



Pitch Count

An Athlete-Centered Approach to Arm Safety

Baseball Canada established a Long Term Athlete Development project team in 2005 to review the state of baseball programs throughout the country and to make recommendations on an athlete-centered regime to improve our programs and structures. An interim report was accepted by Baseball Canada in November 2006 to establish *One Vision, One System, One Country*.

Baseball Canada's Long Term Athlete Development report outlines an athlete-centered pathway to implement an optimal training, competition and recovery program with relation to biological development and maturation. Issues related to arm safety and the optimal development and rest of the throwing were reviewed thoroughly and at the 2007 Baseball Canada Fall Conference recommendations were brought forward.

The recommendations were based on sport science, a review of research on arm safety and an extensive pilot conducted by Baseball Alberta (at all age classes and divisions). Concurrently in 2007, Little League International had introduced a Pitch Count regime based on the recommendations of the American Sports Medicine Institute based on a series of studies carried out on behalf of USA Baseball, Little League International and Major League Baseball. In addition, we had access to research and information from our Long Term Athlete Development experts on rest and recovery and optimal skill development recommendations at each stage of development.

These rules will be presented to the 2008 Baseball Canada Fall Conference for adoption by Baseball Canada commencing with the 2009 playing season. We recommend that *provincial Baseball associations* adopt the same rules, without changes to the rule format, at its next annual meeting in the Fall of 2008.

Recommended Pitch Count Rules

Safety Grid – Number of Pitches

Mosquito (9-11)	Pee Wee (12-13)	Bantam (14-15)	Midget (16-18)	Rest required
1-25	1-30	1-30	1-30	None
26-40	31-45	31-45	31-45	1 day
41-55	46-60	46-60	46-60	2 days
56-65	61-75	61-75	61-75	3 days
66-75	76-85	76-90	76-100	4 days
75	85	90	100	Maximum



Additional Safety Rules:

1. Pitcher cannot pitch in 3 consecutive days.
2. Pitcher, when removed from the position, may play other defensive positions; however, he / she CANNOT play the position of catcher during the remainder of the day.
3. A player cannot play the position of pitcher and catcher in the same game. Once he / she catches in a game, he / she cannot take the pitcher's position in the same game.
4. A pitcher, once removed from the position, may not return to pitch in the same game.
5. A pitcher may not pitch in more than 2 games in a day
6. These rules apply to the pitcher – when a pitcher plays for more than 1 team, his pitch counts shall be cumulative, that is, if he / she is on a rest period arising from a game with Team A, the counts still apply to games involving Team B.

Additional Rules to Guide Usage:

7. A pitch is defined as an official pitch made during play in the game.
8. If a pitcher reaches the maximum pitch count during an at bat, he / she can finish that hitter and the change made at the next stoppage. If a runner is retired and the inning ended while that hitter is at bat, the pitcher should not continue with the hitter in the next inning.
9. Pitchers that play in an age category above their own age group, e.g., 14 playing Midget, shall be governed by their actual age. Coaches shall be responsible for monitoring this and will be laible to penalties for any violation.
10. The home / host team is responsible to appoint an official scorekeeper to keep track of the pitch count for all pitchers during a game. That record shall be the officially recognized pitch count for that game.
11. Intentional walks will be included in pitch counts.

Recommended Guidelines for Enforcement

Each jurisdiction may adopt enforcement and administration guidelines. These are recommendations; however, we would request that all share information and best practice so we can develop an enforcement / administrative regime that best serves the system. In enforcement, we would request that all stakeholders be proactive in promoting safety. Anybody who is aware of a potential violation during a game is encouraged to bring it to the attention of the coach and the affected athlete prior to a situation arising where penalties would be applied.

