# School of Health, Physical Education & Sport Sciences

**Baldwin Wallace University**

Fall 2019

Dr. Amy Jo Sutterluety
Associate Dean

The 2018-19 HPESS graduates in Athletic Training, Exercise Science, Health Coaching and Promotion and Pre-Physical Therapy have had excellent success connecting their curriculum, leadership experiences and Baldwin Wallace opportunities. The following is a brief list of outcomes for the 2018-19 graduating class:

- Two students will attend Baldwin Wallace's Accelerated Nursing Program;
- One student will attend Case Western Reserve Nursing Program;
- One student will attend Palmer School of Chiropractic;
- One student will attend Texas State University Master of Athletic Training;
- One student will attend Bowling Green State University Master of Exercise Physiology;
- Seven students will attend DPT programs: Ohio State, Pitt, Drexel, Cleveland State, Gannon, Rocky Mountain University and D'Youville;
- One student secured an Athletic Training position & two secured entry level positions in Exercise Science;
- Four students are in the interview phase for Exercise Science and/or Health Promotion positions;
- Two students will work as an STNA/clinical while waiting for Physician Assistant acceptance;
- One student is moving to Texas and seeking Health Promotion employment;
- Five students sat for the national Board of Certification (BOC) examination for Athletic Training;
- Five students passed one or more of the following national certifications: American College of Sports Medicine Certified Exercise Physiologist Exam or Certified Personal Trainer Exam, CHES exam or National Strength and Conditioning Certification CSCS exam.

HPESS affiliations:

Would you like to support student research and professional development opportunities?

Perhaps you might consider directing your donation to the HPESS Student Development Fund.

By selecting the "Donation Details" drop box, then "Other" and indicating "HPESS Student Development Fund" you will be placing funds directly into the hands of our HPESS students.

The funds will be awarded to our current undergraduate students with a declared HPESS major or minor who apply to receive funding or reimbursement from attendance at an approved event, conference registration, travel, educational opportunities and research equipment. As a part of the application process a post-activity narrative is required, including photos to be used to further educate student peers and faculty.

