



MUSCULOSKELETAL MATTERS

SPRING 2022



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YOGA FOR THE MULTITASKER

MAYA GLANDER

"How do you not get bored, especially when you are just lying there and breathing?" This question has come up in many conversations when I tell others I practice yoga. In fact, it was one of my first questions when I began practicing.

Yet, the answer may be more elusive than you think. I have found that like the human body, one's yoga practice is far from constant, in fact, it is incredibly dynamic. Minute to minute there are innumerable changes, compensatory mechanisms and regulatory actions occurring internally to keep us in homeostasis. Similarly, my yoga practice differs from day to day. Some days it is more active, while some are more restorative. Others are more strength centered, and frequently I will focus more on balance. However, in the beginning, I did not recognize I had the ability to change it from day to day.

As a person who loved to be busy and "on the go," just like many other medical students, I wondered if yoga would be boring. There were classes I tried that I felt were too slow, or too boring. I became distracted by my thoughts and what was going on around me. I felt unproductive, and I realized I wanted something with more life, more activity, more excitement. After some trial and error, I found Power Yoga and Vinyasa Yoga were the kinds of movement I enjoyed.

Before beginning my practice, I thought all yoga was the same. But there are a variety of types of yoga. For instance, Vinyasa and Power Yoga focus more on the physical "workout" part of yoga. Yin and Restorative Yoga focus on stretching while Hatha and Sivananda include a greater spiritual component.

For me, a more active practice allowed me to focus on the movements and my breath. I felt productive and energized. Learning new poses and completing flows gave me a sense of accomplishment. However, my practice is not always "perfect". Sometimes I am on my phone and pause to go do something, or even switch practices halfway through.

Ultimately, yoga is an incredibly individualized routine. Similar to how physicians can individualize medication regimens, surgeries, dietary recommendations and lifestyle recommendations to their patients, one can individualize yoga to their life and needs. Each one of us is unique, thus one's yoga practice can be too.

Of course, the general opinion is that "yoga is good for you." Many studies have shown that yoga does improve one's sense of well-being, reduces stress and even decreases musculoskeletal pain. However, your yoga practice must be right for you. Let it be something you enjoy, something you want to do and something that energizes you. It may take some trial and error, but I encourage you to explore and find your type of yoga. Whether you are a multitasker, a person who loves silence, someone needing a stretch after an intense workout or someone seeking a spiritual connection, you can individualize yoga to you.

ENSURING BOTH THE PRESENT AND FUTURE OF BASEBALL: AN INTERVIEW WITH DR. BRANDON ERICKSON

Christopher Rennie

Baseball has been colloquially referred to as America's National Pastime for generations. TV viewership alone reaches well into the millions each game, and as demand and competitiveness of the sport has increased, so too have player salaries with some contracts exceeding 450 million dollars. With this, the health of our athletes, both pro and amateur, has become a major point of focus, as we seek to ensure the longevity of our game and the players alike. In an interview, Dr. Brandon Erickson detailed his formative role in this process as a member of the MLB Advisory Committee and as a team surgeon for the Philadelphia Phillies.

As a former D1 wide receiver for Notre Dame's Fighting Irish, Dr. Erickson is intimately familiar with the mental and physical rigor of sports. His introduction to orthopedic surgery actually came from an injury of his own - a lower leg compound fracture that ended his season.

While his playing days may have been over, Dr. Erickson maintained his relationship with sports as he attended medical school, matched into an orthopedic surgery residency at Rush University, and completed a sports medicine fellowship at the Hospital for Special Surgery. From here, he has been dedicated to not only treat players of every age and caliber, but also to better protect them.

Dr. Erickson's research and work on the MLB Advisory Committee for Pitch Smart focuses on identifying injury trends, treatment outcomes, and prevention methods. Through his efforts, we have seen patterns of fastball velocity increasing over the last decade, an increase in UCL injury and surgical repair at younger ages, and an understanding of body mechanics and fatigue as it relates to pitch counts.

He has found that our younger pitchers are throwing more per game, faster, and year-round with multiple teams. These risk factors are ultimately setting them up for mechanical fatigue and failure, injury, and subsequent surgery at key developmental stages. His work has helped generate guidelines that dictate the number of rest days needed for young pitchers based on age and pitch count, helping to ensure the future dreams of these athletes and baseball as a whole can be realized in a safe manner.

In our interview, Dr. Erickson also gave insight into some aspects of working as a team surgeon that people may not know and some lasting advice for the students who will someday make up the future of sports medicine.

Like playing sports, being a team surgeon is much as it sounds - a team effort. Dr. Erickson stressed this heavily, espe-



What it's like being a team doc - you take care of the players certainly but beyond that you're also there for their family.



cially with his athletic trainers, stating "I always let the trainers evaluate [the players] first... they're with those guys every day and have a much greater depth of understanding what's going on with them."

Another pearl Dr. Erickson left with us is the idea that being a team surgeon stretches well beyond the game of baseball. In his role, he not only advises, advocates for, and treats players, but he also is intimately involved with the business side of the sport as well.

He describes the position as almost like being on-call in perpetuity. What people may not know is that every player is typically always injured in some fashion, big or small. He relates the role to being a balancing act at times, answering not only to the player and their family, but also to the organization on timetables as well as the player's agent in regards to rehab and recovery as it relates to the player's best interests.

Ultimately, Dr. Erickson left me with this advice for medical students interested in sports medicine - being a team doc is amazing, but it is not without its trials and tribulations. Continue to work hard, observe, be confident in what you know, and the rest will come.

TELEREHABILITATION FOR AMBULATION AND MUSCLE FUNCTION IN PATIENTS WITH COVID-19

MAYA GLANDER

The significantly infectious nature of COVID-19 required many changes to be made in patient care settings. One such change required was the rehabilitation of patients who caught the virus after the period of infection. Healthcare was primarily delivered by way of telerehabilitation or home-based exercise programs. Though telerehabilitation was utilized by health care providers before the pandemic, patients recovering from severe cases of COVID-19 may have represented unique challenges for physical rehabilitation. These patients often developed compromised lung function, which could be compounded by a lack of mobility in the time surrounding the infection. Due to these difficulties, it is pertinent to assess specifically the physical rehabilitation of patients with prior COVID-19 infections.

Though in-person rehabilitation programs for physical therapy are typically preferred, studies have shown much promise for telerehabilitation and home-based exercise programs since the start of the pandemic. One study showed that 100% of the 33 COVID-19 patients monitored that received inpatient telerehabilitation met their physical therapy goals and were able to be discharged, and 12 of these patients did not need to further receive physical therapy after discharge [6]. Patients participating in telerehabilitation have been shown to have significant clinical improvement in the 1-minute sit-to-stand exercise test repetitions when compared to a control group [4]. Another study monitoring 115 COVID-19 patients showed that telerehabilitation helped patients improve their 1-minute sit-to-stand test repetitions from 20.5 ± 10.2 to 29.4 ± 11.9 repetitions [2]. Also, the percentage of patients whose repetitions were below the 2.5th percentile decreased from 51.3% to 15.7% [2]. Finally, a study showed that telerehabilitation can help with improvements in distance after 6 weeks during another clinically significant exercise test, the 6-minute walking distance test [3]. The group receiving telerehabilitation had an increase of 80.2 meters while performing the 6-minute walking distance test compared to a 17.1-meter improvement in the control group [3]. The adjusted group difference in the 6-minute walking distance test was 65.45 meters and was found to be marginally increased after a 28-week follow-up at 68.62 meters [3]. This study also found improvements in lower-limb muscle strength, as determined by gluteus maximum and anterior deltoid strength as measured by a dynamometer [3]. Lower-limb muscle strength as found by duration in a squat position improved by 20.12 seconds after treatment,

and 22.23 seconds at the follow-up, when compared to a control group [3].

Due to the novelty of the SARS-CoV-2 virus, there is still much to discover about the best methods of intervention for patients requiring physical rehabilitation. Many studies suggest clinical trial protocols that could be conducted in an effort to understand more about how telerehabilitation could potentially benefit these patients. One of these studies outlines a protocol that seeks to determine whether home-based prescribed exercises or telerehabilitation would be most effective for patients [8]. In this study, patients that previously had COVID-19 and have been discharged from the ICU would be either have sessions completing exercises under a physical therapist's remote supervision (telerehabilitation group) or complete prescribed exercises at home alone (home-based group), then come back in for a check-up [8]. This study would test both the adherence to the treatment plan in each group and whether having professional supervision leads to greater functional progress [8]. Similar study protocols have been developed to understand the comparison of outcomes of telerehabilitation when compared to face-to-face rehabilitation, the cost-effectiveness of telerehabilitation for both the hospital and the patients, and the feasibility of implementing telerehabilitation, not only by analyzing costs, but also by analyzing factors like program completion rates and patient satisfaction with the services provided [1,5,7]. Another area for further research may be to investigate whether these findings change based on whether or not these patients require a ventilator during any point of their hospitalization. Since COVID-19 has a variable presentation and severity in patients, and some patients may have deleterious effects with preexisting conditions, it can be hard to target these patients for rehabilitation [1]. Conducting these studies will bring to light the best and most cost-effective rehabilitation process for all types of patients affected by COVID-19. Undertaking these in-depth clinical trials will only lead to a brighter future and better care in physical rehabilitation.

“100% of the 33 COVID-19 patients monitored that received inpatient telerehabilitation met their physical therapy goals and were able to be discharged”

COMMUNITY SERVICE

Community service has long been a foundational pillar for Geisinger Commonwealth School of Medicine's (GCSOM) medical and MBS students. During the spring 2022 semesters, our students have partaken in and led many events that have benefitted the Scranton and greater Pennsylvania communities.

The Student Musculoskeletal Society (SMS) at GCSOM continued their work at the St. Joseph's Center in Dunmore, PA by hosting a field day which included games, a barbecue, arts and crafts, and entertainment for its residents and families. SMS engages with St. Joseph's by providing student volunteers for daily activities as well. Additionally, SMS has hosted art projects, in the GCSOM Medical School Building lobby, for students to de-stress, along with working on developing vaccine clinics for the Scranton area.

