Decompression Illness (DCI) is one of the most severe and life-threatening outcomes in SCUBA diving. DCI most commonly occurs when dissolved gases in body tissues (mainly inhaled nitrogen or helium) come out of solution after ascent and form bubbles leading to tissue damage. DCI can be either Decompression Sickness (DCS) or Arterial Gas Embolism (AGE). The type of DCI is named based on the organs affected, including cutaneous DCI, musculoskeletal DCI, and cerebral DCI.

Electronic sports (esports) are sports by electronic systems in which players and teams interact electronically. Variations have evolved in the internet era, but they began as arcade video games in the 1980s. Esports evolved to have a similar organization to professional sports having athletes, uniforms, spectators, teams, referees, and sponsorships. In recent years, esports has gained acceptance in high school, collegiate, and professional levels of athletics. As of 2019, there are 80 United States colleges with varsity esports teams, with 22 offering scholarships. The professional esports industry earned more than $1 billion in 2019, with an audience of nearly 500 million worldwide. As an effort to become a legitimate sport globally, the International Olympic sub-committee approved esports as an official medal event at the 2022 Asian Games.

Sports have been encouraged by the public health and sports medicine community as a way to improve health and well-being. However, unlike traditional sports, physical and mental demands are different. Esport athletes practice more than recreational gamers with greater intensity and skills of dexterity. Collegiate and pro athletes make about 500 action moves per minute while the average gamer does about 50. It has been estimated that esport athletes, on average, practice up to 5 hours/day which may increase to 10 hours/day during competition practice and up to 3 hours of uninterrupted gaming during tournaments.

A significant health issue among esport athletes is the sedentary nature of the sport. A survey on collegiate esport athletes by Hallie Zwibel, DO, director of sports medicine at the New York Institute of Technology College of Osteopathic Medicine, found that 40% do not receive any physical activity on a
Nutrition is also a consideration in esport athlete well-being. Energy drinks with excess sugar and caffeine have been marketed to gamers to increase mental focus and performance. Poor nutrition could exacerbate metabolic dysregulation in an already sedentary athlete and increase risk of obesity.

Similar to other sports, these unique athletes need a multidisciplinary approach for medical care not limited to physicians, athletic trainers, physical therapist, and mental health services. As esports increases in popularity, sports medicine physicians can play an integral role in diagnosing, preventing, and treating their injuries.

Timeline:
1980s: Esports began as arcade video games.
2014: Robert Morris University started the first esports team.
2017: IOC accepted esports as a sporting activity.
Fall 2018: The first competitive U.S. high school varsity esports season begins.
2024: Esports might be added as an official Olympic sport.


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Check Out AMSSM’s Patient-Focused Resource Center On-Line, SportsMedToday.com!

SportsMedToday.com provides an easy-to-navigate, patient-centered resource center for parents, medical professionals and youth organizations interested in prevention and treatment of sports-related injuries.

Visitors to SportsMedToday.com will find a searchable database with a variety of sports medicine topics arranged by sport, medical condition (injury/illness) and body part, with topics being added and updated continually throughout the year. In addition, healthcare professionals can download tip sheets to share with their patients and partners.
DECOMPRESSION ILLNESS

Continued from page 1

Affected Population/Incidence
DCI occurs in SCUBA diving but can occur in anyone exposed to pressure changes. DCI occurs in 3 per 10,000 recreational dives and 35 per 10,000 commercial dives. Decompression algorithms reduce the risk of DCS by having divers perform safety stops, which allow for degassing. Unfortunately, they are not individualized to the diver and do not prevent the majority of illness, with 97.5% of all recreational DCS occurring in divers who did not violate their decompression obligations. The risk of DCI is increased five-fold in patients with patent foramen ovale (PFO). Additional risk factors include dehydration and excessive activity during a dive.

Pathophysiology/Etiology
While diving, different compositions of inhaled gas mixtures, consisting mostly of nitrogen, are used. With descent, the pressure increases, and these gases dissolve and become supersaturated in body tissues. During ascent, the pressure decreases, bringing the gases out of solution and forming venous gas emboli (VGE). It has recently been postulated that these VGE are produced from pre-existing stable gas micronuclei found on the blood vessel endothelium pre-dive. These VGE and their precursors are normally filtered out by the lungs and with lymphatic drainage. In DCS, the VGE do not get filtered out and instead can get lodged in body tissues leading to damage. The damage can occur in a variety of ways including blood vessel spasm or ischemia. Ischemia is due either to the bubble directly blocking blood flow or causing endothelial damage, leading to tissue swelling.

Arterial gas embolism (AGE) occurs through three main mechanisms. It can occur if the VGE burden is so high the pulmonary capillary beds cannot clear them fast enough. Additionally, if the patient has a PFO, VGE can cross from the venous to the arterial side of the heart. Finally, AGE can develop in pulmonary barotrauma leading to alveolar rupture.

Presentation
In 90% of patients, DCI occurs within the first ten minutes to three hours of surfacing but can be delayed up to 24 hours. Depending on the organ system(s) involved, the patient may have a variety of symptoms including: itching, mottling rash, localized soft tissue swelling, lymph node pain, muscle/joint pain, dyspnea, tachypnea, altered consciousness, sensorimotor deficits, ataxia, back pain, numbness, paresthesia, urinary/gastrointestinal dysfunction, vertigo, nausea, vomiting, nystagmus and/or sensorineural hearing loss.

Diagnosis
The diagnosis of DCI is based on clinical suspicion. There are no diagnostic tests to confirm DCI. Chest radiographs are an important part of the treatment paradigm to rule out contraindications to recompression, such as pneumothorax and pneumomediastinum, prior to treatment. The remaining imaging modalities are mostly useful for ruling out differential diagnoses. Radiographs can rule out immersion pulmonary edema. CT can rule out a cerebrovascular accident. A higher VGE count on echocardiography relates to a higher risk of DCI.

