



“This was a landmark and well controlled research study with baseball pitchers and the IntelliSkin shirt. The increase in throwing velocity was an important finding, but even more important was the shirts ability to delay fatigue as the pitch count increased. This product has great potential, not only for use as an injury prevention and performance enhancement device, but also for accelerating the rehab process following injury or surgery.” **Dr. James Andrews**

**Study Title:** **Performance and fatigue in baseball pitchers using the IntelliSkin™ compression shirt**

**Location:** **The Andrews Research and Education Institute**

**Investigators:** **Elizabeth Russell, PhD**  
**Biomechanics Research Associate**

**James R. Andrews, MD**  
**Medical Director**

**Sanjay Menon, MD, Orthopaedic Fellow**  
**Paul Novakovich, MD, Orthopaedic Fellow**  
**Kevin Witte, MD Orthopaedic Fellow**

### **Background**

Anecdotal reports have indicated that both performance and fatigue are improved in athletic populations wearing the shirt. The purpose of this study was to evaluate the efficacy of the IntelliSkin™ Foundation 2.0 compression shirt on pitching performance, fatigue, pain and discomfort in baseball pitchers.

### **Methods**

Fifteen male baseball pitchers between the ages of 15 and 25 were recruited from local high school and college teams and were identified by head, varsity baseball coaches. Average subject characteristics and standard deviations were as follows: age – 16.1 ± 1.8 years, height – 1.79 ± 0.06 meters, mass – 78.7 ± 10.8 kg. Pitchers had an average of 6 ± 2 years of pitching experience.

### **Results**

**1.** Speed improved when wearing the shirts, but subjects did not feel more fatigued, despite the fact that they were throwing faster.

Pitching performance improved significantly when wearing the IntelliSkin™ Foundation 2.0 compression shirt. The pitchers consistently threw faster in the Shirt condition than in the Control condition ( $p=0.042$ ). The average improvement was over 1 mph which, albeit small, is an important difference for pitchers seeking the greatest advantages available. There were no significant changes in pitching performance over time, indicating that speeds stayed somewhat consistent in both groups across the 60 pitches and any fatigue that may have developed did not significantly affect pitching speed. These results are shown in Figure 1.

**2.** The shirt also decreased pain significantly; this result became even more pronounced when greater numbers of pitches were thrown. This result is of particular importance for injury prevention. Pitching while in pain is the single greatest risk factor for youth pitching injuries.

General pain and discomfort, assessed through a Visual Analog Scale (VAS), was one of the most compelling results of the study. Although both groups increased their ratings of pain as more pitches were thrown ( $p<0.001$ ), during the Shirt condition VAS scores increased significantly less than in the Control condition (interaction  $p = 0.006$ ). This was particularly pronounced from pitches 21-60 ( $p<0.001$  in all instances). Therefore, although the IntelliSkin compression shirt cannot completely diminish all pain (particularly as a pitcher throws more than 20 pitches), it can significantly reduce and delay the pain and discomfort a pitcher experiences. Figure 3 shows VAS scores.

**3.** Lastly, despite the fact that pitchers were given no feedback of their pitching speeds, they felt as though the shirt did have some impact on their performance, especially as the pitch count increased.

### **Conclusions**

The results of this study indicate that the IntelliSkin™ Foundation 2.0 shirt can be recommended as methods for performance enhancement, pain reduction, and injury prevention. It is likely that the shirt may also improve pitching mechanics; however future research is needed to test this hypothesis.



## Subject Comments

S03 – The subject said **“My arm doesn’t hurt near as bad as it did without the shirt.”**

S04 – The subject said **“I didn’t feel nearly as tired wearing shirt.”**

S06 – The subject liked the shirt. “The shirt felt very different from the first time [pitching without the shirt]. Muscles felt contracted more in one spot, rather than feeling the muscle contract the whole length of the arm.”

S08 – Subject said the shirt **“fits better than Under Armour, more form fitting but feels like I’m almost not wearing it.”**

S10 – The subject said wearing the shirt “felt comfortable and good pitching in it. Did not feel any pain. **Elbow usually hurts and there was less [pain] with the shirt.** Felt better pitching in shirt than without it.”

S11 – The subject felt that the shirt “kept the heat in”. He does not know if it made him pitch faster but stated that it feels good and he likes the design of shirt. “It’s cool.”

S13 – **The subject was tired after pitching 60 pitches but his lower back and lats were not as sore as when not wearing the shirt.** The shirt was not uncomfortable anywhere, but he stated he was used to wearing compression shirts. He stated he **“felt the comfort of the shirt and could have kept on pitching.”**

S15 – The subject thought the shirt helped his pitching performance a lot and helping him keep control **(this subject was extremely accurate throughout the protocol when wearing the shirt)**. He stated the following: **“There is nothing I dislike about it.” “It is not that noticeable on you [to wear].” “I am not as tired as I was the last time” (in the Control condition)**. He also stated **that his arm bothered him last week in the Control condition, but did not bother him during the Shirt condition.**

Andrews Institute study: Performance and fatigue in baseball pitchers using the IntelliSkin shirt