



Council on Sports Medicine & Fitness

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From the Chairperson

Joel Brenner, MD, MPH, FAAP

The very busy fall sports season has just ended and the winter season has already started. The reality of the current state of youth sports is that there is no clear break for the athletes between fall and winter seasons as more and more athletes are playing year-round. No break for the athletes also means no break for the parents who have to drive them to practices and games or the physicians who end up taking care of the overuse problems that result from the lack of rest. COSMF continues to partner with other organizations such as American Medical Society for Sports

Medicine, National Athletic Trainers Association, American College of Sports Medicine, Aspen Institute, The Satcher Health Leadership Institute and more to help change the culture of youth sports. My hope is that within the next decade we can help create a safer environment for youth athletes – recreational and school sponsored- to allow them to enjoy physical activity for the rest of their lives while realizing their dreams without getting injured or burned out.

This summer and fall I had the pleasure of advocating for a friend, mentor and colleague and watching him successfully become the Lieutenant Governor of Virginia. Dr Ralph Northam and I have worked together on concussion legislation in Virginia and now as the Lt. Governor he can hopefully help advocate for more laws to help protect children. The legislative process, at a state and federal level, is an “interesting” process and the election process is just as fascinating. I urge all COSMF members to work with your local politicians to help advocate for children and young athletes in your area.

COSMF had a very successful NCE in Orlando this year and hopefully many of you were able to join us. Becky Demorest organized a great educational session highlighted by a roundtable discussion on performance and extreme sports for kids. We had a record attendance this year of over 80 attendees for the morning session. Kudos to Becky for being responsible for organizing the all day COSMF session each year along with the many lectures presented at the NCE. Congratulations to Stephen Rice for being this year’s recipient of the Thomas Shaffer award. The night prior we held the COSMF social gathering at a local pub, which allowed over 45 members to gather in an informal setting. Thank you to Anjie Emanuel for making this happen again.

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COSMF Newsletter

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COSMF continues to be one of the most prolific councils within the AAP for policy statements and clinical reports. The Returning to Learning Following a Concussion was published during the NCE and lead author Mark Halstead gave a plenary session on concussions followed by a press conference announcing the clinical report, which was picked up by many media outlets nationally. Other reports that are in the pipeline include ACL, Female Athlete Triad, Injury Risk in Boys' Youth Ice Hockey, Tackling in Youth Football, Mixed Martial Arts, Performance Enhancing Substances, and Intensive Training.

Other events that COSMF was involved in recently included the Institute of Medicine's report on Concussions where Kevin Walters represented the AAP. Kevin also represented us at a recent conference organized by US Surgeon General David Satcher to launch an initiative titled Protecting Athletes and Sports Safety (PASS). Michele Labotz and I will represent the AAP at the Joint Commission on Sports Medicine and Science in February in Orlando, Florida. I will also be representing COSMF at the AAP Annual Leadership Forum (ALF) in March in Schaumburg, Illinois. If you have any resolutions that you would like to put forth to the board at the ALF please email Anjie and me (Joel.Brenner@chkd.org).

The most exciting news to announce is that COSMF (along with the Sections of Rheumatology and Orthopedics) was awarded the Peds-21 Conference that will take place the Friday at the start of the NCE next year in San Diego. We have a great line-up of speakers for the half-day session including Zackary Lystedt who was instrumental in getting the state concussion laws passed. Our social function will take place on Friday night (possibly on the beach) and the educational session (H program) will be all day Saturday. Please plan on joining us in sunny San Diego October 2014.

Finally as the New Year approaches it means it will be time to say goodbye to 3 executive committee members who have served COSMF for the past 6 years. Mark Halstead, Cynthia LaBella and Stephanie Martin will be rotating off July, 2014. Thank you to all 3 for your dedication, service and volunteering many personal hours to help make COSMF stronger.

As we reflect on the end of a busy year, I would like to share a quote sent to me by a wise friend. Ask yourself if you are being "Mind Full, or Mindful". Remember what is most important in your life and don't forget to take care of yourself.

Namaste,

Joel

SAVE THE DATE!

FRIDAY, OCTOBER 10, 2014—SAN DIEGO, CA

The 2014 Pediatrics for the 21st Century (PEDS 21) Symposium Series is being co-sponsored by the Council on Sports Medicine and Fitness and the Sections on Orthopedics and Rheumatology. Taking place on Friday, October 10, 2014 in San Diego, CA, this cutting-edge symposium entitled **"1, 2, 3, Go! Sports in the World of Pediatrics - Playing it safe and Making it fun!"** promises to be exciting, pertinent, practical and informative for today's youth medical providers.

This half-day afternoon symposium will encompass a luncheon, up to date cutting edge information, scientific and clinical case research abstracts and a keynote speaker presentation by Stan Herring, MD and Zackery Lystedt from Washington state regarding "The Advocacy of Youth Sports Concussion Bills: The Personal Experience of Zackery Lystedt and Family."

The Pediatrics for the 21st Century (PEDS 21) Symposium Series is an AAP initiative designed to address emerging issues that will impact the practice of pediatrics and pediatric care in the 21st century. The symposium seeks to enhance the visibility, clout, and leverage of pediatrics to promote health care policy and decisions that are in the best interest of children. The symposium will also offer practical guidance and information for the practicing pediatrician on issues that will have a substantial, material effect on their practice and child health.

Included with 2014 AAP NCE admission, all comers are welcome to attend this informative and necessary educational event!

Tentative Schedule:

11:30 - 12:45 pm	Luncheon, Networking and Poster Session
12:35 - 1:00 pm	AAP President Remarks/Presentation and Welcome
1:00 - 1:40 pm	"Are we doing kids a favor?": The Preparticipation Physical Evaluation Debate
1:40 - 2:20 pm	Sports Medicine Scenarios: What would you do?
2:20 - 3:00 pm	"Can I play?": The dilemmas of sports participation in those with chronic disease.
3:00 - 3:20 pm	Break and Q/A
3:20 - 4:20 pm	Keynote Speaker: The Advocacy of Youth Sports Concussion Bills: The Personal Experience of Zack Lystedt and Family
4:20 - 5:00 pm	"The Ethics of Kids and Sports: Where does our allegiance lie?"
5:00 - 5:20 pm	Questions and Wrap Up



COSMF Newsletter

Stephen G. Rice, MD, PhD, MPH, FACSM, FAAP

2013 Thomas Shaffer Award Recipient

Sponsored by Nationwide Children's Hospital of Columbus



William Cotton, MD, Steve Rice, MD and Joel Brenner, MD (left to right)

Editor's Note: The Thomas Shaffer Award recognizes an individual who has made a significant contribution to the field of pediatric sports medicine by displaying leadership and vision, providing quality presentations, and publishing documents relevant to this specialty.

Dr Rice has been a primary care sports medicine physician since 1975. Currently, he is located at Jersey Shore University Medical Center in Neptune, New Jersey. His titles include Program Director of the Primary Care Sports Medicine Fellowship and Director of the Jersey Shore Sports Medicine Center. He is a member of the full-time pediatric faculty at Jersey Shore University Medical Center and holds the academic rank of Clinical Professor of Pediatrics at the Rutgers Robert Wood Johnson Medical School in New Brunswick, New Jersey.

Dr Rice received his bachelor's degree in chemistry from Columbia College of Columbia University. He was an MD-Ph.D. scholar at New York University. He did his residency training in pediatrics in Seattle, Washington at Children's Hospital/University of Washington. Dr Rice received an MPH degree in Health Sciences from the School of Public Health and Community Health at the University of Washington.

In September 1996, he relocated to Jersey Shore University Medical Center in Neptune, New Jersey, joining the faculty of the pediatrics residency program, to develop and implement a fellowship program in pediatric sports medicine. This fellowship program was the first pediatrics-based sports medicine fellowship to be accredited by the Residency Review Committee (RRC) for Pediatrics in 1999.

Dr Rice is currently the school district and team physician for Neptune School District, school district physician for Manasquan School district, team physician (with the sports medicine fellow) for Raritan High School, and the team physician for Georgian Court University.