The GCSOM MBS program has been able to partake in community outreach and service programs, despite continuing to be a fully virtual program. Remote students from across the United States have worked with Pike County Hands of Hope to establish a crisis hotline in which students and volunteers man the phone line to assist with any events of homelessness, domestic violence, and other emergency issues that Pike County, PA residents may face. The MBS program also includes students participating in Geisinger Hospital's HELP (Hospital Elder Life Program), which allows students access to the hospital where they can assist and engage with inpatient residents to brighten their days through conversation and various interactive activities. The MBS program also hosts a Service Engagement Committee which held a "Random Acts of Kindness Day"



VOLUNTEER OPPORTUNITIES FOR GCSOM STUDENTS

- [United Neighborhood Center](#) is a local food pantry where volunteers help with stocking food and interact with pantry visitors. Contact: volunteersdforce@unc-nepa.org.
- [Youth Homeless Outreach](#) offers volunteering at the NEPA Youth Shelter. Contact: yhogcsom@gmail.com
- GCSOM [Habitat for Humanity](#) trips happen monthly. This is a great opportunity to get to know a family in NEPA as most house-building opportunities occur in Pittston. Contact: gcsomhabitat@gmail.com
- [Fresh Food Farmacy](#) is always seeking volunteers to shelve food shipments. Contact: Alicia Trelease, amtrelease@geisinger.edu
- GCSOM-NAMI - [National Alliance on Mental Illness](#) is seeking volunteer facilitators for the [Say it Out Loud](#) Campaign: a mental health education program for students at Abington Heights High School. Contact: ecalvo@gcsom.geisinger.edu
- STARS - [Students Together Achieving Remarkable Suc-](#)

[cess](#) is seeking volunteer tutors. This is a great opportunity for students interested in working with Latinx youth in Scranton. Tutoring takes place on Tuesdays from 4-5:30 pm but there may be additional time options to work with students remotely. Contact: Jenny Gonzalez, jkgonzalezmonge@maryu.marywood.edu

- CHOMP - Community Health Outreach Meals Program is a collaborative volunteer opportunity between Meals on Wheels of NEPA and GCSOM, founded by GCSOM graduates. Students deliver a meal to elderly and/or medically vulnerable clients and conduct a Wellness Check. Currently being conducted remotely through Wellness Check calls. Contact: sroe@som.geisinger.edu
- [Luzerne County Special Olympics](#) - Track and Field starts up on April 6th and a gradual return to all sports will follow. Go to specialolympicspa.org > click the big green Volunteer circle > follow the link for new volunteers (class A) > complete application. Contact: Sandy Wazeter, waz134@frontier.com

PHYSICIAN SPOTLIGHT: DR. RAVI VASWANI

SPORTS MEDICINE: LOOKING BEYOND THE INJURY

SAMUEL PAEK

Dr. Vaswani is an alumnus of New York University's Grossman School of Medicine and the University of Pittsburgh Medical Center's (UPMC) orthopedic surgery residency program. He is currently completing the Sports Medicine fellowship at the Hospital for Special Surgery in New York City. Dr. Vaswani has over 30 publications in different musculoskeletal topics and is primarily interested in improving the treatment and outcomes of shoulder instability injuries.

Dr. Vaswani describes the first time he scrubbed into an orthopedic surgery case as an "aha moment." He was moved by the surgeon's impact on a patient's quality of life by amending their wrist fracture and restoring function. Dr. Vaswani was also inspired by his father's care for patients as a physician leading him to choose medicine and, ultimately, orthopedics.

It was during his second year of residency when Dr. Vaswani decided that sports medicine was right for him. During rotations with Dr. Volker Musahl, the director of the Sports Medicine Fellowship at UPMC and a personal mentor, Dr. Vaswani experienced the special opportunities of Sports Medicine, particularly as a team physician. "Being a team physician is a unique challenge when you're covering a sporting event. There are no imaging tools available, so you need to use your clinical acumen and physical exam to assess an athlete's health. Can they go back into the game right away or after some rest? Do they need to sit out for the rest of the game and require surgery?"

A significant part of determining successful treatment is grounded in having meaningful relationships with patients. "You must look beyond the injury in isolation when you're treating athletes," Vaswani emphasized. "Consider their personal life and career goals. Are they trying to perform and get into college or become a professional athlete? Surgery may not always be the right choice depending on their individual circumstances."

Dr. Vaswani works with a wide age range of patients including adolescents, adults, and geriatric populations. Regardless of age, he has found that his patients tend to be healthy, active individuals who are self-motivated to get better. "I feel that this aspect of patient attitude is underappreciated across all of medicine. You're not telling them what to do, you're partnering with them in



their care because they have that common goal of returning to higher-level activity. If patients want to get better then they have better outcomes, and this cannot be overstated enough." This is one of his favorite aspects of Sports Medicine and is part of what motivates him to continue providing excellent patient care.

Dr. Vaswani's typical week consists of a split between being in the clinic and operating days during which he usually performs four to six surgeries. His most common cases consist of arthroscopic meniscectomies and rotator cuff repairs. While the treatment guidelines for many routine procedures have generally remained the same throughout his training, Dr. Vaswani shares how COVID-19 has affected the patient population he treats. Many of his patients who should have undergone surgery were delayed due to the cancelation of elective procedures during the height of the pandemic which has subsequently led to an increase in the number of complex cases that he currently sees. "For example, if rotator cuff tears are left untreated, the muscles can atrophy and become no longer reparable," Dr. Vaswani said. "The patient would then require an alternative treatment such as an allograft or arthroplasty. These cases are time sensitive. Surgery might not be lifesaving, but delays can lead to poor outcomes."

As Dr. Vaswani nears the end of his fellowship, he envisions the next steps of his career as a clinician, educator, and researcher. "It's been a long road but worth it. There are very few fields that you can say to yourself: Wow I get to do this for a living? I feel blessed to go to work every day and do what I do. To me, it's worth it and I am happy I stuck with it."

EXTREME SPORTS: PERCEIVED RISK

FRANK VAZQUEZ

Extreme sports are defined as sports that are perceived to involve a high degree of risk. Perceived being the key word in this definition. Examples of these types of sports include free climbing (climbing with no gear), skydiving, parkour, surfing, and skateboarding. One extreme sport that is close to my heart is known as Martial Arts Tricking. This is a mix of gymnastics flips, breakdancing, and martial arts kicks in an aesthetic style. Many perceive this as a dangerous sport as it involves flipping over your body and landing on one leg. This perception even exists within the community, but it does not have to be this way.

For some background on myself, I am a first-year medical student who was an athletic trainer for two years. Before all of that though, I was a martial arts tricker. This is a sport that many consider dangerous, and for good reason. There are ample chances to land in inopportune positions. Extreme knee valgus, ankle inversion, back hyper extension: tricking is no stranger to these unfortunate mechanisms of injury. This is demonstrated in my journey through the sport. I started out injuring myself every other month, whether that was an ankle sprain or chronic back pain that would be exacerbated by the movements I did or falling incorrectly. This, however, does not define my whole journey, and I do not think it should define anyone's journey.

When I started my athletic training classes, I started to understand the human body and movement much more. I had a better grasp of the interplay of all the different muscles and how important it was to strengthen some and stretch others. As I learned more about common sports injuries, I realized that the idea I had in my head about extreme sports was very wrong. Extreme sports is not just a sport where injuries occur much more often. All the injuries I have had were discussed in the context of conventional sports and there were known ways to limit the risk of these injuries. I incorporated my newfound understanding, I started to implement the proper pre-hab and stretching protocols into my practice. Although it took a few years, I noticed a sharp drop in the incidence of my injuries, and I felt much better while tricking. While an injury still has a

chance of occurring, I do not think that the healthy outlook to have is that injury will be inevitable. This mindset creates complacency with an unhealthy body.

As I said in the beginning, extreme sports have a perception of being dangerous. I believe, however, with the proper education, training, and conditioning, that there should be no reason for this to be the case. I believe in a future in which practitioners of all sports can enjoy the hobby they love the most, while still preserving the only body they have been given. This means everyone from athletic trainers to physical therapists to orthopedic surgeons will need to play a part in maintaining this standard. Everyone along the way should understand the importance of exercise as medicine. What does exercise as medicine look like, however?

The aforementioned question is complicated and most importantly, going to look different for every patient. Some important factors include patient's age, nature of injury, injury location, past injuries, and patient's level of activity just to name a few. Not everyone should be expected to be experts of musculoskeletal health, therefore, we have medical professionals. This does, however, increase the responsibility on health professionals to educate their patients and pay attention to specific details about their patients such as what sport they practice.

To all the medical professionals out there, especially those working on the musculoskeletal system, take time to talk to your patients, get to know them, and get to know the sport they do, even if it is foreign to you. In fact, especially if it is foreign to you. All the physical therapists and doctors who have taken the time to ask me more of those personal questions related to other aspects of my life have made all the difference in my treatment. It informs everything in the treatment, and even knowing the basic movements that occur in the sport can make you a significantly better clinician. Acknowledging this can help these rare sports grow, create healthier populations, and maybe even change the definition of extreme sports to no longer involve a high perceived risk.

TOO MUCH OF A GOOD THING

JOANNA BERNATOWICZ

The summer of my junior year of undergrad, while I was working at a rural, non-profit in southern India, I decided to train for a marathon. Having run a few marathons prior to that summer, I had always found training to be a cathartic way to blow off steam. Logistically, as a woman in a very conservative part of the country, I was restricted by my program director to a half-mile field adjacent to the hospital and was recommended to dress conservatively for my safety. In baggy sweatpants and an oversized t-shirt, I slogged countless miles in the 90-degree heat of tropical India.

While secular, the organization I worked with also preferred that visiting volunteers maintain a vegetarian diet. At the hospital canteen, lentils each day and a boiled egg each week comprised my protein intake. Unfortunately, a nearby latrine contaminated the water supply at the canteen, so for much of the summer I also had one gastrointestinal illness after another. Despite the monotony and difficult context, I still found my runs incredibly enjoyable. The jungle-like scenery, mountains in the distance, and time to think for myself felt like a respite from the stress of the work I was doing at the hospital.

