

# Journal of Athletic Training

<http://www.natajournals.org>

Volume 56, Number 10, October 2021

## Editor-in-Chief

Jay Hertel, PhD, ATC, FNATA  
University of Virginia

## 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, FNATA  
University of Michigan

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

Tracey Covassin, PhD, ATC, FNATA  
Michigan State University

Jennifer E. Earl-Boehm, PhD, ATC, FNATA  
University of Wisconsin-Milwaukee

Phillip A. Gribble, PhD, ATC, FNATA  
The University of Kentucky

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

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

Stephanie Mazerolle Singe, PhD, ATC, FNATA  
University of Connecticut

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

Jason P. Mihalik, PhD, CAT(C), ATC  
University of North Carolina at Chapel Hill

Joseph B. Myers, PhD, ATC  
Tampa Bay Rays

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

Brian Pietrosimone, PhD, ATC  
University of North Carolina at Chapel Hill

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

Stacy E. Walker, PhD, LAT, ATC, FNATA  
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 Editors

Terry L. Grindstaff, PhD, PT, ATC, CSCS  
Creighton University

## Senior Associate Editors

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

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

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 M. Bush, PhD

University of Kentucky

Monica R. Lininger, PhD, LAT, ATC

Northern Arizona University

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

Craig R. Denegar, PhD, PT, ATC, FNATA

University of Connecticut

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, FNATA, FACSM

University of Utah

## Digital Applications Editor

Christopher M. Kuenze, PhD, ATC

Michigan State University

## Managing Editor

Leslie E. Neistadt, ELS

## Editor

Jessica Ingle, BFA

**Indexes:** Currently indexed in MEDLINE, PubMed Central, 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 2021 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

William M. Adams, PhD, ATC  
United States Olympic & Paralympic  
Committee

Jatin P. Ambegaonkar, PhD, ATC, OT, CSCS  
George Mason University

David R. Bell, PhD, ATC  
University of Wisconsin-Madison

Michael F. Bergeron, PhD  
SIVOTEC Analytics

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  
University of Lynchburg

Christopher R. Carcia, PhD, PT  
Duquesne University

Shane V. Caswell, PhD, ATC  
George Mason University

Damien Clement, PhD, ATC, CMPC, NCC  
West Virginia University

Michael W. Collins, PhD  
University of Pittsburgh

R. Dawn Comstock, PhD  
Colorado School of Public Health

Nicole Cosby, PhD, ATC  
Point Loma Nazarene 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

Thomas P. Dompier, PhD, LAT, ATC  
Datalys Center for Sports Injury  
Research and Prevention, Inc

Jeffrey B. Driban, PhD, ATC, CSCS  
Tufts Medical Center

Ruben Echemendia, PhD  
PANBA, Inc0000

Todd A. Evans, PhD, ATC  
University of Northern Iowa

Reed Ferber, PhD, ATC, CAT(C)  
University of Calgary, Canada

Matthew S. Ganio, PhD  
University of Arkansas

Kevin M. Guskiewicz, PhD, ATC,  
FNATA, FACSM  
University of North Carolina at Chapel Hill

Lee Herrington, PhD, MSc, MCSP  
University of Salford, United Kingdom

Matthew Hoch, PhD, ATC  
University of Kentucky

Mark Hoffman, PhD, ATC, FNATA  
Oregon State University

Yuri Hosokawa, PhD, ATC  
Ritsumeikan University

Tricia J. Hubbard-Turner, PhD, LAT,  
ATC, FNATA  
University of North Carolina at Charlotte

Thomas W. Kaminski, PhD, ATC,  
FNATA, FACSM  
University of Delaware

Zachary Y. Kerr, PhD, MPH  
University of North Carolina at Chapel Hill

Roger O. Kollock, PhD, ATC, CSCS  
The University of Tulsa

Kenneth C. Lam, ScD, ATC  
A.T. Still University

Carl G. Mattacola, PhD, ATC, FNATA  
University of North Carolina at Greensboro

Timothy A. McGuine, PhD, ATC  
University of Wisconsin, Madison

Jennifer M. Medina McKeon, PhD,  
ATC, CSCS  
Ithaca College

Kevin C. Miller, PhD, ATC  
Central Michigan University

Anh-Dung Nguyen, PhD, ATC  
High Point University

Sakiko Oyama, PhD, ATC  
The University of Texas at San Antonio

Riann M. Palmieri-Smith, PhD, ATC, FNATA  
University of Michigan

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, FNATA  
University of North Carolina at  
Greensboro

Eric L. Sauers, PhD, ATC, 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. Sittler, EdD, ATC, FNATA  
Temple University

Rebecca Stearns, PhD, ATC  
University of Connecticut

Erik E. Swartz, PhD, ATC, FNATA  
University of New Hampshire

Abbey C. Thomas, PhD, ATC  
University of North Carolina at Charlotte

Toni M. Torres-McGehee, PhD, SCAT,  
ATC  
University of South Carolina

Bonnie L. Van Lunen, PhD, ATC  
Old Dominion University

Luzita I. Vela, PhD, LAT, ATC  
University of Virginia

Evert Verhagen, PhD  
EMGO Institute for Health and Care  
Research

Cailee E. Welch Bacon, 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