Occupation-based Interventions for an Adolescent Baseball Player with Medial Elbow Pain: A Case Report

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Abstract

This case describes an *occupation-based throwing* approach that uses a sport-specific throwing sequence as an adjunct to traditional rote exercises in the conservative management of medial elbow pain in a 12-year-old baseball player (RW). Occupations are meaningful and purposeful activities in everyday life. Occupational therapists, in hand therapy, have struggled to incorporate occupation-based interventions (OBIs) into their treatment plans for the past few decades. This case demonstrates occupation-based treatment ideas for this population. Treatment began with a home exercise program. RW initiated clinic activities with eccentric upper extremity strengthening in addition to plyometric upper extremity strengthening. RW's treatment progressed to include an *occupation-based throwing* approach incorporating throwing a regulation baseball in several positions in the clinic. At four weeks post evaluation, RW was given an interval return-to-throwing program to complete at home. At 12 week follow-up, RW completed a modified version of the interval return-to-throwing program with only minimal pain symptoms. The QuickDASH functional outcome measure (sport module) improved from 81.25 points (out of 100) on initial evaluation to 18.75 points (out of 100) at 12-week follow-up. This case allows occupational therapists to consider a similar occupation-based throwing approach for the conservative management of similar injuries in their clients.

Keywords: occupation-based, baseball, medial elbow pain, interval throwing program

Introduction

The incidence of elbow injuries in adolescent baseball players has been high in the past couple of decades. Hang et al. (2004) reported a 57% incidence rate for medial elbow pain with youth baseball players. In a study done by Matsuura et al. (2016), among 1563 youth baseball players, 29.2% reported an occurrence of elbow pain. Baseball players who threw over 600 pitches throughout a season had a 234% greater occurrence of elbow injuries (Lyman et al., 2001). According to Olsen, Fleisig, Dun, Loftice, and Andrews (2006), youth baseball players who pitched for greater than eight months out of the year had a five times higher occurrence of elbow surgery. Many factors such as sport specialization, year-round participation, high pitch counts, playing on multiple teams, and poor throwing mechanics have contributed to this epidemic (Leahy, Schorpion, & Ganley, 2015). These factors provide an opportunity for occupational therapy services.

Rehabilitation guidelines commonly involve returning joint range of motion (ROM) and the introduction of low-level resistance training (Sgroi & Zajac, 2018). According to Sgroi and Zajac (2018), rehabilitation progresses from a resistance and endurance phase to a plyometric phase, and then an interval throwing program is introduced to complete the overhead athlete return-to-throwing rehabilitation program. The early strengthening phase involves eccentric strengthening as tolerated to the elbow as eccentric strengthening has proven benefits to healing tissue with tendinosis (Brummit & Cuddeford, 2015). Eccentric exercises with adjunct multimodal therapies have been shown to improve pain, strength, and function with elbow tendinopathy (Cullinane, Boocock, & Trevelyan, 2014; Heijnders & Lin, 2015; Peterson, Butler, Eriksson, & Svardsuud, 2014; Raman, MacDermid, & Grewal, 2012; Stasinopoulos, D. & Stasinopoulos, I., 2017). Rotator cuff and scapular strengthening provide proximal stability for an overhand throw (Ellenbecker, Reinhold, & Nelson, 2010; Leahy et al., 2015; Sgroi & Zajac, 2018). Plyometric exercises are focused on the elbow flexors and shoulder decelerators (Ellenbecker et al., 2010; Leahy et al., 2015). The final phase of rehabilitation includes a step-by-step interval throwing program with proper throwing mechanics to be done independently by the client and a partner during their home exercise program (Ellenbecker et al., 2010; Leahy et al., 2015; Sgroi & Zajac, 2018).