From what I attributed to the stress of work and time zone difference; however, I began to develop insomnia. When I would wake too early, I'd wait until the sun came up and then hit the field. Although I ran every day, I did not do so quickly. My split times per mile were usually over 10 minutes. Back home, this was much slower than I used to run. Given the pace, I did not think I could over-exert myself going what I felt to be rather slow. Once my hair began falling out, I again attributed this to emotional stress, still not seeing the connection to the physical demands I was placing on my body. When the summer ended, I figured most of my symptoms would go away.

“Once my hair began falling out, I again attributed this to emotional stress, still not seeing the connection to the physical demands

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I found that I could run incredibly fast when I returned home. 10 pounds lighter from diarrhea and running, I could crank low 7:00 minute paces with ease. I felt addicted, in the best way, to running. When my insomnia didn't abate at home, I would run by the light of the moon and stars. I also greatly enjoyed the unrestrained territory I could run in the states - no more half-mile field to contain myself. With my increased pace, too, I found no reason to break my vegetarian diet. If it isn't broke, don't fix it, right?

Feeling so fast and strong, I resolved to qualify for the Boston marathon, which only required sub-eight-minute miles for my age and gender. As the semester went on, though, I physically began to feel worse and worse. I constantly broke out in acne like never before, had my hair falling out in clumps, still could not sleep, and felt like I had leaden legs each time I ran. Finally, I decided to see a provider at the university health center, worried I might be anemic.

As I explained my symptoms, the provider steered the conversation toward what she thought was anxiety. Was I too stressed at school? Was it racing thoughts that kept me up at night? I tried to explain that I was incredibly happy with school and felt like it was my pounding heart that kept me up at night -- not worries about exams. As my resting rate was well within "normal" at 70 bpm, this was not recognized as tachycardic (although my usual resting rate, prior to that summer and fall, typically fell between 40 to 50 bpm). She recommended I try a meditation app, darkening and cooling my room, and other sleep hygiene techniques. When bloodwork came back with normal hemoglobin, I had run out of ideas for what was wrong. I kept doing what I was doing.

That fall, I ended up running 2 marathons, a Spartan Race, and a half marathon in the span of two months, successfully qualifying for Boston, as well. Looking back now, however, those physical feats did not come without their price. By the last marathon I ran that fall, I was miserable and dispirited with the sport. I made the cutoff time, but it felt like a suffering war with my body to do so. The seemingly endless well of strength I experienced upon returning to the US had run dry. While I maintained my academic performance, I had to drop several classes to accommodate my insomnia.

The shift to winter weather scaled back my activity, resolving my symptoms. It still nagged me that I did not understand what led to my constellation of symptoms. I did not have the faith in the university health center or the resources to seek a second opinion, but I could access databases such as NCBI and UpToDate through my university library. Through these sources, I finally have the answers to what went so horribly wrong in my physical health and performance that summer and fall. I now recognize my symptoms as manifestations of overtraining syndrome. Fatigue, insomnia, tachycardia, restlessness, weight loss, and the perception of heavy muscles all reflect symptoms of the syndrome, according to an article published in Sports Health. Although there is no consensus in the field, the syndrome is thought to arise from a maladaptive stress response to local chronic inflammation from repeated stress without rest. Triggers of the syndrome include illness, personal or occupational stress, heat injury, increased training load without adequate recovery, excessive competitions, and training monotony. As a syndrome of exclusion, overtraining must also be clinically differentiated from malnutrition, burnout from a central cause (mental fatigue without a physical decline in performance), and infection. Further sequelae of the syndrome include greater predisposition to over-use injury and weakened immunity. Thankfully, treatment and prevention are relatively simple: adequate rest, appropriate nutrition, and hydration, resting following illness or severe stress, and tapering before competitions.

As someone who dearly loves running and thought more training was always the answer to running longer and faster, I wish I had known that the activity I did to improve my mental and physical health was actually out of balance in my life. As a medical student and endurance runner, I share this story and information regarding this syndrome for many reasons. So often in athletics, there is a culture of pushing past injury, taking no days off, and trying to defy "the limits." While exercise can have amazing benefits to one's physical health and be a means to cultivate incredible grit and resilience, it is not without its double edge. Understanding that there are consequences of train-

ing harder, not smarter and being able to recognize the symptoms of this syndrome can serve those in the medical profession and the athletes they may care for. To this day, I still struggle with incorporating rest days or easy runs into my routine. My genuine enjoyment of running and preference to do so everyday make it difficult to sacrifice a day off. Through my experiences, however, I've learned the importance of balancing runs of varying difficulty and length, cross training to decrease the stress load on one particular muscle group, and paying attention to the signs and symptoms of fatigue.



ADVANCING MEDICINE IN NEPA WITH BALANCE: AN INTERVIEW WITH DR. JOHN MERCURI

JEFFREY MUN

When Dr. John J. Mercuri is not lending a hand to patients, he can be seen running through the wooded trails of northeastern Pennsylvania (NEPA) or working around his property with an antique John Deere tractor. Dr. Mercuri is a native of Lackawanna County, where he chose to stay for his undergraduate education at The University of Scranton and come back to for his medical practice. As an orthopaedic surgeon, he runs a busy clinical practice with Geisinger Orthopaedics and Sports Medicine, located in the Steamtown Mall. Patients from all across NEPA have come to him for his expertise in knee and hip replacements. He is also heavily involved with education and mentorship of future physicians in the region as the associate program director of the Geisinger Northeast Orthopaedic Surgery Residency Program.

Dr. Mercuri has always believed in the importance of pursuing both his passion for surgery and life-long commitment to staying active. In college, he pursued both athletics and academics on a high level – not only representing the University on the national level at the NCAA Division III Cross Country Championships, but also completing a double major in philosophy and biology. After college, he spent 11 years at NYU in New York City, completing his medical school, residency, and fellowship.

During his time as a medical student, Dr. Mercuri continued to balance his medical pursuit with other important aspects of his life including philosophy and athletics. He trained for three marathons and one half-marathon during his time in medical school. His most memorable race was the Marine Corps Marathon where he ran past the capital landmarks of Washington, D.C. and had the honor of racing with many military personnel. Furthermore, he continued to pursue his passion in philosophy by completing a Masters in Bioethics at NYU.

Dr. Mercuri has always valued family time, and it was one of the biggest reasons he moved back to the area after his training. Much of his extended family lives in the NEPA area. Furthermore, he is a husband and father of two sons. He especially enjoys going out to dinner on the weekends with them or watching his older son start to participate in sports. Dr. Mercuri is able to spend

quality time with his family while maintaining his busy practice through building structure into his demanding surgeon schedule. He makes it a goal to be present on a daily basis, bringing his sons on activities such as grocery shopping (they love the lobster tank).

From introducing robotic MAKO hip replacement surgery to pioneering a guaranteed outcome for knee replacement surgery, Dr. Mercuri is dedicated to providing world-class care in the NEPA region. He leaves some words of advice to our medical school readers: “You’re going to go through several years of medical school, and you may start out thinking that you want to do one thing. You may find out in your third year that you want to do something else. That is okay. That is part of the process of trying to arrive at that part of medicine that you love. Nobody will fault you for pursuing multiple things or changing your mind. But, rather than passively waiting to realize what part of medicine you love, be active and speak to people. Learn more about different specialty areas, get clinical exposure, get involved in research projects, and make connections. Use your time wisely.”

“

You may find out in your third year that you want to do something else. That is okay. That is part of the process of trying to arrive at that part of medicine that you love

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RESEARCH OPPORTUNITIES:

Summer Research Immersion Program

Geisinger Commonwealth School of Medicine’s (GCSOM) Summer Research Immersion Program (SRIP) is an eight-week program open to current first-year medical students at GCSOM who are in good academic standing. The program provides students the opportunity to gain hands-on research experience in basic science, clinical science, public/community health, behavioral health or medical education under the guidance of a research mentor. Participants are also offered supplemental seminars on study design, institutional review board (IRB) protocol development, scientific writing and other topics within research. The experience includes an educational stipend contingent upon fulfillment of program requirements. The link to the SRIP application will be available to eligible GCSOM students through Canvas.

GEISINGER MSKI UPPER EXTREMITY RESEARCH FELLOWSHIP

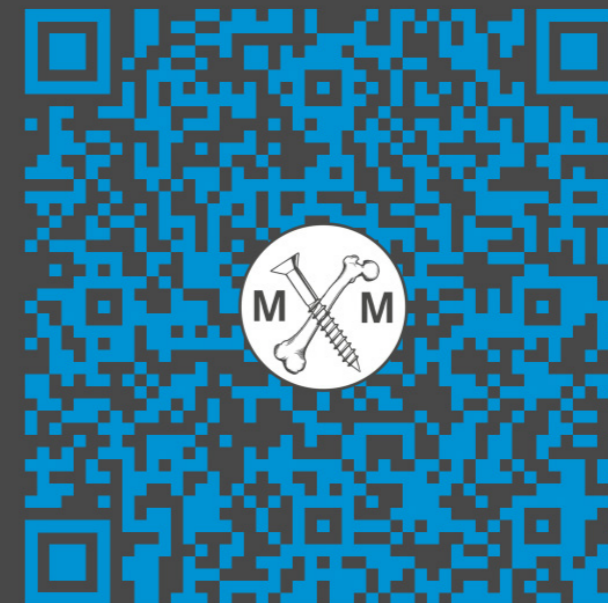
This is a one-year, paid Clinical Research Fellowship in Orthopaedic Surgery within the Geisinger Musculoskeletal Institute for qualified GCSOM students, beginning in July 2022. This research fellowship is designed for qualified GCSOM students interested in both gaining additional research experience and pursuing a career in orthopaedic surgery. The primary goal for this one-year clinical research fellowship is to provide GCSOM students with an opportunity to engage in meaningful clinical research. We aim to provide an opportunity for participating students to strengthen their research skills and knowledge base. We will engage students in a comprehensive musculoskeletal didactic program throughout the year, with the goal of improving their musculoskeletal and orthopaedic knowledge base. Interested candidates should send their CV and cover letter to Jennifer Harding, MSKI Research Director, at jlharding1@geisinger.edu.