12. The designated scorekeeper for each game shall keep a running total of pitches for both teams and make the total available to both teams at the end of each inning. When any pitcher approaches his / her maximum, the scorekeeper will bring it to the attention of the coaches and the umpire. Even if the scorekeeper does not notify the umpires / coaches, the affected pitcher's coach is still responsible for monitoring the count for his player and making the pitching change as required.
13. Game reports shall be filed with leagues / provincial associations for all games – including exhibition, tournaments, regular season and playoffs. Leagues and associations shall monitor / audit the reports to ensure compliance. Coaches will be required to produce their team pitching logs upon request.
14. The Head Coach of each team is responsible for any athletes registered with his team. He is required to maintain a pitching log for all the players on his team. Since players may play as



affiliates with other teams or play with provincial representative teams, any information should be made available to the coach and this information included in the pitching log for the affected players.

15. Each player should as well track his own pitching information, particularly where he she plays as an affiliate or on a provincial representative team.

Penalties:

1. In the event of a protest based on pitch count violations, the game may be subject to forfeit by the offending team, or such other penalty as the league / association may determine.
2. First violation by a coach, a written warning will be issued to the coach.
3. Second violation in a season, a 1 game suspension of the coach.
4. Third violation in a season, a 3 game suspension.
5. Fourth violation, an indefinite suspension until the issues are reviewed by the provincial supervising body.
6. The violations relate to any athlete registered on a team. That is, 1st violation by a coach may be for pitcher A and any subsequent violation (for Pitcher B) shall be cumulative.

Recommendations related to Mosquito –

These thresholds have been successful in pilots; however, concerns have been raised that teams may not have ‘enough pitching’. We can suggest 2 alternatives:

1st - Make the limiting factor in an inning – the pitches thrown (when a pitcher meets his maximum the inning is over) rather than a 5 run maximum in an inning as currently used in many areas.

2nd – Once a pitcher meets his maximum in an inning – coach from the hitting team will pitch the rest of the inning.

Questions / FAQs / Interpretations

In this Q/A, we refer to Dave – a Mosquito age player. Other divisions shall follow their own thresholds as outlined above.

Q: If Dave (Mosquito age) throws 26 pitches in Game 1 of a double header, can he throw in the 2nd game (or in a tournament – in a game later that day).

A: NO – once he goes over the threshold for 1 day’s rest in game, he is finished for that day and must have a full day’s rest.

Q: Can a pitcher throw in consecutive games in the same day?

A: YES, but only if he does not reach a rest threshold in the first game. The pitch counts are cumulative, for example, if the pitcher throws 10 pitches in Game 1, the pitch count for him is carried over into the 2nd game – he would start at 11 with the 1st pitch of the 2nd game.

Q: What’s a day’s rest? If Dave (Mosquito) throws 28 pitches in a game Friday morning, can he throw in a game on Saturday afternoon?

A: NO – he needs a full day after – the day runs from midnight to midnight. He can pitch again on Sunday. The rest period does not begin until midnight of the day he pitched.



Q: I had my pitcher on the line-up card and had to change the pitcher before the start of the game. Are there any penalties under this rule?

A: No – unless there are specific league rules (unrelated to pitch count). If any official, coach, umpire is aware of a potential violation of these pitch count rules, he / she should bring it to the attention of the coach of the pitcher involved. All should take precautions to avoid protests or violations.

Q: LL rules used to allow a pitcher being removed from the game to go to any defensive position or for the catcher to come in to pitch in a game. What is the Baseball Canada position?

A: Baseball Canada rules do not allow a player to both pitch and catch in the same game. This is for safety, rest and recovery reasons. We have determined that the loading on the pitcher's arm is too great. In addition, once a pitcher has been removed from the pitching position, he cannot play the position of catcher for the remainder of the day. This was also adopted by LL in 2008.

Q: Is a balk a pitch under the rules?

A: Under the baseball rules, a balk is a 'no pitch', so we do not count this under the pitch count rules, similarly for throws to the bases by pitchers (pickoffs, to make a play on a runner) or warm-up throws before the inning starts. Similarly, any pitches thrown in an intentional walk count as pitches thrown.

Q: Dave reaches his maximum total during a player's at-bat. Can he finish that hitter?

