NEWSLETTER OF THE AMERICAN ORTHOPAEDIC SOCIETY FOR SPORTS MEDICINE

sportsmedicine UPDATE

SPRING 2017



April Is Youth Sports Safety Month

Demystifying MOC

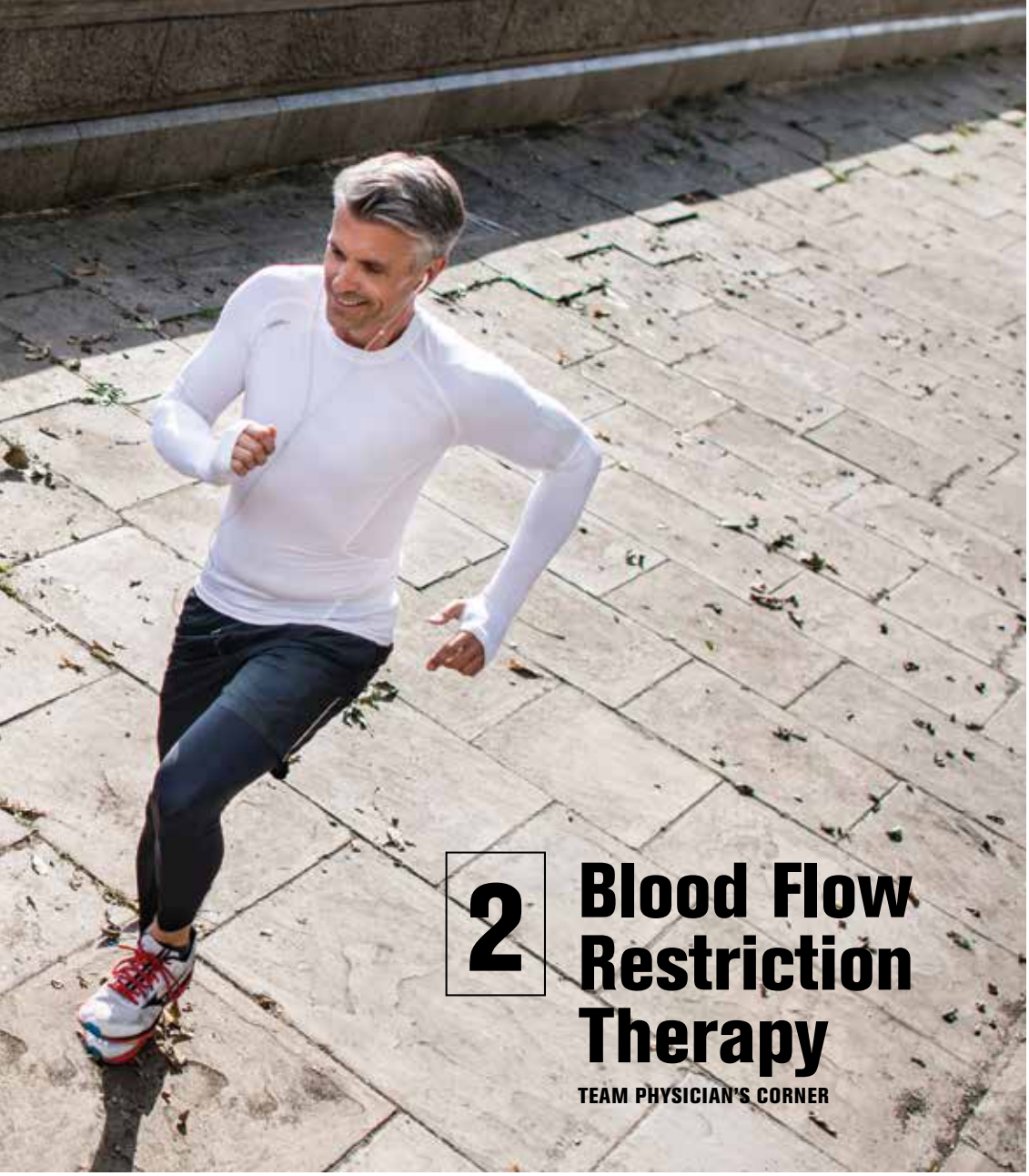
New AOSSM Self-Assessment Examination

ANNUAL MEETING IN TORONTO

Blood Flow Restriction Therapy

AOSSM

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2 Blood Flow Restriction Therapy

TEAM PHYSICIAN'S CORNER

Contents SPRING 2017

1 From the President

7 STOP Sports Injuries

8 Society News
Names in the News

9 Demystifying MOC

11 Research Update

12 Washington Update

13 Education Update

14 Annual Meeting in Toronto

16 Upcoming Meetings & Courses

SPORTS MEDICINE UPDATE is a quarterly publication of the American Orthopaedic Society for Sports Medicine (AOSSM). AOSSM is a global leader in sports medicine education, research, communication, and fellowship, and is comprised of orthopaedic sports medicine specialists, including national and international sports medicine leaders. AOSSM works closely with many other sports medicine specialists and clinicians, including family physicians, emergency physicians, pediatricians, athletic trainers, and physical therapists, to improve the identification, prevention, treatment, and rehabilitation of sports injuries.

This newsletter is also available on the Society's website at www.sportsmed.org.

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FROM THE PRESIDENT

"Ability may get you to the top but it takes character to keep you there."
—John Wooden, former UCLA head coach

As a Society, we have many amazingly talented member surgeons, researchers, and allied health professionals who are keeping athletes of all levels in the game. Our members are constantly accomplishing new feats, from innovative treatments and procedures to cutting-edge musculoskeletal research that is benefiting several medical specialties. All of these accomplishments are rooted in our ability to work within a team framework and underscored by the fundamental characteristic to keep moving forward even when there doesn't seem to be a direct path to success.

With the many twisting roads in healthcare today, including new regulations and laws, codes, insurance adjustments, licensing, recertification, and maintenance of certification, we might be swayed to take the least resistant path. However, it is clear to me as a member of AOSSM what the driving forces have been to our organizational success: a long-standing history and unwavering belief to remain steadfast to our principles of vigorous peer-reviewed research, non-biased educational programming, and respect for one another. It is these values that have shaped this organization into one of the preeminent leaders in sports medicine.