This case report uniquely describes an *occupation-based throwing* approach that is used in conjunction with the standard rehabilitation program that typically includes ROM, strength, throwing plyometrics, and an interval throwing program for adolescent baseball players with medial elbow pain (Ellenbecker et al., 2010; Leahy et al., 2015; Sgroi & Zajac, 2018). Occupations are meaningful and purposeful activities that provide enjoyment and motivation to the client compared to using only rote exercises (Trombly, 1995). This case report incorporates

throwing a regulation baseball versus utilizing just rote exercises at an inclined trampoline from standing and single-knee position as well as with a double-knee position on a BOSU® ball to work on endurance, core strength, and proper throwing mechanics. The purpose is to integrate occupations as a treatment to promote meaningfulness, motivation, and challenge the client ultimately to return to throwing a baseball without any symptoms.

Patient information

RW is a 13-year-old right-hand dominant male who is a 7th-grade student. He frequently participates in baseball and likes to play video games. In winter, RW was throwing a baseball and felt a "pop" in his right medial elbow. He stopped playing baseball for a few weeks and then started participating in low-moderate CrossFit® training and some light hitting in baseball. By late winter, he was resting his elbow to let his injury heal. RW plays pitcher and middle infielder. He throws several pitches which include four-seam fastball, curveball, and slider. He was seen in the spring for his occupational therapy initial evaluation. He stated he only gets right medial elbow pain with throwing a baseball. His goal was to "be able to throw as hard as I can without pain."

Clinical Findings (Spring)

RW initially saw his pediatrician in late winter who diagnosed him with right upper extremity little league elbow syndrome (ICD-10-CM Diagnosis Code M77.02) and recommended to take ibuprofen and start with light toss with a baseball. His pediatrician also referred him to a sports medicine specialist. The sports medicine specialist saw RW in early spring and agreed with the diagnosis of the pediatrician and also recommended no throwing or forceful gripping. RW was referred to occupational therapy for stretching, strengthening, and eventual return-to-throw program. Radiographs of the right elbow were ordered and came back negative. RW and his mother signed the informed consent form in occupational therapy after a thorough explanation (Appendix B). The occupational therapy initial evaluation revealed no visible injury to the right medial elbow. RW had full ROM in his right upper extremity. He reported a pain level of 0/10 at rest and 7/10 at worst with throwing a baseball using the Wong-Baker FACES Pain Rating Scale (Wong-Baker FACES, n.d.). He described how his pain caused him to stop playing baseball. He was quite frustrated stating, "I am annoyed I can't throw without pain even after I rested for a long time." RW discussed how he specifically had medial elbow pain in the overhead (acceleration) and follow-through phases of his throw. He complained of mild ulnar nerve paresthesias in his ring and small fingers. Grip and pinch measurements were taken using a Jamar dynamometer and B&L engineering pinch gauge (Table 1) which have demonstrated high reliability and validity (Bellace, Healy, Besser, Byron, & Holman, 2000; Mathiowetz, Weber, Volland, & Kashman, 1984).

Table 1

RW grip and pinch strength measurements

Right grip = 78#	Left grip = 72.3#
Right lateral pinch = 17#	Left lateral pinch = 14.3#
Right 3 jaw pinch = 12.7#	Left 3 jaw pinch = 10.7#

Note. All pinch and grip measurements were an average of three trials.

Upper strength was measured using manual muscle testing (Table 2) (Cuthbert & Goodheart, 2007).

Table 2

RW manual muscle test strength measurements

Manual muscle test	Right	Left
Flexor carpi ulnaris	5/5	5/5
Flexor carpi radialis	5/5	5/5
Pronator teres	5/5	5/5
Supinator	5/5	5/5
Extensor carpi radialis longus and brevis	5/5	5/5
Extensor carpi ulnaris	4/5	5/5
Lower trapezius	4/5	4+/5
Middle trapezius	4/5	4/5
Rhomboids	4/5	4/5
Teres minor/posterior deltoid	4+/5	4/5
Shoulder forward flexion	5/5	5/5
Shoulder abduction	5/5	5/5
Shoulder external rotation	4/5	4+/5
Shoulder internal rotation	5/5	5/5

Medial elbow stability was tested using manual valgus stress at full elbow extension, 30 degrees of elbow flexion, and 60 degrees of elbow flexion (Karbach & Elfar, 2017). All valgus stress testing was negative. Tinel's test for cubital tunnel syndrome was mildly positive (Scott, 1969).