A: Yes, he can finish the at-bat; however he must be removed from pitching before the next hitter. This only applies to the maximum count. If the pitcher reaches a threshold (for example 25 pitches for Mosquito) and continues to the same batter, the rest requirements come into play. As well in this situation, if the inning ends during the at-bat due to a runner being retired, the pitcher should be replaced at the start of the next inning.

Q: If a game is suspended, can the pitcher continue to pitch the next day in the resumed game?

A: Possibly, but only if the threshold for 1 day's rest has not been reached. Dave (our Mosquito pitcher) would not be able to pitch if he had throw 25+ in the first part of the game. The limiting factor is the number of pitches in a given day / game. If the games ends or is suspended with the pitcher reaching the rest threshold, he must take the prescribed rest period before pitching again.

Q: What happens if my game is rained out in progress? Or ends in a tie?

A: The pitches all count. The pitcher is charged with these pitches and any log or record should reflect that. The normal rest and recovery rules apply.

Q: My pitcher is throwing a perfect game / no hitter when they reach the maximum limit, can they continue?

A: NO, arm safety is paramount.

Q: Are there any special rules for tournaments?

A: NO – a tournament is just another day in the life of a pitcher. If you play Wednesday and start a tournament on Friday, you do not get to wipe the slate clean. The innings pitched on Wednesday count towards any cumulative totals / rest requirements. For example, if a Mosquito pitcher threw 41 pitches on Wednesday, they require 2 full days rest and would not be available to pitch until Saturday in the tournament.

Q: Little League has a set of rules already, why don't we just adopt theirs?



A: Little League International is to be commended and congratulated for their leadership and initiatives in promoting safety and the development of young athletes. Baseball Canada has started a conversation with LL on sharing information, resources and moving towards more coordination of activities. Baseball Canada's program is based on additional information related to LTAD, rest and recovery and covers a wider range of athletes than LL. We will monitor and share information with LL and other stakeholders and hopefully adopt best practices of each in time. The pitch counts applied by Baseball Canada covers specific LTAD stages of development and the additional restrictions applied are for situations where arms receive additional loading involving the position of catcher and upgraded rest provisions.

Q: What about throwing curveballs? Isn't this another safety issue to be addressed?

A: It is recommended that pitchers not throw curveballs until they go through puberty and their major growth spurt (at approximate 14 years of age). Anecdotally this has been the conventional wisdom; however, very recent sport science research shows that the curve ball may actually be less harmful than the fastball. The critical factor leading to injuries is the overuse of young arms and the failure to allow proper rest & recovery after throwing with effort. The figures on arm injuries are rising strongly and our pitch count regime is designed to specifically address the major risk factors. We will continue to monitor the research and information on curve ball usage and update when new information is available. For more information you can read the following article: Dun S, Loftice J, Fleisig GS, Kingsley D, Andrews JR. A Biomechanical Comparison of Youth Baseball Pitches: Is the Curveball Potentially Harmful? *Am J Sports Med* 36(4):686-692, 2008) and also READ THIS ONLINE DISCUSSION: <http://asmiforum.proboards21.com/index.cgi?board=youth&action=display&thread=569>.

Making Changes / Tweaking the System

One of the critical shortcomings of our baseball system in Canada identified in the LTAD study was the failure to align rules nationally. There are numerous rule systems that have developed throughout the country and we want to avoid the same situation with this crucial safety and arm development recommendation. These rules are based on the best medical research and sport science available.

We strongly recommend that PSOs do not 'tweak' or amend these rules without consultation with Baseball Canada. If any group has specific improvements or recommendations, please contact Baseball Canada and the changes will be reviewed by the technical experts. If necessary, pilots will be conducted and the changes reviewed in light of the pilot results and tested against the best available sport science and medical research.

One facet of the Baseball Canada LTAD program is to look for ways of continuously improving our programs and seeking better ways to do things – in this case – the priorities are arm safety and pitching development. We need your feedback and suggestions.