Dr Rice served on two major national committees. He was chairman of the Health and Science Policy Committee of the ACSM from 2003 until 2013 and served on the Executive Committee of the Council on Sports Medicine and Fitness for the American Academy of Pediatrics (AAP) from 2003-2009. He was a member of the ACSM Board of Trustees from 2007-2010. Dr Rice was also very active in the New Jersey Chapter of the American Academy of Pediatrics.

Dr Rice is an active member of the Concussion in Sports Committee of Brain Injury Alliance of New Jersey (since 2004) and twice has been with the Silvio O. Conte award for public awareness and education (in 2006 and 2013) by the BIANJ. He has been named a Top Doctor in New Jersey and the Greater New York Metropolitan area for over 10 years.

His family includes his wife, Hilary Turett and his two sons, Adam and Bryan.

Local Heroes Award Council on Community Pediatrics

Editor's Note: This award recognizes pediatricians who are leaders through community action and advocacy for children in their local communities.



Charles T. Cappetta, MD, FAAP

Dr Cappetta, general pediatrician and adjunct associate professor of pediatrics at the Geisel School of Medicine at Dartmouth, has been a member of the AAP Council on Community Pediatrics for four years. Past president of the New Hampshire Pediatric Society, he also served on the AAP Council on Sports Medicine and Fitness Executive Committee. Over the past 16 years, his Granite State FitKids program has taught 28,000 children about the workings of the human body and how to care for it. For 10 years, Dr Cappetta also ran a new dad's support group on the role of the father in the care of newborns.



COSMF Newsletter

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Council on Sports Medicine and Fitness

**2014 Thomas E Shaffer, MD Award
for Pediatric Sports Medicine**

CALL FOR NOMINATIONS

Deadline – March 31, 2014

Nominations are being sought for an award to recognize an individual who has made a lifelong contribution to the field of pediatric sports medicine by:

- Displaying leadership and vision in the area of pediatric sports medicine;
- Providing quality presentations containing relevant information in the area of pediatric sports medicine; and
- Publishing documents that provide practical pediatric sports medicine information for clinical use.

Award recipients will receive a plaque, honorarium, and reimbursement for expenses to attend the Council's program at the AAP National Conference and Exhibition.

A nomination form is below and can be copied for additional use. Please submit nominations to the address below, or call if you have any questions:

Anjie Emanuel, MPH
American Academy of Pediatrics
141 Northwest Point Blvd
Elk Grove Village, IL 60007
800/433-9016 ext 4979
Fax: 847/434-8000
aemanuel@aap.org

Please declare your nomination below and provide an (up to one-page) explanation of your nomination, along with curriculum vitae or biographical data.

Nominee _____

Address _____

City/State/Zip _____

Phone _____ ☐ Office or ☐ Home (check one)

Nomination Submitted by _____

Address _____

City/State/Zip _____

Phone _____ ☐ Office or ☐ Home (check one)



COSMF Newsletter

Top 5 Sports Medicine Articles of 2013 Presented at the 2013 AAP National Conference & Exhibition

Chris Koutures, MD, FAAP
Author and presenter



1.) Time Interval Between Concussions and Symptom Duration

Eisenberg MA, Andrea J, Meehan W, Mannix R.
Pediatrics 2013;132,8.

- Hypothesis: Those with a previous history of concussion would have a longer time to symptom resolution than those without such a history, and that those who sustained a concussion within the previous year would have a longer time to symptom resolution than those with more remote injuries.
- One year prospective cohort of consecutive patients age 11-21 to tertiary ED within 72 hours of a concussion
- Predictors of Longer Time to Symptom Resolution
 - History of Previous Concussion
 - Concussion in past year: nearly 3 times median duration of symptoms vs. no concussion or most recent > 1 year prior
 - 2 or More Previous Concussions
 - More than double median symptom duration vs. 0-1 previous concussion

2.) Head Impact Exposure in Youth Football: Elementary School Ages 9-12 Years and the Effect of Practice Structure

Cobb BR et al. *Annals of Biomedical Engineering* 2013;41,12 pp 2463-2473

- Quantify the head impact exposure of youth football players, aged 9-12, for all practices and games over the course of single season
- 50 players instrumented with the HIT system
 - Team A, 9-11 years old (contact restrictions in place)
 - Team B, 10-12 years old (no restrictions)
 - Team C, 9-11 years old (no restrictions)
- Findings: For the entire season, players on team A experienced an average of 37-46% fewer impacts than players on teams B and C, though only the difference between teams A and B was statistically significant
- In games, impact frequency and acceleration magnitudes were not significantly different
- Diagnosed Concussions
 - Team A-1
 - Team B-2
 - Team C-1



- The data presented in this study suggest that head impact exposure at the youth level may effectively be reduced by limiting contact in practices.

2B) Incidence of Sports-Related Concussion among Youth Football Players aged 8-12 Years

Kontos AP et al. *Journal of Pediatrics* 2013;163,3 pp717-720.

- The purpose was to investigate concussion incidence in youth tackle football participants aged 8-12 years
- Prospective cohort study was conducted between August and December 2011 on 468 (82% participation rate) participants aged 8-12 years old from 4 nonscholastic youth tackle football leagues composed of 18 teams.
- Total of 11 338 AEs (8415 practice/2923 game)
- 20 diagnosed concussions involving 20 different participants
- 2 concussions in practice and 18 in games
- The findings suggest that reducing contact exposures in youth football will likely have little effect on reducing concussion risk, as few concussions actually occur in practice

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"Top 5 Sports Medicine Articles of 2013" continued from page 4

3) The Disabled Throwing Shoulder: Spectrum of Pathology- 10-Year Update

Kibler WB et al. *Arthroscopy: The Journal of Arthroscopic and Related Surgery* 2013; 29(1):141-161.

- "The Disabled Throwing Shoulder: Spectrum of Pathology"
 - 3 landmark articles published in *Arthroscopy*, 2003
- The editors of *Arthroscopy* and the authors of the original series believed an update would provide an organized overview of current knowledge that could update the thought process regarding the DTS, provide better assessment and treatment guidelines, and guide further research
- Chronic SLAP lesions in throwers may allow for increases in external rotation required for throwing. Articular-side partial-thickness rotator cuff tears may represent failure of the tissue in external rotation, again allowing for the extremes of external rotation required for high-level throwing. It is conceivable that in some throwers, the anatomic repair of these structures will lead to an inability to achieve the extremes of external rotation required to throw at high velocity and may end their careers.
- Surgery should be considered only after extensive and appropriate rehabilitation has failed.
- The surgical approach should be minimalistic, with the concepts to repair as needed but not to achieve normal anatomic repair of the rotator cuff.
- Surgery should be considered as a last resort to attempt to salvage a thrower's career, and throwers must be cognizant of the poor return-to-play rates.

4) Knowledge and Compliance With Pitch Counts Recommendations: A Survey of Youth Baseball Coaches

Fazarale JJ, Magnussen RA, Pedroza AD, Kaeding CC. *Sports Health: A Multidisciplinary Approach* May/June 2012; vol 4, 3: pp 202-204.

- Pain and injuries suffered by youth pitchers are ongoing concerns that have been addressed through the institution of rules and recommendations regarding pitch counts and rest periods
- The aim of study was to see if coaches of youth baseball pitchers in study region were aware of the recommended guidelines and if they followed them.
- The most significant finding of our study is that in spite of significant efforts to educate coaches regarding youth baseball pitching injuries, knowledge of current recommendations for youth pitchers is poor

- Only 35% to 62% of the pitching guideline questions were answered correctly
- These results are concerning as it is quite difficult for coaches to accurately follow guidelines with which they are not familiar
- Given the strong correlations between elevated pitch counts, pitching while fatigued, catching in addition to pitching, and pitching in showcases, leagues should potentially take a more active role in rule enforcement

5) Injury initiates unfavourable weight gain and obesity markers in youth

Myer GD et al. *Br J Sports Med* doi:10.1136/bjsports-2012-091988

- Active maturing females who sustain a knee injury would be at increased risk for greater subsequent increase in overweight and obesity markers as evidenced through BMI Z-scores and fat percentage measurements.
- Prospective longitudinal study of female middle school through university basketball and soccer players
- Salient finding: those who reported a knee injury demonstrated significantly greater increases in BMIZ (increased BMI percentile by up to five units more) and an increase in body fat percentage (by up to 1.5%) relative to their uninjured peers within 1 year of the reported injury
- The present findings indicate that a knee injury during the growing years may be associated with unfavourable changes in body composition for females who participate in sport
- The current results indicate the importance of prevention of physical activity-related injuries with appropriately designed youth prevention programs, which can help children maintain the benefits of sport participation while avoiding the negative effects of injury on the relative body composition.





