

Module 1 – Musculoskeletal Screening:

Why do a functional movement assessment/screening?

- To identify individuals at risk (e.g. individuals with certain muscle imbalances), who are attempting to maintain or increase their activity levels.
- To assist in training program design, by using corrective movements to normalize or improve fundamental movement patterns.
- To provide a systematic tool to monitor progress & movement pattern development in the presence of changing injury status or fitness levels.
- To create a functional movement baseline, which will allow movement to be rated and ranked for statistical observation.

Positive side-effects from musculoskeletal screening (as per Hewitt, 2016):

- Can be used to identify at risk subgroups
- Medical/research team engagement with athletes
- Athlete education & team awareness
- Potential placebo & Hawthorne effects
- Objective testing to identify deficits
- Enhancement of athlete performance
- Target 'evidence-based' interventions

Steps required to validate a musculoskeletal screening test (as per Bahr, 2016):

1. A strong relationship between a marker from a screening test and an injury risk.
2. Tests need to be examined in relevant populations using statistical tools.
3. Evidence that an intervention given to 'at risk' athletes is more beneficial than the same program given to all athletes.

Common Assessment Batteries:

- Functional movement screen (FMS)
- Postural assessment – to identify abnormalities in the resting alignment of the body
- ROM testing (e.g. Ely's test – used to identify rectus femoris tightness)
- Muscle activation tests (e.g. prone hip extension)
- Beighton scoring system for hypermobility

AFL Musculoskeletal Screening Protocol:

- **Level 1 Tests (valid for use in AFL – have been shown to predict future injury & have *high* reliability):** ankle dorsiflexion standing lunge, single leg squat, prone hip internal rotation passive fallout, squeeze 60, squeeze 0, supine hip internal rotation at 90°, supine active hip internal rotation, supine active hip external rotation.
- **Level 2 Tests (may be valid for use in AFL – *may* predict future injury & have *moderate* reliability):** single leg stance for balance, single leg calf raise, hip

quadrant/hip impingement test, modified Thomas test for hip flexor, modified Thomas test for quadriceps length, elevated single leg bridge.

- **Level 3 Tests (may still be clinically relevant, but have no evidence for their validity).**

Module 2 – Injury Prevention & Musculoskeletal Rehabilitation:

- The **training-injury paradox** refers to the fact that athletes who are accustomed to high training loads sustain fewer injuries than athletes training at lower workloads.
- Higher levels of intermittent *aerobic* fitness have been shown to reduce the risk of injury in soccer players (during high speed running/sprinting).
- **Non-contact, soft tissue injuries** are most likely caused by an inappropriate training program (excessive, rapid increases in training load). One way to monitor training load is by calculating the acute:chronic workload ratio.
- How quickly the training load increases is *more* important than the training load itself.

The acute:chronic workload ratio:

- The **acute:chronic workload ratio** is the ratio between the acute training cycle (1 week) and the chronic training cycle (a rolling average of the most recent 4 weeks of training).
- A ratio of over 1.4 (acute:chronic) has been shown to increase an athlete's risk of injury. A ratio of 0.85-1.35 has been shown to make players *more* resistant to injury.
- If the chronic workload is high and the acute workload is low, then the athlete is well prepared.
- If the acute workload exceeds the chronic workload, then the athlete is considered underprepared and at an increased risk of injury.

Injury prevention (based on a specific injury):

- **Primary prevention:** removal or reduction of causal factors (e.g. pre-season screening).
- **Secondary prevention:** early injury detection to prevent progression or worsening of the injury.
- **Tertiary prevention:** reduction of the complications and long-term burden of an injury.

Injury prevention (based on injury risk factors):

- **Universal prevention:** common risk factors to most or all sports (e.g. sleep, nutrition, training loads, mental health).
- **Selective prevention:** risk modifiers displayed by asymptomatic individuals (e.g. age, sex, sport & training age).
- **Indicated prevention:** selective & universal risk factors for athletes at a higher risk of injury (e.g. those with a previous injury history).