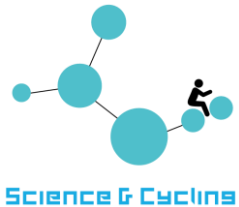


Return to play after severe injury

Assoc. Professor
Jeroen Swart



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RTP after severe injury



RTP after severe injury

What do we know?

- Do athletes return to their previous performance?
- How long should we expect them to be out of competition?
- How do we optimise their training to RTP?



RTP after severe injury



Return to Sports After Multiple Trauma: Which Factors Are Responsible?—Results From a 17-Year Follow-up

Christian D. Weber, MD, Klemens Horst, MD,* Anthony R. Nguyen, MD,†
Magdalena J. Bader, MD,* Christian Probst, MD,‡ Boris Zelle, MD,§ Hans-Christoph Pape, MD,*
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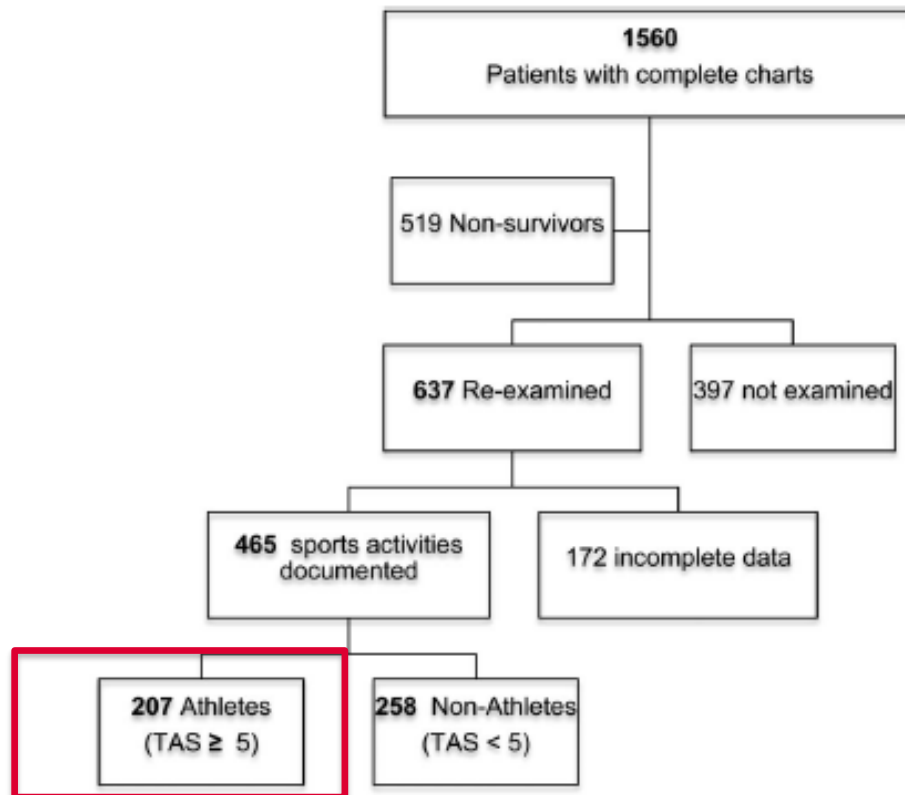


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TABLE 3. Outcome Parameters

	TAS ≥ 5 (n = 207)
SF-12 physical	43.9 (± 11.1)
HASPOC	66.7 (± 45.0)
Glasgow Outcome Scale (GOS)	4.88 (± 0.406)
Need for medical aids	38.5%, n = 80
No Return to number of sport activities	59.1%, n = 123
No Return to quality of activities (high vs low impact)	53.0%, n = 107
Reduced Fitness (self-reported)	74.0%, n = 154
Successful Rehabilitation (self-reported)	73.1%, n = 152
Inpatient rehabilitation (duration in days)	79.2 (± 164.8)
Outpatient rehabilitation (duration in days)	266.7 (± 692.7)



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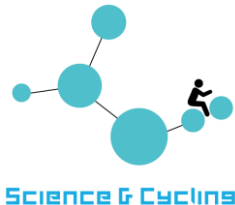
TABLE 4. Regression analysis: Injuries interfering with return to sport

	<i>P</i>	OR	Lower 95% CI	Upper 95% CI
Head/facial	NS	1.96	0.72	5.33
Chest	NS	3.22	0.34	30.51
Abdomen	NS	0.71	0.02	22.89
Spine	NS	6.61	0.78	56.24
Upper extremity	NS	1.81	0.59	5.48
Lower extremity NFS	0.018	2.54	1.17	5.51
Lower extremity (neuro)	NS	0.50	0.88	2.87
Pelvic ring	NS	0.38	0.06	2.55
Hip/Acetabulum	NS	2.89	0.72	11.6
Femur shaft	NS	1.13	0.29	4.21
Knee joint	0.007	3.4	1.39	8.27
Foot/Ankle	NS	1.27	0.54	3.03

RTP after severe injury

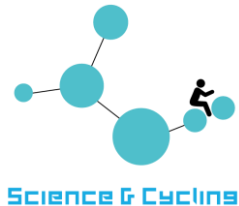
Do high level athletes who sustain poly-trauma return to their previous level?

- Mean 346 days of rehabilitation before RTP
- 73% return to some form of physical activity.
- 53% do not return to their previous sporting activity or level
- 74% report a lower level of fitness than before injury
- Lower extremity injuries associated with lower RTP (OR 2.5)
- Knee injuries are the worst (OR 3.4)



RTP after severe injury

What about professional cycling?





