

YOUTH SPORTS SAFETY ALLIANCETM



PREVENTING SUDDEN DEATH IN YOUTH SPORTS

Hosted by the National Athletic Trainers' Association

IN MEMORIAM

YOUTH ATHLETES WHO DIED IN 2011

<u>Month</u>	<u>Athlete</u>	<u>Age</u>	<u>Cause (Official/Suspected)</u>	<u>State</u>
JANUARY	WG	18	Sudden cardiac arrest	New Jersey
	SO	15	Sudden cardiac arrest	Louisiana
FEBRUARY	CE	17	Sudden cardiac arrest	Oregon
MARCH	WL	16	Sudden cardiac arrest	Michigan
	MH	17	Sudden cardiac arrest	Colorado
	JB	16	Sudden cardiac arrest	North Carolina
	SL	17	Unknown	Florida
APRIL	RG	16	Sudden cardiac arrest	Texas
	SS	15	Sudden cardiac arrest	Texas
	CC	4	Unknown	Texas
	DH	17	Dehydration	Missouri
MAY	RS	14	Sudden cardiac arrest	Wisconsin
	LK	16	Exertional heat stroke	North Carolina
JUNE	HW	13	Commotio cordis	Arizona
	JH	16	Unknown	Wisconsin
JULY	JT	12	Sudden cardiac arrest	Massachusetts
	DJ	16	Sudden cardiac arrest	Virginia
	QE	16	Sudden cardiac arrest	Colorado
	SG	17	Exertional heat stroke	Pennsylvania
	IL	17	Heat exhaustion/Exertional sickling	Florida
	TB	14	Exertional sickling	South Carolina
	JB	18	Exertional heat stroke	New York
	DS	16	Exertional heat stroke	Florida
	FJ	17	Exertional heat stroke	Georgia
AUGUST	LO	15	Unknown	Pennsylvania
	AW	17	Unknown	Florida
	MW	15	Exertional sickling/Sudden cardiac arrest	Arkansas
	SD	15	Sudden cardiac arrest	Pennsylvania
	CO	14	Asthma	Texas
	AS	15	Exertional heat stroke	Texas
	KC	7	Sudden cardiac arrest	Florida
	BR	17	Sudden cardiac arrest	Virginia
SEPTEMBER	KB	17	Traumatic brain injury	Tennessee
	LD	16	Sudden cardiac arrest	Mississippi
	BD	18	Sudden cardiac arrest	Florida
	JD	15	Asthma	California
	JH	12	Sudden cardiac arrest	Louisiana
	FP	14	Asthma	New Jersey
	AG	16	Sudden cardiac arrest	California
	RS	16	Unknown	Oklahoma
	RB	16	Traumatic brain injury	New York
OCTOBER	GG	17	Traumatic brain injury	Florida
	DM	14	Sudden cardiac arrest	Georgia
NOVEMBER	JR	15	Unknown	New York

2011 YOUTH SPORTS SAFETY ALLIANCE SUMMIT

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

Hosted by the National Athletic Trainers' Association on behalf of its 34,000 members.

TABLE OF CONTENTS

Opening Letter.....	I
Agenda.....	II
Alliance Members	IV

Speakers

Marjorie J. Albohm, MS, ATC.....	2
John Almquist, ATC, VATL	3
Douglas Casa, PhD, ATC, FACSM, FNATA.....	4
Yvette Coursey, DPA.....	5
Chris Draft	6
E. Randy Eichner, MD	7
Rhonda Fincher	8
Laura Friend	9
Lisa Gfeller	10
Kevin Guskiewicz, PhD, ATC.....	11
Amy Elizabeth Valasek, MD.....	12
Victoria Vetter, MD	13

In Recognition

Rep. Tim Bishop	16
R. Dawn Comstock, PhD	17
Rep. Keith Ingram	18
Beth Mallon.....	19
PBS Frontline	20

TABLE OF CONTENTS

Updates

Status of Athlete Safety Legislation	22
Advocates for Injured Athletes	25
Brain Injury Association	26
Datalys Center	27
Kendrick Fincher Hydration Foundation	28
Korey Stringer Institute	29
Matthew Gfeller Foundation.....	30
MomsTeam.com	31
National Athletic Trainers' Association	32
National Center for Sports Safety	33
National Cheer Safety Foundation	34
National Council of Youth Sports	35
Nick of Time Foundation	36
Parent Heart Watch	37
Pop Warner Little Scholars, Inc.....	38
Project Adam	39
Safe Kids USA	40
Sickle Cell Foundation of Palm Beach County & Treasure Coast, Inc.	41
SportsConcussions.org.....	42
Sport Safety International	43
U.S. Lacrosse	44

Resources

Statistics on Youth Sport Safety.....	46
Arkansas Act 1214	48
Arkansas Sample Emergency Action Plan.....	50
NATA Position Statement: Preventing Sudden Death in Sports	96
Consensus Statement: Preseason Heat-Acclimatization Guidelines	119
NATA Position Statement: Emergency Planning in Athletics	121



December 6, 2011

At last year's Summit, *ONE YEAR LATER: A Report Card on the Youth Sports Safety Crisis*, we gave ourselves a C+. I think we can safely raise that to a B. The passage of concussion legislation in 70 percent of the states is extremely gratifying, as is the growth of the Youth Sports Safety Alliance over the past year.

Information from the 2010 Summit was widely distributed, with over 40 million media impressions within 48 hours. Making athletes, parents, administrators and health professionals aware of the importance of taking a concussed child out of the game and requiring medical clearance to return will do a lot to change the culture of "playing through pain."

Over 50 organizations have now committed to the Alliance *Call to Action*. Each organization is doing its part; in this proceedings book you will find many of their updates along with the new Position Statement on Preventing Sudden Death in Sports.

What's next? Of course, we need to have concussion statutes in all 50 states. And some of those that have passed may need a new look to bring them into conformity. Our work on concussion is not over and, unfortunately, it is not the only area of concern.

In late July and the first two weeks of August 2011, we saw the deaths of six children and one adult coach. Those deaths, too, were widely covered in the media and caused the public to take another look at safety during the pre-season.

Both brain injury and heat illness are thought of as being related to football alone. But that is not the case, and those are not the only injuries. This conference, being held again on Capitol Hill, will focus on three additional important issues:

- Sudden Cardiac Arrest
- Exertional Sickling
- Sports-Induced Asthma

Discussions of youth athlete safety must be expanded to encompass all sports at all times of the year. We said last year that the Alliance wanted to keep the national focus on these issues, to grow awareness of the potential for danger in sports and to form partnerships among the stakeholders. We're doing that, and we must still push forward.

Your presence at this conference today indicates your commitment to further action. It is almost a cliché that there is power in numbers, but it is the truth and together we will save the lives of those most vulnerable. Thank you for helping us to continue the dialogue.

On behalf of the members and board of directors of the National Athletic Trainers' Association,

Marjorie J. Albohm, MS, ATC
President

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

December 6, 2011

Agenda

MODERATOR: Marjorie J. Albohm, MS, ATC, president, National Athletic Trainers' Association

9:30 a.m.

WELCOME AND INTRODUCTIONS

PREVENTING SUDDEN DEATH IN SPORTS – RELEASE OF NEW POSITION STATEMENT

- **Kevin Guskiewicz**, PhD, ATC, Kenan Distinguished Professor and founding director of the Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center and the Center for the Study of Retired Athletes, University of North Carolina at Chapel Hill
- **Douglas J. Casa**, PhD, ATC, FACSM, FNATA, University of Connecticut Neag School of Education: director, Athletic Training Education; professor, Department of Kinesiology; chief operating officer, Korey Stringer Institute

SUDDEN CARDIAC ARREST

- **Victoria L. Vetter**, MD, attending staff physician, Children's Hospital of Philadelphia, Division of Pediatric Cardiology
- **Laura Friend**, program coordinator, Project ADAM Texas at Cook Children's Medical Center

EXERTIONAL SICKLING

- **E. Randy Eichner**, MD, professor emeritus of medicine at the University of Oklahoma Health Sciences Center
- **Yvette L. Coursey**, DPA, chief executive officer, Sickle Cell Foundation of Palm Beach County and Treasure Coast, Inc.

Q&A

11:45 a.m.-12:45 p.m.

LUNCH AND NETWORKING

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

December 6, 2011

Agenda (continued)

EXERCISE-INDUCED ASTHMA

- Amy Elizabeth Valasek, MD, clinical associate, Johns Hopkins Pediatric Emergency Department; assistant professor, Johns Hopkins Orthopedics, Pediatric Division
- Chris Draft, founder, Chris Draft Family Foundation, former NFL linebacker

HEAT ILLNESS

- Douglas J. Casa, PhD, ATC, FACSM, FNATA
- Rhonda Fincher, co-founder and executive director, Kendrick Fincher Hydration Foundation

BRAIN INJURY/CONCUSSION

- Kevin Guskiewicz, PhD, ATC
- Lisa Gfeller, vice president and treasurer, Matthew Gfeller Foundation, mother of Matthew Gfeller

EMERGENCY ACTION PLANS

- Jon Almquist, ATC, VATL, administrator, Fairfax County Public Schools Athletic Training Program

3:00 p.m.

Q&A AND WRAP-UP

RECOGNIZED FOR THEIR OUTSTANDING SERVICE TO YOUNG ATHLETES:

Congressman Tim Bishop (NY-1)
R. Dawn Comstock, PhD
State Rep. Keith M. Ingram (Ark.)
Beth Mallon
PBS Frontline

YOUTH SPORTS SAFETY ALLIANCE

Members as of November 2011

Academy for Sports Dentistry
www.academyforsportsdentistry.org

Advocates for Injured Athletes
www.injuredathletes.org

American Academy of Orthopaedic Surgeons
www.aaos.org

American Academy of Pediatrics
www.aap.org

American Academy of Podiatric Sports Medicine
www.aapsm.org

American Association of Cheerleading Coaches
& Administrators
www.aacca.org

American Chiropractic Association Sports Council
www.acasc.org

American College of Sports Medicine
www.acsm.org

American Football Coaches Association
www.afca.com

American Medical Society for Sports Medicine
www.amssm.org

American Orthopaedic Society for Sports Medicine
www.sportsmed.org

American Osteopathic Academy of Sports Medicine
www.aoasm.org

Athletic Heart Research Institute
www.athletic-heart.com

Athletic Training Rooms International
www.atrisportsmed.com

Brain Injury Association of California
www.calbia.org

Brain Injury Association of New Jersey
www.bianj.org

Centers for Health and Public Safety
www.lifesavingresources.org

Collegiate and Professional Sports Dietitians Association
www.sportsdietitians.org

Cook Children's Medical Center
www.cookchildrens.org

Datalys Center for Sports Injury Research and Prevention
www.datalyscenter.org

Drum Corps International
www.dci.org

ImPACT
www.impacttest.com

KEN Heart Foundation
www.kenheart.org

Kendrick Fincher Hydration Foundation
www.kendrickfincher.org

Korey Stringer Institute
www.ksi.uconn.edu

Matthew Alan Gfeller Foundation
www.matthewgfellerfoundation.org

MomsTeam
www.momsteam.com

National Academy of Neuropsychology
www.nanonline.org

National Association of School Nurses
www.nasn.org

National Association of Secondary School Principals
www.nassp.org

National Athletic Trainers' Association
www.nata.org

National Basketball Athletic Trainers Association
www.nbata.com

YOUTH SPORTS SAFETY ALLIANCE

Members as of November 2011

National Center for Catastrophic Sports Injury Research
www.unc.edu/depts/nccsi

National Center for Sports Safety
www.sportssafety.org

National Cheer Safety Foundation
www.nationalcheersafety.com

National Coalition for Promoting Physical Activity
www.ncppa.org

National Council of Youth Sports
www.ncys.org

National Interscholastic Athletic Administrators Association
www.niaaa.org

National Sports Safety Organization
www.nssousa.org

National Sportscasters and Sportswriters Association & Hall of Fame
www.nssafame.com

Nick of Time Foundation
www.nickoftime.org

NOCSAE (The National Operating Committee on Standards for Athletic Equipment)
www.nocsae.org

North American Booster Club Association
www.boosterclubs.org

North American Society for Pediatric Exercise Medicine
www.naspem.org

Parent Heart Watch
www.parentheartwatch.org

The Performance Place
www.performanceplacesportsmedicine.com

Pop Warner Little Scholars
www.popwarner.com

Professional Baseball Athletic Trainers Society
www.pbats.com

Professional Football Athletic Trainers Society
www.pfats.com

Project ADAM Texas at Cook Children's Medical Center
www.cookchildrens.org/SpecialtyServices/HeartCenter/Pages/default.aspx

Safe Kids USA
www.usa.safekids.org

Sickle Cell Foundation of Palm Beach County & Treasure Coast, Inc.
www.sicklecellpalmbeach.org

SportsConcussions.org
www.sportsconcussions.org

Sports Safety International
www.sportsafetyinternational.org

Sudden Arrhythmia Death Syndromes (SADS) Foundation
www.stopsads.org

Summa Health System
www.summahealth.org

Taylor Hooton Foundation
www.taylorhooton.org

TBI Phoenix Fund
www.phoenix-fund.org

United States Anti-Doping Agency
www.usantidoping.org

US Lacrosse
www.uslacrosse.org

USA Football
www.usafootball.com

West Coast Sports Medicine Foundation
www.wcsportsmed.com

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

Speakers



MARJORIE J. ALBOHM, MS, ATC

President, National Athletic Trainers' Association;
Director of Clinical Research and Fellowships, Ossur Americas

Marjorie Albohm travels internationally as director of Clinical Research and Fellowships for Ossur Americas and as president of the National Athletic Trainers' Association. She also serves on the board of directors for the Datalys Sports Injury Surveillance Center in Indianapolis. She is a highly regarded speaker, lecturing on a range of athletic training and sports medicine-related topics.

Albohm has received many honors, including the NATA Most Distinguished Athletic Trainer Award and the Tim Kerin Award for Excellence in Athletic Training. She was inducted into the NATA Hall of Fame in 1999 and is a former president of the NATA Research and Education Foundation. Guest appearances include the NBC "Today" show, CNN "House Call with Dr. Sanjay Gupta" and ESPN "Real Sports with Bryant Gumbel." As an expert in the field, she is quoted frequently in trade journals and consumer periodicals. She authored the book "Health Care and the Female Athlete" and co-authored "Your Injury – A Common Sense Guide to Sports Injuries" and "Reimbursement for Athletic Trainers."



JON ALMQUIST, ATC, VATL

Administrator, Fairfax County Public Schools
Athletic Training Program

Jon Almquist is the athletic training program administrator for Fairfax County Public Schools (FCPS), the largest school division in Virginia with 25 high schools with full athletic programs. Almquist provides administrative oversight to the staff of over 50 certified athletic trainers who collectively provide comprehensive athletic health care for over 25,000 student athletes annually. Almquist is the former chair of the NATA Secondary School Athletic Trainers' Committee and the Appropriate Medical Care for Secondary School Age Athlete Task Force and writing team. He has served on the Inter-Association Task Force and subsequent writing team for the Spine Injured Athlete, and on the Task Force for Exertional Heat Illness and Task Force for Sudden Cardiac Arrest.

Almquist currently serves as chair of the Athletic Training Advisory Board with Virginia's Board of Medicine and co-chair of the Sports Medicine Advisory Committee for the Virginia High School League. The FCPS Athletic Training Program maintains one of the largest epidemiology databases of injuries resulting from participation in athletics and is involved in many research projects. Almquist has been involved with concussion management research projects continuously since 1998 in areas of neuropsychological testing, sideline assessment protocols and return-to-play paradigms.



DOUGLAS J. CASA, PHD, ATC, FACSM, FNATA

University of Connecticut Neag School of Education:
Director, Athletic Training Education; Professor, Department of Kinesiology;
Chief Operating Officer, Korey Stringer Institute

For Dr. Douglas Casa, the opportunity to prevent sudden death in sport is the culmination of a life-long path; his passion for the study of exertional heat stroke started in 1985 when he suffered an exertional heat stroke while running a 10K race. This experience motivated what has become his life's cause: the study of exertional heat stroke, heat illnesses, hydration and preventing sudden death in sport – his ultimate goal is to find ways to prevent needless tragedy during sport and physical activity. In April 2010 he was asked to develop and run the Korey Stringer Institute (KSI) at the University of Connecticut. Korey was an All-Pro offensive tackle for the Minnesota Vikings who died from exertional heat stroke in August 2001. The KSI serves the public to work toward preventing sudden death in sport by education, advocacy, public policy, research, media outreach and publications. Additionally, Casa is the editor of a new book: "Preventing Sudden Death in Sport and Physical Activity."

Casa has received the medal for distinguished athletic training research and the Sayers "Bud" Miller Distinguished Educator Award from NATA. He is a fellow of both NATA and the American College of Sports Medicine. He has been a lead or co-author on numerous sports medicine position statements related to heat illness and hydration, published more than 110 peer-reviewed publications, presented more than 300 times on the topic and treated more than 144 cases of exertional heat stroke (with no fatalities). He is an associate editor of the Journal of Athletic Training and on the editorial board of Current Sports Medicine Reports, Journal of Sport Rehabilitation, and the Journal of Strength and Conditioning Research. Casa has discussed his research on the "Today Show," "Good Morning America," ESPN, CNN, PBS, Sports Illustrated, USA Today, Wall Street Journal and the New York Times.



YVETTE L. COURSEY, DPA

Chief Executive Officer, Sickie Cell Foundation
of Palm Beach County and Treasure Coast, Inc.

With advanced degrees in social work and public administration, Dr. Yvette Coursey has utilized her expertise in the areas of social work and health/human services. She has more than 30 years of experience working at the federal, state and county levels of government and the nonprofit arena in administrative and managerial positions. She has worked on behalf of such diverse client populations as the economically disadvantaged, elderly, mentally ill, chemically dependent and persons with various medical conditions. Her experiences also include work with the developmentally disabled, hereditary blood disorders and prevention programs for youth. In addition to her management skills, Coursey's competencies are in the areas of analysis and assessment; conduct of training seminars and workshops; program development and implementation; program monitoring and evaluation. She has also served on grant review panels for the county, state and federal units of government.

Coursey has provided parenting and drug prevention programs for community-based groups and organizations. Her skills have also been utilized by nonprofit and community-based organizations in goal-setting, policy development, organizational structures and board development/training activities. She is currently serving as CEO for Sickie Cell Foundation of Palm Beach County and Treasure Coast, Inc., a position she has held for more than 10 years.



CHRIS DRAFT

Founder, Chris Draft Family Foundation
Former NFL Linebacker

Chris Draft's mission is focused on making a positive difference in the lives of youth and in the community as he leads by example both on and off the field. Draft, who suffers from asthma, is the national spokesman for the National Lieutenant Governor's Association's "Winning with Asthma" program and is involved in national campaigns with the Environmental Protection Agency (EPA), the American Lung Association and the NFL Players Association. In 2006, he established his Atlanta-based foundation with the vision of empowering families to live healthy lifestyles. The Chris Draft Family Foundation's seven initiatives are Asthma Team™, Character Team™, Draft Picks™, Get Checked and Get Fit™, Literacy Leaders™, Community Improvement and Military Appreciation. Through the foundation's seven pillars, thousands of youth, adults, parents and families are impacted annually.

Draft also serves as national ambassador for the Parent Teacher Association (PTA), an official champion of the Alliance for a Healthier Generation and the regional spokesman of the Midwest Dairy Association. He has also served on the board of advisors for the Atlanta NFL Youth Education Town (NFL/YET) Boys and Girls Club for three years and remains involved as an active member of the Friends of the NFL/YET.

The 13-year NFL veteran has received a number of awards and honors for his tireless work in the community, including his selection as Man of the Year by both the St. Louis Rams and the Carolina Panthers and two time finalist for the prestigious Byron "Whizzer" White Award, which recognizes outstanding community service. In addition to numerous accolades, "Do You Want to Play Catch?" marks Draft's 2010 debut as a published author. He is a graduate of Stanford University where he earned a bachelor's degree while becoming a four-year letter winner on the Cardinal football team and a two-year member of the Cardinal baseball team.



E. RANDY EICHNER, MD

Professor Emeritus of Medicine at the
University of Oklahoma Health Sciences Center

Dr. Randy Eichner is professor emeritus of Medicine at the University of Oklahoma Health Sciences Center. Recently retired, he served as team internist for the university's Sooner football team and other varsity athletes. He is a fellow and former trustee of the American College of Sports Medicine (emeritus) and co-founder of the American Medical Society for Sports Medicine.

Eichner served as co-chair of the Inter-Association Task Force on Sickle Cell Trait and the Athlete and the resulting consensus statement. In 2011, he won the National Athletic Trainers' Association President's Challenge Award for lifetime achievement. He serves on the editorial board for *Current Sports Medicine Reports* and is a former editorial board member for *Medicine and Science in Sports and Exercise*, as well as *The Physician and Sportsmedicine*. He has written 235 articles or chapters with a recent focus on sports medicine. Since 2007, he has written a regular column in *Current Sports Medicine Reports*. He wrote a weekly health/fitness news column in the *Daily Oklahoman* for 18 years. Eichner worked on committees or workshops for the National Collegiate Athletic Association, American College of Sports Medicine, U.S. Anti-Doping Agency, NASA, Centers for Disease Control & Prevention and the National Institutes of Health.



RHONDA FINCHER

Co-Founder and Executive Director,
Kendrick Fincher Hydration Foundation

Rhonda Fincher is co-founder and executive director of the Kendrick Fincher Hydration Foundation based in Rogers, Arkansas. The foundation began in 1996 with a mission to promote proper hydration and prevent heat illness through education and supporting activities. The foundation's values are: children should have adequate access to water throughout the school day to maintain proper hydration; athletes should have frequent water/sports drink breaks; athletes should be able to get a drink at any time during practices; coaches should be trained in heat illness prevention and emergency procedures; and, parents should understand their child's hydration needs and encourage proper hydration.

Fincher's son Kendrick went to his first day of football practice on August 7, 1995 and died 18 days later from multi-system organ failure due to heat stroke. The foundation works with schools and athletic teams to educate parents, coaches and athletes on proper hydration and heat illness prevention. Fincher is author of the book "Good Night Kendrick I Love You: A Mother's Journal Through Grief." She is also a contributing writer to various publications.



LAURA FRIEND

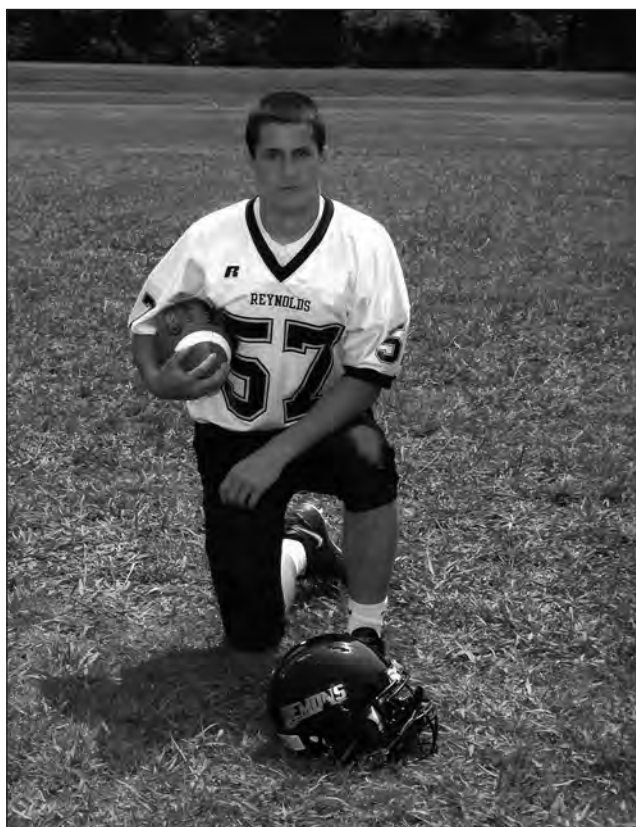
Program Coordinator,
Project ADAM Texas at Cook Children's Medical Center

Laura Friend is the program coordinator for Project ADAM Texas (Automated Defibrillators in Adam's Memory) at Cook Children's Medical Center, an initiative aimed towards education and implementation of school AED cardiac emergency programs in the state of Texas.

Since the death of her 12 year old daughter Sarah in July 2004, Friend has made enormous strides to prevent sudden cardiac death in adolescents and young adults. She created a Texas nonprofit, the Sarah Friend Heart Foundation, which has donated 59 life-saving defibrillators in Texas and trained hundreds of youth and adults in CPR/AED use. She helped form and spearhead Parent Heart Watch, a national nonprofit organization that now has over 300 advocates in the U.S. and seven countries.

Her testimony and advocacy work with legislators, lawyers and doctors contributed to the successful passage in 2007 of Texas Senate Bill 7 that requires AEDs in every Texas public school, incorporated CPR/AED training for all high school graduates and appropriated \$1 million in funding to a cardiovascular screening pilot program in schools.

Friend was a 2008 MSN National Hometown Hero (one of eight), nominated as a tribute for her efforts in protecting children from sudden cardiac arrest. She has been published in various national newspapers and magazines, including USA Today, Woman's World, Time Magazine, Fort Worth Magazine and Fort Worth Child and was a guest on the nationally syndicated "Dr. Oz Show."



LISA GFELLER

Vice President and Treasurer,
Matthew Gfeller Foundation
Mother of Matthew Gfeller

Matthew Alan Gfeller grew up a huge football fan, specifically cheering for the Oklahoma Sooners. He and his brother began playing football with the Pop Warner League. In middle school he achieved his goal to make the RJ Reynolds Varsity squad as a sophomore and to start at linebacker.

On August 22, 2008, Matthew suffered a severe helmet-to-helmet collision during his first varsity football game. It was in the fourth quarter of the game when he was playing right inside linebacker. Tragically, the accident caused a fatal traumatic brain injury. He never regained consciousness and died two days later on August 24, 2008.

The Matthew Alan Gfeller Foundation was established to positively impact the lives of other young people in Matthew's memory. The foundation supports the positive role athletics can play, but wants kids to "play it safe" and believe that head injuries can be minimized through better equipment, training, diagnosis and treatment. The foundation's community service and fundraising efforts focus on the prevention, treatment and research of sports related traumatic brain injuries. In 2010, the Matthew Alan Gfeller Sports Related Traumatic Brain Injury Research Center opened on the campus of the University of North Carolina at Chapel Hill.



KEVIN GUSKIEWICZ, PHD, ATC

Kenan Distinguished Professor and Founding Director of the Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center and the Center for the Study of Retired Athletes, University of North Carolina at Chapel Hill

Dr. Kevin Guskiewicz is the Kenan Distinguished Professor and founding director of the Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center and the Center for the Study of Retired Athletes at the University of North Carolina at Chapel Hill. He also serves as chair of Exercise and Sport Science and holds joint appointments in the Department of Orthopaedics, UNC Injury Prevention Research Center and Doctoral Program in Human Movement Science at UNC-Chapel Hill.

For the past 17 years, Guskiewicz's clinical research program has focused on sport-related concussion. He has investigated the effect of sport-related concussion on balance and neuropsychological function in high school and collegiate athletes, the biomechanics of sport concussion and the long-term neurological effects of concussion and sub-concussive impacts in retired professional football players. Guskiewicz has received 22 funded research grants and published over 125 manuscripts (85 peer-reviewed journal publications and eight textbook chapters on sport concussion). Additionally, he has presented over 200 national and international lectures. Guskiewicz also teaches courses in sports medicine, human anatomy and research methods in sports medicine. He has been awarded fellowship in the American College of Sports Medicine in 2003, the American Academy of Kinesiology in 2006 and the National Athletic Trainers' Association in 2008. In 2010 he was named to the NCAA's Concussion Committee and the NFL's Head, Neck and Spine Committee. In September 2011, he was selected for the prestigious MacArthur Fellowship, given annually to individuals who "show exceptional merit and promise for continued and enhanced creative work."



AMY ELIZABETH VALASEK, MD

Clinical Associate, Johns Hopkins Pediatric Emergency Department;
Assistant Professor, Johns Hopkins Orthopedics, Pediatric Division

Dr. Amy Valasek is an assistant professor in the Department of Orthopedic Surgery, Division of Pediatrics, and a clinical associate in the Pediatric Emergency Room at Johns Hopkins. She had previously been at Towson Orthopaedics Associates practicing primary care sports medicine. She is an active member of the American Academy of Pediatrics, Maryland Chapter Executive Committee for Nutrition and Fitness; American Academy of Pediatrics, Council of Sports Medicine and Fitness; and American Medical Society for Sports Medicine.

Valasek has written numerous articles and book chapters and published in several medical trade publications including *Clinical Pediatrics*. She received her Bachelor of Science degree in biology from Pennsylvania State University and her Master of Science in biotechnology from Johns Hopkins University. She then received her Doctor of Medicine from the University of Maryland, and continued on at Johns Hopkins for pediatric internship and residency, then primary care sports medicine fellowship at the University of Maryland.



VICTORIA L. VETTER, MD

Attending Staff Physician, Children's Hospital of Philadelphia,
Division of Pediatric Cardiology

Dr. Victoria L. Vetter is an attending staff physician at the Children's Hospital of Philadelphia in the Division of Pediatric Cardiology. She is a professor of Pediatrics at the University of Pennsylvania School of Medicine and was the director of Electrophysiology at the Children's Hospital of Philadelphia and the chief of the Division of Pediatric Cardiology, having served in this capacity for over 14 years. She was the principal investigator of the NIH/NHLBI supported Pediatric Heart Disease Clinical Research Network (at the Children's Hospital of Philadelphia) for the past 10 years — a collaboration of eight national clinical sites that conduct research studies in children with congenital or acquired heart disease. She teaches in the Public Health program at Penn.

Vetter's research interests have been in the evaluation and treatment of abnormal heart rhythms in children and in the prevention of sudden cardiac arrest. She is also the principal investigator of the Healthy Heart Screening Study, a large epidemiologic study aiming to evaluate over 15,000 children using electrocardiograms to determine the best methodology to identify children at risk for sudden cardiac arrest. She has worked with a number of community and national advocacy organizations including Sudden Arrest Death Syndromes Foundation (SADS) and the Cardiac Arrest Research and Education Foundation (CARE), Parent Heart Watch, the American Heart Association and the Philadelphia Safe Heart Coalition. She is medical director of the Youth Heart Watch at the Children's Hospital of Philadelphia, an affiliate of Project ADAM, a national program aimed at public access defibrillation and automated external defibrillator (AED) implementation within schools.

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

In Recognition

The purpose of the Alliance is to bring attention to the issue of safety in youth sports. With more than 60 member organizations, there are literally hundreds of individuals who have demonstrated a commitment to advancing preventive measures and interventions. By bringing issues forward to the public, documenting the problem through research, educating stakeholders from the athletes to parents to all those who work on playing fields and in locker rooms, by proposing legislative solutions, and by actually providing safety equipment – the following individuals have distinguished themselves as tireless advocates. They are honored today for their efforts.

REP. TIM BISHOP (NY-1)



Tim Bishop represents New York's First Congressional District which spans the eastern end of Long Island from Smithtown to Montauk Point. A lifelong resident of the area, he was first elected to Congress in 2002.

A strong advocate for America's youth, this year Congressman Bishop sponsored HR 469, the Protecting Student Athletes from Concussions Act of 2011. This legislation would provide for minimum state requirements for the prevention and treatment of concussions caused by participation in school sports. He also sponsored HR 6172 for the same purpose in the 111th Congress.

Rep. Bishop introduced this legislation in order to build on actions of Washington, Oregon, and others in asking school districts across the country to implement a concussion safety and management plan.

"Concussions are an unfortunate reality of competitive sports from the sandlot to the Super Bowl. This legislation will raise awareness of this very prevalent injury among high-schoolers, help teachers identify the subtle warning signs of concussion in classroom performance and provide guidance for parents and coaches on when it is safe for a concussed athlete to return to the playing field."

The legislation requires that individual school districts design plans to educate students, parents and school personnel about concussion safety and how to support students recovering from concussions. Schools also must post information about concussions on school grounds and websites, and are encouraged to implement a "when in doubt, sit it out" policy for students suspected of sustaining a concussion during a school-sponsored athletic activity.

R. DAWN COMSTOCK, PHD



Dawn Comstock, PhD, has dedicated much of her professional life to research and the epidemiology of injury among the physically active. In particular her work focuses on the study of sports, recreation and leisure-time activity-related injuries among children and adolescents as well as the life-long health benefits associated with an active childhood.

She is an associate professor at the Ohio State University College of Medicine, Department of Pediatrics and College of Public Health, Division of Epidemiology and a research faculty member at the Center for Injury Research and Policy (CIRP), the Research Institute at Nationwide Children's Hospital. As a result of her continued examination of youth sports and injury surveillance, Comstock is considered one of the country's leading experts on the topic, and her studies have had wide reaching impact and attention across the national landscape.

Her groundbreaking look at incidence of gender and injury has resulted in front page national and trade media coverage and influenced the way related injuries are prevented and treated. In 2007 she reported in a study published in the *Journal of Athletic Training* that high school girls were more likely to experience concussion in soccer than boys; and she later took a closer look at the types of signs and symptoms – by gender – that young athletes experience. These insights, along with the extensive research she has continued to do on the high school and collegiate fronts have helped to shape injury prevention and treatment protocols at every level of school sports.

Comstock believes that to combat the epidemic of obesity in our country children must be encouraged to get up off the couch and participate in physically active sports, recreation and leisure activities. However, a certain endemic level of injury can be expected in any physical activity. The challenge is to monitor injury trends through surveillance; to investigate the etiology of preventable injuries; to develop, implement, and evaluate protective interventions; and to responsibly report epidemiologic findings of injury research while promoting a physically active lifestyle for children and adolescents.

Comstock's dedication to her profession and continued publication of studies make her an invaluable resource to the organizations closely monitoring and adopting new medical protocols that protect today's young athletes.

REP. KEITH M. INGRAM (ARKANSAS)



Rep. Keith M. Ingram of Arkansas successfully shepherded HB 1743 through the 2011 Arkansas Legislature and it is now known as Act 1214 “to promote the health and safety of students in public school athletic activities through the use of athletic trainers and professional development for coaches.”

This legislation is unique. Though 35 states and the District of Columbia have acted to protect students from the potentially catastrophic results of severe or repeated concussions, Ingram took his state a few steps further.

His bill, which is included in this book, covers a variety of potential dangers for young athletes. School districts in Arkansas will be required to develop procedures that include recognition and management of concussion, dehydration, or other emergencies; environmental issues that threaten health or safety of students; and communicable diseases. Further, the bill sets up a pilot grant program to provide access to certified athletic trainers in schools.

Rep. Ingram’s legislation will have far-reaching impact on the health and safety of Arkansas students.

BETH MALLON



Beth Mallon is an inspirational and dedicated one-woman show who turned a devastating personal situation into a crusade for better youth sports safety health care and awareness. Her impact is making a difference not only to her local San Diego community but to the nation at large.

Mallon, along with her son Tommy, established Advocates for Injured Athletes (AIA), a 501(c)3, in October 2010. The foundation was created after Tommy suffered a career ending catastrophic injury in the final game of his senior high school lacrosse season. While running for a ground ball he collided with an opponent. Initially, the hit did not appear to be anything out of the ordinary, but Tommy did not immediately get up off the field. He was experiencing slight numbness at the back of his head, but his impulse was to “shake it off” and get back in the game. His athletic trainer did not permit Tommy to get up, despite his request to do so. That decision likely saved his life.

Tommy was spine boarded and taken by ambulance to a nearby trauma hospital, was told he had suffered a concussion, that his neck was fractured (C1) and that one of his vertebral arteries had been dissected, which allowed blood to leak out of the artery and caused a dangerous clot to form. He was lucky to be alive but he was at serious risk of grave consequences from his injury. He was transferred to the ICU and subsequently underwent months of challenging and oftentimes painful treatments and therapies. He will never play contact sports again but his spirits and interest in helping others have remained high. He often shares his story with middle school and high school athletes, coaches and parents and has also partnered with Scripps Memorial Hospital in La Jolla, Calif., to promote concussion education.

The experience inspired Tommy, who is now a sophomore at the University of San Diego, and Beth to establish AIA with the mission of promoting sports safety through education. The organization has two primary goals, to educate the public on the essential need for certified athletic trainers to be present at all athletic events and to educate student athletes on recognizing signs and symptoms of potentially life threatening conditions. AIA has also created a unique education program called Athletes Saving Athletes™ slated to launch early 2012 in San Diego County high schools.

The Athlete Saving Athletes full day seminar will be taught by certified athletic trainers. Participating athletes will be trained in how to recognize signs and symptoms of concussion, head and neck injuries, sudden cardiac arrest and heat illness. In addition, all athletes attending the seminar will be CPR and AED-certified. The athletes will be empowered to help save lives by knowing how to recognize signs and symptoms of life threatening situations. Tommy has also helped launch a concussion education video that will be released next year.

Beth’s most recent and compelling educational videotape that highlighted Tommy’s story and the mission of AIA had far-reaching consequences and impact on the athletic training community and beyond. It has become a YouTube frequently downloaded segment and its hard hitting and compassionate message of education and care resonates through every frame.

PBS FRONTLINE



"Football High" Shown: Samuel Harvill from Shiloh Christian High School gets his elbow taped during a game against the Eules Trinity Trojans at Cowboys Stadium in Dallas in 2010.
Credit: Kyle Coburn for FRONTLINE

Corporate sponsorships, nationally televised games, minute-by-minute coverage on sports websites, high school football has never been bigger – or more competitive. In "Football High," a FRONTLINE production with Ark Media that aired on PBS in April 2011, FRONTLINE investigated the new face of high school football and what is being done to ensure the players' safety as the intensity of the sport grows. The documentary examined real life-and-death incidences of heat illness and head injuries, and beyond the broadcast, FRONTLINE expanded its coverage to include online chats with medical experts and provided extensive information for parents, players, coaches and media to sustain this vital dialogue.

FRONTLINE centered its investigation in Arkansas, where two players collapsed from heatstroke last year while practicing during one of the hottest summers on record. The players were placed in the same intensive care unit in Little Rock, both having suffered extensive damage to their internal organs. One boy survived, but the other boy died in the hospital three months after his collapse.

In the wake of the tragedy in Arkansas, FRONTLINE investigated the differences in the two boys' fates. Only one of the boys' teams had an athletic trainer on staff, which reflects the reality in most of Arkansas: only 15 percent of the schools in the state have a certified medical professional at games and practices – below the national average.

The program also investigated the estimated 60,000 concussions suffered each year by high school football players. In 2010, researchers discovered a degenerative mental disease in the brain of 21-year-old Owen Thomas, a University of Pennsylvania football player who committed suicide last year – and had never reported a concussion throughout his football career. Thomas' brain showed evidence of CTE, or chronic traumatic encephalopathy, the same mental degenerative disease rampant in the brains of NFL players with serious mental problems.

FRONTLINE producers Rachel Dretzin and Caitlin McNally led the team that created this groundbreaking special report at a time when youth sports safety legislation was and continues to be considered at both the state and national levels. Recent months have seen an increase in states passing laws that ensure the appropriate on-site medical care and clearance of the athlete to return to play. FRONTLINE's behind the scenes look at the level of play and incidence of heatstroke and head injuries – and the vital need for continued education to treat and prevent it – has raised national awareness of these issues and made a difference in the way youth sports are played today.

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

Updates

During 2011, Alliance members have been busy developing and refining initiatives to promote youth sports safety. Following are their reports – along with a recap of legislative progress on concussion at the state and federal level.

STATE AND FEDERAL LEGISLATIVE ACTIVITY, 2011

PROVISIONS OF STATE CONCUSSION LAWS
AS OF 9/30/11

Year Enacted	State	Removal from Play	Medical Clearance	Education	Informed Consent
2011	AL	Yes	Licensed Physician	Coaches	
2011	AK	Yes	Licensed HCP trained in concussion, or allied professional working under direction of physician	Coaches, athletes, parents	Yes
2011	AR		For all events/conditions (concussion, dehydration, or other health emergencies; environmental issues that threaten; communicable diseases), school districts will adopt policies		
2011	AZ	Yes	RTP with medical clearance by MD, NP, PA, or AT w/training in evaluation and management of concussion	Coaches, athletes and parents	Yes
2011	CA	Yes	RTP with clearance by licensed HCP		Yes
2011	CO	Yes	RTP only with medical clearance by MD, DO, NP, PA, or psychologist with training in neuropsychology or concussion evaluation and management. ATs may be involved in graduated RTP	Coaches	
2010	CT	Yes	Physician, PA, APRN or AT trained in eval/management of concussion	Coaches; coaches required to get permit	
2011	DC	Yes	Licensed or certified HCP	TBD by Mayoral rule	Yes
2011	DE	Yes	Medical clearance by MD or DO; for step progression RTP may be monitored by AT	Coaches	Yes
2010	ID			Coaches, athletes, parents	
2011	IA	Yes	RTP only with medical clearance from MD, PA, DC, NP, RN, AT, or PT	Coaches, athletes, parents	Yes
2011	IL	Yes	RTP with clearance from MD, APN, or PA		
2011	IN	Yes	RTP with clearance from licensed HCP with training in evaluation and management of concussion	Coaches, athletes, parents	Yes
2011	KS	Yes	RTP with medical clearance from physician		Yes
2011	LA	Yes	RTP with clearance from MD, PN, PA, or psychologist trained in concussion evaluation and management.	Coaches	Yes
2010	MA	Yes	RTP with written authorization from physician, neuropsychologist, AT or "other appropriately trained or licensed health care professional as determined by the department of public health"	Coaches, ATs, parents and volunteers; physicians and nurses who work or volunteer with extracurricular activity; school ADs; directors of marching bands	Yes

STATE AND FEDERAL LEGISLATIVE ACTIVITY, 2011

PROVISIONS OF STATE CONCUSSION LAWS
AS OF 9/30/11

Year Enacted	State	Removal from Play	Medical Clearance	Education	Informed Consent
2011	MD	Yes	RTP with medical clearance from HCP trained in evaluation and management of concussion	Awareness for coaches, school personnel, and parents	Yes
2011	MN	Yes	RTP with medical clearance from licensed HCP trained in evaluation and management of concussion	Inform coaches, officials, athletes and parents	Yes
2011	MO	Yes	RTP after evaluation by licensed HCP trained in evaluation and management of concussion, and written clearance from that provider	Coaches, athletes, and parents	Yes
2011	NE	Yes	RTP with medical clearance from MD, AT, neuropsychologist or other experienced in diagnosis & management of TBI among pediatric population	Training for coaches; education for athletes and parents	
2011	NC	Yes	RTP with clearance from MD w/training in concussion or a health care provider working with an MD (neuropsychologist, AT, PA, or NP); also requires venue-specific EAP	Coaches, nurses, ADs, volunteers, athletes and parents	Yes
2011	ND	Yes	RTP with medical clearance from physician	Officials, coaches, and ATs	Yes
2010	NJ	Yes	Physician trained in evaluation and management of concussion	Coaches, athletes, parents; requires ATs to have CE in concussion	Yes
2010	NM	RTP	RTP with release from MD, DO, NP, PA, psychologist, ATC	Coaches, athletes, parents	Yes
2011	NV	Yes	RTP with medical clearance by MD, PT, or AT		Yes
2011	NY	Yes	Minimum 24 hour removal from play; RTP with medical clearance by licensed physician	Coaches, PE teachers, nurses, and athletic trainers	
2010	OK	Yes	RTP with medical clearance by licensed HCP trained in evaluation and management of concussion	Coaches, athletes, parents	Yes
2009	OR	Yes	RTP with medical release from a health care professional (includes AT)	Coaches	
2011	PA	Yes	MD, AT, or neuropsychologist trained in evaluation and management of concussion	Coaches	Yes
2010; 2011	RI	Yes	RTP with medical clearance by MD; 2011 law allows physician to consult with an AT and both must be trained in evaluation and management of concussion	Coaches, athletes and parents	
2011	SD	Yes	RTP with written authorization from licensed HCP	Coaches, athletes, parents	Yes

STATE AND FEDERAL LEGISLATIVE ACTIVITY, 2011

PROVISIONS OF STATE CONCUSSION LAWS AS OF 9/30/11

Year Enacted	State	Removal from Play	Medical Clearance	Education	Informed Consent
2011	TX	Yes	After evaluation by physician, completion of RTP protocol requirements to be established by "Concussion Oversight Team" of school district, written release by physician.	Coaches, staff health care professionals, every 2 years; (coaches must have minimum 2 hour course)	Yes
2011	UT	Yes	Qualified HCP trained in evaluation and management of concussion within the last three years		Yes
2010	VA		Requires Board of Ed to develop guidelines		
2011	VT		RTP requires medical clearance from licensed HCP trained in evaluation and management of concussion	Coaches, athletes, parents	Yes
2009	WA	Yes	As approved by WA State Athletic Association (Approved: MD, DO, PA, NP, AT)	coaches	
2011	WY	Yes	May not return on same day and after only with medical release	Coaches, athletic trainers, parents or volunteers; also physicians and nurses who work or volunteer with extracurricular activity; school athletic directors; directors of marching bands	

FEDERAL LEGISLATION 2011

- Protecting Student Athletes from Concussions Act of 2011 (HR 469)
 - Child Protection Improvement Act (HR 1360 and S 645)
 - Safe Routes to Schools Program Reauthorization (S 800)
 - Successful, Safe and Healthy Students Act (S 919)
- CDC implementation of provisions of the Concussion Treatment and Care Tools Act (ConTACT Act)
- Children's Sports Athletic Equipment Safety Act (HR 11237 and S 601)

Advocates for Injured Athletes has made significant progress in two areas over the past year:

- Educating the public regarding the need for Certified Athletic Trainers at all athletic events, and
- Creating a unique education program for student athletes called “Athletes Saving Athletes™” that we hope to see adopted on a national level

Our approach over the past year has been to bring the important education directly to the athletes. We believe that if athletes begin to recognize the signs and symptoms of potentially life-threatening situations, they will be empowered to help prevent sudden death. We are currently focused on educating athletes on the signs and symptoms of concussion, head and neck injuries, sudden cardiac arrest, heat illness, asthma, and diabetes.

