



Functional Screening for Gaelic Games

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of The Newry Clinic

Introduction

The Functional Athletic Screening procedure as designed by The Newry Clinic is a test of how an athlete moves.

“If you aren’t testing how an athlete moves, then you are only guessing how the athlete moves.”

Screening athletes is an assessment tool that has been used by sport coaches /managers to assist in improving performance. The aims of screening are to highlight specific areas where athletes can adjust components of their training in order to gain improvement. The downfall of most screening procedures is that this is the limit as to where they go. Where the screening procedure designed by The Newry Clinic differs is that not only are we highlighting the athlete’s movement deficiencies, we are also highlighting the reason for such deficiencies and giving the solutions as to how these can be rectified.

The Functional Athletic Screening gives players a score of how they move and therefore provides an objective marker for comparison within a squad and also a marker for re-assessment in the future.

The Screening Procedure:

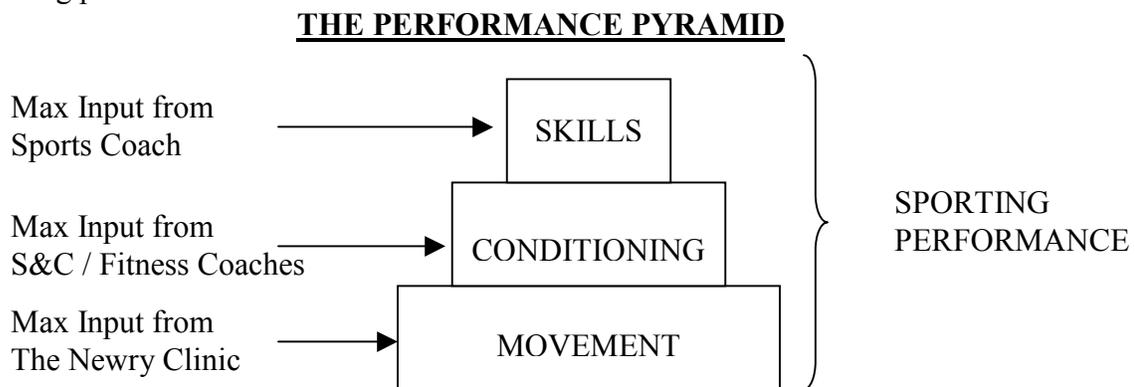
1. Functional Athletic Screening (Movement and Stability Tests)
2. Musculo Skeletal Assessment
3. Exercise Prescription
4. Fitness Testing (Conditioning)

Why Perform Athletic Screening?

In order to better understand what we are trying to achieve with our athletes we should consider the 'Performance Pyramid'. It is a simple diagram constructed to give you a mental image of sporting movement.

The pyramid consists of three fundamentals of sporting performance – each level is built on the other with the lower level needing to be in excess of the one above it to prevent inefficiency of performance – this is known as a 'Buffer Zone'.

This diagram will, hopefully give an understanding of the pre-requisites of maximum sporting performance.



The lower rectangle represents Basic Movement Skills – these are the components of sporting movements, ie running, jumping, etc. When broken down into its most basic level, one of the components of jumping is the squat.

If you have poor squatting technique it will have a negative affect on the ability to produce power when jumping.

The assessment of basic movement skills is not about how strong or fast you are but it assesses your ability to move freely through the full range of movement in a controlled manner, ie how you carry out the movement.

EXAMPLE: When squatting can you maintain your heels on the ground and keep you upper body straight as you lower you body to the floor?

Basic movement skills assess:

1. An athlete's ability to move through fundamental patterns
2. An athletes flexibility / mobility and identifies any restrictions which may limit their movement
3. An athlete's stability – do they have the core strength to control basic movements through a full range?

The middle rectangle represents sports conditioning which is an umbrella for the many facets of athleticism. It encompasses power, strength, speed, agility, coordination and endurance.

Once it has been established that an athlete can move effectively they then need to be assessed to ascertain if they have the athletic ability to perform their particular sport.

Different sports have different requirements but in this section the ability to produce general power or gross athleticism is the key.

The vertical leap is a good example of gross athleticism as gravity affects every individual in the same way regards of their shape or size. The vertical leap assesses explosive power as an athlete jumps as high as they can from a squat. It is dependant on the range you can squat as well as the strength in your legs to push off i.e. it demonstrates our ability to produce power.

Fitness testing at this point is essential to identify the overall physical condition of the athlete so appropriate training programmes can be developed.