The character of its members, always striving for excellence, really does define a society. This message has been delivered time and again in many different ways by current and past leaders of the AOSSM. The late Frank Bassett on "developing our edge"[1] with know*ledge*, Peter Indelicato telling us to "aim high,"[2] Jesse Delee to "keep our eye on the ball,"[3] and recently Bob Arciero pleading for us to "embrace our craft,"[4] are just a few examples of those showing us the way to doing what is right.

As I approach the last few months of my presidency and reflect backwards and look to the future, I am inspired by this commitment to character by our Society's forefathers, and heartened by what I see in the Society's next generation of leaders. Our up-and-coming young leaders are forging a new kind of orthopaedic sports medicine network to engage in top level research, education, and fellowship, all to bring about the best in patient care. An excellent example of this is our newly formed Electronic Medical Publishing Board (EMPB) led by our Electronic Media Editor, Brett Owens, MD. Brett and the members of the EMPB are working on enhancing our journals' social media outreach to engage readers more fully in podcasts and additional content not only to broaden our audience, but to deliver it in the relevant communication vehicles of today. The EMPB also is beginning to strategize the development of more webinars to enhance learning and to better utilize our new online Learning Management System.

> Monitoring your education needs and licensing is critical to staying abreast of the latest research and the needs of your patients. In mid-January, I joined a few AOSSM staff members to meet with the American Board of Orthopaedic Surgery's Executive Medical Director, David Martin, MD. A summary of the MOC process along with what changes are coming through ABOS is on page 9.

Our upcoming Annual Meeting, July 20–23, 2017 in Toronto is another example of our commitment to foster the next generation of leaders. Led by Program Chair, Brian Wolf, MD, and his committee, our 45th conference has an engaging agenda with more round tables, instructional courses, and even live surgeries. More details on what to expect will be hitting your inbox soon with the Preliminary Program, and additional highlights can also be found in this issue of *SMU*. I am also very happy and privileged to announce our keynote speaker is Duke Basketball Head Coach, Mike Krzyzewski.

I hope to see you all in Toronto. Staying on top and abreast of all the changes in healthcare and maintaining the highest of educational standards, as witnessed at Specialty Day and our sold-out hip surgical skills course this past spring, is not an easy mission, but we have always been and will continue to be up to the task. Our collective abilities and character have led us to the top and they will continue to move us forward together.



Annunziato Amendola, MD

1 Bassett presidential address
2 Indelicato presidential address
3 Delee Kennedy Lecture
4 Arciero presidential address



Blood Flow Restriction Therapy: Theories, Science, and Current Clinical Results

BY ASHLEY ANDERSON, MD, AND LANCE LECLERE, MD

Skeletal muscle hypertrophy is defined as an increase in muscle mass, which is an increase in the size rather than the number of skeletal muscle fibers. Signaling cascades and growth factors such as Insulin-like Growth Factor-1 (IGF-1) have been demonstrated to induce skeletal muscle hypertrophy.[1,2,3,4]

The fields of exercise physiology and molecular biology both have independently demonstrated that in order to achieve hypertrophy, muscle fibers must undergo mechanical stress. It has been hypothesized that mechanoreceptors on myocytes may trigger the IGF-1 signaling cascade for hypertrophy.[5] Hence, the American College of Sports Medicine guidelines recommend a muscle should be stressed with a load between 60 percent and 100 percent of the one repetition maximum to obtain increased muscle strength.[6,7]

Postoperative limitations on weight bearing status and the physical inability to perform the required mechanical stress leads to muscular atrophy in knee arthroscopy patients.[8] In chronic unloading states the loss of muscle mass is caused by multiple factors including down regulation of the hypertrophic signaling pathway and activation of intracellular signaling cascades that cause muscle protein degradation.[5]

Blood flow restriction (BFR) as a modification to traditional exercise modalities, such as resistance training or walking has become an area of research interest. In Japan, a form of restricting muscular blood flow during resistance training termed KAATUS training demonstrated muscle hypertrophy and increased strength.[2,9,10] The technique utilizes the application of pneumatic cuff, similar to a blood pressure cuff, on the proximal aspect of an upper or lower extremity. A selected pressure is used to provide venous occlusion to the distal aspect of the limb.[10,11] The patient then performs resistance exercises at approximately 20 percent to 30 percent of one repetition maximum.[11]

BFR creates an anaerobic environment. At the lower oxygen tension level the body recruits muscle fibers normally reserved for more strenuous exercise. In return the mechanical stress on the muscle fibers leads to up-regulation of the muscle hypertrophy-signaling cascade.[12,13]

BFR has quickly gained interest as an exercise technique and could be a revolutionary tool to decrease the time to return to sport postoperatively.[1,12]

Review of Current Methodologies and Applications

Early application of BFR training was demonstrated in the geriatric population in efforts to address age related cardiovascular changes and muscle atrophy. Abe et al. performed a randomized prospective study (n=19) of males and females, age 60 to 78 years old. These patients were randomized to a KAATSU-walk training group or a non-exercising control group. The exercise study group completed six weeks of training consisting of 20 minutes of treadmill walking five days a week. The results demonstrated no significant cardiovascular improvements (as measured by maximal oxygen uptake). However, the patients did have significantly increased skeletal muscle mass measured on thigh cross-sectional area and ultrasound-estimated skeletal muscle mass ($p<0.05$). Additionally, there was an increase in functional ability in the KAATSU-walk training group ($p<0.05$).[12] This study helped spark future research on the combination of exercise intensity and duration in conjunction with BFR.