# The Effect of a Shoulder Exercise and Foam Rolling Regimen on Shoulder Range of Motion In High School Athletes

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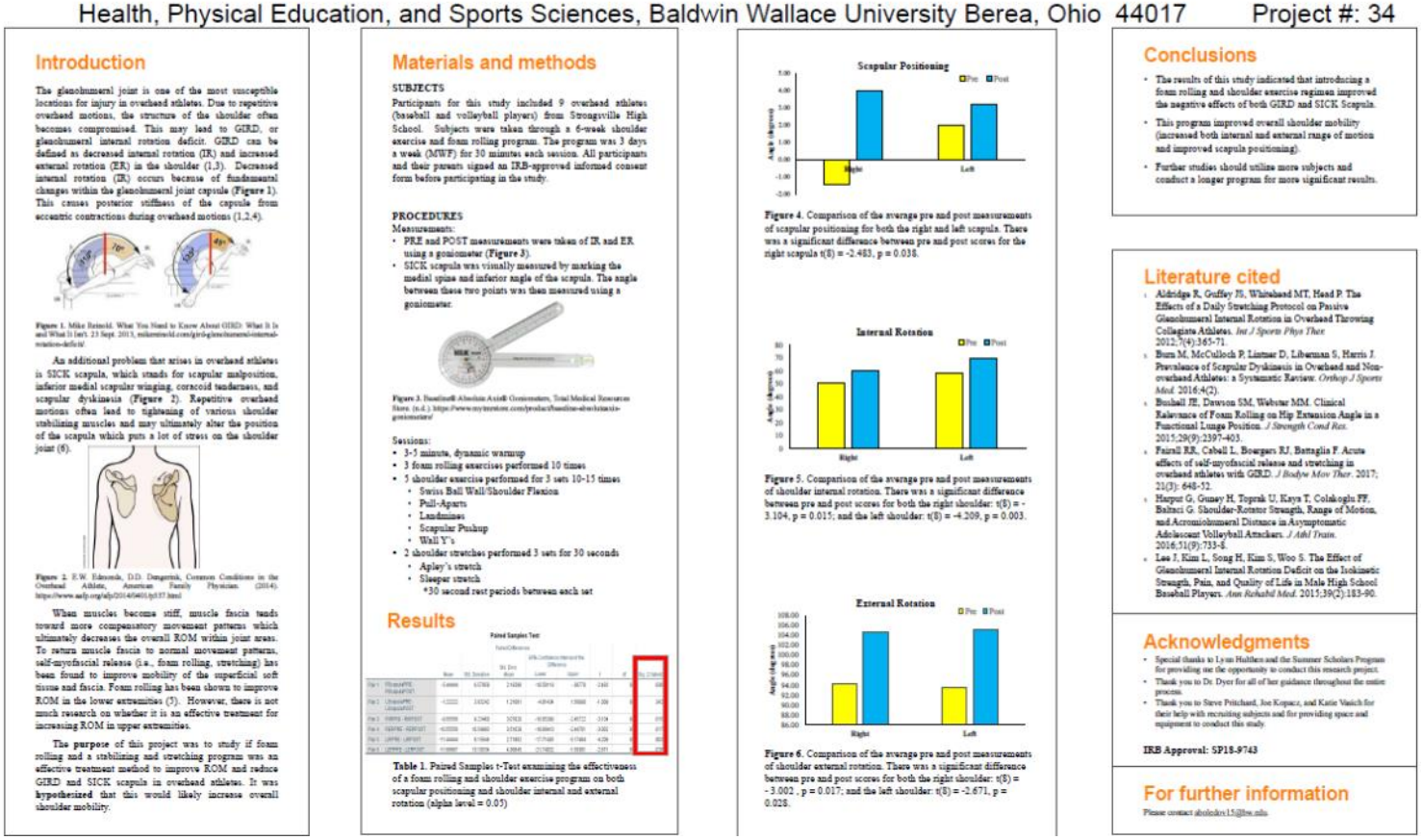

## Introduction

The glenohumeral joint is one of the most susceptible locations for injury in overhead athletes. Due to repetitive overhead motions, the structure of the shoulder often becomes compromised. This may lead to GIRD, or glenohumeral internal rotation deficit. GIRD can be defined as decreased internal rotation (IR) and increased external rotation (ER) in the shoulder (1,3). Decreased internal rotation (IR) occurs because of fundamental changes within the glenohumeral joint capsule (**Figure 1**). This causes posterior stiffness of the capsule from eccentric contractions during overhead motions (1,2,4).

Figure 1. Mike Reinold. What You Need to Know About GIRD: What It Is and What It Isn't. 23 Sept. 2013, mikereinold.com/gird-glenohumeral-internal-rotation-deficit/.

An additional problem that arises in overhead athletes is SICK scapula, which stands for scapular malposition, inferior medial scapular winging, coracoid tenderness, and scapular dyskinesis (**Figure 2**). Repetitive overhead motions often lead to tightening of various shoulder stabilizing muscles and may ultimately alter the position of the scapula which puts a lot of stress on the shoulder joint (8).

Figure 2. R.W. Edwards, D.D. Dangerink, Common Conditions in the Overhead Athlete, American Family Physician. (2014). https://www.aafp.org/afp/2014/0401/p537.html

When muscles become stiff, muscle fascia tends toward more compensatory movement patterns which ultimately decreases the overall ROM within joint areas. To return muscle fascia to normal movement patterns, self-myofascial release (i.e., foam rolling, stretching) has been found to improve mobility of the superficial soft tissue and fascia. Foam rolling has been shown to improve ROM in the lower extremities (3). However, there is not much research on whether it is an effective treatment for increasing ROM in upper extremities.