Treatment/Management
To aid in DCS prevention, divers may opt to use gas compositions with less nitrogen, which significantly reduce VGE formation at 0, 30, 60, and 90 minutes post decompression. Other preventative measures include introduction of a deep stop at 82 feet of sea water to aid in gas elimination from the spinal cord and brain, fast absorbing tissues with rich blood supply. If DCI is suspected, it is imperative to treat promptly with recompression therapy in a Hyperbaric Oxygen Therapy (HBOT) chamber and high flow 100% oxygen via a non-rebreather mask, which increases nitrogen washout and promotes reabsorption of VGE.

Future Directions
Further research is needed to develop individualized prevention algorithms and pre-dive prevention interventions. Unfortunately, very few facilities offer emergency treatment to divers. In August 2020, a call to action was sent to members of the United States government to address the lack of emergency access to pressurized hyperbaric oxygen. After calling local emergency medical services, contact the Divers Alert Network (DAN) for assistance in locating a HBOT chamber and/or physicians serving the diving public.
UPDATE FROM THE AMSSM MSIG (MEDICAL STUDENT INTEREST GROUP)
A Student Interest Group Led by AMSSM Student Members

President’s Message
Melissa Jackels, BS, PSM
University of Hawaii JABSOM MS3

Hello all!
As the COVID-19 pandemic continues to impact our world and healthcare system, it remains difficult to stay or become involved as a medical student in the field of sports medicine. As the community continues to adapt and adjust to the pandemic, more and more virtual and online resources are coming available to help students stay connected and learn about specialties of interest. The AMSSM MSIG and SMRC continue to work to develop webinar series, didactics, and mentorship opportunities to keep students involved in the field of sports medicine—many of these can be accessed online! In addition, recordings of the Virtual Meeting Sessions, and online Case Studies, available through the AMSSM website are an excellent way to develop your medical knowledge as it relates to Sports Medicine and the care of patients. Additionally, the AMSSM MSIG is working to increase our social media presence through our Instagram page, where we provide any updates on upcoming opportunities for student involvement or education. Please give us a follow at https://www.instagram.com/amssmmsig/. We are also working to develop further webinar series tailored to the interest of medical students, and so if there is a topic you would like to see us cover, please feel free to reach out!

I hope everyone is staying safe during this time!

Connect and Follow the AMSSM MISG on Instagram and Facebook
We want to grow our social media presence!

UPDATE FROM THE AMSSM SMRC (RESIDENT INTEREST GROUP)
A Resident Interest Group Led by AMSSM Resident Members

President’s Message
Giorgio Negron, MD
Emory University PM&R Residency PGY3

Hello Fellow Residents!
It is an honor to serve as the AMSSM SMRC President for the 2021 calendar year. We have made it through last academic year stronger than ever. In April, the AMSSM successfully held its 30th Annual Meeting with an incredible line-up of speakers from around the world teaching us in-depth and up-to-date sports medicine knowledge we all love. In addition, the conference showcased trainee-catered learning such as the “S.M.A.R.T – E.S.T Workshop” for sideline coverage, the “Resident/Student specific ICL: What You Need to Know for Fellowship” session, the incredibly popular “Resident and Medical Student Bootcamp,” as well as, of course, the annual tradition of the Fellowship Fair. We applaud the Program Planning Committee to have made this virtual meeting of minds possible!

As the fall begins, residents in their last year are applying for sports medicine fellowships while new fellows are starting strong and knee-deep in sports coverage. The SMRC would like to highlight the many resources AMSSM has to offer to make the path to sports medicine easier. Please check out the resident member webpage to gain access to resident resources such as the list of sports medicine fellowship programs as well as our YouTube account for free online didactics and our recent “Matching Into a Sports Medicine Fellowship Panel Discussion.” I encourage each of you to follow our SMRC social media platforms (Facebook/Instagram) to keep up-to-date on the latest happenings of the AMSSM SMRC. We are open to new ideas and welcome extra help, so please reach out if you would like to become more involved!

Help Us Increase Our Social Media Presence
Connect with the AMSSM SMRC on Facebook and on Instagram!

Follow and Connect with the AMSSM SMRC ■
**AMSSM NEWS**

**UPDATE FROM THE AMSSM SMFC (SPORTS MEDICINE FELLOWS COUNCIL)**

*A Fellow Interest Group Led by AMSSM Fellowship Members*

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**2021-2022 Fellowship Class Representative**

Ruikang (Kong Kong) Liu, MD

*University of Colorado Sports Medicine Fellowship*

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Hi Fellows Class of 2022!

Hope everyone is off to a great year so far. Does every day still feel like you are drinking from a fire hose like med school and residency all over again? I certainly do at times. Crazy to think we are over 1/6th of the way through the year already and interviews will soon start for the next year’s fellows!

I wanted to touch base to remind everyone of some quick upcoming dates:

- 9/15 – Deadline for completing the Fellows Pre-Test (there is one for ultrasound too you can try!)
- 11/9 – Deadline for submitting a case abstract for the 2023 AMSSM Annual Meeting
- 12/7 – Deadline for submitting a research abstract for the 2022 AMSSM annual meeting

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**2021-2022 Fellowship Member Liaisons**

If you are interested in more ways to become involved with AMSSM, keep in mind all of your SMFC fellowship liaisons you can reach out to. Ruikang (Kong Kong) Liu, MD – Fellowship Class Rep ruikang.liu@cuanschutz.edu

James Smith, MD, MPH – Communications Committee jamsmith@uchc.edu

Dana Sheng, MD – Education Committee dana.sheng@gmail.com

Jaire Saunders, MD, MPH – IIOR Committee jaire.saunders@gmail.com

Hunter Haley, MD, MS, Membership Committee hhaleymd@gmail.com

Elisa Giusto, DO, Practice & Policy Committee elisagi@pcom.edu

Mike Cullen, MD, Publications Committee mlcullen@ucdavis.edu

Shane Davis, MD, Research Committee shanedavismd@gmail.com

Laura Mattson, DO, Sports Ultrasound Committee Laurabridge52@gmail.com

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Check out AMSSM Collaborate for all the different interest groups or committees you can sign up for as well under “Communities”!