We will be launching the pilot Athletes Saving Athletes program in 10 high schools in San Diego County beginning early 2012. We hope to gain the attention of student athletes with the help of three amazing athletes who survived different life-threatening athletic situations and are now serving as the face of Athletes Saving Athletes:

- Brittan Sutphin survived sudden cardiac arrest
- Will James survived heat stroke
- Tommy Mallon survived a concussion, a fractured C1 vertebrae, and a dissected vertebral artery

All three athletes survived, thanks to individuals that had been educated on how to recognize signs and symptoms of life-threatening conditions. All three athletes have joined Advocates for Injured Athletes and have committed to helping us educate student athletes through this unique new education program.

Athletes that participate in the Athletes Saving Athletes program will be trained in recognizing signs and symptoms of life-threatening medical conditions and will become certified in CPR and AED through the program. Our pilot program will focus on educating 30 athletes per high school—300 athletes total. We are hoping to educate a team captain from every sport on campus, with the goal of making each competition and practice safer with at least one athlete trained in the signs and symptoms of concussion, head and neck injuries, sudden cardiac arrest, heat illness, asthma, and diabetes. Participating athletes will become Athletes Saving Athletes Ambassadors and will be responsible for, in turn, sharing the information with their teammates.

We hope this unique education program will help reduce the number of student athlete fatalities.

Beth Mallon Co Founder Advocates for Injured Athletes

www.injuredathletes.org



October 5, 2011

Youth Sports Safety Alliance
c/o Ellen Satlof
National Athletic Trainers' Association
2952 Stemmons Freeway
Dallas, Texas, 75247

Dear Ellen,

The Brain Injury Association of New Jersey has a long-standing commitment to addressing prevention of brain injury, and raising awareness about the seriousness of concussion among young athletes. Since its inception in 1981, the Association has worked towards the prevention of brain injury, especially among our youth, including the prevention of brain injury and concussion in sports and recreation. In 2004, the Association formed a Concussion in Youth Sports Committee that began with a summit where groups interested in the well-being of our young athletes met and learned the most current information available about concussion. The Committee developed a Consensus Statement that was endorsed statewide by groups such as: the Medical Society of New Jersey; Academy of Pediatrics, New Jersey Chapter; New Jersey Football Coaches Association; New Jersey Trauma Center Council; New Jersey State School Nurse Association; New Jersey Education Association; and many more.

The work of the Committee continued over the years with the development of www.sportsconcussion.com and sports concussion materials that included a concussion tear off pad for school nurses, coaches and athletic trainers to send home to parents when a concussion happened and posters to raise awareness of sports concussion in the schools and recreation programs in the community. The work of the Committee culminated in the recent signing of concussion legislation in New Jersey that requires that athletes, coaches, and parents and guardians are educated about the nature and treatment of concussions and other sports-related head injuries, and that all measures are taken to prevent a student-athlete from experiencing second-impact syndrome and the effects of multiple concussions. As the legislation goes into effect in schools around New Jersey this fall, the work of the Committee continues, as we do not see this as the end to our efforts but rather the beginning.

Sincerely,

Barbara Geiger-Parker
President and CEO



September 29, 2011

Marjorie J. Albohm, MS, ATC
President
National Athletic Trainers Association
2952 Stemmons Freeway
Dallas, TX 75247

Dear Marje:

On behalf of the Datalys Center for Sports Injury Research and Prevention, I am proud to provide a report of our activities over the past year to the Youth Sports Safety Alliance. As you know, the Datalys Center is currently conducting an injury surveillance and health outcomes study of secondary school athletes in partnership with National Athletic Trainers' Association Research and Education Foundation. While not specific to sudden death, we believe the study will have an overall positive impact for the safety of secondary school athletes.

Additionally, the Datalys Center has partnered with USA Football to examine injury patterns in youth football players ranging from 7 to 14 years of age. Again, not specific to sudden death, but we also believe this study will also have a positive impact in the prevention of injuries in youth football making the game safer.

We commend the efforts of the many members of the Youth Sports Safety Alliance members, but we believe more can always be done to make sport and physical activity safer for our youth. This is especially true regarding sudden death and catastrophic injuries. We commend the Youth Sports Safety Alliance in their efforts to bring these researchers and thought leaders together to discuss these unique challenges.

Sincerely,

Thomas P. Dompier, PhD, ATC
President



Kendrick Fincher Hydration Foundation
mail PO Box 1287 Rogers, AR 72757
location 812 West Cypress Street Rogers, AR
phone 479-986-9960
fax 866-316-9954
e-mail info@kendrickfincher.org

The Kendrick Fincher Hydration Foundation has been educating parents, athletes and coaches about proper hydration and heat illness prevention since 1996. The foundation's focus has always been on prevention, with additional information on emergency procedures in the event of heat illness.

Key points of what we have learned and what we teach:

Children start sports at a young age and education needs to start in kindergarten to instill proper habits. The "Beehydrated" program we started in 2005 educates K-5th grade students on proper hydration and healthy drink choices.

Parents need to be educated so they know what their child's hydration needs are and be courageous to speak up when they are not getting the fluids or breaks that they need at practices or games. The Hydration Campaign (www.hydrationcampaign.com) was designed to ensure coaches, parents, and athletes are all aware of hydration needs and heat illness prevention and emergency procedures.

Parents, coaches and athletes learn in our "beat the heat" program that they need to work together as a team to prevent heat illness. The three key components of proper hydration to prehydrate, hydrate, and rehydrate are a responsibility they share.

School administration and teachers need to embrace the healthy habit of allowing water bottles with a child throughout the school day to ensure all children are getting the liquids they need throughout the day. Water fountains are great for refilling a water bottle, but provide little liquid when making a quick stop between classes or standing in a line of 25 students and being moved through quickly to let all students get a sip. In addition to ensuring the child is properly hydrated for after school activities, the students will learn better if they are properly hydrated.

Much still to do:

As a grass-roots nonprofit organization, it has been a long and continuous struggle to get the attention of the public and the funding necessary to continue. For many years we were a sole and lonely voice coming out of Northwest Arkansas. We are excited to have the Korey Stringer Institute providing much needed expertise and education for heat illness prevention and emergency procedures.

With enough people speaking up and recognizing that heat illness deaths are not acceptable, we can ensure that our children and athletes can compete AND stay healthy and safe.

Rhonda Fincher
Executive Director
Kendrick Fincher Hydration Foundation

Korey Stringer Institute

University of Connecticut
Neag School of Education
249 Glenbrook Rd. U-2064
Storrs, CT 06269
P: 860-486-0065 F: 860-486-1846
Email: ksi@uconn.edu
Site: ksi.uconn.edu

Founder, CEO & Spokesperson

KELCI STRINGER
Chief Operating Officer
DOUGLAS CASA, Ph.D., ATC

Board of Advisors

JAMES GOULD - *CHAIR*
The Walnut Group
JASON BELSER
NFL Players Association
HERBERTO CALYES
TIMEX Corporation
MICHAEL CHASNOFF
Triumvir Inc.
MAXINE CLARK
Built-A-Bear Workshop, Inc.
GARY GELTZOG
National Football League
SCOTTIE GRAHAM
Friend/Teammate of Korey's
EDWARD HARRISON
Cantor Fitzgerald Investment Advisors
CARL MARESH, Ph.D.
University of Connecticut
FREDERIC MAYERSON
The Walnut Group
ORLANDO PACE
Retired All-Pro NFL Player
SCOTT PADDOCK
International Speedway Corporation
BRUCE ROLLINSON
Major Doc H.S. Football Coach
JOHN SHEA
Gatorade

Medical & Science Advisory Board

DOUGLAS CASA, Ph.D., ATC *CHAIR*
University of Connecticut
LAWRENCE ARMSTRONG, Ph.D.
University of Connecticut
EDUISAY BAKER, Ph.D.
Castroville Sports Science Institute
RON COURSON, PT, ATC, EMT
University of Georgia
DAVID CSILLAN, MS, ATC
Ewing High School
JONATHAN DRIZNER, MD
University of Washington
JAY HOFFMAN, Ph.D., CSCS
University of Central Florida
GLEN KENNY, Ph.D.
University of Ottawa
REBECCA LOPEZ, Ph.D., ATC, CSCS
University of South Florida
THOM MAYER, MD
NFL Players Association
BRENDON MCDERMOTT, Ph.D., ATC
University of Tennessee Chattanooga
FRAN O'CONNOR, MD
Endosomal Services University of the Health Sciences
MARGOT PUTUKIAN, MD
Princeton University
MICHAEL RYAN, MS, ATC, PT
Jacksonville Jaguars
MARK VERSTEGEN, MS, CSCS
Athletes Performance
SUSAN YEARGIN, Ph.D., ATC
Illinois State University

Korey Stringer Institute Staff

REBECCA STEARNS, MA, ATC
VP of Operations & Chief Education Officer
JULIE DEMARTINI, MA, ATC
Chief Research Officer
KELLY PAGNOTTA, MA, ATC
Chief Information Officer
MATTHEW GANIO, Ph.D.
Chief Statistical Officer
RIANA PRYOR, MS, ATC
Vice President of Research
ROBERT HUGGINS, MS, ATC
Director, Elite Athlete Health & Performance
LESLIE WILLIS, ATC
Vice President of Information
LUKE BELVAL
Special Projects Coordinator
JILL LIVINGSTON
Research Services Librarian



Founding of the Korey Stringer Institute

In August 2001 Korey Stringer, a Minnesota Vikings offensive lineman, died from exertional heat stroke. Since the time of Korey's death, Korey's wife, Kelci Stringer, has worked tirelessly to develop a heat stroke prevention institute to honor her husband's legacy. To that end, in 2009 she joined forces with exertional heat stroke expert Douglas Casa, Ph.D., ATC, from the Department of Kinesiology in the Neag School of Education at the University of Connecticut, to make this dream a reality, establishing the Korey Stringer Institute (KSI) in partnership with the National Football League and Gatorade.

The Korey Stringer Institute Mission Statement

The mission of the Korey Stringer Institute is to provide first-rate information, resources, assistance, and advocacy for the prevention of sudden death in sport, especially as it relates to exertional heat stroke.

The Korey Stringer Institute is housed at the University of Connecticut's Neag School of Education. UConn has a strong tradition as one of the leading institutions studying heat & hydration issues related to athletes and the physically active. In its beginning, the institute has also partnered with the NFL and Gatorade to further support its efforts and goals.

Korey Stringer Institute Goals

The institute services the needs of youth, high school, college, professional, and recreational athletes and those who are physically active, as well as those who supervise and care for these individuals. Components of these endeavors include: Consultations, advocacy, education, research, change grants, and mass market outreach.

The Korey Stringer Institute has already worked with and helped many prominent organizations. Highlights of these accomplishments are included below:

- Timex was recently added as a corporate sponsor.
- Continuously working with hundreds of other schools, universities, individuals, professional teams, governing bodies, and state governments to enhance policies regarding prevention of sudden death in sport.
- We assisted the state of Arkansas with new heat-safety policies.
- We are currently working with 50 elite triathletes (w/Timex) to improve performance/safety in the heat.
- A sampling of other organizations and individuals that KSI has assisted with education, policies, advocacy, research, and information include: the U.S. Army, American Football Coaches Association (AFCA), National Collegiate Athletic Association (NCAA), National Athletic Trainers' Association (NATA), National Strength and Conditioning Association (NSCA), American College of Sports Medicine (ACSM), Centers for Disease Control and Prevention (CDC), Safe Kids, Advocates for Injured Athletes, International Tennis Federation, NFL, NFLPA, NBC, ABC, USA Today, the Washington Post, the New York Times, Youth Sports Safety Alliance, the National Air and Space Administration (NASA), the Boston Marathon, numerous state organizations, among many others.

If you know of any organization or school that may be interested in our assistance please have them contact us at: ksi@uconn.edu or call 860-486-0265



Gifts to support The Korey Stringer Institute may be made through the UConn Foundation, Inc. a tax-exempt 501(c)(3) corporation dedicated exclusively to benefit the University, and are deductible for federal income tax purposes to the extent allowable by law. All gifts will be used to benefit The Korey Stringer Institute and its mission.



Ellen Satlof
Public Relations Manager
National Athletic Trainers' Association
2952 Stemmons Freeway
Dallas, TX 75247
www.nata.org
972-532-8859

This letter serves to verify that The Matthew Alan Gfeller Foundation supports the call to action of the Youth Sport Safety Alliance. This alliance is committed to their mission of preventing catastrophic injuries and death in young athletes and our Foundation strongly supports their efforts.

The Matthew Alan Gfeller Foundation (www.matthewgfellerfoundation.org) was established to positively impact the lives of other young people in Matthew's memory. The Foundation supports the positive role athletics can play in our kids' lives, but want kids to "play it safe" and believe that head injuries can be minimized through better equipment, training, diagnosis and treatment. Our community service and fundraising efforts focus on the prevention, treatment and research of sports related traumatic brain injuries.

In 2010, the **Matthew Alan Gfeller Sports Related Traumatic Brain Injury Research Center** opened on the campus of the University of North Carolina at Chapel Hill.

Lisa Gfeller
The Matthew Gfeller Foundation
www.matthewgfellerfoundation.org
336-725-3587

**MATTHEW GFELLER FOUNDATION
2880 GALSWORTHY DRIVE
WINSTON-SALEM, NC 27106**



Brooke de Lench, CEO
60 Thoreau Street ~ Floor 2
Concord, Massachusetts 01742
delench@momsteam.com www.MomsTeam.com
+1 800 474 5201

October 10, 2011

Twelve years ago I founded MomsTeam.com with the mission to make youth sports; safer, saner, less stressful and more inclusive. Looking back on the journey we have taken as a team of experts who produce a comprehensive resource for parents of youth and high school experts, I am proudest of the tremendous awareness and strides we have made to keep all of our children safe.

This has been a true team effort. I may be the captain of this team, the one with the vision and wisdom to keep us out front for all these years, but the dozens of medical, nutritional, psychological and athletic experts who have come together to form MomsTeam are the ones who provide real life solutions for the moms, dads and caretakers of young athletes. Along with our editors, writers, videographers and web technicians, these are people who have provided thousands of hours to educating and informing about everything a sports parent needs and wants to know.

As I surf through the thousands of pages of information on the MomsTeam website, I am proudest of the work we have done in our Health and Safety Channel. We and many others can honestly say that MomsTeam are "the pioneers in youth sports concussion information," and our Concussion Safety Center has been the most comprehensive resource for sports parents since 2000, long before concussions were on anyone's radar screen. We are proudest of the lives we potentially have saved.

We are also proud of our cardiac awareness and heat illness center. We know we have saved lives by warning and educating parents at the national and local levels. The MomsTeam Health and Safety center is now over 3,700 pages deep and growing exponentially ever week.

The one thing that is out of our hands is the budget line items at every school and in every club in the nation for athletic trainers. We do our best to educate parents, coaches and administrators on the critical need for ATs and have seen increased awareness as a result of our efforts, and those of others.

But we won't rest until each and every team has at least one athletic trainer on site for every game and practice, because all the information we provide will go for naught if a child suddenly dies while playing their sport because there was no AT present to save them. It all comes down to the first responders: educated medical professionals, who can spring into action without going into shock as many bystanders and fans often do, are truly the ones who will make the difference when it matters.

MomsTeam has long supported the NATA, published its position statements, and done everything it can to promote the outstanding work of the organization and its members, and looks forward to continuing and strengthening our relationship with the NATA in the months and years to come.

Sincerely,

Brooke de Lench



The National Athletic Trainers' Association (NATA) views the athletic training profession as the leading advocate and expert in the fight to protect America's young athletes from catastrophic injury and illnesses or death on the practice and playing fields. As health care professionals who provide services to these players season after season, athletic trainers have a 60+ year tradition of proactively seeking newer and better ways to keep them safe and address problems when they arise.

Many health care, parent, coach and sports organizations are diligently working on a wide spectrum of solutions to various aspects of the athlete safety crisis. We believe it is our duty to serve as a catalyst and organizer to bring these groups together to effect rules and laws, increase awareness, improve health and safety conditions, and even affect cultural attitudes toward injuries.

In the past year, NATA has:

- Directly and indirectly encouraged a wide range of organizations to join the Youth Sports Safety Alliance (www.youthsportssafetyalliance.org), now with more than 50 members.
- Hosted the second Youth Sports Safety Summit (Washington, DC, December 7, 2010).
- Provided almost exclusive financial, human resource and professional services support to the YSSA.
- Garnered national media attention, resulting in extensive coverage reaching millions of Americans to raise awareness of the potential for catastrophic sports injuries.
- Lobbied more than 30 state legislatures for enactment of concussion and sports safety laws.
- In Congress, sponsored Capitol Hill Briefing with the Campaign for Public Health Foundation on injury prevention.
- Worked with Congress to encourage the CDC to implement provisions of the Concussion Treatment and Care Tools Act (ConTACT).
- Released new scientific position statements on pediatric overuse injuries and safe weight loss and maintenance practices in sport and exercise.
- Won the "Power of A" Award from the American Society of Association Executives for our work with the Alliance.
- Reminded all state athletic associations of the importance of appropriate medical care and supervision of secondary school athletes, and asked them to include athletic trainers as approved health care professionals in making return-to-play-after-concussion decisions.
- Developed an online and in-person educational sports safety course for youth coaches.
- Spoken at press event with the Congressional Caucus on Youth Sports to focus on athlete safety.
- Had member participation in Congressional field hearing on sports concussion management.
- Continued to educate more than 34,000 athletic trainers and other sports medicine professionals on the prevention, assessment and rehabilitation of sport injuries and illnesses.
- Supported critical research through the NATA Research and Education Foundation.
- Begun collecting injury surveillance data through our NATA NATION research initiative.

October 2011



October 3, 2011

National Athletic Trainers Association
Attn: Ellen Satlof
Public Relations Manager
2952 Stemmons Freeway
Dallas, TX 75247

Dear Ellen:

As a leading provider for sports safety education, the National Center for Sports Safety (NCSS) recognizes the crisis of sports injuries and sports related fatalities in this country. Since 2004, our non-profit organization has worked to educate coaches across America, on injury prevention, recognizing injuries, and emergency action planning.

Founded in 2001 by world-renowned sports medicine orthopedic surgeon, Dr. Lawrence Lemak, the NCSS' mission is to promote the importance of injury prevention and safety on all levels of youth sports through education and research.

Since 2004, NCSS has focused on developing a sports safety course (PREPARE) designed for educating coaches. The result has been a peer-reviewed, scalable and cost-effective course, which has educated over ten thousand coaches nationally. In addition, in 2010, the NCSS built a sports safety video for parents and athletes. This resource is a helpful tool for parents and athletes to also take a proactive approach to injury prevention, recognition, and sports safety.

There are legions of parents who are going to question, now as never before, their child's welfare during sports activities. Our culture says sports are an important part of personal development. NCSS stands ready to expand the PREPARE course and further sports safety resources to the scale of need.

The National Center for Sports Safety fully supports any attention to preventing injuries and creating awareness, and since 2001, has strived to "Raise the Standard" in youth sports. "There is not one parent that would drop their child at a local community pool if there were not a certified lifeguard on duty. That same standard of care should be available at every sports facility in this country," Dr. Lawrence Lemak.

We fully support the initiative to create a safer environment for all of our young athletes, and applaud the tireless work in creating attention to this national safety issue.

Sincerely,

Kathryn Gwaltney
Executive Director

2316 1st Avenue South
Birmingham, Alabama 35233
www.SportsSafety.org

Overview: Cheerleading Safety in 2011

The skill sets of cheerleading: Acrobatics & Tumbling governed by the National Collegiate Acrobatics & Tumbling Association has completed all of the requirements to receive Title IX status by the Office of Civil Rights.

At the present time the National Cheer Safety Foundation is the leader in cheerleading safety and will soon have a coaches certification program that will be one of the best in the country.

—Dr. Frederick Mueller, National Center for Catastrophic Sports Injury Research

What most people don't know about cheerleading is that it has the highest rate of catastrophic injury to female athletes for either high school or college, AND the highest rate of athlete recovery from catastrophic injury.

—Krista Parks-Robinson, Executive Director, Broke neck in 3 places during cheer in 2002

The skill sets of cheerleading, acrobatics and tumbling being classified as a sport, is all about safety.

—Kimberly Archie, Founder

"I remember I was on a plane and I actually wrote down the meet format and what it should look like, and then I got together with colleagues and it became a group effort," Mulkey said. "But I remember saying there's going to be a point when there's a national championship, and we'll completely break away from cheerleading."

—Felecia Mulkey, Head A&T Coach at University of Oregon, 2010 Inaugural National Champions, & Creator of the A&T Format

Did you know... that in 28 years of data collection at the National Center for Catastrophic Sports Injury Research 64.5% of high school female athletes and 71.4% of college female athletes are injured in cheerleading, including the number one cause of traumatic brain injury.

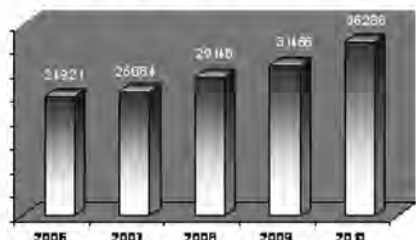
—Mueller F. O., Cannu R. C. Twenty-Seventh Annual Report for Catastrophic Sports Injury

Body Parts Injured in Cheerleading in 2010



Face, head, neck and shoulders account for 11,332 or 31.2% of total ER visits!!

of ER Visits In Cheer Over the Last 5 Years



That is a 45% increase over only 4 years!!

U.S. Consumer Product Safety Commission. NEISS All Injury Program. Washington, DC: 2010.

Sport Safety "Firsts" by the National Cheer Safety Foundation

- Created the first online cheer injury reporting system in 2006
- Provided for free the first downloaded pdf of the most comprehensive rehearsed catastrophic emergency plan for sports now adopted by over 2000 organizations worldwide
- Implemented the first 7 day graduated return to play guidelines for concussion for sport.
- The research of catastrophic injuries by the NCSF panel of experts identified for the first time the patterns of Child Athlete Abuse Syndrome and how to prevent and treat.
- Hosted the first Medical-Legal Summit to address Child Athlete Abuse Syndrome in Boston, MA April 2010
- First sport safety organization to generate over \$100 million in media placements discussing injuries in only 3 years in news sources such as the Wall Street Journal, People magazine, the New York Times, the Washington Post and the Economist
- Launched 11/11/11 the first sport coaching education program based on child protection laws and not the rules of the game

Mission

The National Cheer Safety Foundation is a cheerleading safety organization dedicated to raising the bar in sport safety to reduce injury, disability, and death from the sport of cheerleading; and assist all who are affected by catastrophic cheerleading injuries.

The National Cheer Safety Foundation's philosophy is to bridge the gap between the sport of cheerleading, the sports sciences, and the legal risk management arena. The National Cheer Safety Foundation's mission is to provide the sport of cheerleading with the research and educational services needed to help maximize the enjoyment and safety of all who participate within the sport.

The National Cheer Safety Foundation's Panel of Experts support the foundation by prudently disseminating proven research information and providing proper resources to help educate all who are responsible for implementing safe cheerleading programs. This information is essential to all who are responsible for training, coaching and administrating the sport of cheerleading.

Cheering for your life.
**NATIONAL
CHEERSAFETY
FOUNDATION**

800.596.7860 tel
866.255.7135 fax
www.nationalcheersafety.com



Sally S. Johnson, CSA, IOM
Executive Director
National Council of Youth Sports
7185 SE Seagate Lane
Stuart, FL 34997

Telephone: 772-781-1452
Facsimile: 772-781-7298
E-mail: youthsports@ncys.org
Website: www.ncys.org

President
Wanda L. Rutledge
National Amateur Baseball Federation

Vice President
Jon Butler
Pop Warner Little Scholars

Secretary
Pam Marshall
Amateur Athletic Union

Treasurer
Alicia McConnell
United States Olympic Committee

Director
Tim Brown
Locker 81/SmartGivingCards

Director
Mike Millay
Disney Sports Enterprises

Director
Wayne Moss
Boys & Girls Clubs of America

MISSION STATEMENT

The National Council of Youth Sports leads the amateur youth sports industry in promoting and enhancing the value of participation through advocacy and education.

NCYS is enhancing the youth sports experience in America!

VISION

To be the unified voice for amateur youth sports.

To all Youth Sports Safety Alliance members:

The National Council of Youth Sports (NCYS) is best-known for its advocacy in promoting healthy lifestyles and safe environments for children that advance stronger neighborhoods and communities.

This past year, the NCYS partnered with Chartis Insurance for the 'aHead of the Game' initiative to raise awareness on concussion safety while reducing the risks of concussions and other head injuries in youth sports.

Emergency room visits for concussions in kids ages 8-13 doubled from 1997 to 2007, and concussions skyrocketed 200 percent among kids age 14 to 19 over the same span, according to a recent study by The American Academy of Pediatrics.

A concussion is a type of traumatic brain injury that is caused by a bump, blow, or jolt to the head. Concussions can also occur from a blow to the body that causes the head to rapidly move back and forth. Even a minor bump or blow to the head can be serious if not properly treated, especially if a person suffers multiple concussions over a period of time.

Concussions can occur in any sport or recreational activity. If a concussion is not treated properly and the athlete returns to play too quickly, she or he is susceptible to second-impact syndrome, a condition in which a second head injury – even if less severe – can compound the first.

NCYS is an untiring leader for the protection of children and a significant authority on the health and well-being of youth. The NCYS is the largest known organization in America representing the amateur youth-serving industry. No other sport organization in America reaches more grassroots participants than the combined membership of the NCYS.

Through greater awareness and education, we want to help coaches, parents and young athletes learn signs and symptoms of concussions, seek proper treatment and follow appropriate return to play protocols to avoid the significant dangers of multiple concussions.

Free downloadable educational materials are available for community athletic teams, leagues, schools, recreational centers and amateur youth sports organizations. The 'aHead of the Game' initiative is one more step to keeping our kids safe while enhancing a positive youth sports experience in America for today and for generations to come.

Yours truly for the kids,

Sally S. Johnson, CSA, IOM
Executive Director
National Council of Youth Sports



September 26, 2011

Ellen Satlof
National Athletic Trainers' Association
2952 Stemmons Freeway
Dallas, Texas, 75247

Dear Ms. Satlof:

The Nick of Time Foundation was created in memory of Nick Varrenti, a multi-sport athlete who suffered a sudden cardiac arrest (SCA) and died at age 16. The following NoTF programs work together to help protect our young people and communities by providing early detection, early access to defibrillation, CPR/ AED education and awareness as we train the next generation of "first responders".

- **Free Youth Heart Screenings-** NoTF organizes and facilitates eight to ten on-site free youth heart screenings per school year. Offered to all students ages 14-24 regardless of race, ethnicity, gender and socio-economic status. Our screening model is being used nationwide as the "gold standard" for community based screening programs.
 - **Fact:** SCA is the leading cause of death in exercising young athletes, happening every 3 days in the US. Most have hidden cardiac abnormalities with no warning signs until suffering an SCA.
- **Awareness Programs-** NoTF is working to increase survival of sudden cardiac arrest, with awareness in bystander CPR, AED training and the importance of having Automated External Defibrillators (AED) in all public places. We are also currently working with Cascade HeartRescue and the WA DOH to establish criteria for cities to be designated as "Heart Safe Communities"
 - **Fact:** Success begins with public bystanders. Communities with higher bystander CPR participation have higher SCA survival rates.
- **Heart of Schools Project-** NoTF works to educate school districts and communities about the need for Public Access Defibrillator (PAD) programs. By providing site assessment, emergency preparedness guides, training and program management for locations with existing PAD programs and helping facilitate and implement a program for schools that don't currently have AED's.
 - **Fact:** When someone suffers SCA the only thing that will revive them is a shock with an AED within 3-5 minutes.

We look forward to the future- as one of the NATA Youth Sports Safety Alliance organizations that will work together to educate and in turn protect our young people.

Darla Varrenti
Executive Director

BOARD OF DIRECTORS

Chairman
David Watkins, MWW, PhD

Vice Chair / Treasurer
Steven Apodaca

Secretary
Aaron M. Kells, EMT-P

Laura Friend
Robert Lashbrook
Dwain Mahan

MEDICAL ADVISORY BOARD

Chairman
Dr. Jonathan Drezner, MD

David S. Owens, MD
Jack C. Salerno, MD, FACC, FHRF
Stephen Anderson, MD

Executive Director
Darla Varrenti

Director of Operations
Suzanne Apodaca



Parent Heart Watch (PHW) is delighted to share its accomplishments, challenges and opportunities since December 7, 2010, when the Youth Sports Safety Alliance last convened on Capitol Hill.

ACCOMPLISHMENTS

Launched four targeted educational campaigns: 1) *The Passion Behind the Purpose* - SCA in Youth: Primary & Secondary Prevention 2) *Is Your League or School Prepared* - Commotio Cordis 3) *Safeguarding Tissue Samples* - Cases of Unexplained Sudden Death 4) *Sudden Cardiac Arrest Awareness Month Magnets* - Responding to Cardiac Emergencies, Warning Signs & Symptoms of a Heart Condition and Early Detection Saves Lives.

Screen Across America, a key member-based initiative was also formed. This coalition of PHW member organizations is conducting cardiac screenings for over 13,100 youth in October for Sudden Cardiac Arrest Awareness Month.

As a result of increasing our media pitches and presence at key national conferences, PHW gained 60% more unique website visits and received an unprecedented number of daily requests for free educational printed materials thus raising awareness and educating key stakeholders about SCA in youth.

PHW collaborated with national organizations such as National Athletic Trainers' Association, Black Coaches and Administrators, US Lacrosse, Sudden Cardiac Arrest Coalition and National Center for Child Death Review, and also forged a key relationship with Little League Baseball and Softball.

PHW members across the country continue to make presentations to coaches, legislators, schools and other youth-serving organizations on a regular basis to raise awareness of SCA in youth, and support primary and secondary prevention strategies.

CHALLENGES

Approximately 1 in 40,000 young athletes dies each year from SCA. However: 1) the American Heart Association (AHA) remains steadfast in its position of not recommending the routine use of ECG during cardiac screenings, despite new research supporting the feasibility and cost-effectiveness of ECG screening. The AHA stance obviously affects both physicians' and the general public's opinion towards screenings 2) universal availability of publicly accessible and operational automated external defibrillators (AEDs) in schools and playing fields is still deficient; and 3) there is a lack of standardized autopsy protocol and thorough investigation of unexplained sudden death in youth.

OPPORTUNITIES

Support or initiate efforts to 1) continue to educate communities on the importance of CPR, AEDs, and early recognition of SCA, and emergency action plans in our schools and other youth-serving organizations; 2) establish a mandatory and systematic national registry for sudden cardiac arrest and death in youth; 3) train physicians around the world in electrocardiogram (ECG) interpretation in athletes, which will increase the ability to detect underlying cardiovascular conditions that place athletes at risk, and reduce false positives (this initiative is being led by the American Medical Society for Sports Medicine).



Pop Warner Little Scholars, Inc.
586 Middletown Blvd, Suite C-100 ▪ Langhorne ▪ PA ▪ 19047
Phone: 215-752-2691 ▪ Fax: 215-752-2879
www.popwarner.com



September, 2011 Medical Summary

Having instituted a new Concussion Rule in 2010 that mirrors the Lystedt Law from Washington State, in 2011, the Pop Warner Medical Executive Board convened in June in Chicago.

The Medical Executive Board reviewed and confirmed the 2010 Pop Warner Concussion Rule, and made plans to add several new Committees to work with the Medical Executive Board. The goal is to help address more specifically additional areas of medical specialization, to enable some level of testing and research on products related to medicine and/or safety, and to review legal ramifications of potential changes to Pop Warner's medical and safety rules and policies.

Additionally, Pop Warner Little Scholars has strongly recommended limiting contact in Pop Warner practices, which will be discussed as a possible rule change for the 2012 season.

September 29, 2011

Ellen Satlof
Public Relations Manager
National Athletic Trainers' Association
2952 Stemmons Freeway, #200
Dallas, TX 75247

Dear Ms. Satlof,

At Cook Children's, we place a great emphasis on prevention, Project ADAM (Automated Defibrillators in Adam's Memory) is a great way to make sure that kids throughout Texas are provided with the necessary equipment to have every opportunity to survive cardiac arrest. Project ADAM was created to educate school systems and the physician community about pediatric sudden cardiac death, making them aware of the incidence, possible early warning signs and the need for a timely response.

In 2011, at least 12 students have died from probable sudden cardiac arrest in our Texas schools. The AED law does no good if no one knows how to use it, when to use it or where it is located.

Texas has had at least 5 victories in saving the lives of students, after they had a sudden cardiac arrest. They are alive today because their schools were prepared and practiced for this emergency, where school personnel provided CPR and used the school's AED.

Project ADAM believes it is important for **ALL** school staff members to know; how to recognize a sudden cardiac arrest, that time is critical, who the first responders are, that there is an AED, where the AED is, and enough about the emergency plan to know how to initiate it if they ever witness an unresponsive victim. We would like for every school to have this lifesaving information and use it.

Training in CPR, having an AED and an Emergency Action Plan (EAP) will strengthen each link in the Chain of Survival and have the potential to save the greatest number of lives.

Sincerely yours,



Laura Friend
Project ADAM Texas Coordinator
Cook Children's Medical Center
laura.friend@cookchildrens.org
682-885-6755



Successes & Challenges in Youth Sports Safety

Safe Kids USA has completed a second successful year of its national Youth Sports Safety Program. Partnering with its expert coalition network and athletic trainers across the U.S., the clinic program raises awareness about critical risks and issues related to children and sports participation, and promotes practical and policy changes among youth coaches and parents.

This year, throughout the spring and summer sports seasons, 47 Safe Kids U.S. coalitions executed ***more than 130 sports safety clinics in communities across the country, where approximately 12,400 people were reached.*** This is a cause for celebration not only because of the sheer reach of the program but also because the number of clinics held and number of attendees were doubled from Safe Kids' inaugural year in 2009. Concussions, heat illness and overuse injuries were the most popular topics covered in the clinics among the audiences.

The continual support Safe Kids USA has received from our founding sponsor, Johnson and Johnson as well as the sports medicine and injury prevention community has been tremendous. Both sectors have provided their expertise and valuable time towards Safe Kids' youth sports outreach. A few examples are CDC's Heads Up Campaign, which allows us to incorporate its concussion content into our suite of educational materials for our priority audiences (e.g., parents, youth coaches and athletes); Children's National Medical Center's Dr. Gerard Gioia, NATA member, Dr. Douglas Casa, and Hall of Famer, Steve Young, participating in ***our national Sports Webcast in the spring as expert panelists***; and lastly, NATA's supporting our coalitions in ***providing us with local certified athletic trainers***, who have been a key ingredient in educating our audiences at the sports clinics. Another encouraging development is that majority of our coalitions are ***committed to continuing sports safety outreach throughout the year, given the high demand for it.***

The most challenging experience thus far has likely been the discovery, from our national parent survey, of parents' and coaches' stated knowledge that sports injury prevention is a crucial part, *however*, the acknowledgment of a lack of confidence and/or know-how when it comes to keeping kids safe on the field. This is obviously frustrating because this underscores a lack of keen awareness and initiative regarding preventable and severe risks that exist in youth sport, such as heat stroke or second-impact syndrome.

Recognizing this disconcerting gap is necessary; continuing to develop evidence-based sports safety programs, such as public youth sports clinics, can be a part of the solution. Dedicated organizations with local and national reach (such as NATA and Safe Kids) will need to continually strive to bridge the knowledge gap, heighten risk awareness, and motivate parents and coaches to make pivotal behavior changes that will prevent avoidable deaths and injuries to our young athletes.

In health and safety,
Lindsay Hansen and the Safe Kids USA Sports Team





*Sickle Cell Foundation
of Palm Beach County and Treasure Coast, Inc.*

1600 North Australian Avenue • West Palm Beach, Florida 33407-5621
(561) 833-3113 • Fax: (561) 659-4505



FOUNDER
Eva W. Mack

GENERAL COUNSELOR
Lynn Solomon, Esq.

BOARD OF DIRECTORS CHAIR
Ron O. Carryl

CHIEF EXECUTIVE OFFICER
Yvette L. Coursey, DPA

October 3, 2011

Ms. Ellen Satlof
National Athletic Trainers' Association
2952 Stemmons Freeway
Dallas, Texas 75247

Dear Ms. Satlof:

We applaud you on the topic of your upcoming Summit, "***Preventing Sudden Death in Youth Sports***", and want to take this opportunity to lend our endorsement to the Summit. Sickle Cell Foundation of Palm Beach County and Treasure Coast, Inc. (SCF) is very concerned about the rising incidence of Exertional Sickling and holds the opinion that non-traumatic deaths due to Exertional Sickling can be prevented. Of course, we believe that prevention of death, regardless of the cause, should always be the goal. SCF attempts to be proactive in this endeavor through education to youth, parents, coaches, trainers, the sports/athletic community and the public in general.

Again, we applaud and commend you for your selection of such a timely subject for the 2011 Youth Summit. Please feel free to call upon us if we can be of assistance.

Sincerely,

Yvette

Yvette L. Coursey, DPA
Chief Executive Officer



Nonprofits
First





September 29, 2011

A proud member of the Youth Sports Safety Alliance, SportsConcussions.org addresses the need within our communities for increased concussion awareness. According to the CDC, approximately 3.8 million sports-and recreation-related concussions occur annually. In the case of youth athletes, only about 150,000 seek immediate treatment in the ER. The rest go home.

It is now readily apparent that the long and short-term prognosis for recovery from concussion can be greatly influenced by proper management of the injury. To date, 34 states have passed concussion legislation, and there is a powerful movement stretching from the athletic field to society at large, whereby recognition of the importance of this injury has taken center stage. School districts are implementing district-wide concussion policies for all students and staff, and athletes understand they must do their part and honestly report symptoms. It's a team effort.

The SportsConcussions.org organization and website were launched in 2010 to provide education, tools, and ideas to school districts, leagues, and individuals. We bring information to our audience from the national stage as well as links to state and local resources. The site offers guidance for coaches seeking concussion training, templates for school districts to use in the development of their own management programs, and checklists for parents who may have a concussed child at home.

We actively address the need for all school districts and leagues to implement a comprehensive concussion management plan for their athletes. We also assist organizations that are interested in providing computerized neuropsychological (concussion) testing, through the iBaseline™ program. Part of this effort requires our staff to help establish systems of care for student-athletes within the broader community, which we are fully committed to.

We are honored to have assembled an Advisory Board which includes Dr. Robert Cantu, Chief of Neurosurgery at Emerson Hospital in Boston, Massachusetts, and co-medical director of the Center for the Study of Traumatic Encephalopathy, Ms. Marjorie Albohm, President of the National Athletic Trainers' Association, Leigh Steinberg, sports agent and long-time concussion advocate, Dr. William Meehan, Director, Sports Concussion Clinic, Children's Hospital Boston, and Chris Nowinski, President of Sports Legacy Institute, who is involved with NFL/autopsy research, among others. There have been tremendous advancements over the past year, but as with any issue of critical importance, there is much to be done.

Sincerely yours,

Jean Rickerson, President and Founder/ www.SportsConcussions.org



SPORT SAFETY INTERNATIONAL

PROMOTING YOUTH SPORT SAFETY THROUGH EDUCATION

Sport Safety International (SSI), a proud member of the Youth Sports Safety Alliance, strives to promote injury prevention and safe participation in physical activity and sports by providing the highest quality educational programming to athletes, parents, coaches, and sports medicine professionals.

One of SSI's primary focus areas is concussion education. In 2011, SSI developed the ConcussionWise™ family of online education programs. The goal of ConcussionWise™ is to provide meaningful educational information on the prevention, preparation, response, and recovery aspects of concussion management. What makes the ConcussionWise™ courses unique is their individual approach to target audiences. Currently, SSI offers the following FREE ConcussionWise™ courses that can be used by any individual or organization:

ConcussionWise™ SPORT: for Parents
ConcussionWise™ SPORT: for Athletes
ConcussionWise™ PRO: for Coaches

Additionally, SSI offers the following professional education courses for health care providers:

ConcussionWise™ AT: for Athletic Trainers
ConcussionWise™ DR: for Physicians
ConcussionWise™ RN: for School Nurses

SSI partners with organizations whose goal is to prevent sports related injury and illness. To date, SSI has partnered with several state athletic training associations to bring the continuing education programs to their respective states. The ConcussionWise™ courses have been adopted by the following organizations:

Athletic Trainers' Association of Florida
Athletic Trainers' Society of New Jersey
Connecticut Athletic Trainers' Association
Nebraska State Athletic Trainers' Association
New York State Athletic Trainers' Association
Pennsylvania Athletic Trainers' Society

Additional courses addressing injury prevention and risk management in youth sports are currently under development.

SSI also maintains a website, www.SportSafetyInternational.org, which provides resources and information on prevention of sport related illness and injury.



2011 Youth Sports Safety Alliance Member Report: US Lacrosse

As the national governing body for men and women's lacrosse, US Lacrosse has made a significant commitment to lead sport-specific safety education and research efforts since its formation in 1998. Through our Sports Science & Safety Committee, which is comprised of many prominent professionals from various medical specialties and representatives from a number of multi-sport organizations, US Lacrosse has developed strategic alliances with numerous organizations, conducted unprecedented sport-specific injury research, provided constant review of issues affecting player safety, and provided growing information resources to its more than 350,000 members in 63 chapters throughout the United States. Additionally, we have invested significantly to recently establish the sport's first standardized coaching and officiating education curricula, including both robust on-line resources and one-on-one clinic sessions, which have formally trained and certified thousands of coaches and officials.