Tinel's test for cubital tunnel syndrome is moderately sensitive (70%) and highly specific (98%) (Goldman, Brininger, Schrader, & Koceja, 2009). RW was tender to palpation along his right flexor-pronator mass. The postural observation showed RW had bilateral scapular abduction and bilateral anterior scapular tilt. Core stability was tested having RW perform a one-legged squat where he showed weakness in his core by losing his balance in the eccentric phase of the squat (Kibler, Press, & Sciascia, 2006). The *Quick*DASH was used to assess upper extremity function (Institute for Work & Health, n.d.). The *Quick*DASH is an 11-item questionnaire to help define disability in upper extremity disorders and to observe changes in symptoms and function over time (Institute for Work & Health, n.d.). The full *Quick*DASH revealed a disability/symptom score of 22.5 points out of 100. RW indicated severe difficulty with recreational activities which require you to take some force or impact through your arm. He indicated moderate symptoms in the last week for upper extremity pain and tingling. The *Quick*DASH sports module showed a disability/symptom score of 81.25 points out of 100. RW circled severe difficulty for the following items: using your usual technique for playing your sport, playing your sport because of upper extremity pain, and playing your sport as well as you would like (Table 3). He circled unable in regards to spending your usual amount of time practicing or playing your sport (Table 3).

Table 3

İRW QuickDASH Sports Module initial evaluation results

Did you have difficulty:	Rating
Using your usual technique for playing your sport?	Severe Difficulty
Playing your sport because of upper extremity pain?	Severe Difficulty
Playing your sport as well as you would like?	Severe Difficulty
Spending your usual amount of time practicing or playing your sport?	Unable

Therapeutic intervention

Occupational therapy treatment goals were: 1) Decrease pain level reported to 0/10 when throwing a baseball in 12 weeks. 2) Decrease ulnar nerve paresthesias in right elbow to tolerate throwing a baseball in 12 weeks. 3) No difficulty utilizing proper throwing mechanics in 12 weeks. 4) Independent in home exercise program within one week. 5) *Quick*DASH sports module disability/symptom score of fewer than 20 points in 12 weeks. 6) Increase in scapular and shoulder external rotation manual muscle test strength to 4+/5 or greater to improve

proximal upper extremity stability and arm deceleration while pitching in 12 weeks. Key treatment components at each stage are described herein.

Day 1-7

At the conclusion of the initial evaluation, RW was given a home exercise program, which included dynamic forearm stretching exercises (1 time/day, 20 repetitions), red TheraBand® scapular adduction and external rotation exercises (1 time/day, 30 repetitions), and a doorway chest stretch (2 times/day, 3 repetitions for 30 second holds/session). Dynamic forearm stretching was given to improve medial forearm circulation and flexibility. Anterior chest stretches and TheraBand® strengthening exercises were given to address his poor posture and weak rotator cuff strength. One week later, RW began formal occupational therapy, which included 1) a moist hot pack to right elbow (10 minutes), 2) soft tissue massage and instrument-assisted soft tissue mobilization to right medial elbow (15 minutes), 3) dynamic forearm stretches (20 repetitions), 4) eccentric wrist flexion (3# dumbbell, 3 sets of 10 repetitions), 5) eccentric pronation (1.5# metal bar, 3 sets of 10 repetitions), 6) physio ball prone Y,T,Is (1# dumbbells, 2 sets of 5 repetitions in prone on physio ball), 7) physio ball prone weighted ball shoulder external rotation toss (Figure 1)(1# weighted ball 3 sets of 15 repetitions in prone on physio ball), 8) Bodyblade® shoulder internal/external rotation (3 sets of 30 seconds), 9) physio ball shoulder external rotation toss (1# weighted ball, 3 sets of 10 repetitions in sitting with the occupational therapist tossing the weighted ball from a posterolateral direction), 10) wall alphabet (1# weighted ball, 1 repetition), 11) and a cold pack to right medial elbow to end the treatment.