Orthopaedic Journal
of Sports Medicine



Prevalence and Epidemiology of Injuries Among Elite Cyclists in the Tour de France

Heather S. Haeberle,* BS, Sergio M. Navarro,* BS, Eric J. Power,* BS,
Mark S. Schickendantz,[†] MD, Lutul D. Farrow,[†] MD, and Prem N. Ramkumar,^{†‡} MD, MBA

Investigation performed at Cleveland Clinic, Cleveland, Ohio, USA



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Injury Type	n	Mean Age, y	Return-to-Competition Time, d	Surgical Treatment, %	Return-to-Competition Time by Group, d		P
					Surgery Group	Nonsurgery Group	
Fracture	67	30.4	60.3	43	77.1	44.4	.065
Clavicle	21	30.2	49.0	48	37.6	75.5	.007
Wrist	6	28.4	48.7	50	45.7	N/A	
Hand	5	29.3	45.0	40	68.5	N/A	
Femur	5	31.4	129.4	100	129.4	N/A	
Rib	5	32.9	79.8	40	134.5	43.3	.1485
Humerus	5	31.2	41.0	0	N/A	46.0	
Spine	4	30.2	152.7	100	152.7	N/A	
Scapula	3	28.4	39.0	0	N/A	39.0	
Elbow	2	30.9	31.5	50	26.0	37.0	
Tibia	2	30.8	127.5	100	127.5	N/A	
Forearm	1	25.7	15.0	0	N/A	15.0	
Patella	1	37.2	N/A	100	N/A	N/A	
Pelvis	1	27.5	44.0	0	N/A	44.0	