Today, the application of BFR training for enhanced rehabilitation or modulating effects to exercise programs is gaining momentum in the sports medicine and athletic communities. A systematic review of 16 published, peer-reviewed articles, investigated current implementation methodologies in both aerobic or resistance training for well-trained athletes. The purpose was to report the musculoskeletal adaptations in different athletic populations.[14] This systematic review included papers that used various means of BFR with pneumatic cuffs of different widths and other means of restricting flow with elastic bands. The types of exercises



BFR has gained interest as an exercise technique and could be a revolutionary tool to decrease the time to return to sport postoperatively.

varied greatly with some studies of knee extension, some using squats, others including upper extremity exercises, and finally studies that used walking and running as the exercise mediums.

Five of the 16 studies as mentioned used knee extension exercises and additionally used pneumatic cuffs with documented pressures to attain partial blood flow occlusion (venous). While the studies with squat training did not reveal increased thigh girth,[15,16,17] the knee extension studies did show both increased strength and thigh (extensor) girth in the BFR groups, especially when usual resistance training was augmented with BFR.[15,16,17,18,19,20,21]

Several studies have demonstrated potential metabolic mechanisms for muscle hypertrophy. Manimmanakorn demonstrated increased muscle recruitment in the BFR group.[18,19] Takarada et al. demonstrated venous occlusion induced hormonal growth factors and muscular hypertrophy in older female patients in the setting of low intensity resistance



exercise. Interestingly, these findings were consistent at exercise levels far below those traditionally expected to induce skeletal muscle change.[6,7,21]

Most of previous study designs focus on healthy, athletic subjects. An important application of BFR training has been to treat patients in the rehabilitation phase following a period of injury or deconditioning after injury or surgical intervention. Postoperative rehabilitation can require prolonged treatment to achieve pre-injury muscular strength. Furthermore, some surgical interventions require delays in high intensity training to allow postoperative healing of repaired or reconstructed joints.[6,7]

In a study by Takarada et al. the effects of vascular occlusion in patients following anterior cruciate ligament reconstruction were observed. Sixteen postoperative ACL reconstruction patients were randomly assigned to an experimental or control group.[9,21] Both groups participated in the same postoperative physical therapy program; however, the experimental group had 14 days of intermittent five minute intervals of venous occlusion therapy. The outcomes indicated significant decrease in postoperative extensor muscle atrophy in the experimental group ($p<0.05$) as demonstrated on MRI measured cross-sectional area.[9]

Tennett et al. conducted a pilot study of 17 postoperative arthroscopic knee patients randomized to a control or experimental group. In addition to routine postoperative physical therapy, the experimental group underwent 12 sessions of BFR exercises.[8] After BFR results demonstrated a significant increase in thigh cross-sectional area at 6-cm and 16-cm proximal to the patella ($P = 0.0111$ and 0.0001, respectively), timed stair ascent showed greater improvements ($P = 0.0281$), and patient reported outcome measures significantly improved ($P = 0.0149$) as compared to the control group.[8] Finally, the BFR group had approximately twice







the improvement in extension and flexion strength (P = 0.034) as compared to a routine physical therapy program.[8]

Concerns and Risks

Results are variable in healthy cohorts, and there are suggestions of benefit in groups utilizing knee extension in rehabilitation. The systematic review presented by Scott et al. noted no venous thrombosis, but subjects with a prior history of deep venous thrombosis and/or presence of varicosities were excluded.[14] However, because many of the studies have been performed in small patient sample sizes, concern remains for possible complications associated with venous occlusion.

Although no complications have been reported, there is concern for endothelial damage and the effects on the coagulation cascade with venous stasis in the extremities. Shimizu et al. demonstrated improvements in vascular endothelial function and peripheral blood flow with significant decreases in von Willebrand factor ($p<0.05$).[22] Tennett et al. monitored for post BFR therapy DVT before and after therapy sessions using duplex ultrasonography.[8] The sample size was small, however, no vascular complications were reported.[8] Madarame et al. evaluated the effects of low-intensity resistance training with BFR on the coagulation cascade in 10 patients.[25] Plasma volume reduction was significantly greater after the exercise with BFR ($P<0.05$).[25] The results suggested that in a healthy patient population, low-intensity resistance exercise with BFR does not activate the coagulation system.[25]

There have been rare case reports of rhabdomyolysis after BFR. The reported incidence of rhabdomyolysis after BFR is 0.008%.[23] Published case reports noted an extreme rise in muscle CPK without long-term adverse complications.[24] Elevated CPK was not noted in other experimental trials.[21]

Finally, the effect BFR training has on tendon strength and the possibility of connective tissue injuries related to increased muscle strength without concomitant tendon conditioning remains a concern.[14]

Conclusion

BFR training used as a supplement to routine resistance training could result in increased strength and muscle hypertrophy in healthy athletes. Current literature suggests that BFR while exercising at lower intensity could be used with subjects after surgery or in populations unable to perform higher levels of exertion with routine resistance training. BFR seems to provide a rehabilitation augmentation method that may have promising influences in the goal to achieve accelerated function after surgical intervention, specifically for extensor muscle atrophy.[8,10,27]

Overall, the utilization of venous occlusion therapy may provide patients a safe method to begin strength training at earlier stages of rehabilitation.[8] However, further large-scale clinical trails need to be completed in order to obtain a better understanding of occlusion therapy physiology, complications, side effects, standardized treatment algorithms, and long-term patient outcomes.[26,8,22,23]