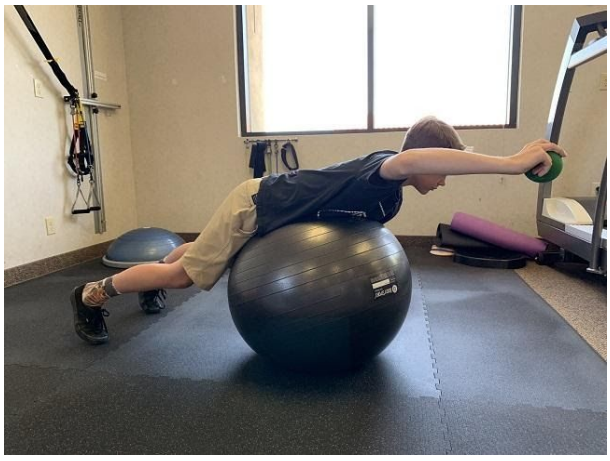
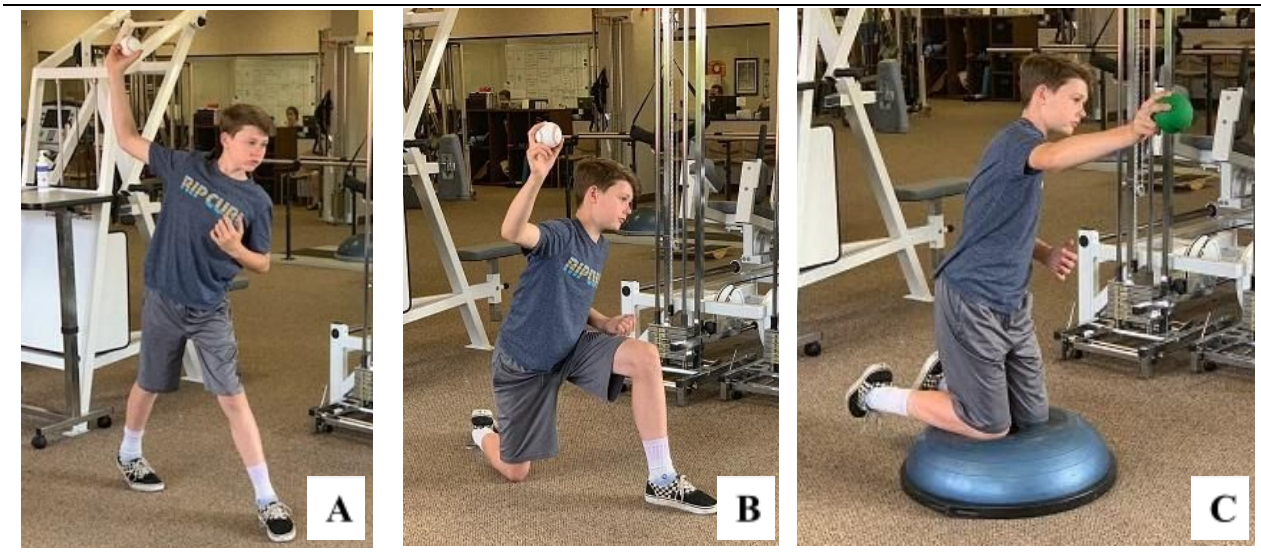


Figure 1. RW case report, in a prone position on physio ball, shoulder in 90º of abduction and 90º of external rotation. The 1# weighted ball is rapidly dropped and caught for three sets of 15 repetitions.