COSMF Newsletter

Top 5 Pediatric Sports Orthopaedics Articles of 2013 Presented at the 2013 AAP National Conference & Exhibition

J. Todd R. Lawrence, MD, PhD

Author and presenter



1.) Cost-Effectiveness Analysis of Primary Arthroscopic Stabilization Versus Nonoperative Treatment for First-Time Anterior Glenohumeral Dislocations

Crall TS, Bishop JA, Guttman D, Kocher M, Bozic K, Lubowitz JH. *Athroscope* 2012;28(12) pp 1755-65.

- Background: First-time traumatic anterior shoulder dislocations have a high risk of recurrent dislocation with conservative management
 - Every dislocation increases the risk of long term arthritic damage and may decrease the success of surgical intervention
 - Arthroscopic stabilization can restore the anatomy, has a low recurrence rate and greatly enhances quality of life.
- Goal: To determine if the improved clinical outcome with early surgical intervention is offset by the cost of treatment to determine the most cost effective treatment?
- Methods: Modeled the clinical scenario of a primary anterior glenohumeral shoulder dislocation with a Markov model and performed a cost-benefit decision analysis.
 - Probabilities: Systematic review of published literature
 - Costs: Estimated from Medicare data based on real patient costs
 - Utility: Systematic review of published literature
- Results: Early surgery was less expensive and provided better overall outcomes for 15 y/o males and females and 25 y/o males.
 - Early surgery was more expensive but provided better clinical outcomes for 25 y/o females and 35 y/o males and females. In these cases early surgery was still the preferred treatment because the additional expense was below the willingness to pay threshold of \$25,000 per quality adjusted life year.
- Implications: The results from this study suggest that early surgical stabilization for young patients is the most cost effective treatment, being both less expensive and providing better clinical outcomes in the long run.

2.) Do Oblique Views Add Value in the Diagnosis of Spondylolysis in Adolescents?

Beck NA, Miller R, Baldwin K, Zhu X, Spiegel D, Drummond D, Sankar WN, Flynn JM. *JBJS* 2013;95:e65(1-7)

- Background: Spondylolysis (a stress fracture in the pars interarticularis) is the most common radiographically identifiable cause of low back pain in adolescents and is present in ~4-8% of the general public.
 - Radiographic evaluation with AP, lateral and oblique images has been standard practice.
 - Lumbar spine radiographs expose pelvic bone marrow and intrapelvic organs to radiation and the effects of radiation exposure during childhood and adolescence has led to a re-evaluation of this practice.
- Goal: To determine the added benefit of oblique views in the diagnosis of spondylolysis.
- Methods: 50 radiographs with a spondy and 50 without a spondy were presented to 4 pediatric orthopaedic spine surgeons in a 2-view (AP & lateral) format and 4-view (+ obliques) format and a consensus diagnosis was obtained.
- Results: No difference in sensitivity or specificity with use of the 2-view versus the 4-view.
 - 4-view vs. 2-view:
 - Radiation dose increased 75%
 - Cancer risk increased ~80%
 - Hours of life lost increased by 6.8 hours
 - Monetary cost increased \$145 (40%)
- Implications: For the monetary cost and the radiation exposure risk, oblique views do not increase the overall sensitivity or specificity for diagnosing of spondylolysis.
- Still consider ordering oblique views if there is strong suspicion of a unilateral defect.

3.) Long-term Patient-reported Outcome After Fractures of the Clavicle in Patients Aged 10 to 18 Years

Randborg PH, Fuglesang HFS, Rotterud JH, Hammer OL, Silvertsen EA. *J. Pediatric Orthopaedics* 2013 Aug 20. [Epub ahead of print]

- Background: Treatment of adolescent clavicle fractures remains controversial
 - Adult literature has suggested that the rate of non-union is higher than once thought and that many patients are dissatisfied with non-operative treatment.
 - Adolescents with clavicle fractures should have the same surgical complications but not the same risk of non-

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"Top 5 Pediatric Sports Orthopaedics Articles of 2013" continued from page 4

union or malunion.

- Goal: To evaluate the long-term radiographic and patient reported outcomes in adolescent clavicle fractures
- Methods: Retrospective review of clavicle fracture patients 10-18 y/o with assessment of DASH and Oxford Shoulder scores
- Results: One non-union and one delayed union identified (Overall non-/delayed union rate 1.2%)
 - Of the 58 displaced fractures treated non-operatively these two non-/delayed unions represent 3.4% incidence.
 - Patient based scores were available on 71% and showed decreased Oxford scores, and decreased cosmetic and overall satisfaction with shortening of the fracture fragments.
- Implications: Overall non-/delayed union rate for displaced midshaft clavicle fractures in 10-18 y/o patients is ~3.4%.
 - Shortening of the fracture has a small but measurable negative effect on clinical outcomes.

4.) Predictors of Recurrent Instability After Acute Patellofemoral Dislocation in Pediatric and Adolescent Patients

Lewallen LW, McIntosh AL, Dahn DL. *AJSM*; 41(3) pp 575-81.

- Background: Non-operative treatment is successful in most cases of acute, traumatic first-time patellofemoral dislocation patients.
 - There is little data to help predict which patients will go on to dislocate again or require surgical intervention.
- Goal: To describe the factors present in pediatric and adolescent first-time acute dislocators that may help predict recurrent instability
- Methods: Retrospective review of patient factors and anatomical characteristics evident on plain radiographs taken at the time of the initial injury and their usefulness in predicting recurrent dislocation episodes.
- Results: Any degree of trochlear dysplasia was associated with a statistically significant increased risk of recurrent dislocation (hazard ratio 2.57). Skeletal immaturity and sports related mechanism of action approached statistical significance.
 - With trochlear dysplasia and skeletal immaturity, the 5-year risk for redislocation was over 70% compared with a patient with no dysplasia and skeletally mature where the risk was about 25%.
- Implications: In a skeletally immature patient with trochlear dysplasia, the high risk of subsequent instability may sway the decision towards early surgical treatment of the instabil-

ity, especially if surgery is already indicated for another pathology (i.e. a large osteochondral fragment).

5.) Prevalence and Incidence of New Meniscus and Cartilage Injuries After a Nonoperative Treatment Algorithm for ACL Tears in Skeletally Immature Children: A Prospective MRI Study

Moksnes H, Engebretsen L, Risberg MA. *AJSM* 2013; 41(8) pp 1771-79

- Background: Rates of ACL tears in skeletally immature patients appear to be rising yet the treatment of these injuries remains controversial.
 - Retrospective studies have noted that time to reconstruction following an ACL tear is associated with increased knee damage yet none of the prior studies has been able to document the true incidence of secondary injuries with a delay in treatment.
- Purpose: To prospectively evaluate the incidence of NEW injuries to menisci and cartilage with a non-operative protocol in skeletally immature patients with an ACL tear
- Methods: 40 consecutive ACL tear patients 12 y/o or younger at time of injury.
 - Diagnosis was confirmed with a diagnostic MRI at the time of injury and then in about 2 year intervals with two subsequent high field strength 3-T MRIs.
 - Surgery was performed only for recurrent knee instability or symptomatic meniscal lesions, otherwise patients were treated with tailored rehabilitation and given a custom brace.
- Results: Almost 90% of the ACL-deficient children were able to participate in pivoting sports or physical education classes.
 - Only about 30% of the children underwent ACL reconstruction during the study period.
 - About 20% of the children sustained a meniscus tear from the time of injury to final follow-up, but less than 4% of patients had a new tear noted from between ~2 and ~4 years into treatment.
- Implications: Almost half of skeletally immature patients with an ACL tear treated non-operatively could be defined as "copers," being able to resume activities without inducing gross intra-articular damage discernable on MRI.
 - With non-operative treatment about 30% of patients will have a secondary meniscus tear. It is still unclear if these could these be avoided if early surgery was performed.