RTP after severe injury

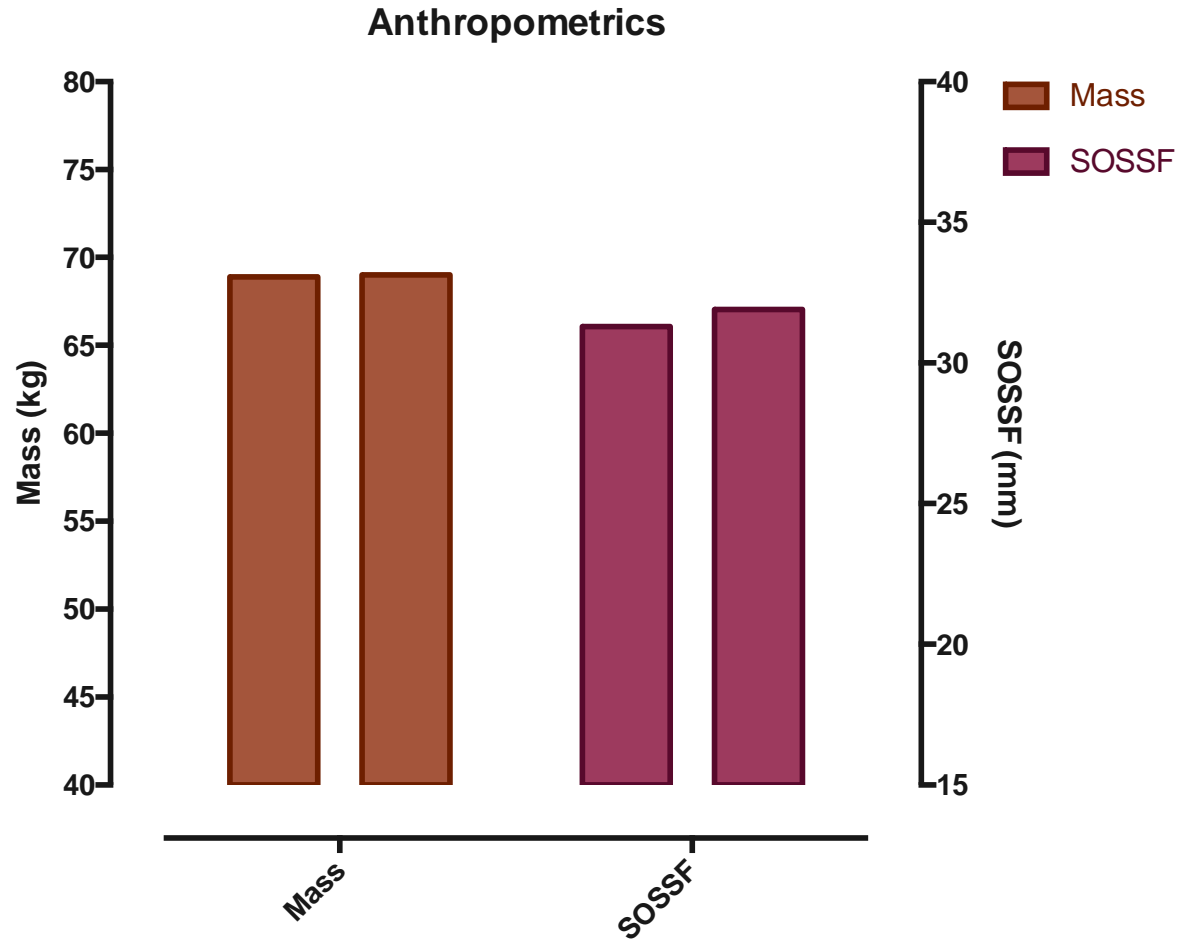


A

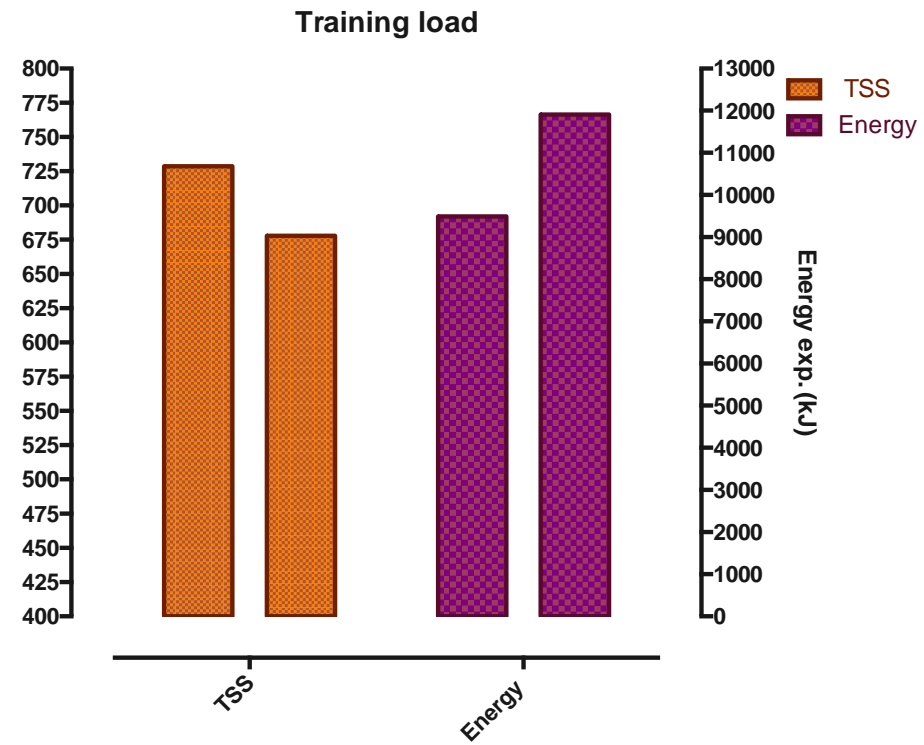
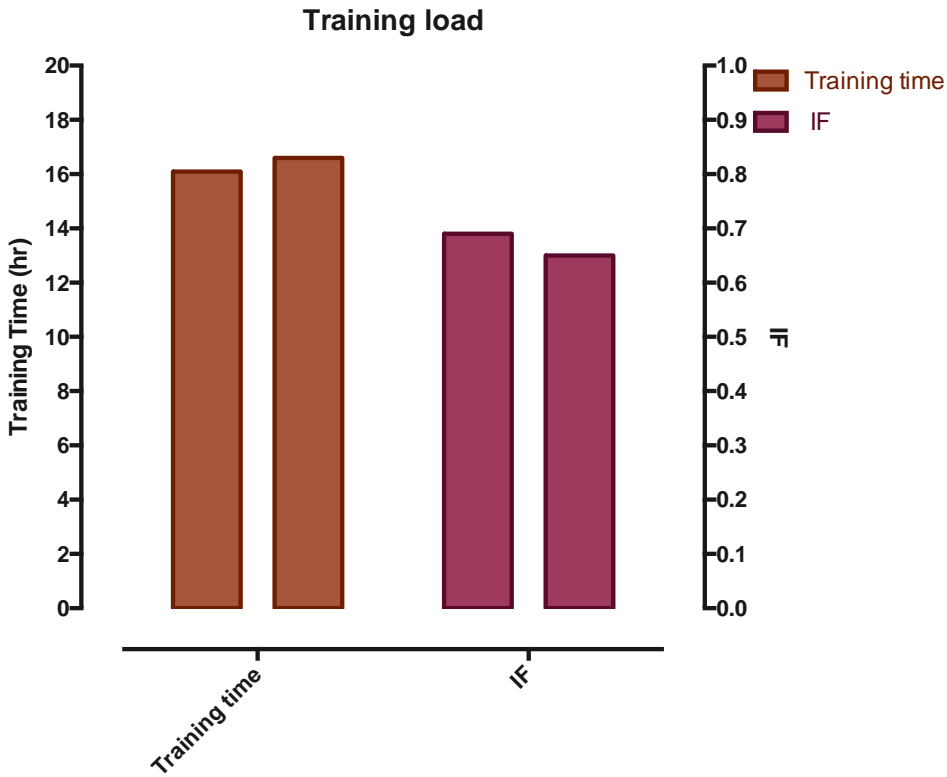


