

5-1-2023

## Acute Effects of Post-Activation Potentiation on Increasing Bat Velocity in Competitive Baseball Players: A Case Series

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<http://dx.doi.org/10.34917/35748977>

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ACUTE EFFECTS OF POST-ACTIVATION POTENTIATION ON INCREASING BAT  
VELOCITY IN COMPETITIVE BASEBALL PLAYERS: A CASE SERIES

By

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A doctoral project submitted in partial fulfillment  
of the requirements for the

Doctor of Physical Therapy

Department of Physical Therapy  
School of Integrated Health Sciences  
The Graduate College

University of Nevada, Las Vegas  
May 2023

**Doctoral Project Approval**

The Graduate College  
The University of Nevada, Las Vegas

May 12, 2023

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entitled

Acute Effects of Post-Activation Potentiation on Increasing Bat Velocity in Competitive  
Baseball Players: A Case Series

is approved in partial fulfillment of the requirements for the degree of

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## **Abstract**

**Purpose/Hypothesis:** Hitting a baseball is widely considered as one of the most difficult motor tasks in sports. It requires quick decision-making and coordinated activation of key muscles to produce a precise and rapid swing. Higher bat velocity has been shown to be associated with offensive performance of baseball players, as greater bat velocities permit more time to be spent analyzing a pitch and can lead to greater outcomes when a ball is hit in play. Baseball players and coaches have traditionally sought on-deck routines to temporarily enhance bat velocity before an at-bat, primarily swinging a weight bat. However, this method has been shown to be ineffective at increasing bat velocity in previous studies. This case series primarily explored the effects of a post-activation potentiation inducing warmup (PAP) procedure on bat velocity and secondarily explored whether upper- or lower-body strength has implications on the effect seen.

**Case Descriptions:** Six high-school male baseball position players completed a dynamic warm-up then were randomly assigned to an order of warmup interventions consisting of either standard bat swings (SBS) or PAP inducing maximum voluntary isometric contractions (MVC). After each intervention and following a ten-minute washout period in between interventions, the bat velocity of ten subsequent swings was recorded. Participants' maximal 1-repetition back squat and bench press were tested for computation of relative strength.

**Outcomes:** Bat velocity was highly variable between the players and across the ten swings for each intervention. Four players demonstrated higher bat velocity following the PAP intervention. There was no clear trend regarding whether stronger individuals, as evident through bench press and back squat performance, contributed to the change in bat velocity following the PAP intervention.

**Conclusion:** Utilizing MVCs to induce a PAP effect may be an effective means of increasing bat

velocity prior to an at-bat, although this is largely individualistic. It is unclear whether strength has a role in inducing the PAP effect from MVCs.

## **Acknowledgements**

This study was supervised by Szu-Ping Lee, PT Ph.D. Associate Professor, Department of Physical Therapy at University of Nevada, Las Vegas. Funding was provided through the UNLVPT Student Opportunity Research Grant and the UNLV Graduate and Professional Student Association.

**Conflict of interest:** The authors have no conflicts of interest (neither financial or nonfinancial) to declare.

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## Introduction

A Major League Baseball (MLB) pitch traveling 90 mph will reach the batter, standing 54 feet away, in 0.41 seconds. The hitter typically has 0.06-0.15 seconds to initiate and complete the swing (2) leaving 0.26-0.35 seconds to determine whether and how to swing. Minimizing the time spent swinging the bat is essential to a productive at-bat, which is the offensive player's turn of batting against a pitcher. Increasing the velocity of the swing is one means of minimizing the time spent swinging the bat (26). Bat velocity is also directly related to offensive productivity, as a faster bat velocity leads to a faster exit velocity. Greater exit velocity results in increased ball flight distance and decreased time for fielders to react to and field the ball.

To swing a baseball bat quickly, control and coordination of multiple parts of the body is important to allow energy to be effectively transferred along the kinetic chain, which consists of the hips, torso, arms, and hands. It is suggested that the hips should reach their peak rotational velocity first, followed by the torso, lead arm, and hands (21). Specifically, the separation of timing between the rotation of the hips and the trunk has been dubbed the X-Factor in golf (12). The peak X-Factor, which occurs at the onset of the downswing, and the X-Factor at impact in both amateur and professional golfers were both found to be highly correlated to clubhead speed at impact (12). Additionally, bat velocity has been shown to be related to muscle activation, strength, and power; Nakata et al. (2013) found that skilled baseball players at the collegiate level were able to achieve higher peak amplitude and earlier activation of the rectus femoris, biceps femoris, and medial gastrocnemius muscles compared to non-skilled players. There has also been an established relationship found between bat velocity and upper body strength & power (15, 18). These studies support the notion that muscle performance and activation are keys to faster bat velocity and exit velocity, and therefore greater offensive performance.

To improve bat velocity, baseball players have historically utilized weighted implements for warming up before facing the pitcher. These routines included swinging multiple bats, heavy bats, and bats with added weight on the barrel. However, it has been repeatedly demonstrated that using these heavier devices to warm up either provide no benefits or decrease the bat velocity in subsequent swings (10, 14, 18, 30). In an effort to find an effective warm-up protocol that players can use in the on-deck circle, researchers have begun investigating the efficacy of alternative warmup routines involving post-activation potentiation (PAP) to enhance muscle power & activation.

PAP is the phenomenon where the contractile history of muscles affects subsequent force development (20). It is hypothesized that previous forceful contractions of a particular muscle enhances myosin light chain phosphorylation, which leads to increased contractile strength and speed of the affected muscle fibers (25). It is further theorized that the amplitude of the H-reflex can be increased during a PAP response, which is an indication of increased motor unit recruitment (1).

It is well established that the benefits of a PAP-inducing protocol in enhancing muscle force is heavily dependent on many different factors, such as percentage of Type II muscle fibers (9, 27), training history, and muscle strength (4, 8, 19, 27, 31). PAP-inducing protocols often use a maximal voluntary contraction (MVC) (11, 17,19, 23) with a movement that mirrors the target movement (3, 4, 5, 6, 8, 11, 19, 22, 24, 29), although the specific quantity of MVCs and the specific movements vary.

Recent research has sought to investigate whether PAP can be induced with utilization of MVCs in the transverse plane to mimic the movement pattern of a baseball bat swing. Higuchi et. al (2013) investigated the acute effects of a PAP warmup in high school baseball players compared

to a standard bat swings (SBS) warmup and a weighted bat swings warmup. Following a baseline measurement, participants completed three 5-second MVCs separated by 5-seconds each and then rested for one minute. Then, three balls were hit off a tee. Each warm up protocol had a washout period of at least 24 hours. The data showed the PAP protocol resulted in an increase in bat velocity of 0.86 mph while the SBS and weighted bat warm ups had no effect. Following a similar protocol, Gilmore et. al (2019) investigated the effect of a PAP warmup on bat velocity in high-school and collegiate aged competitive softball players. Following baseline bat velocity measurements, a PAP warmup was performed with each participant performing three MVCs for five seconds each in a motion that would mimic a swing with 30 seconds of rest in between. Following the PAP protocol, seven maximal swings were taken against a ball on a tee at 1-, 2-, 4-, 6-, 8-, 10-, and 12- minutes. A ten-minute wash out period was used before beginning the control protocol consisting of SBS. The researchers found that at the 6-minute time point, there was a significant increase in bat velocity when compared to the baseline value (+5%, +2.84 mph).

Higuchi and Gilmore both claim utilizing PAP is a legitimate means of acutely increasing bat velocity. However, these are the only two studies that have been completed demonstrating the effect of PAP on bat velocity. Both studies have limited granularity in their measurements; Higuchi et al. (2013) only showed swings between one and two minutes following the PAP protocol, and Gilmore et al. (2019) showed swings at 1-, 2-, 4-, 6-, 8-, 10-, and 12- minutes following but only found significant difference at the 6-minute mark. Furthermore, neither study examined the contribution of individual characteristics such as generalized muscle strength on swing velocity and the effect of PAP. Therefore, the primary aim of this case series was to determine whether a PAP warmup can be used to increase bat velocity when compared with the SBS warmup routine. The secondary aim was to explore the role of upper and lower body strength on the effectiveness of the PAP intervention. We hypothesized that the PAP intervention will result in an increase in bat velocity for each of the ten time points tested when compared to the SBS condition. We further

hypothesized that stronger individuals will see greater increases in bat velocity following the PAP intervention.

## Case Descriptions

This study was approved by the University of Nevada, Las Vegas Institutional Review Board, IRB Number UNLV-2021-109. All participants of 18 years and older signed informed consent. Participants below the age of 18 signed forms of assent and parental consent.

Participants were recruited from Las Vegas's baseball and softball batting facility, Bases Loaded. Players were recruited via recruitment fliers posted in their facility. Eight high-school male baseball positional players aged 16 years and older were recruited for this study. The participants provided either informed consent if 18 years or older, or parental consent and youth assent if younger than 18 years old. Inclusion criteria included: 1.) players that play on a structured, competitive baseball team (high school level or above), 2.) are position players, 3.) capable of providing consent to participate in the study, and 4.) willing and able to travel to one of the approved testing sites. Exclusion criteria included 1.) presence of any injury that causes pain or discomfort when swinging a baseball bat and during strength testing, 2.) presence of any other condition that can potentially lead to injuries when swinging a baseball bat and during strength testing, 3.) presence of any cardiovascular, respiratory, or other critical health conditions that would preclude any form of moderate intensity physical activity as screened through the Physical Activity Readiness Questionnaire for Everyone (PAR-Q+) (Waeburton, 2011). The participants were instructed to come to testing in the same condition as would be expected for game performance, including avoiding strenuous exercise 24 hours before testing, being well-fed and hydrated, and avoiding alcohol, caffeine, and creatine use for at least 48 hours. All participants then completed the PAR-Q+. In addition, participants that were pitchers were also excluded from the study. All participants were all given an identification number. Participant 7 was excluded due to having an active spinal fracture and participant 8 was excluded due to lost and irrecoverable data.

Participant 1 was a 17-year-old shortstop and has been playing baseball for the past 14 years.

Participant 2 was an 18-year-old 1st baseman who has been playing baseball for the past 14

years. Participant 3 was an 18-year-old center fielder who has been competing for 13 years.

