BQ GUIDELINES TO PREVENT THROWING INJURIES

Throwing injuries are an inevitable part of baseball however it is becoming more and more evident that the decisions of coaches can have a significant impact on the likelihood of injury for young baseball players. There is a growing body of research that would suggest that athletes are at an increased risk of injury (overload injuries) when:

* They throw hard (long-toss or pitching/bullpens) for in excess of 8-9 months of the year
* They experience a significant increase in either the Volume (number of throws) or Intensity (velocity/speed) of throws over a short period of time

What are the implications for coaches?

1. Ensure athletes have a break from hard throwing for at least 2-3 months of the year (these do not necessarily have to be consecutive months). This allows muscles and joints the opportunity to repair themselves (adaptation) after the stress of highly repetitive movements experienced throughout a baseball season
2. Progress both the Volume and Intensity of throwing GRADUALLY to ensure adaptation to the applied stress. In laymen’s terms this means coaches should ensure athletes SLOWLY INCREASE both the number of throws and the velocity of throw’s over a period of several weeks.

Both position players and pitchers need to be prepared (through training) for the volume and intensity of throwing they will be expected to do prior to the start of the season/tournament. Despite pitching restrictions in most forms of junior competition these days, you can still put kids at an increased risk of injury if they are not prepared adequately for what you ask them to do.

Here are some common examples of how a coach can put a player at an increased risk of getting injured (overload injuries):

* A player who has been at very few preseason trainings (or has done very little pitching preparation/bullpens) pitches his maximum pitch count in the first game of the season
* A position player, who regularly attends practice but has not done any pitching preparation/bullpens throws a complete game midway through the season
* An athlete who has done no/very little preparation plays in a ‘lightning tournament’ where they play several games over a few days
* A player who has been off for an extended period (in excess of 2 weeks) due to injury returns to full throwing (without a progressive throwing program) immediately after he’s been given clearance to start throwing again

Despite the fact that none of these situations represents a breach of the pitching restrictions in their respective competitions, all of these situations present an increased risk of injury to the athlete because they’ve gone from not very much throwing (or light throwing) to a large number of high velocity throws over a short period of time.

A progressive throwing program (such as the one detailed below) is a good way to introduce athletes back to throwing either after a break (such as the offseason) or after return from an injury.

1. Progressive throwing program (Pre-season or rehab)

After a period of no throwing (either from an injury or just from a break) it’s important to progress the volume and intensity of throwing gradually to prevent the onset of further injury. A progressive throwing program should be included as part of the rehabilitation process to get the athlete back to a ‘normal’ volume of work.

The purpose of the following throwing program is to progress an athlete from a state of ‘no-throwing’ to that of normal training. ***Progression from one stage to the next is only appropriate if the athlete remains pain free! Assess pain during throwing, post throwing and next day.***

**Day 1:**

* 20 throws at 45 feet (<15 meters)
* 10 throws at 60 feet (<20 meters) or pitching distance

**Total: 30 throws**

**Day 2:** Rest

**Day 3:**

* 20 throws at 45 feet (<15 meters)
* 20 throws at 60 feet (<20 meters) or pitching distance

**Total: 40 throws**

**Day 4:** Rest

**Day 5:**

* 20 throws at 45 feet (<15 meters)
* 20 throws at 60 feet (<20 meters) or pitching distance
* 10 throws at 90 feet (<30 meters) or base distance

**Total: 50 throws**

**Day 6:** Rest

**Day 7:**

* 20 throws at 45 feet (<15 meters)
* 20 throws at 60 feet (<20 meters) or pitching distance
* 20 throws at 90 feet (<30 meters) or base distance

**Total: 60 throws**

**Week 2 / Day 8:** Rest

**Day 9:**

* 20 throws at 45 feet (<15 meters)
* 20 throws at 60 feet (<20 meters) or pitching distance
* 20 throws at 90 feet (<30 meters) or base distance
* 10 throws at 120 feet (<40 meters) or back of cut-out
* 10 throws at 60 feet (<20 meters) or pitching distance

**Total: 80 throws**

**Day 10:** Rest

**Day 11:**

* 20 throws at 45 feet (<15 meters)
* 20 throws at 60 feet (<20 meters) or pitching distance
* 20 throws at 90 feet (<30 meters) or base distance
* 20 throws at 120 feet (<40 meters) or back of cut-out
* 10 throws at 60 feet (<20 meters) or pitching distance

**Total: 90 throws**

**Day 12:** Rest

**Day 13:**

* 20 throws at 45 feet (<15 meters)
* 20 throws at 60 feet (<20 meters) or pitching distance
* 20 throws at 90 feet (<30 meters) or base distance
* 20 throws at 120 feet (<40 meters) or back of cut-out
* 10 throws at 150 feet (> 45 meters) or long toss
* 10 throws at 60 feet (<20 meters) or pitching distance

**Total: 100 throws**

**Day 14:** Rest

During this throwing program the athlete should not participate in any other throwing. After Day 14 the athlete is permitted to start throwing on consecutive days or participate in game play. *Progression from one stage to the next is only appropriate if the athlete remains pain free!*

2. Pitching Preparation (Flat-Ground Work & Bullpen Routines)

Pitching preparation involves both ‘Flat-ground’ work and ‘Bullpen’ routines.