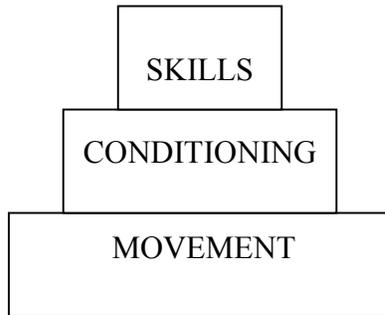
The top rectangle encompasses sport-specific skills. With regard to Gaelic football and hurling this involves passing, tackling, blocking, etc as well as the tactical awareness of how to play certain positions.

At this level the development rests with the sports coach and often benefits from competitive statistics and player analysis.

When screening athletes each one tends to fall into different categories. Our aim is to identify if there are any deficiencies which, if addressed, would enhance sporting performance.

The Categories Athletes Tend To Fall Into Are:

OPTIMAL PERFORMANCE PYRAMID



This shows an athlete who has Optimal Basic Movement patterns and thus has the ability to explore full range of movement in a controlled manner.

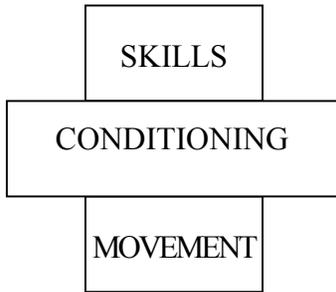
They have Optimal Sports Conditioning for their required sport with a balance of power, speed and endurance ensuring they are above average to physically compete in their sport.

The top level shows Optimal Sport Specific Skills.

This suggests that the athlete moves well and has good athleticism and skill to compete at their particular level. It does not mean, though, that improvement cannot be made but it suggests a balanced training regime to incorporate the whole pyramid will continue to progress.

The optimal performance pyramid shows how, when the ratios of athletic components are balanced correctly, they should fit the Performance Pyramid.

THE OVERPOWERED PERFORMANCE PYRAMID



This athlete tends to score very poorly on basic movement testing as they tend to be lacking adequate flexibility and core stability (lower rectangle) but they have high conditioning results from fitness testing.

These athletes tend to focus on the “show muscles” in the gym and although they obviously train hard, it is often misdirected, lifting heavy weights through a small range of motion and classically focus their attention on their biceps and pecs.

These athletes may be performing adequately in their sport but they are unlikely to improve their power or speed much more due to their limitations in flexibility and movement patterns.

These restrictions may, for example, lead to reduced stride length when running and thus sub-optimal running technique. Although they may be quick they are unlikely to improve their speed until their stride length increases which in turn will only increase if they work on their flexibility to increase this.

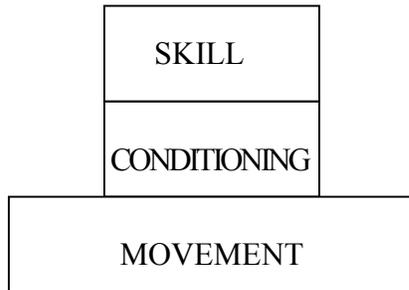
These athletes need education about the balance of their gym programmes as well as extensive input about technique through full range of movement.

Initially the athlete may need to drop their weight as they concentrate on technique but they will quickly increase it again but this time through a greater range, thus improving their power-generating potential.

To maintain their conditioning whilst improving movement patterns they need:

Longer warm-ups	}	To improve flexibility
Deep soft-tissue massage		
Stretching		

THE UNDERPOWERED PERFORMANCE PYRAMID

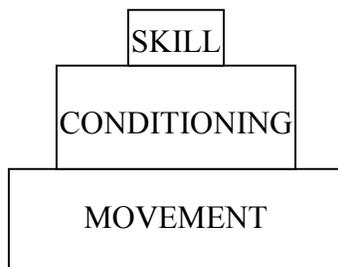


This athlete has optimal levels of basic movement skills, ie can fully squat with control but they lack physical conditioning i.e. they are not strong enough or not fast enough.

These athletes tend to have enough skill to compete at high level and have the basic movement skills to be a good athlete. However, they lack the strength or endurance to cope with the physical demands of the game or with intensive training, particularly if they are aiming to train / play at a higher level.

These athletes need to work closely with strength and conditioning / fitness coaches after they have been fitness-tested to be placed on specific programmes eg strength programme or endurance training.

THE UNDERSKILLED PERFORMANCE PYRAMID



These athletes have optimal basic movement skills and good power production but simply do not have sufficient mastery of the sport skills.

In Gaelic football an hurling these tend to be the big strong midfielder who can run all day and make big tackles but cannot kick-pass a ball ten yards.

They need regular methodical skills training and analysis from their coach, identifying their weaknesses and focussing on them. These athletes require commitment to extensive skills-training because hitting the weights-room alone will not make any difference. However the skills training should include drills which maintain their conditioning.