B

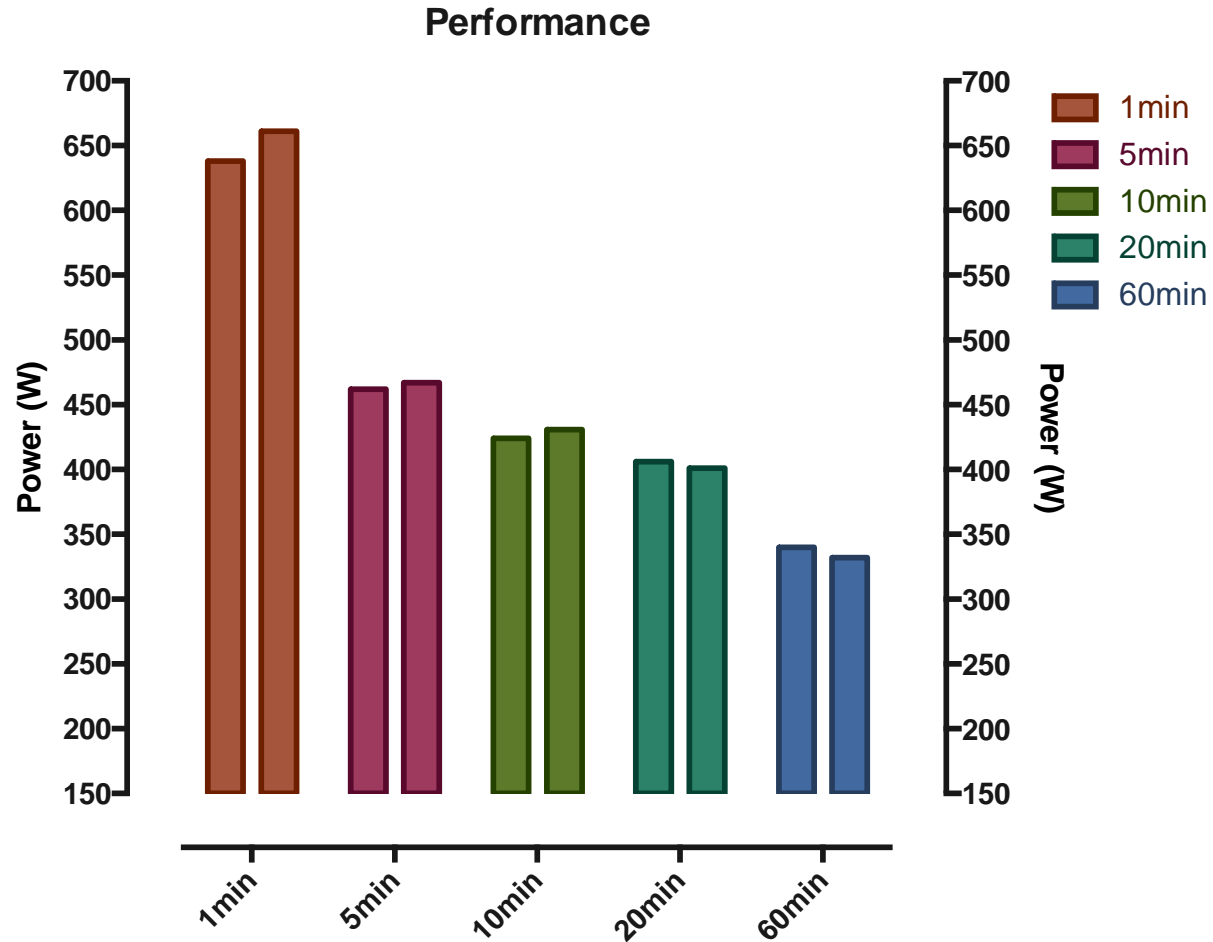
Pre-injury status



Pre-injury status



Pre-injury status