Participant 4 was 18 years old and has been playing various outfield positions for the past 14

years. Participant 5 is a 17-year-old center fielder who has been competing for the past 7 years.

Participant 6 was an 18-year-old outfielder who had been playing competitively for 14 years.

## **Intervention**

The participants were first fitted with a BLAST motion sensor (Blast Motion Inc., Gen 2 Swing Analyzer, 1780 La Costa Meadows Dr Suite 101, San Marcos, California) which uses accelerometers, gyroscopes, and magnetometers to measure bat velocity (mph) when used in conjunction with their mobile app. Sampling frequency was not provided by the manufacturer. The entire testing process was supervised by a certified strength and conditioning specialist (CSCS). The participants then followed the testing protocol shown in Figure 1 beginning with a general full body dynamic warm up detailed in Figure 2. The participants were assigned to a random order of either PAP-SBS or SBS-PAP using an online coin flip randomization tool.

The PAP intervention consisted of three 5-second MVCs separated by 10-seconds each against an immovable surface; in this case series, a fence post was used. An investigator first demonstrated the intervention, in which a game-like stride was taken so the fence post aligned with the midline of their body at a distance of 12 inches from their body (Figure 3). Both hands were placed on the surface of the fence post with their lead hand above their trail hand. The investigator then performed an MVC as if they were trying to push through the fence post, mimicking the motion of a baseball swing. During this MVC, the arms, trunk, pelvis, and leg muscles were all used to produce as much force into the fence post as possible. The participants then demonstrated the movement to the investigators to verify the correct positioning and force production. After verification of correct performance, the participant then performed three 5-second MVCs separated by 10-seconds of rest each. Immediately following the third MVC, a 2-minute rest break was implemented before swing testing took place.

During the SBS intervention, five practice “dry” swings (without hitting a ball) were taken 10 seconds apart with the participant’s personal bat. Following a two-minute rest break, the participants completed the swing testing.

During swing testing, the participants were instructed to take a game-like swing every 20-seconds for 10 swings total to mimic the demands of an at-bat. The swings were taken against a ball on a tee set at belt height in the middle of the plate. The participants were cued to strike the ball towards the back of the batting area. Following the first round of swing testing, the participants were told to rest for 10 minutes. During this rest period, the participants were told to avoid any strenuous activity and to avoid taking any baseball swings. All participants complied with the instructions.

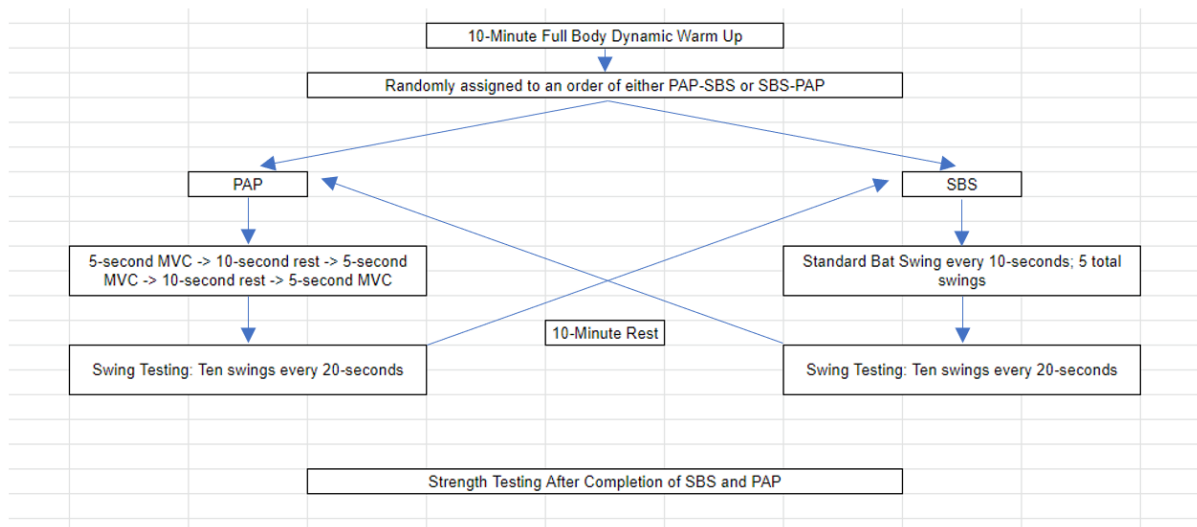


## **Strength Assessment**

Following another ten-minute rest break, all participants performed back squat and bench press strength testing. All the participants used a standard Olympic barbell. The participants first completed a one-repetition max (1RM) back squat then, following a 5-minute break, a 1RM bench press. Both 1RM strength tests followed a standardized progression protocol. In the warmup round, the participants lifted an amount of weight that allowed them to do 5-10 easy repetitions. After a 1-minute rest, in the second warmup round, weight plates were added that allowed them to complete 3-5 repetitions (typically 5-10% more for the bench press and 10-20% more for the back squat compared to the previous round). After a 2-minute rest, more weight was added that allowed the participant to work at a near maximal capacity and complete 2-3 reps in the 3rd warmup round (5-10% more weight for the bench press and 10-20% more for the back squat when compared to the 2nd round). After the 3rd warmup round, the participants rested for 2-4 minutes, before starting the maximal strength testing rounds. The participant self-selected their rest periods in between maximal attempts, which were typically 2-5 minutes. Weight was adjusted (increased or decreased) during the test rounds until the participant established their 1RM strength. Participants performed no more than 5 maximal attempts to avoid excessive fatigue.

## Statistical Analysis

Data was analyzed using Google Sheets (Google Sheets, 1600 Amphitheatre Parkway Mountain View, California). Relative strength scores were determined by dividing the participants' 1RM by their body weight. Swing velocities for both PAP and SBS were an average from the 10 swings. Scatterplots were produced to determine the relationship between bat velocity and relative strength scores.



**Figure 1. Testing Protocol**

<b>Full Body Dynamic Warm-up</b>		
<b>Exercise</b>	<b>Reps</b>	<b>Distance</b>
Steady jog	2	60 ft
Jumping Jacks	15	N/A
Seal Jacks	15	N/A
High Knees	1	60 ft
Butt Kicks	1	60 ft
Lateral Lunge Stretch	1	60 ft
Shuffle	1	60 ft
Karaoke	1	60 ft
Frankenstein	1	60 ft
Toy Soldier	1	60 ft
World's Greatest Stretch	1	60 ft
75 % Max Sprint	1	60 ft
90 % Max Sprint	1	60 ft
5-min free swing		

**Figure 2. Dynamic Warm-up Protocol**



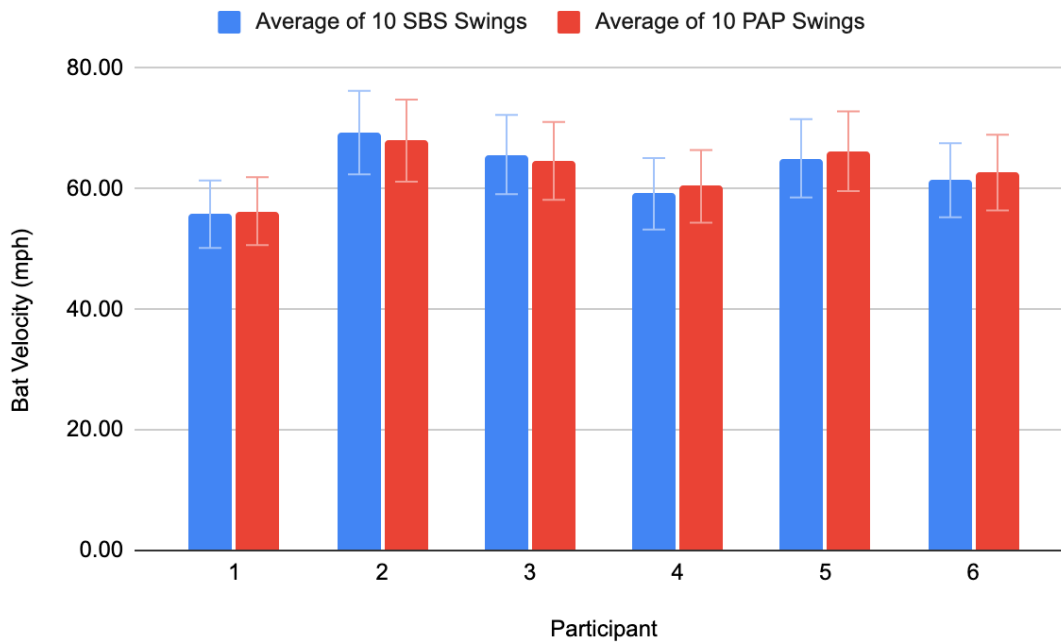
***Figure 3. Demonstration of PAP Intervention. The individual pictured has the immovable surface at the midline of his body following a stride. A force is placed through the immovable surface with both hands in a direction that mimics the swing path of a baseball.***

## Results

The participants' demographics and strength measures are shown in Table 1, while the results of the swing testing are shown in Figure 4. Participant 1 exhibited a slight increase in bat velocity from the PAP condition (0.51 mph greater for PAP). Participant 1 notably had both the lowest relative bench press and back squat performance. Participant 2 demonstrated the greatest overall bat velocity for both the PAP and SBS conditions, with the SBS condition greater by 1.31 mph. Participant 3's bat velocity was slightly higher following the SBS condition by 1.06mph while achieving below average absolute and relative strength for both the bench press and back squat. Participant 4 and Participant 6 both had the largest increases in bat velocity following the PAP condition (+1.24 mph and + 1.27 mph, respectively). Participant 4 had the greatest performance in relative strength for both the bench press and back squat, while participant 6 achieved about average strength for both bench press and back squat.