There are several different types of performance pyramids and each athlete will fall into a different one. Some athletes are naturally gifted but they need to work hard on conditioning; others need to do extra training to work on their athleticism.

Therefore, the pyramids demonstrate that simply replicating the same programme with a squad of athletes will not consistently yield the desired results.

The key is to expose the greatest weakness and work to improve it.

Then re-assess objectively to determine if improvement has been made and decide if other weaknesses have now become apparent.

In order to design an appropriate screening examination, we must first understand what components are required to achieve each person's full potential athletically.

In most field sports these components can be broken down into running (jogging and sprinting), jumping and landing (statically or dynamically), to twist and turn under control and the ability to receive and give heavy body contacts.

These components of running, jumping, etc can be further broken down into MOVEMENT patterns and Stability Tests in order to find the weak links.

Identifying The Weak Links

The term 'weak link' does not mean simply a muscle weakness. It can be used to identify any physical limitation. It can also be used to identify inadequate movement patterns, poor stability, poor endurance, faulty co-ordination, limited sport skill or lack of flexibility.

When we look closely at these movement patterns in the screening process it allows us to identify actual:

- Muscle imbalances (eg short overactive muscles versus long weak muscles. If we look at the hip for example)
- Asymmetries – of Left / Right differences, ie hamstring length affects striding motion
- Weaknesses eg leg strength, upper body strength, core strength
- Mobility / Flexibility eg hip / shoulder ROM
- Co-ordination – especially eye / foot / hand relationships
- Balance / Proprioception especially in the dominant side

If a player has any of the above then they are inefficient in the way they move.

Over time this inefficiency may cause loss of endurance, speed, strength, agility and overall power. Even worse it may lead to eventual breakdown or injury.

Many athletes think they already know what their weakest links are. However, their opinions, emotions, likes and dislikes about training and conditioning, as well as their chosen sport are 5the key factors in a player's perceptions of his / her weak links. It is extremely difficult for an athlete to evaluate him / her self without some objective tool or standard criteria.

It is important to stress that improvement will not prevent injury. But it will reduce the risk of injury. The aim of Functional Athletic Screening is Performance Enhancement!

FAS (Functional Athletic Screening) 10 Tests

1. Deep Squat
2. Single Leg Squat
3. Hurdle Step Over
4. In Line Lunge
5. Shoulder Mobility
6. ASLR (Active Straight Leg Raise)
7. Scapular Stability
8. Bridge Stability
9. TSPU (Trunk Stability Push Up)
10. Seated Rotation

Overall Score Marked out # / 30

Sample Screening Tests

In-Line Lunge



This test attempts to place the body in a position that will focus on the stresses simulated during rotational, decelerating and side-to-side type movements. The In-Line Lunge is a test that places the lower extremities in a scissored position, challenging the body's trunk and extremities to resist rotation and maintain proper alignment.

The ability to lunge effectively with good technique demonstrates how the upper and lower body can move in an independent position and yet complement each other with balance and weight shifting.

This is vital for picking up a ball from the ground efficiently, therefore, executing the movement quickly with the body in a ready state to change direction immediately if needed. It is also the position the body is in when getting up from the ground quickly to commence running.

Failure to Lunge correctly will result in the body being easily knocked to the ground and slow to recover to the upright position, and also the inability to change direction quickly and powerfully when trying to avoid the opposition.

Lunge with Load



Trunk Stability Push-up



This tests the ability to stabilise the spine during movements that require the efficient transfer of power from lower limbs to upper limbs and vice versa (eg absorbing powerful body contacts, pushing / holding off opposition and recovery from a lying down to upright position in the quickest possible time).

Failure on this exercise can predispose the player to low back injury or dysfunction during heavy contacts on the pitch and loss of power during contact with the opposition.



The Musculoskeletal Assessment

The Musculoskeletal Assessment is a series of tests of specific muscle lengths / strengths, joint range of movement, posture and balance.

Not every muscle / joint is tested. Instead the Physiotherapist in this area is guided to specific areas of the body where deficiencies were highlighted in the previous movement assessment. Tests can isolate individual muscles / joints to decide what component of the area is deficient, eg in the case of a muscle is it short and overactive or is it long and underactive (weak). In the case of a joint it may be a hyper mobility (too much movement) or hypo mobility (too little movement / stiffness) problem.

Exercise Prescription

After the Functional Athletic Screening and Musculoskeletal Assessment the athlete will present with identification of any movement dysfunction and reason for the dysfunction. They will then be supplied with a specific exercise program to address any Musculoskeletal issues (such as reduced flexibility or stability) and also an exercise programme to improve their movement skills (such as lunging, squatting correctly).