NYU ORTHOPEDIC RESEARCH

NYU offers multiple one- or two-year research fellowships for medical students interested in Orthopedics. These opportunities exist in multiple divisions such as the division of adult reconstructive surgery, division of shoulder and elbow surgery, division of spine surgery, division of sports medicine, and division of trauma and fracture surgery. This fellowship allows students to work closely with orthopedic doctors in the NYU system to collect data, submit to journals, and present, all while getting the chance to join the surgery team during rounds. All contact information is contained in the link below:

<https://med.nyu.edu/departments-institutes/orthopedic-surgery/education/research-opportunities-medical-students-trainees#adult-reconstructive-surgery>

To see full list of references from each entry, click [HERE](#) or scan the QR code below!



FITNESS FORE-SIGHT CAN HELP YOUR GOLF GAME

PATRICK KOWALSKI

Scottie Scheffler's meteoric rise to the number one spot in the Official World Golf Rankings took just 42 days. Entering 2022, Scheffler had not won a single tournament on the PGA Tour and was fine-tuning his game during the winter months, like many casual golfers, before a busy summer schedule. The 25-year-old from Dallas, Texas first broke through at the Waste Management Phoenix Open spurring a run of four wins in six starts highlighted by a victory at the Masters. Off-season preparation likely played a crucial part in Scheffler's blistering start to the season, and while the average golfer will not be winning any majors, they can add driving distance or take a few extra skins early in the season with the right program.

Kyle Shannon recognized the potential of such initiatives upon launching KSP Fitness in 2016. An Exercise Science graduate from Bloomsburg University in 2014, Shannon started KSP Fitness with individual and small group training sessions in his home basement. "I always wanted to create a culture of a business that people of all abilities and fitness levels who would feel comfortable coming to and have access to coaching," Shannon said. "It was a lot of man hours in the beginning. You know you're working 5:30 AM to 8:00 PM every single day you're grinding it out. You're working more in your business than on your business and you're doing everything that you have to."

KSP fitness has since expanded to a much larger facility in Bethlehem, Pa. that offers services including personal training, sport-specific athletic training, and nutrition counseling. Typical sessions include around 15-20 individuals working with one coach in circuit-style programs focused on keeping heart rates up.

Like many other businesses, KSP Fitness was impacted by the COVID-19 pandemic. Shannon did not stop innovating, however, and began recording workouts with his now-eight person staff for each of his respective programs. The mantra of KSP Fitness revolves around accountability and that was not going to change with a little adversity. "We were closed down for like four months, so we had to switch entirely to online and whatever schedule we have here in person, is what we kept online," Shannon stated. "We [KSP] didn't just want to run a 6:00 AM class and that was it for the day. If you came to the six, we wanted you to tune in at 6:00 AM to keep people on their regimen as much as possible."

The pandemic prompted a need for socially distant, safe activities while vaccinations were under development. Golf filled this void perfectly and with growing popularity in the game, so did interest in KSP Fitness' golf performance program. Originally not commercially advertised, the golf performance program

grew primarily through word of mouth. Now, KSP Fitness has caught the attention of country clubs throughout the Lehigh Valley who have since been hosting sessions led by Shannon at their practice facilities.

What makes the golf performance program so special is its ability to cater to the physical fitness and skill level of each respective golfer. Each enrollee begins with an initial assessment including strength, range of motion, and overall ability to complete a golf swing. A dynamic action, the golf swing encompasses a variety of complex mechanical movements that with the slightest deviation, can yield less than ideal results. "We'll have people that have never golfed before," Shannon emphasized. "Then we also have people that just turned pro. We have people that can swing the club very well, but their bodies might not move as well, or you have people that their bodies move really well, but they're not so good at golf. I don't talk about the swing as far as this is what you need to be doing like. I'm going to get your body as best prepared as I can."

The next step is to get baseline data such as carry distance and clubhead speed through the on-site golf simulator. From here, workouts are individually crafted to correct imbalances or weakness identified during the first visit. Golf performance participants are held to the same standard as regular members at KSP Fitness to achieve the best possible outcomes. At the conclusion of the six weeks, improvement is measured empirically on the simulator and the results speak for themselves. "I enjoy it most out of all the training [programs]," Shannon said with a smile. "The return you see on people is exponential. Their swing speeds go up, they feel better, they're moving better. And then all of a sudden, they're playing better. Their friends are like, 'Whoa, this guy wasn't playing that well last year. What's he doing differently?'"

KSP Fitness hosts a golf tournament each spring that allows for members to display their newfound skills and show that not every golfer has to shake off the rust entering a new season. With the recent success of KSP Fitness, Shannon has stepped back from most of the individual training sessions to oversee the business aspect of his creation. However, he continues to be heavily involved with the golf program that has been integral in KSP Fitness's growth.

For those interested in learning more about the program, or interning with an organization dedicated to uplifting others through their physical fitness journey, KSP Fitness can be reached at Memberships@kshantraining.com or on Instagram [@ksp_fit](https://www.instagram.com/ksp_fit).

THE BALANCE BETWEEN THE PLAY/TRAIN CONTINUUM: AN INTERVIEW WITH HIDI HORIKOSHI

SETH ELLISON

The trend of youth athletes focusing on a single sport and implementing training regimens at earlier ages has either been a natural progression of athletics or a topic of concern depending on who you ask. Hideaki Horikoshi, affectionately known as Hidi, is the owner of Resurrection Movement Studio in Danville, PA. He works with athletes of all ages and has acquired a laundry list of credentials such as a Certified Speed and Agility Specialist, Function Movement Systems Level 2 Specialist, and USA Weightlifting Sports Performance Coach (among numerous others).

First, "play" needs to be defined. "Play can be categorized into two main components: 'unstructured play' and 'structured play,'" says Hidi. A good example of unstructured play is a group of 5-year-olds enjoying a game of tag. As the kids run around and chase each other, there is an immense amount of acceleration, deceleration, changing of direction, and quick decision making. All of which are important skills for all levels and ages.

As athletes grow, the play can become more structured. Modifications can include shrinking the size of the playing field, incorporating obstacles, or introducing limiting rule. "The same abilities are honed, but the skill level required has increased," Hidi continued. "As the athletes grow and mature the play's level of sophistication increases. Higher levels of play can incorporate evaluations of how efficient the athletes are moving with direct applicable of the skills necessary to achieve a certain outcome. A quick example of structured play is a pick-up game of basketball."

Hidi emphasizes that there is nothing harmful about sports. Sports are beneficial in numerous ways. Yet, society (especially adults) has, at times, removed too much of the play aspect of sports at too young of an age and replaced it with a seriousness that diminishes the value. Sports can and should be taken seriously, but that seriousness should be phased in as athletes mature.

Next, we will address what is meant by "training." Training, in this context, is multifaceted: sports-specific training, such as sports-specific movements and conditioning varies from general strength and conditioning. Hidi states, "Both are equally important, but the scale for most athletes tend to tip in favor of too much sports-specific training and not enough generalized strength and conditioning."

For Hidi there is no appropriate age to start training, rather it is what that training looks like and the age to begin anything is when a child shows interest. "The approach to the

issue of training versus play is to find the right balance for each athlete," he reiterates. "The variables that determine the correct balance are an individual athlete's physical capabilities, interest, and ability to remain focused."

For example, the youngest athletes Hidi allows in his youth athletes training classes are middle schoolers. In his experience, most athletes in that age group have the mental focus and adequate motor skills to learn proper technique for movements. Youth training classes for younger children are available, but play is the focus. Examples of this play focused training include an obstacle course that incorporates 10 light weight kettlebell swings at one stage and 10 air squats at the next, while moving over and under barbells between stations. He further explains, "As young athletes mature, we reduce the amount of play and incorporates more training until play is phased out as athletes reaches the collegiate level."

Hidi makes a refined argument for a focus on play at young ages. He is a strong believer that play alone, without training, improves a youth's coordination, speed, strength, and decision-making abilities. Most importantly, play increases their continued interest in physical activities and sports. With the goal of keeping future generations active, the retention of kids in healthy lifestyles is essential to Hidi. The environment that young athletes engage in play and/or training is critical. Specifically, Hidi emphasizes that both training and play for adolescents should occur in positive, supportive environments where they are encouraged to grow and feel heard. Additionally, Hidi has seen longevity when friends train together versus an adolescent athlete training by themselves.

While there may not be a specific set of rules guiding all young individuals interested in sport, Hidi stands resolute in this core belief: Let the kids play.



FROM CRIMSON TO RED: A REFLECTION OF FULFILLMENT AN INTERVIEW WITH DR. RAMAPPA

SAMUEL PAEK

3, 2, 1, Play ball! On a warm sunny day during the height of spring at Fenway Park, Dr. Ramappa will be in the dugout alongside coaches and athletic training staff of the Boston Red Sox as one of its team physicians. When he is not on the field, Dr. Ramappa also works as a team physician with athletes from Harvard University, Simmons College, and the Boston Ballet. He carries out his primary clinical duties as the Chief of Sports Medicine and Shoulder Surgery at the Beth Israel Deaconess Medical Center (BIDMC) and is an active member of the American Orthopedic Society for Sports Medicine. Dr. Ramappa has over 75 publications on numerous topics such as meniscal repair, ACL reconstruction, rotator cuff repair, and the biomechanics of shoulder instability.

Dr. Ramappa has been a long-time Harvard Crimson and native of Boston where he has adopted many roles as a student, professor, orthopedic surgeon, and team physician for multiple organizations. His story in Boston began at Harvard College after which he completed his medical degree at Harvard Medical School. During his medical education, Dr. Ramappa decided to pursue a surgical career and chose to complete his training through the Harvard Combined Orthopedic Residency Program where he served as chief resident at Massachusetts General Hospital (MGH).