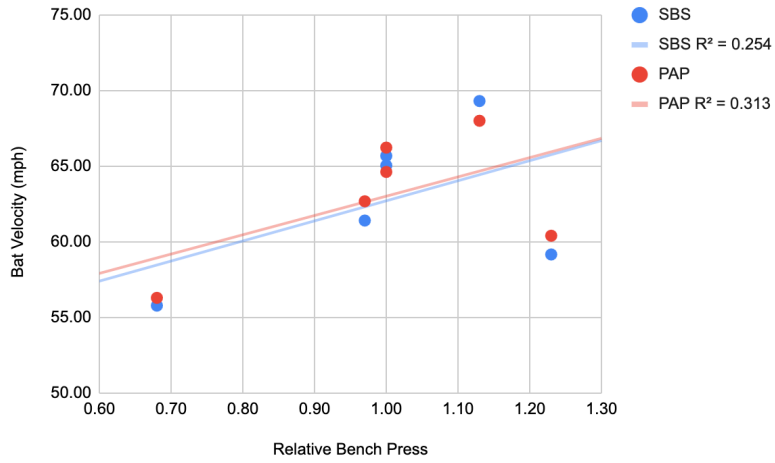
**Table 1. Participant Demographics**

	Age (yrs)	Height (in)	Weight (in)	Position	Experience	Pass PARQ+?	1RM Bench (lbs)	1RM Squat (lbs)	Relative Bench	Relative Squat
Participant 1	17	70	170	IF	14	Yes	115	180	0.68	1.06
Participant 2	18	73	190	IF	14	Yes	215	295	1.13	1.55
Participant 3	18	72	155	OF	13	Yes	155	255	1.00	1.65
Participant 4	18	67	142	OF	14	Yes	175	285	1.23	2.00
Participant 5	17	67	185	OF	7	Yes	185	315	1.00	1.70
Participant 6	16	74	150	OF	8	Yes	145	245	0.97	1.63
Mean	17.3	70.5	165.3		12		165	262.5	1.00	1.60
Standard Deviation	0.8	3.0	19.5		3.3		34.6	47.9	0.2	0.3

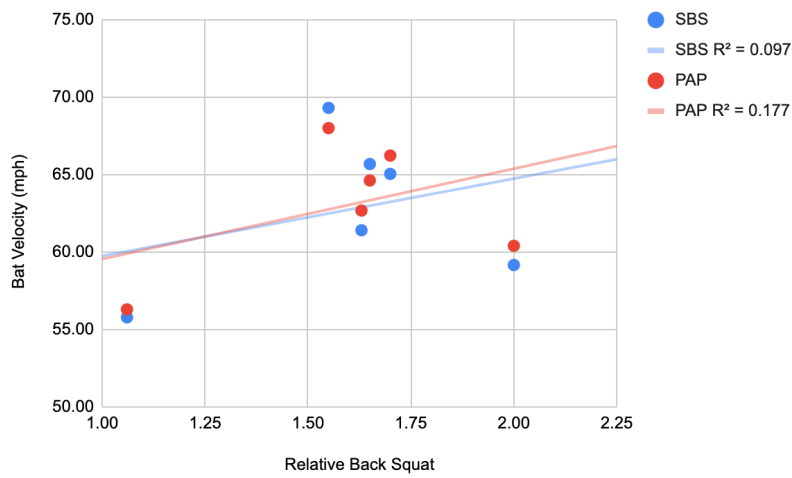


**Figure 4. Comparison of Average Bat Velocity for all Participants for each Intervention**

The relationship between average bat velocity and relative bench press strength is shown in Figure 5, while the relationship between average bat velocity and relative back squat strength is shown in Figure 6. The  $R^2$  values were weak for bat velocity vs relative bench press for SBS (0.254) and PAP (0.313). The  $R^2$  values were very weak for bat velocity vs relative back squat for SBS (0.097) and PAP (0.177).



**Figure 5. Comparison of Relative Bench Press with Average bat Velocity**



**Figure 6. Comparison of Relative Back Squat with Average bat Velocity**

## Discussion

This case series provided an alternative way for competitive baseball players to warm-up before their at-bat and provided some insight into whether strength plays a role in obtaining a benefit from PAP. In total, four participants had a greater bat velocity following the PAP condition when compared to the SBS condition. However, no clear trend was detected regarding which condition induced greater bat velocity and who saw benefit. PAP has previously been established as a phenomenon with great variability and prevalence of individual differences. High variability prevented more granular analysis of the trends in each participant's performance across their ten swings, although this is shown included Figure 7.

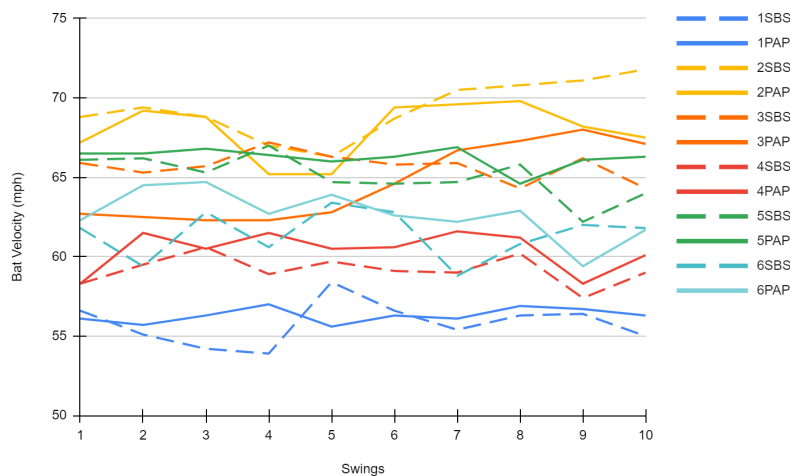
Previous research has identified strength as a contributing factor towards the benefit seen from PAP. The participant with the greatest relative bench press and back squat strength had the second greatest difference in bat velocity between PAP and SBS conditions, effectively tied with participant 6 for the greatest. Despite this, the data as a whole shows no clear trend in the relationship between strength and benefit from PAP. However, this data can be of great insight to the participants in their preparation for competition. Participants 1, 4, 5, and 6 saw an increase in bat velocity following PAP as compared to the SBS condition, which implies this can be an effective strategy used in the on-deck circle to improve their individual performance. Meanwhile, participants 2 and 3 can continue to use SBS in their on-deck warmup as PAP was ineffective for them.

This case series does align with the hypothesis that PAP would increase bat velocity, as four participants saw positive benefit compared to two that did not. This case series does not align with the hypothesis that stronger participants would benefit more from PAP, as there were weak to very weak correlations for both relative bench press and relative back squat. However, the



strongest individual did experience great benefit compared to the rest of the participants. This could imply the participants were not strong enough to experience benefit from PAP; the mean absolute bench press score was 145 pounds and the mean absolute back squat score was 245 pounds. The mean relative bench press and back squat scores were 1.00 and 1.60. All of this suggests the participants as a group were not exceptionally strong which could explain the lack of benefit.

This case series highlights the importance of continuing future research into the effectiveness of PAP as a warm up procedure. It is clear some individuals can benefit from its usage, although who can benefit is less clear. Future research should consider the use of a baseline measurement to obtain change scores for both PAP and control groups, so there is less variability within- and between-subjects. It should also consider the use of other novel strength and power measurements which may be more directly related to bat velocity.



**Figure 7. Bat Velocity for Each Participant Across Ten Swings**

## **Limitations**

Limitations to this case series primarily include the lack of utilization of a baseline measurement from which to calculate change scores for both the PAP and SBS conditions. The variability in bat velocity for each participant across the ten swings interfered with any ability to recognize whether the individual responded to the PAP condition, and whether there was a time-dependent effect. The sample size of this study was also a limitation, as the subjects were obtained through convenience sampling and only consisted of young male participants. These results cannot be generalized to other populations, and any generalizations made to the softball swing should be carefully considered. The participants were also recruited and tested during their summer season, which may have impacted their physical fitness and conditioning. Lastly, there is the potential for a carryover effect between the two conditions with a 10-minute wash out period.

## **Conclusion**

This case series demonstrates that PAP has potential to be incorporated as a part of the warmup before an at bat, despite the lack of significant difference between PAP and the more traditional bat swing warm up routine. Some individuals experienced greater increases in bat velocity following PAP compared to a SBS warmup, and there was no clear relationship between the strength of the participants and whether they experienced a positive effect.

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## Curriculum Vitae

# JOHN MACDONALD, SPT, CSCS

macdonaldjohn@protonmail.com



## EDUCATION

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- June 2020 - Present*      **Doctor of Physical Therapy**  
University of Nevada, Las Vegas (UNLV) – Las Vegas, NV
- August 2016 – May 2020*      **Bachelor of Science, Exercise Science**  
University of Mount Union – Alliance, Ohio

## EMPLOYMENT

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- January 2021 – Present*      **Founder and Owner, For Pete’s Stake LV**  
Own and operate a small business that creates decorative houseplant accessories.
- August 2021 – July 2022*      **Teaching Assistant, UNLV Physical Therapy**  
Assisted with teaching 1<sup>st</sup> year lab sections for DPT 730 Foundations of Observation and Assessment, DPT 754 Musculoskeletal II Orthopedic Assessment, and DPT 752 Physical Agents.  
Responsibilities included arranging weekly open lab and supplemental instruction sessions, grading homework and practical assessments, and assisting with admissions tasks.
- January 2021 – July 2022*      **Player Services and Outside Operations, Angel Park Golf Club**  
Clean and prepare golf carts, maintain operational status of the driving range, and tend to patrons’ needs.
- August 2019 – May 2020*      **MAAC Personal Trainer, University of Mount Union**  
Determined clients’ needs and goals, created exercise programs to target goals, and administered training sessions to work towards goals.
- August 2019 – May 2020*      **MAAC Student Worker, University of Mount Union**  
Assisted with operational duties of the Mount Union rec center, including supervising exercise activity for safety and regularly cleaning equipment.
- August 2018 – May 2020*      **Exercise Science Tutor, University of Mount Union**  
Served as the appointed tutor of the Department of Exercise, Sport, and Nutrition Sciences to tutor topics including Exercise Physiology, Strength and Conditioning, Nutrition, Professional Development, and Research Inquiry.
- June 2018 – May 2020*



**Ohio High School Athletic Association Certified Umpire**

Worked with the Canton High School, Suburban, and Richfield Umpires Associations to officiate baseball games including 8u – 18u. Maintained a safe and competitive environment for players and spectators.