Weeks 1-3

Two weeks after the initial evaluation, additional treatment interventions included a wall dribble (1# weighted ball, 30 seconds) and sport-specific occupational performance exercises were

implemented. RW threw a baseball against an incline trampoline from a stretch starting pitching position (Figure 2A) (15 repetitions), throwing a baseball from a single-knee position (Figure 2B) (15 repetitions), and throwing a weighted ball from bilateral kneeling position on a BOSU® ball (Figure 2C) (15 repetitions). Based on RW's initial throws, the mechanical errors in his throwing technique, as determined by the occupational therapist, were not keeping his glove hand tight to his body, full follow-through after release, and core stability throughout all phases of the throw. Verbal cueing was consistently given regarding proper throwing mechanics. The sport-specific occupational performance exercises were meant to promote motivation, proper throwing mechanics, strength, and endurance. Three weeks after the initial evaluation, all treatment interventions were increased in weight and repetitions. RW reported his pain level at a 1/10 with throwing. He stated, "The rehab process at first was tough because I thought it wasn't working because I felt the same. With patience, I began to see changes and improvements."



Weeks 3-6

One month after the initial evaluation, most treatment interventions increased in weight and repetitions. Based on RW's minimal pain complaints and tolerance with the strengthening program, an interval throwing program (ITP) was added to RWs home exercise program (Appendix C) with thorough instructions on the plan of care with possible symptoms associated with the ITP (Reinhold, Wilk, Reed, Crenshaw, & Andrews, 2002). RW and his mother verbalized an excellent understanding of the ITP. Six weeks post initial evaluation, RW complained of medial elbow pain on the first stage of the ITP. The occupational therapist, RW, and his father discussed proper throwing mechanics during the ITP, and proper follow-through

was reiterated to RW. RW and parents wanted to proceed with working on the home exercise program and the ITP at home before proceeding with further treatment due to a high insurance co-payment. RW was discharged after having attended six occupational therapy visits, each lasting 60 minutes.

Outcomes and follow-up

Table 4 summarizes *Quick*DASH and manual muscle test strength outcomes at day 1 and week 12.

Table 4

RW outcome measures at day 1 and week 12

Time Frame	*Quick*DASH (0/100)	Manual muscle test	
	Full/sport module		
Day 1 (initial presentation)	22.5/81.25	Lower trapezius	4/5
		Middle trapezius	4/5
		Rhomboids	4/5
		Teres minor/posterior deltoid	4+/5
		Shoulder external rotation	4/5
Week 12 (follow-up)	0/18.75	Lower trapezius	5/5
		Middle trapezius	5/5
		Rhomboids	5/5
		Teres minor/posterior deltoid	5/5
		Shoulder external rotation	5/5

Table 5

RW QuickDASH Sports Module final evaluation results

Did you have difficulty:	Rating
Using your usual technique for playing your sport?	No Difficulty
Playing your sport because of upper extremity pain?	Mild Difficulty
Playing your sport as well as you would like?	Mild Difficulty
Spending your usual amount of time practicing or playing your sport?	Mild Difficulty

At the 12 week follow-up, RW reported a pain level of 0/10 at rest and 3/10 at worst with throwing at 120 feet. Tinel's sign for cubital tunnel syndrome was negative. Postural observation revealed symmetrical scapular alignment along with a neutral scapular tilt bilaterally. RW was able to complete a full one-legged squat without a loss of balance. RW reported completing the interval throwing program from the 120-foot phase, and it was decided to remain at this distance. RW noted mild pain symptoms at the 120 feet in the right medial elbow, but this did not hinder his performance while throwing. RW was encouraged to continue with his home exercise program, and a final verbal review of his throwing mechanics was reiterated to promote safe pitching in the future. RW verbalized good understanding of his home exercise program and reported he plans on resuming normal pitching activities in the fall.