US Lacrosse has led and funded the following lacrosse-specific injury research and related initiatives:

Lacrosse Injury Prevention

- US Lacrosse and MedStar Sports Health sponsored a Lacrosse Sports Medicine Conference in 2011.
- Youth Lacrosse Participation: Position Paper authored by Sport Science & Safety Committee in 2011 to assist US Lacrosse with the development of national youth rule standards and best practices by proactively taking the known medical literature and combining it with common sense solutions to make recommendations about youth participation in lacrosse.
- Sudden Cardiac Arrest: US Lacrosse plays a leading role in ongoing research and is committed to educating the national lacrosse community about the potential dangers of commotio cordis, as well as the life-saving value of having AEDs available during lacrosse games and practices. US Lacrosse is partnered with Cardiac Science, a leading manufacturer of AEDs, to provide greater educational resources and special AED pricing for USL members.
- Brain Injury/Concussion
 1. US Lacrosse produced a Lacrosse **Concussion Information Video** in 2011 with NAN/ NATA.
 2. US Lacrosse is a member of the ACSM task force on concussion
 3. US Lacrosse testified in support of state legislation for concussion awareness in MD
 4. Developed co-branded education materials with the CDC on concussion awareness
 5. Led the development of youth, high school and college rule changes to minimize head injuries occurring in men and women's games.
 6. Requested the development a women's lacrosse specific headgear standard from NOCSAE

US Lacrosse Sport Science & Safety Research

- Descriptive epidemiology and trends of scholastic lacrosse injuries
- Head, face and eye injuries in scholastic and collegiate lacrosse
- Support for the development of a mechanical model for commotio cordis research
- Risks and mechanisms of severe injuries among lacrosse players using insurance claims data
- Epidemiology of concussion in boys' and girls' high school lacrosse players
- Trends in sports-related concussion incidence at the high school level, 1998-2007
- Evaluation of the women's lacrosse protective eyewear mandate
- Epidemiology of lacrosse injuries among youth players

Lacrosse has become one of the fastest-growing sports in the nation thanks to the programs, resources and leadership US Lacrosse has provided. However, this dramatic growth has also created the need for greater resources and collaboration in order to maintain player safety and assure a high quality of experience for all participants. Among the biggest challenges US Lacrosse faces in this regard include convincing youth leagues and state high school associations that requiring their coaches and officials to achieve national sport-specific education standards is essential to a safe playing experience.

Today, US Lacrosse is focusing on expanding and improving lacrosse injury data collection efforts, increasing evaluation of our rules with respect to head safety, emphasizing injury awareness in our coaches and officials education and training efforts and considering additional equipment interventions in order to ensure we are doing all we can to address injuries within the lacrosse community. These efforts, designed to increase awareness of the importance of responding appropriately to injuries among young athletes as well as improving the skills and awareness of those who oversee and work with these children to respond appropriately, all serve to help our youth live their lives to their fullest potential.

US Lacrosse
Ann Kitt Carpenetti, Managing Director of Games Administration

www.uslacrosse.org

113 West University Parkway, Baltimore, Maryland 21210
acarpenetti@uslacrosse.org

PREVENTING SUDDEN DEATH IN YOUTH SPORTS

Resources

STATISTICS ON YOUTH SPORTS SAFETY

- There were 120 sports-related deaths of young athletes in 2008–2009; 50 in 2010; and 40 in 2011.¹
- Approximately 8,000 children are treated in emergency rooms each day for sports-related injuries.²
- Among children, those aged 15–17 experience the highest emergency room visits for sports injuries.²
- Rates of sports injury visits to ERs were highest in remote rural settings.²
- High school athletes suffer 2 million injuries, 500,000 doctor visits and 30,000 hospitalizations each year.³
- There are three times as many catastrophic football injuries among high school athletes as college athletes.⁷
- History of injury is often a risk factor for future injury, making prevention critical.³²
- 62 percent of organized sports-related injuries occur during practices.⁹
- Only 42 percent of high schools have access to athletic training services.¹⁰
- 47 percent of schools nationally fall short of the federally recommended nurse-to-student ratio. Many schools have no nurse at all.¹¹
- Ninety-six percent of Americans feel it's important for young athletes to be evaluated by a qualified health care professional before they begin playing sports.¹³

CONCUSSION

- 50 percent of "second impact syndrome" incidents – brain injury caused from a premature return to activity after suffering initial injury (concussion) – result in death.⁴
- Female high school soccer athletes suffer almost 40 percent more concussions than males (29,000 annually).⁵
- Female high school basketball players suffer 240 percent more concussions than males (13,000).⁵
- 400,000 brain injuries (concussions) occurred in high school athletics during the 2008–09 school year.⁶
- 15.8 percent of football players who sustain a concussion severe enough to cause loss of consciousness return to play the same day.⁸
- Emergency department visits for concussions sustained during organized team sports doubled among 8–13 year olds between 1997 and 2007 and nearly tripled among older youth.¹²
- Concussion rates more than doubled among students age 8–19 participating in sports like basketball, soccer and football between 1997 and 2007, even as participation in those sports declined.¹²
- A 2011 study of U.S. high schools with at least one athletic trainer on staff found that concussions accounted for nearly 15% of all sports-related injuries reported to ATs.¹⁹
- High school athletes who have been concussed are three times more likely to suffer another concussion in the same season.²⁰
- Females aged 10–19 years sustained sports- and recreation-related TBIs most often while playing soccer or basketball or while bicycling.²¹
- More than 248,000 children visited hospital emergency departments in 2009 for concussions and other traumatic brain injuries related to sports and recreation.³³

HEAT ILLNESS

- High school athletes, especially males, are at the highest risk of suffering exertional heat illness requiring treatment in U.S. hospital emergency rooms.²²
- 31 high school players died of heat stroke complications between 1995 and 2009.²³
- 64.7% of football players sustaining a heat illness were either overweight or obese.²⁴
- The number of heat-related injuries from 1997 to 2006 increased 133 percent. Youth accounted for the largest proportion of heat-related injuries or 47.6 percent.¹⁴
- Injuries associated with participation in sports and recreational activities account for 21 percent of all traumatic brain injuries among children in the United States.¹⁵
- 2/3 of kids show up for practice at least significantly dehydrated.¹⁶

SUDDEN CARDIAC ARREST

- Sudden cardiac arrest (SCA) is the leading cause of death in exercising young athletes.²⁵
- It's estimated that more than 95 percent of cardiac arrest victims die before reaching the hospital.²⁶
- Just one in 10 U.S. student-athletes who suffer sudden cardiac arrest survives.²⁷
- The incidence of out-of-hospital sudden cardiac arrest in high school athletes ranges from .28 to 1 death per 100,000 high school athletes annually in the U.S.³¹

ASTHMA

- EIA (exercise-induced asthma) affects 12–15% of the population¹⁷
- It is estimated that 80 to 90 percent of all individuals who have allergic asthma will experience symptoms of EIA with vigorous exercise or activity. For teenagers and young adults this is often the most common cause of asthma symptoms.¹⁸

EXERTIONAL SICKLING

- Sickle cell trait was the primary cause of death for 15 out of the 2,387 athlete deaths recorded in the *30-Year U.S. National Registry of Sudden Death in Athletes*.²⁸
- Young athletes with sickle cell trait may be at an increased risk of heat-related illnesses and their complications.²⁹
- Predisposing factors to exertional sickling include heat, dehydration, altitude, asthma, high intensity exercise with few rest intervals.³⁰

STATISTICS ON YOUTH SPORTS SAFETY

- ¹ National Athletic Trainers' Association.
- ² Wier L, Miller A, Steiner C. *Sports Injuries in Children Requiring Hospital Emergency Care, 2006*. HCUP Statistical Brief #75. June 2009. Agency for Healthcare Research and Quality, Rockville, MD. <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb75.pdf>.
- ³ Centers for Disease Control and Prevention.
- ⁴ Cantu RC. *Second impact syndrome: immediate management*. Phys Sportsmed. 1992;20(9):14–17.
- ⁵ Covassin T, Swank C. *Sex Differences and the Incidence of Concussions Among Collegiate Athletes*. J Athl Train. 2003;38(3):238–244.
- ⁶ Yard E, Comstock R. *Compliance with return to play guidelines following concussion in U.S. high school athletes, 2005–2008*. Informa Healthcare. 2009;23(11):888–898.
- ⁷ Boden B. *Catastrophic Head Injury Three Times Greater in High School vs. Collegiate Football Players*. Am J Sports Med. 2007;35(7):1075–1081.
- ⁸ Center for Injury Research and Policy. The Research Institute at Nationwide Children's Hospital, Dr. Dawn Comstock, Columbus, OH.
- ⁹ Rachel J, Yard E, Comstock R. *An Epidemiologic Comparison of High School Sports Injuries Sustained in Practice and Competition*. J Athl Train. 2008;43(2):197–204.
- ¹⁰ National Athletic Trainers' Association.
- ¹¹ National Association of School Nurses, 2008 Survey.
- ¹² Bakhos L, Lockhart G, Myers R. *Emergency Department Visits for Concussion in Young Child Athletes*. Pediatrics. 2010;126(3):e550–6.
- ¹³ American College of Sports Medicine.
- ¹⁴ Nelson NG, Collins CL, Comstock RD, McKenzie LB. *Exertional Heat-Related Injuries Treated in Emergency Departments in the U.S., 1997–2006*. Am J Prev Med. 2011;40(1):54–60.
- ¹⁵ SAFE KIDS USA.
- ¹⁶ Walker, SM, Casa, DJ, et al. *Children participation in summer soccer camps are chronically dehydrated*. Med Sci Sports Exerc. 2004;36(5):S180–181.
- ¹⁷ Rupp NT. *Diagnosis and Management of Exercise-Induced Asthma*. Phys Sportsmed. 1996;24(1):77–80,83–87.
- ¹⁸ Asthma and Allergy Foundation of America.
- ¹⁹ Meehan WP, d'Hemecourt P, Collins C, Comstock RD. *Assessment and Management of Sport-Related Concussions in United States High Schools*. Am J Sports Med. 2011. doi:10.1177/0363546511423503.
- ²⁰ Gissel LM, Fields SK, Collins CL, Dick RW, Comstock RD. *Concussions Among United States High School and Collegiate Athletes*. J Athl Train. 2007;42(4):495–503.
- ²¹ Gilchrist J, Thomas KE, Xu L, McGuire LC, Coronado VG. *Nonfatal sports and recreation related traumatic brain injuries among children and adolescents treated in emergency departments in the United States, 2001–2009*. MMWR Morb Mortal Wkly Rep. 2011;60(39):1337–1342.
- ²² Centers for Disease Control and Prevention.
- ²³ Mueller FO, Colgate B. *Annual Survey of Football Injury Research, 1931–2009*. February 2010; University of North Carolina in Chapel Hill.
- ²⁴ Centers for Disease Control and Prevention. *Heat Illness Among High School Athletes—United States, 2005–2009*. MMWR Morb Mortal Wkly Rep. 2010;59(32):1009–13.
- ²⁵ Drezner JA. *Preparing for sudden cardiac arrest—the essential role of automated external defibrillators in athletic medicine: a critical review*. Br J Sports Med. 2009;43:702–707.
- ²⁶ American Heart Association. *Long-Term Treatment for Cardiac Arrest*. www.heart.org/HEARTORG/Conditions/More/CardiacArrest/Long-Term-Treatment-for-Cardiac-Arrest_UCM_307916_Article.jsp.
- ²⁷ Drezner JA, Chun JS, Karmon KG, Derminer L. *Survival trends in the United States following exercise-related sudden cardiac arrest: 2000–2006*. Heart Rhythm. 2008;5(6):794–799.
- ²⁸ Minneapolis Heart Institute Foundation.
- ²⁹ Pretzlaff RK. *Death of an adolescent athlete with sickle cell trait caused by exertional heat stroke*. Pediatr Crit Care Med. 2002;3(3):308–310.
- ³⁰ Eichner RE. *Sickle Cell Trait*. J Sport Rehab. 2007;16:197–203.
- ³¹ American Heart Association. *CPR Statistics*. www.heart.org/HEARTORG/CPRAndECC/WhatIsCPR/CPRFactsandStats/CPR%20Statistics_UCM_307542_Article.jsp.
- ³² Kucera KL, Marshall SW, Kirkendall DT, Marchak PM, Garrett WE Jr. *Injury history as a risk factor for incident injury in youth soccer*. Br J Sports Med. 2005;39(7):462.
- ³³ Centers for Disease Control and Prevention. *Nonfatal Traumatic Brain Injuries Related to Sports and Recreation Activities Among Persons Aged ≤19 Years—United States, 2001–2009*. MMWR. 2011;60(39):1337–1342.

This Arkansas statute, sponsored by Representative Keith Ingram, is unique among the athlete safety laws recently enacted, most of which focus on concussion. This legislation encompasses environmental issues, dehydration, and communicable diseases – all problems faced by young athletes.

Act 1214
State of Arkansas 2011

AN ACT TO PROMOTE THE HEALTH AND SAFETY OF STUDENTS IN PUBLIC SCHOOL ATHLETIC ACTIVITIES
THROUGH THE USE OF ATHLETIC TRAINERS AND PROFESSIONAL DEVELOPMENT FOR COACHES; AND
FOR OTHER PURPOSES.

Subtitle

TO PROMOTE THE HEALTH AND SAFETY OF STUDENTS IN PUBLIC SCHOOL ATHLETIC ACTIVITIES
THROUGH THE USE OF ATHLETIC TRAINERS AND PROFESSIONAL DEVELOPMENT FOR COACHES.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF ARKANSAS:

SECTION 1. Arkansas Code Title 6, Chapter 18, Subchapter 7 is amended to add an additional section to read as follows:

6-18-708. Health and safety in public schools.

(a) A school district shall develop procedures concerning student physical activity in its public schools that includes without limitation the recognition and management of the following events or conditions that may be encountered by a student during athletic training and physical activities:

- (1) A concussion, dehydration, or other health emergency;
- (2) An environmental issue that threatens the health or safety of students; and
- (3) A communicable disease.

(b)(1) Every three (3) years as part of the requirements for professional development, a person employed by a school district as an athletics coach shall complete training on the events and conditions identified in subsection (a) of this section.

- (2) The training may include a component on best practices for a coach to educate parents of students involved in athletics on sports safety.

SECTION 2. Public School Athletic Trainer Pilot Program.

(a)(1) The Department of Education shall provide grants for providing access to one (1) or more athletic trainers to public schools in Arkansas through the two-year Public School Athletic Trainer Pilot Program.

- (2) The pilot program grants shall be awarded before the 2011-2012 school year in order to allow time for program participants to employ the athletic trainers.

(b) The department shall accept and review applications for participation in the pilot program from:

- (1) Any school that is classified as Class 6A or below by the Arkansas Activities Association; and
- (2) Education service cooperatives.

(c) To be eligible for participation in the pilot program, a school shall agree to provide a room and supplies for the athletic trainer.

(d)(1) The grant recipients shall be selected by the department in consultation with the Arkansas Legislative Task Force on Athletic Training in Public Schools.

(2) At least one (1) rural education service cooperative shall be selected to receive a grant.

(e) The pilot program shall:

(1) Begin with the 2011-2012 school year;

(2) Be implemented by the participating education service cooperatives; and

(3) Be monitored by:

(A) The nonvoting members of the Arkansas Legislative Task Force on Athletic Training in Public Schools, or their designee; or

(B)(i) A subcommittee of the House Committee on Education, or its designee.

(ii) The subcommittee may be a joint subcommittee of both the House Committee on Education and the Senate Committee on Education.

(f) At the end of the pilot program, the persons monitoring the pilot program shall provide a report to the General Assembly containing an evaluation of the pilot program and any additional recommendations for the employment and use of athletic trainers in Arkansas public schools.

SECTION 3. Section 1(k) of Act No. 1453 of the 2009 regular session of the 87th General Assembly, concerning the Arkansas 7 Legislative Task Force on Athletic Training in Public Schools, is amended to read as follows:

(k) The task force shall be abolished on December 31, 2012.

SECTION 4. Section 2(b) of Act No. 1453 of the 2009 regular session of the 87th General Assembly, concerning the Arkansas Legislative Task Force on Athletic Training in Public Schools, is amended to read as follows:

(b) The task force shall submit a written report to the House Committee on Education and the Senate Committee on Education no later than November 1, 2012.

SECTION 5. (a) The Arkansas Legislative Task Force on Athletic Training in Public Schools shall develop a web-based survey to be completed by each public school in Arkansas through the Department of Education website.

(b) The survey shall include without limitation questions concerning:

(1) The recruitment, hiring, and retention of athletic trainers;

(2) Professional development and certification or licensure of athletic training personnel; and

(3) Procedures and training on the recognition and management of the following events or conditions that may be encountered by a student during athletic training and activities:

(A) A concussion, dehydration, or other health emergency;

(B) An environmental issue that threatens the health or safety of students; and

(C) A communicable disease.

(c) The survey shall be reviewed by the nonvoting members of the Arkansas Legislative Task Force on Athletic Training in Public Schools and a report on the survey results and any additional recommendations shall be included in the task force's report to the General Assembly.

Sample Athletic Healthcare Plan Guide



Table of Contents

2	Overview of Emergency Action Plans (EAP)
6	Sample Baseball EAP
8	Sample Basketball, Volleyball, and Wrestling EAP
10	Sample Football Practice Field EAP
12	Sample Football Stadium EAP
14	Sample Soccer EAP
16	Sample Softball EAP
18	Sample Track EAP
20	Sample Wrestling EAP
22	Sample Emergency Contact List
23	Lightening Guidelines and Procedures
24	Concussion Guidelines and Procedures
26	Sample MRSA Procedures
27	Basic Heat Illness Information
33	Sample Hot Weather Practice Procedures
37	Sample Heat Index Charts
42	Sample Verification of EAP and Procedures for Hot Weather Practices
43	Sample Verification of Acknowledgement of Training on Concussions
44	Sample Verification of Acknowledgment of Training on Heat Illness
45	Sample Verification of Acknowledgement of Training on MRSA

The sport-specific venue plans were prepared by Caroline Faure, EdD, ATC, and Brent Faure, MS, ATC, Pocatello, Idaho.

SAMPLE

_____ HIGH SCHOOL

EMERGENCY ACTION PLAN FOR ATHLETICS OVERVIEW

Introduction

Emergency situations may arise at anytime during athletic events. Expedient action must be taken in order to provide the best possible care to the sport participant of emergency and/or life threatening conditions. The development and implementation of an emergency plan will help ensure that the best care will be provided.

As emergencies may occur at anytime and during any activity, all school activities workers must be prepared. Athletic organizations have a duty to develop an emergency plan that may be implemented immediately when necessary and to provide appropriate standards of emergency care to all sports participants. As athletic injuries may occur at any time and during any activity, the sports medicine team must be prepared. This preparation involves formulation of an emergency plan, proper coverage of events, maintenance of appropriate emergency equipment and supplies, utilization of appropriate emergency medical personnel, and continuing education in the area of emergency medicine and planning. Hopefully, through careful pre-participation physical screenings, adequate medical coverage, safe practice and training techniques and other safety avenues, some potential emergencies may be averted. However, accidents and injuries are inherent with sports participation, and proper preparation on the part of the sports medicine team should enable each emergency situation to be managed appropriately.

Components of the Emergency Plan

These are the basic components of every emergency action plan for athletics:

1. Emergency Personnel
2. Emergency Communication
3. Emergency Equipment
4. Roles Of Certified Athletic Trainers, Student Trainers, Coaches, And Administrators
5. Venue Directions (Map)

Emergency Plan Personnel

With athletic practice and competition, the first responder to an emergency situation is typically a coach or member of the sports medicine staff. A team physician may not always be present at every organized practice or competition. The type and degree of sports medicine coverage for an athletic event may vary widely, based on such factors as the sport or activity, the setting, and the type of training or competition. The first responder in some instances may be a coach or other institutional personnel. Certification in cardiopulmonary resuscitation (CPR), first aid, prevention of disease transmission, and emergency plan review is strongly recommended for all athletics personnel associated with practices, competitions, skills instruction, and strength and conditioning.

The development of an emergency plan cannot be complete without the formation of an emergency team. The emergency team may consist of a number of healthcare providers including physicians, emergency medical technicians, certified athletic trainers; student athletic trainers; coaches; parents; and, possibly, other bystanders. Roles of these individuals within the emergency team may vary depending on various factors such as the number of

members of the team and the athletic venue itself. There are four basic roles within the emergency team. The first and most important role is establishing safety of the scene and immediate care of the athlete. Acute care in an emergency situation should be provided by the most qualified individual on the scene. In most instances, this role will be assumed by the Certified Athletic Trainer, although if the team physician is present, he/she may be called in. The second role, EMS activation, may be necessary in situations where emergency transportation is not already present at the sporting event. This should be done as soon as the situation is deemed an emergency or a life-threatening event. Time is the most critical factor under emergency conditions. Activating the EMS system may be done by anyone on the team. However, the person chosen for this duty should be someone who is calm under pressure and who communicates well over the telephone. This person should also be familiar with the location and address of the sporting event. Typically, the school administrator is the best choice to fulfill this role. The third role, equipment retrieval may be done by anyone on the emergency team who is familiar with the types and location of the specific equipment needed. Student athletic trainers and coaches are good choices for this role. The fourth role of the emergency team is that of directing EMS to the scene. One member of the team should be responsible for meeting emergency medical personnel as they arrive at the site of the emergency. Depending on ease of access, this person should have keys to any locked gates or doors that may slow the arrival of medical personnel. A student athletic trainer, administrator, or coach may be appropriate for this role.

Roles within the Emergency Team

1. Establish scene safety and immediate care of the athlete
2. Activation of the Emergency Medical System
3. Emergency equipment retrieval
4. Direction of EMS to scene

Activating the EMS System

Making the Call:

911 (all emergencies in Idaho and Utah)

Providing Information:

- name, address, telephone number of caller
- nature of emergency, whether medical or non-medical *
- number of athletes
- condition of athlete(s)
- first aid treatment initiated by ATC/Physician
- specific directions as needed to locate the emergency scene ("Come to the faculty parking lot off of Fairway Drive")
- other information as requested by dispatcher

When forming the emergency team, it is important to adapt the team to each situation or sport. It may also be advantageous to have more than one individual assigned to each role. This allows the emergency team to function even though certain members may not always be present.

Emergency Communication

Communication is the key to quick emergency response. Administration, athletic trainers, coaches, and emergency medical personnel must work together to provide the best emergency response capability and should have contact information such as telephone tree established as a part of pre-planning for emergency situations. Communication prior to the event is a good way to establish boundaries and to build rapport between both groups of professionals. If emergency medical transportation is not available on site during a particular sporting event then direct communication with the emergency medical system at the time of injury or illness is necessary.

Access to a working telephone or other telecommunications device, whether fixed or mobile, should be assured. The communications system should be checked prior to each practice or competition to ensure proper working order. A back-up communication plan should be in effect should there be failure of the primary communication system. The most common method of communication is a public telephone. However, a cellular phone is preferred if available. At any athletic venue, whether home or away, it is important to know the location of a workable telephone. Pre-arranged access to the phone should be established if it is not easily accessible.

Emergency Equipment

All necessary emergency equipment should be at the site and quickly accessible. Personnel should be familiar with the function and operation of each type of emergency equipment. Equipment should be in good operating condition, and personnel must be trained in advance to use it properly. Emergency equipment should be checked on a regular basis and use rehearsed by emergency personnel. The emergency equipment available should be appropriate for the level of training for the emergency medical providers. Creating an equipment inspection log book for continued inspection is strongly recommended. The school's Certified Athletic Trainers should be trained and responsible for the care of the medical equipment.

It is important to know the proper way to care for and store the equipment as well. Equipment should be stored in a clean and environmentally controlled area. It should be readily available when emergency situations arise

Medical Emergency Transportation

Emphasis should be placed at having an ambulance on site at high risk sporting events. In the event that an ambulance is on site, there should be a designated location with rapid access to the site and a cleared route for entering/exiting the venue. If an ambulance is not present at an event, entrance to the facility should be clearly marked and accessible. In the event of an emergency, the 911 system will still be utilized for activating emergency transport.

In the medical emergency evaluation, the primary survey assists the emergency care provider in identifying emergencies requiring critical intervention and in determining transport decisions. In an emergency situation, the athlete should be transported by ambulance, where the necessary staff and equipment is available to deliver appropriate care. Emergency care providers should refrain from transporting unstable athletes in inappropriate vehicles. Care must be taken to ensure that the activity areas are supervised should the emergency care provider leave the site in transporting the athlete. Any emergency situations where there is impairment in level of

consciousness (LOC), airway, breathing, or circulation (ABC) or there is neurovascular compromise should be considered a "**load and go**" situation and emphasis placed on rapid evaluation, treatment and transportation.

Non-Medical Emergencies

For the following non-medical emergencies: fire, bomb threats, severe weather and violent or criminal behavior, refer to the school district's crisis plan.

Conclusion

The importance of being properly prepared when athletic emergencies arise cannot be stressed enough. An athlete's survival may hinge on how well trained and prepared athletic healthcare providers are. It is prudent to invest athletic department "ownership" in the emergency plan by involving the athletic administration and sport coaches as well as sports medicine personnel. The emergency plan should be reviewed at least once a year with all athletic personnel and local emergency response teams. Through development and implementation of the emergency plan, _____ High School helps ensure that the athlete will have the best care provided when an emergency situation does arise.

Approval and Acceptance of the _____ High School Emergency Plan for Athletics

Approved by _____

_____ High School Principal

Date

Approved by _____

_____ High School Athletic Director

Date

Approved by _____

_____ High School Head Athletic Trainer

Date

SAMPLE

_____ Emergency Plan: Baseball

Baseball Practice Fields at _____

Emergency Personnel: Administration, Certified Athletic Trainer, and Coaches.

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX. Because some practices occur away from _____ practice facilities, we also recommend the head coach of each of the baseball teams carry a cellular phone, in case of emergency.

Emergency Equipment: supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary by the team's physician.

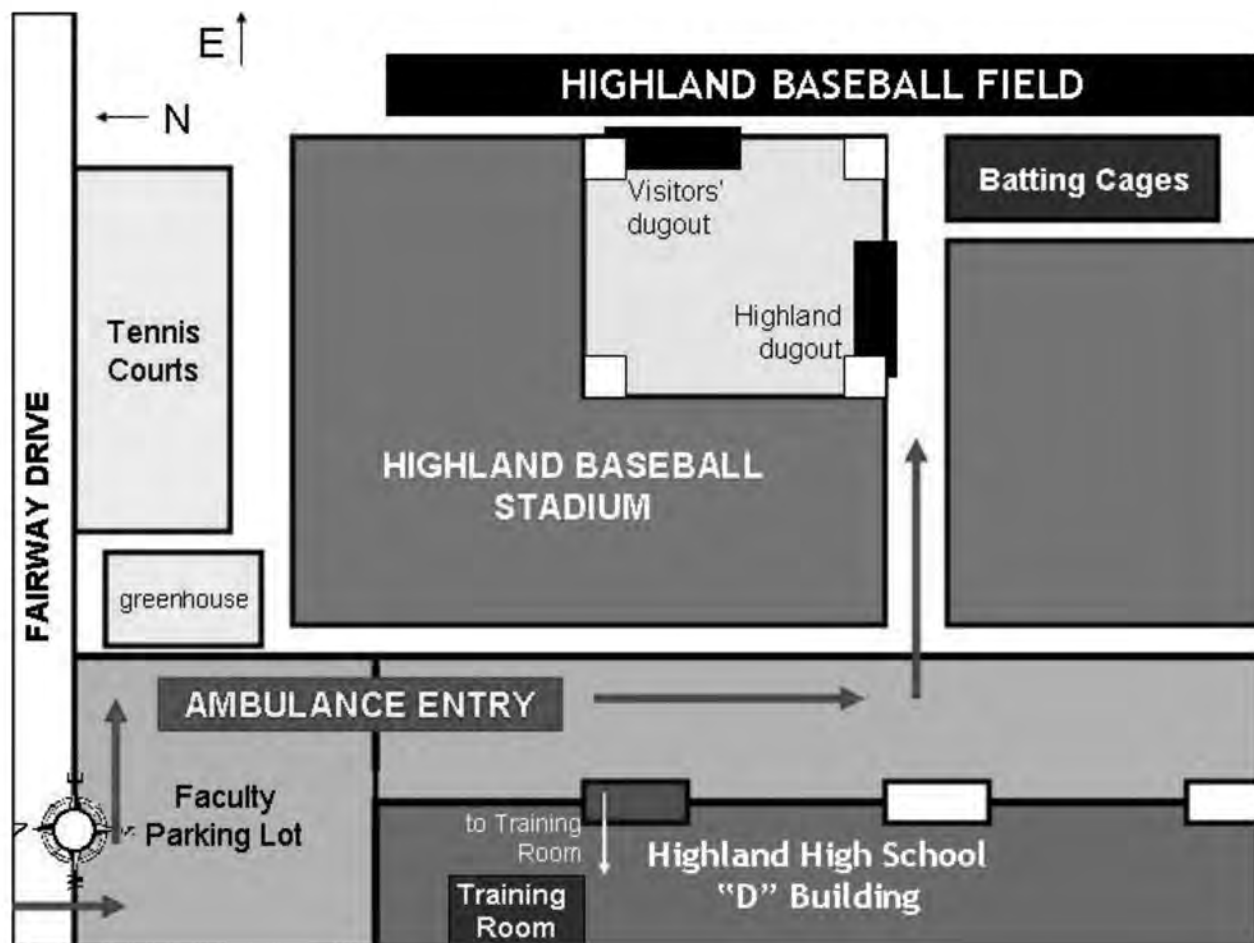
Roles of Administration, Certified Athletic Trainer (ATC), Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested;
- Direct EMS personnel (ambulance) to scene;
- Emergency equipment retrieval
- Unlock and open bar gate between school and practice fields;
- Designate individual to "flag down" EMS and direct to scene;
- Scene control: limit scene to sports medicine personnel and move bystanders (including players) away from area.
- Ensure parking lot is clear and accessible to emergency personnel
- Contact students parent or guardian

Venue Directions:

_____ **Baseball Practice Fields:** Take Olympus Drive to Fairway Drive. Cross Bench Road and enter faculty parking lot off of Fairway Drive, next to the tennis courts. There is a bar-gate on the east side of the school, adjacent to the football practice fields. Enter through that gate. Ambulance may park there, next to the school. School Address: _____

Venue Map: _____ *Baseball Practice Fields*



SAMPLE

Emergency Plan: Basketball, Volleyball & Wrestling

Main Gymnasium at _____

Emergency Personnel: Administration, Certified Athletic Trainer, and Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX. Because of the need for late practices and also because the Certified Athletic Trainers will not be traveling to away games with some teams, it is also recommended that the head coaches of each of the volleyball, basketball and wrestling teams carry a cellular phone, in case of emergency.

Emergency Equipment: Supplies and equipment brought to gym for games include taping and bracing supplies, general trauma and wound care kits. Additional supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary.

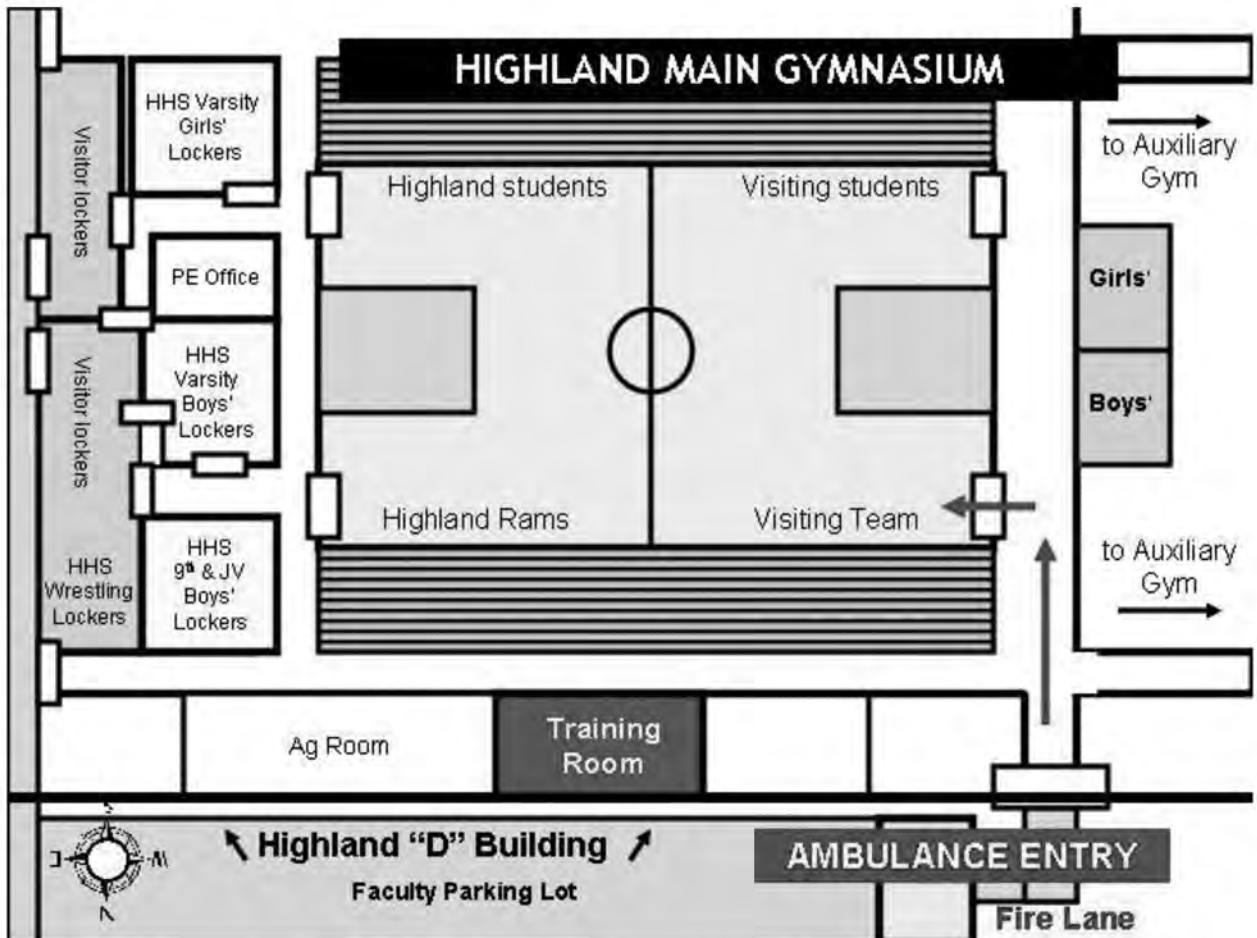
Roles of Certified Administration, Athletic Trainer (ATC), Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS)
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested;
- Direct EMS personnel (ambulance) to scene
- Emergency equipment retrieval
- Ensure emergency entrance to basketball facility ("D" Building) is clear and accessible (check parking lots regularly)
- Unlock and open doors for EMS to access gym
- Direct EMS personnel (ambulance) to scene (in the event there are no student trainers present)
- Scene control: limit scene to sports medicine personnel and move bystanders (including other athletes) away from area of injured athlete.
- Contact students parent or guardian

Venue Directions:

Main Gymnasium at _____: Take Olympus Drive to Fairway. Go east on Fairway, across Bench Road and turn into faculty parking lot adjacent to the school's tennis courts. Enter "D" Building through doors on southwest end of parking lot. Main Gymnasium is located in the center of "D" building.

Venue Map: *Main Gymnasium at* _____



SAMPLE

_____ Emergency Plan: Football

_____ Football Practice Fields

Emergency Personnel: Administration, Certified Athletic Trainer, and Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX. Because many freshman practices are held during early evening hours when the Certified Athletic

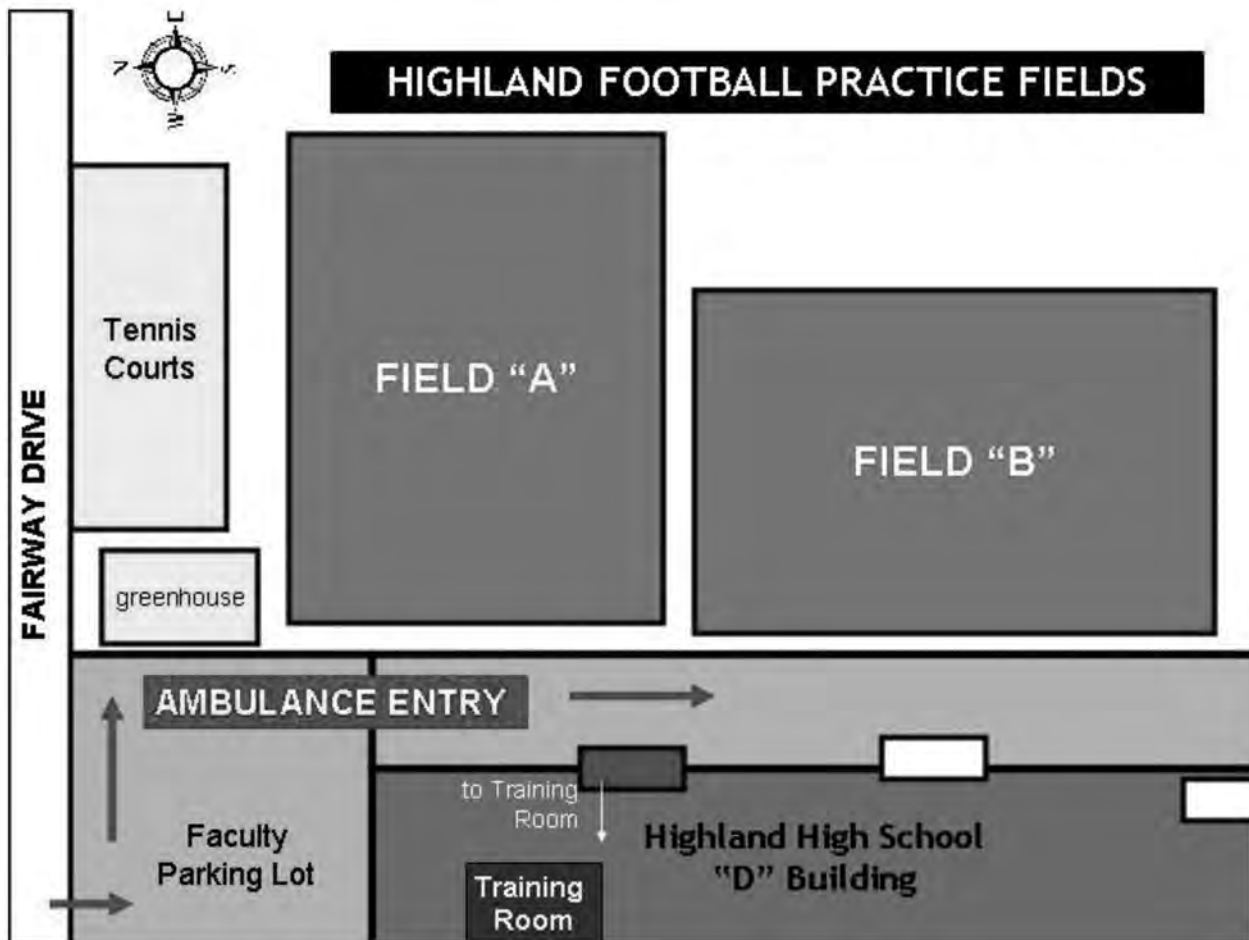
Emergency Equipment: supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary by the team's physician.

Roles of Certified Administration, Athletic Trainer (ATC), and Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested);
- Emergency equipment retrieval
- Direct EMS personnel (ambulance) to scene;
- Unlock and open bar gate between school and practice fields;
- Designate individual to "flag down" EMS and direct to scene;
- Scene control: limit scene to sports medicine personnel and move bystanders (including players) away from area.
- Ensure parking lot is clear and accessible to emergency personnel (watch parking lot).
- Contact students parent or guardian

Venue Directions: _____ **Football Practice Fields:** Take Olympus Drive to Fairway Drive. Cross Bench Road and enter faculty parking lot off of Fairway Drive, next to the tennis courts. There is a bar-gate on the east side of the school, adjacent to the football practice fields. Enter through that gate. Ambulance may park there, next to the school. School Address: 1800 Bench Road. XXX-XXX-XXXX (main office).

Venue Map: *Football Practice Fields*



SAMPLE

Emergency Plan: Football

Stadium

Emergency Personnel: Administration, Certified Athletic Trainer, Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX.

Emergency Equipment: supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, and various wound care necessities. Equipment brought to games to, trauma kit, spine board, c-collars, wound care necessities, crutches, braces, various taping supplies, and any other items deemed necessary.

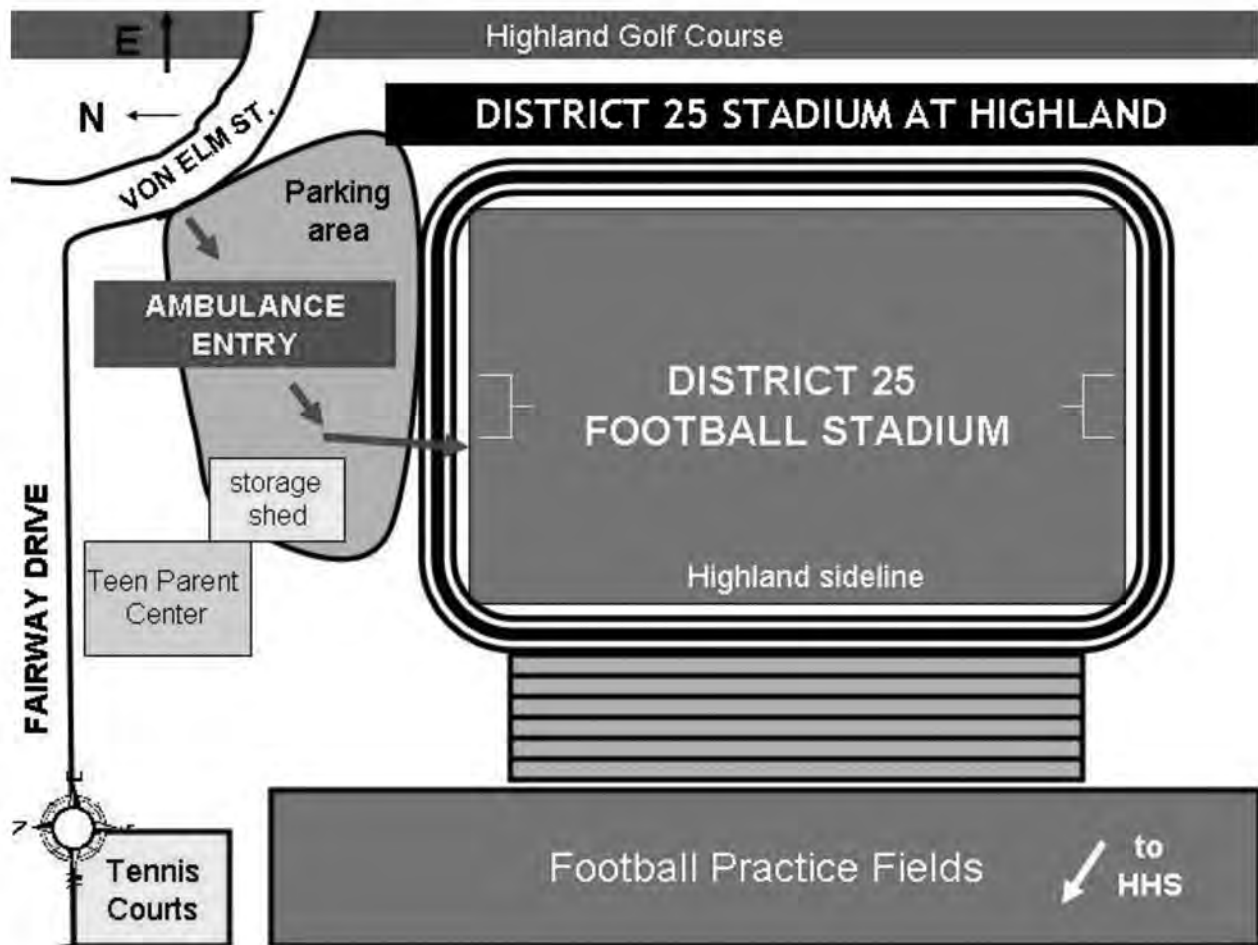
Roles of Administration, Certified Athletic Trainer (ATC), and Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested);
- Direct EMS personnel (ambulance) to scene;
- Emergency equipment retrieval (at request of ATC/Team Physician)
- Unlock gate at the Fairway entrance to District 25 Stadium;
- Ensure parking area inside District 25 Stadium is clear and accessible to emergency personnel (ambulance and fire truck);
- Ensure access inside gate surrounding the track is clear and accessible to emergency personnel;
- Clear and control scene of bystanders;
- Contact students parent or guardian

Venue Directions:

District 25 Stadium: Take Olympus Drive to Fairway. Follow Fairway and turn onto Von Elm Street that leads to the _____ Golf Course parking lot. Stadium field is accessible through gate off Von Elm. Ambulance should enter stadium through gate off the golf course parking lot area and then drive onto track to appropriate sideline area (_____'s sideline will always be on the west side, closest to the bleachers. Directions should be given to dispatcher to direct ambulance to appropriate sideline).

