



# Intelligent Training **Injury & Robustness**

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Performance Assessment Weekend 2018

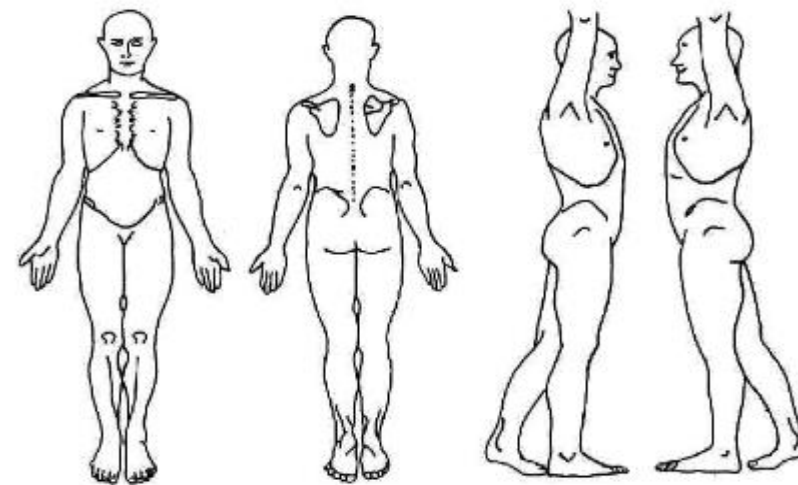
# Introduction to Physiotherapy - Screening

## What it does:


- Initial introduction to physiotherapy
  - History of illness and injury
- Physical capacities (Muscle)
- Range of Movement
- Quality of Movement

## What it doesn't!

- Predict injury



# Introduction to Physiotherapy - Screening

Pre Season Profiling						
Athlete	[REDACTED]				Pre Season	
Date	13/11/2015				1	
Attempt	1st				L	R
ROM	Joint	Test	Units	Target		
	Shoulder	<a href="#">Internal Rotn</a>	Degrees°	≥45-60°	60	50
		<a href="#">External Rotn</a>	Degrees°	≥90-105°	90	90
		<a href="#">CET</a>	Degrees°	≥5-15°	-10	-10
	TxSp	<a href="#">Thoracic Rotn</a>	Degrees°	≥40-50°	45	50
	Hip	<a href="#">Hip Extension</a>	Degrees°	≥12-30°	-5	-5
	Ankle	<a href="#">DF</a>	Cm	10-12cm	8	13
CAPACITY	Muscle					
	Hamstring	<a href="#">90/90 Bridge</a>	Reps to fatigue	> 30	21	26
	Adductor L	<a href="#">Adductor L Bridge Hold</a>	Secs to fatigue	> 30s	39	53
	Adductor M	<a href="#">Adductor M Bridge</a>	Reps to fatigue	> 30	27	30
	Gastroc	<a href="#">Straight leg calf raise</a>	Reps to fatigue	> 30	21	27
	Soleus	<a href="#">Bent leg calf raise</a>	Reps to fatigue	> 30	25	27
FUNCTIONAL	Test					
	QASLS	<a href="#">Single Leg Squat</a>	Score /10 in frontal plane	0-1/10	5	3
	My Jump App	<a href="#">DL hop</a>	cm height		25.3, 28.7, 31.7, 33.3	
			ms flight time		455, 484, 508, 521	
	Y-Balance	<a href="#">3-point reach test</a>	1. Anterior	average cm	87	91.33333333
			2. Posterior-medial	average cm	89.66667	92.5
			3. Posterior-Lateral	average cm	87.66667	91.16666667
	OptoJump		Contact time av	ms		
			Flight time av	ms		
			Stride length av	cm		

