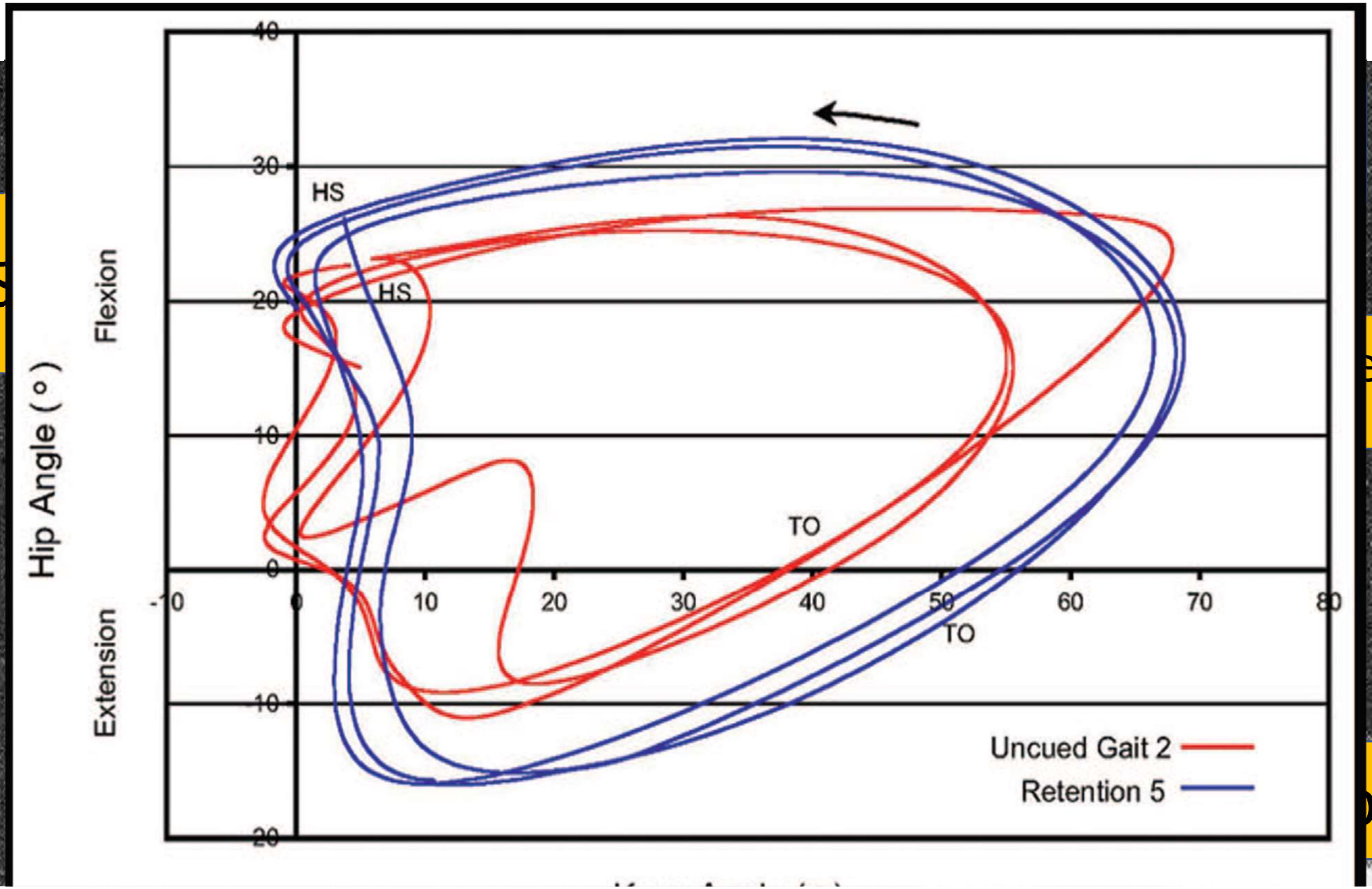
Kinematics

Proprioception

A loading issue?

- Response to external force
- Transfer of load
- Storage of energy
- Release of stored energy

Brain is "*task*" orientated



A motor control issue?