Keep up the strong work and let’s make every day count! ■

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**Collaborative Research Network Update**

The AMSSM Collaborative Research Network (CRN) continues to make large strides towards its mission of fostering collaborative research to improve the clinical practice of sports medicine. A few highlights from the past year are provided below.

In December 2020, the CRN awarded a $300,000 grant to AMSSM members Dr. Aaron Baggish, Dr. Jonathan Drezner, and Dr. Kimberly Harmon for their research project titled “Outcomes Registry for Cardiac Conditions in Athletes (the ORCCA Study): a Prospective, Multisite Research Study.” In its first year, this study focused primarily on implications of the COVID-19 pandemic on cardiac conditions in collegiate athletes diagnosed with SARS-CoV-2 infection. The study team will use year two of the research project to transition this project into a long-term ongoing registry to collect outcomes data on athletes diagnosed with cardiac conditions.

The CRN is honored and excited to serve as the data coordinating center for a $4 million multisite research grant titled: Hamstring Injury (HAMIR) Index: A framework for injury mitigation strategies through innovative imaging, biomechanics, and data analytics. This is a four-year study beginning in July 2021 and ending in June 2025. The study team aims to combine advanced imaging, on-field biomechanics and computational analytics to develop an index that can identify an athlete’s propensity for hamstring injury and re-injury while also identifying targets for injury mitigation. AMSSM research director, Stephanie Kliethermes, PhD, and numerous AMSSM members across multiple sites will serve as co-investigators on this study.

The CRN is growing! We are thrilled to announce the hiring of the AMSSM CRN research program manager, Sarah Sund. Sarah joins AMSSM from the University of Wisconsin-Madison and has many years of experience in clinical research coordination and management. In her role as research program manager, Sarah will assist in coordination and execution of CRN affiliated multisite research projects, help administer the AMSSM research grant program and work closely with AMSSM Research Director Dr. Kliethermes, to grow a robust AMSSM and CRN research footprint.

The CRN is currently planning its 2023 research summit on health disparities in sports and exercise medicine. The goals of this summit will be (1) to identify knowledge gaps and establish research priorities in this space and (2) to develop a robust methodological framework for researchers to consider when conducting health disparities research in sports and exercise medicine. Look for ways to be involved in the planning of this summit over the next 12 months! And we certainly hope you’ll consider joining us on April 27th, 2023 in Phoenix, AZ!

Feel free to contact AMSSM Research Director, Stephanie Kliethermes, PhD, or Chair of the AMSSM CRN Leadership Team, Irfan Asif, MD, with any questions or comments related to the CRN. ■
Nuti: Hello, and welcome to the CMO Corner Podcast. I am your host, Dr. Rathna Nuti, primary care sports medicine out of DFW Metroplex, and today we have Dr. Gary Green. Please go ahead and introduce yourself to the audience.

Green: I am a charter member of the AMSSM, served on the Board in the past, and was the program chairman for an annual meeting. I am currently a clinical professor in sports medicine at UCLA and in private practice with St. John’s Physician Partners in Pacific Palisades, California. I am also the head team physician for Pepperdine University, and for the last eleven years, I have been the medical director for Major League Baseball [MLB].

Nuti: How did you become involved in your current role?

Green: Major League Baseball had a bit of a performance-enhancing drug problem in the 80s and 90s, and this became pretty clear in the early 2000s. I was contacted by then MLB vice president Robert Manfred (now the current commissioner) to develop the drug testing program. I had been involved in performance-enhancing drug testing for many years and had done research at the UCLA Olympic Laboratory. I had also chaired the NCAA drug testing committee for about six years and published research in performance-enhancing drug use and how to deter athletes. MLB contacted me to see if I would be interested in helping them develop their program. When I was first contacted, many people told me not to even go for the interview because they assumed MLB was not interested in changing the culture of baseball. I went, and Rob Manfred was very convincing that they were committed. It’s very easy as sports fans to read the paper and criticize how leagues are doing things. It’s much harder to be on the inside and actually be able to effect change. Rob Manfred as well as Commissioner Bud Selig at the time really convinced me that they were serious about changing the culture.

From 2003-2010, we were very successful. We started at the minor leagues and worked our way through the major leagues, and now I would argue that MLB has the best drug testing program of any professional sport in the world. I would even put us against Olympic testing. At the time, people said, “It’s not possible for an organization to police itself,” yet we were able to do that. We had the cooperation of our union, and the players actually changed. Now our numbers are much lower, and when a player tests positive, other players don’t rush to their defense; they want them out of the game. The players really look at it as cheating and having an effect on the integrity of the game. MLB thought I did a good job in helping them develop their drug testing program. In 2010, they asked me to become the medical director. The last several years, I have become the research director for MLB as well.

Nuti: Definitely a lot of hurdles you have to go over before you can establish a rigorous program. It’s good to know that you got the support that you needed to change the culture. I’m sure it wasn’t easy at all.

Green: My whole career prepared me for this role. It’s being a team physician for thirty years, dealing with drug testing, athletic trainers, and coaches, and understanding the culture of a sport. I didn’t grow up and say, “I want to be the medical director for Major League Baseball.” That would be silly because there are so few of those jobs. Something I have always tried to teach our fellows is it’s really important to do the best possible job you can at each step of your training, and then be open to opportunities. When opportunities come, just try to make the most of them without focusing on where they’re going to lead you. Also, when you have your first job, the word “no” should not be in your vocabulary. Whatever they ask you to do, if they ask you to cover a Friday night softball game, if they need you to work an extra clinic, you really want to build up that trust, especially when you’re young and people might doubt your experience. The way to compensate for lack of experience is with enthusiasm and working hard. You want to be known as the person who gets the job done and is reliable.