# Injury and Illness Audit at BTF

## What is measured and Why?

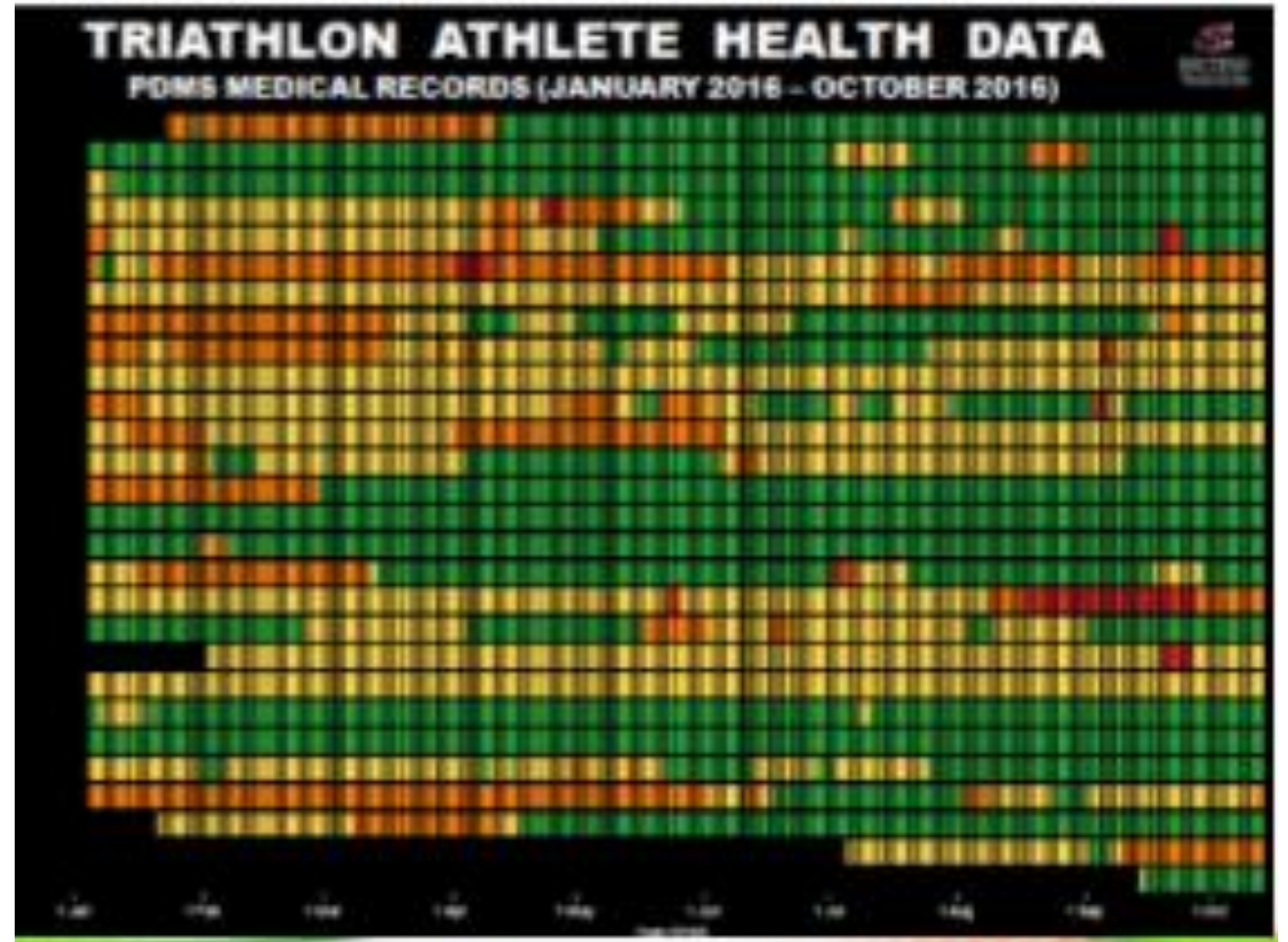
### What?

- All illness and injury burden; recorded in number of days lost or adapted.
- Effect of individual disciplines of swim, bike and run.
- Effect on racing / performance

