

Physical Therapy

Editor in Chief Alan M. Jette, PT, PhD, FAPTA, Boston, MA; ajette@bu.edu

Deputy Editors Diane U. Jette, PT, DSc, FAPTA, Boston, MA; Samuel R. Ward, PT, PhD, La Jolla, CA

Editor Emeritus Jules M. Rothstein, PT, PhD, FAPTA (1989–2005)

Editorial Board Kristin R. Archer, PT, PhD, FAPTA, Nashville, TN; Marla K. Beauchamp, PhD, Hamilton, Ontario, Canada; W. Todd Cade, PT, PhD, St Louis, MO; John Childs, PT, PhD, MBA, OCS, FAPTA, San Antonio, TX; Leonardo Costa, PT, PhD, São Paulo, Brazil; Gammon Earhart, PT, PhD, St Louis, MO; Mary Gannotti, PT, PhD, West Hartford, CT; Kathleen Gill-Body, PT, DPT, NCS, FAPTA, Boston, MA; Arlene Greenspan, PT, DrPH, Atlanta, GA; Karin Harms-Ringdahl, PT, PhD, Huddinge, Sweden; Jill C. Heathcock, PT, PhD, Columbus, OH; Rana Hinman, PT, PhD, Carlton, Victoria, Australia; Sarah H. Kagan, RN, PhD, FAAN, Philadelphia, PA; Teresa Liu-Ambrose, PT, PhD, Vancouver, British Columbia, Canada; Christopher Maher, PT, PhD, FACP, Sydney, NSW, Australia; Christine McDonough, PT, PhD, Boston, MA; Patricia J. Ohtake, PT, PhD, Buffalo, NY; Elizabeth K. Rasch, PT, PhD, Bethesda, MD; Darcy Reisman, PT, PhD, Wilmington, DE; Linda Resnik, PT, PhD, Providence, RI; Barbara K. Smith, PT, PhD, Gainesville, FL; Philip J. van der Wees, PT, PhD, Nijmegen, The Netherlands

Contributing Editors Stuart Binder-Macleod, PT, PhD, FAPTA, Newark, DE; Anthony Delitto, PT, PhD, FAPTA, Pittsburgh, PA; Pamela Duncan, PT, PhD, FAPTA, Winston-Salem, NC; Steven Z. George, PT, PhD, Gainesville, FL; James J. Irrgang, PT, PhD, FAPTA, Pittsburgh, PA; Justin Moore, PT, PhD, Alexandria, VA; Michael Mueller, PT, PhD, FAPTA, St Louis, MO; Ruth Purtilo, PT, PhD, FAPTA, Boston, MA; Richard Shields, PT, PhD, FAPTA, Iowa City, IA; Carolee Winstein, PT, PhD, FAPTA, Los Angeles, CA; Steven Wolf, PT, PhD, FAPTA, Atlanta, GA

Statistical Consultants Hang Lee, PhD, Boston, MA; Xiangrong Kong, PhD, Baltimore, MD; Gregory F. Petroski, PhD, Columbia, MO; Michael E. Robinson, PhD, Gainesville, FL; Paul Stratford, PT, MSc, Hamilton, Ontario, Canada; David Thompson, PT, PhD, Oklahoma City, OK; Samuel Wu, PhD, Gainesville, FL