For example, the argument is made that players have to develop arm strength by throwing as much as possible and development strength by increasing the load on the arm. Actually, sport science tells us that there are critical stages for different skill development in an athlete. For young players aged 9 to 12, this is the optimal period to develop the proper mechanics of throwing, laying down the motor pathways. Training in this period must focus much more on proper throwing mechanics than 'building arm strength'. The optimal period for building 'strength' related skills is later in development (starting approximately 12 months after the peak growth spurt for males). All this has been taken into account in developing these guidelines.



Please help both to bring our rules into alignment and to suggest ways of continuously improving our system. As you may be aware, we are implementing a recognition system to honour groups that meet our Long Term Athlete Development goals (the RBI program) and adherence to our rules will be a critical component of this.

Taking care of the Arm

Proper rest and recovery are the least understood aspects of arm safety by many coaches. Recent sports research has identified improper attention to these issues as major impediments to athlete development and safety. Restrictions in the number of pitches thrown are not effective unless they are accompanied by suitable recovery techniques and adequate rest.

Once a pitcher finishes his performance he has to take steps to recover and get ready to perform again. This means taking steps immediately to dissipate lactic acid build up if / she has reached the maximum loading on the arm. In an athlete who has reached maturity, this threshold is reached at approximately 75 pitches for most players, where muscle fatigue starts to set in. If a pitcher gets into trouble in an inning and reaches the 35 pitch level in that inning muscle fatigue will start and performance deteriorate. These fatigue levels are reached proportionately earlier in younger athletes. Once the pitcher experiences the level of fatigue generated by the maximum pitch count it takes greater than 72 hours of rest to deal with the lactic acid levels resulting from muscle fatigue and micro-destructions at the blood supply level to the arm and shoulder. The pitch count grid is established to meet the physiological needs of young athletes as they develop. During the rest / recovery period, the athletes will continue to throw and develop arm strength – as part of playing other positions and regular training. Programs such as long toss and mechanical drills are strongly encouraged. The restrictions apply to effort produced in competitive pitching and rest / recovery from pain. A young pitcher should be able to throw without pain before taking the mound again. These situations are for a pitcher with good mechanics. A pitcher who has mechanical faults can develop lower fatigue thresholds and cause greater muscular damage. Particular attention should be paid to the development of proper throwing mechanics.

As soon as a pitcher stops throwing (or is removed from the game if playing another position), the recovery process starts. It is important that the athlete undertake a period of light jogging (or similar activity) to allow the lactic acid and toxins built up in his system to be dissipated. This is accompanied by an icing regime to prevent further damage to the muscles and to start the recovery process. The maximum times for icing are 10 minutes on elbow and 20 minutes on shoulder. This should be followed by 2 minutes of aerobic activity for every minute of ice. This aerobic activity should be carried out within 3 hours of activity completion.

Other safety issues that arise are year round throwing programs and try-out camps. Medical research indicated that developing pitchers should take a complete rest from throwing with effort for up to a 4 month continuous stretch during the year. Otherwise, there is cumulative damage and impeded development. In a similar light, try-outs and showcases should only be done when the arm has been properly prepared and rest / recovery principles are respected. Coaches and scouts share the interests of all in making sure that young athletes are seen at their best and arm safety is respected. In these times, players are looked at over a longer period of time and the potential / development path of



athlete is recognized. These same concerns apply to situations where players play for more than 1 team (e.g., club team and a select team) – take care of arm safety.

There are a number of sources of excellent information available on rest / recovery being developed and we would encourage youth coaches to read the article as part of the LL paper (reference below), ASMI website (reference below) and on the LTAD website (reference below).

