VOLUME 33, NUMBER 9

SEPTEMBER 2012

### ORIGINAL ARTICLES

- Development of a Modified Surveillance Definition of Central Line-Associated Bloodstream Infections for Patients with Hematologic Malignancies Megan J. DiGiorgio, MSN, RN, CIC; Cynthia Fatica, BSN, RN, CIC; Mary Oden, RN, BSN, MHS, CIC; Brian Bolwell, MD; Mikkael Sekeres, MD; Matt Kalaycio, MD; Patti Akins, BSN, RN; Christina Shane, MSN, RN; Jacob Bako, BS; Steven M. Gordon, MD; Thomas G. Fraser, MD
- Central Line-Associated Bloodstream Infection Surveillance Outside the Intensive Care Unit: A Multicenter Survey Crystal H. Son, MPH; Titus L. Daniels, MD, MPH; Janet A. Eagan, RN, MPH, CIC; Michael B. Edmond, MD, MPH, MPA; Neil O. Fishman, MD; Thomas G. Fraser, MD; Mini Kamboj, MD; Lisa L. Maragakis, MD, MPH; Sapna A. Mehta, MD; Trish M. Perl, MD, MSc; Michael S. Phillips, MD; Connie S. Price, MD; Thomas R. Talbot, MD, MPH; Stephen J. Wilson, MD, MPH; Kent A. Sepkowitz, MD
- B75 Diagnosing and Reporting of Central Line-Associated Bloodstream Infections •
  Susan E. Beekmann, RN, MPH; Daniel J. Diekema, MD; W. Charles Huskins, MD, MSc; Loreen Herwaldt, MD;
  John M. Boyce, MD; Robert J. Sherertz, MD; Philip M. Polgreen, MD, MPH;
  on behalf of the Infectious Diseases Society of America Emerging Infections Network
- Assessing the Burden of Acinetobacter baumannii in Maryland: A Statewide Cross-Sectional Period Prevalence Survey Kerri A. Thom, MD, MS; Lisa L. Maragakis, MD, MPH; Katie Richards, MPH; J. Kristie Johnson, PhD; Brenda Roup, PhD, RN, CIC; Patricia Lawson, RN, MPH, CIC; Anthony D. Harris, MD, MPH; Elizabeth P. Fuss, RN, MS, CIC; Margaret A. Pass, RN, MS, CIC; David Blythe, MD, MPH; Eli N. Perencevich, MD, MS; Lucy Wilson, MD, ScM; Maryland MDRO Prevention Collaborative
- Relationship between Chlorhexidine Gluconate Skin Concentration and Microbial Density on the Skin of Critically Ill Patients Bathed Daily with Chlorhexidine Gluconate Kyle J. Popovich, MD; Rosie Lyles, MD; Robert Hayes, BA; Bala Hota, MD, MPH; William Trick, MD; Robert A. Weinstein, MD; Mary K. Hayden, MD
- Decreasing Operating Room Environmental Pathogen Contamination through Improved Cleaning
   Practice L. Silvia Munoz-Price, MD; David J. Birnbach, MD, MPH; David A. Lubarsky, MD, MBA;
   Kristopher L. Arheart, EdD; Yovanit Fajardo-Aquino, MD; Mara Rosalsky, RN; Timothy Cleary, PhD;
   Dennise DePascale, MT; Gabriel Coro, MD; Nicholas Namias, MD; Philip Carling, MD
- Evaluation of Potential Environmental Contamination Sources for the Presence of Multidrug-Resistant Bacteria Linked to Wound Infections in Combat Casualties Edward F. Keen III, PhD; Katrin Mende, PhD; Heather C. Yun, MD; Wade K. Aldous, PhD; Timothy E. Wallum, MSc; Charles H. Guymon, MA; David W. Cole, MD; Helen K. Crouch, MPH, CIC; Matthew E. Griffith, MD; Bernadette L. Thompson, RN, BSN, CIC; Joel T. Rose, BS; Clinton K. Murray, MD
- Successful Implementation of a Window for Routine Antimicrobial Prophylaxis Shorter than That of the World Health Organization Standard Heidi Misteli, MD; Andreas F. Widmer, MD, MS; Walter P. Weber, MD; Evelyne Bucher, MD; Marc Dangel, MPH, RN; Stefan Reck, MD; Daniel Oertli, MD, FACS; Walter R. Marti, MD, FACS; Rachel Rosenthal, MD

SHEA The Society for Healthcare CONTENTS CONTINUED INSIDE

THE OFFICIAL JOURNAL OF THE SOCIETY FOR HEALTHCARE EPIDEMIOLOGY OF AMERICA

### Join SHEA

Access to the information you need to meet the infection prevention challenges ahead.

