School of Health and Human Sciences

Baseball Related Injuries: Prospective Studies

Literature Review

- *Major League Baseball*
- *Eichinger et al*.
- *Tremblay etal*.

Projected Studies

1. Survey study: Goal- a simple assessment to determine the knowledge of parents, coaches and kids on pitching guidelines and arm injuries
2. Simulated Pitching Game: Goal- determine at which points in a game when grip strength and soreness may occur
3. Wearable Sensor: Goal- measure intensity and number of total throws during a single game day.
4. Target population: youth baseball pitchers ages 14 - 18

Survey

1. Send survey out to local organizations, coaches and teams
2. Items on arm pain, fatigue, and other baseball related injuries
3. Ask about knowledge of pitch counts
4. Utilized article by Luke Zabawa and Jeremy A. Alland

Survey

34. How much rest does your child typically get after pitching 65 pitches in a game?

- 1 day
- 1 days
- 3 days
- 4 days
- 5 days
- 6 days

35. How much rest *should* your child get after pitching 65 pitches in a game?

- 1 day
- 1 days
- 3 days
- 4 days
- 5 days
- 6 days

36. *Should* your child warm up before pitching?

- Yes
- No

37. Is it ok to play on multiple baseball teams at the same time?

- Yes
- No

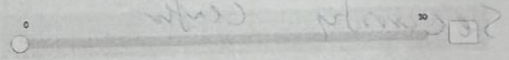
38. Is it ok to pitch in more than 1 game on the same day?

- Yes
- No

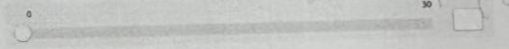
39. At your child's age, is it recommended to participate in multiple different sports?

- Yes
- No

40. How many showcases does your child attend per year?



41. How many showcases on average do you believe that players your child's age attend per year?



42. As a parent or coach, are you aware of the USA Baseball throwing guidelines (Pitch Smart) throwing guidelines?

- Yes
- No
- Maybe—it sounds familiar

43. Who do you feel plays the largest role in preventing baseball injuries for your child?

- My child
- Coaches
- Parents (me)
- Doctors/trainers
- Peers

44. If aware of the above guidelines, do you try to actively follow them?

- Yes
- No

Simulated Pitching Game

1. Players wear a sensor (accelerometer)
2. Simulate a game situation in which they pitch 75 pitches (fast ball only)
3. Measure velocity, grip strength, pain perception, and muscle soreness

Wearable Sensor

1. Players wear sensor on arm during gameplay
2. Measure total throws and pitches during the game
3. Measure throwing intensity of each pitch
4. Compare pitches tracked in game changer to pitches tracked with arm sensory

GAMECHANGER™

Sensors Considered

- PULSE Throw Workload Monitor
  - Arm speed, elbow torque, throwing count
- Ametrics (Actigraph) wGT3X-BT Monitor
  - Accelleration, physical activity intensity

Hand Grip Dynamometer and Mound

1. Hand Grip Dynamometer to measure grip strength before and after pitching.
2. Facility with pitching tunnels (need a mound)

Outcomes

1. We predict that the people who participate in our survey will not not be knowledgeable of the pitch count guidelines.

2. We expect the grip strength of our participants to decrease with the more pitches thrown.

3. We anticipate that the wearable sensor will properly track arm speed, elbow torque, and pitch counts.

Timeline

1. Currently working on IRB for upcoming studies
2. Prospective studies within the next 3-5 years
3. Distribute survey this upcoming spring or summer
4. After survey data has been collected, begin sensor and simulated game the following summer

Thank You

Keith Naugle Ph.D., AT., NSCA-CPT

Tony Kaleth Ph.D., FACSM

David Pierce Ph.D.

Kelly Naugle Ph.D.

Aaron Struminger Ph.D.