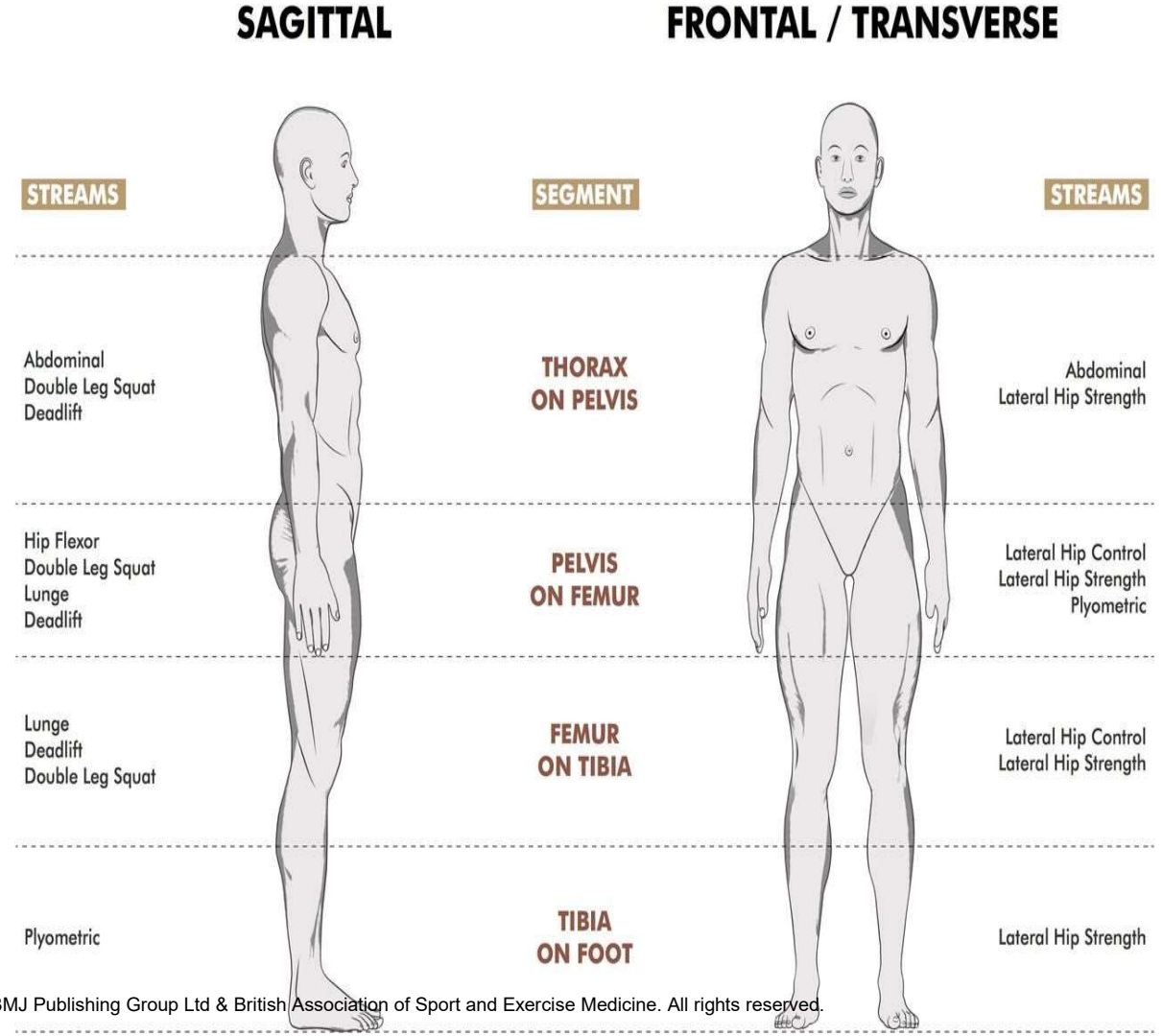
patterning
timing
inhibition
recruitment

