

## The Harm of Improper Long Toss

February 8, 2011

A study presented at [the ASMI 2011 Baseball Injuries Conference](#):

### Biomechanical Comparison of Baseball Pitching and Long-Toss: Implications for Training and Rehabilitation

Looked at biomechanical differences in college pitchers between:

1. Throwing off **a mound**
2. **Long toss at 120 feet** with ball thrown on a straight line
3. **Long toss at 180 feet** with ball thrown on a straight line
4. **Maximal distance** with no restrictions on trajectory

What Did They Find?

- The **lowest arm stress was seen at 120 feet** ("37 m throws") while the **highest stress was seen at Maximal Distance**

**TABLE 3.** Comparison of joint forces and torques (mean  $\pm$  SD) among throws

	Fastball pitch (18.4 m)	37 m throws	55 m throws	Max distance throws (80 $\pm$ 9 m)
Arm cocking				
Elbow varus torque (Nm)	92 $\pm$ 19	90 $\pm$ 18	95 $\pm$ 19	100 $\pm$ 18
Shoulder internal rotation torque (Nm)	94 $\pm$ 18	92 $\pm$ 17	96 $\pm$ 18	100 $\pm$ 18

- **Max distance** throwing actually **DECREASED velocity**:

**TABLE 2.** Comparison of peak velocity data (mean  $\pm$  SD) among throws

	Fastball pitch	37 m throws	55 m throws	Max distance
Ball velocity (m/s)	37 $\pm$ 2	37 $\pm$ 2	37 $\pm$ 2	36 $\pm$ 2

Their conclusions:

shoulder horizontal adduction, or abduction. Forward trunk tilt decreased with throwing distance. **Thus, the current study did not indicate that particular throwing distances were superior for training increased ball velocity.**

**AND...**

supervision of a clinician monitoring tissue healing and joint range of motion. **It is the opinion of the authors that long-toss thrown on a line is a safe exercise for rehabilitation and training, but the use of long-toss throws for maximum distance may not be beneficial.** This advice against maximum distance throwing is based upon the high

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**The Long Toss Rule: How Far is Too Far?**

ONLY throw at a distance where you can keep the ball on a straight line.  
For most this is no more than 120-150 feet.

**Study Suggests "Magic Number" of Innings Pitched That  
Causes Injury**

(click here for a 1-page .pdf this section of the newsletter)

Also presented at the [2010 ASMI Baseball Injuries Conference](#):

**Risk of Serious Injury for Young  
Baseball Pitchers**

**A 10-Year Prospective Study**

500 pitcher and position players were followed for 10 years.

They found the "magic number" of innings per year that significantly increased injury risk to be 100 innings. Specifically:

**Results:** The cumulative incidence of injury was 5.0%. Participants who pitched more than 100 innings in a year were 3.5 times more likely to be injured (95% confidence interval = 1.16 to 10.44). Pitchers who concomitantly played catcher seemed to be injured more frequently, but this trend was not significant with the study sample size.

So PLEASE make sure you track how many innings your son pitches and be aware of this number.

**Have A Question About This Newsletter?**  
Email ([PitchingDoc@msn.com](mailto:PitchingDoc@msn.com)) or call (631-352-7654)  
Dr. Arnold!