One of the things we all like about sports medicine is that it is a team approach. We work with athletic continued on page 7

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trainers, physical therapists, coaches, and players. You have to develop relationships and be present. You can’t just show up right before a game and leave right afterwards. When I joined MLB in 2003, I tried to visit as many teams in spring training as I could. This was very helpful because sometimes you have to implement policies that are not popular, and if the athletic trainers and medical staff know you personally, they are going to cut you some slack and say, “We need to be able to cooperate and get things done.” I have continued the last eighteen years trying to visit as many teams as I can. It is very time-consuming, but I think it pays off in the long run.

Nuti: What have been some of your greatest challenges in being a CMO?

Green: I like doing something different every day. I could never be, say, a cataract surgeon doing the same surgery over and over. Over the last eight years, there have been many different challenges, everything from Zika Virus to concussions to ulnar collateral ligament injuries. It’s important to know the concerns of your clubs. You have to realize that, with the League, your job as a consultant is to make them aware of any vulnerabilities. For instance, if we wanted to eliminate batters being hit by pitches and being hurt, we could put in a rule that you could only throw sixty-five miles an hour. Obviously, that wouldn’t be the same sport of baseball and would impact the integrity of the sport, so you have to be cognizant of how you impact the sport and preserve what we like about it.

Dealing with the media is a big challenge. That happens when you’re a team physician of any kind. I have tried to refer everything to the media relations person at the school, university, or MLB. Reporters have a certain story to tell, and they don’t always follow the facts, so it is really important to have those who deal with the media on a daily basis vet the reporters and make sure they are okay to talk to. You can easily get into big trouble. I have an agreement with Major League Baseball that they would never use my name, and I would never use their name, without permission. If there is something that comes up, and they ask me to clarify it with the media, I am happy to do it. For example, there are many complicated scientific issues that go with drug testing, so I try to educate reporters to make sure they get the story right. You never want to be part of the story; I much prefer being in the background.

The other challenging issue is dealing with unions. At the professional level, players are represented by a Player’s Association. That can be challenging but also very helpful. When something is negotiated, the players have representation. For example, with COVID, we had to deal with thirty different public health agencies, and we would give them our protocols. A lot of the time, they would tell us, “We don’t think this is right or protective.” We would tell them, “This protocol has been negotiated with the union. The players agreed to this.” That helped us a lot. I had to learn how labor law works. Here’s an example for drug testing. We were asked the question when we had this steroid problem: why didn’t we just implement drug testing at the major league level? The reason is that there is a law in the United States that if there is a union, drug testing has to be collectively bargained. If we had tried to unilaterally implement a drug testing program, the union would have successfully challenged that, and it would have been correctly struck down in court. So when Congress was railing at us that we didn’t have a drug testing program, we pointed to the fact that we were abiding by the law they passed. The NCAA or Olympics doesn’t have a union, so when I worked with the NCAA, we could implement whatever drug testing the members wanted without having to go to the student-athletes for permission.

With labor law, you might see something that you don’t like in an agreement with the Player’s Association, and you might say, “They should take that out.” The problem is that was traded for something else, so if you take that piece out, you have to take out the piece they traded for, and that was traded for something else, and so on. You have to unzip the entire package to take out something you don’t like. In medicine, we are used to solving problems. If a patient has an infection, we find it and treat it. We don’t negotiate. In this, it is all a negotiation. The hardest thing is patience. Sometimes, you have a goal you would like to reach, but it may take two years to get to that point. You have to work with your partners in the union and the Player’s Association to get them to that point. Something you think should be relatively easy takes quite a long time.

An example is home plate collisions. We noticed a lot of the concussions occurred due to home plate collisions. In the past, the base runner could run over the catcher and try to knock the ball loose. We researched this in 2011 and determined that 40% of defensive concussions (those that happened while a player was on defense) were in catchers, and 40% of the catcher concussions occurred due to home plate collisions. That was a significant proportion of the concussions that occurred in baseball. It was very clear that the solution was changing the rule on home plate collisions. We proposed that, we showed the data, and it probably took two to three years for it to finally get accepted by baseball operations and the players. Since that time, we have had exactly two concussions in catchers from home plate collisions. One was from an illegal hit; the runner was actually...continued on page 8
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suspended because he violated the rule. The other was somebody who got caught and spun around and had a relatively mild concussion. We have reduced it dramatically where we had years in which there were no concussions in the major and minor leagues. Over the course of seven or eight years, we eliminated probably a thousand days of lost time just through that, but it took several years to sell it to everyone and get it approved. Now, it’s an accepted part of baseball.

Nuti: What is on the horizon for MLB to maximize the health of its athletes?

Green: The two biggest issues we have are hamstring strains, which is probably the biggest cause of time lost, and ulnar collateral ligament tears. About 25% of pitchers in the major leagues have had at least one ulnar collateral reconstruction surgery, sometimes called Tommy John surgery. It is probably responsible for a billion dollars in lost salary per year with players. It’s likely a function of velocity. Players are throwing the ball much harder and exceeding the tensile strength of the elbow ligament. Interestingly, we do MRIs on almost all of the drafted pitchers, and I have yet to see one that was normal. Again, people criticize baseball, “Why do you have this big outbreak of ulnar collateral ligament injuries?” A lot of them come to us partially injured. Much of that has to do with early specialization and early overuse of young arms. We have started something called pitchsmart.org for parents and coaches to try to protect young arms, so that if they are good enough to get drafted and go into the major leagues they don’t have damage already. We only have so much control over this, and if people are coming to us damaged, it’s hard to correct.