**PHYSICAL THERAPY CLINICAL ROTATIONS**

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*January 2023 –  
March 2023*

**Champion Physical Therapy and Performance, Waltham, MA**

Spending 10 weeks at a private practice outpatient sports clinic with an emphasis on treating baseball players. Have worked to improve the facility’s testing procedures related to isometric knee testing for return to sport. Will be presenting inservices on isometric knee testing and neurocognitive considerations for ACLR rehab.

*September 2022 –  
December 2022*

**Valley Health System - Centennial Hills Hospital, Las Vegas, NV**

Spent 10 weeks at an underserved acute care hospital and demonstrated ability to effectively manage 100% of a full-time caseload consisting of 50-70% wound care. Treated patients in Med-Surge, IMC, ICU, PACU, and ED. Efficiently navigated Cerner PowerChart EMR. Assisted in a nursing-directed presentation on fitting and utilization of assistive devices and braces. Observed orthopedic surgery and neonatal-ICU physical therapy. Presented an in-service on differentially diagnosing arterial, venous, and neuropathic lower extremity wounds.

*July 2022 –  
September 2022*

**Encompass Health Valley of the Sun Rehabilitation Hospital, Glendale, AZ**

Spent 10 weeks at an inpatient rehabilitation hospital on the Brain Injury team treating patients with cognitive, musculoskeletal, neurological, and integumentary conditions. Upon completion, managed 71-86% of a full-time caseload without supervision while completing timely documentation using Cerner PowerChart EMR. Throughout the rotation, assisted with family training and home assessments, observed Occupational Therapy, Speech Therapy, and Wound Care, and presented an in-service on “The Motor Cost of Cognitive Tasks”.

*June 2021 –  
July 2021*

**Kelly Hawkins Physical Therapy Works Centennial Hills, Las Vegas, NV**

Spent 5 weeks at an underserved outpatient orthopedic clinic treating individuals primarily affected by chronic neck and back pain. Effectively coordinated care with Physical Therapy Assistants and technicians. Upon completion, managed 70% of a full-time caseload without supervision while efficiently navigating Raintree EMR. Presented an in-service on “Rehab Considerations for the Shoulder and Knee”.

*June 2021 –  
July 2021*

**Kelly Hawkins Physical Therapy Works Centennial Hills, Patient Feedback**

4.9/5: Overall Experience  
100% agree or strongly agree: Trust John to Treat Friends and Family  
Testimonials:

- “After a stroke, I began seeing John at Kelly Hawkins. While under John’s supervision and guidance I’ve made extensive recovery visible to those around me and my family. I strongly believe my degree of recovery is directly related to being trained by John. Thank you John! You’re future in physical therapy is going to be so awesome.”
- “John was very informative, polite and understanding when it can go my recovery process. He made sure to give me exercises to do at home that would help my recovery. I was a true pleasure being helped by him!”
- “John is extremely well mannered and socially articulate. That has one feeling at their best during this painful stage of recovery. Being relaxed and comfortable made me work even harder. I appreciated all his encouragement offered daily. As for therapy, he was diligent in his explanation. I’m glad he explained the difference between accomplishing stretches verses strength. He was flexible to my pain as it was different on various days and he adapted. Overall, I would let him work with my entire family and rol-o-dex of friends. I can’t wait to address him as Dr. John Macdonald.”

## **SPORTS MEDICINE EXPERIENCES**

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### ***Event Coverage***

<i>June 2022</i>	<b>Las Vegas Aces</b> (5 hours) Aided Las Vegas Aces medical staff with pre-game setup, gametime needs, and breakdown.
<i>February 2022</i>	<b>2022 Rock and Roll Running Series</b> (7 hours) Triage runners with various injuries and conditions and directed them to appropriate care. Assisted with setting up medical stations, arranging supplies, and breaking down equipment.
<i>October 2021</i>	<b>2021 Guaranteed Rate Skate America</b> (15 hours) Assisted medical staff with event coverage and determining ability to return to competition. Participated in anti-doping efforts by escorting athletes to doping testing following their performances.
<i>October 2021</i>	<b>2021 UNLV Football</b> (11 hours) Assisted training staff with pre-, mid-, and post-game responsibilities including equipment setup and taping. Provided support to acute injured athletes and assisted training staff with post-game treatment sessions.
<i>July 2021 – August 2021</i>	<b>BIG3 Basketball Tournament</b> (26 hours) Assisted medical staff with pre- and post-game responsibilities. Taped, stretched, mobilized, and warmed up athletes for their games and provided post-game recovery implements.

June 2021                    **2<sup>nd</sup> Annual Native American Youth Basketball Tournament** (6 hours)  
Provided support for athletes including taping ankles, cleaning cuts and bloody noses, and tended to acute injuries offering guidance on ability and safety to return to play.

**Shadowing: Physical Therapy**

July 2022                    **Chicago White Sox**, Glendale, Arizona (8 hours)

March 2022                **PRISM Physical Therapy**, Las Vegas, Nevada (3 hours)

January 2022              **Driveline Baseball**, Kent, Washington (18 hours)

**Shadowing: Strength and Conditioning**

March 2022                **UFC Performance Institute**, Las Vegas, Nevada (3 hours)

February 2022            **Movement Fitness**, Las Vegas, Nevada (3 hours)

January 2022              **Driveline Baseball**, Kent, Washington (2 hours)

March 2019                **T3 Performance**, Avon, Ohio (3 hours)

May 2018                  **Cleveland Sports Institute**, Broadview Heights, Ohio (4 hours)

**Shadowing: Athletic Training**

August 2021 –            **UNLV Football**, Las Vegas, Nevada (6 hours)  
October 2021

August 2018 –            **Mount Union Football and Baseball**, Alliance, Ohio (20 hours)  
May 2019

**Athlete Testing**

September 2018        **Mount Union Varsity Basketball Testing** (100 hours)  
– March 2019            Led pre- and post-season performance testing and mid-season training load data collection, communicating results to the coaching staff to allow for tailored practice sessions.

December 2017 –        **Mount Union Varsity Baseball Testing** (10 hours)  
December 2019           Led pre-season fitness testing for the baseball team to determine their conditioning status and communicated results with the coaching staff.

**RESEARCH AND CONTRIBUTIONS**

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**Investigator**

*August 2020 – Present* “Eliciting a post-activation potentiation response to acutely increase bat velocity in competitive baseball players”, **John MacDonald**, Kat Myers, Phil Yu, Szu-Ping Lee PT, PhD, and John Mercer PhD.

*August 2018 – December 2019* “Analysis of Heart Rate Variability and Training Load in Division III Men’s Soccer Players”, **John MacDonald**, Tanner Slack, and Ron Mendel PhD.

*August 2017 – December 2018* “Comparison of performance measures between starters vs non-starters in a Division III women’s soccer team”, Barry Myers, Dillon Frees, **John MacDonald**, and Ron Mendel PhD

- Presented poster at 2019 American College of Sports Medicine Conference

### **Contributions**

*May 2022* Sport Performance Enhancement SIG Research Review  
Reviewed Article: “Just One More Rep!” – Ability to Predict Proximity to Task Failure in Resistance Trained Persons

*October 2021* Sport Performance Enhancement SIG Research Review  
Reviewed Article: Stronger Subjects Select a Movement Pattern That May Reduce Anterior Cruciate Ligament Loading During Cutting

*October 2019* Mount Union Exercise Science Club  
Gave presentation and demonstration on foundations of velocity-based training for the athlete

### **Participant**

*July 2022* “Development of a cognitive battery for alertness, mood, and social cohesion” Mathias Basner, MD.

*December 2021* “DPT student beliefs, perceptions, and characteristics on pain assessment and management” Greg Hartlet PT, DPT; Neva Kirk-Sanchez PT, PhD; and Marlon Wong PT, PhD.

*June 2021* “Characterizing spinal circuitry in dancers and people post-stroke” Jing Nong Liang PT, PhD; Cassy Turner PT, DPT; and Leonard Ubalde PT, DPT.

*March 2021* “Factors influencing academic performance in graduate health sciences students” Ali Boolani, PhD.

*November 2021* “Do student physical therapists have grit? Assessment of the effortful persistence of physical therapy students” Spencer Barnes; Hailey Craig; and Carly Zebelian.

*October 2021* “Professional Behavior Expectations of Educators among Doctor of Physical Therapy (DPT) Students” Arvie Vitente PhD.

*March 2019* “The Effects of Hydration Status on Athletic Performance” Lauren Oktavec.

January 2019

“Chronobiology of Cellular Glucose Uptake” Gretchen Groves and Tyler Finkenthal.

August 2017

“Dietary Intake and Recovery Status of Division III Baseball Players” Sean Mohny.

## LEADERSHIP EXPERIENCES

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September 2021  
– Present

**President:** UNLVPT Sports Medicine Club  
Organize guest speakers, workshops, lab demonstrations, and volunteer opportunities to promote sports medicine interest and professional development.

September 2021  
– Present

**President:** APTA Nevada Student Special Interest Group  
Represented and advocated for Nevada PT and PTA students to the APTA NV Board of Directors. Organized monthly guest speakers, social events, and networking opportunities.

August 2021 –  
Present

**Advisory Board:** Greater Youth Sports Association of Nevada  
Serve on the volunteer committee, organizing and recruiting volunteers for events.

January 2021 –  
Present

**Mentor:** UNLV CSUN/GPSA Student Mentorship Cooperative  
Serve as a mentor to undergraduate students who express an interest in graduate school.  
Spring 2022: Briauna Davis, Leah Alegre, Dora Segura  
Spring 2021: Briauna Davis, Emily Ospina, Dora Segura

June 2021 –  
Present

**Mentor:** UNLVPT Mentorship Program  
Mentor two first-year DPT students, organizing monthly conversations to ensure they are acclimating to graduate school well.

August 2018 –  
May 2020

**Student Senate Representative:** Mount Union Physical Therapy Club  
Relayed information given during monthly student senate meetings to club members and executive board members.

August 2017 –  
May 2020

**Founder and President:** Mount Union Chess Club  
Founded club in August 2017, serving as President, Treasurer, and Student Senate Representative until August 2018. Drafted a constitution, kept attendance logs, and submitted yearly budgets. Organized twice weekly meetings and monthly competitions.