Discussion

All primary treatment goals for RW were achieved, except for mild pain (3/10) symptoms throwing at 120 feet, using an *occupation-based throwing* approach for medial elbow pain. The *occupation-based throwing* approach emphasized using meaningful and purposeful activities, which included throwing an actual baseball in the clinic, to return to full occupational performance. His full *Quick*DASH disability/symptom scores improved from 22.5 points to 0 (Table 4). He reported no difficulty in participating in recreational activities, no pain, and no tingling in his arm in the last week. Most notably, his *Quick*DASH sports module disability/symptom score went from 81.25 points (out of 100) at initial evaluation to 18.75 points (out of 100) at 12-week follow-up (Table 4). He reported he improved to no difficulty using your usual technique for playing your sport and mild difficulty with pain, level of play, and amount of time practicing his sport (Table 5). Both the full *Quick*DASH and sports module showed clinical significance as both scores decreased greater than 10.2 points (Schmitt & Di Fabio, 2004). In addition to his *Quick*DASH scores, his scapular and rotator cuff (external rotation) manual muscle test grades improved from 4/5 at initial evaluation to 5/5 at 12-week follow-up (Table 4), which indicates compliance with his home exercise program and improved strength and stability for throwing.

From the client's perspective, RW reported he enjoyed the throwing activities in the clinic and at home in which he felt more motivated compared to performing merely rote exercises. He mentioned, "The home throwing was a good way to bring my arm back to life." RW stated he was satisfied with his results and was excited to get back out on the ball diamond. He stated, "Overall, the experience was great!" RW did struggle with pain symptoms during the initial phase of the interval throwing program; however, he was able to rest a couple of weeks and resume the next phase. Furthermore, the occupational therapist, RW, and his mother decided to modify the final phase of the interval throwing program from 180 feet to 120 feet, as RW's physical development was beyond a little league level, yet he was not quite ready for a full interval throwing program appropriate for high school and college-level baseball players. From

a clinical perspective, RW required consistent verbal and tactile cueing for the proper technique of his clinical activities. RW would occasionally lose focus and need verbal reminders to concentrate on his activities. Positive reinforcement was given to help motivate and stay attentive during his treatments.

A challenging aspect of RW's treatment was that the occupational therapist was unable to monitor his home exercise program or his interval throwing program. RW did have pain during the initial phase of the interval throwing program, which may have been due to poor throwing mechanics. RW's mother did report he was consistent with his home exercise program; however, the interval throwing program was completed with a friend and therefore was not closely supervised. Additionally, RW completed only six occupational therapy sessions due to a high insurance copayment, which may have contributed to RW's struggles in the early part of his interval throwing program. RW might have had a smoother transition from the clinic to the interval throwing program if he was able to attend more occupational therapy sessions.

Despite these limitations, the *occupation-based throwing* approach allowed RW to participate in meaningful activities that challenged and motivated him to return to throwing. RW stated, “I liked the throwing in the clinic as it helped me understand my mechanics better." As well, the *occupation-based throwing* approach may have expedited the return to throwing compared to traditional conservative management for medial elbow pain; however, this assumption must be empirically evaluated with further studies.

Conclusion

Medial elbow pain can be treated in many different ways; however, client-centered, occupation-based, motivating, and challenging treatment plans should be considered for optimal outcomes. The approach presented in this case report may provide some valuable perspectives for occupational therapists considering a similar strategy, although, additional research is needed to evaluate the treatment's effectiveness further.

Acknowledgments

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Appendix A

Cover Letter

Jay M. Gerzmehle

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Santee, CA 92071

July 24, 2019

Dear Joy MacDermid, PT, PhD.,

We wish to submit an original research article entitled “Occupation-based Interventions for an Adolescent Baseball Player with Medial Elbow Pain: A Case Report ” for consideration by The Journal of Hand Therapy.