- One year subscription to Infection Control & Hospital Epidemiology
- Online access to Infection Control & Hospital Epidemiology
- Monthly newsletter with abstracts of scientific journal articles and current events
- Online job board
- Online member search
- Continuing Medical Education (CME) and Continuing Nursing Education (CNE) opportunities

### About SHEA

The Society for Healthcare Epidemiology of America (SHEA) was founded in 1980 to advance the science of healthcare epidemiology and infection prevention. SHEA works to maintain the utmost quality of patient care and healthcare worker safety in all healthcare settings, applying epidemiologic principles and prevention strategies to a wide range of quality-of-care issues. SHEA is strengthened by its active membership in all branches of medicine, public health, and healthcare epidemiology. The Society's expertise is sought by healthcare regulatory and accrediting agencies, and its scientific voice is influential in guiding decision-making bodies towards rational, effective, cost-conscious policies.

The Society for Healthcare Epidemiology of America

### Mission

SHEA's mission is to prevent and control healthcare-associated infections and advance the field of healthcare epidemiology.

### Core Values

SHEA as an organization:

- Advances the science of healthcare epidemiology through research and education
- Translates knowledge into effective policy and practice
- Mentors, trains and promotes professional development in healthcare epidemiology
- Collaborates and shares expertise with other organizations
- Adheres to high ethical standards and promotes honesty and ethical principles in the practice of epidemiology

### Areas of Focus

- Epidemiologic research and laboratory investigation
- Applying the best evidence for protecting patients and reporting data
- Risk reduction programs focused on device and procedure management
- Policy development and implementation
- Education and information

Please contact info@shea-online.org with membership inquiries.

Join SHEA at www.shea-online.org

VOLUME 33, NUMBER 9

SEPTEMBER 2012

CONTENTS CONTINUED FROM COVER

- 917 Infection Control Knowledge, Attitudes, and Practices among Healthcare Workers at Mulago Hospital, Kampala, Uganda Ajay K. Sethi, PhD, MHS; Charles W. Acher, MPH; Bruce Kirenga, MBChB; Scott Mead, MD; Curtis J. Donskey, MD; Achilles Katamba, MBChB, PhD
- 924 Innovative Approaches for Understanding Seasonal Influenza Vaccine Declination in Healthcare Personnel Support Development of New Campaign Strategies Tamara M. Schult, MPH; Ebi R. Awosika, MD, MPH; Michael J. Hodgson, MD, MPH; Pamela R. Hirsch, NP-C, Med, MS; Kristin L. Nichol, MD, MPH, MBA; Sue R. Dyrenforth, PhD; Scott C. Moore, PhD

### COMMENTARY

932 Casablanca Redux: We Are Shocked That Public Reporting of Rates of Central Line-Associated
Bloodstream Infections Are Inaccurate • Daniel J. Sexton, MD; Luke F. Chen, MBBS; Rebekah Moehring, MD;
Paul A. Thacker, BS; Deverick J. Anderson, MD

### REVIEW ARTICLE

936 Prevention of Central Line-Associated Bloodstream Infections in Hemodialysis Patients • John M. Boyce, MD

### CONCISE COMMUNICATIONS

- A Qualitative Assessment of a Performance Measure for Reporting Influenza Vaccination Rates among Healthcare Personnel Taranisia MacCannell, PhD, MSc; Alicia Shugart, MA; Amy K. Schneider, MPH; Megan C. Lindley, MPH; Suchita A. Lorick, DO, MPH; Agam Rao, MD; LaDora O. Woods; Faruque Ahmed, PhD; Ronda L. Sinkowitz-Cochran, MPH
- 949 Air Contamination around Patients Colonized with Multidrug-Resistant Organisms Marie Charlotte Bernard, MD; Philippe Lanotte, PhD; Christine Lawrence, PhD; Alain Goudeau, PhD; Louis Bernard, MD, PhD