### Why?

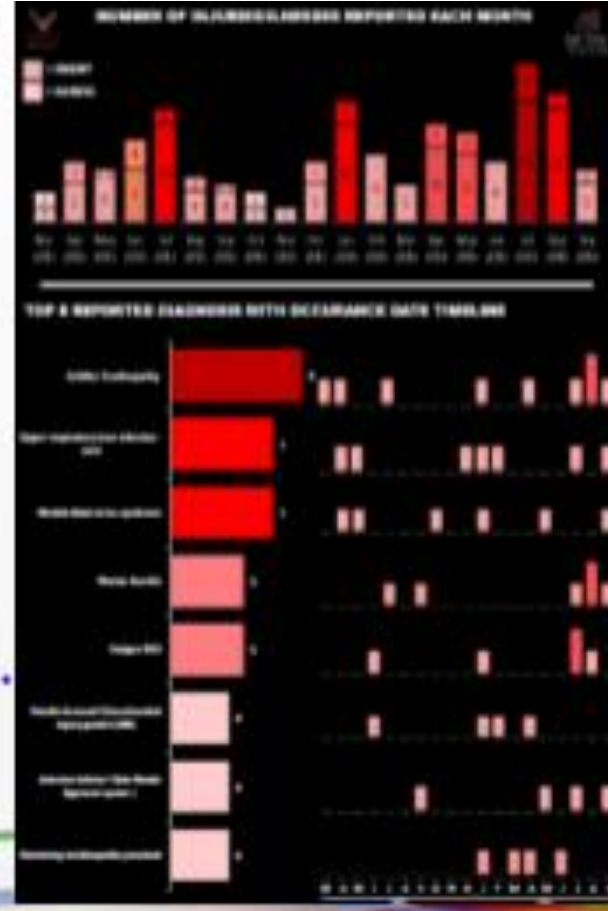
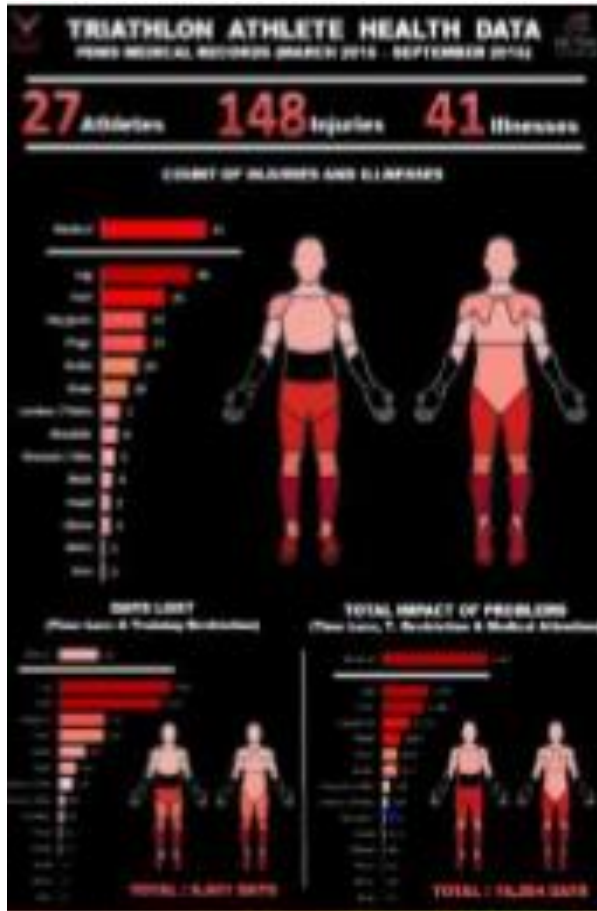
Reduce injury and illness risk to maximise performance, through:

- Maximising Availability / freedom to train
- Optimising Effort /reduce modification
- Ensuring Recovery





# Results of Audit



- Filter through the programme.
- Patterns and Trends
  - Injury Type
  - Female v's Male
  - Times of season
  - Risk periods in athlete development