One of my personal projects is trying to avoid head injuries in pitchers from a batted ball that strikes them. Fortunately, these are rare, but we have had a couple epidural hematomas in major and minor league pitchers. We have been trying to develop head gear for pitchers to wear, and we have a prototype that was actually quite good at reducing forces on pitchers; however, it’s quite bulky, and the pitchers just refuse to wear it. It takes a lot of development to produce something that is going to reduce the force of a hundred mile-an-hour line drive, but players are not ready to wear that yet. Only one pitcher wore our first one, and unfortunately, he didn’t pitch terribly well, so he ended up not being a model for everyone. Of note, the cap did end up going into the Hall of Fame, but the pitcher didn’t. We are still trying to reduce the risk because that is something that concerns me. It’s not common, but it is a potentially catastrophic injury that could result in serious disability or death. When we went to manufacturers to try to get something done, it turns out the NOCSAE [National Operative Committee on Standards for Athletic Equipment] rating for protective gear for helmets in the field only goes up to 65 miles an hour. A professional pitcher is going to be able to catch that; if you can’t, you’re probably in the wrong profession. A lot of the manufacturers said, “We’re not going to get into this if we don’t have a certification.” Because of the liability, we had to find our own manufacturer and test it ourselves.

As a physician, we are really only concerned with the medical aspects, so one of the challenges as a medical director for a league is realizing you are not the only player in the game. There are other considerations often way above your head. We don’t have any expertise on labor law and negotiating with players associations and things like that. Our role is to give them the best medical advice possible. As a team physician, you can sometimes advise a player that they shouldn’t be playing, but ultimately, they may decide that they want to play. We have all had patients that ignore our advice. I feel like as long as I have done my job and given them good, sound medical advice, then if they decide because of other reasons not to follow it, I have done my job.

We all have patients that do behaviors we wouldn’t recommend or are not healthy, whether they are smoking cigarettes or drinking too much alcohol. We try to intervene with them, get them to change, and give them the best advice possible, and then we don’t drop them as a patient. We continue to treat them and continue to try to get them to lead a healthier lifestyle.

Nuti: How has the pandemic impacted your job? Is there any evolution in your job with the delta variant?

Green: Almost every minute of every day since it started. It’s probably been the biggest change I have seen in my career, probably for most of us who practice medicine. The biggest change happened last year when we decided we were going to try and play. Other sports like the NBA, NHL, and MLS decided to play in a bubble because they had that luxury. You have multiple basketball courts in a small area. For us, there really aren’t ten major league parks within a small geographical area where it would be practical to do that. We could have played in Arizona or Florida outdoors, but I don’t think anybody wanted to do that in the middle of the summer. We had to explore other options.

We realized very quickly we were going to have to have access to extensive amounts of testing for COVID. In the spring of 2020, there was a limited amount of testing in the United States. We didn’t want to be accused of taking away testing from people who were hospitalized continued on page 9
or needed it. One of our drug testing labs in Salt Lake City had basically shut down because there were no doping samples to be done because there were no sports at that time. In order to keep that lab going and ensure a steady supply of testing, we converted it to a COVID viral testing lab. We did 200,000 tests last year and another 200,000 this year. This way, we were able to add to the supply in the United States. In addition to testing players, we also did testing for local communities, so we really felt like we were helping the problem, and we weren’t taking away necessary tests for people who needed it. That was the first hurdle we had to overcome. We had outbreaks but were able to recover from them. We played all but two games out of a sixty game season last year, and we went for almost two months during the middle of the pandemic with not one positive test per day until the very last game of the World Series. That was a success.

(As of July 2021), I think we have over 85% of our players vaccinated and 23 of the 30 teams over 85% just by themselves. It’s been a challenge every day. We had meetings all the time, and sometimes the information would change from the beginning of a meeting to the end of a meeting. We have met once a week or once every two weeks with the NBA, NHL, MLS, and NFL since this started, and we realized that we have more knowledge and information about COVID than most of the public health people we deal with. Combined, we have done millions of tests, and we have seen the effects of testing and masking. We do very effective contact tracing that is way beyond the scope of most public health agencies. We can very quickly determine how an outbreak occurred. Through doing variant testing, we can tell if this was a single outbreak or multiple ones at the same time. We have a very good handle on what works and what doesn’t work. As opposed to most public health agencies, we’re able to test rapidly and change our protocols almost on a moment’s notice. I tell our teams and our league the most important thing under COVID is flexibility. If you can’t be flexible, then you can’t play. All of us who deal with sports know coaches and athletes like a routine. They want to cover as many variables as they can, and with COVID, it’s just not possible. Last year, when we were planning for the season, we didn’t know how many games we were going to play, where we were going to play, what the schedule would look like, or if you’d have to postpone games. Sometimes, an hour before the game, we’d have to postpone it. That throws everyone’s routine off. Coaches and players don’t like it, but if you can’t be flexible in the face of the pandemic, you really can’t play.

**Nuti:** Any other things you would like to share with the audience?

**Green:** This has been an incredibly rewarding experience and the apex of my career. I really do feel that everything I did up to this point prepared me: how to deal with difficult situations and keep your eye on the prize, so to speak, so you make sure you are moving in the correct direction. That’s what we want to do for our teams or our patients that we work with. I think it’s really important to embrace opportunities because you never know where they are going to take you.