References

1. Abe T, Kearns CF, Sato Y. Muscle size and strength are increased following walk training with restricted venous blood flow from the leg muscle, Kaatsu-walk training. *J Appl Physiol.* 2006. 100:1460–1466.
2. Abe T, Yasuda T, Midorikawa T, Sato Y, Kearns CF, Inoue K, Koizuma K, Ishii N. Skeletal muscle size and circulating IGF-1 are increased after two weeks of twice daily "KAATSU" resistance training. *International Journal of KAATSU Training Research.* 2005. 1:6–12.
3. Glass DJ. Skeletal muscle hypertrophy and atrophy signaling pathways. *International Journal of Biochemistry & Cell Biology.* 2005.37(10):1974–1984.
4. Goldspink G. Mechanical signals, IGF-1 gene splicing, and muscle adaptation. *Physiology.* 2005. 20:232–238.
5. Myer RA. Does blood flow restriction enhance hypertrophic signaling in skeletal muscle? *J Appl Physiol.* 2006. 100:1443–1446.
6. American College of Sports Medicine position stand. Progression models in resistance training for healthy adults. *Medicine & Science in Sports & Exercise.* 2009. 41:687–708.
7. American College of Sports Medicine. Position stand on progression models in resistance training for healthy adults. *Medicine & Science in Sports & Exercise.* 2002. 34:364–380.
8. Tennett DJ, et al. Blood flow restriction training after knee arthroscopy: A randomized controlled pilot study. *Clinical Journal of Sports Medicine.* 2016. 1–6.
9. Takarada Y, Sato Y, Ishii N. Effects of resistance exercise combined with vascular occlusion on muscle function in athletes. *European J Appl Physiol.* 2002. 86(4):308-314.
10. Takarada Y, Takazawa H, Ishii N. Applications of vascular occlusion diminishes disuse atrophy of knee extensor muscles. *Medicine & Science in Sports & Exercise.* 2000. 32(12):2035-2039.
11. Pope ZK, Willardson JM, Schoenfeld BJ. Exercise and blood flow restriction. *Journal of Strength Conditioning Research.* 2013. 27:2914-2926.
12. Abe T, Sakamaki M, Fuita S, Ozaki H, Sugaya M, Sato Y, Nakajima T. Effects of low-intensity walk training with restricted leg blood flow on muscle strength and aerobic capacity in older adults. *Journal of Geriatric Physical Therapy.* 2010. 33(1):34-40.
13. Adams GR, Cheng DC, Haddad F, Baldwin KM. Skeletal muscle hypertrophy in response to isometric, lengthening, and shortening training bouts of equivalent duration. *J Appl Physiol.* 2004. 96:1613–1618.
14. Scott BR, Loenneke JP, Slattery KM, Dascombe BJ. Blood flow restricted exercise for athletes: a review of available evidence. *Journal of Science and Medicine in Sport.* 2016. 16:360–367.
15. Luebbers PE, Fry AC, Kriley LM, et al. The effects of a 7 week practical blood flow restriction program on well-trained collegiate athletes. *Journal of Strength Conditioning Research.* 2014. 28(8):2270–2280.
16. Yamanaka T, Farley RS, Caputo JL. Occlusion training increases muscular strength in division IA football players. *Journal of Strength Conditioning Research.* 2012. 26(9):2523–2529.
17. Cook CJ, Kilduff LP, Beaven CM. Improving strength and power in trained athletes with 3 weeks of occlusion training. *International Journal of Sports Physiology & Performance.* 2014. 9(1):166–172.
18. Manimmanakorn A, Hamlin MJ, Ross JJ, et al. Effects of low-load resistance training combined with blood flow restriction or hypoxia on muscle function and performance in netball athletes. *Journal of Science & Medicine in Sport.* 2013. 16(4):337–342.
19. Manimmanakorn A, Manimmanakorn NN,Taylor R, et al. Effects of resistance training combined with vascular occlusion or hypoxia on neuromuscular function in athletes. *European J Appl Physiol.* 2013. 113(7):1767–1774.
20. Sakuraba K, Ishikawa T. Effect of isokinetic resistance training under a condition of restricted blood flow with pressure. *Journal of Orthopaedic Science.* 2009. 14(5):631–639.
21. Takarada Y, Nakamura Y, Aruga S, et al. Rapid increase in plasma growth hormone after low-intensity resistance exercise with vascular occlusion. *J Appl Physiol.* 2000. 88(1):61–65.
22. Shimizu R, Hotta K, Yamamoto S, et al. Low-intensity training with blood flow restriction improves vascular endothelial function and peripheral blood circulation in healthy elderly people. *European J Appl Physiol.* 2016. 116:749–757.
23. Iversen E, Røstad V. Low-load ischemic exercise-induced rhabdomyolysis. *Clinical Journal of Sport Medicine.* 2010. 20(3):218–219.
24. Tabata S, Suzuki Y, Azuma K, Matsumoto H. Rhabdomyolysis after performing blood flow restriction training: A case report. *Journal of Strength Conditioning Research.* 2016. 30(7):2064-2068.
25. Madarame H, Kurano M, Takano H, et al. Effects of low intensity resistance exercise with blood flow restriction on the coagulation system in healthy subjects. *Clinical Physiology & Functional Imaging.* 2010. 30:210–213.
26. Nakajima T, Kurano M, Iida H, et al. Use and safety of KAATSU training: Results of a national survey. *International Journal of KAATSU Training Research.* 2006. 2(1):5–13.
27. Takarada T, Takazawa H, Sato Y, Takebayashi S, Tanaka Y, Ishii N. Effects of resistance exercise combined with moderated vascular occlusion on muscular function in humans. *J Appl Physiol.* 2000. 88(2097–2106).

Be an Advocate for Injury Prevention During Youth Sports Safety Month

April is Youth Sports Safety Month, and you can help us get the message of injury prevention out to young athletes, parents, and coaches! Want to know how you can help?

- **Join us for one of two tweet chats**
  Safety Concerns for Baseball and Softball Players, April 5, 12 PM ET
  Balancing Participation in Youth Sports, April 26, 9 PM ET
- **Share our Facebook and Twitter posts**
  Use the hashtags #SportsSafety and #YSSM2017 in your tweets
- **Submit a blog post around a youth sports safety topic**
- **Host a youth sports safety event in your community!**
  Visit www.STOPSportsInjuries.org, and find our "Event Tools" under the "Resources" tab to help you plan.

Share any other ideas or questions with Joe Siebelts at joe@aossm.org.



Geier Presenting Youth Sports Safety Info at TEDx

Finally, sports medicine is getting mainstream attention! Join the livestream on May 13 at www.ted.com/watch/tedx-talks to watch AOSSM's Dr. David Geier take the TEDx stage to discuss the practices that are sending our young athletes to emergency rooms and ORs.