The researchers at ASMI published in 2006 a study on risk factors leading to injuries / surgery for adolescent pitchers. They examined 95 adolescent pitchers who had shoulder and elbow surgery, and 45 adolescent pitchers who never had a significant pitching-related injury. The adolescent pitchers ranged anywhere from 14 to 20 years of age. The study compared their responses to a survey to determine risk factors associated with pitching injuries and surgery. When a pitcher regularly threw with arm fatigue, he was 36 times more likely to be in the surgery group as opposed to the non-surgery group. When a pitcher engaged in more than 8 months of competitive pitching during a year, he was 5 times more likely to be in the surgery group. When a pitcher threw more than 80 pitches in a game/appearance, he was 4 times more likely to be in the surgery group. When a pitcher self-reported that he threw more than 85 mph, he was 2.5 times more likely to be in the surgery group. There were no significant differences regarding private pitching instruction, coach's chief concern, pitcher's self-rating, exercise programs, stretching practices, relieving frequency, or age at which pitch types were first thrown. In conclusion, the factors with the strongest association with injury were overuse and fatigue.

Other safety guidelines are not specifically provided for in these rules; however, should be taken into account by any coach who wants to be proactive in protecting the arm safety of his athletes. For example, 35+ pitches in one inning causes as much stress on the arm as 75 pitches at 15-20 per inning. If your pitcher has a high count inning, you should look at removing him / her as soon as possible.

Another safety factor not addressed in the rules but which should be considered are the seasonal loading – 11-12 year olds maximum 1000 pitches per season; 13-14 year olds – 1000 pitches per season; 15-18 year olds – 1250 pitches per season.

Pre-Game warm-ups and bullpens should consist of 30-45 pitches with only the last 10-15 pitches at high intensity. Coaches should take care to make sure their pitchers never max out in the bullpen. For relief pitchers in the bullpen, getting up and down in the bullpen should be monitored – 3 “scares” (mound warm-ups in pen) are the equivalent of 15+ pitches in a game and, although not counted in the formal pitch count, a coach should watch for early signs of fatigue in his pitcher.

Fatigue indicators such as loss of speed, command and control should be watched for by coaches. In the event of complaints of soreness and tenderness, the pitcher should be removed from the game immediately.

Proper Pitching Mechanics and the Coach

Baseball Canada has been introducing new coach training programs using competency-based training with adult education methods. These programs have coaching theory and technical information integrated together and they are based on LTAD principals. The training is specific to the needs of both athletes and coaches in providing the information on proper training, competition and rest programs for



developing athletes. Coaches, even those with training under the old system are encouraged to register and follow the training programs. For coaches handling community and competitive programs, more information is available through your Provincial baseball association or at nccp.baseball.ca. These workshops include proper throwing fundamentals, pitching, skills analysis (basic error detection and correction), as well as, season planning and practice planning.

One issue requiring monitoring – the strategy of coaches having hitters taking pitches at younger ages in order to drive up pitch counts for opposing pitchers. This should be strongly discouraged as it takes away decision-making choices from the young hitters and becomes ‘coach’s game’ rather than an athlete-centered system.

Coaches should be encouraged to learn how to teach the curve ball and off-speed pitches so that proper mechanics are developed, i.e., players learn to throw without excessive snapping or torque.

Forms:

These forms will be available on the website in Word / Excel / PDF format with both the provincial and Baseball Canada logos on them. We’re always interested in improvements and would ask if you have upgrades or additional forms, please send them to us and we’ll add them to the system.

Pitcher’s Log

Game Report

Team Pitching Log

Incident report

Additional references:

Long Term Athlete Development – general information (resource information and downloads) – see www.ltad.ca.

LTAD – Baseball Canada report can be found at <http://www.baseball.ca/files/ltad.pdf>;

General LTAD – rest & recovery (reference)

<http://www.ltad.ca/Content/Resources%20and%20Downloads/Downloads.asp>

American Sports Medicine Institute – information can be found at www.asmi.org – has excellent info on throwing programs, arm care and a moderated forum on sports injuries.

Little League International – Pitch Count Publication – Protecting Young Pitching Arms – background paper issued by LL International – outlines their rules and has excellent sections on best practices, pitching mechanics and arm care – see

http://www.littleleague.org/Learn_More/rules/pitch_count_resource_page.htm