

Journal of Athletic Training

<http://www.natajournals.org>

Volume 52, Number 12, December 2017

Editor-in-Chief

Craig R. Denegar, PhD, PT, ATC, FNATA
University of Connecticut

Associate Editors

David C. Berry, PhD, AT, ATC
Saginaw Valley State University

Paul A. Borsa, PhD, ATC, FACSM
University of Florida

Steven P. Broglio, PhD, ATC
University of Michigan

Douglas J. Casa, PhD, ATC, FNATA, FACSM
University of Connecticut

Mitchell L. Cordova, PhD, ATC, FNATA, FACSM
Florida Gulf Coast University

Joseph M. Hart, PhD, ATC, FNATA, FACSM
University of Virginia

Kristin L. Kucera, PhD, MSPH, ATC
University of North Carolina at Chapel Hill

Stephanie M. Mazerolle, PhD, ATC, FNATA
University of Connecticut

Patrick O. McKeon, PhD, ATC, CSCS
Ithaca College

Joseph B. Myers, PhD, ATC
Tampa Bay Rays

James A. Oñate, PhD, ATC, FNATA
The Ohio State University

Darin A. Padua, PhD, ATC
University of North Carolina at Chapel Hill

Susan A. Saliba, PhD, PT, ATC, FNATA
University of Virginia

Stacy E. Walker, PhD, ATC
Ball State University

Official publication of the following associations

National Athletic Trainers' Association
Taiwan Athletic Trainers' Society
Japan Athletic Trainers' Organization
Athletic Rehabilitation Therapy Ireland

Clinical Applications Editor

Marjorie A. King, PhD, ATC, PT
Plymouth State University

Senior Associate Editors

J. Ty Hopkins, PhD, ATC, FNATA, FACSM
Brigham Young University

Jay Hertel, PhD, ATC, FNATA, FACSM
University of Virginia

Jennifer M. Hootman, PhD, ATC, FNATA, FACSM
Centers for Disease Control and Prevention

Sandra J. Shultz, PhD, ATC, FNATA, FACSM
University of North Carolina at Greensboro

Tamara C. Valovich McLeod, PhD, ATC, FNATA
Arizona School of Health Sciences

Statistical Consultants

R. Curtis Bay, PhD
A.T. Still University

Heather Bush, PhD
University of Kentucky

Stephen W. Marshall, PhD
University of North Carolina at Chapel Hill

Bryan L. Riemann, PhD, ATC, FNATA
Armstrong State University

Statistical Consultant Emeritus

Bruce M. Gansneder, PhD
University of Virginia

Consulting Editors

Christopher D. Ingersoll, PhD, ATC, FNATA, FACSM
The University of Toledo

Kenneth L. Knight, PhD, ATC, FNATA, FACSM
Brigham Young University

David H. Perrin, PhD, ATC, FNATA, FACSM
University of Utah

Clint Thompson, MA, ATC
Seattle, WA

Managing Editor

Leslie E. Neistadt, ELS

Editor

Kevin P. Clear

Indexes: Currently indexed in MEDLINE, PubMed Central, Focus on Sports Science & Medicine (ISI: Institute for Scientific Information), Research AlertTH (ISI: Institute for Scientific Information), Physical Education Index, SPORT Discus (SIRC: Sport Information Resource Centre, Canada), CINAHL (Cumulative Index to Nursing & Allied Health Literature), AMED (Allied and Alternative Medicine Database), EMBASE (Elsevier Science), Science Citation Index, Current Contents/Clinical Medicine, Science Citation Index Expanded (SciSearch), Journal Citation Reports/Science Edition, Biological Abstracts, and BIOSIS Previews.

The *Journal of Athletic Training* (ISSN 1062-6050) is published monthly (\$267 for 1-year institutional subscription; \$303 foreign) by the National Athletic Trainers' Association, Inc., 1620 Valwood Parkway, Ste. 115, Carrollton, TX 75006. Periodicals postage paid at Carrollton, TX, and at additional mailing offices. Claims for copies lost in the mail must be received within 90 days (180 days foreign) of the issue date to ensure replacement at no charge.

POSTMASTER: Send address changes to *Journal of Athletic Training*, c/o NATA, 1620 Valwood Parkway, Ste. 115, Carrollton, TX 75006. **CHANGE OF ADDRESS:** Request for address change must be received 30 days prior to date of issue with which it is to take effect. Duplicate copies cannot be sent to replace those undelivered as a result of failure to send advance notice. **ADVERTISING:** Although advertising is screened, acceptance of the advertisement does not imply NATA endorsement of the product or the views expressed. Rates available upon request. The views and opinions in the *Journal of Athletic Training* are those of the authors and are not necessarily of the National Athletic Trainers' Association, Inc.

Copyright 2017 by the National Athletic Trainers' Association, Inc. All rights reserved. Printed in the United States. The *Journal of Athletic Training* is printed on paper that meets the requirements of ANSI/NISO Z39.48-1992 (Permanence of Paper).