Come Grow with STOP Sports Injuries

Did you know more than 1,000 organizations currently collaborate with STOP Sports Injuries? The program was founded on the idea that grassroots efforts could help spread awareness and information about preventing overuse and trauma injuries in young athletes. This number includes more than 800 sports medicine practices, which hold local events and share our injury prevention information with patients. If you have not already signed-up, be sure to visit www.STOPSportsInjuries.org and click "Get Involved" to learn more.

SPORTS SAFETY TIPS MADE EASY

Sharing sports injury prevention information this spring season is easier than ever. Our site offers visitors a fresh, easy-to-navigate, and mobile-friendly environment while exploring injury prevention materials–which have also been expanded. Visit www.STOPSportsInjuries.org to see all the site has to offer, and be sure to share with your patients!



Welcome to Our New Collaborating Organizations!

Thank you to the newest STOP Sports Injuries collaborating organizations for their commitment to keeping young athletes safe. Interested in having your practice or institution listed in the next *SMU*? Head over to www.STOPSportsInjuries.org and click "Join Our Team" to submit an application!

CHILD SAFETY ORGANIZATIONS

Taylor Haugen Foundation
Niceville, Florida

MEDICAL INSTITUTIONS

St. Michael Hospital
Shanghai, China

SPORTS MEDICINE PRACTICES

Advanced Neuromuscular Physiotherapy
North Bethesda, Maryland

Advanced Orthopedics & Sports Medicine
Lees Summit, Missouri

ApexNetwork Physical Therapy
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SPECIALTY DAY 2018 ABSTRACT

Get your research in front of the best in sports medicine. Visit www.sportsmed.org to submit your abstract for Specialty Day 2018 in New Orleans. Deadline for submissions is May 17, 2017.





Be a Part of the Sports Medicine Conversation

Join our youth sports injury prevention TweetChats held monthly the second Wednesday of the month at 9 PM ET/8 PM CT at #SportSafety. *AOSSM, AJSM, Sports Health,* and *OJSM* are also all on social media. Learn about the latest news and articles and stay up to date on Society happenings and deadlines.

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NAMES IN THE NEWS



Wojtys Selected as SPTS Jack C. Hughston Physician Award Recipient

Congratulations to AOSSM member and *Sports Health* Editor-in-Chief, **Edward M. Wojtys, MD,** who was presented with the prestigious Sports Physical Therapy Section's (SPTS) Jack C. Hughston Sports Physician Award in February. Each year SPTS gives the award to acknowledge and honor a physician of the SPTS who has made a distinguished contribution to the specialty of sports physical therapy. The recipient has also played an important role in the development, progression, and/or support of the profession and has demonstrated clear contributions to the highest level of practice. Widely considered as one of the fathers of sport medicine, Dr. Jack C. Hughston's life has had a major impact on the way orthopaedic injury—especially sports injury—disease and other conditions are diagnosed, analyzed, and treated.

Got News We Could Use? *Sports Medicine Update* Wants to Hear from You!

Have you received a prestigious award recently? A new academic appointment? Been named a team physician? AOSSM wants to hear from you! *Sports Medicine Update* welcomes all members' news items. Send information to Lisa Weisenberger, Director of Communications, at lisa@aossm.org. High resolution (300 dpi) photos are always welcomed.

Demystifying MOC

By David F. Martin, MD, Executive Medical Director, American Board of Orthopaedic Surgery

Note: ABOS and AOSSM will be creating regular articles in each upcoming issue of SMU to discuss aspects of recertification and subspecialty examinations.



While ABOS recertification and subspecialty examinations are rigorous, most orthopaedic surgeons who took a recertification examination in 2016 did so successfully and passed. The key? Preparation. That's the easy part. Here's how the process works.

The ABOS supports professional self-regulation and on behalf of patients, families, and communities seeks to improve patient care through meaningful and relevant programs for certification and continuous professional development. The ABOS Maintenance of Certification (MOC) program is intended to foster career-long practice improvement so individuals can effectively demonstrate their knowledge, skills, and professionalism as ABOS Diplomates.

Detailed information about the MOC requirements can be found at www.abos.org, but the basic requirements are:

1. **CME:** During the first three years of the 10-year MOC Cycle, Diplomates need to earn 120 orthopaedic-related Continuing Medical Education (CME) credits, with at least 20 of these credits from Self-Assessment Examinations (SAE). An additional 120/20 credits must be earned by the time that the recertification examination application is submitted.
2. **Case List:** A list of recent surgical cases is submitted. Feedback is provided to the Diplomate based on the case list, providing benchmarks and normative data—this is a great way to reflect on your practice and education needs.
3. **Application/Peer Review:** An application is required prior to sitting for an examination. A list of physicians familiar with your practice is requested and the ABOS contacts those individuals for peer review. This is very helpful and feedback is carefully evaluated and considered.
4. **Medical Knowledge:** Medical knowledge is generally measured by a secure examination. There are currently options to take either a computer examination or an oral examination, with ABOS now considering other pathways, as well.

ABOS Practice-Profiled Written Examinations no longer contain general orthopaedic questions. ABOS Diplomates now have the opportunity to take a written examination that contains only sports medicine questions, even if they do not hold an Orthopaedic Sports Medicine Subspecialty Certificate. While I encourage everyone eligible to apply for Subspecialty Certification in Orthopaedic Sports Medicine, there is now the option to recertify your General Orthopaedic Surgery Board Certification with a sports medicine-only examination. For those who hold Subspecialty Certification in Orthopaedic Sports Medicine, please make sure you register for a combined examination. That one examination—offered in either a computer based or oral format—will recertify both your General and Subspecialty Certificate for 10 years.

Many of the recent changes that the ABOS has occurred because of input from Diplomates. We are working on other changes that I am sure will continue to improve and streamline the process for you. Please continue to provide us with feedback. You can email me at dmartin@abos.org with questions or comments.