We can manipulate input (rehab) to get a better output

CNS compensation manifests in movement

Identify and address the central adaptation

Level 1: intersegmental control and strength rehabilitation streams



Enda King et al. Br J Sports Med 2018;52:1054-1062

BJSM

Workshop: Ankle Injury

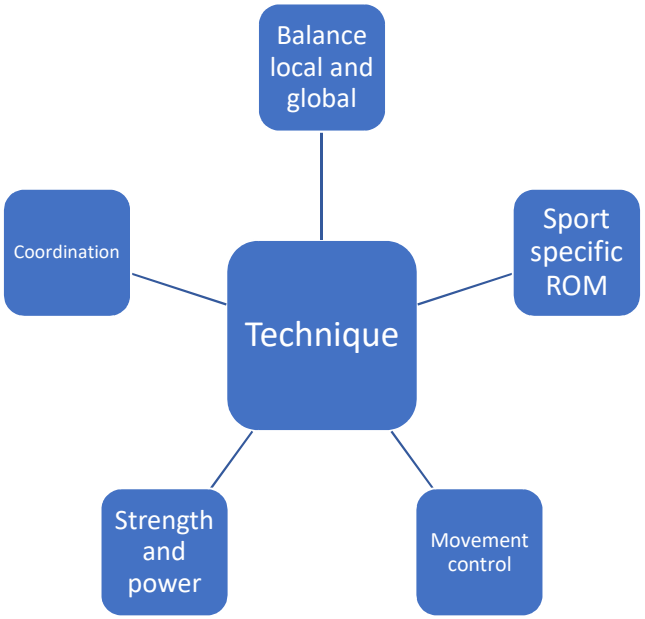
Observe position of the foot

Consider the feedback (proprioception)

Consider the effect on the evertor muscles

Benchmarks : Netball 05/11/19

Key Areas



Test	Score R	L
LANDING LESS	VALGUS, STIFF, TOES, TRUNK DISPLACEMENT	STIFF, TOES
TRIPLE HOP	4992, ↓ 10%	5500
Y BALANCE (DYNAMIC) PL	78, ↓ 21%	99
KTW	7.5CM	10CM
BESS BALANCE (STATIC)	5 ERRORS	2 ERRORS
HHD HIP ABD (AVERAGE)	12.4	15.2