Venue Map: *Football Stadium*



SAMPLE

Emergency Plan: Soccer

Soccer Complex

Emergency Personnel: Administration Certified Athletic Trainer and Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX.

Emergency Equipment: Supplies and equipment brought to Bannock Soccer Complex for games include taping and bracing supplies, general trauma and wound care kits. Additional supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary by the team's physician.

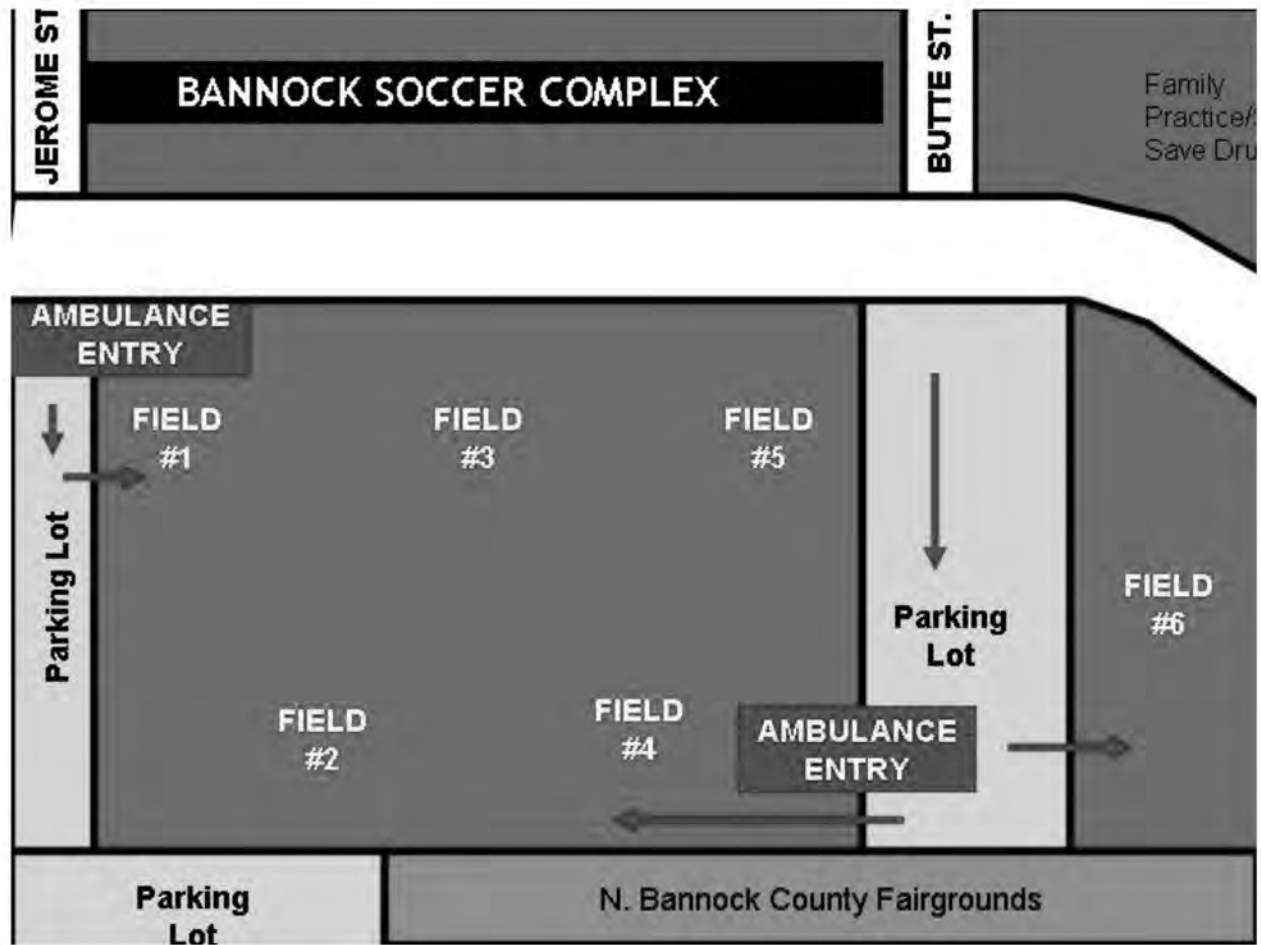
Roles of Administration, Certified Athletic Trainer (ATC), Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested;
- Emergency equipment retrieval (at request of ATC/Team Physician)
- Assist Certified Athletic Trainer, as needed and requested.
- Direct EMS personnel (ambulance) to scene;
- Ensure emergency entrance to soccer facility is clear and accessible (watch for congested parking lots);
- Direct EMS personnel (ambulance) to scene (in the event that there are no student trainers present);
- Scene control: limit scene to sports medicine personnel and move bystanders (including other athletes) away from area of injured athlete.
- Contact students parent or guardian

Venue Directions:

Bannock Soccer Complex: Take Alameda Drive to Pocatello Creek Road. Go north on Olympus Road approximately $\frac{3}{4}$ mile. Bannock Soccer Complex is located just north of Fairway Drive within the Bannock County Fairgrounds. There are two access lanes to soccer fields. The first is located from the main parking lot, across from Butte Street. This is the best access area for emergency vehicles. There is a gate to drive in to the field area at the western most end of the parking lot. The second access area is located at north end of soccer fields, across from Jerome Street. This access is much more limited.

Venue Map: Soccer Complex



SAMPLE

Emergency Plan: Softball

Softball Complex

Emergency Personnel: Administration, Certified Athletic Trainer, and Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX.

Emergency Equipment: Supplies and equipment brought to park for games include taping and bracing supplies, general trauma and wound care kits. Additional supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary by the team's physician.

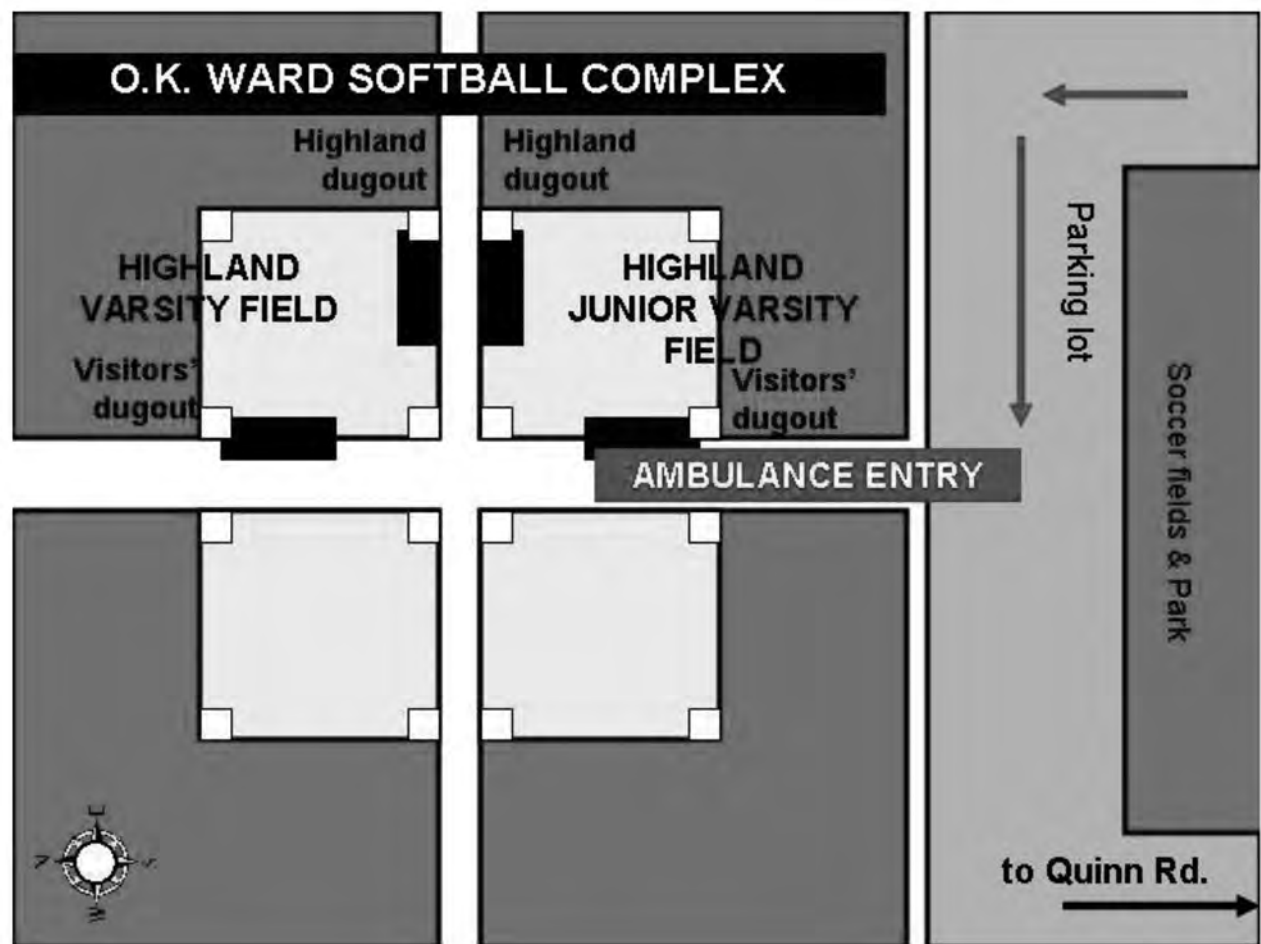
Roles of Administration, Certified Athletic Trainer (ATC), Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested;
- Return to play decision-making on the injured student-athlete;
- Emergency equipment retrieval (at request of ATC/Team Physician)
- Assist Certified Athletic Trainer, as needed and requested.
- Direct EMS personnel (ambulance) to scene;
- Ensure emergency entrance to softball facility is clear and accessible;
- Direct EMS personnel (ambulance) to scene (in the event that there are no student trainers present);
- Scene control: limit scene to sports medicine personnel and move bystanders (including other athletes) away from area of injured athlete.
- Contact students parent or guardian

Venue Directions:

O.K. Ward Softball Complex: Take Yellowstone Avenue to Quinn Road (Chubbuck). Travel west on Quinn Road, past Hawthorne Road, to O.K. Ward Park entrance. Softball complex is at the northern end of the park, adjacent to Interstate 86. There is an emergency entrance into the softball complex at the center of the parking lot adjacent to it.

Venue Map: Softball Complex



SAMPLE

_____ Emergency Plan: Track & Field

Track & Field Stadium at _____

Emergency Personnel: Administration, Certified Athletic Trainer, and Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX.

Emergency Equipment: Supplies and equipment brought to Stadium for meets include taping and bracing supplies, general trauma and wound care kits. Additional supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary by the team's physician.

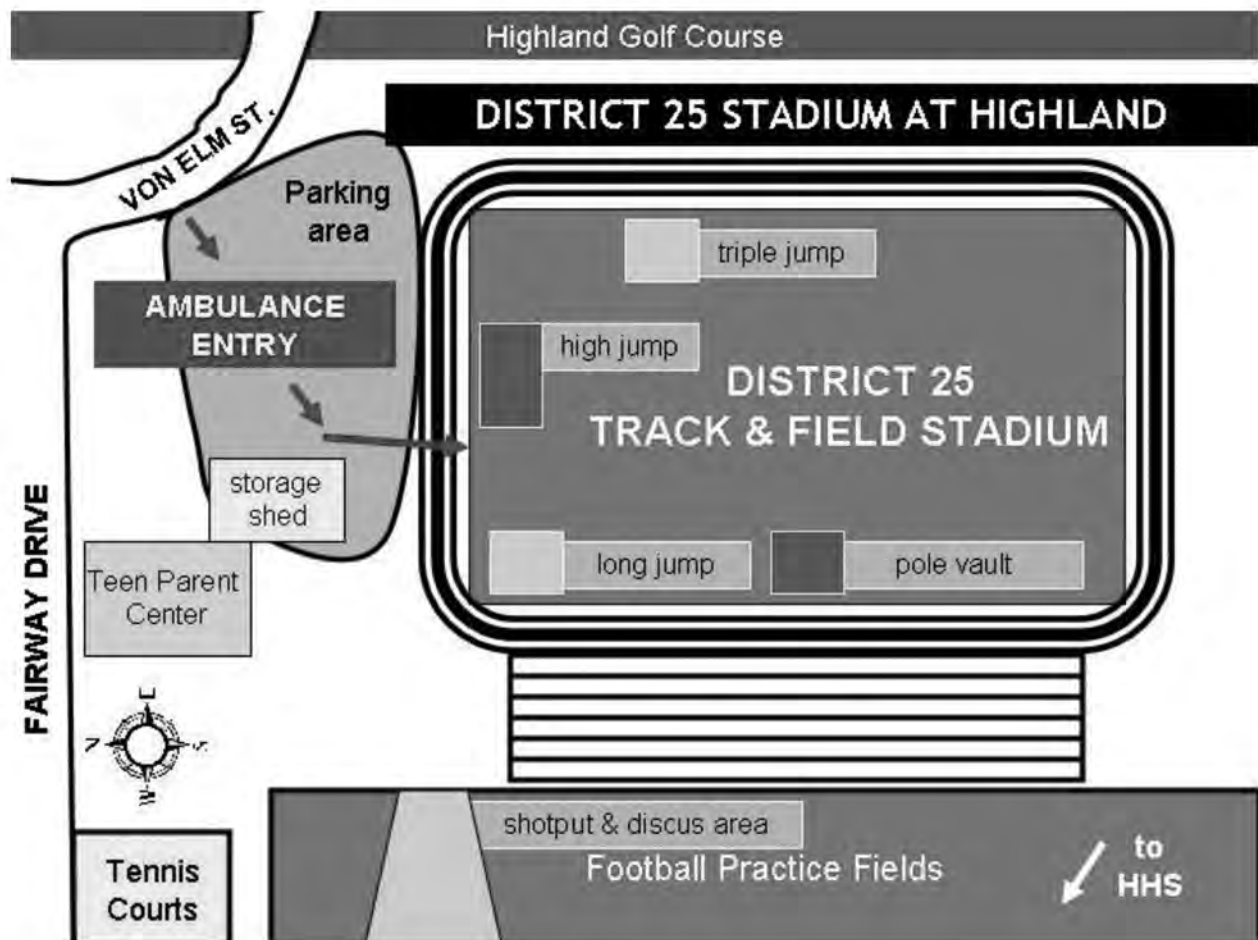
Roles of Administration, Certified Athletic Trainer (ATC), Coaches

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested;
- Emergency equipment retrieval (at request of ATC/Team Physician)
- Assist Certified Athletic Trainer, as needed and requested.
- Direct EMS personnel (ambulance) to scene;
- Ensure emergency entrance to track & field facility is clear and accessible
- Unlock and open bar gate between school and practice fields;
- Scene control: limit scene to sports medicine personnel and move bystanders (including other athletes) away from area of injured athlete.
- Contact students parent or guardian

Venue Directions:

District 25 Track & Field Stadium: Take Olympus Drive to Fairway. Follow Fairway and turn onto Von Elm Street which leads to _____ Golf Course parking lot. Stadium field is accessible through gate off of Von Elm. Ambulance should enter stadium through gate off the golf course parking lot area and then drive onto track to appropriate area. If running events are taking place, ambulance should park next to gate entrance to the track, or the ambulance may opt to pull onto infield grass area. ATC on scene will provide specific directions depending on condition and site of injured athlete.

Venue Map: *Track & Field Stadium at*



SAMPLE

Emergency Plan: Wrestling

Practice Facility at _____

All mats are to be thoroughly cleaned, disinfected and dried after each practice and match. It is recommended that this cleaning, disinfecting, and drying process be done at least once during practice, as well.

All wrestlers should be required to shower at the conclusion of each practice or match to prevent communicable skin disorders.

Emergency Personnel: Administration, Certified Athletic Trainer, and Coaches

Emergency Communication: The Certified Athletic Trainers and/or Coach carry cellular telephones (XXX-XXX-XXXX). Additional fixed telephone lines accessible from _____ High School XXX-XXX-XXXX.

Emergency Equipment: Supplies and equipment brought to gym for matches include taping and bracing supplies, general trauma and wound care kits. Disinfectant spray, paper towels, nose plugs, and wound care supplies will be available for each mat during duals and tournaments. Additional supplies stored in Training Room include trauma kit, splint kit, spine board, c-collars, crutches, wheelchairs, various wound care necessities, and any other items deemed necessary by the team's physician.

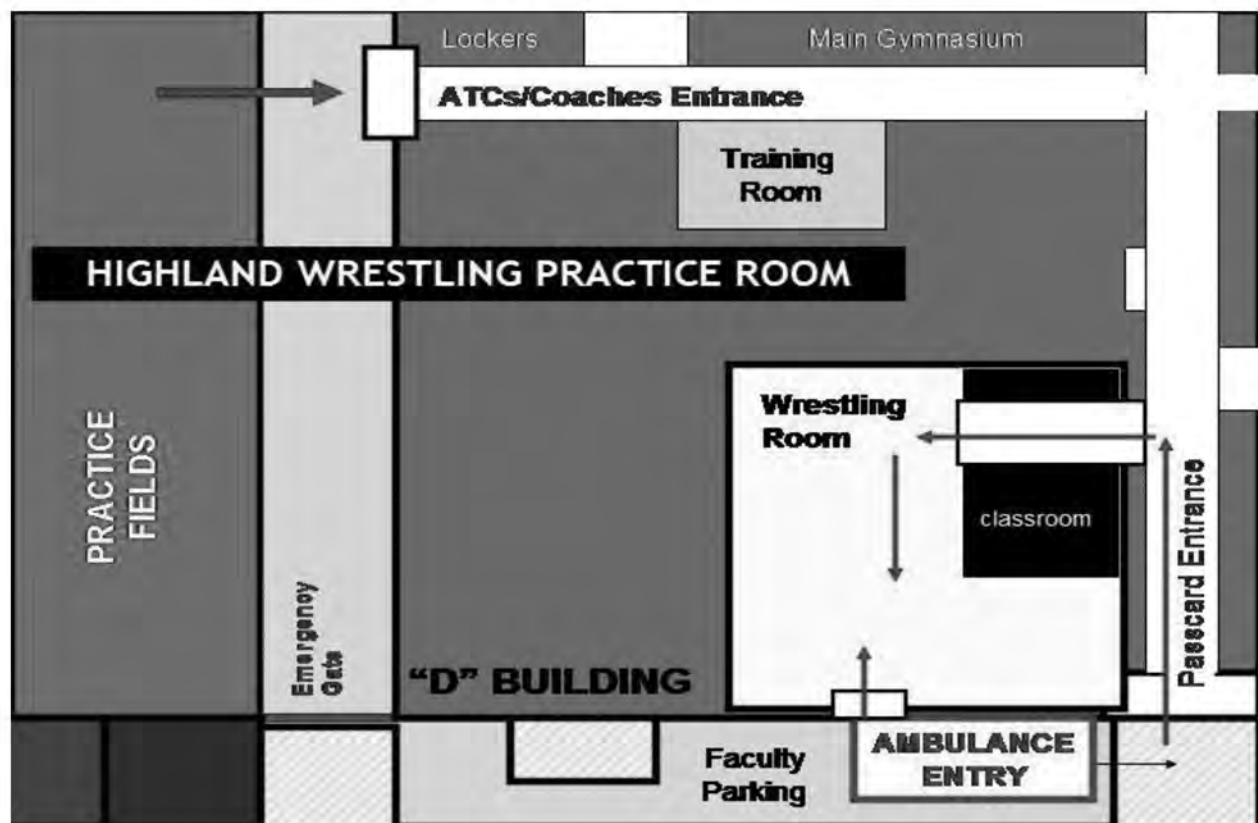
Roles of Certified Athletic Trainer (ATC)

- Immediate evaluation and care of the more seriously-injured or ill student-athletes;
 - Activation of emergency medical system (EMS);
 - 911 call (provide name, address, telephone number; number of individuals injured; condition of injured; first aid treatment; specific directions; other information as requested);
- Emergency equipment retrieval (at request of ATC/Team Physician)
- Assist Certified Athletic Trainer, as needed and requested.
- Direct EMS personnel (ambulance) to scene;
- Ensure emergency entrance to basketball facility ("D" Building) is clear and accessible (check parking lots regularly);
- Unlock and open doors for EMS to access gym;
- Direct EMS personnel (ambulance) to scene (in the event there are no student trainers present);
- Scene control: limit scene to sports medicine personnel and move bystanders (including other athletes) away from area of injured athlete.
- Contact students parent or guardian

Venue Directions:

Auxiliary Gymnasium at _____: Take Olympus Drive to Fairway. Go east on Fairway, across Bench Road and turn into faculty parking lot adjacent to the school's tennis courts. Enter "D" Building through door adjacent to sliding garage. In the event that door is locked, enter through "D" building passcard entrance door (normal entrance) and proceed through door to first classroom on the left.

Venue Map: Wrestling Practice Room



SAMPLE

HIGH SCHOOL EMERGENCY PLAN FOR ATHLETICS

Emergency Contacts	
Police Department	XXX-XXX-XXXX
Fire & Ambulance	XXX-XXX-XXXX
Medical Center	XXX-XXX-XXXX
High School Training Room	XXX-XXX-XXXX
ATC – Cell Phone	XXX-XXX-XXXX
High School Main Office	XXX-XXX-XXXX
Administrative Office	XXX-XXX-XXXX
Athletic Director	XXX-XXX-XXXX
Athletic Director Cell Phone	XXX-XXX-XXXX

AAA Lightning Guidelines and Procedures

The following procedures will be put in place for lightning disturbances or other weather related issues:

Lightning Delay Procedures

- 1) Use the AAA Handbook/NFHS Rulebook as a guide to implement lightning delay procedures.
- 2) When thunder is heard or a cloud-to-ground lightning bolt is seen or an approved lightning/storm detector indicates that lightning is within eight (8) miles of the venue, the thunderstorm is close enough to strike your location. Suspend play and take shelter immediately.
- 3) Adhere to the 30 minute rule before resuming play, regardless of the point of interruption.
- 4) Communicate with host school administration, visitor administration, and head coaches of both teams as conditions change.
- 5) Attempt to finish contest, if at all possible, once lightning disturbances subside.
- 6) It is ultimately the responsibility of the game officials in communication with the host site administration as to whether to suspend the contest or extend the delay additionally.

*Refer to page 35 of the NFHS Sports Medicine Handbook for more information regarding lightening safety.

AAA Concussion Guidelines and Procedures

The Arkansas Activities Association Board of Directors has adopted the following guidelines for dealing with a concussed student athlete:

1. **No athlete should return to play or practice on the same day of a concussion.**
2. **Any athlete suspected of having a concussion should be evaluated by an appropriate health-care professional that day (MD, DO, Nurse Practitioner, Certified Athletic Trainer, or Physician Assistant).**
3. **Any athlete with a concussion should be medically cleared by an appropriate health-care professional prior to resuming participation in any practice or competition.**
4. **After medical clearance, return to play should follow a step-wise protocol with provisions for delayed return to play based upon the return of any signs or symptoms.**

Concussions at all levels of sports have received a great deal of attention in the past few years. The attention has increased even more so over the past year, culminating with the NFL, NCAA, and NFHS testifying before the U. S. Congress about what each organization is doing to protect athletes from concussions. Over the past year and a half the Arkansas Activities Association has taken a proactive stance by providing our member schools with educational resources dealing with concussions. During the 2009-2010 school year, the AAA Sports Medicine Advisory Committee recognized concussion as our Sports Medicine Point of Emphasis. Concussion awareness was included in all required sports rules meetings.

A concussion is a brain injury that results in a temporary disruption of normal brain function. A concussion occurs when the brain is violently rocked back and forth or twisted inside the skull as a result of a blow to the head or body. Most concussed athletes do not lose consciousness, yet they often show other common signs, symptoms and behaviors of concussion. Adolescent athletes are particularly vulnerable to the effects of concussion. Once considered little more than a minor “ding” on the head, it is now understood that a concussion has the potential to result in short- and long-term changes in brain function. Continued participation in any sport following a concussion can lead to worsening concussion symptoms, as well as further injury to the brain – and even death. The AAA strongly believes that student athletes who show signs/symptoms of a concussion should be removed from play.

The NFHS Sports Medicine Advisory Committee (composed of leading doctors, athletic trainers, research specialists and state association staff) developed new guidelines for concussion management of a student exhibiting signs, symptoms or behaviors consistent with a concussion. Those guidelines will go into all NFHS rules books and will be in effect starting with the 2010 – 2011 school year. They have also been included in all required AAA sports rules meetings. The language will read:

Any athlete who exhibits signs, symptoms, or behaviors consistent with a concussion (such as loss of consciousness, headache, dizziness, confusion, or balance problems) shall be immediately removed from the contest and shall not return to play until cleared by an appropriate health-care professional.

Behavior or signs observed indicative of a possible concussion:

- Loss of consciousness
- Appears dazed or stunned
- Appears confused
- Forgets plays
- Unsure of game, score or opponent
- Moves clumsily
- Answers questions slowly
- Shows behavior or personality changes
- Cannot recall events prior to or after the injury

Symptoms reported by a player indicative of a possible concussion:

- Headache
- Nausea
- Balance problems or dizziness
- Double or fuzzy vision
- Sensitivity to light or noise
- Feeling sluggish
- Feeling foggy or groggy
- Concentration or memory problems
- Confusion

In order for the NFHS rule to be effective coaches, officials, administrators, and health-care professionals must know and recognize their roles. The rule calls for the immediate removal of the participant from the contest. It is important to note that the responsibility of the official is limited to activities that occur on the field, court, or mat. Once the participant has been removed from a contest due to a suspected concussion, the coach or appropriate health-care professional(s) assumes full responsibility for the athlete's further evaluation and safety.

The safety of the student athlete is of paramount concern during any athletic contest. The new rules adopted by the NFHS and the AAA should provide a framework for the effective recognition and management of a concussed student athlete. We encourage every coach and official to view the free new NFHS 20-minute online coaches education course – *Concussion in Sports – What You Need to Know*, it is a useful tool for providing concussion education, the course also contains supplemental information from the NFHS and the CDC. The free course is also appropriate for administrators, health-care providers, parents, and students. It can be found at www.nfhslearn.com.

*Refer to page 91 of the NFHS Sports Medicine Handbook for more information regarding concussions.

Sample MRSA Procedures

Defense against MRSA

- Athletes MUST wash their hand prior to any athletic participation.
- Athletes should have all cuts and scrapes covered prior to participation. After participation clean the wound and recover.
- DO NOT allow athletes to share water bottles, towels, razors, or athletic equipment. (use cups disposable drinks, individual towels or disposable towels, and make sure athletes are wearing the equipment that was issued to them.
- Make alcohol based hand sanitizer available during practice and games.
- Athletes MUST take showers after practice and games.
- Disinfect ALL balls used in practice or games by spraying the with Lysol.
- Clean locker rooms, meeting areas, in-door workout facilities, courts, and cheerleading mats weekly with an FDA approved solution that targets MRSA (wrestling mats should be cleaned daily)
- If you have turf in your indoor facility check with manufacturer to see which disinfectants are recommended.
- Wash all soft good items daily (towels, practice gear, etc.)
- Specific equipment for each sport should be cleaned weekly (volleyball knee pads, football equipment, catcher's gear, etc.
- Weight rooms should be equipped with disinfecting wipes and hand sanitizer (wipe down weights after each use, encourage athletes to clean hands, cover and tears on weight benches, athletes should wear shirts while working out)
- Any athlete with signs and symptoms of an infection should be isolated from the rest of the team immediately and referred to a licensed health care professional, such as a school nurse, certified athletic trainer, or physician

**Refer to page 100 of the NFHS Sports Medicine Handbook for more information regarding skin conditions and infections,

Basic Heat Illness Information

Exertional heat stroke has had a 100% survival rate when immediate cooling (via cold water immersion or aggressive whole body cold water dousing) was initiated within 10 minutes of collapse.

While exertional heat illness (EHI) is not always a life-threatening condition, exertional heat stroke (EHS) can lead to fatality if not recognized and treated properly. EHI is most commonly composed of four different conditions including exertional heat stroke, heat exhaustion, heat syncope, and heat cramps. Each condition presents in different ways, and it is imperative to understand the distinctive signs and symptoms of each. As the word heat implies, these conditions most commonly occur during the hot summer months; however, EHI can happen at any time and in the absence of high environmental temperatures. Through proper education and awareness, all forms of exertional heat illness can be prevented, recognized, and treated correctly.

Exertional Heat Stroke (EHS)

- Severe condition characterized by core temperature > 40°C (104°F), central nervous system (CNS) dysfunction, and multiple organ system failure induced by strenuous exercise, often occurring in the hot environments³⁻⁴
- EHS is a medical emergency and can be a fatal condition if the individual's core body temperature remains above 40°C for an extended period of time without the proper treatment³

Signs and Symptoms

Core body temperature > 40°C, tachycardia (increased heart rate), hypotension, sweating, hyperventilation, altered mental status (disorientation/confusion), dizziness, irrational behavior, irritability, headache, inability to walk, loss of balance/muscle function, vomiting, diarrhea, collapse, seizures, and coma.¹⁻⁴

It is recommended when performing temperature assessment, ONLY a rectal temperature should be used with a hyperthermic individual; it is the only method for an accurate and immediate temperature assessment if an ingestible thermometer was not used. Other temperature devices (tympanic, oral, skin, or axillary) may give false readings.^{1-2, 4}

Predisposing Factors

Vigorous activity in hot-humid environment (usually lasting longer than 1 hour), lack of heat acclimatization, poor physical fitness, dehydration, sleep deprivation, fever or illness, warrior mentality, high pressure to perform and heavy equipment/uniform.¹⁻²

Treatment

Rapid and aggressive whole-body cooling is the key to survival of exertional heat stroke

- The fastest way to decrease body temperature is to remove excess clothing and equipment and immerse the body into a pool or tub of cold water -- cold water immersion -- (35-59°F) ³⁻⁴
- The individual should be immersed within 30 minutes for optimal results and submersed until rectal temperature is below 38.3-38.9°C (101-102°F) ¹⁻⁴
- After cooling, the individual should then be transported to a medical facility for monitoring of possible organ system damage ²⁻⁴
- For more information please see [KSI Cold Water Immersion Cooling Guidelines](#)

Return-to-Play

Return to activity should be determined by a physician. Individuals should avoid exercise for a minimum of one (1) week after release from medical care. Individuals should start with a gradual return to activity under the supervision of a qualified health professional. ¹⁻²

Prevention

To prevent EHS, individuals should adapt to exercise in the heat gradually over 10-14 days (acclimatization) by progressively increasing duration and intensity of work, incorporate rest breaks, minimize amount of equipment/uniform worn in hot-humid weather, provide and encourage adequate fluid consumption. ¹⁻³

***IT IS IMPORTANT TO REALIZE THAT EHS IS DIFFERENT FROM CLASSICAL HEAT STROKE, WHICH USUALLY AFFECTS THE ELDERLY AND CHILDREN DURING PROLONGED ENVIRONMENTAL HEAT EXPOSURE**

- View [KSI Exertional Heat Stroke Survival Kit](#) for further assistance.

Heat Exhaustion

- **Most common heat-related condition observed in active populations** ²
- **Defined as the inability to continue exercise due to cardiovascular insufficiency and energy depletion that may or may not be associated with physical collapse** ¹⁻⁴

Signs and Symptoms

Fatigue, weakness, heavy sweating, dehydration, sodium loss, fainting, dizziness, irritability, headache, hyperventilation, nausea, vomiting, decreased urine output and blood pressure, decreased muscle coordination, and core temperature between 36-40°C ²⁻⁴

Obtain a rectal temperature and assess central nervous system function to rule out exertional heat stroke (< 40°C). ^{1,3}

Predisposing Factors

Exercising in hot and humid environment (air temp > 33°C), inadequate fluid intake (dehydration), and body mass index > 27kg/m ²

Treatment

To treat exertional heat illness, move individual to cool/shaded area, remove excess clothing, elevate legs to promote venous return, cool with fans, rotating ice towels, or ice bags. Individual should respond quickly to treatment, if not heat stroke could be suspected. Provide oral fluids for rehydration. ^{1,4}

Return-to-Play

Returning to activity the same day of episode is not prudent or advised. Individuals should wait 24-48 before returning to activity and should gradually increase intensity and volume of exercise ^{1-2,4}

Prevention

To prevent EHI, individuals should adapt to exercise in the heat gradually -- acclimatize -- over 10-14 days by progressively increasing duration and intensity of work ^{1,3}

Heat Syncope

- Also known as orthostatic dizziness.
- Refers to a fainting episode that someone can experience in high environmental temperatures, usually during the initial days of heat exposure. ^{1,3}

Signs and Symptoms

Dizziness (vertigo), weakness, tunnel vision, pale or sweaty skin, nausea, decreased pulse rate, and normal exercising rectal temperature. ^{1,3}

Predisposing Factors

Standing for long periods of time, usually wearing a uniform, immediately after cessation of activity, or after rapidly standing from prolonged resting or sitting posture. ^{1,3}

Treatment

- Move person to shaded/cool area, monitor vital signs, elevate legs to promote venous return, and rehydrate ³
- Individuals who experience heat syncope will recover relatively quickly, within 10-15 minutes. ³

Return-to-Play

An athlete may return to play once his/her symptoms have resolved and any other medical conditions have been ruled out. Athletes should attempt to rehydrate as necessary.

Prevention

Heat syncope often occurs in individuals that are unacclimatized to the heat (the body is not used to increased environmental temperatures) therefore, individuals should adapt to exercise in the heat gradually acclimatize over 10-14 days by progressively increasing duration and intensity of work^{1, 3}

Heat Cramps (Exercise-Associated Muscle Cramps)

- Defined as an acute, painful, involuntary muscle contraction usually occurring during or after intense exercise, often in the heat, lasting approximately 1-3 minutes¹⁻⁴
- Often occurs in the muscles of the legs, arms, or abdomen²

Signs and Symptoms

Dehydration, thirst, sweating, transient muscle cramps, and fatigue³⁻⁴

A precursor to the initial onset of cramps involves twitches or fasciculations¹⁻²

Predisposing factors

Exercise-induced muscle fatigue, excessive body water loss and excessive sodium loss (sweating)^{2, 4}

Treatment

To treat heat cramps: rest, stretch and massage with muscle in full length position, and provide fluids or food with salt content such as a sports drink¹⁻⁴

Return-to-Play

Individuals can return to play usually during the same exercise session with rest and fluid replacement¹⁻²

Prevention

To prevent heat cramps, individuals should maintain fluid and salt balance, especially when exercising in the heat and sweat losses are great.

Supplemental/extra sodium may be needed.¹⁻²

Exertional Sickling

Sickle cell trait (SCT) is a genetic variation and usually benign. About 1 in 12 African Americans and about 1 in 2,000 to 1 in 10,000 Caucasians have SCT. While not the same as sickle cell anemia, SCT can cause exertional sickling also termed explosive rhabdomyolysis, during intense exercise. Exertional sickling occurs when the sickled red blood cells “log-jam” in the blood vessels, which can cause fatal ischemic/exertional rhabdomyolysis.^{5, 6}

Signs and Symptoms

Usually occurs in the first few minutes of high intensity exercise

Reports of increasing pain and weakness in the muscles, especially in the lower extremity. This might be perceived as “cramping” but is much more diffuse than heat cramps. Heat cramps normally cause the athlete immediate acute pain that immobilizes them while exertional sickling is more of a strong ischemic pain. ^{5,6}

Legs become weak and unstable, athletes normally collapse and most often are mistaken for a case of heat stroke, heat exhaustion or heat cramps. ^{5,6}

Predisposing factors

Heat, dehydration, altitude, asthma, high intensity exercise with few rest intervals ^{5,6}

Treatment

Give supplemental oxygen if possible ³

Cool the athlete, if needed

Call 911 and explain to doctors the urgent care needed to prevent explosive rhabdomyolysis ^{5,6}

Return-to-Play

Blood samples must return to normal (specifically creatine kinase and liver/renal markers). ^{5,6}

In mild and well-managed cases athletes may be able to return to play the next day, in severe cases, extended stay in a hospital may be warranted and return to play may take weeks, if at all. ⁵

Prevention

Sickle cell trait is genetic. Athletes with a family history of sickling should be tested.

Those with known SCT or a high probability of SCT should be treated as follows: ^{5,6}

Allow a greater time for build up in training

Provide breaks as needed or longer “breathers” between intervals and allow SCT athletes to set their own pace

No all-out exertion lasting longer than 2 minutes

Have supplemental oxygen ready if at high altitudes

Be aware of the signs and symptoms and tell the athlete to report them immediately if they begin to experience these

References:

1. Armstrong, LE. 2003. Exertional Heat Illnesses. In Exertional Heatstroke: A Medical Emergency, edited by Douglas J. Casa and Lawrence E. Armstrong, 29-56. Illinois: Human Kinetics Publishers, Inc.
2. American College of Sports Medicine Position Stand; Exertional Heat Illness during Training and Competition. Medicine & Science in Sports & Exercise. 2007; 556-572
3. Binkley, H., Beckett, J., Casa, D.J., Kleiner, D.M., Plummer, P.E. 2002. National Athletic Trainers' Association Position Statement: Exertional Heat Illnesses. Journal of Athletic Training.37 (3):329-343.
4. Inter-Association Task Force on Exertional Heat Illness Consensus Statement
5. Eichner, RE. Sick Cell Trait. J of Sport Rehab. 2007; 16: 197-203.
6. Inter Association Task Force Consensus Statement: Sick Cell Trait and the Athlete. 2007

*Refer to page 42 of the NFHS Sports Medicine Handbook for more information regarding heat illness.

SAMPLE

Hot Weather Practice Procedures

INTRODUCTION

The following policy on heat illness has been developed by the Sports Medicine and Athletic Department to provide the highest quality healthcare for student---athletes at _____ High School. This procedure is reviewed annually and revised as needed. Annual training occurs for the sports medicine staff as well as annual updates and training with the local EMS provider. Prolonged environmental heat exposure and endogenous heat production during activity both require elaborate regulation by the endocrine, exocrine, circulatory, and neurologic systems. Heat illnesses are best thought of as a collection of illnesses that range from benign to potentially fatal. From the mild heat syncope and cramp, to moderate heat exhaustion, and the life threatening heat stroke, this guideline serves to review and provide optimal strategies to help minimize heat illnesses.

“Exertional heat stroke has had a 100% survival rate when immediate cooling (via cold water immersion or aggressive whole body cold water dousing) was initiated within 10 minutes of collapse.” From Korey Stringer Institute, University of Connecticut:
<http://ksi.uconn.edu/info/basic.html>

Because of this, _____ School Athletic Department has adopted a **“cool first, transport second policy”**.

PREVENTION OF HEAT ILLNESS

Circumstances in which heat illness conditions occur may be predictable. The appropriate modification of these circumstances should be discussed and implemented starting during the pre---season.

Pre---Season

- ☐ Thorough and complete pre---participation history and physical examination
 - o Note history of heat illness
 - o Note history of sickle cell trait and screening test results If positive:
 - o Student athlete counseled on sickle cell trait
 - o AT for sport notified
 - o Coaches notified

- ☐ Sickle cell trait does not predispose to heat illness but the conditions may be confused with each other and outcome from EHS may be more severe. (for more information on sickle cell – see page 113 in NFHS Sports Medicine Handbook)
 - o Type and duration of training activities within the past 1---2 months
 - o Extent of training done in heat
 - o Acclimatize athletes to high heat and humidity gradually over 10---14 days
 - o Set up strength and conditioning/acclimatization programs
 - o Education athletic training staff and coaching staff on heat illness recognition, management and prevention
 - o Review National Athletic Trainers’ Association Position Statement: Fluid Replacement for Athletes.
 - o Perform training sessions when medical care is available and on---site

- ☐ Preparation of Sports Medicine and Practice Facilities
 - o Ice/water
 - o Ice towels
 - o Coolers/water bottles
 - o Water/sports drink (Gatorade)
 - o Ice tubs/cold whirlpools
- ☐ 2 large Ice tubs outside on football practice field under misting tents during fall football camp
- ☐ Cold whirlpool located in athletic training room
 - o Lower air conditioning in buildings (70°)
- ☐ Emergency planning/Communication
 - o Communication between athletic trainers, team physicians and local EMS
 - o Availability of cell phones or radios
 - o Cold tubs---checked and filled before every practice
- ☐ Cold whirlpool in athletic training room constantly full and checked each morning
 - o Temperature maintained at 55 degrees
- ☐ Ice tubs filled before practice and ice chest filled with ice and ready for use
- ☐ If immersion necessary, additional ice is readily available from athletic training room and/or in ice chest located next to the ice tubs during fall camp
 - o Carts for patient transport

Pre---Practice

- ☐ Monitor Heat Index via internet weather report
- ☐ Communicate with coaches (adjust practice times, breaks, intensity of workout)
- ☐ Equipment check---utilize light colors, lightweight, and sun---protection
- ☐ Communicate with student---athletes
- ☐ Diet/nutrition (when and what to eat)
- ☐ Stop medications that impair heat loss, increase thermogenesis, or decrease sweating (Ephedra compounds, antihistamines, large amounts of caffeine, diuretics) and substitute with safer medications
- ☐ Hydration
 - o See National Athletic Trainers' Association Position Statement: Fluid Replacement for Athletes
- ☐ Weight charts
 - o Daily weigh---in pre and post practice
 - o If > 3% weight loss from day before, must increase salt/fluid intake before practice and monitor athletes for signs of symptoms heat illness closely
- ☐ At discretion of Sports Medicine team &/or parent, student athlete may be held from practice until rehydrated
- ☐ Ice/water/ice towels available
- ☐ Designate cool/shaded area (4 - 10x10 pop-up tents, misting lines, fans,& 8-benches)
- ☐ Ice tubs (practice field, athletic training room)
 - o Temperature of tubs and cold whirlpool re---checked
 - o Athletic training staff ensures that there is enough ice in ice machine and/or ice chest to adequately cool water and checks to make sure there is ice floating at the top of the ice tubs
- ☐ Emergency equipment (AED, oxygen, thermometer, transport carts, etc)

During Practice

- ☐ Monitor Heat Index every 20---30 minutes via internet weather report as needed
- ☐ Minimize warm up time in heat
- ☐ Conduct warm ups in the shade or cooler (indoor) environments when possible
- ☐ Communication with coaching staff
 - o Increase breaks (frequency & duration)
 - o Lower intensity of workout depending on heat
 - o Minimal equipment, clothing
- ☐ Ice, water, towel availability
- ☐ Injured athletes observe practice from cool/shaded areas
- ☐ Cold tubs (Athletic Training Room and football practice field)
 - o Can access athletic training room with cart to transport student athletes from practice field. (Cart access to rear entrance of athletic training room.)
 - o Ice towels on practice field to be used during transport
- ☐ Sports Medicine Staff field communication (cell phones, radios)
- ☐ Heat Illness recognition
 - o Any athletes who display signs and symptoms of heat illness must have participation restricted based on the judgment of the sports medicine staff/coach/parent
- ☐ Practice modification
 - o Rest breaks should be planned to match conditions and intensity of activity
 - o Minimize the amount of equipment and clothing worn in hot or humid conditions
- ☐ Pre---hydration and hydration during activity
 - o See National Athletic Trainers' Association Position Statement: Fluid Replacement for Athletes

Post---Practice

- ☐ Communicate with coaches (injury report; weather forecast, etc.)
- ☐ Communicate with student athletes
 - o Encourage student athletes to sleep at least 6---8 hours at night in a cool environment
 - o Eat a well---balanced diet that includes proper hydration
- ☐ Lots of fluids; low---fat meal; no caffeine or alcohol
- ☐ Lightly salted foods; no fast food; drink fluids with meal
 - o Extra sodium may be required when exercising in hot conditions or on days with multiple practices, either in diet or rehydration beverages
 - o Signs placed in athletic training room & locker rooms regarding heat illness prevention
- ☐ Hydration
 - o See National Athletic Trainers' Association Position Statement: Fluid Replacement for Athletes
- ☐ Weight charts
 - o Note > 3% weight loss and monitor athletes for signs or symptoms heat illness closely and educate the student athlete regarding appropriate rehydration
- ☐ Have cold tubs available (athletic training room)
 - o Cold whirlpool is available post---practice for cryotherapy in athletic training room
 - o Outdoor ice tubs may also be used for cryotherapy
- ☐ Ice is added as needed to achieve a temperature of 55 degrees

RETURN TO ACTIVITY

If an athlete has experienced any of the previous heat related illnesses, he or she should be evaluated by a physician to determine a return to play strategy. Student athletes with exertional heat stroke should avoid heat exposure for a minimum of one week. The student athlete should not return to athletic activity until fully cleared by physician.