# What we know...

## Risk Periods

Development – Junior to U23

- Race distance
- Volume, intensity of training
- Move to centre/university

## Gender

- Types of injuries

## Seasonal

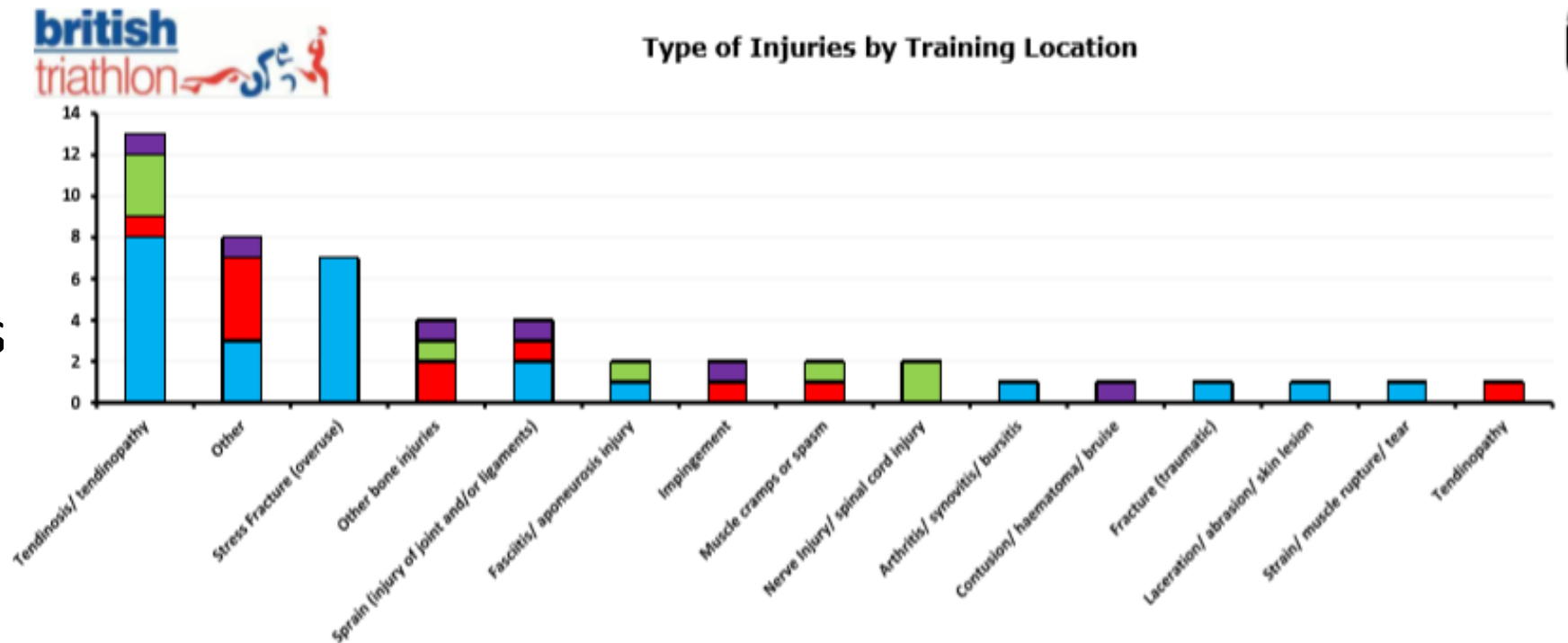
- Winter V's Summer



# Common Triathlon Injuries

- Overuse (Training Volume V's Physical capacity/Robustness)
- Lower Limb
- Run Specific

1. Tendinopathies
2. Bone Stress
3. Shin Splints



# Bone Stress: Signs and Symptoms

- Common sites – Shin, Foot, Hip, Lumbar spine

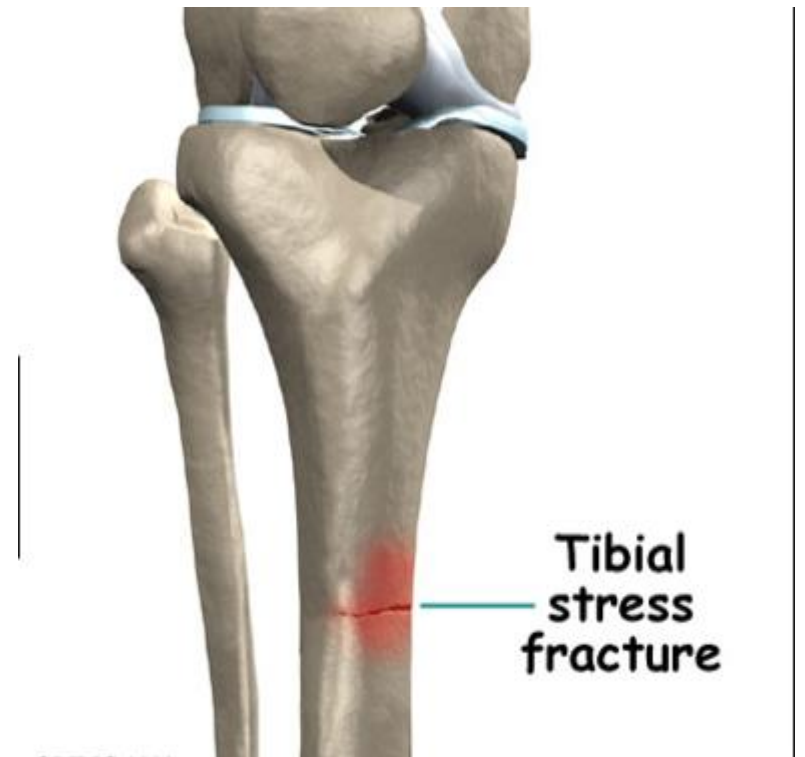
S&S:

- Localised bone pain (normally on running/impact)
  - Comes on earlier in session
  - Felt on lower impact activities, walking, stairs, out of saddle
- Ache post activity/night pain

Why:

- Previous Hx of bone stress
- Increase in training volume
- Change of surface
- Random presentation
- Girls – gaps in menstrual cycle

Diagnosis: CT Scan V's X Ray







# Female Athletes and Bone Stress

- Increase risk in females: train >5 hours a day
- Dietary deficiencies, negative energy balance
- Menstrual irregularities
  - Alteration in oestrogen / effect on bone
- Lower bone mineral density

\*Late starting / irregular menstruation

Contact GP for Review



# Tendinopathies – inability to tolerate load

- Common sites – Achilles, Hamstring, Peroneal

S&S:

- Pain on loading
- am stiffness
- Unpredictable response to load

Why:

- Spikes in loading history, \* training after a break, after offload
  - Volume, speeds, biomechanics, footwear
- Previous tendinopathy
- Poor muscle capacity/strength



# Tendinopathies - Prevention

- Load monitoring – graded increase in training loads
- Graded return to running post breaks
- Avoiding fatigued running



- **S&C**

- The muscle/tendon units ability to accept load
- Increase specific muscle capacity
  - Calf (Gastroc and Soleus)
  - Hamstring



# Robustness – the basics

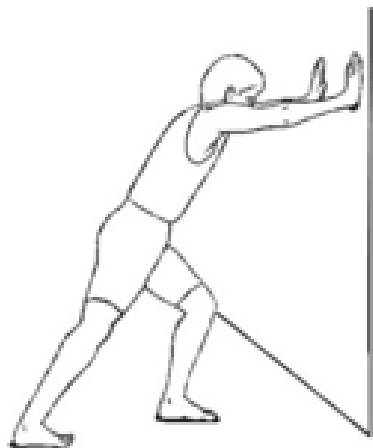
## S&C: the 4<sup>th</sup> discipline of Triathlon

- Stretching
- Foam roller
- Core Control
- Lower Limb Capacity
- Drills
  - Plyometric loading
  - Landing mechanics
  - Multi directional





# Essential Stretches



# Essential Foam Roller



# Core Control for Triathletes

- Streamline in the swim
- Stability on the bike
- Efficiency on the run

**Dynamic Core Control!**

**Ineffective core:**



# Effective Core Control for Triathletes

## 1. Glutes: Clams



## 2. Dead Bugs / Supermans



## 3. Functional Exercise e.g. Deadlifts / Overhead Squats



# 4 Strength exercises not to miss!

Posterior Chain Strength:  
R v's L, Capacity (pre/post injury)

Calf = Straight Leg Heel Raises

Calf = Bent Leg Heel Raises

Hamstring Bridges

Glute = Clams





# Injury Prevention: Key Components

## Intrinsic

- S&C
  - Range of Movement
  - Strength
  - Capacity
- Drills
  - Technique based
- Rest and Recovery
  - Nutrition
    - Fuelling = what, how and when

## Extrinsic

- Training
  - Loading, build up
  - Terrain
  - Make up// Fresh & recovered for key sessions
- Equipment
  - Bike set up
  - Footwear



# Questions