ABOS Board Certification, MOC, and Subspecialty Certification in Orthopaedic Sports Medicine set our subspecialty apart and improve the quality of care for our patients. I look forward to working with you to improve and streamline our programs, while continually trying to add value for you and for our profession.

AOSSM gratefully acknowledges and thanks

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Donations as of 12/31/2016

Clinician Scholar Career Development Program

The Clinician Scholar Career Development Program (CSCDP) is a joint effort between AAOS, OREF, and OTA. This annual program brings together experienced orthopaedic clinician scientists with interested PGY2-PGY5 residents, fellows, and junior faculty through year three surgeons. Through a 1 1/2 day workshop, participants interact with leading clinician scientists to learn about writing grants for government and private organizations, collaborating with scientists, training as a clinician scientist, and mentoring.

AOSSM will again sponsor a member to attend the CSCDP September 21–23, 2017 in Rosemont, Illinois. The deadline for applications is March 31, 2017. Application information for the 2017 CSCDP is available on the AAOS website at (http://www.aaos.org/research/opportunities/cscdp). AOSSM encourages surgeons who are pursuing a career in orthopaedic sports medicine, have matched to a sports fellowship, and are interested in pursuing an academic career to apply. Interested applicants should ensure that their application indicates their membership in AOSSM.

For more information about the CSCDP please contact Kevin Boyer, AOSSM Director of Research, kevin@aossm.org.

NBA/GE CALL FOR PROPOSALS ON BONE STRESS INJURIES



The NBA and GE Healthcare have partnered to award $1.5 million for "research studies that will improve understanding of prevention, treatment, and recovery related to Bone Stress Injuries." Complete details for this grant can be found at https://gex.brightidea.com/BoneStressCFP2017.

The submission deadline is April 17, 2017.



ARE YOU GIVING YOUR BASEBALL ATHLETES THE BEST CARE?

Join us at **Baseball 2017: Youth to the Big Leagues – Managing the Developing Player** and hear from the experts as they discuss the latest techniques for injury prevention and treatment, as well as tips for managing non-clinical aspects of care. Course chairs, **Charles A. Bush-Joseph, MD,** Lead Team Physician for the Chicago White Sox and **Steven B. Cohen, MD,** Head Team Physician for the Philadelphia Phillies have put together a team of faculty that will not only help you improve the care that you provide to these athletes, but also broaden your knowledge of other professionals that touch the athlete – from the strength and conditioning coach to the professional scout.

Join other coaches, athletic trainers, therapists and physicians and be a part of the discussion that will give your developing baseball athletes the best shot.

Advanced registration deadline
July 31, 2017.

VISIT **WWW.SPORTSMED.ORG** FOR COMPLETE DETAILS AND TO REGISTER.



Washington Update

By Julie Williams, AAOS Senior Manager of Government Relations

Sports Licensure Clarity Act Update

HR 302, the Sports Licensure Clarity Act of 2017, was introduced by Representative Brett Guthrie (R-KY) and Cedric Richmond (D-LA) on January 5, 2017. It would extend the liability insurance coverage of a state-licensed medical professional to another state when the professional provides medical services to an athlete, athletic team, or team staff member. It passed the House of Representatives on January 9, 2017. Last Congress, the same bill, HR 921, also passed the House. AAOS and AOSSM have made action on this bill a priority and have worked with a coalition of medical professionals to move it forward. The next step is passage in the Senate. We are now negotiating a path forward with the Senate Health, Education, Labor, and Pensions Committee, chaired by Senator Lamar Alexander (R-TN).

Controlled Substances Transportation Act

Rep. Pete Sessions (R-TX) will be reintroducing the Controlled Substances Transportation Act during the 115th Congress. AAOS and AOSSM are currently seeking a Senate sponsor and have reached out to Senate Majority Whip Cornyn (R-TX). The next step after introduction in early spring for the House bill is passage through the Judiciary Committee and the Energy and Commerce Committee. Judiciary Committee Chairman Bob Goodlatte (R-VA) has said it is a priority for the committee. Last year's House bill passed through Energy and Commerce Committee so we don't anticipate a problem. The next goal is House passage and action in the Senate.

Energy and Commerce Health Care Reform Agenda

Republicans have begun considering a handful of bills in various committees—including the House's Energy and Commerce Committee—that could make up part of the plan to replace the ACA. "First, our committees are set to begin holding legislative hearings on bills to deliver relief for Americans struggling under Obamacare," stated House Speaker Paul Ryan (R-WI) at a press conference in January. "This is the next step in a step-by-step approach to repealing and replacing Obamacare with an affordable, patient-centered system. We know that this law is collapsing. We hear it every day from our constituents. We hear it from the families who tell us the deductibles are so high, it doesn't feel like they have insurance. We hear it from the people who have been denied choices. This law is collapsing, and we need to step in and restore real choices and real competition so that we can actually lower costs for patients and families."

Quality Payment Program Resources

The Centers for Medicare & Medicaid Services (CMS) recently posted new resources to the Quality Payment Program website at https://qpp.cms.gov/resources/education to help eligible clinicians and data submission vendors successfully prepare to participate in the program. According to the agency email announcement, CMS encourages these eligible clinicians, registries, qualified clinical data registries (QCDRs), and electronic health record (EHR) vendors to visit the website to review the new materials and information.

New AOSSM Self-Assessment Examination 2017 to Release in April

Assess your sports medicine knowledge and identify areas for further study when preparing for the American Board of Orthopaedic Surgery's (ABOS) Maintenance of Certification (MOC) program. AOSSM has three different Self-Assessment exam versions available, each with 125 peer-reviewed questions. The Self-Assessment Exam helps fulfill your MOC Part II Self-Assessment Examination (SAE) requirement and offers CME credits.

Who should purchase these exams?

