The role strength and conditioning plays within Fast Bowlers

Those readers that don’t know me, my name is Nick Karamouzis. In 2013, I graduated from the University of Teesside in Sports Therapy. That year, I obtained an internship at Hampshire Cricket. A year went by and fortunately was asked to stay on at the club for another 2 years – go me! I’m currently undertaking an MSc in Applied Sports Science at the University of Worcester and work alongside Lead S&C Michael Main (@MTJM89) and Head Physiotherapist Thihan Chandramohan (@TCPHSYIO). Easily best looking sports science and med team in cricket!!

What is Cricket?
Cricket is a game played with a bat and a ball. The game can last anywhere from 4 hours to 5 days depending on the format. Played between two teams of eleven players, each team takes it in turn to bat, whilst the opposing team fields the ball. The batting will continue until each batsman is out or a specified number of overs have been bowled. At that point the teams switch roles and the opposing team comes in to bat. The team with the most runs at the end wins. It is a unique sport in that is a series of individual battles put together to create a team game.

https://www.youtube.com/watch?v=D5kUPIblNbE

Is a fast bowler important?
Fast bowlers are considered some of the most influential players on the cricket field. Bowling in cricket involves an initial run-up, numerous rotations and circumduction of a straight arm about the glenohumeral joint to propel a ball at a batter. Put simply, the bowling action compromises of a short phase of acceleration, followed by a bound, a landing and a launch – think of a javelin throw. However, unlike Javelin this unhealthy,
stressful movement is repeated numerous times, over months, days and hours.

This complex movement has been researched thoroughly over many years. Current research has shown that at front foot contact, ground reaction forces can be as high as 8 to 12 times bodyweight. Epidemiological research has also shown that young and adolescent fast bowlers are at the highest injury risk, which has led most of the interventional studies to predominately focus on reducing injury incidence in this population. Less attention has actually been focused on the enhancement of bowling performance. There has however been recent increased interest from scientists, researchers and strength and conditioning coaches in the long-term development of the youth population.

**What makes a fast bowler?**

A major contributor to high level fast bowling performance is the velocity at which a bowler can deliver the ball. However, there is limited scientific information on the characteristics which relate to fast bowling ball speed. A number of reviews have concluded that although past investigators have correlated certain biomechanical attributes to high bowling speeds, none confirm any strong relationships between components of the technique and faster bowling speeds. Despite this lack of consensus, run up speed is one important determinant of release speed as well as other correlating attributes such as strength, greater physical stature and overall muscle morphology.

This lack of research led criteria means that skills coaches are still inconclusive as to what attributes contribute to creating a fast bowler. Despite, or because of this lack of clarity, Strength and Conditioning coaches are evermore interested on how to develop physical capacities to enhance bowling performance. Essentially fast bowlers are a prize asset in any professional cricket team. With only around six in a squad, keeping them available to train and play is critical to winning games, trophies and championships. This is a tricky business at times and requires an integrated approach involving all the members of the coaching/support team as well as intricate workload management, physical conditioning and player monitoring.

**What we do with them?**

Using scientific rationale and my overall knowledge of the sport, I have listed a few components that I believe a fast bowler needs to optimally perform at the highest level.
• Efficient Running Mechanics and Speed – Due to the exhausting season, if a player can become more technically efficient in this area, they can increase running speed, reduce fatigue and improve consistency in execution despite increasing workload.

Exercises you might see: specific drills working on ankle stiffness and reduction of trunk/pelvis rotation.

• Global Strength – This to me is the most important ingredient. If you think that throwing a med ball into a wall will make you bowl 90+mph consistently – then you’re wrong. Strength plays a huge role increasing rate of force development, attenuating and dissipating force. However, as many lower and upper extremity injuries can be reduced by sound functional movement patterns, movement competency must be acquired first before obtaining the desired physical adaptations. Because of this, we generally stay away from Olympic lifting and aren’t overly concerned about numbers and kilograms with our players on athletic development pathways. Our main aim is to get them moving better first!