### RESEARCH BRIEFS

- **Hospital Flood Preparedness: A Survey of 15 Provinces in Central Thailand** Anucha Apisarnthanarak, MD; Thana Khawcharoenporn, MD, MSc; Keith F. Woeltje, MD, PhD; David K. Warren, MD, MPH
- 954 Carbapenem-Resistant Enterobacteriaceae: A Statewide Survey of Detection in Massachusetts Hospitals • Evangeline Thibodeau, MD; Robert Duncan, MD, MPH; David R. Snydman, MD; Barbara Bolstorff, MPH; Johanna Vostok, MPH; Kerri Barton, MPH; Alfred DeMaria Jr., MD
- Active Surveillance for Methicillin-Resistant Staphylococcus aureus including Polymerase Chain Reaction-Based Screening Prevents Transmission in a Dermatology Ward Georg Daeschlein, MD; Sebastian von Podewils, MA; Tina Bloom; Hermann Haase, PhD; Andreas Arnold, MD; Sebastian Fochler, MD; Abdulkareem Al-Jebori, MD; Maria Niggemeier; Michael Jünger, MD

CONTENTS CONTINUED ON NEXT PAGE

VOLUME 33, NUMBER 9

SEPTEMBER 2012

CONTENTS CONTINUED FROM PREVIOUS PAGE

### LETTERS TO THE EDITOR

- Using an Intensified Infection Prevention Intervention to Control Carbapenemase-Producing
   Enterobacteriaceae at a Thai Center Anucha Apisarnthanarak, MD; Pattarachai Kiratisin, MD, PhD;
   Thana Khawcharoenporn, MD, MSc; David K. Warren, MD
- 961 Chlorhexidine Is Better than Aqueous Povidone Iodine as Skin Antiseptic for Preventing Surgical Site Infections Olivier Mimoz, MD, PhD
- 962 Seasonal Influenza Vaccine Compliance and Use of Declination Forms Kenneth Soyemi, MD, MPH; Julia Howland, MPH; Daniel Lee, MPH, MBA
- **Reply to Soyemi et al** Terri Rebmann, PhD, RN, CIC; Kathleen S. Wright, EdD, MPH; John Anthony, MT(ASCP), CIC; Richard C. Knaup, BA; Eleanor B. Peters, MSPH, MA

An Official Publication of the Society for Healthcare Epidemiology of America

### EDITOR

Suzanne F. Bradley, MD • Ann Arbor, MI

### DEPUTY EDITOR

Carol A. Kauffman, MD • Ann Arbor, MI

### SENIOR ASSOCIATE EDITORS

C. Glen Mayhall, MD • Galveston, TX Gina Pugliese, RN, MS • Chicago, IL William Schaffner, MD • Nashville, TN

### ASSOCIATE EDITORS

Ebbing Lautenbach, MD, MPH • Philadelphia, PA Preeti N. Malani, MD, MSJ • Ann Arbor, MI David Weber, MD, MPH • Chapel Hill, NC

### STATISTICS CONSULTANT

Rodney L. Dunn, MS • Ann Arbor, MI

SECTION EDITOR FOR GUIDELINES, POSITION PAPERS, AND INVITED REVIEWS Carol Chenoweth, MD • Ann Arbor, MI

### MANAGING EDITOR

Rob Blixt • Chicago, IL

### PAST EDITORS

### Infection Control

Richard P. Wenzel, MD, 1980–1990 (vols. 1–11) *Infection Control and Hospital Epidemiology* Richard P. Wenzel, MD, 1991–1992 (vols. 12 and 13) Michael D. Decker, MD, 1993–2001 (vols. 14–22) Barry M. Farr, MD, 2002–2004 (vols. 23–25) William R. Jarvis, MD, 2005–2006 (vols. 26 and 27)