The **purpose** of this project was to study if foam rolling and a stabilizing and stretching program was an effective treatment method to improve ROM and reduce GIRD and SICK scapula in overhead athletes. It was **hypothesized** that this would likely increase overall shoulder mobility.

## Materials and methods

**SUBJECTS**

Participants for this study included 9 overhead athletes (baseball and volleyball players) from Strongsville High School. Subjects were taken through a 6-week shoulder exercise and foam rolling program. The program was 3 days a week (MWF) for 30 minutes each session. All participants and their parents signed an IRB-approved informed consent form before participating in the study.

**PROCEDURES**

Measurements:

- PRE and POST measurements were taken of IR and ER using a goniometer (**Figure 3**).
- SICK scapula was visually measured by marking the medial spine and inferior angle of the scapula. The angle between these two points was then measured using a goniometer.

Figure 3. Baseline® Absolute Axis® Goniometers, Total Medical Resources Store. (n.d.). https://www.mymemtom.com/product/baseline-absolutaxis-goniometer/

Sessions:

- 3-5 minute, dynamic warmup
- 3 foam rolling exercises performed 10 times
- 5 shoulder exercise performed for 3 sets 10-15 times
  - Swiss Ball Wall/Shoulder Flexion
  - Pull-Aparts
  - Landmines
  - Scapular Pushup
  - Wall Y's
- 2 shoulder stretches performed 3 sets for 30 seconds
  - Apley's stretch
  - Sleeper stretch

  *30 second rest periods between each set

## Results

Table 1. Paired Samples t-Test examining the effectiveness of a foam rolling and shoulder exercise program on both scapular positioning and shoulder internal and external rotation (alpha level = 0.05)



Figure 4. Comparison of the average pre and post measurements of scapular positioning for both the right and left scapula. There was a significant difference between pre and post scores for the right scapula $t(8) = -2.483$, $p = 0.038$.



Figure 5. Comparison of the average pre and post measurements of shoulder internal rotation. There was a significant difference between pre and post scores for both the right shoulder: $t(8) = -3.104$, $p = 0.015$; and the left shoulder: $t(8) = -4.209$, $p = 0.003$.



Figure 6. Comparison of the average pre and post measurements of shoulder external rotation. There was a significant difference between pre and post scores for both the right shoulder: $t(8) = -3.002$, $p = 0.017$; and the left shoulder: $t(8) = -2.671$, $p = 0.028$.

## Conclusions

- The results of this study indicated that introducing a foam rolling and shoulder exercise regimen improved the negative effects of both GIRD and SICK Scapula.
- This program improved overall shoulder mobility (increased both internal and external range of motion and improved scapula positioning).
- Further studies should utilize more subjects and conduct a longer program for more significant results.

## Literature cited


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**IRB Approval: SP18-9743**


## For further information

Please contact aboledov15@bw.edu

Student and faculty research collaboration was robust in 2018-19. The research project above by Alexis Boledovic was selected by the Ovations judges as a highlighted project! The following are a list of 2019 HPESS Ovations Research posters:

**The Effect of a Shoulder Exercise and Foam Rolling Regimen on Shoulder Range of Motion In High School Athletes**
Alexis Boledovic
Project Mentor: Dr. Jaimy Dyer

**Collegiate Football Athlete Treated For Acute Rhabdomyolysis Found To Have Accessory Ureter**
Kelly Ferian, Dane Eberle, Jake Woodruff
Project Mentors: Dr. Elizabeth Walters & Professor Karyn Gentile

**Self-regulation, self-efficacy, and balance in ambulatory adults with Cerebral Palsy**
Jessica Edwards
Project Mentor: Dr. Amy Jo Sutterluety

**Collegiate Track Athlete with Bilateral Functional Popliteal Entrapment Syndrome**
Rebecca Osan
Project Mentors: Dr. Elizabeth Walters & Professor Karyn Gentile

**HPESS Center for Coaching Excellence Presents: Positive Impact on Youth Football**
Peter George, Ashley Ackerman, Jacob Holloway
Project Mentor: Dr. Kerry Bebie