COSMF Newsletter

Athletes and the Arts: Expand Your Influence

By Randall Dick, FACSM

Performing artists are athletes. Just like sport athletes, they

- Practice or perform almost every day
- Play through pain
- Compete in challenging environments
- Experience little "off season"
- Face extreme competition
- Risk the temptation of substance abuse
- Face real risk of career-threatening injury

Yet the sport athlete, even at many youth club levels, has access to nutritional, injury prevention and tactical training and benefits from over-arching practice and competition guidelines (such as the AAP's Council on Sports Medicine and Fitness recommendations). On the other hand, performing artists (musicians, dancers, singers, conductors, actors, marching band – all ages from child to the elderly), face many similar and some unique issues (e.g., hearing loss) but have access to few if any of these resources.

ATHLETES AND THE ARTS (www.athletesandthearts.com) is a multi-organizational initiative focused on linking the sport athlete and musician/performing artist communities through collaborative exchange and application of wellness, training and performance research and education. This program is committed to the belief that athletes exist throughout the performing arts community and that established training, wellness and prevention research for sport athletes can benefit artists' general health and performance. Similarly, the athletic and general population can gain from principles primarily applied within the performing arts arena such as breath control, rhythm and creativity.

The mission of the Athletes and the Arts initiative is "Integrating the science of sport and the performing arts for the mutual benefit of both." Two specific mission objectives are particularly relevant to the AAP:

- Educate/train sports medicine and general health care providers to understand and treat the unique wellness issues faced by musicians/performing artists.
- Enhance artists' access to knowledgeable health care by creating a directory of allied health care providers that have a willingness and expertise to deal with their health and wellness issues.

The sports medicine community has the general knowledge to address many of these health and wellness issues, yet often is

not aware of the need or nuances of working with this underserved population.

"Common" Issues

Although we know little about the energy expenditures of performing artists, general sport pre- and post-performance nutrition and hydration concepts are needed and applicable to this population (See website for one-page SCAN nutrition and hydration facts targeted to performing artists.). Overuse and injury prevention, travel tips, cross-training and acclimatization strategies (think marching bands/drum corp) are other issues commonly addressed in the youth sport athlete population that can be applied to young performing artists. For example, consider the instrument weight, playing posture/position and length of time they are playing their instruments. Targeted exercises may improve performance and minimize injury.

"Unique" issues

Noise-Induced Hearing Loss (NIHL) is a flagship issue for musicians, as concussion is for many sport athletes. Fifty percent of musicians may have problems with hearing loss; every patient you see who is a performing artist (especially musicians) should have a baseline hearing screen with a qualified audiologist and ongoing reviews as their careers develop. Education about hearing loss using materials from the Athletes and the Arts website or other resources is essential.

NIHL quick overview: The normal approved dose (NIOSH) is 85 decibels over 8 hours. For every 3 dB increase over 85, allowable time exposure is halved (e.g. 88 dB - 4 hrs/day, 91 dB - 2 hrs/day, 94 dB - 1 hr/day). Comparable sounds include: 80 dB = alarm clock or busy street, 90 dB = lawn mower, 100 dB = snowmobile.

Many high-level (cf. club sport athletes in the sport world) young musicians practice for 6 hours daily. The dynamic range of live or recorded music can often peak at or above 94 dB. Hearing damage can occur with exposure to these volumes for 60 minutes or less daily.

Other issues to consider with young performing artists are how to optimize performance and how much practice is needed to reach the goal. The goal, though, is less well defined and measurable in the aesthetically based world of performance than in the realm of sport. Injury prevention and recovery are different as well. Health professionals know a lot about strengthening or recovery of a quadriceps muscle; however, there is little science about training and recovery for the small muscles around the mouth (the embouchure) of concern to a wind or reed player or the repetitive affect of complex choreography on the joints of a growing dancer.

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COSMF Newsletter

"Athletes and the Arts: Expand Your Influence" continued from page 6

Practice and Performance in Perspective

What is the optimal number of hours to practice? At what point do additional hours of practice hurt rather than help performance? There is minimal research for the performing arts population but the sport world provides some guidance:

- The AAP publishes guidelines about the diversity and volume of youth activities; the NCAA allows no more than 20 hours of practice a week, with one day per week completely off.
- Sport athletes have light and intense practice days, mandated practice lengths and limited repetition (e.g., pitch counts in baseball). Recovery from training and tapering prior to performance are validated practice components.
- Many sport athletes cross-train to maintain aerobic fitness while minimizing the mental and physical stress associated with their principal sport. Soccer players play basketball, swimmers do running workouts and vice versa.

Many of these sport findings can be applied to performing artists. When counseling a performing artist, consider the following:

- The ability to identify and objectively measure improvement in each aspect of the performing arts is essential in order to better understand the type and volume of practice necessary to optimize performance. Understand their ultimate goal and how long and how intensely (per week) they are working to achieve it.
- At some point the number of practice hours may hurt rather than help. Consider FOCUSED practice segments with different goals in each session. Rote repetition for extended periods of time has not proven successful in the athletic world.
- Large ACUTE increases in the time spent physically practicing/performing may increase risk of injury. If the volume or intensity of practice must increase, do it gradually.
- Introduce the concept of "Exercise is Medicine." Help artists understand how much their instrument weighs and the strength needed to hold it during long stretches of practice, how many repetitive strokes, jumps or steps they take a day, and how much their posture is dependent on core strength. Prescribe 30-45 minutes of current practice time for separate complementary physical activity. Emphasize rest and recovery when possible.

Key Points for Three Target Audiences

These points will be emphasized during the educational sessions associated with the upcoming Jonathan Batiste Tour.

Current Athletes and the Arts Partners

- American College of Sports Medicine (ACSM)
- Center for Music Arts Entrepreneurship, Loyola University (New Orleans)
- Performing Arts Medical Association (PAMA)
- National Hearing Conservation Association
- New Orleans Performing Artists Clinic
- American Medical Society for Sports Medicine (AMSSM)
- American Osteopathic Academy of Sports Medicine (AOASM)
- Music Teachers National Association (MTNA)
- Drum Corp International (DCI)
- Conn-Selmer

Jonathan Batiste, a talented musician, has agreed to be the first Athletes and the Arts artist in residence and will promote the initiative throughout his upcoming U.S. tour (October 2013 - April 2014). This highly lauded, instantly likeable performer will conduct educational sessions for both youth and targeted adults (health care professionals, performing artists, teachers).

Performing Artist

Establish MD relationship BEFORE you need it. *Get a wellness partner. Perform for them so they understand your craft.*

Practice, Perform in Perspective *How much is enough? Avoid too much, too soon. Document a typical week of activities.*

Evaluate your exposure to sound. *Develop a prevention strategy for noise-induced hearing loss.*

Health Care Professional

Performers are Unique. *Identify performing arts patients, educate them on the common sport issues and understand/learn the unique needs.*

Observe a Performance in your Office. *Understand specifics of the activity. Evaluate posture, ergonomics, and repetition.*

Discuss a typical week. *Understand all activities including length, intensity of practices, performances, teaching and develop a prevention strategy BEFORE a problem occurs.*

Hearing Loss. *Test for and educate about noise-induced hearing loss. Consider a licensed audiologist.*

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Teacher

Promote joy of performance. *Provide a range of performance opportunities so students feel comfortable in performance setting.*

Teach healthy practice strategies. *Encourage students to problem solve, avoid mindless practice, understand NIHL. Break up practice sessions to enhance concentration and avoid overuse.*

Select appropriate repertoire. *Challenge student growth without overwhelming them physically or mentally.*

Know your role if a student is injured. *Ask appropriate questions to steer to medical consultation if needed. Work as partners with medical professionals to help student return to play.*

Common Points for all Target Audiences

Exercise is Medicine *Investing in targeted core, strength and aerobics training to optimize performance and longevity.*

Hydrate, Eat, Sleep *Care for your "core instrument" to maximize health and longevity.*

Cross-train *Establish activities that complement your MENTAL and PHYSICAL skills to avoid overuse and burnout.*

Policy

The AAP and many other organizations see the value of standards and recommendations for influencing behavior, health and safety. The same opportunities exist in the performing arts community, and medical professionals have an opportunity to develop content. The National Association of Schools of Music (NASM) Health and Safety Standard provides such an example.