November 2018 –  
August 2019

**Vice-President:** Mount Union Exercise Science Club  
Helped President organize monthly meetings and events. Gave supplementary lecture on application of velocity-based training to strength and conditioning.

August 2018 –  
May 2019

**Mentor:** Mount Union Exercise Science Mentorship Program

Mentored three exercise science students beginning their first year. Provided scheduling feedback, coursework help, and general college advice.

## **CERTIFICATIONS AND TRAINING**

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<i>2021 – 2023</i>	<b>Certified Strength and Conditioning Specialist (CSCS)</b> National Strength and Conditioning Association (NSCA)
<i>2021 – 2023</i>	<b>Basic Life Support Certification (BLS)</b> American Heart Association (AHA)
<i>Fall 2021</i>	<b>Otago Exercise Program: Falls Prevention Training</b> University of North Carolina
<i>Fall 2021</i>	<b>STEADI Training</b> Centers for Disease Control and Prevention (CDC)
<i>Summer 2020</i>	<b>Bloodborne Pathogens Training</b> UNLV Risk Management and Safety
<i>Summer 2020</i>	<b>HIPAA Training</b> UNLV Risk Management and Safety
<i>Fall 2018, 2019</i>	<b>Peer Tutor Training Level I &amp; II</b> College Reading and Learning Association
<i>Fall 2019</i>	<b>Biomedical Research Ethics Training</b> Collaborative Institutional Training Initiative (CITI)

## **SERVICE**

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### ***Professional***

<i>November 2022</i>	<b>UNLVPT Interviews: Class of 2026</b> (14 hours) Coordinated student check in and gave department tours. Mingled with students and assisted with set-up and tear-down.
<i>October 2022</i>	<b>UNLVPT Faculty Search</b> (2 hours) Attended faculty candidate presentation, engaged in Q&A, and provided feedback to the Search Committee.
<i>October 2022</i>	<b>APTA Nevada Annual Meeting</b> (10 hours) Served on the Planning Committee and helped organize educational content. Led tech support and day-of operations for guest speakers.

- April 2022*      **Lambda Kappa Delta Pre-PT Club: SPT Panel** (1 hour)  
Answer Pre-PT student questions about PT school, admissions, and career development.
- January 2022*      **UNLVPT Interviews: Class of 2025** (20 hours)  
Coordinated student check in and communicated with other coordinators to stay on time. Escorted interviewees to and from their interviews and mingled with students and answered pertinent questions. Assisted with preparation, planning, set-up, and clean-up.
- June 2021*      **UNLVPT Welcome Clinic 2021** (2 hours)  
Helped set-up and tear down tables, food, and games to welcome first year students to UNLVPT.
- January 2021*      **UNLVPT Interviews: Class of 2024** (3 hours)  
Answered questions from UNLVPT interviewees regarding school, extracurriculars, and life outside school.
- January 2020*      **Mount Union Exercise Science Faculty Search Committee** (4 hours)  
Selected by faculty to lead student panel to offer student perspective on faculty candidates
- Community**
- October 2022*      **PT Day of Service: Wetland Cleanup** (2 hours)  
Cleaned up trash from a local wetland.
- February 2022*      **Rock Steady Boxing** (2 hours)  
Assisted with guarding and setup & tear down of food & seating.
- January 2022*      **2022 Sin City Classic** (5 hours)  
Organized and coordinated volunteer opportunities between Sin City Classic and UNLVPT.
- November 2021*      **Texas Hold'em Wheelchair Rugby Tournament** (5 hours)  
Assisted game management with shot clock operations.
- September 2021*      **Cleveland Clinic, UNLVPT, and UNLVOT Balance and Memory Screening** (3 hours)  
Screened community members' risk of falling, assessed balance, memory, and cognitive deficits, and educated on ways to improve deficits and risk factors.
- June 2021*      **Greater Youth Sports Association Summer Sports Clinic** (5 hours)  
Coached elementary school athletes in football, soccer, and basketball. Monitored their responses to hot weather and provided care when necessary. Helped set up and take down registration & equipment and helped distribute lunch.
- March 2021*      **The Pad Henderson** (12 hours)

	Helped maintain clean and safe-to-use gym equipment and assisted with climbers' needs.
<i>December 2020</i>	<b>Culinary Academy of Las Vegas Winter Giving</b> (10 hours) Prepared boxes of food for families impacted by the COVID-19 pandemic.
<i>December 2020</i>	
<i>November 2019</i>	<b>Greater Youth Sports Association Ball Drive</b> (7 hours) Collected and distributed sports equipment to underprivileged youth.
	<b>Heroin Anonymous</b> (2 hours) Visited a Heroin Anonymous meeting and provided support to community members.
<i>October 2019</i>	
	<b>Alliance Detox Clinic</b> (2 hours) Visited a detox clinic and gave support to individuals recovering from alcohol abuse.
<i>March 2019</i>	
	<b>Exercise Science Club Field Day</b> (6 hours) Ran a field day event to give proceeds to help fund a classmate's cancer treatment.
<i>February 2019</i>	
<i>August 2018 – December 2018</i>	<b>Relay for Life 2019</b> (6 hours) Organized a table to support community members battling cancer
	<b>Mount Union Community Client Training</b> (60 hours) Led a community member through a full semester of evaluations and training to help them meet their individual health goal.
<i>December 2017</i>	
	<b>Care on the Square</b> (8 hours) Helped prepare, package, deliver, and distribute food to houseless groups in Cleveland

## PROFESSIONAL DEVELOPMENT

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### ***Membership in Professional Organizations***

<i>2021 – Present</i>	American Baseball Biomechanics Association (ABBS)
<i>2021 – Present</i>	National Strength and Conditioning Association (NSCA)
<i>2020 – Present</i>	American Physical Therapy Association (APTA)
<i>2020 – Present</i>	American Academy of Sports Physical Therapy (AASPT)
<i>2020 – Present</i>	APTA Nevada (APTANV)

### ***Continuing Competency Courses Attended***

<i>March 2022</i>	<b>Champion Performance Specialist</b> (Audit) – Mike Reinold
<i>January 2022</i>	<b>Sloptimal Loading: Realistic ExRx for Rehabilitation</b> (13 Hours) – Scot Morrison



*June 2021*      **What They Don't Teach You in School: 2021 Recent Advances in the Evaluation and Treatment of the Shoulder and the Knee (Audit) – Kevin Wilk**  
Assisted with AV equipment, recording, camera operation, and virtual engagement.

***Conferences Attended***

*February 2023*      **APTA Combined Sections Meeting**, San Diego, California

*November 2022*      **NSCA Nevada State Clinic** (0.7 CEUs Category A)

*October 2022*      **NASA Human Research Program Investigator's Workshop**, Virtual

*November 2021*      **NSCA Nevada State Clinic** (0.7 CEUs Category A)

*February 2022*      **APTA Combined Sections Meeting**, San Antonio, Texas

*December 2021*      **Orthopaedic Summit: Evolving Techniques**, Las Vegas, Nevada  
Served as a model for hands-on content.

*September 2021*      **AASPT Annual Meeting and Scientific Conference**, Virtual

*February 2021*      **APTA Combined Sections Meeting**, Virtual

*December 2020*      **AASPT Team Concept Conference**, Virtual

*November 2020*      **APTA National Student Conclave**, Virtual

*January 2020*      **NASA Human Research Program Investigator's Workshop**, Galveston, Texas

*November 2019*      **Space Health Innovations Conference**, San Francisco, California

*June 2019*      **International Society of Sports Nutrition Conference**, Las Vegas, Nevada

*May 2019*      **ACSM Annual Meeting**, Orlando, Florida

*November 2018*      **MWACSM Annual Meeting**, Grand Rapids, Michigan

*November 2017*      **MWACSM Annual Meeting**, Grand Rapids, Michigan

***Webinars and Club Meetings Attended***

UNLVPT Sports Medicine Club

*November 2022*      Manual Therapy Lab  
○ Tiffany Barrett PT, DPT, OCS

*November 2022*      It's the Hard Wood Life: Working in Professional Basketball  
○ Bernard Condevaux PT

- October 2022*      The Power Within: Treating Powerlifters  
                           ○ Mike Taylor PT, DPT, CSCS
- October 2022*      Setting Up Your Career as a Student Physical Therapist  
                           ○ Chris Hughen PT, DPT
- September 2022*    Critically Reading and Appraising Research  
                           ○ Erik Meira PT, DPT, SCS, CSCS
- September 2022*    Treating Olympians: Perspectives from Both Ends of the Pool  
                           ○ Chris Lefever PT, DPT, SCS, CSCS and Hailey Anderson
- September 2022*    D1 Football, Basketball, and Academia  
                           ○ Rick Joreitz PT, DPT, SCS, ATC
- April 2022*            Cirque Du Soleil and Performance Medicine  
                           ○ Tiffney Touton PT, DPT, OCS, ATC, CSCS
- April 2022*            Golf and Cash Physical Therapy  
                           ○ Ashley Campbell PT, DPT, SCS
- April 2022*            Assessment and Treatment of Running Related Injuries  
                           ○ Tiffany Barrett PT, DPT, OCS
- March 2022*            PRISM Physical Therapy: Cash Pay  
                           ○ Scott Pensivy PT, ATC, LAT and Sofia Cruz PT, DPT
- March 2022*            Taping Lab Part II  
                           ○ Keoni Kins PT, DPT, LAT, ATC
- March 2022*            Physical Therapy in Division I Athletics  
                           ○ Sarah Hixon PT, DPT, LAT, ATC
- February 2022*      Physical Therapy in Professional Baseball  
                           ○ Brooks Kline PT, DPT, SCS and Katie Stone PT, DPT, ATC
- January 2022*        Intervention Strategies for Psychological Readiness, Resilience, and Fear Avoidance  
                           ○ Elizabeth Wellsandt PT, DPT, PhD, OCS
- November 2021*      Sports Medicine Business: Cash-PT  
                           ○ Beren Shah PT, DPT
- October 2021*        Residency and Fellowship Roundtable  
                           ○ Erin Conner PT, DPT, SCS, Cert. DN; John Lencioni PT, DPT, CSCS  
                           ○ Ernest Miller PT, DPT, CSCS; Jozef Palasiewicz PT, DPT  
                           ○ Zach Thomas PT, DPT, CSCS, C-PS
- October 2021*        Military Physical Therapy