Having been a lifelong athlete, Dr. Ramappa wanted to work with people pursuing athletic endeavors at every level. "I want to help them get back to what they enjoy because it's extremely gratifying to be a part of that." He believes that the general outcomes of orthopedic treatment distinguish it from other surgical specialties that focus on symptomatic relief or the management of chronic issues. "What we do is definitive care," Dr. Ramappa underscored. "People do well, and we can make them better."

Orthopedic Sports Medicine physicians can work with patients of various age groups and pathologies. There is a plethora of published literature available with treatment guidelines and excellent outcomes for injured athletes. These patients generally do very well and regain their functional capabilities – something he can attest to as a patient who had undergone ACL reconstruction. It was the culmination of small moments and experiences such as these that helped finalize Dr.

Ramappa's decision to pursue Sports Medicine.

Following his residency training, he completed his first orthopedic fellowship in trauma at the MGH. Dr. Ramappa decided to continue his specialized education by learning from world-renowned shoulder surgery experts in Switzerland and France through the Edwin Cave Travelling Fellowship. Finally, Dr. Ramappa completed his third and final fellowship at the prestigious Steadman Hawkins Clinic in Colorado. Dr. Ramappa recalls his fellowship director, Dr. Hawkins, who left a lasting impression. "He had the ability to make everyone around him better and inspired them to be their best selves. It's a special talent that he had and I would love to emulate that with my peers and students."

Dr. Ramappa decided to return to Boston where he accepted a faculty position with the orthopedic surgery department at Harvard Medical School. He has enjoyed spending his time investing in the education of medical students and residents, advancing the field through research, and being a pioneer at the forefront of innovation in Sports Medicine.

Outside the hospital, Dr. Ramappa spends time at Fenway Park working with major league baseball players. As one of the Red Sox team physicians, he is responsible for overseeing the care of their athletes during spring training and throughout the regular season during home games. He observes when injuries occur in real-time on the sidelines and works with athletes throughout their recovery until they're ready to get back on the field. This is a unique aspect of the Sports Medicine subspecialty that Dr. Ramappa has found great fulfillment in.

Reflecting on his education and career, Dr. Ramappa stated, "It's been a wonderful experience and journey. Part of the lifelong learning process is having that desire to continuously improve yourself. If I had to go back in time, I wouldn't change anything and I would pick the same path all over again. I love what we do and want to enable students to join us." As a parting word for students, Dr. Ramappa shared, "Do what you love and do it with passion. Everything will fall into place afterward."

WHY RESISTANCE TRAINING PAYS OFF IN THE LONG RUN

YASH ADROJA

I recall one winter evening when I was eating dinner with my crew in quarters. All of a sudden, the tones dropped and I heard "Ambulance, ambulance, injured person from a fall," followed by the address of the incident over the speaker. I swiftly got up and proceeded to head over to the ambulance with the other EMTs on duty. Upon arriving on scene, we found an elderly male who had suffered from a fall in his bathroom. This was a pretty common occurrence in terms of the nature of the call. As I started to treat the patient and obtain a history, I could only feel emotional for the patient as I suspected this fall could drastically change his life.

Before continuing with this patient encounter, it is important to take a step back and take a deeper look into the literature regarding falls. Exercise in ANY form is a common intervention physicians utilize as a first line of treatment. Physical exercise is a key intervention used to improve insulin sensitivity in those with Type 2 Diabetes [1], reduce inflammatory markers in people suffering from chronic kidney disease [2], and improve functional capacity in those with multiple sclerosis [3]. While any form of exercise is beneficial, resistance training (RT) is often underutilized. RT can be anything from lifting weights to using your own body weight as resistance while exercising. Aging has been demonstrated to result in reduced mitochondrial function [4]. One of the consequences of this phenomenon in skeletal muscle is sarcopenia. The onset of sarcopenia is typically age related and can be defined as the progressive decline of muscle mass, quality, and strength [5]. This progressive decline of muscle mass can have a myriad of deleterious consequences in the elderly population. Sarcopenia can result in an increased risk of falls and fractures and is a strong predictor of hospitalization in elderly patients [6,7]. Although there are fascinating trials taking place with selective androgen receptor modulators and myostatin inhibitors, to date there are no approved muscle building therapies in the United States [6]. This is where RT becomes paramount.

Since there are no current pharmacological treatments for sarcopenia, the best evidence-based prevention and treatment

regimen is RT. Recently, a systematic review and meta-analysis of 26 studies (25 randomized controlled trials) examined a variety of exercises and their impact to delay sarcopenia progression [8]. It was found that RT especially can improve knee extension strength and physical performance characteristics in older populations with sarcopenia. There are countless benefits that can result from RT. Robust evidence exists that shows RT can improve skeletal muscle hypertrophy, muscle function, and functional outcomes as well as improve mental health [9-10]. RT in combination with a diet that is high in protein may be the best approach. A systematic review found that protein intake above the recommended dietary allowance (RDA) of 0.8g/kg/d may be beneficial in preventing hip fractures and bone mineral density loss [11]. There was also no evidence showing higher protein intake had negative impacts on health.

As many of my experiences go serving as an EMT, I never knew what happened to my patient after I transferred care. In my time working as an EMT, I cannot count the number of times I have had an elderly patient who experienced a dramatic fall. Sarcopenia is a serious and debilitating condition that can be prevented and delayed with the addition of RT. This recommendation also applies to younger individuals as well. Often, I hear friends say they don't want to perform RT because they fear they will get "bulky". My favorite analogy response to this is saying just because you drive a car doesn't make you a NASCAR driver. There are several benefits to having increased lean muscle tissue as showcased by the literature. On the bright side, there seems to be no evidence indicating differences in isometric strength between heavy and light load resistance training [12]. This means it doesn't matter if you lift light or heavy as long as it is performed with intensity! The impacts of RT go beyond preventing sarcopenia as a 2018 meta-analysis of 33 studies found that strength training twice a week significantly reduced depressive symptoms in adults regardless of current health status [13]. As a society, we can all benefit from RT and get stronger to prevent sarcopenia and live the best life possible.

Interested in writing about a topic in musculoskeletal medicine?

We are now accepting editorial submissions! We will be featuring one editorial in each issue of Musculoskeletal Matters and posting the rest of the submissions on the website! Submissions and questions can be sent to Patrick Kowalski (pkowalski@som.geisinger.edu).

Introduction

Exercise can be defined as any movement requiring muscle work, resulting in energy usage and calories burnt [1]. Although exercise and physical activity are different as exercise is a subcategory of physical activity that is planned and done with discretion [1], for the purpose of this article, the terms will be used interchangeably. Several types of physical activity, including aerobic, muscle-strengthening, bone-strengthening, and stretching, contribute to beneficial lifestyle outcomes [1]. The American Heart Association (AHA) recommends either moderate-intensity aerobic exercise for at least 150 minutes per week, 75 minutes of vigorous aerobic activity per week, or dispersed throughout the week [2]. Also, individuals who exercise are generally happier and more efficient [1]. Physical activity decreases the risk of developing cardiovascular disease, diabetes, cancer, and various musculoskeletal diseases [1,2,3]. Aside from health improvement, exercise has been found to contribute to cognitive function, suggesting its role in academic performance [1,6-8]. In addition to physical activity and brain benefits, physical activity also plays a role in the etiology of mental health, with exercise combating depression, anxiety, and overall stress in individuals [6-9]. The benefits of exercise are evident across all ages, with promising life outcomes [1,3].

Exercise and Disease

Exercise significantly reduces disease incidence, including cardiovascular disease, diabetes, cancer, and musculoskeletal diseases [1,3]. Being physically active produced a 50% risk reduction and a 20% mortality benefit depending on the exercise expenditure [3]. Participants with high levels of maintained physical activity and fitness had the lowest risk for premature death than individuals with no physical activity [3]. Even slight movement and exercise show promise in health outcomes [1,3]. One hour of walking per week has shown protective capabilities in health. Also, for individuals who were once unfit and turned a new leaf to physical activity over five years, a study reported a 44% risk reduction of death compared to individuals who remained unfit [3]. Specifically, exercise plays a role in primary and secondary preventative measures for various diseases [3].

Cardiovascular Disease

In the primary prevention of cardiovascular disease, exercise maintains cholesterol levels and strengthens heart muscles [3]. Strengthening heart muscles allows the heart to pump blood more efficiently and with minimal tension [3]. Physical

activity with significant energy expenditure can ease the progression of cardiovascular disease, reducing fatal premature outcomes [1,3].

Diabetes

The role of physical activity in the prevention and maintenance of diabetes is evident as studies show exercise improves blood sugar, providing greater glycemic control [1,3]. Physical activity has shown better outcomes, more sufficient in reducing the risk of type II diabetes than metformin, an anti-diabetic medication [1,3].

Cancer

Another benefit of exercise is its effectiveness in cancer protection and reduced progression. The immune system is a vital source in cancer prevention. The immune system has cells and various mechanisms preventing tumor growth [4]. Individuals who are immunodeficient are at increased risk of tumor growth, potentially resulting in cancer [4]. Exercise plays a role in an active immune system, improving its functionality by increasing the circulation of white blood cells throughout the body [4]. The heightened activity of the immune system makes it more effective at combating carcinogenic nasties and any disturbance in cell growth control mechanisms [4]. Physical activity can prevent the progression of cancer fatality by reducing obesity and unfit. According to a study [4], individuals who are obese and inactive with cancer comprise one third of cancer-related deaths. Body mass has been noted as a potential risk factor for breast cancer, and exercise with energy expenditure can reduce the severity associated with this cancer [4]. Physical activity is a vital preventative measure in the seriousness of many cancers, including breast cancer, endometrial cancer, prostate cancer, and colon cancer [1,3,4].