- Orthopaedic surgeons preparing for the MOC recertification exam, sports medicine subspecialty certification exam, and/or combined sports medicine recertification exam
- General orthopaedic surgeons or other health professionals needing a sports medicine refresher
- Physicians who need MOC Part II SAE credits

Exam highlights:

- Downloadable answer key, including feedback and references for further study
- Ability to self-pace your study from the comfort of your home or office
- Imaging examples to build diagnostic skills
- Ability to reset and re-take the exam to reinforce learning but only the first attempt is recorded
- iOS app that links to your online account
- Additional questions for purchase in groups of 25 in any topic domain to further measure learning

The cost per exam is $125/Members and $150/Non-Members. To order, visit www.sportsmed.org or call AOSSM at 847/292-4900. Questions? Contact Meredith Herzog at meredith@aossm.org.

AOSSM gratefully acknowledges Arthrex for an educational grant in support of the Self-Assessment Exams.

2017 AOSSM Fellows Course

Kick Off to Your Orthopaedic Sports Medicine Training Year

AOSSM announces the second Fellows Course. The course will take place July 30–31, 2017 at the OLC in Rosemont, Illinois. Led by Course Chairs, Stephen F. Brockmeier, MD, Jeffrey R. Dugas, MD, and Kurt P. Spindler, MD, this course is a kickoff to the orthopaedic sports medicine fellows' 2017–2018 training year. It provides an educational platform to learn the principles of success for team coverage, key topics of sideline emergencies, and imaging/arthroscopy of the shoulder, elbow, and knee. The format includes didactic and hands-on lab sessions at the level expected of an incoming fellow or independent practitioner. Registration will open in April. Please contact Meredith Herzog at meredith@aossm.org for details.

SURGICAL SKILLS COURSE

The Cutting Edge 2017: Arthroscopic and Open Shoulder Techniques in the Athlete's Shoulder

October 13–14, 2017

Orthopaedic Learning Center
Rosemont, IL

AOSSM
Surgical Skills Courses

Orthopaedic Learning Center, Rosemont, IL

Don't miss this opportunity to enhance your skills and engage in a small course setting with top shoulder experts, including Course Chairs:

Brett D. Owens, MD
Matthew T. Provencher, MD

Be sure that you are among those who know current best practices on open and arthroscopic treatment of athletic shoulder injuries and return home with practical tips and techniques to apply in your practice setting.

Who Should Attend this Course:

- Attending surgeon with practice interest in athletic shoulder injuries
- Sports medicine surgeon who wants to improve shoulder technical skill
- Senior resident or fellow in sports medicine



This course has limited space availability!

REGISTER TODAY AT www.sportsmed.org.

The American Orthopaedic Society for Sports Medicine



Register Now for AOSSM 2017 Annual Meeting

Registration is now open at www.sportsmed.org for the Annual Meeting, July 20–23, 2017, in beautiful, Toronto, Canada. This year's meeting is bigger and better than ever before. Providing an unparalleled level of sports medicine education, with more instructional courses, round table discussions, and poster and paper presentations, not to mention live surgery featuring knee and shoulder procedures and our Presidential Guest Speaker, Duke University Men's Basketball Coach, Mike Krzyzewski.

Looking to engage with your colleagues on the latest research, prevention, treatment, and sports medicine business developments? This is the meeting for you. Program Chair, Brian Wolf, MD, MS, and his committee have crafted a program that will leave you prepared to take back practical tools and tips to implement in your practice and with patients. Don't miss a single day:

- **THURSDAY, JULY 20** starts with an array of instructional courses providing in-depth information on hot topics. Next join us in the general session where we'll feature presentations on bicep injuries and their treatments. Concurrent sessions will delve into a variety of topics highlighted by team physician issues, cartilage and biologics, the business of sports medicine,



and two video sessions featuring shoulder and hip techniques. The AOSSM Medical Publishing Group Reviewers Workshop and NIH Reviewers Workshop will happen in the afternoon and offers attendees an opportunity to learn best practices for getting involved with our journals and NIH research. Our Thursday, opening reception will be at the Westin Harbour Castle and includes family fun, food, and networking with your peers.

- **FRIDAY, JULY 21** includes more instructional courses and then sessions on ACL, shoulder instability, outcome measures-logistics, hip (FAI), modernizing your sports medicine practice, knee ligaments, and team physician sideline management topics. The highlight of the day will be two live surgery sessions featuring knee and shoulder techniques. Then the day is capped off with the poster tours featuring more than 100 posters.
- **SATURDAY, JULY 22** is truly a slam dunk with rotator cuff and shoulder instability discussions, team physician and biologics, and mitigating narcotics in the sports medicine patient. Plus,



Presidential Guest Speaker, Duke University Men's Basketball Coach, Mike Krzyzewski

Presidential Guest Speaker Mike Krzyzewski, Duke University Men's Basketball Coach, will inspire us with his life perspectives learned through coaching basketball. The afternoon brings you stimulating interactions with renowned experts during 30 round table discussions and a research workshop on early sports specialization and return to play. New this year, are five instructional courses starting at 1:00 p.m. for those of you who like to sleep in. Topics will include, on shoulder instability, multi-ligament injuries of the knee, rotational laxity of the knee, AC/Clavicle injuries, and ACL return to play criteria. Our Saturday, family-friendly event will be held at the Hockey Hall of Fame. You won't want to miss this opportunity to network with your colleagues and get your picture taken with the famous Stanley Cup!

- **SUNDAY, JULY 23** brings the meeting to a close with the latest research on youth sports injuries and staying active with osteoarthritis.

Questions? Send us an email at info@aossm.org or view the full preliminary program at www.sportsmed.org. Advanced registration deadline is June 23, 2017.

Get your passports ready and meet us in Toronto!

BOOK YOUR HOTEL NOW

Housing is filling up fast, book yours today at www.sportsmed.org. Rooms at the discounted rates will sell quickly so be sure to book your hotel early for the best selection and price. Reservations can also be made by calling 855/416-4093. The Westin Harbour Castle, Fairmont Royal York, and Delta are all included in the hotel room block. All hotels are within a mile of the Convention Centre.