*September 2021*                      ○ Major Michael Heiner PT, DPT

Taping Lab Part I

○ Keoni Kins PT, DPT, LAT, ATC

#### APTA NV Student Special Interest Group Lecture Series

*September 2022*    On-Site Physical Therapy: Why Wait? Bringing Care to the Workplace  
○ Divya Raghavan PT, DPT, OCS

*August 2022*            Travel Therapy: A Life on your Terms  
○ Yonas Tekeste PT, DPT, CSCS

*July 2022*                Canine Physical Therapy: How to Make a Ruff Day Better  
○ Kelly Straub MPT, CCRP, APT

*June 2022*              Navigating Uncertainty in the Job Market: Tips for Job Hunting and Salary Negotiation  
○ Ben Fung PT, DPT, MBA

*May 2022*                A PT's Role in Community Health and the Nonprofit Sector  
○ Hannah McCarl PT, DPT

*April 2022*              The Power of Education and Social Media in Physical Therapy Practice  
○ Zac Cupples PT, DPT, OCS, CSCS

*March 2022*             Working in Home Health with a Cardiopulmonary Focus  
○ Rocky Barrett PT, DPT

*February 2022*        Navigating the Early Professional Environment – Resources & Insights  
○ Karlo Arciaga PT, DPT, Cert-DN

#### American Academy of Sports Physical Therapy

*September 2022*    Casual Chats on Serious Stuff  
○ Derek Miles

*September 2022*    A Peek Behind the Paper: Effect of Forearm Position on Glenohumeral External Rotation Measurements in Baseball Players  
○ Ben Kibler, MD; Aaron Sciascia PhD, ATC, PES, SMTTC, FNAP  
○ Ameer Seitz PT, PhD, DPT

*September 2022*    Emotional Heat Illness  
○ Shelly Weinstein PT, MS, ATC; Angelique Bannister PT, DPT, SCS, CSCS

*April 2022*              Return to Training (Part 1) The Knee – Squat, Hinge, and Other Grind Lifts  
○ Courtney Bohne PT, DPT, SCS, OCS, FAAOMPT  
○ Chris Slocum CSCS, SCCC, CSCCa, USAW

- April 2022*      Casual Chats on Serious Stuff  
                           ○ Dustin Grooms
- April 2022*      On-the-Field Decision Making  
                           ○ Danny Smith PT, DHSc, OCS, SCS, ATC
- March 2022*      Division 1 Sports Fellowship Q&A  
                           ○ Erin Conner PT, DPT, SCS, Cert-DN  
                           ○ Tommy Otley PT, DPT
- March 2022*      Putting Too Much on Your Plate: Identifying and Managing Upper Extremity  
 Physeal Injuries in the Youth Athlete  
                           ○ Dylan Roman PT, DPT
- March 2022*      Reverse Engineering Elastic Strength Development: A Transdisciplinary  
 Approach  
                           ○ Jarred Boyd PT, DPT, MSAT, SCS, CSCS  
                           ○ Eric Schmitt MS, CSSC
- February 2022*    ACL Injury Mechanisms in Professional Soccer  
                           ○ Francesco Della Villa, MD
- January 2022*      June ECP Happy Hour: “All About eSports”  
                           ○ Jessica Yuen PT, DPT
- November 2021*    May ECP Happy Hour: “Resume Building and Interview Workshop”  
                           ○ Lucas Van Etten PT, DPT, OCS, MBA  
                           ○ Brian Weidner
- October 2021*      Return to Weightlifting s/p Shoulder Injury Part 2: Ballistic and Olympic Lifts  
                           ○ Quinn Henoach PT, DPT  
                           ○ Cristi Bartlett CSCS
- October 2021*      Return to Weightlifting s/p Shoulder Injury Part 1: Bench and Overhead  
 Press  
                           ○ Bryan Mann PhD, CSCS\*D, RSCC\*D, TSAC-F, NSCAF  
                           ○ Dan Lorenz PT, DPT, ATC, CSCS
- September 2021*    Mental Health and Well-Being: Treating Athlete Patients and Yourself  
                           ○ Cassie Pasquariello PhD, MS, EdM
- April 2021*      NCAA Division I PT Panel  
                           ○ Michael Zarro PT, DPT, SCS, CSCS  
                           ○ Drew Lukes PT, DPT, CSCS  
                           ○ Vien Vu PT, DPT, CSCS  
                           ○ Ryan Jarema PT, DPT, SCS, ATC  
                           ○ Julia Rapicavoli PT, DPT, ATC/L
- April 2021*      Mental Health and Well-Being: Treating Athlete Patients and Yourself  
                           ○ Cassie Pasquariello PhD, MS, EdM

## UNLV Multidisciplinary Sports Didactics

- September 2022*      Arthrokinematics of the Hip
  - Wade Gaal MD, CAQSM
  
- April 2022*            High Yield Pediatric Sports Medicine Issues
  - Glenn Barnes DO, CAQSM
  
- March 2022*           Resistance Training with an Immature Skeleton
  - Jeff Conkle BS, MA, CSCS
  
- February 2022*        Lab: Introduction to Diagnostic Musculoskeletal Ultrasound
  - Glenn Barnes DO, CAQSM
  
- October 2021*         Common Elbow Pathology in the Athlete
  - Adam Trujillo MD
  
- September 2021*      Diastasis Rectus Abdominis
  - Kara Radzak PhD, LAT, ATC
  
- August 2021*         Sideline Emergencies
  - Glenn Barnes DO, CAQSM
  
- April 2021*            Heat Related Injury
  - Kevin Mailland DO
  
- April 2021*            An Introduction to Ankle Sprains
  - Frank Truong MD
  
- April 2021*            Joint Dislocations and Reductions: An Overview
  - Christle Guevarra DO, MS, PGY-4
  
- March 2021*           Management of Common Upper Extremity Fractures
  - Glenn Barnes DO, CAQSM
  
- March 2021*           Limping Pediatric Patient; Daily Management of Athletes with Diabetes; Spondylitis
  - Glenn Barnes DO, CAQSM
  
- February 2021*        Sports Nutrition Basics for the Sports Medicine Practitioner
  - Mike Israetel PhD
  
- January 2021*         Ultrasound Diagnostics in the Wrist and Hand
  - Glenn Barnes DO, CAQSM
  
- November 2020*      Glute Activation in Running
  - Tedd Girouard MS, LAT, ATC
  
- November 2020*      Acromioclavicular Joint Pathology
  - Robbie Birch MD

*November 2020* Cervical Spine Injuries in Athletes  
○ Glenn Barnes DO, CAQSM

Grand Rounds with Kevin E. Wilk PT, DPT, FAPTA

*May 2022* Neuroplasticity Following an ACL Injury: Pathomechanics and Treatment  
○ Dustin Grooms PhD, ATC

*March 2022* Why the Increase in Injuries in Baseball Players & What we can do to Reduce or Slow the Rate  
○ Brandon Erickson MD  
○ Peter Chalmers MD

*September 2021* Mental Health Issues in Health Care: Who's Taking Care of the Athlete & Us!  
○ Bhrett McCabe PhD

*May 2021* Core Injuries: Recognition & Treatment Options Rehab Following Core Surgery & Core Training  
○ Benton Emblom MD

*April 2021* Biomechanical Analysis of Baseball Pitching: Common Flaws and Corrections for Little Leaguers to Minor Leaguers  
○ Glenn Fleisig PhD

*March 2021* Neuroplasticity Associated with ACL Injury – A Path to Enhance Injury Prevention and Rehabilitation  
○ Dustin Grooms PhD, ATC

*December 2020* Return to Sports Testing and Criteria & Unique Shoulder Case Studies  
○ George Davies PT, DPT, SCS, ATC, CSCS, FAPTA

*November 2020* Ask Kevin Wilk  
○ Kevin Wilk PT, DPT, FAPTA

*November 2020* Rotator Cuff Injuries: From the Pitcher to the Aging Patient  
○ Nikhil Verma MD

*October 2020* ACL Treatment: Surgery Options, Rehab Approaches, & Return to Play  
○ Freddie Fu MD  
○ James Irrgang PT, PhD

UNLVPT Brown Bag Lectures

*September 2022* Eccentric Training: The Best Way to Build Strength  
○ Bob Donatelli PT, PhD

*March 2022* PT in PAM: Physical Therapy in Performing Arts Medicine  
○ Logan Ponce PT, DPT, CSCS

*February 2022* Becoming a Faculty Member: Pathways, Tips, and Strategies

- Merrill Landers PT, DPT, PhD
- October 2021*      Return to Sport: Quantifying Performance to Enhance Outcomes

  - Joseph Hernandez PT, DPT
- September 2021*      iPT: There's an app for that? Enhancing your practice and learning through mHealth technology

  - Danille Parker PT, DPT, GCS, CEEAA
- April 2021*      'Soft' Skills: The Difference Between Being a Good PT and a Great PT

  - Sarah Cwiak PT, DPT
- April 2021*      The Secrets of Becoming a Resilient PT

  - Renee Ostertag PT, DPT, MDT, CCTP
  - Robyn Gisbertis PT, DPT, PA-C, MS
- February 2021*      How Two UNLVPT Alums Paid Off \$300,000 in Student Loans in Under 3 Years

  - Danielle Garcia PT, DPT
  - Ron Garcia PT, DPT
- December 2020*      Standardized care processes, patient outcomes, and clinical decision making

  - Stephen Hunter PT, DPT, OCS, FAPTA
- November 2020*      Global and Community Health

  - Efosa Guobadia PT, DPT
- October 2020*      Private Practice with COVID-19

  - Edwin Suarez PT, MSPT
- September 2020*      Now that I'm a licensed therapist, how do I start my own private practice?