Senior Manuscript Reviewers Neil Artz, PhD; Karen Barker, PhD; Paul Beattie, PhD, PT, OCS, FAPTA; M.J. Blaschak, PT, PhD, MSEE; Stephen Blumberg, PhD; Michael Bodner, PhD; Geoff Bostick, PhD; Jennifer Brach, PT, PhD, GCS; Timothy Brindle, PhD; Helen Brooks, PhD; Donna Cech, PT, MS; Cathy Chapple; Yuping Chen, PT, ScD; Nicole Christensen, PT, PhD; Kevin Chui, PT, DPT, PhD, GCS, OCS; Rhea Cohn, PT, DPT; Chad Cook, PT, PhD, MBA, FAAOMPT; Janet Copeland, Dip PT, BA, MHealSc; Catherine Curtis, PT, EdD; Timothy Dall; Willem De Hertogh, PT, PhD; Stacey Lynn DeJong, PT, PhD, PCS; Joost Dekker, PhD, MCS; Clare Delany, PhD; Leland Dibble, PT, PhD, ATC; Almas Dossa, PT, PhD; Pam Duffy, PT, PhD, OCS; Ryan Duncan, PhD; Kim Dunleavy, PhD, PT, MOMT, OCS; Stacey Dusing, PT, PhD, PCS; Marie Earl, PT, PhD; Brian Eckenrode, PT, DPT, MS, OCS; Ian Edwards, PhD; Cheryl Ford-Smith, PT, DPT, MS, NCS; Jorge Fuentes, PT MSc RS, PhD; Stephanie Glegg, MSc, OTR; Adam Goode, PT, DPT, PhD; Sharon Gorman, PT, DPTSc, GCS; Bruce Greenfield, PhD, OCS; Anita Gross, PT, PhD; Regina Harbourne, PT, MS, PCS; Dustin Hardwick, DPT, PhD; Karen Hayes, PT, PhD; Eric Hegedus, PT, DPT, MHSc, OCS, CSCS; Roger Hilfiker; G. Thomas Hornby, PT, PhD; Markus Huebscher, PhD; Lana Karasik, PhD; Albere Köke, PhD; Suzanne Kuys, PhD; Alyssa LaForme Fiss, PT, PhD, PCS; Merrill Landers, PT, DPT, PhD, OCS; Catherine Lang, PT, PhD; Abigail Leddy, PT, DPT; Szu-Ping Lee, PT, PhD; Natalie Leland, PhD, OTR/L, BCG, FAOTA; Vernon Lin, MD, PhD; Michele Lobo, PT, PhD; Paula Ludewig, PT, PhD; Mari Lundberg, PhD; Susan Magasi, PhD; Matthew Major, PhD; Daniel Malone, PhD, CCS; Kathleen Kline Mangione, PT, PhD, FAPTA; Gregory Marchetti, PT, MS, PhD; Brook Martin, PhD; Karen McCulloch, PT, PhD; Margaret McNeely, MSc, PT, PhD; Gretchen Meyer, MD, PhD; Andrew Moore, PhD; David Morris, PT, PhD; Susan Muir-Hunter, PT, PhD; Gina Musolino, PT, EdD; Kristin Musselman, MSc, PhD; Joe Nocera, PhD; Margaret O'Neil, MSc, PT; Anand Pandyan, PhD; Kirkwood Personius, PT, PhD; Stéphane Poitras, PT, PhD; Emilio Joseph Puentedura, PT, DPT; Lori Quinn, EdD, PT; Troy Rand, MS; Daniel Cury Ribeiro, PhD; Kathleen Rockefeller, PT, ScD, MPH; Sandy Ross, BSPT, MHS; Sean Daniel Rundell, DPT, MS, PhD; Pasqualina Santaguida, PhD; Andrew Sawers, PhD; David Scalzitti, PT, PhD, OCS; Susan Scherer, PT, PhD; Harvey Schwartz, PhD, MBA; Delva Shamley, PhD; Nancy Sharby, MS, PT, DPT; Susan Slade, PhD; Beth Smith, PT, DPT, PhD; James Michael Smith, DPT; Neil Spielholz, PhD, PT, FAPTA; Jennifer Stith, PT, PhD, LCSW; Sandra Stuckey, PT, MA, PhD; Laura Lee Swisher, PhD; Annie Tessier, PhD; Michael Tevald, PT, PhD; Kimberly Topp, PT, PhD; Melissa Moran Tovin, PT, MA, PhD; Julia Treleaven, Bphty, PhD; Catherine Trombly Latham, ScD; Frank Underwood, PhD, PT, ECS; Kirsti Uusi-Rasi, PhD; Ann Vendrely, PT, EdD, DPT; Susan Flannery Wainwright, PT, PhD; Benedict Wand, PhD; Stuart Warden, PT, PhD; Cherie Wells; Marie Westby, PT, PhD; Ann Williams, PT, PhD; Cynthia Zadai, DPT, MS, CCS, FAPTA; Joseph Zeni, PhD

PTJ Editorial Office **Managing Editor:** Jan P. Reynolds, janreynolds@apta.org; **PTJ Online Editor / Assistant Managing Editor:** Steven Glaros; **Associate Editor:** Stephen Brooks, EL; **Editorial Assistant:** Natacha Leonard; **Editorial Tracking Manager:** Karen Darley

Association Staff **Chief Executive Officer:** J. Michael Bowers; **Vice President of Research:** Robyn Watson Ellerbe, PhD; **Advertising Manager:** Julie Hilgenberg; **Permissions / Reprint Coordinator:** Michele Tillson

Advertising Sales Ad Marketing Group, Inc, 2200 Wilson Blvd, Suite 102-333, Arlington, VA 22201; 703/243-9046, ext 102; **President / Advertising Account Manager:** Jane Dees Richardson

Board of Directors **President:** Sharon L. Dunn, PT, PhD, OCS; **Vice President:** Lisa K. Saladin, PT, PhD, FASAHP; **Secretary:** Laurita M. Hack, PT, DPT, MBA, PhD, FAPTA; **Treasurer:** Elmer Platz, PT; **Speaker of the House:** Susan R. Griffin, PT, DPT, MS, GCS; **Vice Speaker of the House:** Stuart Platt, PT, MSPT; **Directors:** Susan A. Appling, PT, DPT, PhD, OCS; Jeanine M. Gunn, PT, DPT; Roger A. Herr, PT, MPA, COS-C; Matthew R. Hyland, PT, PhD, MPA; Kathleen K. Mairrella, PT, DPT, MA; Sheila K. Nicholson, PT, DPT, JD, MBA, MA; Carolyn Oddo, PT, MS, FACHE; Robert H. Rowe, PT, DPT, DMT, MHS, FAAOMPT; Sue Whitney, PT, DPT, PhD, NCS, ATC, FAPTA