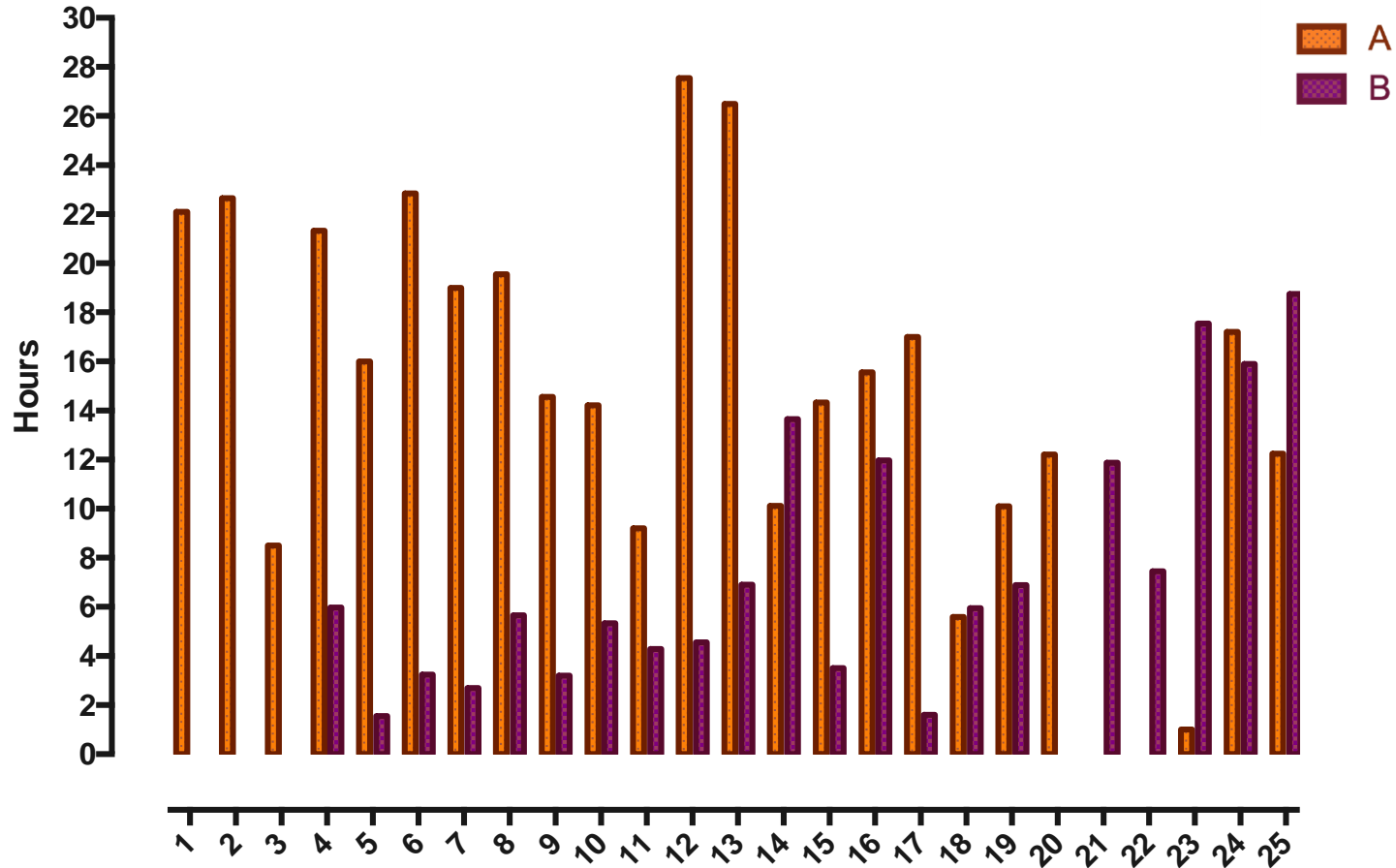


The injury



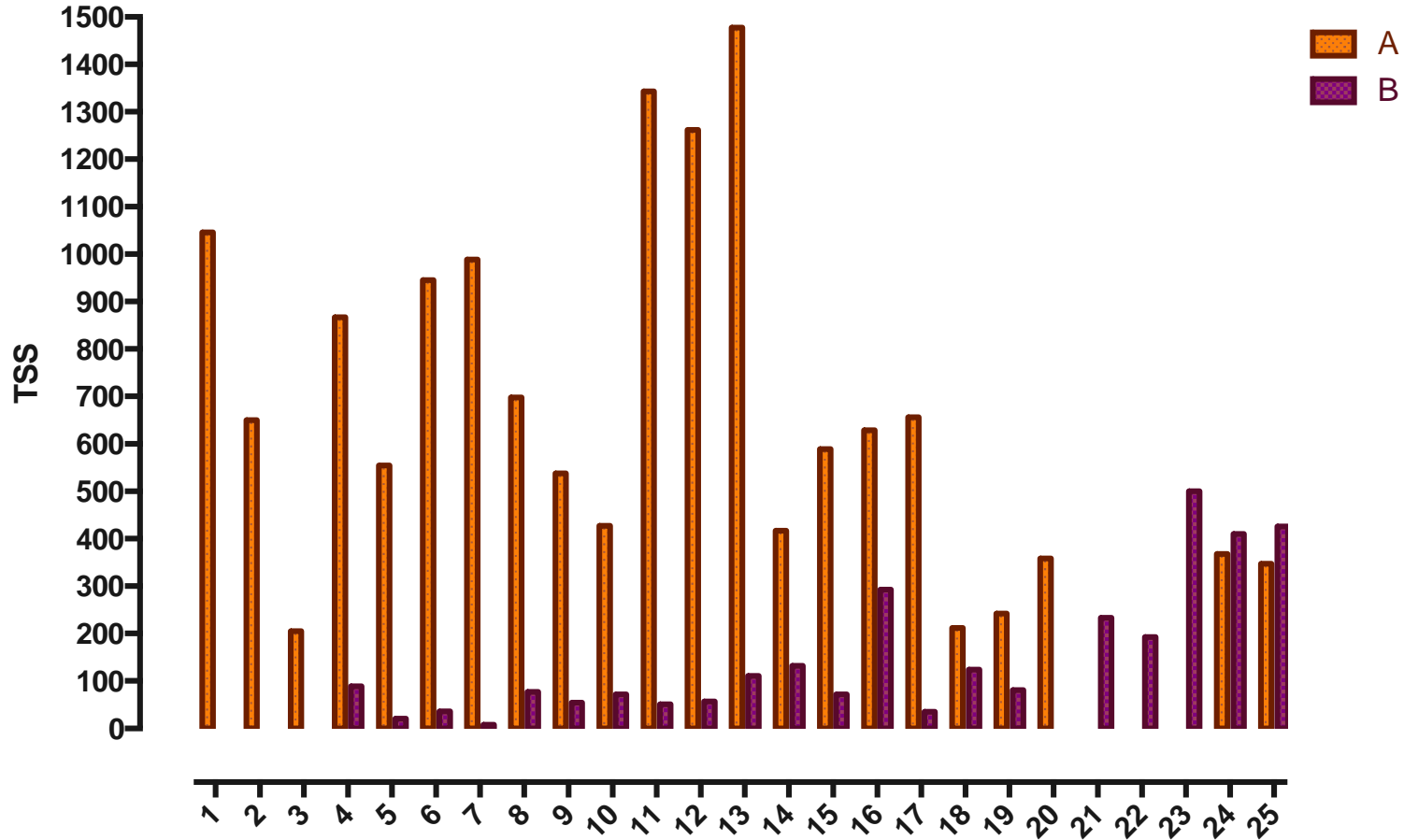
Post-injury