SAMPLE HEAT INDEX CHARTS

Use charts such as the ones below to develop a plan for what your school will do at different levels of heat index. Suggested items to discuss as procedures are:

- ☐ Monitor Heat Index every 20---30 minutes via internet weather report as needed
- ☐ Minimize warm up time in heat
- ☐ Conduct warm ups in the shade or cooler (indoor) environments when possible
- ☐ Communication with coaching staff
 - o Increase breaks (frequency & duration)
 - o Lower intensity of workout depending on heat
 - o Minimal equipment, clothing
- ☐ Ice, water, towel availability
- ☐ Injured athletes observe practice from cool/shaded areas
- ☐ Cold tubs (Athletic Training Room and football practice field)
 - o Can access athletic training room with cart to transport student athletes from practice field. (Cart access to rear entrance of athletic training room.)
 - o Ice towels on practice field to be used during transport
- ☐ Sports Medicine Staff field communication (cell phones, radios)
- ☐ Heat Illness recognition
 - o Any athletes who display signs and symptoms of heat illness must have participation restricted based on the judgment of the sports medicine staff/coach/parent
- ☐ Practice modification
 - o Rest breaks should be planned to match conditions and intensity of activity
 - o Minimize the amount of equipment and clothing worn in hot or humid conditions
- ☐ Pre---hydration and hydration during activity
- ☐ **Reschedule practice at cooler time of day**
- ☐ **Postpone practice**
- ☐ **Cancel practice**

NOAA's National Weather Service

Heat Index

Temperature (°F)

Relative Humidity (%)	Temperature (°F)															
	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

☐ Caution

☐ Extreme Caution

☐ Danger

☐ Extreme Danger

		Relative Humidity (%)												
Air Temperature	°F	40	45	50	55	60	65	70	75	80	85	90	95	100
	110	136												
	108	130	137											
	106	124	130	137										
	104	119	124	131	137									
	102	114	119	124	130	137								
	100	109	114	118	124	129	136							
	98	105	109	113	117	123	128	134						
	96	101	104	108	112	116	121	126	132					
	94	97	100	103	106	110	114	119	124	129	135			
	92	94	96	99	101	105	108	112	116	121	126	131		
	90	91	93	95	97	100	103	106	109	113	117	122	127	132
	88	88	89	91	93	95	98	100	103	106	110	113	117	121
	86	85	87	88	89	91	93	95	97	100	102	105	108	112
	84	83	84	85	86	88	89	90	92	94	96	98	100	103
	82	81	82	83	84	84	85	86	88	89	90	91	93	95
	80	80	80	81	81	82	82	83	84	84	85	86	86	87

Heat Index
(Apparent
Temperature)

With Prolonged Exposure
and/or Physical Activity

Extreme Danger
Heat stroke or sunstroke highly likely
Danger
Sunstroke, muscle cramps, and/or heat exhaustion likely
Extreme Caution
Sunstroke, muscle cramps, and/or heat exhaustion possible
Caution
Fatigue possible

Extreme danger
Danger
Extreme caution
Caution

		RELATIVE HUMIDITY (PERCENT)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
AIR TEMPERATURE (DEGREES FAHRENHEIT)	140	125																				
	135	120	128																			
	130	117	122	131																		
	125	111	116	123	131	141																
	120	107	111	116	123	130	139	143														
	115	103	107	111	115	120	127	135	143	151												
	110	99	102	105	108	112	117	123	130	137	143	150										
	105	95	97	100	102	105	109	113	118	123	129	135	142	149								
	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144						
	95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136				
	90	83	84	85	86	87	88	90	91	93	95	96	98	100	102	106	109	113	117	122		
	85	78	79	80	81	82	83	84	85	86	87	88	89	90	91	93	95	97	99	102	105	108
	80	73	74	75	76	77	77	78	79	79	80	81	81	82	83	85	86	86	87	88	89	91
	75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80
	70	64	64	65	65	66	66	67	67	68	68	69	69	70	70	70	71	71	71	71	71	72

Apparent temperature
is how hot the heat-humidity combination makes it feel.

Apparent temperature
is how hot the heat-humidity combination makes it feel.

Sample heat index charts from state associations:

Tennessee

<http://www.tssaa.org/Handbook/heatpolicy.pdf>

Kentucky

<http://www.khsaa.org/sportsmedicine/heat/heatindexchartcolor.pdf>

Oregon

<http://www.osaa.org/heatindex/>

SAMPLE VERIFICATION OF EMERGENCY ACTION PLANS AND PROCEDURES FOR HOT WEATHER PRACTICES

Please copy form as needed

_____ School has emergency action plans for each athletic venue. The plans are reviewed annually with the local emergency service provider.

(signature)

(title or position)

(date completed)

(signature)

(title or position)

(date completed)

_____ School has procedures for hot weather practices.

(signature)

(title or position)

(date completed)

(signature)

(title or position)

(date completed)

SAMPLE VERIFICATION OF ACKNOWLEDGMENT OF TRAINING ON CONCUSSIONS

Please copy form as needed

Each coach or volunteer in every sport providing instruction, assistance, or supervision in an athletic activity for an AAA member school must sign this form certifying that the coach or volunteer has completed the training on concussions. The training **must** be completed every three years.

I hereby verify by signing below that I have completed the training on concussions.

_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)

THIS FORM IS TO BE KEPT ON FILE AT EACH AAA MEMBER SCHOOL AND PRESENTED FOR REVIEW UPON REQUEST BY THE AAA OR ADE.

SAMPLE VERIFICATION OF ACKNOWLEDGMENT OF TRAINING ON HEAT ILLNESS

Please copy form as needed

Each coach or volunteer in every sport providing instruction, assistance, or supervision in an athletic activity for an AAA member school must sign this form certifying that the coach or volunteer has completed the training on Heat Illness. The training **must** be completed every three years.

I hereby verify by signing below that I have completed the training on Heat Illness.

_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)
_____	_____	_____
(signature)	(title or position)	(date completed)

THIS FORM IS TO BE KEPT ON FILE AT EACH AAA MEMBER SCHOOL AND PRESENTED FOR REVIEW UPON REQUEST BY THE AAA OR ADE.

SAMPLE VERIFICATION OF ACKNOWLEDGMENT OF TRAINING ON M.R.S.A

Please copy form as needed

Each coach or volunteer in every sport providing instruction, assistance, or supervision in an athletic activity for an AAA member school must sign this form certifying that the coach or volunteer has completed the training on M.R.S.A. The training **must** be completed every three years.

I hereby verify by signing below that I have completed the training on M.R.S.A.

(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)
(signature)	(title or position)	(date completed)

THIS FORM IS TO BE KEPT ON FILE AT EACH AAA MEMBER SCHOOL AND PRESENTED FOR REVIEW UPON REQUEST BY THE AAA OR ADE.

National Athletic Trainers' Association Position Statement: Preventing Sudden Death in Sports

Douglas J. Casa, PhD, ATC, FNATA, FACSM* (co-chair); Kevin M. Guskiewicz, PhD, ATC, FNATA, FACSM† (co-chair); Scott A. Anderson, ATC‡; Ronald W. Courson, ATC, PT, NREMT-I, CSCS§; Jonathan F. Heck, MS, ATC||; Carolyn C. Jimenez, PhD, ATC¶; Brendon P. McDermott, PhD, ATC#; Michael G. Miller, PhD, EdD, ATC, CSCS**; Rebecca L. Stearns, MA, ATC*; Erik E. Swartz, PhD, ATC, FNATA††; Katie M. Walsh, EdD, ATC‡‡

*Korey Stringer Institute, University of Connecticut, Storrs; †Matthew Gfeller Sport-Related Traumatic Brain Injury Research Center, University of North Carolina at Chapel Hill; ‡University of Oklahoma, Norman; §University of Georgia, Athens; ||Richard Stockton College, Pomona, NJ; ¶West Chester University, PA; #University of Tennessee at Chattanooga; **Western Michigan University, Kalamazoo; ††University of New Hampshire, Durham; ‡‡East Carolina University, Greenville, NC

Objective: To present recommendations for the prevention and screening, recognition, and treatment of the most common conditions resulting in sudden death in organized sports.

Background: Cardiac conditions, head injuries, neck injuries, exertional heat stroke, exertional sickling, asthma, and other factors (eg, lightning, diabetes) are the most common causes of death in athletes.

Recommendations: These guidelines are intended to provide relevant information on preventing sudden death in sports and to give specific recommendations for certified athletic trainers and others participating in athletic health care.

Key Words: asthma, cardiac conditions, diabetes, exertional heat stroke, exertional hyponatremia, exertional sickling, head injuries, neck injuries, lightning safety

Sudden death in sports and physical activity has a variety of causes. The 10 conditions covered in this position statement are

- Asthma
- Catastrophic brain injuries
- Cervical spine injuries
- Diabetes
- Exertional heat stroke
- Exertional hyponatremia
- Exertional sickling
- Head-down contact in football
- Lightning
- Sudden cardiac arrest

(Order does not indicate rate of occurrence.)

Recognizing the many reasons for sudden death allows us to create and implement emergency action plans (EAPs) that provide detailed guidelines for prevention, recognition, treatment, and return to play (RTP). Unlike collegiate and professional teams, which usually have athletic trainers (ATs) available, nearly half of high schools as well as numerous other athletic settings lack the appropriate medical personnel to put these guidelines into practice and instead rely on the athletic director, team coach, or strength and conditioning specialist to do so.

To provide appropriate care for athletes, one must be familiar with a large number of illnesses and conditions in order to

properly guide the athlete, determine when emergency treatment is needed, and distinguish among similar signs and symptoms that may reflect a variety of potentially fatal circumstances. For the patient to have the best possible outcome, correct and prompt emergency care is critical; delaying care until the ambulance arrives may result in permanent disability or death. Therefore, we urgently advocate training coaches in first aid, cardiopulmonary resuscitation (CPR), and automated external defibrillator (AED) use, so that they can provide treatment until a medical professional arrives; however, such training is inadequate for the successful and complete care of the conditions described in this position statement. Saving the life of a young athlete should not be a coach's responsibility or liability.

For this reason, we also urge every high school to have an AT available to promptly take charge of a medical emergency. As licensed medical professionals, ATs receive thorough training in preventing, recognizing, and treating critical situations in the physically active. Each AT works closely with a physician to create and apply appropriate EAPs and RTP guidelines.

Throughout this position statement, each recommendation is labeled with a specific level of evidence based on the Strength of Recommendation Taxonomy (SORT).¹ This taxonomy takes into account the quality, quantity, and consistency of the evidence in support of each recommendation: Category A represents consistent good-quality evidence, B represents

inconsistent or limited-quality or limited-quantity evidence, and C represents recommendations based on consensus, usual practice, opinion, or case series.

The following rules apply to every EAP:

1. Every organization that sponsors athletic activities should have a written, structured EAP. *Evidence Category: B*
2. The EAP should be developed and coordinated with local EMS staff, school public safety officials, onsite first responders, school medical staff, and school administrators. *Evidence Category: B*
3. The EAP should be specific to each athletic venue. *Evidence Category: B*
4. The EAP should be practiced at least annually with all those who may be involved. *Evidence Category: B*

Those responsible for arranging organized sport activities must generate an EAP to directly focus on these items:

1. Instruction, preparation, and expectations of the athletes, parents or guardians, sport coaches, strength and conditioning coaches, and athletic directors.
2. Health care professionals who will provide medical care during practices and games and supervise the execution of the EAP with respect to medical care.
3. Precise prevention, recognition, treatment, and RTP policies for the common causes of sudden death in athletes.

The EAP should be coordinated and supervised by the onsite AT. A sports organization that does not have a medical supervisor, such as an AT, present at practices and games and as part of the medical infrastructure runs the risk of legal liability. Athletes participating in an organized sport have a reasonable expectation of receiving appropriate emergency care, and the standards for EAP development have also become more consistent and rigorous at the youth level. Therefore, the absence of such safeguards may render the organization sponsoring the sporting event legally liable.

The purpose of this position statement is to provide an overview of the critical information for each condition (prevention, recognition, treatment, and RTP) and indicate how this information should dictate the basic policies and procedures regarding the most common causes of sudden death in sports. Our ultimate goal is to guide the development of policies and procedures that can minimize the occurrence of catastrophic incidents in athletes. All current position statements of the National Athletic Trainers' Association (NATA) are listed in the Appendix.

ASTHMA

Recommendations

Prevention and Screening

1. Athletes who may have or are suspected of having asthma should undergo a thorough medical history and physical examination.² *Evidence Category: B*
2. Athletes with asthma should participate in a structured warmup protocol before exercise or sport activity to decrease reliance on medications and minimize asthmatic symptoms and exacerbations.³ *Evidence Category: B*
3. The sports medicine staff should educate athletes with asthma about the use of asthma medications as prophylaxis before exercise, spirometry devices, asthma

triggers, recognition of signs and symptoms, and compliance with monitoring the condition and taking medication as prescribed. *Evidence Category: C*

Recognition

4. The sports medicine staff should be aware of the major asthma signs and symptoms (ie, confusion, sweating, drowsiness, forced expiratory volume in the first second [FEV₁] of less than 40%, low level of oxygen saturation, use of accessory muscles for breathing, wheezing, cyanosis, coughing, hypotension, bradycardia or tachycardia, mental status changes, loss of consciousness, inability to lie supine, inability to speak coherently, or agitation) and other conditions (eg, vocal cord dysfunction, allergies, smoking) that can cause exacerbations.^{4,5} *Evidence Category: A*
5. Spirometry tests at rest and with exercise and a field test (in the sport-specific environment) should be conducted on athletes suspected of having asthma to help diagnose the condition.^{2,6} *Evidence Category: B*
6. An increase of 12% or more in the FEV₁ after administration of an inhaled bronchodilator also indicates reversible airway disease and may be used as a diagnostic criterion for asthma.⁷

Treatment

7. For an acute asthmatic exacerbation, the athlete should use a short-acting β_2 -agonist to relieve symptoms. In a severe exacerbation, rapid sequential administrations of a β_2 -agonist may be needed. If 3 administrations of medication do not relieve distress, the athlete should be referred promptly to an appropriate health care facility.⁸ *Evidence Category: A*
8. Inhaled corticosteroids or leukotriene inhibitors can be used for asthma prophylaxis and control. A long-acting β_2 -agonist can be combined with other medications to help control asthma.⁹ *Evidence Category: B*
9. Supplemental oxygen should be offered to improve the athlete's available oxygenation during asthma attacks.¹⁰ *Evidence Category: B*
10. Lung function should be monitored with a peak flow meter. Values should be compared with baseline lung volume values and should be at least 80% of predicted values before the athlete may participate in activities.¹¹ *Evidence Category: B*
11. If feasible, the athlete should be removed from an environment with factors (eg, smoke, allergens) that may have caused the asthma attack. *Evidence Category: C*
12. In the athlete with asthma, physical activity should be initiated at low aerobic levels and exercise intensity gradually increased while monitoring occurs for recurrent asthma symptoms. *Evidence Category: C*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. In 2009, asthma was thought to affect approximately 22 million people in the United States, including approximately 6 million children.⁴ Asthma is a disease in which the airways become inflamed and airflow is restricted.⁴ Airway inflammation, which

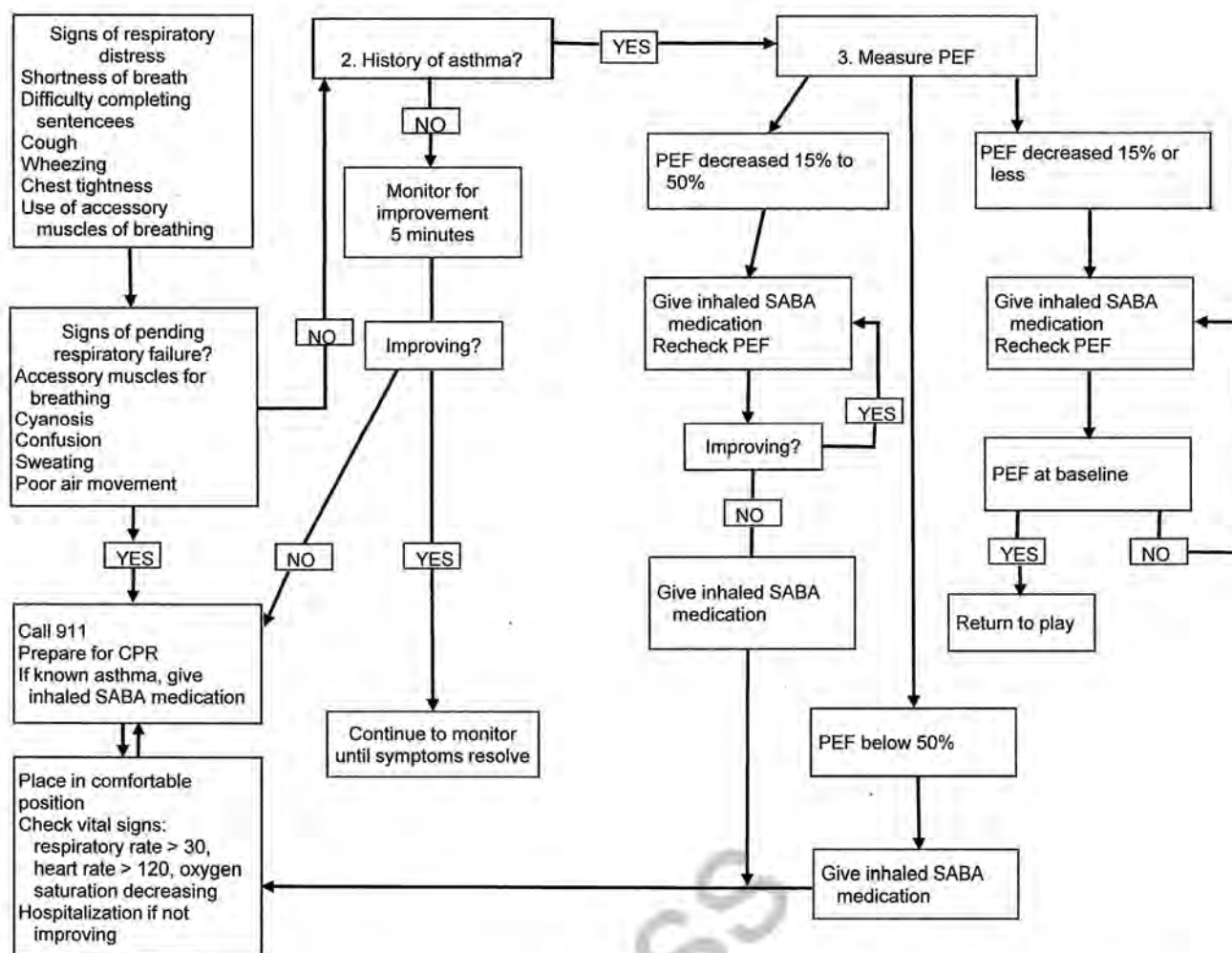


Figure 1. Asthma pharmacologic management. Abbreviations: CPR, cardiopulmonary resuscitation; PEF, peak expiratory flow; SABA, short-acting β_2 -agonist. Casa DJ, *Preventing Sudden Death in Sport and Physical Activity*, 2012: Jones & Bartlett Learning, Sudbury, MA. www.jblearning.com. Reprinted with permission.

may lead to airway hyperresponsiveness and narrowing, is associated with mast cell production and activation and increased number of eosinophils and other inflammatory cells.^{2,3} Cellular and mediator events cause inflammation, bronchial constriction via smooth muscle contraction, and acute swelling from fluid shifts. Chronic airway inflammation may cause remodeling and thickening of the bronchiolar walls.^{12,13}

Clinical signs of asthma include confusion, sweating, drowsiness, use of accessory muscles for breathing, wheezing, coughing, chest tightness, and shortness of breath. Asthma may be present during specific times of the year, vary with the type of environment, occur during or after exercise, and be triggered by respiratory infections, allergens, pollutants, aspirin, non-steroidal anti-inflammatory drugs, inhaled irritants, exposure to cold, and exercise.⁵

Prevention. Athletes suspected of having asthma should undergo a thorough health history examination and preparticipation physical examination. Unfortunately, the sensitivity and specificity of the medical history are not known, and this evaluation may not be the best method for identifying asthma.¹⁴

Performing warmup activities before sport participation can help prevent asthma attacks. With a structured warmup protocol, the athlete may experience a refractory period of as long as 2 hours, potentially decreasing the risk of an exacerbation or decreasing reliance on medications.⁶ In addition, the sports medicine team should provide education to assist the athlete in recognizing asthma signs and symptoms, understanding how to use medication as prescribed (including potential adverse effects and barriers to taking medications, which can include failure to recognize the importance of controlling asthma, failure to recognize the potential severity of the condition, medication costs, difficulty obtaining medications, inability to integrate treatment of the disease with daily life, and distrust of the medical establishment), and using spirometry equipment correctly.^{2,4,5}

Recognition. Athletes with asthma may display the following signs and symptoms: confusion, sweating, drowsiness, FEV₁ of less than 40%, low level of oxygen saturation, use of accessory muscles for breathing, wheezing, cyanosis, coughing, hypotension, bradycardia or tachycardia, mental status

changes, loss of consciousness, inability to lie supine, inability to speak coherently, or agitation.^{2,4,5} Peak expiratory flow rates of less than 80% of the personal best or daily variability greater than 20% of the morning value indicate lack of control of asthma. The sports medicine staff should consider testing all athletes with asthma using a sport-specific and environment-specific exercise challenge protocol to assist in determining triggers of airway hyperresponsiveness.⁶

Treatment. Treatment for those with asthma includes recognition of exacerbating factors and the proper use of asthma medications (Figure 1). A short-acting β_2 -agonist should be readily available; onset of action is typically 5 to 15 minutes, so the medication can be readministered 1 to 3 times per hour if needed.¹⁰ If breathing difficulties continue after 3 treatments in 1 hour or the athlete continues to have any signs or symptoms of acute respiratory distress, referral to an acute or urgent care facility should ensue. For breathing distress, the sports medicine team should provide supplemental oxygen to help maintain blood oxygen saturation above 92%.¹⁰

Proper use of inhaled corticosteroids can decrease the frequency and severity of asthma exacerbations while improving lung function and reducing hyperresponsiveness and the need for short-acting β_2 -agonists.^{15,16} Leukotriene modifiers can be used to control allergen-, aspirin-, or exercise-induced bronchoconstriction and decrease asthma exacerbations.¹⁷

Return to Play. No specific guidelines describe RTP after an asthma attack in an athlete. However, in general, the athlete should first be asymptomatic and progress through graded increases in exercise activity. Lung function should be monitored with a peak flow meter and compared with baseline measures to determine when asthma is sufficiently controlled to allow the athlete to resume participation.¹¹ Where possible, the sports medicine staff should identify and treat asthmatic triggers, such as allergic rhinitis, before the athlete returns to participation.

CATASTROPHIC BRAIN INJURIES

Recommendations

Prevention

1. The AT is responsible for coordinating educational sessions with athletes and coaches to teach the recognition of concussion (ie, specific signs and symptoms), serious nature of traumatic brain injuries in sport, and importance of reporting concussions and not participating while symptomatic. *Evidence Category: C*
2. The AT should enforce the standard use of certified helmets while also educating athletes, coaches, and parents that although such helmets meet a standard for helping to prevent catastrophic head injuries, they do not prevent cerebral concussions. *Evidence Category: B*

Recognition

3. The AT should incorporate the use of a comprehensive objective concussion assessment battery that includes symptom, cognitive, and balance measures. Each of these represents only one piece of the concussion puzzle and should not be used in isolation to manage concussion. *Evidence Category: A*

Treatment and Management

4. A comprehensive medical management plan for acute care of an athlete with a potential intracranial hemorrhage or diffuse cerebral edema should be implemented. *Evidence Category: B*
5. If the athlete's symptoms persist or worsen or the level of consciousness deteriorates after a concussion, the patient should be immediately referred to a physician trained in concussion management. *Evidence Category: B*
6. Oral and written instructions for home care should be given to the athlete and to a responsible adult. *Evidence Category: C*
7. Returning an athlete to participation after a head injury should follow a graduated progression that begins once the athlete is completely asymptomatic. *Evidence Category: C*
8. The athlete should be monitored periodically throughout and after these sessions to determine whether any symptoms develop or increase in intensity. *Evidence Category: C*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. Cerebral concussion is classified as mild traumatic brain injury and often affects athletes in both helmeted and nonhelmeted sports.^{18,19} The Centers for Disease Control and Prevention estimated that 1.6 to 3.8 million sport-related concussive injuries occur annually in the United States.²⁰ Although they are rare, severe catastrophic traumatic brain injuries, such as subdural and epidural hematomas and malignant cerebral edema (ie, second-impact syndrome), result in more fatalities from direct trauma than any other sport injury. When these injuries do occur, brain swelling or pooling of blood (or both) increases intracranial pressure; if this condition is not treated quickly, brainstem herniation and respiratory arrest can follow. Catastrophic brain injuries rank second only to cardiac-related injuries and illnesses as the most common cause of fatalities in football players.²¹ However, the National Center for Catastrophic Sport Injury Research reported that fatal brain injuries have occurred in almost every sport, including baseball, lacrosse, soccer, track, and wrestling.²² For a catastrophic brain injury such as second-impact syndrome, which has a mortality rate approaching 50% and a morbidity rate nearing 100%, prevention is of the utmost importance.

Prevention. Preventing catastrophic brain injuries in sports, such as skull fractures, intracranial hemorrhages, and diffuse cerebral edema (second-impact syndrome), must involve the following: (1) prevention and education about traumatic brain injury for athletes, coaches, and parents; (2) enforcing the standard use of sport-specific and certified equipment (eg, National Operating Committee on Standards for Athletic Equipment [NOCSAE] or Hockey Equipment Certification Council, Inc [HECC]-certified helmets); (3) use of comprehensive, objective baseline and postinjury assessment measures; (4) administration of home care and referral instructions emphasizing the monitoring and management of deteriorating signs and symptoms; (5) use of systematic and monitored graduated RTP progressions; (6) clearly documented records of the evaluation and management of the injury to help guide a sound RTP decision; and (7) proper preparedness for on-field medical management of a serious head injury.

Prevention begins with education. The AT is responsible for coordinating educational sessions with athletes and coaches to teach the recognition of concussion (ie, specific signs and

symptoms), serious nature of traumatic brain injuries in sport, and importance of reporting their injuries and not participating while symptomatic. During this process, athletes who are at risk for subsequent concussion or catastrophic injury should be identified and counseled about the risk of subsequent injury.

As recommended in the NATA position statement on management of sport-related concussion,²³ the AT should enforce the standard use of helmets for preventing catastrophic head injuries and reducing the severity of cerebral concussions in sports that require helmet protection (eg, football, men's lacrosse, ice hockey, baseball, softball). The AT should ensure that all equipment meets NOCSAE, HECC, or American Society for Testing and Materials (ASTM) standards. A poorly fitted helmet is limited in the amount of protection it can provide, and the AT must play a role in enforcing the proper fit and use of the helmet. Protective sport helmets are designed primarily to help prevent catastrophic injuries (eg, skull fractures and intracranial hematomas) and not concussions. A helmet that protects the head from a skull fracture does not adequately prevent the rotational and shearing forces that lead to many concussions,²⁴ a fact that many people misunderstand.

Recognition. The use of objective concussion measures during preseason and postinjury assessments helps the AT and physician accurately identify deficits associated with the injury and track recovery. However, neuropsychological testing is only one component of the evaluation process and should not be used as a standalone tool to diagnose or manage concussion or to make RTP decisions after concussion. Including objective measures of cognitive function and balance prevents premature clearance of an athlete who reports being symptom free but has persistent deficits that are not easily detected through the clinical examination. The concussion assessment battery should include a combination of tests for cognition, balance, and self-reported symptoms known to be affected by concussion. Because many athletes (an estimated 49% to 75%)^{25,26} do not report their concussions, this objective assessment model is important. The sensitivity of this comprehensive battery, including a graded symptom checklist, computerized neuropsychological test, and balance test, reached 94%,²⁷ which is consistent with previous reports.^{28,29}

Multiple concussion assessment tools are available, including low-technology and high-technology balance tests, brief paper-and-pencil cognitive tests, and computerized cognitive tests. As of 2010, the National Football League, National Hockey League, and National Collegiate Athletic Association require an objective assessment as part of a written concussion management protocol. By using objective measures, which were endorsed by the Third International Consensus Statement on Concussion in Sport (Zurich, 2008),^{30,31} ATs and physicians are better equipped to manage concussion than by relying solely on subjective reports from the athlete. Additionally, the often hidden deficits associated with concussion and gradual deterioration that may indicate more serious brain trauma or postconcussion syndrome (ie, symptoms lasting longer than 4 weeks) may be detected with these tools.

Treatment. Once the athlete has been thoroughly evaluated and identified as having sustained a concussion, a comprehensive medical management plan should be implemented. This begins with making a determination about whether the patient should be immediately referred to a physician or sent home with specific observation instructions. Although this plan should include serial evaluations and observations by the AT (as outlined earlier), continued monitoring of postconcussion signs and

symptoms by those with whom the athlete lives is both important and practical. If symptoms persist or worsen or the level of consciousness deteriorates after a concussion, the athlete should be immediately referred to a medical facility. To assist with this, oral and written instructions for home care should be given to the athlete and to a responsible adult (eg, parents or roommate) who will observe and supervise the athlete during the acute phase of the concussion while at home or in the dormitory. The AT and physician should agree on a standard concussion home instruction form similar to the one presented in the NATA position statement²³ and Zurich guidelines.^{30,31}

The proper preparedness for on-field and sideline medical management of a head injury becomes paramount if the athlete has a more serious and quickly deteriorating condition. If the athlete presents with a Glasgow coma score of less than 8 or other indications of more involved brain or brainstem impairment appear (eg, posturing, altered breathing pattern), the AT or other members of the sports medicine team must be prepared to perform manual ventilations through either endotracheal intubation or bag-valve-mouth resuscitation. These procedures should be initiated if the athlete is not oxygenating well (ie, becoming dusky or blue, ventilating incompletely and slower than normal at 12 to 15 breaths per minute).³² Additionally, the sports medicine team should aim to reduce intracranial pressure by elevating the head to at least 30° and ensuring that the head and neck are maintained in the midline position to optimize venous outflow from the brain. Hyperventilation and intravenous (IV) diuretics such as mannitol (0.5 to 1.0 g/kg) may also decrease intracranial pressure.³² Obviously, being prepared for immediate transfer to a medical facility is extremely important under these conditions.

Return to Play. Once the athlete is asymptomatic, has been cleared by a physician with training in concussion management, and has returned to baseline on follow-up assessments, a graduated RTP protocol should begin (Table 1). If the exertional activities do not produce acute symptoms, he or she may progress to the next step. No more than 2 steps should be performed on the same day, which allows monitoring of both acute (during the activity) and delayed (within 24 hours after the activity) symptoms. The athlete may advance to step 5 and return to full participation once he or she has remained asymptomatic for 24 hours after step 4 of the protocol. The athlete should be monitored periodically throughout and after these sessions with objective assessment measures to determine whether an increase in intensity is warranted. If the athlete's symptoms return at any point during the RTP progression, at least 24 hours without symptoms must pass before the protocol is reintroduced, beginning at step 1.

Table 1. Graduated Return-to-Play Sample Protocol

Exertion Step	Activities
1.	20-min stationary bike at 10–14 mph (16–23 kph)
2.	Interval bike: 30-s sprint at 18–20 mph (29–32 kph), 30-s recovery × 10 repetitions; body weight circuit: squats, push-ups, sit-ups × 20 s × 3 repetitions
3.	60-yd (55-m) shuttle run × 10 repetitions with 40-s rest, plyometric workout: 10-yd (9-m) bounding, 10 medicine ball throws, 10 vertical jumps × 3 repetitions; noncontact, sport-specific drills × 15 min
4.	Limited, controlled return to practice with monitoring for symptoms
5.	Full sport participation in practice

The AT should document all pertinent information surrounding the evaluation and management of all suspected concussions, including (a) mechanism of injury; (b) initial signs and symptoms; (c) state of consciousness; (d) findings on serial testing of symptoms, neuropsychological function, and balance (noting any deficits compared with baseline); (e) instructions given to the athlete, parent, or roommate; (f) recommendations provided by the physician; (g) graduated RTP progression, including dates and specific activities involved in the athlete's return to participation; and (h) relevant information on the player's history of prior concussion and associated recovery patterns.²³ This level of detail can help prevent a premature return to participation and a catastrophic brain injury such as second-impact syndrome.

CERVICAL SPINE INJURIES

Recommendations

Prevention

1. Athletic trainers should be familiar with sport-specific causes of catastrophic cervical spine injury and understand the physiologic responses in spinal cord injury. *Evidence Category: C*
2. Coaches and athletes should be educated about the mechanisms of catastrophic spine injuries and pertinent safety rules enacted for the prevention of cervical spine injuries. *Evidence Category: C*
3. Corrosion-resistant hardware should be used in helmets, helmets should be regularly maintained throughout a season, and helmets should undergo regular reconditioning and recertification.³³ *Evidence Category: B*
4. Emergency department personnel should become familiar with proper athletic equipment removal, seeking education from sports medicine professionals regarding appropriate methods to minimize motion. *Evidence Category: C*

Recognition

5. During initial assessment, the presence of any of the following, alone or in combination, requires the initiation of the spine injury management protocol: unconsciousness or altered level of consciousness, bilateral neurologic findings or complaints, significant midline spine pain with or without palpation, or obvious spinal column deformity.³⁴⁻³⁹ *Evidence Category: A*

Treatment and Management

6. The cervical spine should be in neutral position, and manual cervical spine stabilization should be applied immediately.^{40,41} *Evidence Category: B*
7. Traction must not be applied to the cervical spine.^{42,43} *Evidence Category: B*
8. Immediate attempts should be made to expose the airway. *Evidence Category: C*
9. If rescue breathing becomes necessary, the person with the most training and experience should establish an airway and begin rescue breathing using the safest technique.^{44,45} *Evidence Category: B*

10. If the spine is not in a neutral position, rescuers should realign the cervical spine.^{46,47} However, the presence or development of any of the following, alone or in combination, is a contraindication to realignment^{45,48}: pain caused or increased by movement, neurologic symptoms, muscle spasm, airway compromise, physical difficulty repositioning the spine, encountered resistance, or apprehension expressed by the patient. *Evidence Category: B*
11. Manual stabilization of the head should be converted to immobilization using external devices such as foam head blocks.^{47,49} Whenever possible, manual stabilization⁵⁰ is resumed after the application of external devices. *Evidence Category: B*
12. Athletes should be immobilized with a long spine board or other full-body immobilization device.^{51,52} *Evidence Category: B*

Equipment-Laden Athletes

13. The primary acute treatment goals in equipment-laden athletes are to ensure that the cervical spine is immobilized in neutral and vital life functions are accessible. Removal of helmet and shoulder pads in any equipment-intensive sport should be deferred⁵³⁻⁵⁶ until the athlete has been transported to an emergency medical facility except in 3 circumstances⁵⁷: the helmet is not properly fitted to prevent movement of the head independent of the helmet, the equipment prevents neutral alignment of the cervical spine, or the equipment prevents airway or chest access.^{53,54,58} *Evidence Category: C*
14. Full face-mask removal using established tools and techniques⁵⁹⁻⁶¹ is executed once the decision has been made to immobilize and transport. *Evidence Category: C*
15. If possible, a team physician or AT should accompany the athlete to the hospital. *Evidence Category: C*
16. Remaining protective equipment should be removed by appropriately trained professionals in the emergency department. *Evidence Category: C*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. A catastrophic cervical spinal cord injury occurs with structural distortion of the cervical spinal column and is associated with actual or potential damage to the spinal cord.⁶² The spinal injury that carries the greatest risk of immediate sudden death for the athlete occurs when the damage is both severe enough and at a high enough level in the spinal column (above C5) to affect the spinal cord's ability to transmit respiratory or circulatory control from the brain.^{63,64} The priority in these situations is simply to support the basic life functions of breathing and circulation. Unfortunately, even if an athlete survives the initial acute management phase of the injury, the risk of death persists because of the complex biochemical cascade of events that occurs in the injured spinal cord during the initial 24 to 72 hours after injury.⁶⁴ Because of this risk, efficient acute care, transport, diagnosis, and treatment are critical in preventing sudden death in a patient with a catastrophic cervical spine injury.

Treatment and Management. A high level of evidence (ie, prospective randomized trials) on this topic is rare, and technology, equipment, and techniques will continue to evolve, but

the primary goals offered in the NATA position statement on acute management of the cervical spine-injured athlete⁶⁵ remain the same: create as little motion as possible and complete the steps of the EAP as rapidly as is appropriate to facilitate support of basic life functions and prepare for transport to the nearest emergency treatment facility.

Additional complications can affect the care of the spine-injured athlete in an equipment-intensive sport when rescuers may need to remove protective equipment that limits access to the airway or chest. Knowing how to deal properly with protective equipment during the immediate care of an athlete with a potential catastrophic cervical spine injury can greatly influence the outcome. Regardless of the sport or the equipment, 2 principles should guide management of the equipment-laden athlete with a potential cervical spine injury:

1. Exposure and access to vital life functions (eg, airway, chest for CPR, or use of an AED) must be established or easily achieved in a reasonable and acceptable manner.
2. Neutral alignment of the cervical spine should be maintained while allowing as little motion at the head and neck as possible.

Return to Play. Return to play after cervical spine injury is highly variable and may be permitted only after complete tissue healing, neurologic recovery, and clearance by a physician. Factors considered for RTP include the level of injury, type of injury, number of levels fused for stability, cervical stenosis, and activity.⁶⁶

DIABETES MELLITUS

Recommendations

Prevention

1. Each athlete with diabetes should have a diabetes care plan that includes blood glucose monitoring and insulin guidelines, treatment guidelines for hypoglycemia and hyperglycemia, and emergency contact information. *Evidence Category: C*
2. Prevention strategies for hypoglycemia include blood glucose monitoring, carbohydrate supplementation, and insulin adjustments. *Evidence Category: B*
3. Prevention strategies for hyperglycemia are described by the American Diabetes Association (ADA) and include blood glucose monitoring, insulin adjustments, and urine testing for ketone bodies.⁶⁷ *Evidence Category: C*

Recognition

4. Hypoglycemia typically presents with tachycardia, sweating, palpitations, hunger, nervousness, headache, trembling, or dizziness; in severe cases, loss of consciousness and death can occur. *Evidence Category: C*
5. Hyperglycemia can present with or without ketosis. Typical signs and symptoms of hyperglycemia without ketosis include nausea, dehydration, reduced cognitive performance, feelings of sluggishness, and fatigue. *Evidence Category: C*
6. Hyperglycemia with ketoacidosis may include the signs and symptoms listed earlier as well as Kussmaul breathing (abnormally deep, very rapid sighing respirations characteristic of diabetic ketoacidosis), fruity odor to

the breath, unusual fatigue, sleepiness, loss of appetite, increased thirst, and frequent urination. *Evidence Category: C*

Treatment and Management

7. Mild hypoglycemia (ie, the athlete is conscious and able to swallow and follow directions) is treated by administering approximately 10–15 g of carbohydrates (examples include 4–8 glucose tablets or 2 tablespoons of honey) and reassessing blood glucose levels immediately and 15 minutes later. *Evidence Category: C*
8. Severe hypoglycemia (ie, the athlete is unconscious or unable to swallow or follow directions) is a medical emergency, requiring activation of emergency medical services (EMS) and, if the health care provider is properly trained, administering glucagon. *Evidence Category: C*
9. Athletic trainers should follow the ADA guidelines for athletes exercising during hyperglycemic periods. *Evidence Category: C*
10. Physicians should determine a safe blood glucose range to return an athlete to play after an episode of mild hypoglycemia or hyperglycemia. *Evidence Category: C*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. Diabetes mellitus is a chronic metabolic disorder characterized by hyperglycemia, caused by either absolute insulin deficiency or resistance to the action of insulin at the cellular level, which results in the inability to regulate blood glucose levels within the normal range of 70–110 mg/dL. Type 1 diabetes is an autoimmune disorder stemming from a combination of genetic and environmental factors. The autoimmune response is often triggered by an environmental event, such as a virus, and it targets the insulin-secreting beta cells of the pancreas. When beta cell mass is reduced by approximately 80%, the pancreas is no longer able to secrete sufficient insulin to compensate for hepatic glucose output.^{67,68}

Prevention. Although the literature supports physical activity for people with type 1 diabetes, exercise training and competition can result in major disturbances to blood glucose management. Extreme glycemic fluctuations (severe hypoglycemia or hyperglycemia with ketoacidosis) can lead to sudden death in athletes with type 1 diabetes mellitus.^{69–71} Prevention of these potentially life-threatening events begins with the creation of the diabetes care plan by a physician. The plan should identify blood glucose targets for practices and games, including exclusion thresholds; strategies to prevent exercise-associated hypoglycemia, hyperglycemia, and ketosis; a list of medications used for glycemic control; signs, symptoms, and treatment protocols for hypoglycemia, hyperglycemia, and ketosis; and emergency contact information.⁷²

Preventing hypoglycemia relies on a 3-pronged approach of frequent blood glucose monitoring, carbohydrate supplementation, and insulin adjustments. The athlete should check blood glucose levels 2 or 3 times before, every 30 minutes during, and every other hour up to 4 hours after exercise. Carbohydrates should be eaten before, during, and after exercise; the quantity the athlete ingests depends on the prevailing blood

Table 2. Treatment Guidelines for Mild and Severe Hypoglycemia^{76,77}

Mild Hypoglycemia	Severe Hypoglycemia
<ol style="list-style-type: none">1. Give 10–15 g of fast-acting carbohydrate. Example: 4–8 glucose tablets, 2 Tbsp honey.2. Measure blood glucose level.3. Wait 15 min and remeasure blood glucose level.4. If blood glucose level remains low, administer another 10–15 g of fast-acting carbohydrate.5. Recheck blood glucose level in 15 min.6. If blood glucose level does not return to normal after second dose of carbohydrate, activate EMS.7. Once blood glucose level normalizes, provide a snack (eg, sandwich, bagel).	<ol style="list-style-type: none">1. Activate EMS.2. Prepare glucagon for injection, following directions in glucagon kit.3. Once athlete is conscious and able to swallow, provide food.

Abbreviation: EMS, emergency medical services. Revised with permission from Jimenez GC, Corcoran MH, Crawley JT, et al. National Athletic Trainers' Association position statement: management of the athlete with type 1 diabetes mellitus. *J Athl Train*. 2007;42(4):536–545.

glucose level and exercise intensity. Finally, some athletes may use insulin adjustments to prevent hypoglycemia. These adjustments vary depending on the method of insulin delivery (insulin pump versus multiple daily injections), prevailing blood glucose level, and exercise intensity.^{67,68,73,74}

Athletes with type 1 diabetes may also experience hyperglycemia, with or without ketosis, during exercise. Hyperglycemia during exercise is related to several factors, including exercise intensity^{75,76} and the psychological stress of competition.⁷⁷ When the insulin level is adequate, these episodes of hyperglycemia are transient. However, when the insulin level is insufficient, ketosis can occur. Exercise is contraindicated when ketones are present in the urine. Athletic trainers should know the ADA guidelines for athletes exercising during an episode of hyperglycemia.⁶⁷ In addition, the athlete's physician should determine the need for insulin adjustments during hyperglycemic periods.