Exercises you might see: Multi-joint compound lifts targeting predominately the posterior chain. Our ‘bang for buck’ exercises compromise of:

I. Squat derivatives - Safety Bar Box/Squat, Box Squat, Back Squat, Front Squat.

II. Deadlift Derivatives – Hex Bar Deadlift, Rack Pulls, Romanian Deadlift.

III. Lunge Patterns – Split Squat, Barbell Split Squat, Reverse Lunging w/ Plate/Barbell, Walking variations w/ bars, plates, dumbbells, kettlebells etc.


V. Others – Hip Thrust and Trunk Work.

• Aerobic Capacity – Traditionally, if you asked any old time cricketer about fitness for bowling – they would probably say they completed slow, continuous, monotonous distance running. Now I’m not saying this is wrong but
continuous aerobic training, even if performed at high intensity has little transfer to the needs of a fast bowler. Additionally due to poor hormonal responses, loss of mobility and the potential interferences high volume running can have on strength, speed and power, so we generally stay away from this method. Instead, we spend more time on developing efficient running patterns (see photo) prior to strength sessions followed by 15-20 minute impact/non-impact max aerobic speed sessions depending on what phase we are in to optimise performance.

**Current Phase: General Preparation: 15mins - sprint mechanics, strength session and Bike/Rowing MAS @ >100% see: Dan Baker for more information (“Recent trends in high-intensity aerobic training for field sports”).**

- **Trunk Qualities** – This is one key physical component that we have aimed to progress in the last few years. Trunk strength and stiffness qualities are essential to maximise the players ability to transfer force from the lower body through the trunk effectively to the upper body. If a player struggles to brace their trunk under high force/load the bowling action can become both unsafe and ineffective. Excessive lateral flexion and hyper extension through torso and the lumbar spine combined with compressive ground reaction force are seen to be the largest contributors to bone stress injuries in amongst fast bowlers.

*Exercises you might see: braced plank, side plank, RKC planks, pallof press variations and roll outs. More recently, we have implemented the use of high intensity trunk work on the glute ham raise as seen within this video: [https://www.youtube.com/watch?v=VZ1HDZ0iJHw](https://www.youtube.com/watch?v=VZ1HDZ0iJHw)*

- **Mental Toughness (Grit)** – Not a physical characteristic, but important none the less. This component can mean various things in fast bowling from working on strategies to develop aggression, to finding the determination to run in and bowl flat out for hours in the heat of the summer. Our players work with specialist sport psychologists to develop this resilience, using a range of mental techniques. Not all fast bowlers are born angry! I thought I’d use a quote from Brett Lee for this component as this sums it ups nicely:

> “The question is always asked: how can bowlers get injured? Are we playing too much cricket? Are the guys not doing enough weights? Are they doing too much weights? Are
they not stretching enough? Are they wrapped up in cotton wool? Are they bowling too much in the nets? Is their workload too heavy?

“At the end of the day we weren’t put on the earth to bowl with a cricket ball. To think about running in at 28-30km/h, contort your body, hyper-extend, counter-rotate, and when I land my front foot it feels 15 times my own body weight…Imagine trying to tell an Olympic javelin thrower to run in on a wet surface if it’s a dewy night, to land in a foot-hole and try throwing a javelin – he’d laugh at you and say no way!”

I also had chance to catch up with Craig White, one of our fast bowling coaches and ex-England Cricket Player. He told me the most annoying aspect of being a fast bowler is...“if you’re a batsmen, you can hide if things aren’t going right. However as a fast bowler, if things are going wrong then you’ve got to find a way of getting it right….and you’re on your own”.

Summarising, the strength and conditioning world within cricket is growing and expanding all the time, and there are exciting times ahead. The more we learn about the physical demands of cricket the more specific we can be with our interventions. Saying this, I truly believe developing basic athleticism sets up fast bowlers to be able to perform optimally at the highest level. Hopefully this article will give you some insight on the role strength and conditioning plays within fast bowlers. I’d like to thank Mike Boyle for the opportunity to write an article on strengthcoach.com. If you’d like to find out more you can find me on twitter: @nick_karamouzis.