Training load

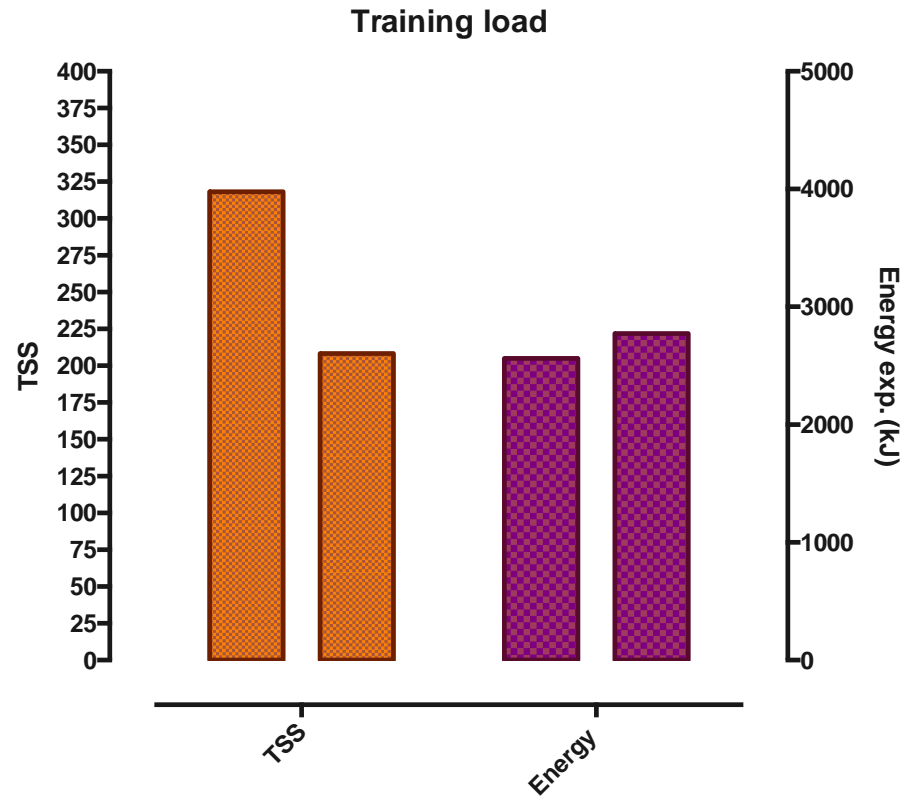
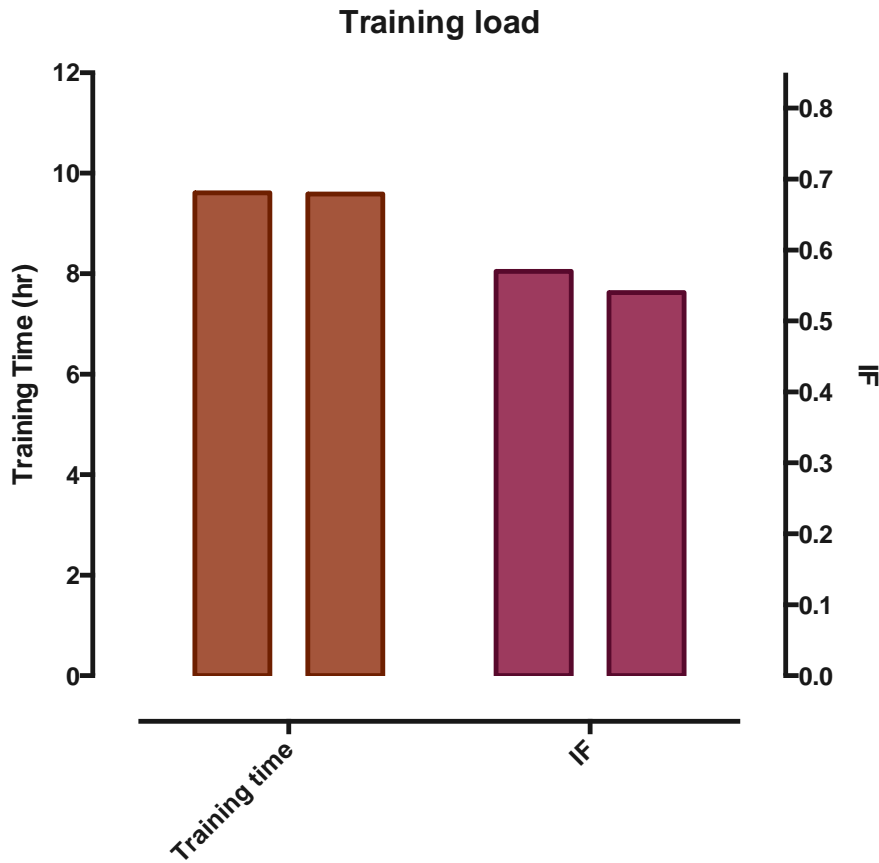