Recognition. Signs and symptoms of hypoglycemia typically occur when blood glucose levels fall below 70 mg/dL (3.9 mmol/L). Early symptoms include tachycardia, sweating, palpitations, hunger, nervousness, headache, trembling, and dizziness. These symptoms are related to the release of epinephrine and acetylcholine. As the glucose level continues to fall, symptoms of brain neuronal glucose deprivation occur, including blurred vision, fatigue, difficulty thinking, loss of motor control, aggressive behavior, seizures, convulsions, and loss of consciousness. If hypoglycemia is prolonged, severe brain damage and even death can occur. Athletic trainers should be aware that the signs and symptoms of hypoglycemia are individualized and be prepared to act accordingly.^{78–80}

Although the signs and symptoms of hypoglycemia may vary from one athlete to another, they include nausea, dehydration, reduced cognitive performance, slowing of visual reaction time, and feelings of sluggishness and fatigue. The signs and symptoms of hyperglycemia with ketoacidosis may include those listed earlier as well as Kussmaul breathing, fruity odor to the breath, sleepiness, inattentiveness, loss of appetite, increased thirst, and frequent urination. With severe ketoacidosis, the level of consciousness may be reduced. Athletic trainers should also be aware that some athletes with type 1 diabetes intentionally train and compete in a hyperglycemic state (above 180 mg/dL [10 mmol/L]) to avoid hypoglycemia. Competing in a hyperglycemic state places the athlete at risk for dehydration, reduced athletic performance, and possibly ketosis.^{67,81}

Treatment and Management. Treatment guidelines for mild and severe cases of hypoglycemia are shown in Table

2.^{82,83} The ADA provides guidelines for exercise during hyperglycemic periods. If the fasting blood glucose level is ≥ 250 mg/dL (≥ 13.9 mmol/L), the athlete should test his or her urine for the presence of ketones. If ketones are present, exercise is contraindicated. If the blood glucose value is ≥ 300 mg/dL (≥ 16.7 mmol/L) and without ketones, the athlete may exercise with caution and continue to monitor blood glucose levels. Athletes should work with their physicians to determine the need for insulin adjustments for periods of hyperglycemia before, during, and after exercise.⁶⁷

Return to Play. The literature does not address specific RTP guidelines after hypoglycemic or hyperglycemic events. Therefore, RTP for an athlete varies with the individual and becomes easier as the AT works with the athlete on a regular basis and learns how his or her blood glucose reacts to exercise and insulin and glucose doses. The athlete should demonstrate a stable blood glucose level that is within the normal range before RTP. Athletic trainers working with new athletes should seek guidance from the athlete, athlete's physician, and athlete's parents to gain insight on how the athlete has been able to best control the blood glucose level during exercise.

EXERTIONAL HEAT STROKE

Recommendations

Prevention

1. In conjunction with preseason screening, athletes should be questioned about risk factors for heat illness or a history of heat illness. *Evidence Category: C*
2. Special considerations and modifications are needed for those wearing protective equipment during periods of high environmental stress. *Evidence Category: B*
3. Athletes should be acclimatized to the heat gradually over a period of 7 to 14 days. *Evidence Category: B*
4. Athletes should maintain a consistent level of euhydration and replace fluids lost through sweat during games and practices. Athletes should have free access to readily available fluids at all times, not only during designated breaks. *Evidence Category: B*
5. The sports medicine staff must educate relevant personnel (eg, coaches, administrators, security guards, EMS staff, athletes) about preventing exertional heat stroke (EHS) and the policies and procedures that are to be followed in the event of an incident. Signs and symptoms of

a medical emergency should also be reviewed. *Evidence Category: C*

Recognition

6. The 2 main criteria for diagnosis of EHS are (1) core body temperature of greater than 104° to 105°F (40.0° to 40.5°C) taken via a rectal thermometer soon after collapse and (2) CNS dysfunction (including disorientation, confusion, dizziness, vomiting, diarrhea, loss of balance, staggering, irritability, irrational or unusual behavior, apathy, aggressiveness, hysteria, delirium, collapse, loss of consciousness, and coma). *Evidence Category: B*
7. Rectal temperature and gastrointestinal temperature (if available) are the only methods proven valid for accurate temperature measurement in a patient with EHS. Inferior temperature assessment devices should not be relied on in the absence of a valid device. *Evidence Category: B*

Treatment

8. Core body temperature must be reduced to less than 102°F (38.9°C) as soon as possible to limit morbidity and mortality. Cold-water immersion is the fastest cooling modality. If that is not available, cold-water dousing or wet ice towel rotation may be used to assist with cooling, but these methods have not been shown to be as effective as cold-water immersion. Athletes should be cooled first and then transported to a hospital unless cooling and proper medical care are unavailable onsite. *Evidence Category: B*
9. Current suggestions include a period of no activity, an asymptomatic state, and normal blood enzyme levels before the athlete begins a gradual return-to-activity progression under direct medical supervision. This progression should start at low intensity in a cool environment and slowly advance to high-intensity exercise in a warm environment. *Evidence Category: C*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. Exertional heat stroke is classified as a core body temperature of greater than 104° to 105°F (40.0° to 40.5°C) with associated CNS dysfunction.⁸⁴⁻⁸⁷ The CNS dysfunction may present as disorientation, confusion, dizziness, vomiting, diarrhea, loss of balance, staggering, irritability, irrational or unusual behavior, apathy, aggressiveness, hysteria, delirium, collapse, loss of consciousness, and coma. Other signs and symptoms that may be present are dehydration, hot and wet skin, hypotension, and hyperventilation. Most athletes with EHS will have hot, sweaty skin as opposed to the dry skin that is a manifestation of classical EHS.^{84,85,88,89}

Although it is usually among the top 3 causes of death in athletes, EHS may rise to the primary cause during the summer.⁸⁹ The causes of EHS are multifactorial, but the ultimate result is an overwhelming of the thermoregulatory system, which causes a buildup of heat within the body.^{84,90-92}

Prevention. Exercise intensity can increase core body temperature faster and higher than any other factor.⁸⁵ Poor physical condition is also related to intensity. Athletes who are less fit than their teammates must work at a higher intensity to produce the same outcome. Therefore, it is important to alter exercise intensity and rest breaks when environmental conditions are dangerous.⁹³

As air temperature increases, thermal strain increases, but if relative humidity increases as well, the body loses its ability to use evaporation as a cooling method (the main method used during exercise in the heat).^{87,94-97} Adding heavy or extensive protective equipment also increases the potential risk, not only because of the extra weight but also as a barrier to evaporation and cooling. Therefore, extreme or new environmental conditions should be approached with caution and practices altered and events canceled as appropriate.

Acclimatization is a physiologic response to repeated heat exposure during exercise over the course of 10 to 14 days.^{90,98} This response enables the body to cope better with thermal stressors and includes increases in stroke volume, sweat output, sweat rate, and evaporation of sweat and decreases in heart rate, core body temperature, skin temperature, and sweat salt losses.⁹⁰ Athletes should be allowed to acclimatize to the heat before stressful conditions such as full equipment, multiple practices within a day, or performance trials are implemented.^{91,93}

Hydration can help reduce heart rate, fatigue, and core body temperature while improving performance and cognitive functioning.⁹⁶⁻⁹⁸ Dehydration of as little as 2% of body weight has a negative effect on performance and thermoregulation.⁸⁷ Caution should be taken to ensure that athletes arrive at practice euhydrated (eg, having reestablished their weight since the last practice) and maintain or replace fluids that are lost during practice.

Assessment. The 2 main diagnostic criteria for EHS are CNS dysfunction and a core body temperature of greater than 104° to 105°F (40.0° to 40.5°C).⁹⁹⁻¹⁰¹ The only accurate measurements of core body temperature are via rectal thermometry or ingestible thermistors.¹⁰² Other devices, such as oral, axillary, aural canal, and temporal artery thermometers, are inaccurate methods of assessing body temperature in an exercising person. A delay in accurate temperature assessment must also be considered during diagnosis and may explain body temperatures that are lower than expected. Lastly, in some cases of EHS, the patient has a lucid interval during which he or she is cognitively normal, followed by rapidly deteriorating symptoms.⁸⁶

Due to policy and legal concerns in some settings, obtaining rectal temperature may not be feasible. Because immediate treatment is critical in EHS, it is important to not waste time by substituting an invalid method of temperature assessment. Instead, the practitioner should rely on other key diagnostic indicators (eg, CNS dysfunction, circumstances of the collapse). If EHS is suspected, cold-water immersion should be initiated at once. The evidence strongly indicates that in patients with suspected EHS, prompt determination of rectal temperature followed by aggressive, whole-body cold-water immersion maximizes the chances for survival. Practitioners in settings in which taking rectal temperature is a concern should consult with their administrators in advance. Athletic trainers, in conjunction with their supervising physicians, should clearly communicate to their administrators the dangers of skipping this important step and should obtain a definitive ruling on how to proceed in this situation.

Treatment. The goal for any EHS victim is to lower the body temperature to 102°F (38.9°C) or less within 30 minutes of collapse. The length of time body temperature is above the critical core temperature (~105°F [40.5°C]) dictates any morbidity and the risk of death from EHS.¹⁰³ Cold-water immersion is the most effective cooling modality for patients with EHS.^{104,105} The water should be approximately 35°F (1.7°C) to

59°F (15.0°C) and continuously stirred to maximize cooling. The athlete should be removed when core body temperature reaches 102°F (38.9°C) to prevent overcooling. If appropriate medical care is available, cooling should be completed before the athlete is transported to a hospital. If cold-water immersion is not available, other modalities, such as wet ice towels rotated and placed over the entire body or cold-water dousing with or without fanning, may be used but are not as effective. Policies and procedures for cooling athletes before transport to the hospital must be explicitly clear and shared with potential EMS responders, so that treatment by all medical professionals involved with a patient with EHS is coordinated.

Return to Play. Structured guidelines for RTP after EHS are lacking. The main considerations are treating any associated sequelae and, if possible, identifying the cause of the EHS, so that future episodes can be prevented. Many patients with EHS are cooled effectively and sent home the same day; they may be able to resume modified activity within 1 to 3 weeks. However, when treatment is delayed, patients may experience residual complications for months or years after the event. Most guidelines suggest that the athlete be asymptomatic with normal blood work (renal and hepatic panels, electrolytes, and muscle enzyme levels) before a gradual return to activity is initiated.¹⁰⁶ Unfortunately, no evidence-based tools are available to determine whether the body's thermoregulatory system is fully recovered. In summary, in all cases of EHS, after the athlete has completed a 7-day rest period and obtained normal blood work and physician clearance, he or she may begin a progression of physical activity, supervised by the AT, from low intensity to high intensity and increasing duration in a temperate environment, followed by the same progression in a warm to hot environment. The ability to progress depends largely on the treatment provided, and in some rare cases full recovery may not be possible. If the athlete experiences any side effects or negative symptoms with training, the progression should be slowed or delayed.

EXERTIONAL HYPONATREMIA

Recommendations

Prevention

1. Each physically active person should establish an individualized hydration protocol based on personal sweat rate, sport dynamics (eg, rest breaks, fluid access), environmental factors, acclimatization state, exercise duration, exercise intensity, and individual preferences. *Evidence Category: B*
2. Athletes should consume adequate dietary sodium at meals when physical activity occurs in hot environments. *Evidence Category: B*
3. Postexercise rehydration should aim to correct fluid loss accumulated during activity. *Evidence Category: B*
4. Body weight changes, urine color, and thirst offer cues to the need for rehydration. *Evidence Category: A*
5. Most cases of exertional hyponatremia (EH) occur in endurance athletes who ingest an excessive amount of hypotonic fluid. Athletes should be educated about proper fluid and sodium replacement during exercise. *Evidence Category: C*

Recognition

6. Athletic trainers should recognize EH signs and symptoms during or after exercise, including overdrinking, nausea, vomiting, dizziness, muscular twitching, peripheral tingling or swelling, headache, disorientation, altered mental status, physical exhaustion, pulmonary edema, seizures, and cerebral edema. *Evidence Category: B*
7. In severe cases, EH encephalopathy can occur and the athlete may present with confusion, altered CNS function, seizures, and a decreased level of consciousness. *Evidence Category: B*
8. The AT should include EH in differential diagnoses until confirmed otherwise. *Evidence Category: C*

Treatment and Management

9. If an athlete's mental status deteriorates or if he or she initially presents with severe symptoms of EH, IV hypertonic saline (3% to 5%) is indicated. *Evidence Category: B*
10. Athletes with mild symptoms, normal total body water volume, and a mildly altered blood sodium level (130 to 135 mEq/L; normal is 135 to 145 mEq/L) should restrict fluids and consume salty foods or a small volume of oral hypertonic solution (eg, 3 to 5 bouillon cubes dissolved in 240 mL of hot water). *Evidence Category: C*
11. The athlete with severe EH should be transported to an advanced medical facility during or after treatment. *Evidence Category: B*
12. Return to activity should be guided by a plan to avoid future EH episodes, specifically an individualized hydration plan, as described earlier. *Evidence Category: C*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. Exertional hyponatremia is a rare condition defined as a serum sodium concentration less than 130 mEq/L.¹⁰⁷ Although no incidence data are available from organized athletics, the condition is seen in fewer than 1% of military athletes¹⁰⁸ and up to 30% of distance athletes.^{107,109} Signs and symptoms of EH include overdrinking, nausea, vomiting, dizziness, muscular twitching, peripheral tingling or swelling, headache, disorientation, altered mental status, physical exhaustion, pulmonary edema, seizures, and cerebral edema. If not treated properly and promptly, EH is potentially fatal because of the encephalopathy. Low serum sodium levels are identified more often in females than in males and during activity that exceeds 4 hours in duration.^{107,110} Two common, often additive scenarios occur when an athlete ingests hypotonic beverages well beyond sweat losses (ie, water intoxication) or an athlete's sweat sodium losses are not adequately replaced.^{111–114} Water intoxication causes low serum sodium levels because of a combination of excessive fluid intake and inappropriate body water retention. Insufficient sodium replacement causes low serum sodium levels when high sweat sodium content leads to decreased serum sodium levels (which may occur over 3 to 5 days). In both scenarios, EH causes intracellular swelling due to hypotonic intravascular and extracellular fluids. This, in turn, leads to potentially fatal neurologic and

physiologic dysfunction. When physically active people match fluid and sodium losses, via sweat and urine, with overall intake, EH is prevented.^{94,115} Successful treatment of EH involves rapid sodium replacement in sufficient concentrations via foods containing high levels of sodium (minor cases) or hypertonic saline IV infusion (for moderate or severe cases).

Prevention. Exertional hyponatremia is most effectively prevented when individualized hydration protocols are used for the physically active, including hydration before, during, and after exercise.^{94,115} This strategy should take into account sweat rate, sport dynamics (eg, rest breaks, fluid access), environmental factors, acclimatization state, exercise duration, exercise intensity, and individual preferences. The strategy should guide hydration before, during, and after activity to approximate sweat losses but ensure that fluids are not consumed in excess. This goal can be achieved by calculating individual sweat rates (sweat rate = pre-exercise body weight – postexercise body weight + fluid intake + urine volume/exercise time, in hours) for a representative range of environmental conditions and exercise intensities. Suggestions for expediting this procedure can be found in the NATA position statement on fluid replacement.⁹⁴ Sweat rate calculation is the most fundamental consideration when establishing a rehydration protocol. Average sweat rates from the scientific literature or other athletes vary from 0.5 L/h to more than 2.5 L/h.¹¹⁵

Dietary sodium is important for normal body maintenance of fluid balance and can help prevent muscle cramping, heat exhaustion, and EH.⁹¹ The AT should encourage adequate dietary sodium intake, especially when athletes are training in a hot environment and as a part of daily meals.¹¹⁶ Sport drinks generally contain low levels of sodium relative to blood and do little to attenuate decreases in whole-body sodium levels. Instead, athletes should consume foods that are high in sodium (eg, canned soups, pretzels) during meals before and after exercise. Including sodium in fluid-replacement beverages should be considered under the following conditions: inadequate access to meals, physical activity exceeding 2 hours in duration, and during the initial days to weeks of hot weather.^{94,115} Under these conditions, adding salt in amounts of 0.3 to 0.7 g/L can offset salt losses in sweat and minimize medical events associated with electrolyte imbalances.

Postexercise hydration should aim to correct the fluid loss accumulated during activity.^{94,115} Ideally completed within 2 hours, rehydration fluids should contain water, carbohydrates to replenish glycogen stores, and electrolytes to speed rehydration. When rehydration must be rapid (within 2 hours), the athlete should compensate for obligatory urine losses incurred during the rehydration process and drink about 25% more than sweat losses to ensure optimal hydration 4 to 6 hours after the event.¹¹⁷ However, athletes should not drink enough to gain weight beyond pre-exercise measurements.^{94,115,116}

Body weight changes, urine color, and thirst offer cues to the need for rehydration.¹¹⁸ When preparing for an event, an athlete should know his or her sweat rate and pre-exercise hydration status and develop a rehydration plan (discussed in detail in the recommendations).^{94,115} If the athlete's specific needs are unknown, the athlete should not drink beyond thirst.

Recognition. The AT should recognize and the physically active should be educated on EH signs and symptoms during exercise.^{113,114,116} After an exercise bout or competition, symptoms of EH may appear immediately or gradually progress over several hours. The most efficient method of diagnosing

EH onsite is the use of a handheld analyzer, which can identify the serum sodium concentration within minutes.^{113,114} Athletic trainers should work with physicians and EMS to maximize access to these analyzers when EH is likely.

A collapsed, semiconscious, or unconscious athlete should be evaluated for all potential causes of sudden death in sport. The key to the differential diagnosis of EH is serum sodium assessment, which should be conducted when EH is suspected.^{113,114} If a portable serum sodium analyzer is not available, it is then necessary to rule out other conditions that may warrant onsite treatment (eg, EHS) before emergency transport.⁹¹

Treatment. If the athlete's mental status deteriorates or if he or she initially presents with severe symptoms, IV hypertonic saline (3% to 5%) is indicated.^{91,113,114} Intravenous hypertonic saline rapidly corrects the symptoms of EH and decreases intracellular fluid volume. Serial measures of blood sodium should be obtained throughout treatment (after every 100 mL of IV fluid). To avoid complications, hypertonic saline administration should be discontinued when the serum sodium concentration reaches 128 to 130 mEq/L.¹¹⁴ Normal saline (0.9% NaCl) IV fluids should not be provided to patients without prior serum sodium assessment.^{113,114} Ideally, the ATs have discussed with EMS in the off-season the importance of having a portable sodium analyzer available and being ready to administer hypertonic saline during transport.

Athletes with mild symptoms, normal total body water volume, and a mildly altered blood sodium concentration (130 to 135 mEq/L) should restrict fluids and consume salty foods or a small volume of oral hypertonic solution (eg, 3 to 5 bouillon cubes dissolved in 240 mL of hot water). This can be continued until diuresis and correction of the blood sodium concentration occur; such management may take hours to complete, but it is successful in stable patients.¹¹⁴

The patient with severe EH should be transported to an advanced medical facility during or after treatment. Once the patient arrives at the emergency department, a plasma osmolality assessment is performed to identify hypovolemia or hypervolemia. Patients with persistent hypovolemia despite normal serum sodium values should receive 0.9% NaCl IV until euvolemia is reached. The progress of symptoms and blood sodium levels determines the follow-up care.¹¹⁹

Return to Play. When EH is treated appropriately with IV hypertonic saline, chronic morbidity is rare. Literature documenting the expected time course of recovery after EH is lacking, but recovery seems to depend on the severity and duration of brain swelling. Rapid recognition and prompt treatment reduce the risk of CNS damage.¹²⁰

Return to activity should be guided by a plan to avoid future EH episodes, specifically an individualized hydration plan (documented earlier).^{94,115} This plan should also be based on the history and factors that contributed to the initial EH episode.

EXERTIONAL SICKLING

Recommendations

Prevention

1. The AT should educate coaches, athletes, and, as warranted, parents about complications of exertion in the athlete with sickle cell trait (SCT). *Evidence Category: C*

2. Targeted education and tailored precautions may provide a margin of safety for the athlete with SCT. *Evidence Category: C*
3. Athletes with known SCT should be allowed longer periods of rest and recovery between conditioning repetitions, be excluded from participation in performance tests such as mile runs and serial sprints, adjust work-rest cycles in the presence of environmental heat stress, emphasize hydration, control asthma (if present), not work out if feeling ill, and have supplemental oxygen available for training or competition when new to a high-altitude environment. *Evidence Category: B*

Recognition

4. Screening for SCT, by self-report, is a standard component of the preparticipation physical evaluation (PPE) monograph. Testing for SCT, when included in the PPE or conducted previously, confirms SCT status. *Evidence Category: A*
5. The AT should know the signs and symptoms of exertional sickling, which include muscle cramping, pain, swelling, weakness, and tenderness; inability to catch one's breath; and fatigue, and be able to differentiate exertional sickling from other causes of collapse. *Evidence Category: C*
6. The AT should understand the usual settings for and patterns of exertional sickling. *Evidence Category: C*

Treatment

7. Signs and symptoms of exertional sickling warrant immediate withdrawal from activity. *Evidence Category: C*
8. High-flow oxygen at 15 L/min with a nonrebreather face mask should be administered. *Evidence Category: C*
9. The AT should monitor vital signs and activate the EAP if vital signs decline. *Evidence Category: C*
10. Sickling collapse should be treated as a medical emergency. *Evidence Category: C*
11. The AT has a duty to make sure the athlete's treating physicians are aware of the presence of SCT and prepared to treat the metabolic complications of explosive rhabdomyolysis. *Evidence Category: B*

Background and Literature Review

Prevention. No contraindications to participation in sport exist for the athlete with SCT.¹²¹⁻¹²³ Recognition of the athlete's positive SCT status must be followed with targeted education and tailored precautions because deaths have been tied to lapses in education and inadequate precautions.¹²⁴ The athlete with SCT should be informed that SCT is consistent with a normal, healthy life span, although associated complications may occur. Education should include genetic considerations with respect to family planning and questioning about any past medical history of sickling events. Athletes and staff should be educated about the signs, symptoms, and settings of exertional sickling and precautions for the athlete with SCT.¹²³

The premise behind the suggested precautions is that exertional sickling can be brought about through intense, sustained activity with modifiers that increase the intensity.¹²⁵ One precaution that can mitigate exertional sickling is a slow, paced

training progression that allows longer periods of rest and recovery between repetitions.^{123,125} Strength and conditioning programs may increase preparedness but must be sport specific. Athletes with SCT should be excluded from participation in performance tests, such as mile runs and serial sprints, because several deaths have occurred in this setting.¹²⁴ Cessation of activity with the onset of symptoms is essential to avoid escalating a sickling episode (eg, muscle cramping, pain, swelling, weakness, and tenderness; inability to catch one's breath; fatigue).^{123,125} In general, when athletes with SCT set their own pace, they seem to do well.^{123,125} Therefore, athletes with SCT who perform repetitive high-speed sprints, distance runs, or interval training that induces high levels of lactic acid as a component of a sport-specific training regimen should be allowed extended recovery between repetitions because this type of conditioning poses special risks to them.^{123,125}

Factors such as ambient heat stress, dehydration, asthma, illness, and altitude predispose the athlete with SCT to a crisis during physical exertion, even when exercise is not all-out.^{123,125} Extra precautions are warranted in these conditions. These precautions may include the following:

- Work-rest cycles should be adjusted for environmental heat stress.
- Hydration should be emphasized.
- Asthma should be controlled.
- The athlete with SCT who is ill should not work out.
- The athlete with SCT who is new to a high-altitude environment should be watched closely. Training should be modified and supplemental oxygen should be available for competitions.

One last precaution is to create an environment that encourages athletes with SCT to immediately report any signs or symptoms such as leg or low back cramping, difficulty breathing, or fatigue. Such signs and symptoms in an athlete with SCT should be assumed to represent sickling.¹²³

Recognition. The PPE monograph¹⁴ recommends screening for SCT with the question, "Do you or [does] someone in your family have SCT or disease?" Small numbers of affected athletes limit the collection of sufficient evidence to support testing for SCT in the PPE. However, because PPE medical history form answers are highly suspect¹²⁶ and deaths can be tied to a lack of awareness about SCT, the argument for testing to confirm trait status remains strong. The National Collegiate Athletic Association currently mandates testing for SCT. Irrespective of testing, the AT should educate staff, coaches, and athletes on the potentially lethal nature of this condition.¹²³ Education and precautions work best when targeted at the athletes most at risk. Incidence rates of SCT are approximately 8% in African Americans, 0.5% in Hispanics, and 0.2% in whites (but more common in those from the Mediterranean, the Middle East, and India).¹²⁷

Not all athletes who experience sickling present the same way. The primary limiting symptoms are leg or low back cramps or spasms, weakness, debilitating low back pain,¹²⁸ difficulty recovering ("I can't catch my breath"), and fatigue. Sickling often lacks a prodrome, so these symptoms in an athlete with SCT should be treated as exertional sickling.¹²³

Sickling collapse has been mistaken for cardiac collapse or heat illness.¹²⁹ However, unlike sickling collapse, cardiac collapse tends to be instantaneous, is not associated with cramping, and results in the athlete hitting the ground without any protective reflex mechanism and being unable to talk. Also unlike sickling collapse, heat illness collapse often occurs after a

moderate but still intense bout of exercise, usually more than 30 minutes in duration. In addition, the athlete will have a core body temperature $>104^{\circ}\text{F}$ (40.0°C). Alternatively, sickling collapse typically occurs within the first half hour on the field, and core temperature is not greatly elevated.^{129,130}

Sickling is often confused with heat cramping but may be differentiated by the following:

- Heat cramping often has a prodrome of muscle twinges; sickling has none.
- Heat-cramping pain is more excruciating and can be pinpointed, whereas sickling cramping is more generalized but still strong.
- Those with heat cramps hobble to a halt with “locked-up” muscles, whereas sickling athletes slump to the ground with weak muscles. Many times, sickling athletes push through several instances of collapse before being unable to continue.
- Those with heat cramps writhe and yell in pain; their muscles are visibly contracted and rock hard. Those who are sickling lie fairly still, not yelling in pain, with muscles that look and feel normal to the observer.

Certain factors are common in severe or fatal exertional sickling collapses. These cases tend to be similar in setting and syndrome and are characterized by the following:

- Sickling athletes may be on the field only briefly before collapsing, sprinting only 800 to 1600 meters, often early in the season.
- Sickling can occur during repetitive running of hills or stadium steps, during intense, sustained strength training; if the tempo increases toward the end of intense 1-hour drills; and at the end of practice when athletes run “gas-sers.” Sickling occurs rarely in competition, most often in athletes previously exhibiting symptoms in training for sport.¹²³

Severe to fatal sickling cases are not limited to football players. Sickling collapse has occurred in distance racers and has killed or nearly killed several collegiate and high school basketball players (including 2 women) in training, typically during “suicide sprints” on the court, laps on a track, or a long training run.¹²³

The harder and faster athletes with SCT work, the earlier and greater the sickling. Sickling can begin after only 2 to 3 minutes of sprinting—or any all-out exertion—and can quickly increase to grave levels if the athlete struggles on or is urged on by the coach.¹²⁴

Athletes react in different ways. Some stoic athletes simply stop and say, “I can’t go on.” When the athlete rests, sickle red cells regain oxygen in the lungs; most sickle cells then revert to normal shape, and the athlete soon feels good again and ready to continue. This self-limiting feature surely saves lives.

Treatment. Complaints or evidence of exertional sickling signs and symptoms in a working athlete with SCT should be assumed to represent the onset of sickling and first managed by cessation of activity. A sickling collapse is treated as a medical emergency. Immediate action can save lives.¹²³

1. Check vital signs.
2. Administer high-flow oxygen, 15 L/min (if available), with a nonrebreather face mask.
3. Cool the athlete if necessary.
4. If the athlete is obtunded or if vital signs decline, call 911, attach an AED, and quickly transport the athlete to the hospital.^{125,129} Appropriate medical personnel should start an IV.

5. The AT should inform treating physicians of the athlete’s trait status so that they are prepared to treat explosive rhabdomyolysis and associated metabolic complications.^{124,125,129,131,132}

6. Proactively prepare by having an EAP and appropriate emergency equipment available.

Return to Play. After nonfatal sickling, the athlete may return to sport the same day or be disqualified from further participation. Athletes whose conditions are identified quickly and managed appropriately may return the same day as symptoms subside. Others have self-limiting myalgia from myonecrosis in moderate rhabdomyolysis and may need 1 to 2 weeks of recovery with serial assessments.¹²² Patients with severe rhabdomyolysis necessitating dialysis and months of hospitalization¹³³ may not RTP due to diminished renal function, muscle lost to myonecrosis, or neuropathy from compartment syndrome.¹²¹ As with any RTP after a potential deadly incident, it is imperative that the physician, AT, coach, and athlete work in concert to ensure the athlete’s safety and minimize risk factors that may have caused the initial incident.

HEAD-DOWN CONTACT IN FOOTBALL

Recommendations

Prevention

1. Axial loading is the primary mechanism for catastrophic cervical spine injury. *Head-down contact*, defined as initiating contact with the top or crown of the helmet, is the only technique that results in axial loading. *Evidence Category: A*
2. *Spearing* is the intentional use of a head-down contact technique. Unintentional head-down contact is the inadvertent dropping of the head just before contact. Both head-down techniques are dangerous and may result in axial loading of the cervical spine and catastrophic injury. *Evidence Category: A*
3. Football helmets and other standard football equipment do not cause or prevent axial-loading injuries of the cervical spine. *Evidence Category: A*
4. Injuries that occur as a result of head-down contact are technique related and are preventable to the extent that head-down contact is preventable. *Evidence Category: C*
5. Making contact with the shoulder or chest while keeping the head up greatly reduces the risk of serious head and neck injury. With the head up, the player can see when and how impact is about to occur and can prepare the neck musculature. Even if head-first contact is inadvertent, the force is absorbed by the neck musculature, the intervertebral discs, and the cervical facet joints. This is the safest contact technique. *Evidence Category: C*
6. The game can be played as aggressively with the head up and with shoulder contact but with much less risk of serious injury (Figure 2). However, the technique must be learned, and to be learned, it must be practiced extensively. Athletes who continue to drop their heads just before contact need additional coaching and practice time. *Evidence Category: C*
7. Initiating contact with the face mask is a rule violation and must not be taught. If the athlete uses poor technique by lowering his head, he places himself in the head-



Figure 2. Initiating contact with the shoulder while keeping the head up reduces the risk of head and neck injuries.

down position and at risk of serious injury. *Evidence Category: C*

8. The athlete should know, understand, and appreciate the risk of head-down contact, regardless of intent. Formal team education sessions (conducted by the AT, team physician, or both with the support of the coaching staff) should be held at least twice per season. One session should be conducted before contact begins and the other at the midpoint of the season. Recommended topics are mechanisms of head and neck injuries, related rules and penalties, the incidence of catastrophic injury, the severity of and prognosis for these injuries, and the safest contact positions. The use of videos such as *Heads Up: Reducing the Risk of Head and Neck Injuries in Football*¹³⁴ and *Tackle Progression*¹³⁵ should be mandatory. Parents of high school athletes should be given the opportunity to view these videos. *Evidence Category: C*

Recognition

9. Attempts to determine a player's intent regarding intentional or unintentional head-down contact are subjective. Therefore, coaching, officiating, and playing techniques must focus on decreasing all head-down contact, regardless of intent. *Evidence Category: C*
10. Officials should enforce existing helmet contact rules to further reduce the incidence of head-down contact. A clear discrepancy has existed between the incidence of head-down or head-first contact and the level of enforcement of the helmet contact penalties. Stricter officiating

would bring more awareness to coaches and players about the effects of head-down contact. *Evidence Category: B*

Background and Literature Review

Definition and Pathophysiology. Sudden death from a cervical spine injury is most likely to occur in football from a fracture-dislocation above C4. Axial loading is accepted as the primary cause of cervical spine fractures and dislocations in football players.^{136,137} Axial loading occurs secondary to head-down contact, whether intentional or unintentional, when the cervical vertebrae are aligned in a straight column. Essentially, the head is stopped at contact, the trunk keeps moving, and the spine is crushed between the two. When maximum vertical compression is reached, the cervical spine fails,¹³⁸ resulting in damage to the spinal cord.

Although the football helmet has been successful in reducing the number of catastrophic brain injuries, it is neither the cause nor the solution for cervical spine fractures, primarily because with head-first impact, the head, neck, and torso decelerate non-uniformly. Even after the head is stopped, the body continues to accelerate, and no current football helmet can effectively manage the force placed on the cervical spine by the trunk.¹³⁹⁻¹⁴¹ As identified in the 1970s, contact technique remains the critical factor in preventing axial loading.

Prevention. Initiating contact with the shoulder while keeping the head up is the safest contact position.¹⁴²⁻¹⁴⁸ With the head up, the athlete can see when and how impact is about to occur and can prepare the neck musculature accordingly. This guideline applies to all position players, including ball carriers. The game can be played just as aggressively with this technique but with much less risk of serious head or neck injury. Tacklers can still deliver a big hit, and ball carriers can still break tackles.¹⁴⁹

A top priority for prevention is player education. Athletes have to know, understand, and appreciate the risks of head-first contact in football.^{150,151} The videos *Heads Up: Reducing the Risk of Head and Neck Injuries in Football*¹³⁴ and *Tackle Progression*¹³⁵ are excellent educational tools. Parents of high school players should also be given the opportunity to view these videos. Coaches have a responsibility to spend adequate time teaching and practicing correct contact techniques with all position players. The goal should be not merely to discourage head-down contact but to eliminate it from the game.¹³⁹

Recognition. Coaches have stated that although they have taught players to tackle correctly, the players still tended to lower their heads just before contact.^{143,144} It seems that players have learned to approach contact with their head up, but they need to maintain this position during contact.^{146,149} Instinctively, players protect their eyes and face from injury by lowering their heads at impact.^{144,146,149} Therefore, coaches must allocate enough practice time to overcome this instinct. Players who drop their heads at the last instant are demonstrating that they need additional practice time with correct contact techniques in game-like situations. In addition to teaching correct contact in the beginning of the season, coaches should reinforce the technique regularly throughout the season.¹⁴⁴

The increase in catastrophic cervical spine injuries in the early 1970s was attributed to coaches teaching players to initiate contact with their face masks.^{136,150} Players did not execute maneuvers as they were taught, often unintentionally, and they lowered their heads just before impact, resulting in increased exposure to axial loading and cervical spine fractures. The

teaching of face-first contact remains a rule violation at the high school level and is a concern at all levels of football.

Adequate enforcement of the helmet contact rules will further reduce the risk of catastrophic injuries.^{142-144,152-154} Both the National Collegiate Athletic Association and the National Federation of State High School Associations have changed their helmet contact penalties multiple times in the past 5 years¹⁵⁵ to resolve the dilemma for officials trying to distinguish between intentional and unintentional helmet contact. The current rules for both organizations are now more complete and concise.

A discrepancy has existed between enforcement of the helmet contact penalties and the incidence of head-down contact. Contact with the top of the helmet has been observed in 40% of plays¹⁴⁶ and 18% of helmet collisions in 2007.¹⁵⁶ In contrast, NCAA Division I officials called 1 helmet contact penalty in every 75 games in 2007.¹⁵⁷ If illegal helmet contact is not penalized, the message is that the technique is acceptable.¹⁵⁸ Therefore, football officials must continue to improve the enforcement of these penalties.

LIGHTNING SAFETY

Recommendations

Prevention

1. The most effective means of preventing lightning injury is to reduce the risk of casualties by remaining indoors during lightning activity. When thunder is heard or lightning seen, people should vacate to a previously identified safe location.¹⁵⁹⁻¹⁶¹ *Evidence Category: A*
2. Establish an EAP or policy specific to lightning safety.^{161,162} *Evidence Category: C*
3. No place outdoors is completely safe from lightning, so alternative safe structures must be identified. Sites that are called "shelters" typically have at least one open side and therefore do not provide sufficient protection from lightning injury. These sites include dugouts; picnic, golf, or rain shelters; tents; and storage sheds.^{160,163,164} Safe places to be while lightning occurs are structures with 4 substantial walls, a solid roof, plumbing, and electric wiring—structures in which people live or work.^{160,164} *Evidence Category: B*
4. Buses or cars that are fully enclosed and have windows that are completely rolled up and metal roofs can also be safe places during a lightning storm.¹⁶⁵ *Evidence Category: B*
5. People should remain entirely inside a safe building or vehicle until at least 30 minutes have passed since the last lightning strike or the last sound of thunder.^{166,167} *Evidence Category: A*
6. People injured by lightning strikes while indoors were touching electric devices or using a landline telephone or plumbing (eg, showering). Garages with open doors and rooms with open windows do not protect from the effects of lightning strikes.^{159,161,168-170} *Evidence Category: B*

Treatment and Management

7. Victims are safe to touch and treat, but first responders must ensure their own safety by being certain the area is

safe from imminent lightning strikes.^{171,172} *Evidence Category: A*

8. Triage first lightning victims who appear to be dead. Most deaths are due to cardiac arrest.^{171,173,174} Although those who sustain a cardiac arrest may not survive due to subsequent apnea, aggressive CPR and defibrillation (if indicated) may resuscitate these patients. *Evidence Category: A*
9. Apply an AED and perform CPR as warranted.¹⁷⁴ *Evidence Category: A*
10. Treat for concussive injuries, fractures, dislocations, and shock.^{14,164} *Evidence Category: A*

Background and Literature Review

Definition. Lightning is a natural phenomenon that most people observe within their lifetimes. One of the most dangerous natural hazards encountered, it causes more than 60 fatalities and hundreds of injuries annually in the United States.^{169,175} Lightning occurs with greater frequency in the southeastern United States, the Mississippi and Ohio river valleys, the Rocky Mountains, and the Southwest,¹⁷⁵ but no location is truly safe from the hazard of lightning. Lightning is most prevalent from May through September, with most fatalities and trauma reported in July.^{169,175,176} Most deaths and injuries are recorded between 10:00 AM and 7:00 PM, when many people are engaged in outdoor activities.^{159,169,177}

Lightning can occur from cloud to cloud or cloud to ground. Injuries and deaths are often attributed to cloud-to-ground lightning, but compared with cloud-to-cloud lightning, it occurs only 30% of the time. Negatively charged ionized gas builds up in clouds and seeks objects on the earth (eg, people, houses, trees) that have positively charged regions. When the 2 channels meet, lightning is produced, and an audible repercussion is created; we know this as thunder.^{170,178} The lightning channel has an average peak current of 20000 A and is 5 times hotter than the surface of the sun.^{170,178}

Prevention. Prevention of lightning injury is simple: Avoid the risk of trauma by staying completely indoors in a substantial building where people live and work.^{160,162} A proactive lightning-specific safety policy is paramount to preventing lightning-specific injury. The policy should identify a weather watcher whose job is to look for deteriorating conditions. The weather watcher must have the unchallengeable authority to clear a venue when conditions are unsafe.¹⁶¹ In addition to on-site observations for deteriorating conditions, use of federal weather monitoring Web sites is encouraged. Safe buildings must be identified before outdoor activity begins.^{161,162,179} The lightning safety plan must allow sufficient time to safely move people to the identified building, and this time frame should be adjusted according to the number of people being moved. For example, moving a soccer team to safety takes less time than moving a football team. It is also critical to remain wholly within the safe building for at least 30 minutes after the last sighting of lightning and sound of thunder.^{166,168}

Treatment. People who have been struck by lightning are safe to touch and treat and do not carry an electric charge. However, rescuers themselves are vulnerable to a lightning strike while treating victims during active thunderstorms. Treatment of lightning strike patients includes establishing and maintaining normal cardiorespiratory status.^{161,162,171,173,174} Patients may present in asystole, pulseless, and with fixed and dilated pupils.

Therefore, CPR should be continued even when defibrillation with an AED is not indicated (eg, asystole). Advanced cardiac life support, medications, intubation, and continued CPR may resuscitate these victims. People with a Glasgow Coma Scale score as low as 5 have survived after aggressive resuscitation.¹⁸⁰ After a lightning strike, many patients present with symptoms resembling a concussion. Some may have temporary paralysis, hearing loss, or skin markings, yet true burns are rare. Patients should be assessed and treated for concussion, fractures, dislocations, and shock.¹⁷⁴

Return to Play. Lightning strike patients are eligible to return to previous activities upon release by a qualified physician. Many never seek treatment and do not need hospitalization. If orthopaedic injuries are present, recovery follows the typical protocols. More often than not, however, patients experience neurologic sequelae and have difficulty returning to their preinjury levels.^{175,181} They may never fully return to desired levels, and they need consistent and perhaps multidisciplinary medical and psychological follow-up.^{174,181}

SUDDEN CARDIAC ARREST

Recommendations

Prevention

1. Access to early defibrillation is essential. A goal of less than 3–5 minutes from the time of collapse to delivery of the first shock is strongly recommended. *Evidence Category: B*
2. The preparticipation physical examination should include the completion of a standardized history form and attention to episodes of exertional syncope or presyncope, chest pain, a personal or family history of sudden cardiac arrest or a family history of sudden death, and exercise intolerance. *Evidence Category: C*

Recognition

3. Sudden cardiac arrest (SCA) should be suspected in any athlete who has collapsed and is unresponsive. A patient's airway, breathing, circulation, and heart rhythm (using the AED) should be assessed. An AED should be applied as soon as possible for rhythm analysis. *Evidence Category: B*
4. Myoclonic jerking or seizure-like activity is often present after collapse from SCA and should not be mistaken for a seizure. Occasional or agonal gasping should not be mistaken for normal breathing. *Evidence Category: B*

Management

5. Cardiopulmonary resuscitation should be provided while the AED is being retrieved, and the AED should be applied as soon as possible. Interruptions in chest compressions should be minimized by stopping only for rhythm analysis and defibrillation. Treatment should proceed in accordance with the updated American Heart Association guidelines,¹⁸² which recommend that health care professionals follow a sequence of chest compressions (C), airway (A), and breathing (B). *Evidence Category: B*

Background and Literature Review

Definition, Epidemiology, and Pathophysiology. Sudden cardiac death (SCD) is the leading cause of death in exercising young athletes.^{183,184} The underlying cause of SCD is usually a structural cardiac abnormality. Hypertrophic cardiomyopathy and coronary artery anomalies are responsible for approximately 25% and 14% of SCD, respectively, in the United States.¹⁸³ Commotio cordis accounts for approximately 20% of SCD in young athletes; caused by a blunt, nonpenetrating blow to the chest, it induces ventricular arrhythmia in an otherwise normal heart.¹⁸³ Other structural anomalies that can cause SCD include myocarditis, arrhythmogenic right ventricular dysplasia, Marfan syndrome, valvular heart disease, dilated cardiomyopathy, and atherosclerotic coronary artery disease. In 2% of athletes with SCD, a postmortem examination fails to identify a structural abnormality. These deaths may result from inherited arrhythmia syndromes and ion channel disorders or familial catecholaminergic polymorphic ventricular tachycardia.¹⁸³

The incidence of SCD in high school athletes is estimated to be 1:100000 to 1:200000.^{184,185} In collegiate athletes, this incidence is slightly higher, with estimates ranging from 1:65000 to 1:69000.^{184,186} A recent report¹⁸⁵ described the incidence of SCD in National Collegiate Athletic Association student-athletes as 1:43000, with higher rates in black athletes (1:1700) and male basketball players (1:7000). Unfortunately, because we have no mandatory national reporting system, the true incidence of SCD is unknown and probably underestimated. The reports demonstrating the greatest incidence have estimated up to 110 deaths each year in young athletes, equating to 1 death every 3 days in the United States.¹⁸⁷

Prevention. Preparticipation screening is one strategy available to prevent SCD, but the best protocol to screen athletes is highly debated, and some methods lack accuracy. As many as 80% of patients with SCD are asymptomatic until sudden cardiac arrest occurs,^{188,189} suggesting that screening by history and physical examination alone may have limited sensitivity to identify athletes with at-risk conditions. Further research is needed to understand whether additional tests such as electrocardiograms and echocardiograms improve sensitivity and can be performed with acceptable cost-effectiveness and an acceptable false-positive rate. Detection of asymptomatic conditions should be improved with standardized history forms and attention to episodes of exertional syncope or presyncope, chest pain, a personal or family history of sudden cardiac arrest or a family history of sudden death, or exercise intolerance; selective use of electrocardiograms in high-risk athletes; and a stronger knowledge base for health care professionals.