Exercises can consist of:

1. Stretches
2. Mobility exercises
3. Core Stability work
4. Functional Exercises
5. Movement re-education
6. Endurance exercises
7. Power drills

They will only be given exercises appropriate to their level, ie if they cannot lunge properly then they will not be asked to Lunge with Load (weights).

Exercises must be performed regularly but again this is decided on assessment.

It is essential that these exercises are then included as part of their complete specific training programme.

Conditioning – (Strength and Conditioning) 6 Tests

1. 20m Shuttle Test (Cardio Vascular)
2. 30m Sprint Test (Speed)
3. T-Test (Agility)
4. Vertical Jump Test (Leg Power / Strength)
5. Push Up Fatigue Test (Upper Body Strength)
6. Sit Up Fatigue Test (Abdominal Strength)

The Outcomes

From the results of the Functional Athletic Screening and the Fitness Testing, we have an objective marker of the athlete's physical condition:

1. Score for Functional Athletic Screening marked out of 30
2. Fitness testing – timed readings

So What Now?

A report and recommendations can now be presented to managers / Strength and Conditioning coaches. Individual Functional Athletic Screening not only gives a score but also identifies areas where improvements can be gained. This also applies to the fitness testing. Where the two are related (Functional Athletic Screening and Fitness testing) is that the Functional Athletic Screening will have a direct effect on the Fitness testing but improvements in fitness can only be expected when a satisfactory training programme is implemented from the conditioning side.

Functional Athletic Screening and Fitness testing allows us to categorise players for dividing into training groups.

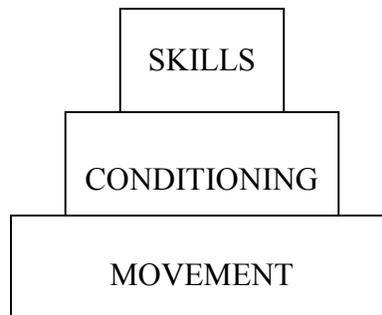
Categories may be:

1. High scorers
2. Implications for Lower Limb conditioning
3. Implications for Upper Limb conditioning
4. No Gym experience
5. Low conditioning
6. Specific conditioning
7. Treatment required

Therefore, conditioning can focus on the deficient area rather than continuing to concentrate on strengths only.

Conclusion

- If Functional Athletic Screening score improves then the athlete has a better foundation of movement (pyramid) which allows fitness (speed, power, agility, balance, etc) to improve.
- For Fitness to improve then the Functional Athletic Screening must be applied alongside a Strength and Conditioning programme to satisfy the 'Performance Pyramid'.



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MCSP SRP AACP OCPPP

Managed Sports Injuries Clinics within Newcastle University and was responsible for the care of the **Elite Athlete Squad**. This was made up of individuals who were **national and international level** in sports such as Rugby, Badminton, Judo and Swimming. His experience in Sports Injuries was further enhanced as Head Physiotherapist to **Professional Rugby League Team, Gateshead Thunder**, allowing Kieran to develop his skills in rehabilitation and core stability training. Following his extensive Musculoskeletal training and experiences, Kieran returned to Northern Ireland and has continued work at elite level with **Down Minor Gaelic Football Team** who became All Ireland Champions in 2005. He has also provided physiotherapy services to Down Senior Gaelic Football Squad.

FRANK QUINN

MCSP SRP ACPSM OCPHE

Has also worked in Sports Physiotherapy for the **British Gymnastics Association, British Swimming Association, Durham County Cricket Club and North of England Rugby Team**. However, the pinnacle of his career so far has been working for 3 seasons with **Sunderland Football Club** in the English Premiership and First Division with the club's Senior and Reserve squads. Since returning to Northern Ireland in 2005 he has been involved with the Down Senior Gaelic Football Squad, Abbey CBS, Newry - Hogan Cup Winners 2006.

STEPHEN BRANNIGAN

MCSP MSOM

Has worked in Sports Physiotherapy with **Birmingham City Football Club** for five seasons (four in the Premiership) as their first team physiotherapist. He has treated international players from all over the world such as Kenny Cunningham (Captain, Republic of Ireland), Christophe Dugarry (France World Cup Winner), Maik Taylor (N. Ireland Goalkeeper and Captain), Dwiight Yorke (Captain Trinidad and Tobago). Away from the Football Club he was heavily involved in the development and growth of a busy private practice in Birmingham where he has treated a wide range of sporting personalities including **European Tour Golfers and Class 1 Jockeys**