NASM is an association of 644 schools of music, primarily at the collegiate level. It is the national accrediting agency for music- and music-related disciplines and uses national standards to characterize basic requirements and conditions for the study of music. However, until recently, there were no standards specific to health and safety.

A new Health and Safety Standard was added to the NASM Handbook in November 2011 that reads in part:

It is the obligation of the institution that all students in music programs be fully apprised of health and safety issues, hazards, and procedures inherent in practice, performance, teaching

and listening both in general and as applicable to their specific specializations...

Music program policies, protocols, and operations must reflect attention to injury prevention and to the relationships among musicians' health, the fitness and safety of equipment and technology, and the acoustic and other health-related conditions in practice, rehearsal, and performance facilities.

Specific methods for addressing these issues are the prerogative of the institution.

Because the specifics of identifying and addressing these issues are an institutional prerogative, there is a great opportunity for medical professionals to collaborate with their local schools of music through this standard to develop specific health and safety guidelines. Collectively, this effort can enhance the knowledge and wellness of 100,000 music students annually and the future generations they touch through both performing and teaching. Please consider whether your practice can assist in this effort both at established schools of music and through outreach and education at local secondary school and private music, dance, marching band/drum corps and theatre programs.

Summary

Performing artists of all ages and genre are a population that is underserved as regards to medical coverage, care, injury prevention and wellness. The Athletes and the Arts initiative recognizes that sports medicine health professionals can be a valuable resource for filling this gap by applying their existing knowledge of treating sport athletes while gaining a better understanding of the performers' unique needs and environment. By integrating the science of sport and Exercise is Medicine concepts into the performing arts population, sports medicine professionals can expand their impact to an entirely new patient base that desperately needs their help.

How do you get involved?

- Recognize the needs of performing artists and work to become a medical and educational resource for this under-served population.
- Help develop specific health and safety guidelines for a local music school per the NASM initiative.
- Write a blog for the Athletes and the Arts website.
- Attend or contribute to an educational session on the Jon Batiste tour.
- Share educational information from the Athletes and the Arts website with your local performing arts community.
- Develop metrics by which a performance can be measured and improvement can be documented.



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2013 Sports Medicine Abstracts

WINNER OF 2013 ODED BAR-OR RESEARCH AWARD



*Editor's Note: The recipient of the 2013 Oded Bar-Or Award is **Nicholas M. Edwards, MD, MPH** for his research presentation on **Effects of Heating & Cooling Degrees, Precipitation, and Wind Speed On Childhood Physical Activity**. We congratulate Nicholas and thank all of our presenters for their submissions! The Oded Bar-Or Award is a \$500 honorarium presented annually at the conclusion of the*

Council on Sports Medicine and Fitness' Program at the AAP National Conference and Exhibition. It is in recognition of the best pediatric sports medicine or healthy active living presentation given at the Council's abstract session.

Effects of Heating & Cooling Degrees, Precipitation, and Wind Speed On Childhood Physical Activity

Nicholas M. Edwards, MD, MPH¹, Philip R. Khoury, M.S.² and Gregory D. Myer, MS¹, (1)Cincinnati Children's Hospital Medical Center & University of Cincinnati, Cincinnati, OH, (2) Cincinnati Children's Heart Institute, Division of Pediatric Cardiology, Cincinnati Children's Hospital Medical Center, Cincinnati, OH

Introduction: Past studies using pedometry and physical activity (PA) questionnaires have shown that inclement weather is a barrier to PA in children. However, this relationship between weather and PA in children has not been fully evaluated using accelerometry.

Purpose: To evaluate the effect of local weather conditions on physical activity (PA) in 3-7 year old children.

Methods: This study enrolled 372 children and objective measures of total physical activity (TPA) (RT3, triaxial accelerometer) were collected for 3 days every 4 mo from age 3 to age 7 y from 2001-2006. Weather information (temperature maximum/minimum, precipitation, wind speed) from the local municipal airport was obtained from the US National Climatic Data Center and merged with 9,264 participant-days of PA data. Heating and cooling degrees, a measure used to estimate energy requirements for geographic areas in the form of degree days, were calculated using 65 degrees Fahrenheit (F) as a basis. Pearson correlation coefficients were calculated between PA variables (counts per minute (cpm), minutes Moderate/Vigorous PA) and weather variables. Multivariate regression was used to test the relationship between weather and PA.

Results: Temperatures ranged between -8 to 100 degrees F over the duration of the study. Mean daily precipitation was 0.1 inches

and wind speed mean was 6 mph. Across the 5 years of the study, mean total PA was 609 ± 258 (standard deviation) and mean MVPA was 88 ± 57 minutes. Both TPA ($r = -0.15$) and MVPA ($r = -0.16$) were both significantly negatively correlated with cooling/heating degrees ($P < 0.0001$). They were significantly negatively associated with precipitation ($r = 0.07$ for both) and wind speed ($r = -0.06$ for both) ($P < 0.0001$). Heating/cooling degrees were significantly associated with TPA and MVPA independent of precipitation and wind speed. Each 10 additional heating/cooling degrees in the model was associated with 8 minutes less MVPA.

Conclusion: More extreme weather (higher or lower temperatures, higher wind, more rain/snow) is associated with decreased physical activity in young children. As weather patterns become more extreme, PA interventions should be designed and tested with consideration of weather effects. Supported in part by grants: NIH NHLBI R01HL064022, NCATS KL2TR000078, & the CCHMC Heart Institute Research Core.

RESEARCH ABSTRACTS PRESENTED AT THE 2013 COSMF PROGRAM

Perceptions and Fears About Sudden Cardiac Arrest and AEDs: Raising Public Awareness in a Community Sports Program

Janet Lioy, MD, The Children's Hospital of Philadelphia, Philadelphia, PA and Andrew Greubel, St. Joseph's Preparatory School, Philadelphia, PA

Introduction: Youth baseball is the 2nd most common sport played aside from basketball with approximately 8 million children between 6 and 17 years participating yearly. Little attention is paid to serious, life threatening fatal arrhythmias occurring with Commotio Cordis, the second leading cause of death in young athletes. Cases have risen to over 230 and nearly half occur during competitive sports, such as baseball. Heart guard protection have not been shown to improve outcome, in fact, over 30% of those suffering from Commotio Cordis were wearing chest protectors.

Purpose: To assess whether providing education and information about Sudden Cardiac Arrest (SCA) and Automated External Defibrillator (AED) usage to a group of coaches, parents and student athletes would result in improved willingness in bystander participation of AED and CPR initiation during a SCA emergency.

Methods: We conducted a randomized, blinded survey of a

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group of participants in Little League baseball in large metropolitan suburban setting. 60 participants, (divided into 2 groups of 30 each: 10 youth players; 10 parents; 10 coaches in each group), were given the identical 10 question survey on injury awareness, prevention, Commotio Cordis and the use of AEDs during sudden blunt chest injury resulting in cardiac arrest. Group 1 was given the survey without education. Group 2 viewed a set of 3 short instructional videos and an information fact sheet about Commotio Cordis and AEDs. All participants were blindly selected randomly by an outside party. All results were analyzed by Group assignment and were blinded to the investigators.

Results: Most of the 60 respondents in both groups did not think of serious injuries during games. Regardless of education, both groups demonstrated statistically significant overall lack of knowledge of serious sports injuries in youth baseball and rarely wore heart protective gear. Although the majority knew what an AED was, both groups did not know where the AED was located in their school or playing field environment. Most in Group 1, (no education), were unaware of Commotio Cordis injuries and were not comfortable nor were likely to use an AED in an emergency situation. After receiving simple education most participants in Group 2 were significantly more likely to use an AED without hesitation in an emergency, and also use heart protection during youth baseball. All results reached statistical significance.