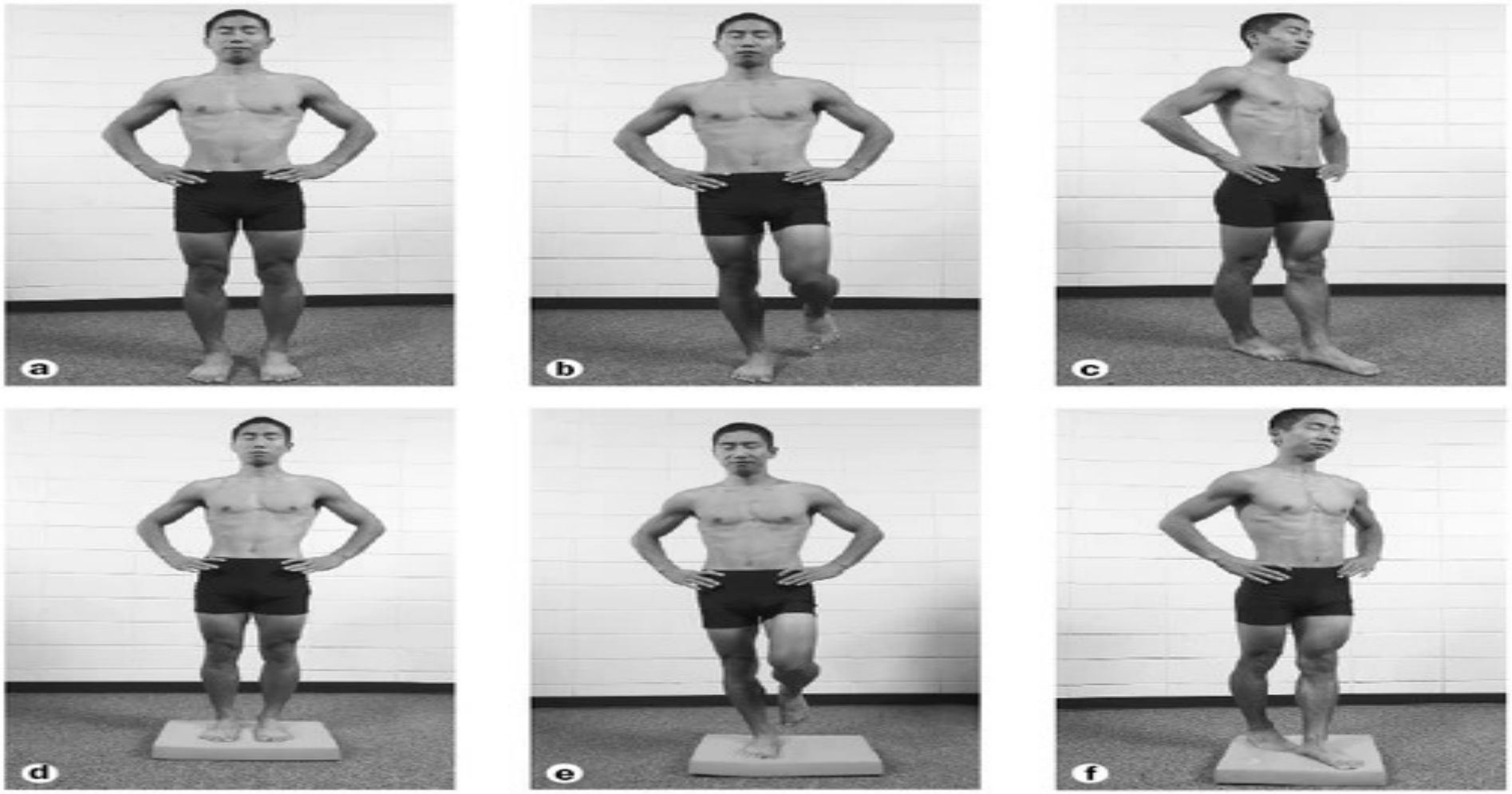
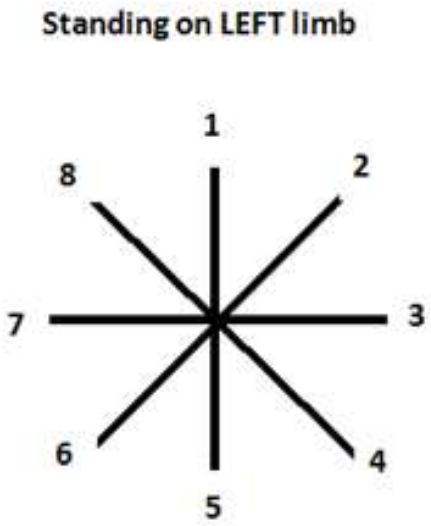


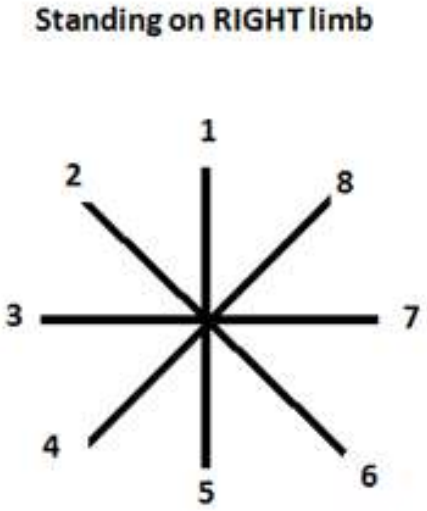
FIGURE 12.3 Balance error scoring system (BESS). Top row, firm surface condition. Bottom row, soft surface condition. Left column, parallel stance. Middle column, single-leg stance. Right column, tandem stance.

Ankle Assessment Static Balance

BESS Score Card (# of errors)	Firm Surface	Foam Surface
Double Leg Stance		
Single Leg Stance		
Tandem Stance		
Total Scores		
BESS Total		

Dynamic balance





Landing Error Scoring System Scoring Sheet

Observing from the front (jumps 1 & 2)	Observing from the side (jumps 3 & 4)
1. Stance Width	6. Initial landing of feet
2. Maximum foot rotation position	7. Amount of knee flexion displacement
3. Initial foot contact	8. Amount of trunk flexion displacement
4. Maximum knee valgus	9. Total joint displacement in sagittal plane
5. Amount of trunk lateral flexion	10. Overall Impression