Musculoskeletal Disease

Exercise has been reported to reduce the development and progression of musculoskeletal diseases [1,3]. Physical activity increases bone density, reducing the chance of bone loss [1,3]. During physical activity, broken bones are most commonly due to falls and loss of balance [3]. Regular exercise builds bone strength and improves balance, reducing the chance of injury [1,3]. Literature reports a lower fracture incidence among individuals who exercise than individuals who do not [3]. In the long run, exercise poses a great solution to independence, especially for the elderly, helping to maintain independence and perform day-to-day activities that require movement [3].

Exercise and Biological Processes

Neurogenesis and Cognition

Neurogenesis is a process that promotes neural plasticity, brain homeostasis, and preservation of the brain through the proliferation and differentiation of neuronal cells in the hippocampal region of the brain [5]. Several studies [1,6,7] suggest that physical activity regulates downstream anatomical activities that favor brain plasticity. Exercise influences the uptake of Insulin-growth factor 1 (IGF-1), a hormone necessary for brain growth and development [1,5-7]. The increase in circulation of IGF-1 supports neuronal growth and differentiation in the hippocampus [5]. The hippocampus is essential for learning and memory [1,6,7]. Thus, the stimulation of IGF-1 from exercising may improve cognitive functions [6]. Fibroblast growth factor-2 (FGF-2) and brain-derived neurotrophic factor (BDNF) also play a vital role in the growth of neural progenitor cells in the hippocampus [1,5-7]. With exercise, both FGF-2 and BDNF increase, allowing the generation of hippocampal neuronal cells, vital for distinct learning and memory divisions, and lowering the risks of cognitive impairment [6].

Sleep

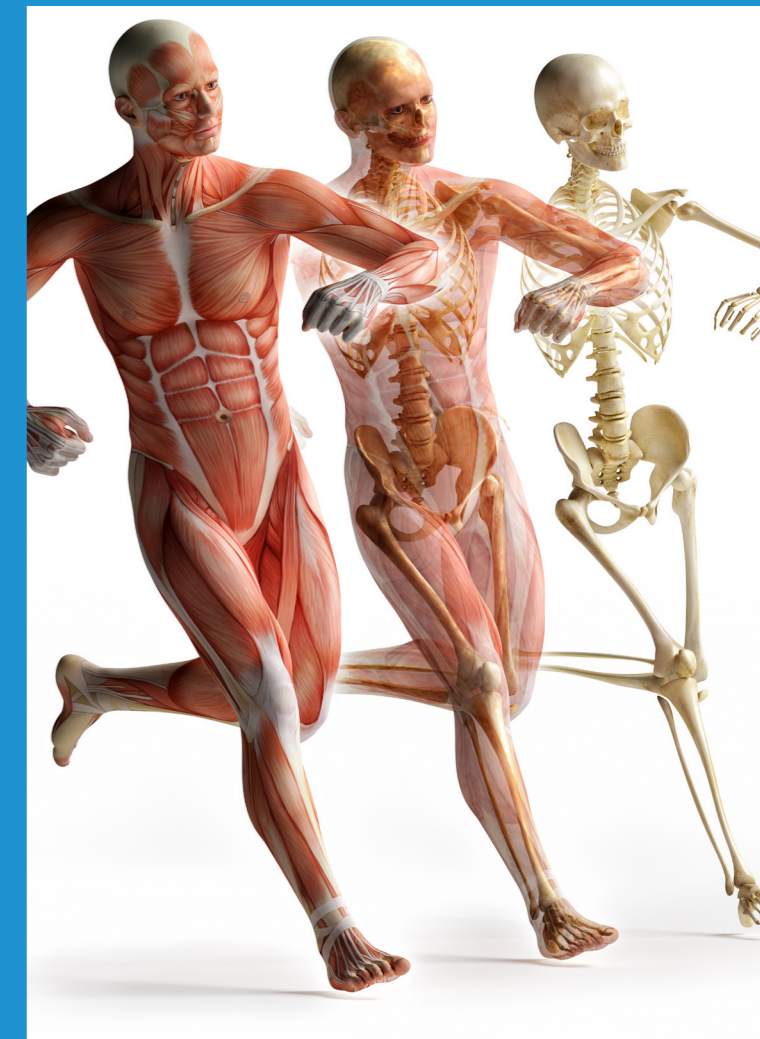
Exercise has a positive impact on sleep and sleep has an impact on exercise, suggesting their bidirectional relationship [8]. Sleep is essential in the restoration and rejuvenation of bodily functions, and exercise makes for significantly longer sleep duration, permitting consolidation of things learned, cleansing, and long-term refinement for vital body systems, including the cardiovascular, musculoskeletal, immune, and nervous systems [8]. Exercise reduces sleep disturbance, making it an option for restlessness associated with insomnia and mental disorders such as depression [8].

Mood

Exercise has also been associated with improved mood [1,9]. Physical activity increases blood circulation, impacting several systems, including the limbic system, necessary for mood and emotion. Exercise reduces the presence of negative affect stimulated by the amygdala and stimulates the hippocampus, which in addition to learning memory, has a role in mood and motivation [9]. Regulation of negative affect and emotion reduces anxiety, depression, and negative mood [9].

Conclusion

Physical activity is an imperative factor in maintaining the quality of life. Exercise is recommended to improve better life outcomes [1,3]. Making exercise a part of your life can reduce the development of cardiovascular disease, diabetes, reduce the risk of cancer and various musculoskeletal illnesses [1,3,4]. Aside from its connection to better pathology, exercise is also an accepted recommendation for mental disorders, including depression, as physical activity allows for better sleep and mood [1,6-9]. Exercise can be a haven for stress relief [7]. Physical activity also improves cognitive function due to its involvement with neurogenesis and various neuronal pathways involved in memory and learning [1,6,7]. Whether it be a walk a day, or an activity in a gym, physical activity engagement exerts benefits on everyone [1].



POST COVID-19 RECOVERY: PULMONARY PERSPECTIVES ON REGAINING YOUR FITNESS LEVEL

EMILY KUMMERER

In November of 2019, a new virus called COVID-19 turned the world upside down. Since then, face masks have become common wardrobe accessories, exercise equipment and toilet paper to become scarce, and ingrained “pandemic” as a household term, not just something read in a history textbook.

While everyone has had a different experience with COVID-19, it is rare to find someone that has not either had the virus or know someone who has had it. The symptoms range from mild to severe. Some can take recover at home, while others are admitted to the intensive care unit and placed on ventilators. Many have died from complications from the virus. Everyone who gets the virus has a unique course both during and in recovery. One thing for certain is that if you had a moderate or severe case, the recovery can feel like it never ends (I speak from experience on this point).

I had the pleasure of speaking with Dr. Cynthia Tsai and Dr. Ajay Shetty, both Pulmonologists in PA, on their perspective on advising patients recovering from COVID-19 on returning to their desired level of active.

Dr. Shetty, originally from India, served five years in India’s Air Force following his medical training. He moved to the United States for residency at SUNY-Brookland/Kings County Hospital in NY at the height of the AIDs epidemic. Here, he began treating the critically ill patients in the intensive care unit, which inspired him to pursue pulmonology with a focus on critical care. Throughout the COVID-19 pandemic he continues to treat critically ill patients, whose goals for activity are vastly different than what an athlete’s goals are. Nonetheless, there are some underlying themes that Dr. Shetty felt are important when recovering from an infection with COVID-19.

When a patient suffers from a severe case of COVID-19 they suffer from deconditioning. If severe enough, deconditioning can develop into critical fitness neuropathy, which is when a patient presents with severe muscle weakness that appears slack [1]. To help combat this, regardless of the point of the infection, you want to be moving. “Keep pushing the limits” Dr. Shetty advises, as this is the only way to reverse this muscle weakness, just be sure to maintain your pulse oximetry at a minimum of 88%.

Commonly, Dr. Shetty is asked, “How do I strengthen my lungs?” Unlike returning from a musculoskeletal injury, Dr. Shetty states, “A lung is not a muscle that you can strengthen. The lung needs to heal.” However, working on surrounding muscles groups including the heart, diaphragm, and skeletal muscles

can compensate for the damage in the lungs.

He suggests doing combination workouts of strength and aerobic exercise. At first, this might be more strength focused as you are limited by your lungs, but he emphasized to keep pushing the boundaries of your aerobic movement.

Dr. Tsai grew up in Atlanta, GA, where she spent her childhood dancing, leading to a career as a professional dancer. Her initial goals were to stay in the dance world, but then found herself interested in what higher education had to offer. She enrolled in college, graduate school, and eventually medical school. During college she picked up running as a form of stress relief and mediation. She started with short distances, but before she knew it, found herself running multiple marathons. Her passion for running came to a halt when she was diagnosed with COVID-19 early in the pandemic. Being an athlete, her entire life and a pulmonologist Dr. Tsai has an exceptionally unique perspective on COVID-19 and what it takes to recover from it – especially when trying to get back to your pre-COVID fitness level. We hear about the common COVID-19 symptoms: cough, shortness of breath, loss of taste/smell, fever. However, a less recognized symptom, inflammation, is not as openly discussed. COVID-19 causes massive amounts of inflammation throughout the body. This prolonged inflammation will cause your body to become deconditioned. To combat and recover from deconditioning, Dr. Tsai reminds her patients that they are starting from scratch and need to take it easy. “You may feel great one day... the second day you may feel like you’ve been hit by a ton of bricks, even though you felt great the day before. That’s the unpredictability of COVID.”

Dr. Tsai reiterated that “Every day will be different, and every person’s recovery will be different, so it is imperative to listen to your body.” She said as you work back up to your desired goals to push your limits, but watch your heart rate, SOB, and stay hydrated.

Both Dr. Shetty and Dr. Tsai had some important key takeaways when it comes to recovery: focus on the positive trends, continue to be active, and pick up new healthy habits. Look back at where you were a week ago, a month ago, and if you’re seeing a positive trend, the odds are, that improvement will continue, even if your day to day fluctuates. The COVID-19 vaccine severely reduced hospitalizations, in 2021 about 9/10 patients in the ICU Dr. Shetty was caring for were unvaccinated. Dr. Tsai has seen patients who had COVID before the vaccine was made available and once vaccinated had their lingering

symptoms resolved. Getting vaccinated can make a huge difference with your outcome if you end up testing positive.