Subscriptions

Physical Therapy (**PTJ**) (ISSN 0031-9023) is published monthly by the American Physical Therapy Association (APTA), 1111 North Fairfax Street, Alexandria, VA 22314-1488, at an annual subscription rate of \$12 for members, included in dues. Nonmember rates are as follows: Individual (inside USA)—\$129; individual (outside USA)—\$149 surface mail, \$209 air mail. Institutional (inside USA)—\$169; institutional (outside USA)—\$189 surface mail, \$249 air mail. Periodical postage is paid at Alexandria, VA, and at additional mailing offices. **Postmaster:** Send address changes to *Physical Therapy*, 1111 North Fairfax Street, Alexandria, VA 22314-1488. Single copies: \$15 USA, \$15 outside USA. All orders payable in US currency. No replacements for nonreceipt after a 3-month period has elapsed. Canada Post International Publications Mail Product Sales Agreement No. 0055832.

Members and Subscribers

Send changes of address to: APTA, Attn: Member Services Dept, 1111 North Fairfax St, Alexandria, VA 22314-1488. Subscription inquiries: 703/684-2782, ext 3124. **PTJ** is available in a special format for readers who are visually impaired. For information, contact APTA's Member Services Department at 703/684-2782, ext 3124.

Mission Statement

Physical Therapy (**PTJ**) engages and inspires an international readership on topics related to physical therapy. As the leading international journal for research in physical therapy and related fields, **PTJ** publishes innovative and highly relevant content for both clinicians and scientists and uses a variety of interactive approaches to communicate that content, with the expressed purpose of improving patient care. **PTJ** is the official scientific journal of the American Physical Therapy Association (APTA).

Readers are invited to submit manuscripts to **PTJ**. **PTJ**'s content—including editorials, commentaries, and letters—represents the opinions of the authors and should not be attributed to **PTJ** or its Editorial Board. Content does not reflect the official policy of APTA or the institution with which the author is affiliated, unless expressly stated.

PTJ Online at ptjournal.apta.org

RSS **PTJ** Online is available via RSS feeds. **PTJ** posts articles ahead of print and rapid reader responses to articles. Articles, letters to the editor, and editorials are available in full text starting with Volume 79 (1999) and in searchable PDF format starting with Volume 60 (1980). Entire issues are available online beginning with Volume 86 (2006) and include additional data, video clips, and podcasts.

Indexing and Document Delivery

PTJ is indexed by MEDLINE, PubMed, Cumulative Index to Nursing & Allied Health (CINAHL), EMBASE/Excerpta Medica, AgeLine, Allied and Complementary Medicine Database (AMED), Index Medicus, and Science Citation Index (SCI), among others. A complete list is available from ptjournal.apta.org/site/misc/about.xhtml.

Article abstracts are available online at ptjournal.apta.org (1980 through present) and via MEDLINE, PubMed, Allied and Complementary Medicine Database (AMED), Cumulative Index to Nursing & Allied Health (CINAHL), Dialog, and OCLC FirstSearch, among others.

Full-text articles are available for free at ptjournal.apta.org 12 months after the publication date (1980 to present). Full text is also provided through Dialog, EBSCOhost, InfoTrac, ProQuest, and Westlaw.

Reprints

Readers should direct requests for reprints to the corresponding author of the article. Students and other academic customers may receive permission to reprint copyrighted material from this publication by contacting the Copyright Clearance Center Inc, 222 Rosewood Dr, Danvers, MA 01923. Authors who want reprints should contact June Billman, Cadmus Communications, at 800/487-5625, or billmanj@cadmus.com. Non-academic institutions needing reprint permission information should go to ptjournal.apta.org/site/misc/terms.xhtml.

Advertising

Advertisements are accepted by **PTJ** when they conform to the ethical standards of the American Physical Therapy Association. **PTJ** does not verify the accuracy of claims made in advertisements, and acceptance does not imply endorsement by **PTJ** or the Association. Acceptance of advertisements for professional development courses addressing advanced-level competencies in clinical specialty areas does not imply review or endorsement by the American Board of Physical Therapy Specialties.

Statement of Nondiscrimination

APTA prohibits preferential or adverse discrimination on the basis of race, creed, color, gender, age, national or ethnic origin, sexual orientation, disability, or health status in all areas including, but not limited to, its qualifications for membership, rights of members, policies, programs, activities, and employment practices. APTA is committed to promoting cultural diversity throughout the profession.