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

The occurrence of medial elbow injuries in adolescent baseball players has been frequent in the past couple of decades. In this paper, we report on an *occupation-based throwing* approach using specific meaningful and purposeful activities in addition to traditional conservative management in treating medial elbow pain with an adolescent baseball player. This method is significant because it is a unique treatment approach, which utilizes client-centered, meaningful, and motivating throwing activities (occupations) for the client to return to throwing a baseball versus implementing rote exercises alone.

We believe that this case report is appropriate for publication by the Journal of Hand Therapy because it aims to show an alternative treatment to traditional conservative management for baseball players with medial elbow pain. We feel this *occupation-based throwing* approach will appeal to many upper extremity therapists within your readership.

We have no conflicts of interest to disclose.

Please address all correspondence concerning this case report to me at jaygerzmehle@gmail.com.

Thank you for your consideration of this case report.

Sincerely,

Jay M. Gerzmehle

Appendix B

Rocky Mountain University of Health Professions

Case Report Permission

Investigator: Jay Gerzmehle

OTD Cohort 32

Rocky Mountain University of Health Professions

Contact: (608)-201-9940

I am asking you to give permission to use information about your child's condition, disease, or experience to write what is called a case report. Case reports are typically used to share information about one patient's clinical care that may be useful for other medical providers. A case report may be published in a journal or online educational publication for others to read, and/or presented at a conference. This case report is for student learning and graduation requirements. The case report is independent from the clinic or healthcare institution where you receive your medical care, and therefore the facility does not assume any risk or liability related to this case report. Please read this form carefully, take your time to make your decision, and ask any questions that you may have.

I must protect your child's privacy and not disclose any personal information such as name, date of birth, medical record number, diagnosis, etc. The information I record will only be about your child's diagnosis and care that is required to complete the case report. This may include old or new chart notes about your child's care. It may also include diagnostic test results such as lab results, imaging, or reports from specialists. When the case report is published or presented, I won't use your child's name. However, your child might be identifiable by their unique experience.

Allowing your child's information to be used in a case report does not create any additional costs to you. You will not be paid or receive free care. Giving permission for your child's information to be used in this case report is your choice (voluntary). You may choose not to give permission, or you may change your mind at any time. However, once the case report is written, it will not be possible for you to withdraw. Your decision will not change the quality of care you receive.

If you have any questions, please contact Jay Gerzmehle at (608) 201-9940.

By signing this form, I confirm that:

- I have read each page of this form.
- I understand how my child's health and medical care information will be used.
- All my questions have been answered to my satisfaction.
- I understand that this case report is an independent effort by the student and not affiliated with any clinic or medical care institution.
- I understand the risks of allowing my child's de-identified information to be used in this case report.
- I understand that my child's care will the same, whether I give permission now or change my mind later.
- I authorize access to my child's personal health information (medical record) as explained in this form.

_____

Printed Child's Name

_____	_____	_____
Printed Guardian's Name	Guardian's Signature	Date

Appendix C

Interval Throwing Program for Baseball Players: Phase I

45' Phase

Step 1:
A) Warm-up Throwing
B) 45' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 45' (25 Throws)

Step 2:
A) Warm-up Throwing
B) 45' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 45' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 45' (25 Throws)

60' Phase

Step 3:
A) Warm-up Throwing
B) 60'(25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 60' (25Throws)

Step 4:
A) Warm-up Throwing
B) 60' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 60' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 60' (25 Throws)

90' Phase

Step 5:
A) Warm-up Throwing
B) 90' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 90' (25 Throws)

Step 6:
A) Warm-up Throwing
B) 90' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 90' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 90' (25 Throws)

120' Phase

Step 7:
A) Warm-up Throwing
B) 120' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 120' (25 Throws)

Step 8:
A) Warm-up Throwing
B) 120' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 120' (25 Throws)
F) Rest 5-10 min.
G) Warm-up throwing
H) 120' (25 Throws)