Post-injury

Training load



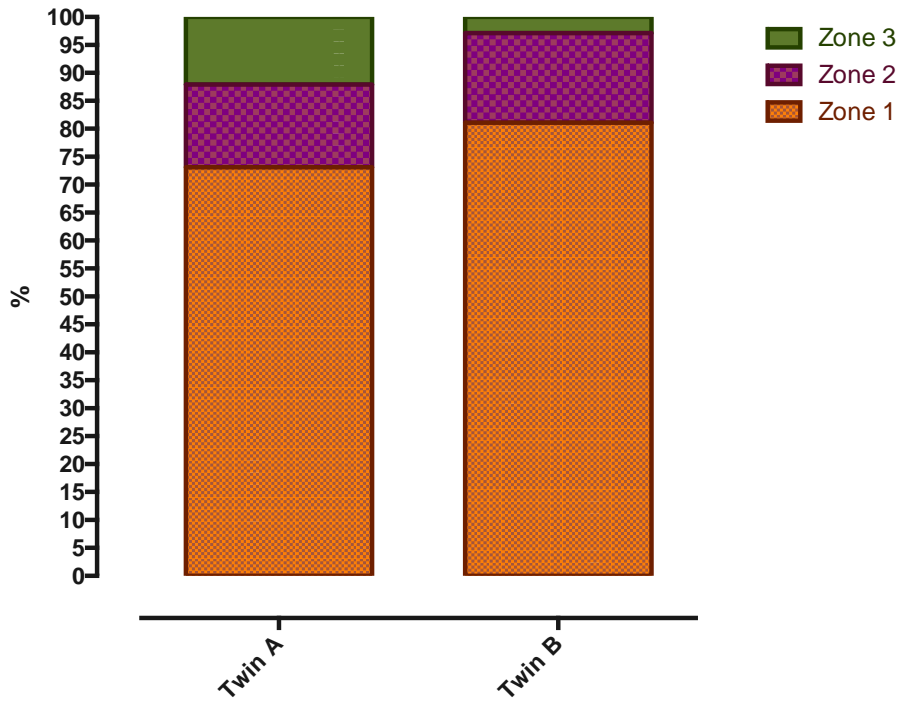
Post-injury



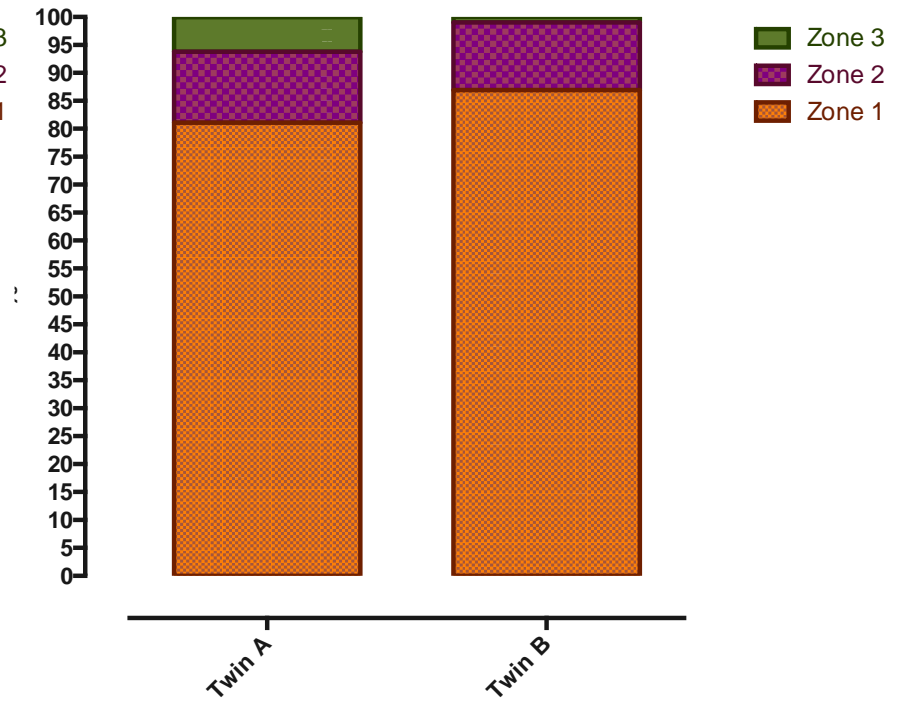
Post-injury

TID

Physiological test data



FTP derived



Post-injury

A

RELATIVE VO₂ MAX (ML/MIN/KG)

75.47

ABSOLUTE VO₂ MAX (L/MIN)

5.28

PEAK POWER OUTPUT (WATTS)

465

PEAK POWER-TO-WEIGHT (W/KG)

6.64

GROSS EFFICIENCY (%)

22.1

COMPOUND SCORE (W²/KG)

3089

B

RELATIVE VO₂ MAX (ML/MIN/KG)

73.12

ABSOLUTE VO₂ MAX (L/MIN)

5.12

PEAK POWER OUTPUT (WATTS)

460

PEAK POWER-TO-WEIGHT (W/KG)

6.57

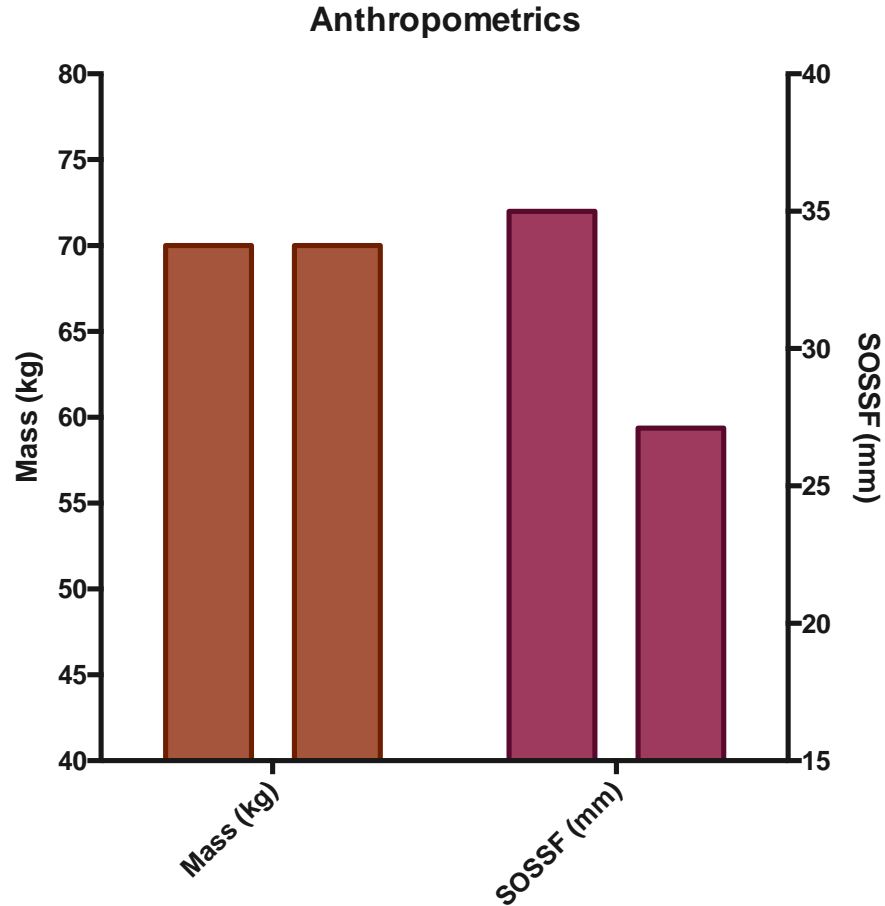
GROSS EFFICIENCY (%)