  - Ashley Reagor PT, MSPT, ATC
- September 2020*      Native American Health and Cultural Competency

  - Natalie Weeks-O'Neil PT, DPT
- June 2020*      Grief and Loss Felt by All During Social Crises

  - Lisa VanHoose PT, PhD, MPH
- June 2020*      COVID-19 and the Associated Pulmonary Dysfunction

  - Rocky Barrett PT, DPT
- UNLVPT Distinguished Lecture Series
- November 2021*      Evidence-Based Physical Therapy for Patients with Low Back Pain: Past, Present, and Future

  - Julie Fritz PT, PhD, FAPTA
- November 2021*      Pain Management in a Time of Dual Pandemics: Opportunities to Advance Health Equity

- Julie Fritz PT, PhD, FAPTA
  - November 2020* Attempting to improve stroke rehabilitation across the translational pathway
    - Catherine Lang PT, PhD, FAPTA
  - November 2020* Wearable sensors are changing how we think about movement and rehabilitation
    - Catherine Lang PT, PhD, FAPTA
- UNLVPT Diversity, Equity, and Inclusion Club
- November 2021* Land Acknowledgement, Native American Heritage Month, Current Events
  - October 2021* Hispanic Heritage Month, Indigenous Peoples' Day, Cultural Appropriation
  - September 2021* Able-ism and What is DEI?
- APTA Webinars
- January 2022* More Than a Physical Therapy Business (Myodetox)
  - December 2021* Building a Physical Therapy Practice with a Human Development Focus (Champion Physical Therapy and Performance)

**Advocacy**

- October 2022* **APTA Nevada Annual Meeting**
- August 2022* **APTA House of Delegates**  
Attended 2022 House of Delegates via APTA NV scholarship and participated in discussion of house motions.
- May 2022* **APTA NV SPRING Into Action**  
Participated in a professional development event consisting of networking, financial planning, student involvement, resume review and mock interviews.
- August 2021, 2022* **APTA House of Delegates Student Network**  
Participated in student group chat discussing house motions and the implications for students
- September 2021* **APTA Nevada Annual Meeting**

**HONORS, AWARDS, AND GRANTS**

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- December 2022* **UNLVPT Scholarship**  
Awarded \$1,415 for demonstration of merit and development in service, leadership, and research excellence.
- November 2021* **UNLVPT Scholarship**



Awarded \$3,221 for demonstration of merit and development in service, leadership, and research excellence.

*September 2021  
– Present*

**UNLV Graduate and Professional Student Association Research Scholarship**

Awarded \$1,161 to fund student research project, “Eliciting a post-activation potentiation response to acutely increase bat velocity in competitive baseball players”.

*August 2021 –  
Present*

**UNLVPT Student Opportunity Research Grant**

Awarded \$3,000 to fund student research project, “Eliciting a post-activation potentiation response to acutely increase bat velocity in competitive baseball players”.

*January 2021 –  
Present*

**UNLVPT Scholarship**

Awarded \$4,600 for demonstration of merit and development in service, leadership, and research excellence.

*June 2019*

**Rosemary F. Ilg Crumbley Award**

Awarded to a deserving junior or senior student with a major within the Department of Exercise, Sport and Nutrition Sciences who possesses qualities such as perseverance, vitality for life, enthusiasm for learning, strong work ethic, and an interest in sports.

*August 2018 –  
May 2020*

**University of Mount Union Dean’s List**

Member of the Dean’s List for achieving a 3.55 GPA for 8/8 semesters.

*August 2017 –  
May 2020*

**University of Mount Union Trustee Scholarship**

Awarded \$17,000 annually based on academic credentials.

*November 2018*

**Academic All-Ohio Athletic Conference Award**

Awarded to varsity athletes for achieving a 3.50 cumulative GPA.

# **Katrina Myers, MA, SPT**

Las Vegas, NV · katjmy3rs@gmail.com

## **Education**

DPT University of Nevada, Las Vegas 2020-2024 Physical Therapy  
MA California State University, Chico 2018-2020 Exercise Physiology - Muscle Protein Synthesis (Cum Laude)  
BS California State University, Chico 2014-2018 Exercise Physiology (Cum Laude)

## **Research Experience**

*Benefits of Early Childhood Education Program with Active Learning Techniques on underserved Las Vegas Elementary Schools: Anatomy Academy.* University of Nevada, Las Vegas, 2022-2024

*The Connection between Emotional Regulation and Pain*  
Presented at: Leavitt Physical Therapy, August 19, 2022

*Acute Effects of Post-Activation Potentiation on Increasing Bat Velocity in Competitive Baseball Players* University of Nevada, Las Vegas, 2020-2023

*Pre- vs. Post-Exercise Supplementation to Increase Muscle Strength with Resistance Training: A Review on Nutrient Timing* California State University, Chico, January-May 2019

*The Effects of Musical Genre on Aerobic Performance: An Undergraduate Honors Thesis*  
California State University, Chico, August 2014-May 2018

## **Associated Experience**

*Centennial Hills Hospital Medical Center, Inpatient Clinical Experience in Acute Care, April 2023*

I observed the acute, wound care setting for patients in a med-surg unit. I saw various negative pressure therapy patients that varied from pressure injuries to diabetic foot ulcers, and hiatal hernias. In addition, these patients also underwent functional training and education on how to care for their wounds while still retaining their function for their ADLs.

*Summerlin Hospital, Inpatient Clinical Experience in Wound Care, March 2023*

I observed and help treat patients that needed wound care to various injuries ranging from arterial insufficiency wounds to pressure injuries, and lymphedema that was infected with pseudomonas. I was able to sharp debride and dress the wound with the proper dressings that would help in fighting the infection as well as keeping the wound in optimal conditions for healing.

*Pediatric Setting: Clark County School District, March 2023*

I observed and interacted with children that ranged from 4 years old to 16 years old. Their diagnoses spanned from spina bifida, cerebral palsy, and to spinal muscle atrophy. I also was able to observe an IEP meeting to ensure that the individual child was getting the appropriate therapy for their functional needs in the classroom and playground.

*Sunrise Hospital and Medical Center, Inpatient Clinical Experience in Acute Care, February 2023*

I observed ICU and trauma care patients that ranged from spinal trauma, cancer, and severe TBI. I was able to have interactive experiences with the patients as well as interactive conversation with the physical therapist and their treatment plan of care while they are in the hospital, and their goals for the patient once they are stable enough to leave ICU and step down to a lower level of Acute Care.

*MountainView Hospital, Inpatient Clinical Experience in Acute Care, February 2023*

I observed various levels of acute care patients that ranged from stroke, wound care, severe deconditioning, and total hip replacements. I was able to have interactive experiences with the patients as well as interactive conversation with the physical therapist and their treatment plan of care while they are in the hospital, and their goals for the patient once they are stable enough to leave the hospital and proceed with further care or home.

*Dignity Health Physical Therapy, Inpatient Clinical Experience for Vestibular Disorders, October 2022*

I observed various levels of vestibular disorders during an initial evaluation and the treatment of those specific vestibular disorders. I was able to have interactive experiences with patients and how their disorder affects their everyday lives. I learned the best treatment in a real-life situation to help better serve that population.

*Dignity Health Physical Therapy, Inpatient Clinical Experience for Neurological Disorders, October 2022*

I observed various levels of Neurological disorders during initial evaluations and during intervention. I was able to foster my confidence in screening, performing a systems review, differential diagnosis, and treating different levels of neurological dysfunctions. I was able to observe implementation of this through scientific evidence and clinical reasoning for different levels of spinal cord injuries.

*Fyzical Therapy and Balance Centers, Inpatient Clinical Experience for Vestibular Disorders, September 2022*

I observed various levels of vestibular disorders during an initial evaluation and during intervention. I was able to foster clinical reasoning across patient care for those with vestibular disorders. I was able to connect key components of movement science, professional behavior, and clinical knowledge to different observed situations.

*Leavitt Physical Therapy, Student Physical Therapist, July 2022-August 2022*

I applied clinical reasoning and patient-centered care using the ICF model to help facilitate and treat patients' health condition, body structures and functions, activity limitations, and participation restrictions. I conducted many initial evaluations and managed my own patient-caseload of various conditions in outpatient orthopedics.

*McCarthy Physical Therapy, Physical Therapy Aide, May 2016-May 2020*

I aided physical therapists in performing patient exercises and stretching routines. This often involved doing the exercises with the patients to ensure that the exercises prescribed emphasized decreasing their key impairments. I also ensured patient comfortability and excellent customer service.

## **Additional Employment Experience**

*University of Nevada, Las Vegas Physical Therapy Teaching Assistant, August 2022-May 2023*

I engaged in classroom material and prepared presentations of different levels of psychosocial aspects of physical therapy. I also aided the students in learning exercise physiology as it relates to physical therapy and its correlating therapeutic exercise interventions. I also graded and gave students feedback on homework assignments. I also engaged with students through activities related to pharmacology in the physical therapy setting.

*WPC Retirement Services, Inc., Administrator Assistant, February 2022-June 2022*

I assisted in making 401k and Defined Benefit Pension Plans for companies, corporations, and sole proprietors. I also assisted in plan installations, custom designs, and administrations and the associated billing of invoices to clients and reconciliations of bank accounts related to those installation plans. I also maintained stock of essential supplies.

*California State University, Chico Exercise Physiology Teaching Assistant, August 2018-December 2019*

I aided students with the development and the application of in-depth knowledge of exercise physiology that emphasized energy systems used during exercise and their relationship to the circulatory, respiratory, and neuro-endocrine systems. Learning was applied through lab experiences for clinical exercise physiology, exercise prescription, environmental exercise physiology, exercise and disease, and biological adaptations.

*California State University, Chico Biomechanics Teaching Assistant, August 2018-December 2019*

I aided students with the application of anatomical and mechanical implications of human movement with emphasis on skillful and safe movement for performance. I also taught how to use qualitative and quantitative methods of analysis for lab activities.

*California State University, Chico Motor Development and Motor Learning Instructional Student Assistant, August 2018-May 2020* I aided students with the application of motor development theories, acquisition, and development of skills through the development of movement concepts and skill themes. This was implemented through interactive lab activities that encompassed physical, neurological, and physiological changes from infancy through adulthood.

*California State University, Chico Human Nutrition Graduate Assistant, August 2018-December 2018*

I tutored students about the physiological and chemical roles of proteins, lipids, carbohydrates, vitamins, minerals, and water and their functioning in the human body. I held discussions about how digestion of food, use of nutrients, and other metabolic factors affect their functioning.