In 2007, the American Heart Association released a helpful 12-point preparticipation cardiovascular screen for competitive athletes based on the medical history and physical examination (Table 3).

Emergency Preparedness. Preparation is the key to survival once SCA has occurred. Public access to AEDs and established EAPs greatly improve the likelihood of survival. All necessary equipment should be placed in a central location that is highly visible and accessible; multiple AEDs may be needed for larger facilities. An EAP should be in place and specific to each athletic venue and should include an effective communication system, training of likely first responders in CPR and AED use, acquisition of the necessary emergency equipment, a coordinated and practiced response plan, and access to early

Table 3. The 12-Element AHA Recommendations for Preparticipation Cardiovascular Screening of Competitive Athletes

Medical history^a

Personal history

1. Exertional chest pain/discomfort
2. Unexplained syncope/near-syncope^b
3. Excessive exertional and unexplained dyspnea/fatigue, associated with exercise
4. Prior recognition of a heart murmur
5. Elevated systemic blood pressure

Family history

6. Premature death (sudden and unexpected, or otherwise) before age 50 years due to heart disease, in ≥ 1 relative
7. Disability from heart disease in a close relative <50 years of age
8. Specific knowledge of certain cardiac conditions in family members: hypertrophic or dilated cardiomyopathy, long-QT syndrome or other ion channelopathies, Marfan syndrome, or clinically important arrhythmias

Physical examination

9. Heart murmur^c
10. Femoral pulses to exclude aortic coarctation
11. Physical stigmata of Marfan syndrome
12. Brachial artery blood pressure (sitting position)^d

^aParental verification is recommended for high school and middle school athletes.

^bJudged not to be neurocardiogenic (vasovagal); of particular concern when related to exertion.

^cAuscultation should be performed in both supine and standing positions (or with Valsalva maneuver), specifically to identify murmurs of dynamic left ventricular outflow tract obstruction.

^dPreferably taken in both arms (Kaplan NM, Gidding SS, Pickering TG, Wright JT Jr. Task Force 5: systemic hypertension. *J Am Coll Cardiol*. 2005;45(8):1346–1348).

Reprinted with permission from Maron BJ, Thompson PD, Ackerman MJ, et al. Recommendations and considerations related to preparticipation screening for cardiovascular abnormalities in competitive athletes: 2007 update. *Circulation*. 2007;115(12):1643–1655.

defibrillation. It should identify the person or group responsible for documentation of personnel training, equipment maintenance, actions taken during the emergency, and evaluation of the emergency response.¹⁹² The EAP should be coordinated with the local EMS agency and integrated into the local EMS system. It should also be posted at every venue and near appropriate telephones and include the address of the venue and specific directions to guide EMS personnel.

Assessment. Differential diagnosis of nontraumatic exercise-related syncope or presyncope includes sudden cardiac arrest, EHS, heat exhaustion, hyponatremia, hypoglycemia, exercise-associated collapse, exertional sickling, neurocardiogenic syncope, seizures, pulmonary embolus, cardiac arrhythmias, valvular disorders, coronary artery disease, cardiomyopathies, ion channel disorders, and other structural cardiac diseases. In any athlete who has collapsed in the absence of trauma, suspicion for sudden cardiac arrest should be high until normal airway, breathing, and circulation are confirmed. Agonal

respiration or occasional gasping should not be mistaken for normal breathing and should be recognized as a sign of SCA¹⁹³; myoclonic jerking or seizure-like activity shortly after collapse should also be treated as SCA until proven otherwise.^{194,195} If no pulse is palpable, the patient should be treated for SCA, and CPR should be initiated.

Treatment. In any athlete who has collapsed and is unresponsive, SCA should be suspected. If normal breathing and pulse are absent, CPR should be started immediately and EMS activated. The CPR should be performed in the order of CAB (chest compressions, airway, breathing) by medical professionals (hands-only CPR is now recommended for lay responders) while waiting for arrival of the AED and stopped only for rhythm analysis and defibrillation. This should continue until either advanced life support providers take over or the victim starts to move.^{193,194,196,197} Early detection, prompt CPR, rapid activation of EMS, and early defibrillation are vital to the athlete's survival. For any athlete who has collapsed and is unresponsive, an AED should be applied as soon as possible for rhythm analysis and defibrillation if indicated. The greatest factor affecting survival after SCA arrest is the time from arrest to defibrillation.^{195,196} Survival rates have been reported at 41%–74% if bystander CPR is provided and defibrillation occurs within 3 to 5 minutes of collapse.^{186,193,196–207}

Certain weather situations warrant special consideration. In a rainy or icy environment, AEDs are safe and do not pose a shock hazard. However, a patient lying on a wet surface or in a puddle should be moved. A patient lying on a metal conducting surface (eg, stadium bleacher) should be moved to a nonmetal surface. If lightning is ongoing, rescuers must ensure their safety by moving the patient indoors if possible.

ACKNOWLEDGMENTS

We gratefully acknowledge the efforts of Gianluca Del Rossi, PhD, ATC; Jonathan Drezner, MD; John MacKnight, MD; Jason Mihalik, PhD, ATC; Francis O'Connor, MD, MPH; and the Pronouncements Committee in the preparation of this document.

DISCLAIMER

The NATA publishes its position statements as a service to promote the awareness of certain issues to its members. The information contained in the position statement is neither exhaustive nor exclusive to all circumstances or individuals. Variables such as institutional human resource guidelines, state or federal statutes, rules, or regulations, as well as regional environmental conditions, may impact the relevance and implementation of these recommendations. The NATA advises its members and others to carefully and independently consider each of the recommendations (including the applicability of same to any particular circumstance or individual). The position statement should not be relied upon as an independent basis for care but rather as a resource available to NATA members or others. Moreover, no opinion is expressed herein regarding the quality of care that adheres to or differs from NATA's position statements. The NATA reserves the right to rescind or modify its position statements at any time.

Appendix. National Athletic Trainers' Association Statements^a

Topic (Year)	Citation	URL
Safe weight loss and maintenance practices in sport and exercise (2011)	Sammarone Turocy P, DePalma BF, Horswill CA, et al. National Athletic Trainers' Association position statement: safe weight loss and maintenance practices in sport and exercise. <i>J Athl Train</i> . 2011;46(3):322-336.	http://www.nata.org/sites/default/files/JAT-46-3-16-turocy-322-336.pdf
Prevention of pediatric overuse injuries (2011)	Valovich McLeod TC, Decoster LC, Loud KJ, et al. National Athletic Trainers' Association position statement: prevention of pediatric overuse injuries. <i>J Athl Train</i> . 2011;46(2):206-220.	http://www.nata.org/sites/default/files/Pediatric-Overuse-Injuries.pdf
Skin diseases (2010)	Zinder SM, Basler RSW, Foley J, Scarlata C, Vasily DB. National Athletic Trainers' Association position statement: skin diseases. <i>J Athl Train</i> . 2010;45(4):411-428.	http://www.nata.org/sites/default/files/position-statement-skin-disease.pdf
Acute management of the cervical spine-injured athlete (2009)	Swartz EE, Boden BP, Courson RW, et al. National Athletic Trainers' Association position statement: acute management of the cervical spine-injured athlete. <i>J Athl Train</i> . 2009;44(3):306-331.	http://www.nata.org/sites/default/files/acutemgmt-ofcervicalspineinjuredathlete.pdf
Preventing, detecting, and managing disordered eating in athletes (2008)	Bonci CM, Bonci LJ, Granger LR, et al. National Athletic Trainers' Association position statement: preventing, detecting, and managing disordered eating in athletes. <i>J Athl Train</i> . 2008;43(1):80-108.	http://www.nata.org/sites/default/files/Preventing-DetectingAndManagingDisorderedEating.pdf
Environmental cold injuries (2008)	Cappaert TA, Stone JA, Castellani JW, Krause BA, Smith D, Stephens BA. National Athletic Trainers' Association position statement: environmental cold injuries. <i>J Athl Train</i> . 2008;43(6):640-658.	http://www.nata.org/sites/default/files/EnvironmentalColdInjuries.pdf
Sickle cell trait and the athlete (2007)	Anderson S, Eichner ER. Consensus statement: sickle cell trait and the athlete. ^b	http://www.nata.org/sites/default/files/SickleCellTraitAndTheAthlete.pdf
Emergency preparedness and management of sudden cardiac arrest in high school and college athletic programs (2007)	Drezner JA, Courson RW, Roberts WO, Mosesso VN, Link MS, Maron BJ. Inter-Association Task Force Recommendations on emergency preparedness and management of sudden cardiac arrest in high school and college athletic programs: a consensus statement. <i>J Athl Train</i> . 2007;42(1):143-158.	http://www.nata.org/sites/default/files/sudden-cardiac-arrest-consensus-statement.pdf
Management of the athlete with type I diabetes mellitus (2007)	Jimenez CC, Corcoran MH, Crawley JT, et al. National Athletic Trainers' Association position statement: management of the athlete with type I diabetes mellitus. <i>J Athl Train</i> . 2007;42(4):536-545.	http://www.nata.org/sites/default/files/MgmtOfAthleteWithType1DiabetesMellitus.pdf
Management of asthma in athletes (2005)	Miller MG, Weller JM, Baker R, Collins J, D'Alonzo G. National Athletic Trainers' Association position statement: management of asthma in athletes. <i>J Athl Train</i> . 2005;40(3):224-245.	http://www.nata.org/sites/default/files/MgmtOfAsthmaInAthletes.pdf
Head-down contact and spearing in tackle football (2004)	Heck JF, Clarke KS, Peterson TR, Torg JS, Weis MP. National Athletic Trainers' Association position statement: head-down contact and spearing in tackle football. <i>J Athl Train</i> . 2004;39(1):101-111.	http://www.nata.org/sites/default/files/HeadDownContactAndSpearingInTackleFB.pdf
Management of sport-related concussion (2004)	Guskiewicz KM, Bruce SL, Cantu RC, et al. National Athletic Trainers' Association position statement: management of sport-related concussion. <i>J Athl Train</i> . 2004;39(3):280-297.	http://www.nata.org/sites/default/files/MgmtOfSportRelatedConcussion.pdf
Emergency planning in athletics (2002)	Andersen JC, Courson RW, Kleiner DM, McLoda TA. National Athletic Trainers' Association position statement: emergency planning in athletics. <i>J Athl Train</i> . 2002;37(1):99-104.	http://www.nata.org/sites/default/files/EmergencyPlanningInAthletics.pdf
Exertional heat illness (2002)	Binkley HM, Beckett J, Casa DJ, Kleiner DM, Plummer PE. National Athletic Trainers' Association position statement: exertional heat illnesses. <i>J Athl Train</i> . 2002;37(3):329-342.	http://www.nata.org/sites/default/files/ExternalHeatIllnesses.pdf
Fluid replacement for athletes (2000)	Casa DJ, Armstrong LE, Hillman SK, et al. National Athletic Trainers' Association position statement: fluid replacement for athletes. <i>J Athl Train</i> . 2000;35(2):212-224.	http://www.nata.org/sites/default/files/FluidReplacementsForAthletes.pdf
Lightning safety for athletics and recreation (2000)	Walsh KM, Bennett B, Cooper MA, Holle RL, Kithil R, Lopez RE. National Athletic Trainers' Association position statement: lightning safety for athletics and recreation. <i>J Athl Train</i> . 2000;35(4):471-477.	http://www.nata.org/sites/default/files/LightningSafety4AthleticsRec.pdf

^a Updated position statements are posted at www.nata.org. Readers should check the Web site for the most current versions.

^b Available online only.

References

1. Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. *Am Fam Physician*. 2004;69(6):548–556.
2. Weiler JM. Exercise-induced asthma: a practical guide to definitions, diagnosis, prevalence, and treatment. *Allergy Asthma Proc*. 1996;17(6):315–325.
3. Reiff DB, Choudry NB, Pride NB, Ind PW. The effect of prolonged submaximal warm-up exercise on exercise-induced asthma. *Am Rev Respir Dis*. 1989;139(2):479–484.
4. National Heart Lung and Blood Institute. *What Is Asthma?* http://www.nhlbi.nih.gov/health/dci/Diseases/Asthma/Asthma_WhatIs.html. Accessed February 22, 2010.
5. National Institutes of Health, National Heart, Lung, and Blood Institute. *Global Strategy for Asthma Management and Prevention*. Bethesda, MD: National Institutes of Health, National Heart, Lung, and Blood Institute; 2002. No. 02-3659.
6. Rundell KW, Wilber RL, Szmedra L, Jenkinson DM, Mayers LB, Im J. Exercise-induced asthma screening of elite athletes: field versus laboratory exercise challenge. *Med Sci Sports Exerc*. 2000;32(2):309–316.
7. Lung function testing: selection of reference values and interpretative strategies. American Thoracic Society. *Am Rev Respir Dis*. 1991;144(5):1202–1218.
8. Allen TW. Sideline management of asthma. *Curr Sports Med Rep*. 2005;4(6):301–304.
9. Boulet LP. Long versus short-acting beta 2-agonists: implications for drug therapy. *Drugs*. 1994;47(2):207–222.
10. Dennis RJ, Solarte I, Fitzgerald M. Asthma in adults. In: *BMJ Clinical Evidence Handbook*. London, England: BMJ Publishing Group; 2008:502–503.
11. *National Asthma Education and Prevention Program, Expert Panel Report II: Guidelines for the Diagnosis and Management of Asthma*. Bethesda, MD: National Institutes of Health; 1997. No. 97-4051:12–18.
12. de Magalhães Simões S, dos Santos MA, da Silva Oliveira M, et al. Inflammatory cell mapping of the respiratory tract in fatal asthma. *Clin Exp Allergy*. 2005;35(5):602–611.
13. Hamid Q, Song Y, Kotsimbos TC, et al. Inflammation of small airways in asthma. *J Allergy Clin Immunol*. 1997;100(1):44–51.
14. Bernhardt DT, Roberts WO. *Preparticipation Physical Evaluation*. 4th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2010.
15. Haahtela T, Jarvinen M, Kava T, et al. Comparison of a beta 2-agonist, terbutaline, with an inhaled corticosteroid, budesonide, in newly detected asthma. *N Engl J Med*. 1991;325(6):388–392.
16. Barnes PJ, Pedersen S, Busse WW. Efficacy and safety of inhaled corticosteroids. New developments. *Am J Respir Crit Care Med*. 1998;157(3 pt 2):S1–S53.
17. Leff JA, Busse WW, Pearlman D, et al. Montelukast, a leukotriene-receptor antagonist, for the treatment of mild asthma and exercise-induced bronchoconstriction. *N Engl J Med*. 1998;339(3):147–152.
18. Hootman JM, Dick R, Agel J. Epidemiology of collegiate injuries for 15 sports: summary and recommendations for injury prevention initiatives. *J Athl Train*. 2007;42(2):311–319.
19. Lincoln AE, Caswell SV, Almqvist JL, Dunn RE, Norris JB, Hinton RY. Trends in concussion incidence in high school sports; a prospective 11-year study. *Am J Sports Med*. 2011;39(5):958–963.
20. Langlois JA, Rutland-Brown W, Wald MM. The epidemiology and impact of traumatic brain injury: a brief overview. *J Head Trauma Rehabil*. 2006;21(5):375–378.
21. Mueller F, Cantu R, eds. *Football Fatalities and Catastrophic Injuries: 1931–2008*. Durham, NC: Carolina Academic Press; 2010.
22. National Center for Catastrophic Sport Injury Research. <http://unc.edu/depts/nccsi>. Accessed October 6, 2011.
23. Guskiewicz KM, Bruce SL, Cantu RC, et al. National Athletic Trainers' Association position statement: management of sport-related concussion. *J Athl Train*. 2004;39(3):280–297.
24. Halstead DP. Performance testing updates in head, face, and eye protection. *J Athl Train*. 2001;36(3):322–327.
25. McCrea M, Hammeke T, Olsen G, Leo P, Guskiewicz K. Unreported concussion in high school football players: implications for prevention. *Clin J Sport Med*. 2004;14(1):13–17.
26. Register-Mihalik JK, Guskiewicz KM, Marshall SW, et al. *Knowledge, Attitudes, and Behaviors Concerning Concussion Among High School Athletes* [dissertation]. The University of North Carolina at Chapel Hill; 2010.
27. Broglio SP, Macciocchi SN, Ferrara MS. Sensitivity of the concussion assessment battery. *Neurosurgery*. 2007;60(6):1050–1058.
28. McCrea M, Guskiewicz KM, Marshall SW, et al. Acute effects and recovery time following concussion in collegiate football players: the NCAA Concussion Study. *JAMA*. 2003;290(19):2556–2563.
29. Guskiewicz KM, Ross SE, Marshall SW. Postural stability and neuropsychological deficits after concussion in collegiate athletes. *J Athl Train*. 2001;36(3):263–273.
30. McCrory P, Meeuwisse W, Johnston K, et al. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *J Athl Train*. 2009;44(4):434–448.
31. McCrory P, Meeuwisse W, Johnston K, et al. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *Clin J Sport Med*. 2009;19(3):185–200.
32. Guha A. Management of traumatic brain injury: some current evidence and applications. *Postgrad Med J*. 2004;80(949):650–653.
33. Swartz EE, Decoster LC, Norkus SA, Cappaert TA. The influence of various factors on high school football helmet face mask removal: a retrospective, cross-sectional analysis. *J Athl Train*. 2007;42(1):11–20.
34. Crosby E. Airway management after upper cervical spine injury: what have we learned? *Can J Anaesth*. 2002;49(7):733–744.
35. Sanchez AR II, Sugalski MT, LaPrade RF. Field-side and prehospital management of the spine-injured athlete. *Curr Sports Med Rep*. 2005;4(1):50–55.
36. Domeier RM, Frederiksen SM, Welch K. Prospective performance assessment of an out-of-hospital protocol for selective spine immobilization using clinical spine clearance criteria. *Ann Emerg Med*. 2005;46(2):123–131.
37. Domeier RM, Swor RA, Evans RW, et al. Multicenter prospective validation of prehospital clinical spinal clearance criteria. *J Trauma*. 2002;53(4):744–750.
38. Holly LT, Kelly DF, Counelis GJ, Blinman T, McArthur DL, Cryer HG. Cervical spine trauma associated with moderate and severe head injury: incidence, risk factors, and injury characteristics. *J Neurosurg*. 2002;96(3 suppl):285–291.
39. Iida H, Tachibana S, Kitahara T, Horiike S, Ohwada T, Fujii K. Association of head trauma with cervical spine injury, spinal cord injury, or both. *J Trauma*. 1999;46(3):450–452.
40. Crosby ET. Airway management in adults after cervical spine trauma. *Anesthesiology*. 2006;104(6):1293–1318.
41. Lennarson PJ, Smith DW, Sawin PD, Todd MM, Sato Y, Traynelis VC. Cervical spinal motion during intubation: efficacy of stabilization maneuvers in the setting of complete segmental instability. *J Neurosurg*. 2001;94(2 suppl):265–270.
42. Turner LM. Cervical spine immobilization with axial traction: a practice to be discouraged. *J Emerg Med*. 1989;7(4):385–386.
43. Bivins HG, Ford S, Bezmanovic Z, Price HM, Williams JL. The effect of axial traction during orotracheal intubation of the trauma victim with an unstable cervical spine. *Ann Emerg Med*. 1988;17(1):25–29.
44. Aprahamian C, Thompson BM, Finger WA, Darin JC. Experimental cervical spine injury model: evaluation of airway management and splinting techniques. *Ann Emerg Med*. 1984;13(8):584–587.
45. Gabbott DA, Baskett PJ. Management of the airway and ventilation during resuscitation. *Br J Anaesth*. 1997;79(2):159–171.
46. Cantu RC. Head and spine injuries in the young athlete. *Clin Sports Med*. 1988;7(3):459–472.
47. De Lorenzo RA, Olson JE, Boska M, et al. Optimal positioning for cervical immobilization. *Ann Emerg Med*. 1996;28(3):301–308.
48. De Lorenzo RA. A review of spinal immobilization techniques. *J Emerg Med*. 1996;14(5):603–613.
49. Chandler DR, Nemejc C, Adkins RH, Waters RL. Emergency cervical-spine immobilization. *Ann Emerg Med*. 1992;21(10):1185–1188.

50. Gerling MC, Davis DP, Hamilton RS, et al. Effects of cervical spine immobilization technique and laryngoscope blade selection on an unstable cervical spine in a cadaver model of intubation. *Ann Emerg Med.* 2000;36(4):293–300.
51. Johnson DR, Hauswald M, Stockhoff C. Comparison of a vacuum splint device to a rigid backboard for spinal immobilization. *Am J Emerg Med.* 1996;14(4):369–372.
52. Luscombe MD, Williams JL. Comparison of a long spinal board and vacuum mattress for spinal immobilisation. *Emerg Med J.* 2003;20(5):476–478.
53. Donaldson WF III, Lauerma WC, Heil B, Blanc R, Swenson T. Helmet and shoulder pad removal from a player with suspected cervical spine injury: a cadaveric model. *Spine (Phila Pa 1976).* 1998;23(16):1729–1733.
54. Prinsen RK, Syrotaik DG, Reid DC. Position of the cervical vertebrae during helmet removal and cervical collar application in football and hockey. *Clin J Sport Med.* 1995;5(3):155–161.
55. Metz CM, Kuhn JE, Greenfield ML. Cervical spine alignment in immobilized hockey players: radiographic analysis with and without helmets and shoulder pads. *Clin J Sport Med.* 1998;8(2):92–95.
56. Tierney RT, Mattacola CG, Sittler MR, Maldjian C. Head position and football equipment influence cervical spinal-cord space during immobilization. *J Athl Train.* 2002;37(2):185–189.
57. Sherbondy PS, Hertel JN, Sebastianelli WJ, Milton S. The effect of protective equipment on cervical spine alignment in collegiate lacrosse players. *Am J Sports Med.* 2006;34(10):1675–1679.
58. Mihalik JP, Beard JR, Petschauer MA, Prentice WE, Guskiewicz KM. Effect of ice hockey helmet fit on cervical spine motion during an emergency log roll procedure. *Clin J Sport Med.* 2008;18(5):394–398.
59. Copeland AJ, Decoster LC, Swartz EE, Gattie ER, Gale SD. Combined tool approach is 100% successful for emergency football face mask removal. *Clin J Sport Med.* 2007;17(6):452–457.
60. Gale SD, Decoster LC, Swartz EE. The combined tool approach for face mask removal during on-field conditions. *J Athl Train.* 2008;43(1):14–20.
61. Toler JD, Petschauer MA, Mihalik JP, Oyama S, Halverson SD, Guskiewicz KM. Comparison of 3 airway access techniques during suspected spine injury management in American football. *Clin J Sport Med.* 2010;20(2):92–97.
62. Banerjee R, Palumbo MA, Fadale PD. Catastrophic cervical spine injuries in the collision sport athlete, part I: epidemiology, functional anatomy, and diagnosis. *Am J Sports Med.* 2004;32(4):1077–1087.
63. Clark CR, Ducker TB, Cervical Spine Research Society. *The Cervical Spine.* 3rd ed. Philadelphia, PA: Lippincott-Raven; 1998:xx, 1003.
64. Hulsebosch CE. Recent advances in pathophysiology and treatment of spinal cord injury. *Adv Physiol Educ.* 2002;26:238–255.
65. Swartz EE, Boden BP, Courson RW, et al. National Athletic Trainers' Association position statement: acute management of the cervical spine-injured athlete. *J Athl Train.* 2009;44(3):306–331.
66. Ellis JL, Gottlieb JE. Return-to-play decisions after cervical spine injuries. *Curr Sports Med Rep.* 2007;6(1–4):56–61.
67. Zinman B, Ruderman N, Campaigne BN, Devlin JT, Schneider SH. Physical activity/exercise and diabetes. *Diabetes Care.* 2004;27(suppl 1):S58–S62.
68. Riddell MC, Perkins BA. Type 1 diabetes and exercise, part I: applications of exercise physiology to patient management during vigorous activity. *Can J Diabetes.* 2006;30(1):63–71.
69. The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med.* 1993;329(14):977–986.
70. Ludvigsson J, Nordfeldt S. Hypoglycaemia during intensified insulin therapy of children and adolescents. *J Pediatr Endocrinol Metab.* 1998;11(suppl 1):159–166.
71. The Diabetes Control and Complications Trial Research Group. Hypoglycemia in the Diabetes Control and Complications Trial. *Diabetes.* 1997;46(2):271–286.
72. American Diabetes Association. Care of children with diabetes in the school and day care setting. *Diabetes Care.* 1999;22(1):163–166.
73. Berger M. Adjustments of insulin and oral agent therapy. In: Ruderman N, Devlin JT, Schneider SH, Kriska A, eds. *Handbook of Exercise in Diabetes.* Alexandria, VA: American Diabetes Association; 2002:365–376.
74. Wright DA, Sherman WM, Dermbach AR. Carbohydrate feedings before, during, or in combination improve cycling endurance performance. *J Appl Physiol.* 1991;71(3):1082–1088.
75. Marliss EB, Vranic M. Intense exercise has unique effects on both insulin release and its roles in glucoregulation: implications for diabetes. *Diabetes.* 2002;51(suppl 1):S271–S283.
76. Mitchell TH, Abraham G, Schiffrin A, Leiter LA, Marliss EB. Hyperglycemia after intense exercise in IDDM subjects during continuous subcutaneous insulin infusion. *Diabetes Care.* 1988;11(4):311–317.
77. Hargreaves M, Angus D, Howlett K, Conus NM, Febbraio M. Effect of heat stress on glucose kinetics during exercise. *J Appl Physiol.* 1996;81(4):1594–1597.
78. Cryer PE, Davis SN, Shamoon H. Hypoglycemia in diabetes. *Diabetes Care.* 2003;26(6):1902–1912.
79. Bolli GB. How to ameliorate the problem of hypoglycemia in intensive as well as nonintensive treatment of type 1 diabetes. *Diabetes Care.* 1999;22(suppl 2):B43–B52.
80. McAulay V, Deary IJ, Frier BM. Symptoms of hypoglycaemia in people with diabetes. *Diabet Med.* 2001;18(9):690–705.
81. Hornsby WG Jr, Chetlin RD. Management of competitive athletes with diabetes. *Diabetes Spectrum.* 2005;18(2):102–107.
82. American Diabetes Association. Hypoglycemia (low blood glucose). <http://www.diabetes.org/type-1-diabetes/hypoglycemia.jsp>. Accessed September 13, 2011.
83. American Diabetes Association. Living with diabetes. <http://www.diabetes.org/living-with-diabetes/treatment-and-care/blood-glucose-control/tight-diabetes-control.html>. Accessed September 13, 2011.
84. American College of Sports Medicine, Armstrong LE, Casa DJ, et al. Exertional heat illnesses during training and competition. *Med Sci Sports Exerc.* 2007;39(3):556–572.
85. Mora-Rodríguez R, Del Coso J, Estevez E. Thermoregulatory responses to constant versus variable-intensity exercise in the heat. *Med Sci Sports Exerc.* 2008;40(11):1945–1952.
86. Casa DJ, Armstrong LE, Ganio MS, Yeargin S. Exertional heat stroke in competitive athletes. *Curr Sports Med Rep.* 2005;4(6):309–317.
87. Montain SJ, Coyle EF. Influence of graded dehydration on hyperthermia and cardiovascular drift during exercise. *J Appl Physiol.* 1992;73(4):1340–1350.
88. Hubbard RW, Armstrong LE. The heat illness: biochemical, ultrastructural, and fluid-electrolyte considerations. In: Pandolf KB, Sawka N, Gonzalez RR. *Human Performance Physiology and Environment Medicine at Terrestrial Extremes.* Indianapolis, IN: Benchmark Press; 1988:305–359.
89. Bergeron MF, McKeag DB, Casa DJ, et al. Youth football: heat stress and injury risk. *Med Sci Sports Exerc.* 2005;37(8):1421–1430.
90. Armstrong LE, Maresh CM. The induction and decay of heat acclimatization in trained athletes. *Sports Med.* 1991;12(5):302–312.
91. Binkley HM, Beckett J, Casa DJ, Kleiner DM, Plummer PE. National Athletic Trainers' position statement: exertional heat illnesses. *J Athl Train.* 2002;37(3):329–343.
92. Casa DJ, Almquist J, Anderson S. Inter-Association Task Force on Exertional Heat Illnesses consensus statement. *NATA News.* June 2003;24–29.
93. Casa DJ, Csillan D; Inter-Association Task Force for Preseason Secondary School Athletics Participants. Preseason heat-acclimatization guidelines for secondary school athletics. *J Athl Train.* 2009;44(3):332–333.
94. Casa DJ, Armstrong LE, Hillman SK, et al. National Athletic Trainers' Association position statement: fluid replacement for athletes. *J Athl Train.* 2000;35(2):212–224.
95. Casa DJ, Stearns RL, Lopez RM, et al. Influence of hydration on physiological function and performance during trail running in the heat. *J Athl Train.* 2010;45(2):147–156.
96. Castellani J. Physiology of heat stress. In: Armstrong LE, ed. *Exertional Heat Illnesses.* Champaign, IL: Human Kinetics; 2003:1–15.
97. Sawka MN, Latzka WA, Matott RP, Montain SJ. Hydration effects on temperature regulation. *Int J Sports Med.* 1998;19(suppl 2):S108–S110.

98. Casa DJ, Clarkson PM, Roberts WO. American College of Sports Medicine roundtable on hydration and physical activity: consensus statements. *Curr Sports Med Rep.* 2005;4(3):115–127.
99. Epstein Y, Roberts WO. The pathophysiology of heat stroke: an integrative view of the final common pathway. *Scand J Med Sci Sports.* In press.
100. Bouchama A, Knochel JP. Heat stroke. *N Engl J Med.* 2002;346(25):1978–1988.
101. McDermott BP, Casa DJ, Yeargin SW, Ganio MS, Armstrong LE, Maresh CM. Recovery and return to activity following exertional heat stroke: considerations for the sports medicine staff. *J Sport Rehabil.* 2007;16(3):163–181.
102. Casa DJ, Becker SM, Ganio MS, et al. Validity of devices that assess body temperature during outdoor exercise in the heat. *J Athl Train.* 2007;42(3):333–342.
103. Costin A. Emergency treatment of exertional heatstroke and comparison of whole body cooling techniques. *Med Sci Sports Exerc.* 1990;22(1):15–18.
104. Casa DJ, Anderson JM, Armstrong LE, Maresh CM. Survival strategy: acute treatment of exertional heat stroke. *J Strength Cond Res.* 2006;20(3):462.
105. Casa DJ, McDermott BP, Lee EC, Yeargin SW, Armstrong LE, Maresh CM. Cold water immersion: the gold standard for exertional heatstroke treatment. *Exerc Sport Sci Rev.* 2007;35(3):141–149.
106. O'Connor FG, Casa DJ, Bergeron MF, et al. American College of Sports Medicine roundtable on exertional heat stroke: return to duty/return to play. Conference proceedings. *Curr Sports Med Rep.* 2010;9(5):314–321.
107. Almond CSD, Shin AY, Fortescue EB, et al. Hyponatremia among runners in the Boston Marathon. *N Engl J Med.* 2005;352(15):1550–1556.
108. Armed Forces Health Surveillance Center. Update: exertional hyponatremia, active component, U.S. Armed Forces, 1999–2010. *MSMR.* 2011;18(3):12–15.
109. Hoffman MD, Stuenkel JK, Rogers IR, Weschler LB, Hew-Butler T. Hyponatremia in the 2009 161-km Western States Endurance Run. *Int J Sports Physiol Perform.* In press.
110. Casa DJ, Roberts WO. Considerations for the medical staff in preventing, identifying and treating exertional heat illnesses. In Armstrong LE, ed. *Exertional Heat Illnesses.* Champaign, IL: Human Kinetics; 2003:169–195.
111. Armstrong LE, Epstein Y. Fluid-electrolyte balance during labor and exercise: concepts and misconceptions. *Int J Sport Nutr.* 1999;9(1):1–12.
112. Armstrong LE, Curtis WC, Hubbard RW, Francesconi RP, Moore R, Askew W. Symptomatic hyponatremia during prolonged exercise in the heat. *Med Sci Sports Exerc.* 1993;25(5):543–549.
113. Hew-Butler T, Ayus JC, Kippes C, et al. Statement of the Second International Exercise-Associated Hyponatremia Consensus Development Conference, New Zealand, 2007. *Clin J Sport Med.* 2008;18(2):111–121.
114. Speedy DB, Noakes TD, Schneider C. Exercise-associated hyponatremia: a review. *Emerg Med (Fremantle).* 2001;13(1):17–27.
115. American College of Sports Medicine, Sawka MN, Burke LM, et al. American College of Sports Medicine position stand: exercise and fluid replacement. *Med Sci Sports Exerc.* 2007;39(2):377–390.
116. Armstrong LE. Exertional hyponatremia. In: Armstrong LE, ed. *Exertional Heat Illnesses.* Champaign, IL: Human Kinetics; 2003:103–135.
117. Shirreffs SM, Taylor AJ, Leiper JB, Maughan RJ. Post-exercise rehydration in man: effects of volume consumed and drink sodium content. *Med Sci Sports Exerc.* 1996;28(10):1260–1271.
118. Armstrong LE. Assessing hydration status: the elusive gold standard. *J Am Coll Nutr.* 2007;26(suppl 5):S575–S584.
119. Armstrong LE, McDermott BP. Symptomatic exertional hyponatremia. In: Casa DJ, ed. *Preventing Sudden Death in Sport and Physical Activity.* Burlington, MA: Jones and Bartlett; 2012:185–200.
120. Ayus JC, Krothapalli RK, Arieff AI. Treatment of symptomatic hyponatremia and its relation to brain damage: a prospective study. *N Engl J Med.* 1987;317(19):1190–1195.
121. Diggs LW, Flowers E. High school athletes with the sickle cell trait (Hb A/S). *J Natl Med Assoc.* 1976;68(6):492–493, 479.
122. Murphy JR. Sickle cell hemoglobin (Hb AS) in black football players. *J Am Med Assoc.* 1973;225(8):981–982.
123. National Athletic Trainers' Association. Sickle cell trait and the athlete. <http://www.nata.org/consensus-statements>. Accessed September 13, 2011.
124. Anzalone ML, Green VS, Buja M, Sanchez LA, Harrykisssoon RI, Eichner ER. Sickle cell trait and fatal rhabdomyolysis in football training: a case study. *Med Sci Sports Exerc.* 2010;42(1):3–7.
125. Eichner ER. Sickle cell trait in sports. *Curr Sports Med Rep.* 2010;9(6):347–351.
126. Carek PF, Futrell M, Hueston WJ. The preparticipation physical examination history: who has the correct answers? *Clin J Sport Med.* 1999;9(3):124–128.
127. Bonham VL, Dover GJ, Brody LC. Screening student athletes for sickle cell trait: a social and clinical experiment. *N Engl J Med.* 2010;363(11):997–999.
128. Schnebel B, Eichner ER, Anderson S, Watson C. Sickle cell trait and lumbar myonecrosis as a cause of low back pain in athletes [abstract]. *Med Sci Sports Exerc.* 2008;40(suppl 5):S537.
129. Eichner ER. Sickle cell trait. *J Sport Rehabil.* 2007;16(3):197–203.
130. Gardner JW, Kark JA. Fatal rhabdomyolysis presenting as mild heat illness in military training. *Mil Med.* 1994;159(2):160–163.
131. Helzlsouer KJ, Hayden FG, Rogol AD. Severe metabolic complications in a cross-country runner with sickle cell trait. *JAMA.* 1983;249(6):777–779.
132. West SA, Ciccolella ME. Issues in the standard of care for certified athletic trainers. *J Legal Asp Sport.* 2004;14(1):63–74.
133. Hale MH, Clugston JR, Price BR, Pass AN, Gupta A. Severe low back pain in a football player. Poster presented at: American Medical Society for Sports Medicine 17th Annual Meeting; March 25–29, 2008; Las Vegas, NV.
134. National Athletic Trainers' Association. *Heads Up: Reducing the Risk of Head and Neck Injuries in Football* [DVD]. Dallas, TX: National Athletic Trainers' Association; 2006.
135. USA Football. *Tackle Progression.* Indianapolis, IN. <http://videos.usafootball.com/video/Tackle-Progression-Level-of-C-2>. Accessed October 3, 2011.
136. Torg JS, Truex R Jr, Quedenfeld TC, Burstein A, Speelman A, Nichols CE III. The National Football Head and Neck Injury Registry: report and conclusions, 1978. *JAMA.* 1979;241(14):1477–1479.
137. Torg JS, Vegso JJ, O'Neill MJ, Sennett B. The epidemiologic, pathologic, biomechanical, and cinematographic analysis of football-induced cervical spine trauma. *Am J Sports Med.* 1990;18(1):50–57.
138. Torg JS, Quedenfeld TC, Burstein A, Speelman AD, Nichols CE III. National Football Head and Neck Injury Registry: report on cervical quadriplegia, 1971 to 1975. *Am J Sports Med.* 1979;7(2):127–132.
139. Bishop PJ. Factors related to quadriplegia in football and the implications for intervention strategies. *Am J Sports Med.* 1996;24(2):235–239.
140. Bishop PJ, Wells RP. The inappropriateness of helmet drop tests in assessing neck protection in head-first impacts. *Am J Sports Med.* 1990;18(2):201–205.
141. Burstein AH, Otis JC, Torg JS. Mechanics and pathomechanics of athletic injuries to the cervical spine. In: Torg JS, ed. *Athletic Injuries to the Head, Neck, and Face.* Philadelphia, PA: Lea & Febiger; 1982:139–154.
142. Cantu RC, Mueller FO. Catastrophic football injuries: 1977–1998. *Neurosurgery.* 2000;47(3):673–675.
143. Mueller FO, Blyth CS. Fatalities from head and cervical spine injuries occurring in tackle football: 40 years' experience. *Clin Sports Med.* 1987;6(1):185–196.
144. Heck JF. The incidence of spearing by high school football ball carriers and their tacklers. *J Athl Train.* 1992;27(2):120–124.
145. Hodgson VR, Thomas LM. Play head-up football. *Natl Fed News.* 1985;2:24–27.
146. Heck JF. The incidence of spearing during a high school's 1975 and 1990 football seasons. *J Athl Train.* 1996;31(1):31–37.
147. National Federation of State High School Associations. *Official Football Rules.* Indianapolis, IN: National Federation of State High School Associations; 2002.
148. Kleiner DM, Almquist JL, Bailes J, et al. *Prehospital Care of the Spine-Injured Athlete.* Dallas, TX: Inter-Association Task Force for Appropriate Care of the Spine-Injured Athlete; 2001.
149. Heck JF. Re-examining spearing: the incidence of cervical spine injury hides the risks. *Am Football Coach.* 1999;5(8):52–54.