20.8

COMPOUND SCORE (W²/KG)

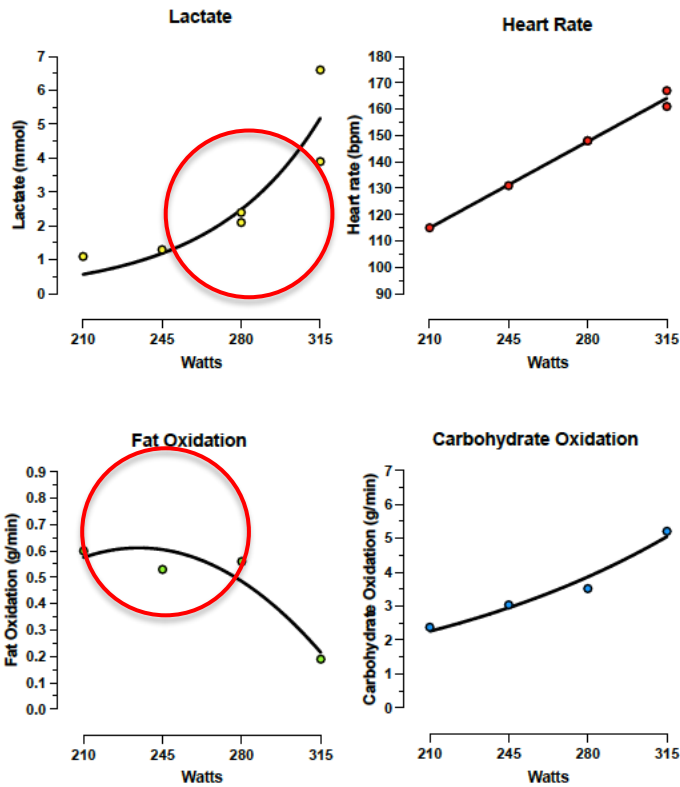
3023

Post-injury

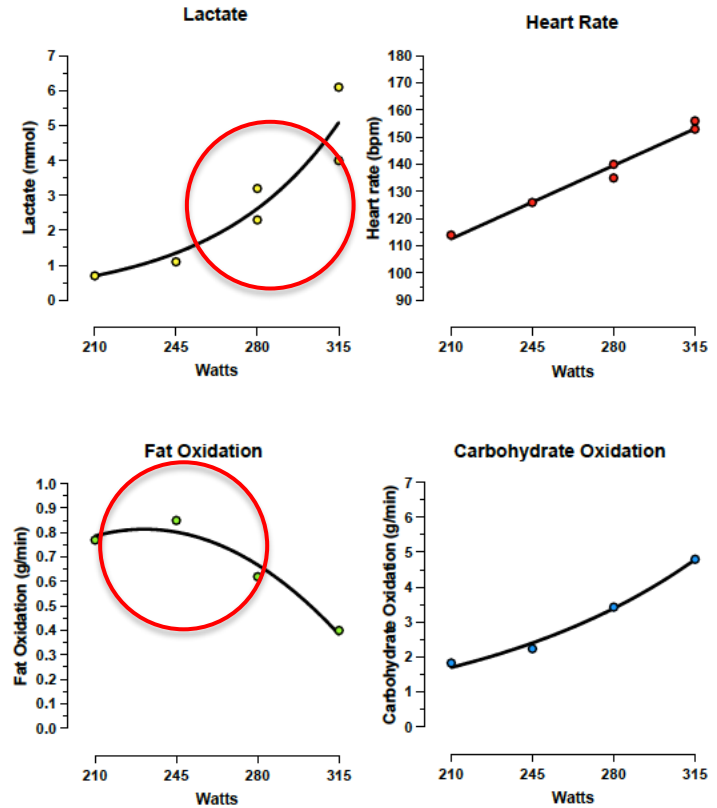


Post-injury

A



B



RTP after severe injury

Summary

- RTP 125-150 days with severe injury
- Return to competitive level more likely after 150-200 days
- Training intensity distribution may be important & could affect both somatotype & training induced metabolic adaptations at RTP
- Polytrauma takes longer (2X) and has poorer outcomes
 - 25% do not return to previous level
 - Lower limb and knee injuries increase this risk 2-3 fold

THANK YOU