A lot of the stuff we do as team physicians, we do in the shadows. We’re a lot like the umpires: nobody notices us until we do a bad job. I am also a big proponent of preparation. On my wall, I have John Wooden’s pyramid. He was a mentor of mine and someone I was able to get to know toward the end of his life. He always said, “Failure to prepare is preparing to fail.” Fortunately in MLB, catastrophic injuries are very rare, but I insist every team go through their emergency action plan, because when it does happen, you have to be ready for it. We had a situation with pitcher Danny Farquar of the White Sox; he came off the mound, went into the dugout, held his head, and said he had the worst headache of his life. He had a burst aneurysm. In fifteen minutes, he was in Rush Hospital, had surgery, and survived completely intact neurologically. As you know, most people with burst aneurysms never make it to the hospital. Had this happened to him at home or some other place, he probably wouldn’t have survived, but he had it in a place where there was an emergency action plan, and that is a credit to that organization that was prepared. That is one of the things that I think you really want to emphasize is preparedness. People always ask me, “What team do you root for?” I always say, “I root for the medical staff to have a good game, and I root for the umpires.” Those are my two teams, and if they have a good game, the outcome is not as important.

**Nuti:** Thank you for joining us today, Dr. Green. We really appreciate your thoughts and insights.
Friends and Colleagues,

I enthusiastically welcome you to another edition of The Sideline Report! Our contributors are excited to share their thoughts on care of unique populations ranging from esport to underwater diving athletes. We are also honored to present an interview with Dr. Gary Green of Major League Baseball in the latest installment of the CMO Corner; first, read the article, then listen to the podcast!

Recently, I stood in front of volleyball and football players at a local college. I had been asked to give a presentation on the importance of getting vaccinated against COVID-19. My notes were prepared, and my team physician voice was warmed up. But as I looked out at these young men and women, some pulling uncomfortably on their masks, I was surprised by a rush of joy and gratitude. What a thrill to see student-athletes together again after the tragedies and heartbreak of the last year! They came back because they wanted to compete, use their bodies, and develop talents that will benefit them in the years to come. I was reminded that an athlete is a special person, an individual willing to enter the arena and risk injury and ridicule to showcase gifts that bring them happiness and fulfillment. It is a delight to care for such a population.

The next thought that came to mind was, “All of these young men and women are someone’s son or daughter,” and this brought a sense of humility and responsibility. I was there because these student-athletes, the college, and their families trusted me. They expected me to give sound advice to guide them to better health, keep them from illness and injury, and “primum non nocere.” My job was to treat them like I would my own children.

I hope we always keep in mind the blessing and responsibility we have to care for others as our brothers and sisters, rejoice in their successes, and lift them when they stumble. Compassion should be the first tool in our toolkit, but the second should be knowledge, and to that end, we present to you this publication. May you find it helpful in guiding your own special populations to health and well-being!

Keep your stick on the ice,
Jake Miller
The World of Sports Medicine

By Gregory Walker, MD; Manoj Poudel, MD; and Jesse Charnoff, MD

Patients use fewer analgesics following supervised exercise therapy and patient education: an observational study of 16,499 patients with knee or hip osteoarthritis

Minh (Quan) Le, MD

Knee and hip osteoarthritis (OA) affect more than 300 million people worldwide. Initial recommended treatments include exercise therapy, patient education, and weight loss. However, individuals are often prescribed NSAIDS, paracetamol, and opioids for pain control. In the June 2021 British Journal of Sports Medicine, Thorlun et al performed a retrospective cohort study analyzing 16,499 patients with knee or hip osteoarthritis and found that an 8-week structured exercise therapy and outpatient education program resulted in reduction of analgesic use. Participants were recruited from a health registry in Denmark with average age 65 years, overweight, and 73% female. 12,324 participants (75%) had symptomatic knee OA, while 4,175 (25%) had symptomatic hip OA. Interventions included 2-3 sessions of patient education and 12 sessions of 60-minute supervised neuromuscular exercise therapy for a total of 8 weeks. Overall, the authors found a reduction of analgesic use (paracetamol, NSAIDs, and opioid users combined) from 62.2% at baseline to 44.1% at the follow-up. The authors observed that 52% of participants changed to a lower risk analgesic medication (opioid to NSAID) or discontinued analgesics use. Opioid use had a relative reduction of 36% following exercise and education intervention. Additionally, the visual analog scale at follow-up improved by 13.2mm (0–100 mm). While the patient population was large, this study was observational and did not include a control group to evaluate for changes as a result of disease progression. This study suggests that exercise combined with education can decrease pain and aid in decreasing analgesic medications for knee or hip OA.


Should younger soccer players wear headgear to prevent concussion?

Manoj Poudel, MBBS

Recent discussions have highlighted the short- and long-term adverse effects of repeated heading of the soccer ball. The effects could be worse for younger soccer players, raising the question: should soccer players wear headgear to prevent concussion and chronic traumatic encephalopathy? Recently, McGuine et al performed a large-scale cluster randomized controlled trial to discover if headgear reduces sport-related concussion in adolescents. Nearly 3,000 players (67% female, age 15.6±1.2) were included in the study and were divided into headgear and no headgear groups for the season. The primary outcomes were incidence and severity (days out from soccer) after the soccer-related concussion. 130 participants (5.3% female, 2.2% male) sustained soccer-related concussion during the season. The incidence and severity were not different between groups. Hence, it was concluded that soccer headgear did not reduce the incidence or severity of soccer-related concussion in adolescents.


ACL Reconstruction Delay in Pediatric and Adolescent Patients Is Associated with a Progressive Increased Risk of Medial Meniscal Tears

Gregory Walker, MD

A recent study published in The Journal of Bone and Joint Surgery explored the relationship between time from injury of primary anterior cruciate ligament (ACL) tear and risk for subsequent medial meniscus tears in patients 18 years of age or younger. In this retrospective, multi-center study, patients were included if they sustained a primary ACL tear, had no history of ipsilateral knee injury, and were 18 years of age or younger. The primary outcome was arthroscopically-confirmed meniscal tear. A multivariable Poisson regression model was used to investigate whether time from injury to surgical procedure was a risk factor for subsequent medial meniscus tear. 546 patients (15.3±/1.6 years old) were identified and included for statistical analysis. For each week surgery was delayed, there was a 2% increased risk for medial meniscus tear. Delays in surgery increased risk for medial meniscus tears for male but not female patients. Obese male patients were at greatest risk for development of subsequent medial meniscus tear with a 77.9% increased risk for every 10-week delay in surgery.