*Chico Area Recreation and Parks District Youth Volleyball Coach, August 2014-May 2017*

I fostered an environment for learning for youth athletes of all ages. I created engaging drills that not only enhanced youth physical and sport skills, but also created the space for them to build character and leadership skills through working as a collaborative team. I also managed practice, game schedules, and was a part of the referee staff.

*Atria Senior Assisted Living Food Assistant, June 2014-May 2016*

I helped with nutrition of the older adults living in the assisted living home. I encouraged them to come to the dining hall to build connection with the other seniors, as well as making sure that if they had any nutritional needs that they were met. I took orders from the residents for all meals.

*Force Volleyball Club Assistant Coach, October 2013-May 2014*

I organized skillful drills for competitive volleyball players in preparation for volleyball tournaments. I was in charge of organizing practice flow and creating an environment for which the players could grow their athletic skills in a safe and biomechanically advantageous way both on and off the court.

## **Volunteer Work**

*High Rollers Wheelchair Rugby DI Tournament, November 17 & 18, 2022*

I was involved in supporting, helping expand, and promote adaptive sports for individuals with disabilities. I was involved with setting up a rugby sports tournament in addition to helping with the tournament and keeping score of penalties and scores.

*Rocksteady Boxing for Parkinson's Disease, September-October 2022*

I got people with Parkinson's Disease involved with high intensity exercise that also intertwined cognitive functioning. I used strength training exercises while dual tasking, emphasizing memory and while being able to work with a partner. I implemented this in a group class setting where individuals felt included in all exercises and activities.

*Senior Living Risk Fall Screening, September 30, 2022*

I was able to screen older adults of an assisted senior living facility for fall risk. I was able to implement the STEADI toolkit for my screening. After the screening, I was able to provide the older adults with resources for getting them help for any fall risk potentials as well as exercises that they can start working on at home for the improvement of function.

*Balance and Memory Screening, September 14, 2022*

I implement both the STEADI, the AD36, and the Stay Independent Questionnaire to help screen older adults for both fall risk and dementia risk. I was also involved with providing resources to help them in any impairments that were found and gave them exercises that they can do at home to help increase their balance, coordination, and memory.

## **Memberships and Professional Organizations**

Member of the American Physical Therapy Association 2020-Current Member of the Nevada Physical Therapy Association 2020-Current Member of the California Physical Therapy Association 2022-Current Member of the Academy of Geriatrics of the American Physical Therapy Association 2022-Current Member of the Academy of Oncology of the American Physical Therapy Association 2023-Current

### **Certifications**

OTAGO Exercise Program: Fall Preventions Training 2022-Current First Aid, CPR/BLS, and AED Certified 2016-Current

### **Continuing Education**

Pain Neuroscience (6hrs) April 21, 2023 The Therapeutic Application of Magic Tricks in a Clinical Setting (2hrs) October 19, 2022

Tales of the Heart: Inspiration to Motivate Change in Clinical Practice and Education October 13 & 14, 2022 Distinguished Lecture Series (4hrs)

STEADI (2hrs) September 9, 2022

Documentation for Evaluation and Re-evaluations (1hr) July 27, 2022 Sleep as a Component of

Holistic Health Video Presentation (1hr) July 20, 2022 Pain Peculiarities in Everyday Life Video

Presentation (1hr) July 21, 2021 Pain Neuroscience (6hrs) April 16, 2021

# PHILLIPP EDWARD J. YU

yuphillipp@yahoo.com

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## Education

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### **Doctor of Physical Therapy – Student PT**

Department of Physical Therapy, School of Allied Health

University of Nevada, Las Vegas - 4505 S Maryland Pkwy, Las Vegas, NV 89119

### **Bachelor of Health Sciences – Graduated Spring of 2019**

**Major:** Kinesiological Sciences, School of Allied Health

University of Nevada, Las Vegas - 4505 S Maryland Pkwy, Las Vegas, NV 89119

## Certifications

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American Heart Association - BLS/CPR Certified

OTAGO Exercise Program: Falls Prevention Training

## Clinical and Work Experience

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### SYNERGY Physical Therapy Las Vegas, NV – **Physical Therapy Technician**

#### **April 2018 – Currently Employed**

- Over 6 years of experience:
  - Explaining and teaching patients with new or difficult exercises
  - Maintaining a clean and safe environment for patients
  - Helping office staff with scheduling

### Sunrise System, Mountain View Hospital – **Clinical Experience**

- 10-week clinical rotation, January 2023 – May 2023
  - Wound Care/Multi-Setting
  - Multi-disciplinary team care and experience with OT, Speech, Nursing and Case Management

### UFC Performance Institute Las Vegas, NV – **Clinical Experience**

- 10-week clinical rotation, September 2022 – December 2022
  - Outpatient Sports Rehabilitation
  - Directed athletes' rehabilitation and return to high level MMA
  - Coordinated team efforts in rehabilitating athletes from strength and conditioning to nutrition

### Encompass Health Rehabilitation Hospital of Desert Canyon Las Vegas, NV – **Clinical Experience**

- 10-week clinical rotation, June 2022 – September 2022
  - Inpatient Rehabilitation
  - Treatment of a wide variety of patient populations
  - Primary rehabilitation of various neuro populations such as SCI, Stroke, TBI, MS and Parkinson's

Sports and Performance Physical Therapy Reno, NV – **Clinical Experience**

- 5-week clinical rotation, June 2021-July 2021
  - Outpatient clinic
  - Worked with a variety of patients from dancers to bullfighters
  - Treated a wide range of conditions from musculoskeletal, neurological, orthopedics and sports.

Spartanburg Regional Hospital Spartanburg, SC – **Shadowing/Intern in the Physical Therapy Department**

August 2017

- Completed 50 hours of internship following Physical Therapists in LTAC and SNF settings
- Helped patients with strengthening and rehabilitation exercises post-op

Cleveland Clinic, Lou Ruvo Center for Brain Health Las Vegas, NV – **Shadowing/Intern Physical Therapy**

November 2017 – January 2018

- Completed 20 hours of internship following Physical Therapists in outpatient neurological setting

Marquis Plaza Regency Las Vegas, NV – **Intern**

November 2012 – March 2013

- Completed over 60 hours of internship following resident Respiratory Therapists
- Completed many daily tasks that keep the facility working, moving oxygen tanks, giving breathing treatments, showers, changing tracheotomy tubes and neck straps

Levi Strauss & Co. Las Vegas, NV – **Part Time Supervisor**

August 2014 – February 2018

- Involved in the hiring, training, and development of staff to provide a consumer first experience

## **Professional Development**

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Conferences/Seminars

- **UNLV Sports Innovation Meeting**, April 2023
- **APTA Combined Sections Meeting**, February 2022, 2023)
- **NSCA Nevada State Clinic**, (November 2021, 2022)

- Matthew Crawley, MS, CSCS\*D, RSCC and Kyle Larimer, MS, CSCS, RSCC, “**Core Competencies of Strength & Conditioning and Their Application for the MMA Athlete**”
- Kelly Dormandy, MEd, CSCS, “**Discipline Your Dedication - Action, Adversity & Advancement**”
- Leslie Schilling, MA, RDN, CSCS, “**Relative Energy Deficiency in Sport (Red-S): A Syndrome of Low-Energy Availability & How to Avoid It**”
- Sandor “Manny” Manuel, CSCS, “**How to Build Acceleration: A Systematic Approach to Developing Acceleration**”
- Rocky Snyder, CSCS, NSCA-CPT, “**The Power of Joint Centration & How to Design Programs to Achieve It**”
- Matt Parvis, MS, CSCS, RSCC\*D, “**Strategic Business Growth Through Services Marketing**”

Attended the Physical Therapy Department’s Distinguished Lecture Series:

- Dr. Julie Fritz, PhD, PT, ATC, “**Pain Management in a Time of Dueling Pandemics**” & “**Evidence-Based Physical Therapy for Patients with Low Back Pain: Past Present and Future**” (November 2021)
- Dr. Adriaan Louw PT, PhD, “**Teaching People About Pain, Pain Neuroscience Education**” (April 2021)
- Dr. Katherine Lang PT, PhD, FAPTA, “**Wearable Sensors are Changing How We Think About Movement and Rehabilitation**” & “**Attempting to Improve Stroke Rehabilitation Across the Translational Pathway**” (November 2020)

Attended the Physical Therapy Department’s Brown Bag Lecture series:

- Dr. Robert Asuncion PT, DPT, CSCS, “**How to Become a Sports Physical Therapist & Return Athletes to High-Level Play**” (November 2021)
- Dr. Efosa Guobadia PT, DPT, Founder of PT Haven, “**Global Community Health**” (April 2021)

Attended UNLV’s Multidisciplinary Didactics

- Dr. Brianna Millsaps MD, “**Blood Flow Restriction**” (November 201)

Member of UNLVPT’s Sports Medicine Club

## **Community Involvement**

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Advocation

- Advocated against CMS-2021-0119-0053

Member of Lambda Kappa Delta **Pre-Physical Therapy Honor Society**

- Chair of Public Relations for the 2016-2017 year
- Vice President for 2017-2018 year



Volunteered various charities and foundations

- **Rock Steady Boxing: Fight Back Against Parkinson's**
- **East Valley Family Services: Adopt A Family**
- **Shelby Estocado Charity Golf Tournament**
- **American Foundation for Suicide Prevention**
- **AID for AIDS of Nevada Inc.**
- **Nevada Partnership for Homeless Youth**
- **Opportunity Village**
- **Nevada NSPCA**

## **Research**

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**Current Ongoing Research** – “Eliciting a Post-Activation Potentiation Response to Acutely Increase Bat Velocity in Collegiate Baseball Players”

- Plans to present at CSM 2023
- Researching the effects of maximal isometric voluntary contractions on swing kinematics and kinetics in baseball players

**Nevada INBRE 2017 Undergraduate Research Opportunity Program Award Recipient**

- Poster Presentation
- Received grant to study the effects of loaded landings on collegiate soccer players
- Research was focused on the kinematics and kinetics of kicking and non-kicking legs of D-I athletes