IMPORTANT TRAVEL INFORMATION

Passports and Visa

As a reminder, the United States Department of State and Homeland Security's announcement of the Western Hemisphere Travel Initiative states that all U.S. citizens, Canadians, citizens of the British Overseas Territory of Bermuda, and citizens of Mexico must obtain a passport or another accepted secure document to enter or re-enter the United States.

Children 15 years of age and under are now required to show proof of citizenship. They are not required to show photo ID. If you are traveling with children, you should carry identification for each child. Divorced parents who share custody of their children should carry copies of the legal custody documents.

In addition, your current passport must not have an expiration date within six months of July dates of travel. Check your expiration date now and renew immediately, if necessary. For more information on how to obtain your travel documents and to review the requirements visit https://travel.state.gov/content/passports/en/passports.html.

Citizens of certain countries and territories need a visa to visit Canada. Others need an Electronic Travel Authorization (eTA). For more information on visa requirements, visit http://www.cic.gc.ca/english/visit/eta.asp. Should you require a letter of invitation in order to attend the meeting and obtain a visa, contact AOSSM at aossm@aossm.org.

Airports

Toronto Pearson International Airport (YYZ) (approximately 16 miles)
This airport is served by more than 75 airlines.

Billy Bishop Toronto City Airport (YTZ) (approximately 2 miles)
This airport is served by Air Canada and Porter Airlines.

UPCOMING
MEETINGS & COURSES

For information and to register, visit www.sportsmed.org.



AOSSM Annual Meeting
(REGISTRATION NOW OPEN)
July 20–23, 2017
Toronto, Canada

AOSSM/AAOS Orthopaedic Sports Medicine Review Course
(REGISTRATION NOW OPEN)
August 11–13, 2017
Chicago, Illinois

Baseball 2017: Youth to the Big Leagues: Managing the Developing Player
October 11–13, 2017
Rosemont, Illinois

The Cutting Edge 2017: Arthroscopic and Open Shoulder Techniques in the Athlete's Shoulder
(REGISTRATION NOW OPEN)
October 13–14, 2017
Rosemont, Illinois

Advanced Team Physician Course
December 7–10, 2017
Washington, D.C.

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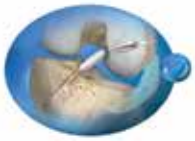
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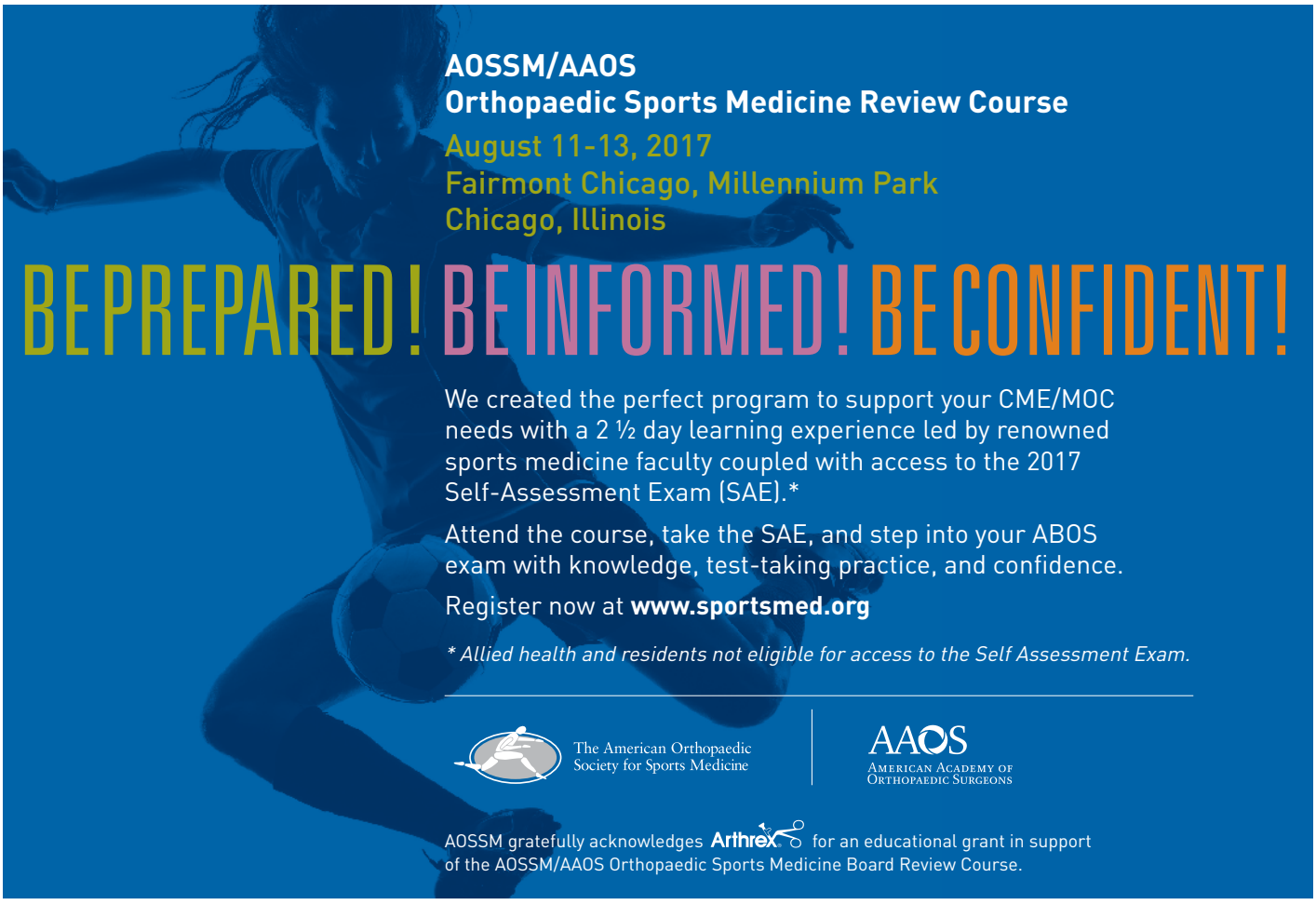
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