Conclusion: There is a serious need for AED and sudden education of all participants in middle school youth sport, to become knowledgeable about SCA during competitive sports, encourage heart protection and AED awareness and usage. AEDs should be available to all youth baseball leagues and mandatory education should be provided for all coaches, parents, and players in youth baseball before the playing season begins.

Trends in Physician Referrals for Participants At a University-Sponsored Summer Sport Camp Program

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Purpose: Youth athletes commonly attend summer sport camp programs sponsored by colleges and universities. Though sport participation presents a risk for injury, there is a dearth of information to describe the sport camp injury/illness experience. The purpose of this study is to describe the physician referral profile, inclusive of medical facilities and diagnoses, from 2008-2013.

Methods: The study was conducted at a large National Collegiate Athletic Association Division I university, which sponsored a sport camp program for 28 different sports over 10 weeks each



summer. Camp participants ranged in age from 6 through 19 years, and in athletic skill level from novice to elite. Athletic trainers (ATs) and athletic training students (ATs) provided sports health care services to injured/ill camp participants, which included documentation of all injuries/illnesses and providing physician referrals when warranted. Data, via injury/illness log books and medical referral log books, were accessed retrospectively for 2008-2011. For 2012, a paper-based standardized documentation form replaced the injury/illness log book, and the referral log book was modified to capture more variables. The data were entered into an electronic spreadsheet and applied to the National Athletic Injury/Illness Reporting System.

Results: From 2008-2012, 53,215 youth athletes attended the sport camp program. The overall injury/illness rate was 11.6 per 100 camp participants and 6.7 per 100,000 participant-days. Athletic trainers made 556 medical referrals, which occurred at rates of 1.0 per 100 participants and 0.6 per 100,000 participant-days. Referrals were predominantly made to university health services located on campus (40.3%), an emergency department (29.5%), and a center for sports medicine (16.5%). Wrestling was disproportionately represented by referrals (17.2%) when compared to the other 27 sports, ($P < 0.001$). Hospital admission was required for one camp participant. For 2012, concussion was the most common condition for which athletic trainers provided referrals (32.1%), followed by fractures (19.2%). Physicians diagnosed concussions for 21.8% of referrals and fractures for 16.7%. Non-sport-related injuries/illnesses, such as kidney stones, comprised 14.1% of referrals. Given the ongoing nature of this study, data for the 2013 summer sport camp season has not yet been collected.

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Conclusion: The presence of ATs and ATSS allowed for more comprehensive documentation of all medical referrals. Addition of variables, such as the reason for referral and physician diagnosis, in 2012 provided a greater level of detail to describe referrals. These can be used to increase preparedness for managing injuries/illnesses. Generally the rates for physician referral were low, which may be attributed to ATs and ATSS ability to triage and manage minor injuries/illnesses on-site. Establishing a relationship between the sport camp program and three medical facilities was paramount for providing a safe sport camp experience. This relationship, along with sports health care documentation, demonstrates compliance with the AAP's 2011 camp policy statement.

Discharge Instructions for Youth Sports-Related Concussions in the Pediatric Emergency Department 2004-2012

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Purpose: To determine if the 2010 Centers for Disease Control (CDC) recommendations on management of concussions and the development of a dedicated sports concussion center has improved discharge recommendations for youth Sports Related Concussion (SRC) seen in the pediatric emergency department (ED).

Methods: A retrospective chart review was conducted on patients evaluated in the pediatric emergency department from January 2004 to July 2012. Patients were selected by ICD9 code for having a concussion during a sporting activity. Discharge instructions were reviewed for recommendations for cognitive rest, physical rest, PCP follow up, and referral to a concussion specialist or center. An appropriate discharge was defined as having some type of rest and provider follow-up. Logistic regression was used for statistical analysis.

Results: There were 497 youth SRC from 392,908 total ED visits, 20 of which were excluded due to lack of documentation. Overall, only 66% had appropriate discharge recommendations. This improved to 75% after 2010, which was not found to be statistically significant (OR 1.02, p=0.179). Recommended physical rest instructions remained constant over the time period. Only 4% had some type of recommended cognitive rest, which only increased to 12% of the patients seen after 2010. Factors that were found to be statistically significant in receiving better discharge recommendations include children who were older (OR=1.10, p=0.010), boys (OR=1.70, p=0.027), and if a head CT was performed

(OR=1.01, p=0.018). Lastly, referrals to a sports concussion specialist or center dramatically increased from an average of 8% to 43% after 2010.

Conclusion: Even with the 2010 CDC Heads-Up campaign on concussion education, appropriate discharge recommendations for youth SRC have not improved. Although providers frequently recommend physical rest, recommendations for cognitive rest remain low. Children who are diagnosed with SRC are likely continuing to participate in cognitive activities (returning to school, reading, watching TV, texting, etc.) with lack of recommended rest. Fortunately, more referrals are being made to sports concussion specialists where appropriate ongoing concussion management can be instituted.

Vestibular Deficits and Rehabilitation Following Youth Concussions

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Purpose: To characterize the prevalence of vestibular deficits, referral to vestibular rehabilitation therapy, and recovery from vestibular deficits in a sample of pediatric concussion patients cared for in a referral sports medicine clinic.

Methods: Of a sample of 3740 unique patients seen in a tertiary pediatric hospital-affiliated sports medicine clinic from 7/1/2010-12/31/2011 and diagnosed with concussion, a 5 percent random sample (247) of medical records was reviewed. Within the random sample, all related visits were examined.

Results: 81 percent of patients had at least one vestibular deficit on exam, including symptoms with fast saccades (110/247), symptoms with gaze stability (85/247), dysmetria (11/247), positive Romberg sign (16/247), or abnormal tandem gait (188/247). 53 percent of patients were referred to vestibular therapy. For patients with vestibular deficits, the median number of days to return to school was 59 days and the median number of days until fully cleared for athletic activity was 102 days, as compared to 7 days to return to school and 32 days before fully cleared among patients without vestibular deficits. Of those patients with prior concussions, 90 percent had vestibular deficits (compared to 75 percent for those without concussion history) and 57 percent were referred to vestibular therapy (compared to 46 percent for those without concussion history). For patients initially seen at least 4 weeks following injury, 83 percent had vestibular deficits and 67

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percent were referred to vestibular therapy.

Conclusion: Children and adolescents with concussion experience a high prevalence of vestibular deficits, which may be associated with extended recovery times. Those patients with prior concussions may be at higher risk for vestibular deficits. Many concussion patients may require vestibular rehabilitation therapy, especially if symptoms persist 4 weeks following injury. Further work is needed to determine the association between concussion, vestibular deficits, and cognitive and physical recovery time, as well as the role and appropriate timing of vestibular therapy.

Factor Structure, Validity, and Clinical Utility of a 19-Item Post-Concussion Symptom Scale

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Purpose: The primary goals of this study were to (1) examine the factor structure of a self-reported 19-item post-concussion symptom scale (PCSS) in pediatric athletes following concussion and (2) investigate factor structures with respect to time. Because this 19-item PCSS utilized a Likert-type scale to assess symptom severity a secondary goal was to evaluate the utility of summation scores pertaining to each factor.

Methods: This was a retrospective medical record review of persons between 6 and 22 years of age with a diagnosis of concussion seen at outpatient sports medicine clinics in the Chicago area between April 2008 and September 2012. Exclusion criteria were conditions that suggested a specific cause of symptoms. Study participants who fulfilled these criteria were identified and pertinent data abstracted included age, gender, injury date and mechanism, previous head injury, date PCSS completed, scores for each of the 19 PCSS items. Data was entered into a standardized computer-based template prior to statistical analysis.