**Flat-Ground Work (or ‘touch & feel bullpens’)** involves practicing pitching on flat-ground at low intensity (~50%). ***All players in the team should participate in flat-ground work until at least U14’s.*** This involves practicing the pitching delivery, throwing different types of pitches, and hitting a small target, all done at slow speed possibly over a shorter distance. The receiver does not need to wear a mask and can squat down like a catcher. This can be done at the end of the warm-up/throwing routine.

**Bullpen Routines** are thrown from a mound at close to pitching speed and require the catcher to have full protective equipment on. The number and intensity, (and also purpose) of the pitches thrown in the bullpen routine should be managed by a coach and gradually increased over time. **Ideally, pitchers would have thrown at least 2-3 bullpens before they pitch in a game situation**, however, it may not be practical to have all players throw bullpens at every practice session. Players who have not been able to throw bullpens at practice should do ‘Flat-ground work’ and be limited to 20-30 pitches in a game situation. Pitchers (who have been throwing bullpens regularly at practice) should be limited to no more than 50 pitches (or 30 pitches for U14’s or below) for their first outing, but can then progress each week (increments of 10-15 pitches each week) towards their maximum limit.

Please see below a Bullpen routine used within the Rams program.

**RAMS BULLPEN ROUTINE**

Pitchers should have warmed up and played catch to at least 120ft prior to starting a bull-pen routine. The following routine can then be used either to prepare to come into a game and pitch or as part of a practice routine during the week.

(From the wind-up)

* 2 x FB away, 2 x FB middle 2 x FB inside (6 pitches)
* FB Tilt to a Right Handed Hitter (RHH), FB Tilt to a Left Handed Hitter (LHH) (4 pitches)
* Box 3 of each Off-speed pitch (6 pitches)

 (From the set position)

* Fast/Slow Tilt to a RHH, Fast/Slow Tilt to a LHH (4 Pitches)
* 2 x Tough Pitches for all types of pitches (6 pitches)
* Finish with a strike on each side of the plate (2 pitches)

(Total 28 pitches)

The bullpen routine should be used as a guide and may be varied depending on how long they have to warm up, and how many pitches the pitcher needs to throw in this outing (also possibly including a bullpen assessment).

**Definitions**

To **Box** a pitch: To throw a pitch in the bottom half of the strike zone, but over the heart of the plate.

**Tilt:** 2 pitch sequence, up and in, down and away.

**Reverse Tilt:** Two pitch sequence, down and away, followed but up and in.

**Tough Pitches:** 3-2 count, bases loaded, tied game, must be able to throw a strike with all pitches.

**To Double-up:** Two pitches in the same location.

**Over the falls:** To deliberately throw a breaking-ball in the dirt

The bullpen routine could then also be followed by a 24-pitch assessment process to be recorded on a specific record sheet. The additional 24-pitch assessment should only be completed after the pitcher has completed at least 2-3 (20-25pitch) bullpens and is still pain free.

**WHAT ELSE CAN THE COACH DO?**

The coach can also do the following to ensure they minimise the risk (& severity) of injury to their athletes:

1. Ensure adequate warm-up (& cool down) for all practice sessions and games
2. Provide a progressive Strength & Conditioning Program (the ABF have created a basic introduction to Strength training that can be found at <http://www.qldcoaches.baseball.com.au/site/baseball/qldcoaches/downloads/Underpinning_Strength_Program.pdf> )
3. Manage the Volume and Intensity of throwing athletes are exposed to and progress slowly (including considering other programs they may be involved in)
4. Share pitching duties throughout the team (rather than just having the best pitchers pitch every week) and have more kids throw short outings
5. Ensure that junior pitchers don’t throw more than 100 innings in a calendar year and that they do get an offseason (3-4 months of no throwing)
6. Continually update your knowledge (eg. Injury prevention and first aid) and apply that information accordingly (ensure access to ice etc.)
7. Communicate effectively with (and observe) your athletes and don’t ask them to throw if they are sore

If you have any further questions please see the Further Reading section below or contact the BQ High Performance Manager (Andy Utting) on 0420 460 029 or high.performance@baseballqld.asn.au.

**FURTHER READING**

1. Fleisig Et.Al. (2010) “Risk of Serious Injury for Young Baseball Pitchers: A 10-year Prospective Study” *The American Journal of Sports Medicine.*  (<http://ajs.sagepub.com/content/39/2/253>)

2. Laudner, K (2011) “The Throw – From Below: Hip mechanics dictate overhead motion” *Lower Extremity Review* ( [www.lowerextremityreview.com](http://www.lowerextremityreview.com) ) May 2011

3. Ray, Tracy.R (2010) “Youth Baseball Injuries: Recognition, Treatment, & Prevention” *Current Sports Medicine Reports (American College of Sports Medicine) Volume 9. Number 5.*  September/October 2010 ( [www.acsm-csmr.org](http://www.acsm-csmr.org) )

4. AOSSM (2005) “Prevention and Emergency Management of Youth Baseball & Softball Injuries” *American Orthopaedic Society for Sports Medicine* (<http://www.baseball.com.au/site/baseball/abf/downloads/Youth%20Baseball%20Injury%20Management.pdf> )or via the ABF website ([www.baseball.com.au](http://www.baseball.com.au))

5. ABF (2011) “ National Strength Program for Young Players: A Critical Foundation for Long Term Athletic Development” (<http://www.qldcoaches.baseball.com.au/site/baseball/qldcoaches/downloads/Underpinning_Strength_Program.pdf>)