# Position Statement for Tommy John Injuries in Baseball Pitchers

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## EPIDEMIC

During the past few years there has been an "epidemic" rise in the number of professional pitchers requiring ulnar collateral ligament reconstruction ("Tommy John surgery").[1] This is like déjà vu, as a similar sharp rise was seen in adolescent pitchers near the turn of the century.[2,3] These two rises are indeed connected; that is, today's pro pitcher in his 20's was an adolescent pitcher a dozen years ago. Thus in many cases, the injury leading to Tommy John surgery in today's young pro pitchers actually began while they were adolescent amateurs. Observations by orthopaedic surgeons support this link, as the torn ulnar collateral ligament (UCL) in a pro pitcher usually looks like it has worn out over time.

## RISK FACTORS FOR ADOLESCENT PITCHERS

Research has shown that the amount of competitive pitching and pitching while fatigued are strongly linked to injury.[4,5,6] Other risk factors may include pitching on multiple teams, pitching year-round, playing catcher when not pitching, poor pitching mechanics, and poor physical conditioning. Recommendations for youth pitchers are shown on the ASMI Position Statement for Youth Pitchers.[7]

## COMMON MISCONCEPTIONS ABOUT TOMMY JOHN SURGERY

*"Pitchers should get Tommy John surgery over with as soon as possible, as they will be better and throw harder after the surgery."*
Not true. While there may be instances of pitchers throwing faster after returning from Tommy John surgery, this was due to the surgeon fixing the problem followed by the pitcher working intensely with the physical therapist, athletic trainer, strength coach, and pitching coach. The rest after surgery may have also helped the athlete's body. However, performance usually decreases over time for MLB pitchers after Tommy John surgery (similar to the typical decrease over time for healthy MLB pitchers).[11] Furthermore, a recent study by MLB and ASMI showed no differences in pitching biomechanics between professional pitchers with a history of Tommy John surgery and professional pitchers with no history of injury.

*"The biggest risk factor for elbow injuries in young pitchers is the curveball."*
Not true. Too much competitive pitching and pitching while fatigued are the biggest risk factors.[4,5,6] While biomechanical research[8,9,10] and epidemiologic research[4,6] have not shown a strong connection between curveball and elbow injuries, a youth pitcher may not have enough

physical maturity, neuromuscular control, and proper coaching instruction to throw a curveball with good mechanics. The first steps should be to learn, in order: 1) basic throwing, 2) fastball pitching, 3) change-up pitching.[7]

*"Lowering or eliminating the mound would reduce the stress on the elbow and reduce the number of UCL injuries."*
Not true. Elbow torques during full-effort pitching on a mound and full-effort throwing on flat ground are about the same. The real solution is for young pitchers to do less full-effort pitching and more throwing (practice throws, playing other positions, playing other sports). To become a successful adult pitcher, the youth should not strive to be a "youth pitcher" but instead should be a young athlete that is a good pitcher.

*"Baseball in Latin America must be doing something right, because the prevalence of Tommy John surgery is so low among professional pitchers from Latin America."*
Not true. A recent survey [unpublished] revealed no difference in the prevalence of Tommy John surgery between pitchers from the U.S. and pitchers from Latin America. The survey showed that 16% of U.S. born-pitchers and 16% of Latin American pitchers in professional baseball have a history of Tommy John surgery.

## RECOMMENDATIONS FOR PROFESSIONAL PITCHERS AND TEAMS FOR REDUCING RISK OF TOMMY JOHN INJURY

1. Optimize pitching mechanics to ensure using the whole body in a coordinated sequence (kinetic chain). A biomechanical analysis is recommended, as it provides objective data to the pitching coach, strength coach, and pitcher. A biomechanical analysis can also serve as a baseline for re-evaluation later in the pitcher's career, after performance improvement or after return from injury.
2. Do not always pitch with 100% effort. The best professional pitchers pitch with a range of ball velocity, good ball movement, good control, and consistent mechanics among their pitches. The professional pitcher's objectives are to prevent baserunners and runs, not to light up the radar gun.
3. Open communication between a pitcher and the professional coaching and medical staff is paramount. The pitcher's elbow and body are living tissue. Pitching and training create small tears in the tissue; rest, nutrition, and hydration repair the tears. A pitcher and his team should have a plan, but that plan needs to be monitored and sometimes adjusted depending on how the pitcher feels. Specifically, the pitcher should keep his trainer or coach up to date about any soreness, stiffness, and pain. That way when there is an issue, the player and team can consider rest, modified activity, or examination from the team physician to allow the elbow to heal and avert serious injury.
4. The pitching coach needs to watch for signs of fatigue on the mound. This could be seen in-game as well as in bullpen sessions.
5. The team trainers, coaches, medical staff, and front office must share knowledge in a holistic approach to minimize the risk of injury.
6. Flat-ground throwing drills and bullpen sessions should not always be at maximum effort. Reduced effort will allow for physical fitness and technique without adding undue stress to the UCL.

7. Be wary of pitching in winter league baseball. The UCL and body need time to recover and build strength, so the concept of annual periodization should include adequate rest from full-effort pitching.
8. Exercise, rest, and nutrition are vital for a pitcher's health. Performance-Enhancing Drugs (PEDs) may enable the athlete to achieve disproportionately strong muscles that overwhelm the UCL and lead to injury.
9. Pitchers with high ball velocity are at increased risk of injury. The higher the ball velocity, the more important to follow the guidelines above.

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