TOTAL SCORE =

(worst score = 15 ; best score = 0)

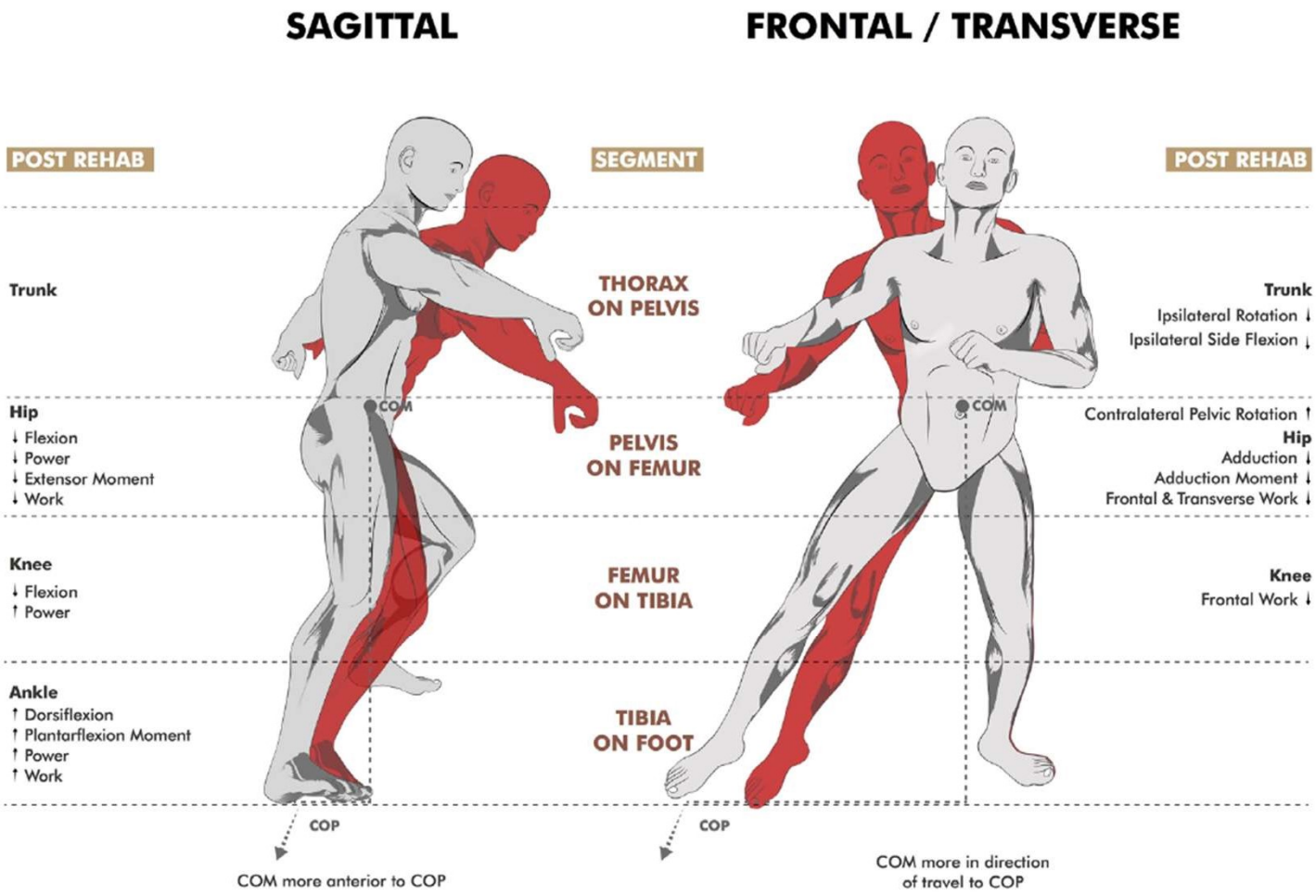


Figure 7 Biomechanical changes in cutting mechanics after rehabilitation (grey figure). COM, centre of mass; COP, centre of pressure.

