YOUNG PITCHERS AT RISK FOR SERIOUS INJURIES

Baseball experiences great popularity both for the enjoyment of participation and for the low risk of significant injury. Approximately nine million players between the ages of six to seventeen annually attest to the love of the game.

Unfortunately, over the past three decades the game has become of increasing importance, providing economic benefits and societal status to those with high levels of performance. As a result, a youth recreational game is becoming increasingly serious and the primary goal of participation has become success.

Baseball, as any sport, should promote fun, participation, skill development, maximal effort, a desire to win, an understanding of losing, teamwork, cooperation, determination, perseverance and social skills.

Baseball must also give young athletes the chance to develop and maximize their skills to reach their highest level of achievement, but overzealous practices in pursuit of success can lead to serious overuse injuries.

This has become most apparent in young pitchers who have sustained injuries previously only seen in adult players. These injuries are of the magnitude that can limit ultimate performance and end the ability to pitch.

Little League elbow was a popular term in the past, an inflammation of the inner part of the elbow in young pitchers... In the overwhelming majority of players, the symptoms resolved with no long-term problems.

Recently it has become apparent that not all elbow and shoulder problems experience simple and complete resolution. As a result of overuse, poor biomechanics, and a lack of appropriate conditioning, the significant forces created by the pitching motion has resulted in growth plate fractures, growth abnormalities, strains and tears of the rotator muscles and tendons, joint instability, tears of the cartilage in the joint, bone breakdown and ligament tears, including the ulnar collateral (Tommy John) ligament. Long periods of rest, extensive rehabilitation and surgery are frequently required to heal these injuries, some of which will never return to their previously normal structure.

DR. JAMES ANDREWS - EXPERIENCE

Dr. James Andrews, of the Alabama Sports Medicine and Orthopedic Center and the American Sports Medicine Institute in Alabama repaired an average of four Tommy John ligaments from 1995 ñ 1997 on high school pitchers, 17 between 1998 ñ 2000, 26 by 2002 and more than 54 in 2003. There is little question in his mind that serious arm injuries are increasing in under 18 year-old players, even those between 11 to 15 years of age.

DR. FRANK JOBE - OPINION

Dr. Frank Jobe, associate of the Kerlan ñ Jobe Orthopedic Clinic and Marilyn M. Pink, Ph.D., P.T., director, Biomechanics Laboratory, Centinela Hospital Medical Center express similar concern about the injuries to young pitchers. They believe the passion for success has resulted in an excessive number of pitches thrown by young players. This is often associated with the additional risk of poor biomechanics and inadequate conditioning. Dr. Jobe believes the current environment of excess needs, moderation or serious injuries will continue to increase. What did professional pitchers do?

DR. CHANDLER - ARE THE PRACTICES OF Today's

YOUNG PITCHERS NECESSARY TO REACH ELITE LEVELS OF PERFORMANCE?

Dr. Joseph B. Chandler, Chairman of the Major League Baseball Medical Advisory Committee, interviewed 30 major and 71 minor league pitchers in 2002 to determine their pitching history. High pitch counts and reports of arm injuries were uncommon and most first threw a curveball at 14 and a slider at 18 years. Year round baseball was uncommon and most played other sports during the year. Professional pitchers reached their elite status without following the excess practices of today.

DR. BARRY GOLDBERG ñ DR. FREDERICK MUELLER

USA BASEBALL MEDICAL & SAFETY ADVISORY COMMITTEE

Dr. Barry Goldberg, director of Sports Medicine, Yale University Health Services and Dr. Frederick Mueller, chairman of the University of North Carolina Sports and Exercise Research at the Center for Catastrophic Sports and Injury Research, demonstrated in a preliminary pilot study in 2004 that early pitching practices appear to create an increased risk for an eventual pitching injury. Pitching volume, type of pitches thrown, inadequate rehabilitation of prior injuries and a lack of formal conditioning appear to be increasing the chance of sustaining a later significant injury.

Too much too soon combined with inappropriate preparation has caused a growing incidence of serious arm injuries in young pitchers. The recommendations of Drs. Jobe, Andrews, Chandler and the USA Baseball Medical & Safety Advisory Committee should reduce this growing problem.

RECOMMENDATIONS

Coaches and parents should listen and react appropriately to a youth pitcher when he/she complains about arm pain. A pitcher who complains or shows signs of arm pain during a game should be removed immediately from pitching. Parents should seek medical attention if pain is not resolved within four days or if the pain recurs immediately the next time the player pitches. League officials should educate parents about this consideration.

Pitch counts should be monitored and regulated in youth baseball. Recommended limits for young pitchers are as follows:

9-10 Year Old Pitchers 50 pitches per game 75 pitches per week 1,000 pitches per season 2,000 pitches per year

11-12 Year Old Pitchers 75 pitches per game 100 pitches per week 1,000 pitches per season 2,000 pitches per year

13-14 Year Old Pitchers 75 pitches per game 125 pitches per week 1,000 pitches per season 3,000 pitches per year

15-18 Year Old Pitchers 100 pitches per game 150 pitches per week 1,500 pitches per season 3,500 pitches per year

Pitch count limits pertain to pitches thrown in games only. These limits do not include throws from other positions, instructional pitching during practice sessions and throwing drills, all of which are important for the development of technique and strength.

Backyard pitching practice after a pitched game is strongly discouraged. Excessive practice when a pitcher is in a slump should also be strongly discouraged.

Pitchers should not throw breaking pitches (curveballs, sliders, etc.) in competition until their bones have matured (indicated by the level of pubertal development) typically between 13-15 years of age.

In order to succeed a youth pitcher should focus on learning good mechanics, firmly establish the skill of an accurate fastball and then learn to vary the speed of his/her pitches.

Pitchers are discouraged from pitching for more than one team in a given season. Coaches will tend to use better pitchers on each team, which would significantly increase pitch volume.

Pitchers should compete in baseball no more than nine months in any given year as per iodization is needed to give the body time to rest and recover. For at least three months a year a pitcher should not play any baseball or softball, participate in throwing drills or participate in other stressful overhead activities (javelin throwing, football quarterback, softball, competitive swimming, etc.).

Pitchers should engage in year round physical conditioning including activities to improve endurance, strengthen the upper and lower body, enhance core strength, develop neuromuscular coordination and maintain flexibility. Specific programs should be geared to the stage of pubertal development.

Pitchers should be discouraged from participating in showcases due to the risk of injury. The importance of showcases should be de-emphasized, and at the least, pitchers should be permitted appropriate time to prepare for the display of their skills.

Baseball players should be discouraged from copying the style of professionals as these players have developed individual adaptations.

It should be strongly discouraged for a pitcher to return to the mound in a game once he/she has been removed as the pitcher.

The passion and importance placed on the success in the game of baseball, by parents, coaches and players must be tempered. The current practices of high pitch volume, early use of the curve and slider, inadequate instruction of biomechanics and a lack of appropriate conditioning will result in an increased risk of serious injury.

These injuries can prevent young pitchers from reaching their maximum potential and can cause lifetime limitations in activity. Stress and overuse must be replaced by moderation. Advancing development coupled with appropriate teaching and conditioning will permit the elite player to evolve with a lower risk of a significant injury.

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