Results: 402 concussed individuals constituted the study sample. Most (66.8%) were male and the mean (SD) age was 14.27 ± 2.67 years. 57% denied previous head injury, and the mean (SD) number of concussions sustained was 1.04 ± 0.21 . The most frequently reported mechanism was football (20.7%), followed by soccer (17.7%), ice hockey (15.21%), and falls (11.97%). Factor analyses supported a 3 factor solution for post-concussive symptoms that included 18 of the original 19 items. These consisted of (1) eight cognitive-related items, (2) six somatic-related, and (3) four emotional-related. Results supported the use of a summation score for factors (2) and (3) but not for factor (1). Finally, it was discovered that factor (3) summation scores increased 14 days

after concussion, possibly indicating the emotional impact of an injury.

Conclusion: Concussion management emphasizes importance of self-reported symptoms as indicators of injury and post-injury recovery. Factor analysis has been used to provide a more focused approach to the concussed athlete by grouping symptoms into common categories. Current studies, however, remain limited by numerous methodological and analytical factors. Additionally, although the majority of symptom checklists employ Likert-type scales to characterize symptom severity, no literature exists regarding the utility of summation scores. Our investigation demonstrates a consistent symptom factor structure in a population of concussed individuals in the acute, sub-acute, and chronic stages of concussion. It is the first study to date supporting the use of summation scores in 2 of the 3 factors identified (somatic, emotional). Furthermore, the discovery of increasing severity of emotional symptoms with time has significant implications in providing a more targeted approach to concussion evaluation and management.

Risks of Specialized Training and Growth for Injury in Young Athletes: A Prospective Cohort Study

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Purpose: To determine whether the degree of sports specialization, weekly training volumes, and growth rates are independent risk factors for injury in young athletes.

Methods and Study Design: This multi-center prospective cohort study followed injured young athletes recruited from sports medicine clinics and uninjured athletes recruited during their sports physical at primary care clinics. At baseline, all athletes were 8-18 years old and completed a survey reporting training volumes, degree of sports specialization, Tanner stage, and had height and weight measured. This same data was collected from each participant at 6 month intervals for up to 3 years (2010-2012).

Results: There were 1206 participants (50.7% male) who evaluated at baseline while longitudinal follow up data collection is ongoing at time of submission. There were 837 injured participants with a total of 859 unique injuries with 360 uninjured participants that served as controls. Injured athletes were older than uninjured athletes (14.0 ± 2.2 vs. 12.9 y/o ± 2.6 , $p < 0.001$), reported a higher average hours/week playing organized sports (11.3 ± 6.9 vs. 9.4 ± 8.2 ; $p < 0.001$), and higher average hours/

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week in total (gym, free play, organized) sports activity (19.7 +/- 9.8 vs 17.6 +/- 10.3; , $p < 0.001$). Using a six point specialization score designed for this study, injured athletes had a significantly higher degree of specialization than uninjured athletes (3.3 +/- 1.6 vs. 2.7 +/- 1.6; OR 1.27, $p < 0.001$), even after adjusting for hrs/week in total sports activity and age ($p < 0.001$). Injured athletes had similar annual calculated growth rate at baseline (4.75 vs 4.75 cm/yr). Young athletes who participated in more total hours then age ($p = 0.004$) and who participated in > 2 times organized sports then free play ($p = 0.004$) were more likely to be injured. Young athletes at risk for serious overuse injury also participate in more total hours then age and are more specialized.

Conclusions: Injured young athletes are older and spend more total sports hours/week and in hours/week of organized sports. There is an independent risk of injury in athletes that are more specialized, even when accounting for hours/week of sports participation and age. There is also a risk of injury and serious overuse when participating in more sports hours/week then age and all types of injury if participates in more than twice organized sports then free play hours. There does not appear to be a relationship between growth rate and increased risk of injury in the baseline data.

Clinical Relevance: Determining the degree of sports specialization and weekly training volumes may help pediatricians identify young athletes at higher risk for all type and serious overuse injury. **Acknowledgements:** 2 Consecutive American Medical Society for Sports Medicine Foundation Grants

Association of Helmet Brand and Mouth Guard Type With Incidence of Sport Related Concussion in High School Football Players

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Purpose: Approximately 40,000 Sport Related Concussions (SRC)/year occur in US high school football. Football helmet and mouth guard manufacturers cite laboratory research that their brand/models will lessen impact forces associated with SRC greater than their competitors' models, and further claim players who utilize their equipment may reduce their risk of SRC. However, there is limited prospective data on how specific football helmets and mouth guards affect incidence and severity of SRC in players. Our objective was to determine if football helmet brand and mouth guard type are associated with incidence and severity of SRC in high school football players.

Methods: This prospective study included 36 high schools and 1,332 football players (grades 9 – 12, age: 15.9 + 1.8 yrs) during the 2012 football season. Subjects completed a pre-season demographic and injury questionnaire. Athletic trainers recorded incidence and severity of SRC. Chi-square tests were used to compare incidence of SRC in injured vs non-injured players. SRC severity (median days lost, IQR) was analyzed using Kruskal-Wallis test. Relative risks [RR, 95% CI] were calculated for variables with significant tests ($p < .05$).

Results: One hundred seventy one players (13%) reported SRC within the previous 12 months. Helmets worn by players were manufactured by Riddell (52%), Schutt (35%) and Xenith (13%) and purchased in 2011-2012 (39%), 2009-2010 (33%), 2002-2008 (28%). Mouth guards worn by players included generic models provided by school (61%) and specialized mouth guards (39%) custom fitted by dental professionals or specifically marketed to reduce SRC. A total of 115 (8.6%) players sustained 116 SRCs. There was no difference in rate of SRC {%, 95% CI} by the type of helmet worn [$p = 0.454$], (Riddell {9.5, 7.4 - 12.0}, Schutt {8.1, 5.9 - 11.1} and Xenith {6.7, 3.7 - 11.8}), or year the helmet was purchased [$p = 0.745$], (2011-2012 {9.3, 7.0 - 12.3}, 2009-2010 {7.9, 5.7 - 11.0} and 2002-2008 {8.8, 6.2 - 12.3}. Severity (days lost) of SRC was not different ($p = 0.883$) for players wearing Riddell (13.5: 8.8, 19.0), Schutt (13.0: 10, 21.5) and Xenith (13.5: 10.8, 21.3) helmets. The SRC rate for players who wore a specialized or custom-fitted mouth guard (12.5, 9.8 – 15.8) was higher [RR = 1.9, 1.36 – 2.70], than for players who wore a generic mouth guard (6.4, 4.8, 8.3), [$p < 0.001$].

Conclusion: Contrary to manufacturer claims, lower risk and

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severity of SRC were not associated with a specific helmet brand. Rates of SRC were similar for players wearing newer versus older helmets. Players using a generic mouth guard provided by school had a lower rate of SRC compared to players with more expensive specialized or custom mouth guards marketed to reduce concussion risk. Caution is advised when recommending specific preventive equipment based on manufacturer claims of reduced concussion risk.

Frequency of Concussion Symptoms in Healthy Children With No History of Concussion

Neil Khanna, BS and Cynthia LaBella, MD, FAAP, Northwestern University's Feinberg School of Medicine, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL

Purpose: Post-concussion symptoms scales (PCSS) are commonly used tools for concussion evaluation and management in adults. However, there is a lack of normative data for these scales in children aged 10-17, limiting their clinical utility with this population. The goal of this study was to describe the frequency of concussion symptoms reported by healthy children 10-17 years of age with no history of concussion. **Methods:** We recruited 95 subjects from pediatric orthopaedic and sports medicine clinics after verifying for eligibility via chart review and patient interview. Subjects had to be 10-17 years of age, have no prior history of concussion, balance, or neurological disorders, no active lower extremity injury, pes planovalgus, pronation, or genu valgum, no history of ankle sprain, and a negative Trendelenburg's test. After enrollment, subjects completed a post-concussion symptom scale (PCSS) by rating severity of 20 concussion symptoms on a scale of 0-6.