150. Clarke KS. Cornerstones for future directions in head/neck injury prevention in sports. In: Hoerner EF, ed. *Head and Neck Injuries in Sports: ASTM STP 1229*. Philadelphia, PA: American Society for Testing and Materials; 1994(1229):3-9.
151. Heck JF, Weis MP, Gartland JM, Weis CR. Minimizing liability risks of head and neck injuries in football. *J Athl Train*. 1994;29(2):128-139.
152. Centers for Disease Control. Football-related spinal cord injuries among high school players: Louisiana, 1989. *MMWR Morb Mortal Wkly Rep*. 1990;39(34):586-587.
153. Drake GA. Research provides more suggestions to reduce serious football injuries. *Natl Fed News*. November/December 1994;18-21.
154. Peterson TR. Roundtable: head and neck injuries in football. Paper presented at: American Society for Testing and Materials International Symposium on Head and Neck Injuries in Sports; May 1993; Atlanta, GA.
155. Heck J. Helmet contact penalties and historical changes. <http://www.jonheck.com/hdc/penalties.htm>. Accessed July 11, 2010.
156. Mihalik JP, Bell DR, Marshall SW, Guskiewicz KM. Measurement of head impacts in collegiate football players: an investigation of positional and event-type differences. *Neurosurgery*. 2007;61(6):1229-1235.
157. Heck J. NCAA helmet-contact penalty data: major Division I football, 2000-2007. <http://www.jonheck.com/hdc/enforcement.htm>. Accessed September 28, 2011.
158. National Federation of State High School Associations. *Official Football Rules*. Indianapolis, IN: National Federation of State High School Associations; 1988.
159. National Lightning Safety Institute. Multi-agency recommendations for lightning safety. http://www.lightningsafety.com/nlsi_pls/multi_recommendation.html. Accessed September 13, 2011.
160. Holle RL. Lightning-caused deaths and injuries in and near dwellings and other buildings. Paper presented at: 4th Conference on the Meteorological Applications of Lightning Data; January 11-15, 2009; Phoenix, AZ.
161. Bennett B, Holle R, Lopez R. Lightning safety guidelines. In: Klossner D, ed. *National Collegiate Athletic Association Sports Medicine Handbook, 2010-2011*. Overland Park, KS: National Collegiate Athletic Association; 2010:13-15.
162. Walsh KM, Bennett B, Cooper MA, Holle RL, Kithil R, Lopez REL. National Athletic Trainers' Association position statement: lightning safety for athletics and recreation. *J Athl Train*. 2000;35(4): 471-477.
163. Rakov VA. Lightning protection of structures and personal safety. Paper presented at: International Lightning Detection Conference; November 7-8, 2000; Tucson, AZ.
164. Roeder WP, Vavrek RJ. Lightning safety for schools: an update. National Oceanic and Atmospheric Administration. <http://www.lightningsafety.noaa.gov/resources/ASSE-Schools.pdf>. Accessed September 13, 2011.
165. Holle RL. Lightning-caused deaths and injuries in the vicinity of vehicles. Paper presented at: 3rd Conference on Meteorological Applications of Lightning Data; January 19-23, 2008; New Orleans, LA.
166. Cherington M. Lightning injuries in sports: situations to avoid. *Sports Med*. 2001;31(4):301-308.
167. Lengyel MM, Brooks HE, Holle RL, Cooper MA. Lightning casualties and their proximity to surrounding cloud-to-ground lightning. Paper presented at: American Meteorological Society annual meeting; January 9-13, 2005; San Diego, CA.
168. Holle RL, Lopez RE, Howard KW, Vavrek J, Allsopp J. Safety in the presence of lightning. *Semin Neurol*. 1995;15(4):375-380.
169. Duclos PJ, Sanderson LM. An epidemiological description of lightning-related deaths in the United States. *Int J Epidemiol*. 1990;19(3):673-679.
170. Uman M. *All About Lightning*. New York, NY: Dover Publications; 1986.
171. Cooper MA. Lightning prognostic signs for death. *Ann Emerg Med*. 1980;9(3):134-138.
172. Cooper MA. Myths, miracles, and mirages. *Semin Neurol*. 1995;15(4): 358-361.
173. Cooper MA. Emergent care of lightning and electrical injuries. *Semin Neurol*. 1995;15(3):268-278.
174. Cooper MA. Lightning injuries. eMedicine. <http://emedicine.medscape.com/article/770642>. Accessed September 13, 2011.
175. Holle RL, Cummins KL, Demetriades NWS. Monthly distributions of NLDN and GLD360 cloud-to-ground lightning. Paper presented at: International Lightning Detection Conference; April 21-22, 2010; Orlando, FL.
176. Lopez RE, Holle RL, Heitkamp TA, Boyson M, Cherington M, Langford K. The underreporting of lightning injuries and deaths in Colorado. *Bull Am Meteorol Soc*. 1993;74(11):2171-2178.
177. Lopez RE, Holle RL. Demographics of lightning casualties. *Semin Neurol*. 1995;15(3):286-295.
178. Rakov V, Uman M. *Lightning: Physics and Effects*. Cambridge, England: Cambridge University Press; 2003.
179. American Meteorological Society. Lightning safety awareness statement. http://ametsoc.org/policy/lightningpolicy_2002.html. Accessed September 15, 2011.
180. Steinbaum S, Harviel JD, Jaffin JH, Jordan MH. Lightning strike to the head: a case report. *J Trauma*. 1994;36(1):113-115.
181. Cherington M. Neurological manifestations of lightning strikes. *Neurology*. 2003;60(2):182-185.
182. Field JM, Hazinski MF, Sayre MR, et al. Part I: executive summary: 2010 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation*. 2010;122(18, suppl 3):S640-S656.
183. Maron BJ. Sudden death in young athletes. *N Engl J Med*. 2003;349(11):1064-1075.
184. Van Camp SP, Bloor CM, Mueller FO, Cantu RC, Olson HG. Nontraumatic sports death in high school and college athletes. *Med Sci Sports Exerc*. 1995;27(5):641-647.
185. Harmon K, Asif I, Klossner D, Drezner J. Incidence of sudden cardiac death in NCAA athletes. *Circulation*. 2011;123(15):1594-1600.
186. Drezner JA, Rogers KJ, Zimmer RR, Sennett BJ. Use of automated external defibrillators at NCAA Division I universities. *Med Sci Sports Exerc*. 2005;37(9):1487-1492.
187. Maron BJ, Doerer JJ, Haas TS, Tierney DM, Mueller FO. Profile and frequency of sudden death in 1463 young competitive athletes: from a 25 year U.S. national registry, 1980-2005. Paper presented at: American Heart Association Scientific Sessions; November 12-15, 2006; Chicago, IL.
188. Maron BJ, Shirani J, Poliac LC, Mathenge R, Roberts WC, Mueller FO. Sudden death in young competitive athletes: clinical, demographic, and pathological profiles. *JAMA*. 1996;276(3):199-204.
189. Basso C, Maron BJ, Corrado D, Thiene G. Clinical profile of congenital coronary artery anomalies with origin from the wrong aortic sinus leading to sudden death in young competitive athletes. *J Am Coll Cardiol*. 2000;35(6):1493-1501.
190. Maron BJ, Thompson PD, Puffer JC, et al. Cardiovascular preparticipation screening of competitive athletes: a statement for health professionals from the Sudden Death Committee (clinical cardiology) and Congenital Cardiac Defects Committee (cardiovascular disease in the young), American Heart Association. *Circulation*. 1996;94(4):850-856.
191. Maron BJ, Douglas PS, Graham TP, Nishimura RA, Thompson PD. Task Force 1: preparticipation screening and diagnosis of cardiovascular disease in athletes. *J Am Coll Cardiol*. 2005;45(8):1322-1326.
192. Andersen J, Courson RW, Kleiner DM, McLoda TA. National Athletic Trainers' Association position statement: emergency planning in athletics. *J Athl Train*. 2002;37(1):99-104.
193. Emergency Care Committee, Subcommittees and Task Forces of the American Heart Association. 2005 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care, part 3: overview of CPR. *Circulation*. 2005;112(suppl 24):IV12-IV18.
194. Drezner JA, Rao AL, Heistand J, Bloomingdale MK, Harmon KG. Effectiveness of emergency response planning for sudden cardiac arrest in United States high schools with automated external defibrillators. *Circulation*. 2009;120(6):518-525.
195. Drezner JA, Courson RW, Roberts WO, Mosesso VN Jr, Link MS, Maron BJ. Inter-association Task Force recommendations on emergency preparedness and management of sudden cardiac arrest in high school and college athletic programs: a consensus statement. *J Athl Train*. 2007;42(1):143-158.
196. Emergency Care Committee, Subcommittees and Task Forces of the American Heart Association. 2005 American Heart Association guidelines for

- cardiopulmonary resuscitation and emergency cardiovascular care, part 4: adult basic life support. *Circulation*. 2005;112(suppl 24):IV19–IV34.
197. Emergency Care Committee, Subcommittees and Task Forces of the American Heart Association. 2005 American Heart Association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care, part 5: electrical therapies. Automated external defibrillators, defibrillation, cardioversion, and pacing. *Circulation*. 2005;112(suppl 24):IV35–IV46.
 198. The American Heart Association in collaboration with the International Liaison Committee on Resuscitation. Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care, part 4: the automated external defibrillator. Key link in the chain of survival. *Circulation*. 2000;102(suppl 8):I60–I76.
 199. Caffrey SL, Willoughby PJ, Pepe PE, Becker LB. Public use of automated external defibrillators. *N Engl J Med*. 2002;347(16):1242–1247.
 200. Hallstrom AP, Ornato JP, Weisfeldt M, et al. Public-access defibrillation and survival after out-of-hospital cardiac arrest. *N Engl J Med*. 2004;351(7):637–646.
 201. Page RL, Joglar JA, Kowal RC, et al. Use of automated external defibrillators by a U.S. airline. *N Engl J Med*. 2000;343(17):1210–1216.
 202. Valenzuela TD, Roe DJ, Nichol G, Clark LL, Spaite DW, Hardman RG. Outcomes of rapid defibrillation by security officers after cardiac arrest in casinos. *N Engl J Med*. 2000;343(17):1206–1209.
 203. Weaver WD, Hill D, Fahrenbruch CE, et al. Use of the automatic external defibrillator in the management of out-of-hospital cardiac arrest. *N Engl J Med*. 1988;319(11):661–666.
 204. White RD, Asplin BR, Bugliosi TF, Hankins DG. High discharge survival rate after out-of-hospital ventricular fibrillation with rapid defibrillation by police and paramedics. *Ann Emerg Med*. 1996;28(5):480–485.
 205. Myerburg RJ, Fenster J, Velez M, et al. Impact of community-wide police car deployment of automated external defibrillators on survival from out-of-hospital cardiac arrest. *Circulation*. 2002;106(9):1058–1064.
 206. White RD, Bunch TJ, Hankins DG. Evolution of a community-wide early defibrillation programme experience over 13 years using police/fire personnel and paramedics as responders. *Resuscitation*. 2005;65(3):279–283.
 207. Mosesso VN Jr, Davis EA, Auble TE, Paris PM, Yealy DM. Use of automated external defibrillators by police officers for treatment of out-of-hospital cardiac arrest. *Ann Emerg Med*. 1998;32(2):200–207.

Address correspondence to National Athletic Trainers' Association, Communications Department, 2952 Stemmons Freeway, Dallas, TX 75247.

In Press

Preseason Heat-Acclimatization Guidelines for Secondary School Athletics

Douglas J. Casa, PhD, ATC, FNATA, FACSM*; David Csillan, MS, LAT, ATC*

Inter-Association Task Force for Preseason Secondary School Athletics Participants: Lawrence E. Armstrong, PhD, FACSM†; Lindsay B. Baker, PhD‡; Michael F. Bergeron, PhD, FACSM§; Virginia M. Buchanan, JD†; Michael J. Carroll, MEd, LAT, ATC||; Michelle A. Cleary, PhD, LAT, ATC||; Edward R. Eichner, MD, FACSM†; Michael S. Ferrara, PhD, ATC, FNATA||; Tony D. Fitzpatrick, MA, LAT, ATC||; Jay R. Hoffman, PhD, FACSM, FNCSA¶; Robert W. Kenefick, PhD, FACSM#; David A. Klossner, PhD, ATC||; J. Chad Knight, MSHA, MESS, ATC, OTC||; Stephanie A. Lennon, MS, NBCT, LAT, ATC||; Rebecca M. Lopez, MS, ATC||; Matthew J. Matava, MD**; Francis G. O'Connor, MD, FACSM††; Bart C. Peterson, MSS, ATC||; Stephen G. Rice, MD, PhD, FACSM, FAAP‡‡; Brian K. Robinson, MS, LAT, ATC||; Robert J. Shriner, MS, LAT, ATC||; Michael S. West, MS, ATC||; Susan W. YeARGIN, PhD, ATC||

*Co-Chairs; †Individual Representatives; ‡Gatorade Sports Science Institute; §American College of Sports Medicine; ||National Athletic Trainers' Association; ¶National Strength and Conditioning Association; #United States Army Research Institute of Environmental Medicine; **American Orthopaedic Society for Sports Medicine; ††American Medical Society for Sports Medicine; ‡‡American Academy of Pediatrics

A proper heat-acclimatization plan in secondary school athletic programs is essential to minimize the risk of exertional heat illness during the preseason practice period. Gradually increasing athletes' exposure to the duration and intensity of physical activity and to the environment minimizes exertional heat-illness risk while improving athletic performance. Progressive acclimatization is especially important during the initial 3 to 5 days of summer practices. When an athlete undergoes a proper heat-acclimatization program, physiologic function, exercise heat tolerance, and exercise performance are all enhanced.¹⁻⁶ In contrast, athletes who are not exposed to a proper heat-acclimatization program face measurable increased risks for exertional heat illness.

For these reasons, the Inter-Association Task Force for Preseason Secondary School Athletics, in conjunction with the National Athletic Trainers' Association's Secondary School Athletic Trainers' Committee, recommends that these "Preseason Heat-Acclimatization Guidelines for Secondary School Athletics" be implemented by all secondary school athletic programs. These guidelines should be used for all preseason conditioning, training, and practice activities in a warm or hot environment, whether these activities are conducted indoors or outdoors. When athletic programs implement these guidelines, the health and safety of the athletes are primary. However, the recommendations outlined here are only minimum standards, based on the best heat-acclimatization evidence available. Following these guidelines provides all secondary school athletes an opportunity to train safely and effectively during the preseason practice period.

DEFINITIONS

Before participating in the preseason practice period, all student-athletes should undergo a preparticipation medical

examination administered by a physician (MD or DO) or as required/approved by state law. The examination can identify predisposing factors related to a number of safety concerns, including the identification of youths at particular risk for exertional heat illness.

The *heat-acclimatization period* is defined as the initial 14 consecutive days of preseason practice for all student-athletes. The goal of the acclimatization period is to enhance exercise heat tolerance and the ability to exercise safely and effectively in warm to hot conditions. This period should begin on the first day of practice or conditioning before the regular season. Any practices or conditioning conducted before this time should not be considered a part of the heat-acclimatization period. Regardless of the conditioning program and conditioning status leading up to the first formal practice, all student-athletes (including those who arrive at preseason practice after the first day of practice) should follow the 14-day heat-acclimatization plan. During the preseason heat-acclimatization period, if practice occurs on 6 consecutive days, student-athletes should have 1 day of complete rest (no conditioning, walk-throughs, practices, etc).

Days on which athletes do not practice due to a scheduled rest day, injury, or illness do not count toward the heat-acclimatization period. For example, an athlete who sits out the third and fourth days of practice during this time (eg, Wednesday and Thursday) will resume practice as if on day 3 of the heat-acclimatization period when returning to play on Friday.

A *practice* is defined as the period of time a participant engages in a coach-supervised, school-approved, sport- or conditioning-related physical activity. Each individual practice should last no more than 3 hours. Warm-up, stretching, and cool-down activities are included as part of the 3-hour practice time. Regardless of ambient tempera-

ture conditions, all conditioning and weight-room activities should be considered part of practice.

A *walk-through* is defined as a teaching opportunity with the athletes not wearing protective equipment (eg, helmets, shoulder pads, catcher's gear, shin guards) or using other sport-related equipment (eg, footballs, lacrosse sticks, blocking sleds, pitching machines, soccer balls, marker cones). The walk-through is not part of the 3-hour practice period, can last no more than 1 hour per day, and does not include conditioning or weight-room activities.

A *recovery period* is defined as the time between the end of 1 practice or walk-through and the beginning of the next practice or walk-through. During this time, athletes should rest in a cool environment, with no sport- or conditioning-related activity permitted (eg, speed or agility drills, strength training, conditioning, or walk-through). Treatment with the athletic trainer is permissible.

RECOMMENDATIONS FOR THE 14-DAY HEAT-ACCLIMATIZATION PERIOD

1. Days 1 through 5 of the heat-acclimatization period consist of the first 5 days of formal practice. During this time, athletes may not participate in more than 1 practice per day.
2. If a practice is interrupted by inclement weather or heat restrictions, the practice should recommence once conditions are deemed safe. Total practice time should not exceed 3 hours in any 1 day.
3. A 1-hour maximum walk-through is permitted during days 1–5 of the heat-acclimatization period. However, a 3-hour recovery period should be inserted between the practice and walk-through (or vice versa).
4. During days 1–2 of the heat-acclimatization period, in sports requiring helmets or shoulder pads, a helmet should be the only protective equipment permitted (goalies, as in the case of field hockey and related sports, should *not* wear full protective gear or perform activities that would require protective equipment). During days 3–5, only helmets and shoulder pads should be worn. Beginning on day 6, all protective equipment may be worn and full contact may begin.
 - A. Football only: On days 3–5, contact with blocking sleds and tackling dummies may be initiated.
 - B. Full-contact sports: 100% live contact drills should begin no earlier than day 6.
5. Beginning no earlier than day 6 and continuing through day 14, double-practice days must be followed by a single-practice day. On single-practice days, 1 walk-through is permitted, separated from the practice by at least 3 hours of continuous rest. When a double-practice day is followed by a rest day, another double-practice day is permitted after the rest day.
6. On a double-practice day, neither practice should exceed 3 hours in duration, and student-athletes should not participate in more than 5 total hours of practice. Warm-up, stretching, cool-down, walk-through, conditioning, and weight-room activities are included as part of the practice time. The 2 practices should be separated by at least 3 continuous hours in a cool environment.
7. Because the risk of exertional heat illnesses during the preseason heat-acclimatization period is high, we strongly recommend that an athletic trainer be on site before, during, and after all practices.

REFERENCES

1. American College of Sports Medicine, Armstrong LE, Casa DJ, et al. American College of Sports Medicine position stand: exertional heat illnesses during training and competition. *Med Sci Sports Exerc.* 2007;39(3):556–572.
2. Bergeron MF, McKeag DB, Casa DJ, et al. Youth football: heat stress and injury risk. *Med Sci Sports Exerc.* 2005;37(8):1421–1430.
3. Binkley HM, Beckett J, Casa DJ, Kleiner DM, Plummer PE. National Athletic Trainers' Association position statement: exertional heat illnesses. *J Athl Train.* 2002;37(3):329–343.
4. Casa DJ, Almquist J, Anderson S, et al. Inter-Association Task Force on Exertional Heat Illness consensus statement. *NATA News.* June 2003;24–29.
5. Department of the Army and Air Force. *Heat Stress Control and Casualty Management.* Washington, DC: Dept of the Army and Air Force; 2003. Technical bulletin MED 507/AFPAM 48-152 (I).
6. Wallace RF. *Risk Factors and Mortality in Relation to Heat Illness Severity.* Natick, MA: United States Army Research Institute Environmental Medicine; 2003. Technical report T-03/14.

DISCLAIMER

The National Athletic Trainers' Association (NATA) and the Inter-Association Task Force for Preseason Secondary School Athletics advise individuals, schools, athletic training facilities, and institutions to carefully and independently consider each of the recommendations. The information contained in the statement is neither exhaustive nor exclusive to all circumstances or individuals. Variables such as institutional human resource guidelines, state or federal statutes, rules, or regulations, as well as regional environmental conditions, may impact the relevance and implementation of these recommendations. The NATA and the Inter-Association Task Force advise their members and others to carefully and independently consider each of the recommendations (including the applicability of same to any particular circumstance or individual). The foregoing statement should not be relied upon as an independent basis for care but rather as a resource available to NATA members or others. Moreover, no opinion is expressed herein regarding the quality of care that adheres to or differs from any of NATA's other statements. The NATA and the Inter-Association Task Force reserve the right to rescind or modify their statements at any time.

National Athletic Trainers' Association Position Statement: Emergency Planning in Athletics

J. C. Andersen*; Ronald W. Courson†; Douglas M. Kleiner‡;
Todd A. McLoda§

*Armstrong Atlantic State University, Savannah, GA; †University of Georgia, Athens, GA; ‡University of Florida, Health Science Center/Jacksonville, Jacksonville, FL; §Illinois State University, Normal, IL

J. C. Andersen, PhD, ATC, PT, SCS, contributed to conception and design; acquisition and analysis and interpretation of the data; and drafting, critical revision, and final approval of the article. Ronald W. Courson, ATC, PT, NREMT-I, CSCS, Douglas M. Kleiner, PhD, ATC, CSCS, NREMT, FACSM, and Todd A. McLoda, PhD, ATC, contributed to acquisition and analysis and interpretation of the data and drafting, critical revision, and final approval of the article.

Address correspondence to National Athletic Trainers' Association, Communications Department, 2952 Stemmons Freeway, Dallas, TX 75247.

Objectives: To educate athletic trainers and others about the need for emergency planning, to provide guidelines in the development of emergency plans, and to advocate documentation of emergency planning.

Background: Most injuries sustained during athletics or other physical activity are relatively minor. However, potentially limb-threatening or life-threatening emergencies in athletics and physical activity are unpredictable and occur without warning. Proper management of these injuries is critical and should be carried out by trained health services personnel to minimize risk to the injured participant. The organization or institution and its personnel can be placed at risk by the lack of an emergency plan, which may be the foundation of a legal claim.

Recommendations: The National Athletic Trainers' Association recommends that each organization or institution that sponsors athletic activities or events develop and implement a written emergency plan. Emergency plans should be developed by organizational or institutional personnel in consultation with

the local emergency medical services. Components of the emergency plan include identification of the personnel involved, specification of the equipment needed to respond to the emergency, and establishment of a communication system to summon emergency care. Additional components of the emergency plan are identification of the mode of emergency transport, specification of the venue or activity location, and incorporation of emergency service personnel into the development and implementation process. Emergency plans should be reviewed and rehearsed annually, with written documentation of any modifications. The plan should identify responsibility for documentation of actions taken during the emergency, evaluation of the emergency response, institutional personnel training, and equipment maintenance. Further, training of the involved personnel should include automatic external defibrillation, cardiopulmonary resuscitation, first aid, and prevention of disease transmission.

Key Words: policies and procedures, athletics, planning, catastrophic

Although most injuries that occur in athletics are relatively minor, limb-threatening or life-threatening injuries are unpredictable and can occur without warning.¹ Because of the relatively low incidence rate of catastrophic injuries, athletic program personnel may develop a false sense of security over time in the absence of such injuries.¹⁻⁴ However, these injuries can occur during any physical activity and at any level of participation. Of additional concern is the heightened public awareness associated with the nature and management of such injuries. Medicolegal interests can lead to questions about the qualifications of the personnel involved, the preparedness of the organization for handling these situations, and the actions taken by program personnel.⁵

Proper emergency management of limb- or life-threatening injuries is critical and should be handled by trained medical and allied health personnel.¹⁻⁴ Preparation for response to emergencies includes education and training, maintenance of emergency equipment and supplies, appropriate use of person-

nel, and the formation and implementation of an emergency plan. The emergency plan should be thought of as a blueprint for handling emergencies. A sound emergency plan is easily understood and establishes accountability for the management of emergencies. Furthermore, failure to have an emergency plan can be considered negligence.⁵

POSITION STATEMENT

Based on an extensive survey of the literature and expert review, the following is the position of the National Athletic Trainers' Association (NATA):

1. Each institution or organization that sponsors athletic activities must have a written emergency plan. The emergency plan should be comprehensive and practical, yet flexible enough to adapt to any emergency situation.
2. Emergency plans must be written documents and should be distributed to certified athletic trainers, team and at-

tending physicians, athletic training students, institutional and organizational safety personnel, institutional and organizational administrators, and coaches. The emergency plan should be developed in consultation with local emergency medical services personnel.

3. An emergency plan for athletics identifies the personnel involved in carrying out the emergency plan and outlines the qualifications of those executing the plan. Sports medicine professionals, officials, and coaches should be trained in automatic external defibrillation, cardiopulmonary resuscitation, first aid, and prevention of disease transmission.
4. The emergency plan should specify the equipment needed to carry out the tasks required in the event of an emergency. In addition, the emergency plan should outline the location of the emergency equipment. Further, the equipment available should be appropriate to the level of training of the personnel involved.
5. Establishment of a clear mechanism for communication to appropriate emergency care service providers and identification of the mode of transportation for the injured participant are critical elements of an emergency plan.
6. The emergency plan should be specific to the activity venue. That is, each activity site should have a defined emergency plan that is derived from the overall institutional or organizational policies on emergency planning.
7. Emergency plans should incorporate the emergency care facilities to which the injured individual will be taken. Emergency receiving facilities should be notified in advance of scheduled events and contests. Personnel from the emergency receiving facilities should be included in the development of the emergency plan for the institution or organization.
8. The emergency plan specifies the necessary documentation supporting the implementation and evaluation of the emergency plan. This documentation should identify responsibility for documenting actions taken during the emergency, evaluation of the emergency response, and institutional personnel training.
9. The emergency plan should be reviewed and rehearsed annually, although more frequent review and rehearsal may be necessary. The results of these reviews and rehearsals should be documented and should indicate whether the emergency plan was modified, with further documentation reflecting how the plan was changed.
10. All personnel involved with the organization and sponsorship of athletic activities share a professional responsibility to provide for the emergency care of an injured person, including the development and implementation of an emergency plan.
11. All personnel involved with the organization and sponsorship of athletic activities share a legal duty to develop, implement, and evaluate an emergency plan for all sponsored athletic activities.
12. The emergency plan should be reviewed by the administration and legal counsel of the sponsoring organization or institution.

BACKGROUND FOR THIS POSITION STAND

Need for Emergency Plans

Emergencies, accidents, and natural disasters are rarely predictable; however, when they do occur, rapid, controlled re-

sponse will likely make the difference between an effective and an ineffective emergency response. Response can be hindered by the chaotic actions and increased emotions of those who make attempts to help persons who are injured or in danger. One method of control for these unpredictable events is an emergency plan that, if well designed and rehearsed, can provide responders with an organized approach to their reaction. The development of the emergency plan takes care and time to ensure that all necessary contingencies have been included. Lessons learned from major emergencies are also important to consider when developing or revising an emergency plan.

Emergency plans are applicable to agencies of the government, such as law enforcement, fire and rescue, and federal emergency management teams. Furthermore, the use of emergency plans is directly applicable to sport and fitness activities due to the inherent possibility of "an untoward event" that requires access to emergency medical services.⁶ Of course, when developing an emergency plan for athletics, there is one notable difference from those used by local, state, and federal emergency management personnel. With few exceptions, typically only one athlete, fan, or sideline participant is at risk at one time due to bleeding, internal injury, cardiac arrest, shock, or traumatic head or spine injury. However, emergency planning in athletics should account for an untoward event involving a game official, fan, or sideline participant as well as the participating athlete. Although triage in athletic emergency situations may be rare, this does not minimize the risks involved and the need for carefully prepared emergency care plans. The need for emergency plans in athletics can be divided into 2 major categories: professional and legal.

Professional Need. The first category for consideration in determining the need for emergency plans in athletics is organizational and professional responsibility. Certain governing bodies associated with athletic competition have stated that institutions and organizations must provide for access to emergency medical services if an emergency should occur during any aspect of athletic activity, including in-season and off-season activities.⁶ The National Collegiate Athletic Association (NCAA) has recommended that all member institutions develop an emergency plan for their athletic programs.⁷ The National Federation of State High School Associations has recommended the same at the secondary school level.⁸ The NCAA states, "Each scheduled practice or contest of an institution-sponsored intercollegiate athletics event, as well as out-of-season practices and skills sessions, should include an emergency plan."⁶ The *1999–2000 NCAA Sports Medicine Handbook* further outlines the key components of the emergency plan.⁶

Although the *1999–2000 NCAA Sports Medicine Handbook* is a useful guide, a recent survey of NCAA member institutions revealed that at least 10% of the institutions do not maintain any form of an emergency plan.⁷ In addition, more than one third of the institutions do not maintain emergency plans for the off-season strength and conditioning activities of the sports.

Personnel coverage at NCAA institutions was also found to be an issue. Nearly all schools provided personnel qualified to administer emergency care for high-risk contact sports, but fewer than two thirds of institutions provided adequate personnel to sports such as cross-country and track.⁹ In a memorandum dated March 25, 1999, and sent to key personnel at

all schools, the president of the NCAA reiterated the recommendations in the 1999–2000 *NCAA Sports Medicine Handbook* to maintain emergency plans for all sport activities, including skill instruction, conditioning, and the nontraditional practice seasons.⁸

A need for emergency preparedness is further recognized by several national organizations concerned with the delivery of health care services to fitness and sport participants, including the NATA Education Council,¹⁰ NATA Board of Certification, Inc.,¹¹ American College of Sports Medicine, International Health Racquet and Sports Club Association, American College of Cardiology, and Young Men's Christian Association.¹² The NATA-approved athletic training educational competencies for athletic trainers include several references to emergency action plans.¹⁰ The knowledge of the key components of an emergency plan, the ability to recognize and appraise emergency plans, and the ability to develop emergency plans are all considered required tasks of the athletic trainer.¹¹ These responsibilities justify the need for the athletic trainer to be involved in the development and application of emergency plans as a partial fulfillment of his or her professional obligations.

In addition to the equipment and personnel involved in emergency response, the emergency plan must include consideration for the sport activity and rules of competition, the weather conditions, and the level of competition.¹³ The variation in these factors makes venue-specific planning necessary because of the numerous contingencies that may occur. For example, many youth sport activities include both new participants of various sizes who may not know the rules of the activity and those who have participated for years. Also, outdoor sport activities include the possibility of lightning strikes, excessive heat and humidity, and excessive cold, among other environmental concerns that may not be factors during indoor activities. Organizations in areas of the country in which snow may accumulate must consider provisions for ensuring that accessibility by emergency vehicles is not hampered. In addition, the availability of safety equipment that is necessary for participation may be an issue for those in underserved areas. The burden of considering all the possible contingencies in light of the various situations must rest on the professionals, who are best trained to recognize the need for emergency plans and who can develop and implement the venue-specific plans.

Legal Need. Also of significance is the legal basis for the development and application of an emergency plan. It is well known that organizational medical personnel, including certified athletic trainers, have a legal duty as reasonable and prudent professionals to ensure high-quality care of the participants. Of further legal precedence is the accepted standard of care by which allied health professionals are measured.¹⁴ This standard of care provides necessary accountability for the actions of both the practitioners and the governing body that oversees those practitioners. The emergency plan has been categorized as a written document that defines the standard of care required during an emergency situation.¹⁵ Herbert¹⁶ emphasized that well-formulated, adequately written, and periodically rehearsed emergency response protocols are absolutely required by sports medicine programs. Herbert¹⁶ further stated that the absence of an emergency plan frequently is the basis for claim and suit based on negligence.

One key indicator for the need for an emergency action plan is the concept of foreseeability. The organization administrators and the members of the sports medicine team must ques-

tion whether a particular emergency situation has a reasonable possibility of occurring during the sport activity in question.^{14,15,17} For example, if it is reasonably possible that a catastrophic event such as a head injury, spine injury, or other severe trauma may occur during practice, conditioning, or competition in a sport, a previously prepared emergency plan must be in place. The medical and allied health care personnel must constantly be on guard for potential injuries, and although the occurrence of limb-threatening or life-threatening emergencies is not common, the potential exists. Therefore, prepared emergency responders must have planned in advance for the action to be taken in the event of such an emergency.

Several legal claims and suits have indicated or alluded to the need for emergency plans. In *Gathers v Loyola Marymount University*,¹⁸ the state court settlement included a statement that care was delayed for the injured athlete, and the plaintiffs further alleged that the defendants acted negligently and carelessly in not providing appropriate emergency response. These observations strongly support the need to have clear emergency plans in place, rehearsed, and carried out. In several additional cases,^{19–21} the courts have stated that proper care was delayed, and it can be reasoned that these delays could have been avoided with the application of a well-prepared emergency plan.

Perhaps the most significant case bearing on the need for emergency planning is *Kleinknecht v Gettysburg College*, which came before the appellate court in 1993.^{5,17} In a portion of the decision, the court stated that the college owed a duty to the athletes who are recruited to be athletes at the institution. Further, as a part of that duty, the college must provide "prompt and adequate emergency services while engaged in the school-sponsored intercollegiate athletic activity for which the athlete had been recruited."¹⁷ The same court further ruled that reasonable measures must be ensured and in place to provide prompt treatment of emergency situations. One can conclude from these rulings that planning is critical to ensure prompt and proper emergency medical care, further validating the need for an emergency plan.⁵

Based on the review of the legal and professional literature, there is no doubt regarding the need for organizations at all levels that sponsor athletic activities to maintain an up-to-date, thorough, and regularly rehearsed emergency plan. Furthermore, members of the sports medicine team have both legal and professional obligations to perform this duty to protect the interests of both the participating athletes and the organization or institution. At best, failure to do so will inevitably result in inefficient athlete care, whereas at worst, gross negligence and potential life-threatening ramifications for the injured athlete or organizational personnel are likely.

Components of Emergency Plans

Organizations that sponsor athletic activities have a duty to develop an emergency plan that can be implemented immediately and to provide appropriate standards of health care to all sports participants.^{5,14,15,17} Athletic injuries may occur at any time and during any activity. The sports medicine team must be prepared through the formulation of an emergency plan, proper coverage of events, maintenance of appropriate emergency equipment and supplies, use of appropriate emergency medical personnel, and continuing education in the area of emergency medicine. Some potential emergencies may be averted through careful preparticipation physical

Sample Venue-Specific Emergency Protocol

University Sports Medicine Football Emergency Protocol

1. Call 911 or other emergency number consistent with organizational policies
2. Instruct emergency medical services (EMS) personnel to "report to _____ and meet _____ at _____ as we have an injured student-athlete in need of emergency medical treatment."
University Football Practice Complex: _____ Street entrance (gate across street from _____) cross street: _____ Street
University Stadium: Gate _____ entrance off _____ Road
3. Provide necessary information to EMS personnel:
 - name, address, telephone number of caller
 - number of victims; condition of victims
 - first-aid treatment initiated
 - specific directions as needed to locate scene
 - other information as requested by dispatcher
4. Provide appropriate emergency care until arrival of EMS personnel: on arrival of EMS personnel, provide pertinent information (method of injury, vital signs, treatment rendered, medical history) and assist with emergency care as needed

Note:

- sports medicine staff member should accompany student-athlete to hospital
- notify other sports medicine staff immediately
- parents should be contacted by sports medicine staff
- inform coach(es) and administration
- obtain medical history and insurance information
- appropriate injury reports should be completed

Emergency Telephone Numbers

_____ Hospital	_____ - _____
_____ Emergency Department	_____ - _____
University Health Center	_____ - _____
Campus Police	_____ - _____

Emergency Signals

Physician: arm extended overhead with clenched fist

Paramedics: point to location in end zone by home locker room and wave onto field

Spine board: arms held horizontally

Stretcher: supinated hands in front of body or waist level

Splints: hand to lower leg or thigh

screenings, adequate medical coverage, safe practice and training techniques, and other safety measures.^{1,22} However, accidents and injuries are inherent with sports participation, and proper preparation on the part of the sports medicine team will enable each emergency situation to be managed appropriately.

The goal of the sports medicine team is the delivery of the highest possible quality health care to the athlete. Management of the emergency situation that occurs during athletic activities may involve certified athletic trainers and students, emergency medical personnel, physicians, and coaches working together. Just as with an athletic team, the sports medicine team must work together as an efficient unit to accomplish its goals.²² In an emergency situation, the team concept becomes even more critical, because time is crucial and seconds may mean the difference among life, death, and permanent disability. The sharing of information, training, and skills among the various emergency medical care providers helps reach the goal.^{22,23}

Implementation. Once the importance of the emergency plan is realized and the plan has been developed, the plan must be implemented. Implementation of the emergency plan requires 3 basic steps.²³

First, the plan must be committed to writing (Table) to provide a clear response mechanism and to allow for continuity among emergency team members.^{14,16} This can be accomplished by using a flow sheet or an organizational chart. It is also important to have a separate plan or to modify the plan

for different athletic venues and for practices and games. Emergency team members, such as the team physician, who are present at games may not necessarily be present at practices. Moreover, the location and type of equipment and communication devices may differ among sports, venues, and activity levels.

The second step is education.²³ It is important to educate all the members of the emergency team regarding the emergency plan. All personnel should be familiar with the emergency medical services system that will provide coverage to their venues and include their input in the emergency plan. Each team member, as well as institution or organization administrators, should have a written copy of the emergency plan that provides documentation of his or her roles and responsibilities in emergency situations. A copy of the emergency plan specific to each venue should be posted prominently by the available telephone.

Third, the emergency plan and procedures have to be rehearsed.¹⁶ This provides team members a chance to maintain their emergency skills at a high level of competency. It also provides an opportunity for athletic trainers and emergency medical personnel to communicate regarding specific policies and procedures in their particular region of practice.²² This rehearsal can be accomplished through an annual in-service meeting, preferably before the highest-risk sports season (eg, football, ice hockey, lacrosse). Reviews should be undertaken as needed throughout the sports season, because emergency medical procedures and personnel may change.

Personnel. In an athletic environment, the first person who responds to an emergency situation may vary widely^{22,24}; it may be a coach or a game official, a certified athletic trainer, an emergency medical technician, or a physician. This variation in the first responder makes it imperative that an emergency plan be in place and rehearsed. With a plan in place and rehearsed, these differently trained individuals will be able to work together as an effective team when responding to emergency situations.

The plan should also outline who is responsible for summoning help and clearing the uninjured from the area.

In addition, all personnel associated with practices, competitions, skills instruction, and strength and conditioning activities should have training in automatic external defibrillation and current certification in cardiopulmonary resuscitation, first aid, and the prevention of disease transmission.^{5,7}

Equipment. All necessary supplemental equipment should be at the site and quickly accessible.^{13,25} Equipment should be in good operating condition, and personnel must be trained in advance to use it properly. Improvements in technology and emergency training require personnel to become familiar with the use of automatic external defibrillators, oxygen, and advanced airways.

It is imperative that health professionals and organizational administrators recognize that recent guidelines published by the American Heart Association call for the availability and use of automatic external defibrillators and that defibrillation is considered a component of basic life support.²⁶ In addition, these guidelines emphasize use of the bag-valve mask in emergency resuscitation and the use of emergency oxygen and advanced airways in emergency care. Personnel should consider receiving appropriate training for these devices and should limit use to devices for which they have been trained.

To ensure that emergency equipment is in working order, all equipment should be checked on a regular basis. Also, the use of equipment should be regularly rehearsed by emergency personnel, and the emergency equipment that is available should be appropriate for the level of training of the emergency medical providers and the venue.

Communication. Access to a working telephone or other telecommunications device, whether fixed or mobile, should be ensured.^{5,17,21} The communications system should be checked before each practice or competition to ensure proper working order. A back-up communication plan should be in effect in case the primary communication system fails. A listing of appropriate emergency numbers should be either posted by the communication system or readily available, as well as the street address of the venue and specific directions (cross streets, landmarks, and so on) (Table).

Transportation. The emergency plan should encompass transportation of the sick and injured. Emphasis should be placed on having an ambulance on site at high-risk events.¹⁵ Emergency medical services response time should also be factored in when determining on-site ambulance coverage. Consideration should be given to the level of transportation service that is available (eg, basic life support, advanced life support) and the equipment and training level of the personnel who staff the ambulance.²³

In the event that an ambulance is on site, a location should be designated with rapid access to the site and a cleared route for entering and exiting the venue.¹⁹ In the emergency evaluation, the primary survey assists the emergency care provider in identifying emergencies that require critical intervention

and in determining transport decisions. In an emergency situation, the athlete should be transported by ambulance to the most appropriate receiving facility, where the necessary staff and equipment can deliver appropriate care.²³

In addition, a plan must be available to ensure that the activity areas are supervised if the emergency care provider leaves the site to transport the athlete.

Venue Location. The emergency plan should be venue specific, based on the site of the practice or competition and the activity involved (Table). The plan for each venue should encompass accessibility to emergency personnel, communication system, equipment, and transportation.

At home sites, the host medical providers should orient the visiting medical personnel regarding the site, emergency personnel, equipment available, and procedures associated with the emergency plan.

At away or neutral sites, the coach or athletic trainer should identify, before the event, the availability of communication with emergency medical services and should verify service and reception, particularly in rural areas. In addition, the name and location of the nearest emergency care facility and the availability of an ambulance at the event site should be ascertained.

Emergency Care Facilities. The emergency plan should incorporate access to an emergency medical facility. In selection of the appropriate facility, consideration should be given to the location with respect to the athletic venue. Consideration should also include the level of service available at the emergency facility.

The designated emergency facility and emergency medical services should be notified in advance of athletic events. Furthermore, it is recommended that the emergency plan be reviewed with both medical facility administrators and in-service medical staff regarding pertinent issues involved in athlete care, such as proper removal of athletic equipment in the facility when appropriate.^{22,23,27}

Documentation. A written emergency plan should be reviewed and approved by sports medicine team members and institutions involved. If multiple facilities or sites are to be used, each will require a separate plan. Additional documentation should encompass the following^{15,16}:

1. Delineation of the person and/or group responsible for documenting the events of the emergency situation
2. Follow-up documentation on evaluation of response to emergency situation
3. Documentation of regular rehearsal of the emergency plan
4. Documentation of personnel training
5. Documentation of emergency equipment maintenance

It is prudent to invest organizational and institutional ownership in the emergency plan by involving administrators and sport coaches as well as sports medicine personnel in the planning and documentation process. The emergency plan should be reviewed at least annually with all involved personnel. Any revisions or modifications should be reviewed and approved by the personnel involved at all levels of the sponsoring organization or institution and of the responding emergency medical services.

SUMMARY

The purpose of this statement is to present the position of the NATA on emergency planning in athletics. Specifically,

professional and legal requirements mandate that organizations or institutions sponsoring athletic activities have a written emergency plan. A well-thought-out emergency plan consists of a number of factors, including, but not necessarily limited to, personnel, equipment, communication, transportation, and documentation. Finally, all sports medicine professionals, coaches, and organizational administrators share professional and legal duties to develop, implement, and evaluate emergency plans for sponsored athletic activities.

ACKNOWLEDGMENTS

This position statement was reviewed for the National Athletic Trainers' Association by the Pronouncements Committee and by John Cottone, EdD, ATC; Francis X. Feld, MEd, MS, CRNA, ATC, NREMT-P; and Richard Ray, EdD, ATC.

REFERENCES

1. Arnheim DD, Prentice WE. *Principles of Athletic Training*, 9th ed. Madison, WI: WCB/McGraw-Hill Inc; 1997.
2. Dolan MG. Emergency care: planning for the worst. *Athl Ther Today*. 1998;3(1):12-13.
3. Kleiner DM, Glickman SE. Considerations for the athletic trainer in planning medical coverage for short distance road races. *J Athl Train*. 1994; 29:145-151.
4. Nowlan WP, Davis GA, McDonald B. Preparing for sudden emergencies. *Athl Ther Today*. 1996;1(1):45-47.
5. Shea JF. Duties of care owed to university athletes in light of Kleinecht. *J Coll Univ Law*. 1995;21:591-614.
6. Halpin T, Dick RW. 1999-2000 *NCAA Sports Medicine Handbook*. Indianapolis, IN: National Collegiate Athletic Association; 1999.
7. Brown GT. NCAA group raising awareness on medical coverage. *NCAA News*. 1999; March 15:6-7.
8. Shultz SJ, Zinder SM, Valovich TC. *Sports Medicine Handbook*. Indianapolis, IN: National Federation of State High School Associations; 2001.
9. Dempsey CW. *Memorandum to all National Collegiate Athletic Association Institutions: Emergency Care and Coverage at NCAA Institutions*. Indianapolis, IN: National Collegiate Athletic Association; March 25, 1999.
10. National Athletic Trainers' Association Education Council. *Athletic Training Educational Competencies*, 3rd ed. Dallas, TX: National Athletic Trainers' Association; 1999.
11. National Athletic Trainers' Association Board of Certification. *Role Delineation Study of the Entry-Level Athletic Trainer Certification Examination*, 3rd ed. Philadelphia, PA: FA Davis; 1995.
12. Herbert DL. Do you need a written emergency response plan? *Sports Med Stand Malpract Rep*. 1999;11:S17-S24.
13. Rubin A. Emergency equipment: what to keep on the sidelines. *Physician Sportsmed*. 1993;21(9):47-54.
14. Appenzeller H. *Managing Sports and Risk Management Strategies*. Durham, NC: Carolina Academic Press; 1993:99-110.
15. Rankin JM, Ingersoll C. *Athletic Training Management: Concepts and Applications*. St Louis, MO: Mosby-Year Book Inc; 1995:175-183.
16. Herbert DL. *Legal Aspects of Sports Medicine*. Canton, OH: Professional Reports Corp; 1990:160-167.
17. *Kleinknecht v Gettysburg College*, 989 F2d 1360 (3rd Cir 1993).
18. *Gathers v Loyola Marymount University*, Case No. C759027, Los Angeles Super Court (settled 1992).
19. *Mogabgab v Orleans Parish School Board*, 239 So2d 456 (Court of Appeals, Los Angeles, 970).
20. *Hanson v Kynast*, 494 NE2d 1091 (Oh 1986).
21. *Montgomery v City of Detroit*, 448 NW2d 822 (Mich App 1989).
22. Kleiner DM. Emergency management of athletic trauma: roles and responsibilities. *Emerg Med Serv*. 1998;10:33-36.
23. Courson RW, Duncan K. *The Emergency Plan in Athletic Training Emergency Care*. Boston, MA: Jones & Bartlett Publishers; 2000.
24. National Athletic Trainers' Association. Establishing communication with EMTs. *NATA News*. June 1994:4-9.
25. Waechterle JF. Planning for emergencies. *Physician Sportsmed*. 1991; 19(2):35, 38.
26. American Heart Association. Guidelines 2000 for cardiopulmonary resuscitation and emergency cardiovascular care: international consensus on science. *Curr Emerg Cardiovasc Care*. 2000;11:3-15.
27. Kleiner DM, Almquist JL, Bailes J, et al. *Prehospital Care of the Spine-Injured Athlete: A Document from the Inter-Association Task Force for Appropriate Care of the Spine-Injured Athlete*. Dallas, TX: National Athletic Trainers' Association; 2001.

NOTES

NOTES



Athletic trainers are health care professionals who specialize in the prevention, diagnosis, treatment and rehabilitation of injuries and sport-related illnesses. They prevent and treat chronic musculoskeletal injuries from sports, physical and occupational activity, and provide immediate care for acute injuries. Athletic trainers offer a continuum of care that is unparalleled in health care. NATA represents and supports 34,000 members of the athletic training profession.

[www. nata.org](http://www.nata.org)

YOUTH SPORTS SAFETY ALLIANCE™

CALL TO ACTION

THE YOUTH SPORTS SAFETY ALLIANCE COMMITS TO

- Ensuring that youth athletes have access to health care professionals who are qualified to make assessments and decisions.
- Educating parents, athletes, coaches, teachers and others about the signs and symptoms of sports injuries and conditions (e.g., brain injury, heat illness and exertional sickling).
- Ensuring pre-participation exams before play begins and, where appropriate, conducting baseline testing.
- Ensuring that sports equipment, uniforms, playing surfaces and environmental conditions are checked for safety and best conditions.
- Writing to state legislators and members of Congress, expressing concerns.
- Insisting that research into youth sports injuries and their effects be undertaken immediately and be supported by tax dollars.
- Supporting through tax and research dollars a national registry of sport-related catastrophic injuries and fatalities to improve safety and participation.
- Demanding that appropriate emergency action plans and safety and medical protocols and procedures are in place at every sporting event and facility.
- Educating players and others that there's a difference between pain and injury, and working to eliminate the culture of "playing through pain" without assessment.
- Ensuring that both general and sport-specific safety education be a priority for every administrator, coach, parent and player.

For more information please visit www.youthsportssafetyalliance.org