150' Phase

Step 9:
A) Warm-up Throwing
B) 150' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 150' (25 Throws)

Step 10:
A) Warm-up Throwing
B) 150' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 150' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 150' (25 Throws)

180' Phase

Step 11:
A) Warm-up Throwing
B) 180' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 180' (25 Throws)

Step 12:
A) Warm-up Throwing
B) 180' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 180' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 180' (25 Throws)

Step 13:
A) Warm-up Throwing
B) 180' (25 Throws)
C) Rest 5-10 min.
D) Warm-up Throwing
E) 180' (25 Throws)
F) Rest 5-10 min.
G) Warm-up Throwing
H) 180' (20 Throws)
I) Rest 5-10 min.
J) Warm-up Throwing
K) 15 throws progressing from 120 → 90'

Step 14: Return to respective position or progress to step 14 below.

All throws should be on an arc with a crow-hop

Warm-up throws consist of 10-20 throws at approximately 30 feet

Throwing Program should be performed every other day, 3 times per week unless otherwise specified by your physician or rehabilitation specialist.

Perform each step _____ times before progressing to next step.

Flat Ground Throwing for Baseball Pitchers

Step 14:
A) Warm-up Throwing
B) Throw 60 ft. (10-15 throws)
C) Throw 90 ft. (10 throws)
D) Throw 120 ft. (10 throws)
E) Throw 60 ft. (flat ground) using pitching mechanics (20-30 throws)

Step 15:
A) Warm-up Throwing
B) Throw 60 ft. (10-15 throws)
C) Throw 90 ft. (10 throws)
D) Throw 120 ft. (10 throws)
E) Throw 60 ft. (flat ground) using pitching mechanics (20-30 throws)
F) Throw 60-90 ft. (10-15 throws)
G) Throw 60 ft. (flat ground) using pitching mechanics (20 throws)

Progress to Phase II – Throwing Off the Mound

45 feet = 13.7 meters
60 feet = 18.3 meters
90 feet = 27.4 meters
120 feet = 36.6 meters
150 feet = 45.7 meters
180 feet = 54.8 meters

Interval Throwing Program: Phase II – Throwing Off the Mound

STAGE ONE: FASTBALLS ONLY

Step 1: Interval Throwing
15 Throws off mound 50%*

Step 2: Interval Throwing
30 Throws off mound 50%

Step 3: Interval Throwing
45 Throws off mound 50%

Step 4: Interval Throwing
60 Throws off mound 50%

Step 5: Interval Throwing
70 Throws off mound 50%

Use Interval Throwing 120ft (36.6m) Phase as warm-up

ALL THROWING OFF THE MOUND SHOULD BE DONE IN THE PRESENCE OF YOUR PITCHING COACH OR SPORT BIOMECHANIST TO STRESS PROPER THROWING MECHANICS

(Use speed gun to aid in effort control)

Step 6: 45 Throws off mound 50%
30 Throws off mound 75%

Step 7: 30 Throws off mound 50%
45 Throws off mound 75%

Step 8: 10 Throws off mound 50%
65 Throws off mound 75%

STAGE TWO: FASTBALLS ONLY

Step 9: 60 Throws off mound 75%
15 Throws in Batting Practice

Step 10: 50-60 Throws off mound 75%
30 Throws in Batting Practice

Step 11: 45-50 Throws off mound 75%
45 Throws in Batting Practice

STAGE THREE

Step 12: 30 Throws off mound 75% warm-up
15 Throws off mound 50% BEGIN BREAKING BALLS
45-60 Throws in Batting Practice (fastball only)

Step 13: 30 Throws off mound 75%
30 Breaking Balls 75%
30 Throws in Batting Practice

Step 14: 30 throws off mound 75%
60-90 Throws in Batting Practice (Gradually increase breaking balls)

Step 15: SIMULATED GAME: PROGRESSING BY 15 THROWS PER WORKOUT (Pitch Count)

* Percentage effort