Despite a decrease in cases in the United States over the past few months, COVID-19 has not been eradicated. It remains unpredictable and continues to cause severe illness and death. In the event that you or a loved one are diagnosed with

COVID-19, or you are counseling your patients on what to do post-infection, the most important thing is to stay positive (or remind them to) and remember that it takes time to fully recover. Fortunately, compared to the early stages of the pandemic, there are proven treatments to aid in the recovery and expedite the process of getting back to your exercise goals.

BEAUTY IS PAIN: EXPERIENCES OF A CHILD ATHLETE

KATERINA FUTCH

Growing up a competitive dancer, I was taught that a little bit of pain meant progress. We were to push our boundaries a little further every week in hopes to gain a new skill or better technique. We were told that this was the way to come out on top at competition. For more than 10 years of my life, I lived by this ideology. That was until I felt something in my hip snap while on stage at the age of 16, no longer allowing me to push through the pain. The Orthopedist told me that I had a very common birth defect in which the head of my femur was slightly flattened, termed femoroacetabular impingement [1]. This defect restricted my hip’s range of motion, leading to a labrum injury. He said that most people never realize they have the defect unless in sports that push the boundary such as soccer goalies, gymnasts, and dancers. I underwent bilateral femoral head reshaping and labral reconstruction during the fall season of my junior year of high school. When I had asked my surgeon when I was cleared to dance, he told me, “If you were my daughter the answer would be never. However, from a post operative standpoint, you can start to ease back into things in February.” By the spring, I had learned that season’s dances and was back on stage.

Unfortunately, injuries like this were not uncommon at my dance studio. It was almost a rite of passage that if you were in the senior class you had developed bursitis, tendonitis, or required a knee brace. No one told us that our priority of reaching the next flexibility goal would likely be detrimental to the future of our dance career. To be honest, I don’t even think the instructors were aware of such outcomes.

Hip labral tears specifically are defined as a “wear and tear injury” by Boston Children’s Hospital and femoral impingement of the labrum specifically has been linked to early arthritis [1,2]. Because of the wear and tear nature of this injury, there is hope to prevent such injuries from occurring in the first place. In a study that looked at injuries in youth sports, of the 1614 subject cohort, 52% of the injuries were due to overuse. Sports cited in the study include tennis players, swimmers, dancers, track athletes, runners, gymnasts,



and cheerleaders [3]. With the amount of children entering competitive sports continuing to increase each year, I believe that the time has come to start emphasizing the need for biomechanical education to these coaches that already do so much for our children.

A study at Cincinnati Children’s Hospital has already begun to look at ways to limit the likelihood of children developing these injuries. The study recommended identifying those individuals with higher risks via angle of standing quadriceps, BMI in relation to tibial strain, and menstrual cycle. It then used these data points to integrate hip and quadriceps strengthening drills and continued assessment of the athlete’s biomechanics [4]. With pre-season metrics of musculoskeletal structure and knowledge on how to limit stress on the body during times of physical demand, there is potential to reduce these incidents.

As a former athlete, I am appreciative to have grown up in an environment of continued self-improvement and teamwork. However, I am even more grateful for the efforts that have been made in identifying overuse injuries and how to prevent them. AS previously stated, during my training days, my teammates and I were not aware of the implications of our continuously strenuous workouts. I must admit that I would do it all again if given the chance to go back. However, the purpose of this article is to stress the importance of knowledge about the possibility of such limiting defects and long-term effects of overuse injuries when not controlling for such and hopefully shed light on the need for further research, monitoring, and education on the impact of youth athletes.

BENEFITS OF PRESCRIBING MOVEMENT

ALIA SADEK

The first Surgeon General's Report on Physical Activity and Health in the United States (U.S.) was released in 1996 and reported 60% of Americans were not regularly active and 25% were physically inactive [1]. In an effort to address this public health concern, The U.S. Department of Health and Human Services released the first Physical Activity Guidelines for Americans in 2008, identifying evidence-based physical activity recommendations for all age groups. The most cited message moving forward became adults should participate in 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity, in addition to at least two days of muscular strength training, each week to decrease all-cause mortality, prevent disease, and promote health-related fitness [2, 3].

Despite these recommendations and growing evidence identifying physical inactivity as one of the four greatest risk factors for cardiovascular disease, certain cancers, and the most prevalent chronic conditions of our time, approximately 75% of adults do not currently meet the recommended guidelines and 20% remain physically inactive [4, 5]. Low socioeconomic status, poor built environments, and individual perceived barriers (such as time and motivation) are major factors cited for the lack of improvement in national physical activity participation [6]. In turn, physical inactivity has accrued an estimated 117 billion dollars in annual healthcare costs and healthcare systems across the nation are struggling to promote preventative care (such as physical activity) in light of this illness burden [4]. In 2010, it was estimated 8 in every 10 adults saw a healthcare provider in the past year, but only 1 in every 3 received physical activity counseling [7]. Although the reasons for which may include the lack of best practices for physical activity counseling and the variability in patients, providers, and clinical settings, physical activity benefits all individuals and must be integrated in the day-to-day care and long term treatment plans of all patients [3].

As future and current healthcare professionals, we can begin with what has already been established, but overlooked, in the most recent Physical Activity Guidelines for Americans released in 2018. The first step- before discussing minutes or intensity of physical activity- for patients who are assessed as currently inactive

or insufficiently active (e.g. not meeting the recommended physical activity guidelines) is motivating patients to move more in their daily lives [3]. Whether it is 3 minutes of walking up stairs instead of taking the elevator or a 5 minute walk around the neighborhood, any reduction in sedentary behavior and increase in light-intensity physical activity produces health benefits in these individuals [3]. Thus, the majority of American adults can enhance their current health by beginning with simply moving more and sitting less.

“any reduction in sedentary behavior and increase in light-intensity physical activity produces health benefits in these individuals.”

By taking a step back and beginning here, providers can introduce patients to physical activity via a feasible, low-risk, and little to no cost lifestyle modification. These lifestyle modifications also require little out-of-scope knowledge and time on the provider's part, which were two major barriers previously identified as reasons why many physicians and other healthcare professionals do not currently provide physical activity counseling [8]. So how can providers actually counsel their patients to make this change? The most practical and efficacious tool within providers' reach for successful physical activity counseling lies in motivational interviewing. Motivational interviewing is an evidence-based communication tool used to help facilitate patient-driven change in a collaborative and empowering manner [9; Figure 1]. Originally developed for substance use counseling, motivational interviewing has since been demonstrated to be an effective means in eliciting lifestyle modifications in clinical practice [10]. For example, the three-year Americans in Motion-Healthy Interventions study demonstrated motivational interviewing used in family medicine practices was a key strategy for helping patients attain long-term weight loss and increases in physical activity [11].

What comes next for these patients who choose to move more or those who already do? Here, providers have choices:

- Encourage patients to progress. Depending on the patient's goal and motivation, this may involve participating in longer bouts of physical activity or incorporating new types of physical activity into their routine.
- Educate patients on the current physical activity recommendations for them. Utilize the Physical Activity Guidelines for Americans to help patients optimize their physical activity participation for their age, medical conditions, and preferences.
- Collaborate with patients to create an exercise prescription. Using the F.I.T.T. Principle (Frequency, Intensity, Time, and Type), providers can work with patients to begin more structured physical activity (i.e. exercise) specific for their goals.
- Refer patients to community-based exercise programs. To help patients take the next step in their health-related fitness, providers can utilize bridge programs (e.g. Exercise is Medicine Greenville®) to directly connect patients with exercise professionals in their community [12].

The take-home message is that healthcare providers should make physical activity a topic of conversation regardless of the clinical setting, and now have an evidence-based treatment option in prescribing movement appropriate for patients of any fitness level. Not only will this improve patients' quality of life and physical function, but it will work to alleviate the greater chronic disease burden of America, a milestone we have yet to overcome.

The Tenants of Motivational Interviewing

Adapted from Miller & Rollnick (2013)

A — Ask Permission

“Can we talk about your physical activity today?”

O — Open-Ended Questions

“Why do you want to change?”

A — Affirmations

“I appreciate you sharing that with me today”

R — Reflective Listening

“So, it sounds like you...”

S — Summarization

“Here is what I have heard so far: ”

MAKING BAKING INTO A WORKOUT

ALICE BOUCHARD

1st PICK THE RIGHT RECIPE

Just like picking the right show to watch on Netflix, there is some art to choosing your recipe, but you do not want to mindlessly scroll forever. Generally, I opt for something with lots of gluten to develop that is just a little bit complicated – bread. For the purposes of this article, we'll be making soft pretzels.

2nd COLLECT YOUR INGREDIENTS

Hopefully your pantry and kitchen are on opposite sides of your very large house so you get some extra steps in, but if you're like me, it's just steps away in your small apartment. Alas, you'll have to get some movement in another way – grab your bag of flour and get some squats in while you make your way back to the kitchen (10 or 15 should do). Measure your flour out – use the smallest or most obscure measuring cup you have so as to move as much as possible and use your brain for some extra mental gymnastics. Now that you are sweating, from all the mental math of course, bring that flour bag back to the pantry. Do not forget to do some more squats along the way.

Next you will want to get your yeast ready. Yeast, like muscles that have not been worked out in ages, need a little bit of a warm-up. Do not go too hot or you'll burn out your yeast (like a young physician that has not learned to take breaks). For this step there are several variations:

Beginner – turn your faucet to warm and measure out your water. Double check the water is not too hot – touch the water with your finger, if it burns you like a bad exam grade, it is too hot.

Intermediate – walk all the way down the hall (or neighborhood) to borrow some water from your neighbor. Then come back and heat the water on the stove top. This modification allows for extra steps and forces you to socialize.

Advanced – find your nearest well and collect some water by hoisting the bucket up. Then, use those muscles to start a fire. This variation comes with the added perk of the best tasting water, for the small price of taking so much longer.