Editorial Board

- Jatin P. Ambegaonkar, PhD, ATC, OT, CSCS
George Mason University
- Lawrence E. Armstrong, PhD, FACSM
University of Connecticut
- Christopher M. Bailey, PhD
Case Medical Center
- Michael F. Bergeron, PhD
Youth Sports of the Americas
- J. Troy Blackburn, PhD, ATC
University of North Carolina at Chapel Hill
- Michelle C. Boling, PhD, LAT, ATC
University of North Florida
- Thomas G. Bowman, PhD, ATC
Lynchburg College
- Robert C. Cantu, MD
Emerson Hospital
- Thomas A. Cappaert, PhD, ATC, CSCS, CES
Indiana University–Purdue University Indianapolis
- Christopher R. Carcia, PhD, PT
Duquesne University
- Shane V. Caswell, PhD, ATC
George Mason University
- Michael W. Collins, PhD
University of Pittsburgh
- R. Dawn Comstock, PhD
Colorado School of Public Health
- Tracey Covassin, PhD, ATC, FNATA
Michigan State University
- Kevin M. Cross, PhD, PT, ATC
University of Virginia
- Gianluca Del Rossi, PhD, ATC, FNATA
University of South Florida
- Eamonn Delahunt, PhD, BSc (Physiotherapy)
University College Dublin
- Lindsay J. DiStefano, PhD, ATC
University of Connecticut
- Carrie L. Docherty, PhD, ATC, FNATA
Indiana University
- Michael G. Dolan, MA, ATC, CSCS
Canisius College
- Thomas P. Dompier, PhD, ATC
Datalys Center for Sports Injury Research and Prevention, Inc
- Jeffrey B. Driban, PhD, ATC, CSCS
Tufts Medical Center
- Jennifer E. Earl-Boehm, PhD, ATC
University of Wisconsin-Milwaukee
- Kyle Ebersole, PhD, ATC
University of Wisconsin-Milwaukee
- Ruben Echemendia, PhD
PANBA, Inc
- Todd A. Evans, PhD, ATC
University of Northern Iowa
- Reed Ferber, PhD, ATC, CAT(C)
University of Calgary, Canada
- Sandra Fowkes Godek, PhD, ATC
West Chester University
- Matthew S. Ganio, PhD
University of Arkansas
- Phillip A. Gribble, PhD, ATC, FNATA
The University of Toledo
- Terry L. Grindstaff, PhD, PT, ATC, CSCS
Creighton University
- Kevin M. Guskiewicz, PhD, ATC, FNATA, FACSM
University of North Carolina at Chapel Hill
- Jolene M. Henning, EdD, ATC
High Point University
- Lee Herrington, PhD, MSc, MCSP
University of Salford, United Kingdom
- Mark Hoffman, PhD, ATC, FNATA
Oregon State University
- Tricia J. Hubbard-Turner, PhD, LAT, ATC, FNATA
University of North Carolina at Charlotte
- Lennart D. Johns, PhD, ATC
Quinnipiac University
- Daniel A. Judelson, PhD
Nike Sport Research Lab
- Thomas W. Kaminski, PhD, ATC, FNATA, FACSM
University of Delaware
- Zachary Y. Kerr, PhD, MPH
University of North Carolina at Chapel Hill
- Sarah B. Knowles, PhD, MPH
Palo Alto Medical Foundation Research Institute
- Michael C. Koester, MD, AT Ret
Slocum Center for Orthopedics and Sports Medicine
- John E. Kovaleski, PhD, ATC
University of South Alabama
- Kenneth C. Lam, ScD, ATC
A.T. Still University
- Kevin G. Laudner, PhD, ATC, FACSM
Illinois State University
- Carl G. Mattacola, PhD, ATC, FNATA
University of Kentucky
- Timothy A. McGuine, PhD, ATC
University of Wisconsin, Madison
- Jennifer M. Medina McKeon, PhD, ATC, CSCS
Ithaca College
- Jason P. Mihalik, PhD, CAT(C), ATC
University of North Carolina at Chapel Hill
- Kevin C. Miller, PhD, ATC
Central Michigan University
- John Nyland, EdD, PT, SCS, ATC, CSCS
Spalding University
- Sakiko Oyama, PhD, ATC
The University of Texas at San Antonio
- Riann M. Palmieri-Smith, PhD, ATC
University of Michigan
- Brian Pietrosimone, PhD, ATC
University of North Carolina at Chapel Hill
- Scott G. Piland, PhD, ATC
The University of Southern Mississippi
- William A. Pitney, EdD, ATC, FNATA
Northern Illinois University
- Johna K. Register-Mihalik, PhD, LAT, ATC
Matthew Gfeller Sport-Related TBI Research Center
- Scott E. Ross, PhD, ATC
University of North Carolina at Greensboro
- Eric L. Sauers, PhD, ATC, CSCS, FNATA
Arizona School of Health Sciences
- Randy J. Schmitz, PhD, ATC, FNATA
University of North Carolina at Greensboro
- JoEllen Sefton, PhD, ATC, CMT
Auburn University
- Susan M. Sigward, PhD, PT, ATC
University of Southern California
- Michael R. Sitler, EdD, ATC, FNATA
Temple University
- Chad Starkey, PhD, ATC, FNATA
Ohio University
- Erik E. Swartz, PhD, ATC, FNATA
University of New Hampshire
- David I. Swedler, PhD, MPH
University of Illinois at Chicago School of Public Health
- Abbey C. Thomas, PhD, ATC
University of North Carolina at Charlotte
- Paula Sammarone Turocy, EdD, ATC
Duquesne University
- Bonnie L. Van Lunen, PhD, ATC
Old Dominion University
- Evert Verhagen, PhD
EMGO Institute for Health and Care Research
- Cailee E. Welch, PhD, ATC
A.T. Still University
- Erik A. Wikstrom, PhD, ATC, FACSM
University of North Carolina at Chapel Hill
- Gary B. Wilkerson, EdD, ATC, FNATA
University of Tennessee, Chattanooga
- Jonathan E. Wingo, PhD
University of Alabama
- Susan W. Yeargin, PhD, ATC
University of South Carolina