Results: At least one symptom was reported by 67.2% of males and 55.9% of females. PCSS symptoms reported most frequently were nervousness (27.4% of subjects), trouble falling asleep (23.2%), difficulty concentrating (22.1%), difficulty remembering (22.1%), sleeping more than usual (16.8%), headache (15.8%), and irritability (14.7%). The mean total PCSS score for males ($n=61$, $M=5.6$, $SD=8.0$, range=0-42) was higher than that for females ($n=34$, $M=2.8$, $SD=4.2$, range=0-16) although this difference was only marginally significant ($p=0.07$). Mean total PCSS score for non-athletes ($n=13$) was 3.8 ($SD=3.6$, range=0-13), for single-sport athletes ($n=32$) was 2.8 ($SD=5.9$, range=0-26), and for multi-sport athletes ($n=50$) was 5.9 ($SD=8.1$, range=0-42). The mean total PCSS score for single-sport athletes was significantly lower than that for multi-sport athletes ($p=.004$).

Conclusion: Our results show that approximately 60% of healthy children 10-17 years of age with no history of concussion will report at least one concussion symptom. Symptom frequency and severity were higher for multi-sport vs. single sport athletes, however, there was no correlation between age or gender and symptom frequency or severity. These data suggest that there may be value in obtaining a baseline PCSS score for children 10-17 years

of age at their pre-participation examinations or annual well-child care visits. This information can then be used as a reference for measuring recovery if the child should suffer a concussion.

Training and Developmental Risk Factors for Apophyseal Injuries in Young Athletes: A Clinical Evaluation

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Purpose: To identify training and developmental risk factors for apophyseal injuries (AI) in young athletes. Both Apophysitis and Apophyseal Avulsions were included in the definition of Apophyseal injury.

Methods: AI were evaluated as part of a larger multi-center prospective clinical cohort study following injured and uninjured athletes aged 8-18 years old at 6-month intervals for a maximum of 3 years, from 2010-2013. At each interval, subjects completed surveys reporting training volumes, degree of sports specialization, and Tanner stage. Additionally, subjects were given a clinical diagnosis when applicable, and their heights and weights were measured. We compared data from subjects with AI to data from uninjured subjects.

Results: There were 96 subjects in the AI group and 360 uninjured controls. The AI group had 66 males (69% $p<0.001$). The mean age was lower for the AI group vs. the uninjured group (12.2 ± 1.7 vs. 12.9 ± 2.6 yrs.) ($p<0.05$, OR = 0.89), and for females (11.5 ± 1.6 vs. 12.9 ± 2.5 yrs.) ($p<0.005$, OR = 0.77). These results remained significant when adjusted for BMI. For males, there was a trend toward greater mean growth rate in the AI group vs. the uninjured group (6.8 ± 5.3 vs. 5.2 ± 3.5 cm/yr; $p=0.09$, OR=1.1). Mean Tanner stage for females with AI was lower than for uninjured females for both breast (2.4 ± 0.9 vs. 3.2 ± 1.4 ; $p<0.05$, OR = 0.63) and pubic hair (1.8 ± 0.7 vs. 2.7 ± 1.3 ; $p<0.05$, OR = 0.50), while there were no differences in male Tanner stages. There were no significant differences between groups in degree of sports specialization, hours spent in gym class, organized sports, or recreational sports, and total physical activity hours. When total physical activity hours were adjusted for age, and an outlier of 104 hours per week was eliminated, females with AI were shown to have participated in about 2 hours more physical activity per week than their uninjured counterparts ($p<0.05$).

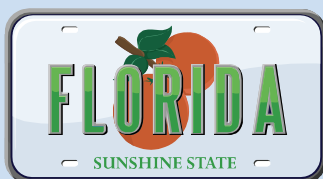
Conclusion: Young athletes with AI seen in a clinical setting are younger, male, and may have higher growth rates than uninjured controls. Females with AI tend to spend more total hours in physical activities than uninjured female controls.



COSMF Newsletter

Education Coordinator Update

I wanted to thank everyone who participated in and attended the 2013 COSMF H Program in Orlando, Florida. We had our best turn out to date and had a lively and informative discussion on Performance and Extreme Sports for Kids. I appreciate all of the hard work our speakers do in preparing their presentations and want to thank everyone involved for an incredible H program!



Congratulations to Steve Rice, MD, PhD, MPH, FAAP who was the 2013 Thomas Shaffer Award winner. Please also congratulate Nick Edwards, MD who was the winner of our 2013 Oded Bar Or Award (Best abstract presentation- \$500 award) for his abstract entitled "Effects of Heating and Cooling Degrees, Precipitation and Wind Speed on Childhood Physical Activity." Please consider submitting or helping a resident, fellow or medical student submit a clinical case or research abstract for our posters or abstract presentations. Ideas, concerns and questions are always welcome as well!

Please stay tuned for our 2014 AAP NCE COSMF Program including our H program (please note: Saturday October 11, 2014) focusing on **"The X's and O's of Youth Contact Sports"** and the Peds 21 Symposium (Friday, October 10, 2014) : **"1, 2, 3, Go! Sports in the World of Pediatrics - Playing it safe and Making it fun!"** (see insert)

I promise informative presentations, lively debate, wonderful conversation, and possibly some tacos on the beach!

See you in San Diego,

Becky Demorest, MD
COSMF Education Coordinator
rebeccademorest@gmail.com



2014 COSMF H Program Tentative Schedule

Saturday, October 11, 2014

Roundtable Discussion on "The X's and O's of Youth Contact Sports" (8:00 - 11:00 am)

8:00 - 8:50 am	Sports Concussion Debate: Yea or Nay for Baseline Neuropsychological Testing?
8:50 - 9:40 am	To Hit or not to Hit, That is the question!
9:40 - 10:10 am	Bubble Wrap Me, Doc: Is protective equipment all it is cracked up to be?
10:10 - 10:40 am	The Psychology of Doctoring a Rough and Tough Team
10:40 - 11:00 am	Roundtable Discussion
11:00 - 11:15 am	Break
11:15 - 12:00 pm	Top 10 Orthopedic and Sports Papers of 2014
12:00 - 1:00 pm	Thomas Shaffer Award, Luncheon and COSMF meeting
1:00 - 1:45 pm	Vito Periello Lecture Series
1:45 - 2:15 pm	Hot Topics in Sports Medicine
2:15 - 2:30 pm	Break
2:30 - 4:00 pm	Abstracts and Clinical Cases
4:00 - 5:00 pm	ACSM Exchange Lecture
5:00 pm	Oded Bar Or Award and Closing



COSMF Newsletter

AAP Section on Orthopaedics Membership Offer

COSMF Members: The Section on Orthopaedics (SOOr) has invited COSMF members to join the SOOr. There is no additional fee for this service and membership serves to promote communication and activities between the two groups. The application for SOOR membership can be found at: <http://www.aap.org/en-us/about-the-aap/Committees-Councils-Sections/Pages/Online-Council-Section-Membership-Application.aspx>

Welcome New Council on Sports Medicine & Fitness Members!

Amanda Hinkle, MD
Neeru Jayanthi, MD
Victoria Judd, MD, FAAP
Peter Kriz, MD, FAAP
Sarah Cribbs, MD, FAAP
Mohit Singla MD, MB, BS, FAAP
Robert Benowicz, MD, FAAP
Pamela Lachniet, MD, FAAP

Margaret Greco, MD, FAAP
Mark Griffiths, MD, FAAP
Ahsley Karpinos, MD, MPH, FAAP
Steven Schulenburg, MD
Danielle Greco, DO
Emily Stuart, MD
Sonja Vindheim, DO
Jonathan Minor, MD

Megan Long, MD
Jennifer Potonia, DO
Jeffrey Neal, MD
Ryan Kelln, DO
Shauna Wong, MD
Jennifer Weis, MD, FAAP

Council on Sports Medicine & Fitness Executive Committee

July 1, 2013 - June 30, 2014

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Canadian Pediatrics Society

Newsletter Editor

Chris Koutures, MD, FAAP

AAP Staff

Anjie Emanuel, MPH
Manager

Michael Chorvat
Newsletter Designer

We want to hear from you!

Please send contributions and newsworthy items for the COSMF newsletter to Chris Koutures, MD, FAAP at brubad@pacbell.net, or Anjie Emanuel, MPH Manager, Sports Medicine & Fitness at aemanuel@aap.org.