Start with the end in mind

Positional demands

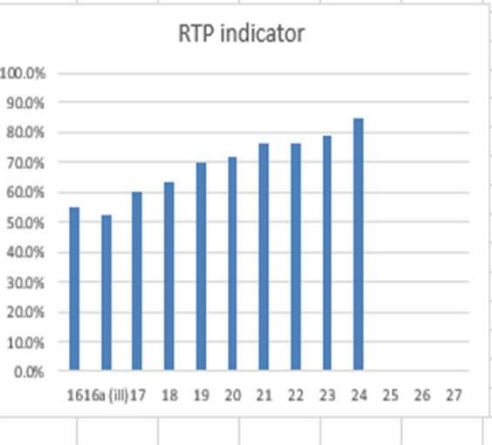
- ***Players performed >700 turns in Purposeful Movement (PM), most of these being of 0°-90°***
- ***Defenders also spent a significantly greater %PM time moving backwards than the other two positions.***
- ***Different positions could benefit from more specific conditioning programs.***

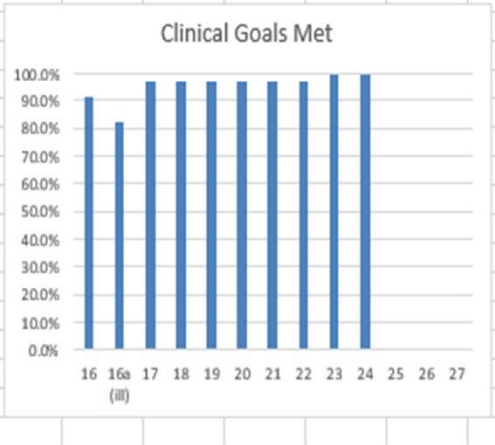
Bloomfield et al J.Sports sci. Med 2007

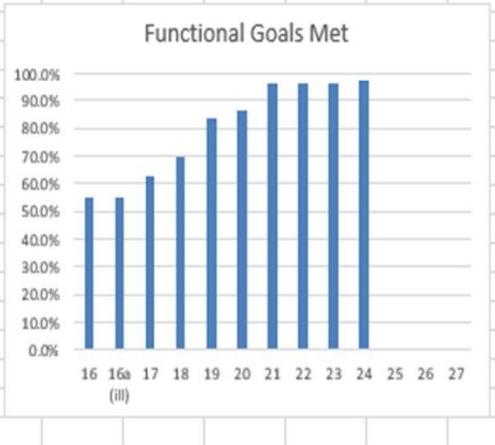
Early > late Rehabilitation phases

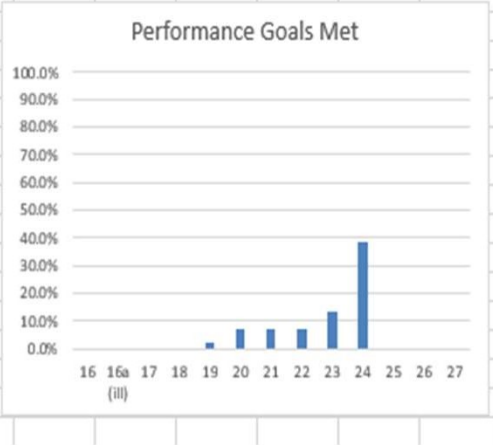
Why?


Overall RTP Readiness
85%
Clinical Goals Met*
100%
Functional Goals Met
98%
Performance Goals Met
39%
ncl Psych Readiness to Return
98%


RTP indicator
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
16 16a (iii) 17 18 19 20 21 22 23 24 25 26 27


Clinical Goals Met
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
16 16a (iii) 17 18 19 20 21 22 23 24 25 26 27


Functional Goals Met
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
16 16a (iii) 17 18 19 20 21 22 23 24 25 26 27


Performance Goals Met
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
16 16a (iii) 17 18 19 20 21 22 23 24 25 26 27

Ankle rehab progressions

Planning: Return to Performance

- Level of original learning
- Perceived similarity
- Task Structure
- Similarity of goals and processing
- Number, variability and order of examples
- Contextual Interference

Group STATIONS

B. Proprioception

(static and dynamic balance)

A. Movement CAPABILITY

(Double and single leg landing, consider ability to remain planes of movement)

C. Sport relevant / Motor learning

(establish a sport specific drill, how would you advance from a neuromuscular perspective)