Disclaimer: The information provided in this section does not necessarily represent the official view of AMSSM but is nonetheless available for consumption and consideration of the membership.
News from the Board

President’s Message

By Amy Powell, MD, FAMSSM
2021-22 AMSSM President

It’s been a long 18 months for all of us. Even more reason why it was so invigorating to gather together in Denver in July 2021 with members of the AMSSM Board of Directors for our first in-person meeting since December 2019. This was the first in-person Board Meeting for 7 of the 17 members of the Board of Directors. Beyond the formal agenda, meeting with the CRN Leadership and faculty and fellows participating in the Fellows Research & Leadership Committee, we were able to spend time sharing lessons learned and what we wished we’d known before we started our terms. We spent time doing Board development, learning more about one another, our passions, why we chose sports medicine as a calling and our vision for AMSSM in the future. It was a much needed chance to conduct our work and dream about the future.

The first four months of my presidency have been very busy.

• In August, AMSSM partnered with the White House and 11 other medical and sports organizations to encourage conversations about COVID-19 vaccinations during sports physicals. AMSSM Board Member & Publications Chair Jason Matuszak, MD, FAMSSM, was the lead author and facilitator in producing a multi-organizational statement that included AMSSM, AAFP, AAP, AAPM&R, ACEP, ACSM, AOASM, AOSSM, NATA, NCAA, NFHS and USOPC. AAP helped orchestrate the necessary organizational approvals to update the PPE forms. And AMSSM released an updated COVID guidance statement for vaccines in record time, with Dusty Narducci, MD, serving as lead author. The White House put out a release in support of these efforts and multiple media outlets covered this, including the New York Times and NBC News.

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NEWS FROM THE BOARD

PRESIDENT’S MESSAGE
Continued from page 12

• In July, AMSSM completed the last in a series of suggested curricular guidelines for MSK and Sports Medicine in residency training within the five primary specialties. These curriculums were developed by teams of writing groups, led by the AMSSM Education Committee and published in Current Sports Medicine Reports over a 15-month period.

• June was a busy month for the AMSSM Board reviewing and approving the following scientific statements:
  • the AMSSM Position Statement on Principles for the Responsible Use of Regenerative Medicine in Sports Medicine. Jon Finnoff, DO, FAMSSM served as the lead author of this paper that will be published in the coming months.
  • the AMSSM/AIUM Sports Ultrasound Terminology Consensus Statement. Mederic Hall, MD, served as the lead author of this paper.
  • the AMSSM/CASEM Consensus Statement on Exercise Curricula.

• In May, the AMSSM Board voted to Affirm for Value USA Football’s eight updated recommendations for Youth Football. Multiple AMSSM members were part of the group developing these updates.

Other Board News & appointments:

• CRN At-Large – Cynthia LaBella, MD, FAMSSM, approved as Board At-Large representative on the CRN Leadership Committee.
• BJSM Associate Editor – Matt Gammons, MD, FAMSSM, approved as AMSSM’s Associate Editor for BJSM.
• BJSM 2022 Guest Editors – Tina Master, MD, and Brett Toresdahl, MD, approved as Guest Editors of 2022 AMSSM issue of BJSM.
• Membership – Katherine Rizzone, MD, MPH, approved as Vice Chair of Membership Committee.
• Sports U/S – Jeremiah Ray, MD, approved as Vice Chair of Sports Ultrasound Committee.
• DEI – Monique Burton, MD, approved as Chair of Diversity, Equity & Inclusion Subcommittee.
• Fellows – Yao-Wen Eliot Hu, MD, approved as Chair of Top 120 Articles for Fellows Subcommittee.
• PM&R Journal – Daphne Scott, MD, approved as AMSSM’s editor for the first collaborative AMSSM/AAPM&R sports medicine special issue of the PM&R Journal, which is scheduled to be published in 2022.
• PAA – Irfan Asif, MD, approved as AMSSM’s representative on the Physical Activity Alliance Board of Directors.
• MACRA – Luis Rodriguez, MD, nominated to serve on the MACRA work group on low back pain.
• Education – Megan Ferderber, MD, approved as chair of the Medical Education Curriculum Subcommittee.
• Foundation Board – Jon Divine, MD, MS, FAMSSM, approved to serve on the AMSSM Foundation Board of Directors.
• TPCC – Amy Powell, MD, FAMSSM, and Cindy Chang, MD, FAMSSM, approved as AMSSM reps for the Team Physician Consensus Conference scheduled for November in Scottsdale, AZ (on select MSK Issues).

I look forward to continuing to serving you this year with your Board and the AMSSM team. Don’t ever be afraid to reach out.

PRESIDENT’S MESSAGE

Continued from page 12

I look forward to continuing to serving you this year with your Board and the AMSSM team. Don’t ever be afraid to reach out.
Foundation President’s Message
By Susan Joy, MD
AMSSM Foundation President

As we cruise well over a year and a half into the pandemic, there is still a palpable craving for connection. We continue to reengage in our communities, reinvent sports participation in our new reality, reunite with colleagues across the country and further develop innovative methods of education borne out of necessity. While we have not been able to share in person our collective achievements as the American Medical Society for Sports Medicine, our leadership has masterfully shepherded us thus far. So too on the Foundation side has there been great effort behind the scenes that we did not get to celebrate at our ever-popular AMSSM Foundation Party the past two years, but we will.

Momentum to support education, research and humanitarian projects remains fed by our sense of synergy and dedication to our profession and supported by our generous member donations and industry grants. It is exciting to see the addition of AMSSM Minority Research Grant Award and the Agostini Medical Student Community Outreach Fund that will fund competitive grants for AMSSM medical student members developing community programs/events to encourage young people from underrepresented backgrounds to consider sports medicine.