Once the water is warm, sprinkle in some sugar (yeast loves glucose, too), and then spread the yeast on top. In a matter of minutes, your yeast will spring to life and make your water look foamy.

3rd MIX IT ALL TOGETHER

Not feeling like this is enough of a workout? Time to change that. Melt your butter – if you are warm enough, just standing next to it will do. Otherwise, perhaps consider a microwave and use this moment as a water break. Next, mix together your butter, flour, yeast mix, and a pinch of salt. At first, the mixing will feel like no biggie – just wait. As you stir, enjoy the added resistance as the dough begins to form. Do not forget to mix with your non-dominant hand too (we need to balance this workout). Keep going until you do not think you can go any longer. Feeling the lactic acid yet? Turn your dough onto a floured surface. Now start kneading. Knead as hard as you can, alternating hands. Bang your dough against the counter – baking is great for anger management, too. The more aggressively you knead the better because you can never develop too much gluten. Finally, when your wrists start to ache and your dough ball looks like a masterpiece, place it in a lightly oiled bowl and cover it.

4th LET IT RISE

Set a timer for 1 hour and let your hard work rise. While your yeast is working hard, you should be too. Do as much of the following in one hour as you can:

- 100 push-ups
- 100 crunches
- 100 tricep dips
- Do all your dishes
- Watch a podcast

- Do 300 Anki cards
- 100 pull ups

If time permits: stare at your beautiful pretzel dough as it comes to life.

5th SHAPE THOSE PRETZELS

Now that you have done most of your workout comes the best part – carbo loading. Pour your baking soda into some water and bring it to a roaring boil. While you are doing that, cut your dough into 8 pieces. Use your now very tired hands to roll the dough into a snake, then fold into a pretzel. Bonus points if you fold it right without looking it up. Repeat with all your pieces.

6th POACH AND BAKE YOUR PRETZELS

Place them into the boiling water for 30 seconds using chopsticks to get them out. This will test your dexterity with something very slippery. Repeat with all your pretzels. Then brush with an egg wash and finish them off with some salt. Pop these bad boys in the oven and watch them turn golden brown. While they bake, do some jumping jacks – we cannot forget about cardio.

7th EAT YOUR DELICIOUS PRODUCT

Remove your precious goods from the oven. Do they not look beautiful? Use the last bit of energy you have to lift one onto a plate. Now sit down and enjoy your well-deserved break and eat all the calories you just burned right back.

In case you want to make pretzels now, [here](#) is the recipe! They are delicious and well worth the workout to make them.



SPORTS MEDICINE ON THE SLOPES A DISCUSSION WITH DR. MATT MCELROY

SETH ELLISON

At an elevation of just under 9,000 feet, with ample downhill runs and cross-country ski trails, Crested Butte, Colorado is an ideal location to grow up with a passion for skiing. Dr. Matt McElroy spent his adolescence racing down the local resort's slopes and his love for the sport has led to his position as one of USA Ski Team's physicians.

The Olympics and World Tour/Cup are the pinnacles of the sport. Dr. McElroy humbly emphasizes he never made it to that level, but he will admit (if pushed) that he did race competitively in high school through college and spent some time competing at the national level. The network he built during his competitive years as an alpine racer provided him with an "in" to one day work with these world class athletes.

Dr. McElroy emphasizes the importance of wellness, "I am a firm believer in 'exercise is the best medicine' and that diet makes a significant difference in one's life." So, when sports medicine fellowships first became available in the early 2000s, Dr. McElroy knew it was a strong fit and trained at St. Vincent Health Systems.

The idea of working with the national ski team originated when Dr. McElroy became the mentee of a doctor that worked with the men's free style team. In 2008, Dr. McElroy applied to serve as a volunteer physician with the national team. Selected applicants choose a track (snowboard, alpine, cross country, Nordic, free style, etc.) and serve a one-year probationary period in which they work at non-World Cup level races (similar to AAA level baseball). Given his background, Dr. McElroy selected the alpine track and was prepared to begin his probationary year. Before he went to his first lower rank event, the doctor scheduled to work at the World Cup race in Germany had to pull out. Dr. McElroy got the call to serve as the replacement, prompting his unanticipated, immediate ascension to the highest level of competition.

That first event set a high bar: Dr. McElroy ate with the team, attended team meetings, and he got to know the athletes on a personal level. International skiing super stars, like Lindsey Vonn, were common tablemates. He enjoyed the collegial atmosphere and the fact that his focus was on the athletes and their health, not providing post injury press announcements.

After a few years serving as the physician for the U.S. women's alpine ski team, Dr. McElroy made the switch to the Nordic combined track. Nordic combined is an event that meshes ski jumping with cross country skiing. First, the athletes jump to compete for the longest distance. Those measurements are then used to adjust their times in the cross-country event.



In mid-March 2022, Dr. McElroy transitioned to the cross-country track, and he accompanied the U.S. team to Sweden. Despite being seen as a significant underdog, the United States took home gold! Given his tenure with the organization and understanding of the sport, his duties have now extended beyond simply serving as team physician. From calling out split times to assisting the competitors with equipment adjustments before and during the races.

The passion Dr. McElroy has for working with all the athletes is evident. Yet, his enthusiasm when talking about the cross-country team is abundantly apparent. Working with and befriending the cross-country skiers instills humility: Many have advanced degrees in chemical engineering and other intellectually demanding fields. Their chances of getting wealthy from the sport are slim, but they dedicate as much time to their training as well-paid, major-league athletes while maintaining their careers and completing their education. Then there are the physical demands of cross-country skiing. The sport requires the lungs of a track athlete and robust upper body strength to pull oneself through the uphill portions of the course. The lower body strength and endurance are obvious, but many do not realize the immense coordination required to navigate difficult turns at speed when going downhill while wearing cross country bindings (detached heel adds an additional element of difficulty compared to a full ski binding set up).

Dr. McElroy's own humility is unmistakable when talking with him. Throughout the interview he repeatedly states that he is talking too much about himself and that the athletes should be the focus. He is full of gratitude for the medical profession. "A medical degree can open opportunities outside of the traditional role. I get to serve the healthcare needs of my community while traveling to international events to support the U.S. ski team." Both endeavors continue to enrich his life. He is also grateful for the support that his employer, Geisinger Health Systems, continually provides as he travels with the national team.

MEET THE TEAM

Emily Kummerer

Editor in Chief

Emily grew up in sunny south Florida. She graduated in 2019 from the University of South Florida in Tampa with her bachelors in cell and molecular biology. Following that she moved to Scranton, PA to complete her master's in biomedical sciences at Geisinger Commonwealth School of Medicine. When not studying Emily enjoys hiking, long rides on her Peloton, baking sourdough bread, playing with her Bernese Mountain Dog, Remy and spending time with her friends, family and fiancé.

Sydney Williams

Design Editor

Sydney grew up in Fayetteville, Georgia and earned a degree in neuroscience from Georgia State University. She is a member of Alpha Kappa Alpha Sorority Incorporated. Sydney enjoys working out, meditating, traveling and spending time with her dog.

Seth Ellison

Current Events Editor

Seth was born and raised in Central Pennsylvania prior to heading south for college. He graduated with an undergraduate degree in biology from Mary Washington then began a career in finance. Seth has an MBA from Duke and a Master's of Biomedical Science from GCSOM. The last years of Seth's business career were spent as a business executive including roles as CFO, COO, and CDO. Lake living, time with his friends, family, and fiancé, current events, and fitness take up most of his free time.

Frank Vazquez

Research Editor

Frank grew up in Fort Myers, FL and has an undergraduate degree in Athletic training. He practiced as an Athletic Trainer at Olympic Heights High School for two years as the sole athletic trainer for all sports in the school. During this time, he also worked in a physical therapy clinic running rehabilitation protocols. Frank is a gymnast and martial artists and hopes to help people who practice these sports in the future as an orthopedic surgeon. He also loves to spend his free time at the gym or hiking nature trails.

Jeff Mun

Physician Network Editor

Jeff grew up in Seoul, South Korea and majored in biology at Swarthmore College. Before medical school, he worked as a research assistant at the NIH. When he is not grinding the books, Jeff loves baking his signature banana bread, competing in ironman triathlons, and hanging out with friends.

Sam Paek

Institutional Liaison

Sam grew up around Richmond, VA where he spent his childhood summers fishing, hiking, and exploring the outdoor scene. He completed his undergraduate degree in Biology at Virginia Commonwealth University in 2018. In his free time he enjoys snowboarding, playing basketball, and painting.

MEET THE TEAM (CONTINUED)

Patrick Kowalski

Editorials Coordinator

Patrick Kowalski grew up in Bethlehem, PA and graduated from Penn State in 2016 with a degree in Kinesiology. After undergrad, he spent time coaching high school soccer and lacrosse before completing the MBS program in 2020. During his free time, he enjoys a wide variety of sports, outdoor activities, and chess.

Niki Viradia

Community Service (Volunteering) Editor

Niki grew up in Raleigh, North Carolina before moving to Boston, and then settling in South Florida. She graduated from North Carolina State University with a B.S. in biological sciences and is currently pursuing a master's degree in biomedical sciences. Niki has worked as a clinical researcher in nutrition, psychiatry, and plant biology. She enjoys Orangetheory Fitness, experimenting with recipes, and feeding the wild ducks that visit her backyard.

Steven Grammp

Social Media/Marketing

Steven grew up in East Stroudsburg, PA, located in the Poconos. He graduated from Penn State with a degree in Biological Sciences in 2020. He competed in football most of his life and still enjoys watching. In his downtime he likes to go golfing, hiking, and snowboarding.

Stacey Brown of Brown Eye Design

Social Media/Marketing

Stacey loves any opportunity to combine art and technology. Her education includes a Bachelors of Science degree from Penn State University in Business Management with a minor in Theater Arts. In addition, she has a degree in Animation from the Art Institute of York. As an artist, her main interests are digital painting, graphic design, animation, and 3D modeling. She creates her work while living on a small family farm in Northern Pennsylvania and enjoys spending time with her family and pets.



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