Below are some of the highlights of the AMSSM Foundation’s annual commitment to deliver and support programs and grants that advance our profession:

- **Education** - $217,000/year – to support Fellowship training; Traveling Fellowship & Global Exchange Program; support of Annual Meeting content; making educational learning modules freely accessible to physicians around the world; free online learning through podcasts/webinars; and a variety of scholarships for AMSSM members.

- **Research** - $187,000/year – to support AMSSM’s Collaborative Research Network; support of the Fellows Research & Leadership Conference; $75,000 in AMSSM research grants (including a revised grant that in 2021 began supporting underrepresented minority member researchers); and awards for top research at the Annual Meeting.

- **Humanitarian** – $27,000/year - to support an Annual Meeting humanitarian service project; five $2,000 local outreach grants to support projects led by members; and a $5,000 global outreach grant.

- **$1.4M+ CRN Grant Commitment** – to help grow and advance sports medicine research, AMSSM & the Foundation are in the midst of a 5-year commitment of $1.4M+ in CRN & AMSSM Foundation Grant Funding.

Your support is vital to the AMSSM Foundation being able to offer these programs each. Gifts made to the AMSSM Foundation are fully tax deductible.

Please join me in making your gift today!

**2021-22 AMSSM Foundation Leadership**

**OFFICERS**

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<tr>
<th>Role</th>
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<tr>
<td>President</td>
<td>Susan Joy, MD</td>
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<td>Secretary/Treasurer</td>
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<td>Immediate Past President</td>
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**2021-22 BOARD OF DIRECTORS**

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<td>Chelsea Backer, DO</td>
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<td>Frances Comer, DO</td>
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Member in the Spotlight

Catherine Rainbow, MD

By Lauren M. Simon, MD, MPH, FAMSSM

I caught up with our newest Member in the Spotlight, Dr. Catherine Rainbow, on a warm summer day in South Carolina, when mares were starting to wean their foals who were born earlier in the winter. It brought back memories of her family’s farm in Florida, where they breed thoroughbred horses. Her mother’s family has bred horses for generations.

From an early age, Dr. Rainbow worked on the farm, and she learned about musculoskeletal injuries in horses such as osteochondritis dissecans (OCD) and fractures and the behaviors necessary to raise healthy horses. Although she was intrigued by those medical conditions in horses, she was even more interested in learning how to care for people with similar injuries. She comments, “It is easier to speak with humans.”

She says her brother William “Beau” Rainbow, who is a veterinarian for thoroughbred horses, likes to remind her with friendly banter that the medical technology for horses used for regenerative medicine is frequently way ahead of what she and other medical physicians have available for humans, and he wonders when human medicine will catch up.

Dr. Rainbow recalls that she wanted to be a physician since she was in the fifth grade. She grew up in Ocala, Florida, where she played on the tennis team at Vanguard High School. She played tennis at Davidson College in North Carolina, a small Division I University which at that time was in the Southern Conference. She received her medical degree at Eastern Virginia Medical School in Norfolk, Virginia. Although she originally thought she would become an orthopedic surgeon, she went on a field trip to a professional ice hockey game in her third year of medical school with her school’s Family Medicine Interest Group. When she watched the primary care sports medicine physician caring for the athletes, she knew she had found her career choice as a PCSM physician. She did her Family Medicine Residency at Carolinas Medical Center (now known as Atrium Health), where she was mentored by AMSSM members Dr. Dave Price and Dr. Robert Jones. She has worked for several years with Dr. Price on his “Heart of a Champion” community service mass screening preparticipation evaluations, including ECGs. She did her PCSM Fellowship with her co-fellows Dr. Wes Bailey and Dr. Shane Hudnall at Moses Cone Hospital System under the direction of AMSSM Past President Dr. Bert Fields.

After completing her fellowship in 2011, Dr. Rainbow joined Atrium Health Hospital System in Charlotte, South Carolina, where she works at the Musculoskeletal Institute, caring for recreational, school, collegiate and professional athletes in an outpatient setting. She has served as team physician for South Mecklenburg High School for the past decade and team physician for the University of Winthrop in Rockhill, South Carolina. She teaches resident physicians and nurse practitioners in her practice. She also uses a clinic model of having an athletic trainer (ATC) work on her clinic team, helping her to care for PCSM patients and patients with concussions.

She works in a region where many people ride horses and once the community found out Dr. Rainbow can “speak horse” (that she is familiar with horses, equestrian training and riding injuries, etc.). Her practice attracted many types of equestrians such as English Riders, Hunters, Jumpers and Dressage competitors as her patients.

Even during the COVID-19 pandemic, she adapted quickly to seeing her equestrian and other PCSM patients on telehealth before Atrium Health resumed in-person visits. She enjoys learning how to efficiently run a PCSM practice from her Medical Director, AMSSM member Dr. Kevin Burroughs.

In AMSSM, Dr. Rainbow enjoys attending the Annual Meetings for the learning opportunities and catching up with friends. She says she will always remember her first case presentation at AMSSM, which she did as a sports medicine fellow, in which she presented a football athlete who sustained a posterior hip dislocation at a game on unlucky Friday the 13th! She encourages AMSSM members to “learn as much as you can from mentors and continue the constant process of updating and refining your skills.”

In her time off, she loves to travel and has been fortunate to go to Kenya, where her father, a former Safari guide, was raised. She competed in the Lewa Half Marathon in Kenya (see photo pictured there with her parents). She also loves to exercise with her energetic Jack Russell Terriers, Ted and Tessa (see photo). Thank you Dr. Rainbow for being our Member in the Spotlight!

We look forward to seeing you in the equestrian-friendly town of Austin, Texas, at the 2022 AMSSM Annual Meeting!