### EDITORIAL ADVISORY BOARD

Miriam Alter, PhD, MD • Galveston, TX
Deverick Anderson, MD, MPH • Durham, NC
Anucha Apisarnthanarak, MD • Pratumthani,
Thailand

Lennox Archibald, MD, FRCP • Alachua, FL Hilary Babcock, MD • St. Louis, MO Shailen Banerjee, PhD • Atlanta, GA Elise M. Beltrami, MD, MPH • Atlanta, GA Jo Anne Bennett, RN, PhD • New York, NY David Birnbaum, PhD, MPH • Sidney, BC Marc Bonten, MD • Utrecht, Netherlands Christian Brun-Buisson, MD • Creteil, France John P. Burke, MD • Salt Lake City, UT David P. Calfee, MD, MS • New York, NY Yehuda Carmeli, MD, MPH • Tel Aviv, Israel Donald E. Craven, MD • Burlington, MA Christopher Crnich, MD, MS • Madison, WI Erika D'Agata, MD, MPH • Boston, MA Daniel Diekema, MD • Iowa City, IA Erik Dubberke, MD, MSPH • St. Louis, MO Charles E. Edmiston, Jr., PhD • Milwaukee, WI Theodore C. Eickhoff, MD • Denver, CO Mohamad Fakih, MD, MPH • Grosse Pointe Woods,

Jon P. Furuno, PhD • Portland, OR
Petra Gastmeier, MD • Berlin, Germany
Jeffrey Gerber, MD, PhD • Philadelphia, PA
Dale N. Gerding, MD • Hines, IL
Donald A. Goldmann, MD • Boston, MA
Nicholas Graves, PhD • Brisbane, Australia
Donna Haiduven, RN, PhD, CIC • Tampa, FL
Anthony D. Harris, MD, MPH • Baltimore, MD
Elizabeth Henderson, PhD • Calgary, AB

David K. Henderson, MD • Bethesda, MD Loreen A. Herwaldt, MD • Iowa City, IA Peter N. R. Heseltine, MD • Brea, CA John A. Jernigan, MD, MS • Atlanta, GA James T. Lee, MD, PhD • St. Paul, MN L. Clifford McDonald, MD • Atlanta, GA Allison McGeer, MD • Toronto, ON Leonard A. Mermel, DO, ScM • Providence, RI Robert R. Muder, MD • Pittsburgh, PA Linda Mundy, MD • St. Louis, MO Joseph M. Mylotte, MD, CIC • Buffalo, NY Jan Evans Patterson, MD • San Antonio, TX David A. Pegues, MD • Los Angeles, CA Eli Perencevich, MD, MS • Iowa City, IA Didier Pittet, MD, MS • Geneva, Switzerland Issam Raad, MD • Houston, TX Manfred L. Rotter, MD, DipBact • Vienna, Austria William A. Rutala, PhD, MPH • Chapel Hill, NC Lisa Saiman, MD, MPH • New York, NY Sanjay Saint, MD, MPH • Ann Arbor, MI Sorana Segal-Maurer, MD • Flushing, NY Lynne M. Sehulster, PhD • Atlanta, GA John A. Sellick, DO • Amherst, NY Kent Sepkowitz, MD • New York, NY Andrew E. Simor, MD • Toronto, ON Philip W. Smith, MD • Omaha, NE Kurt Stevenson, MD, MPH • Columbus, OH Nimalie Stone, MD • Atlanta, GA Thomas Talbot, MD, MPH • Nashville, TN Paul Tambyah, MBBS • Singapore William Trick, MD · Chicago, IL Antoni Trilla, MD, PhD • Barcelona, Spain Robert A. Weinstein, MD • Chicago, IL Andreas Widmer, MD, MS . Basel, Switzerland Marcus Zervos, MD • Detroit, MI

Infection Control and Hospital Epidemiology (ISSN 0899-823X) is published monthly by the University of Chicago Press, 1427 E. 60th St., Chicago, IL 60637-2954 (http://www.journals.uchicago.edu/ICHE/). The editorial office is in Chicago, Illinois.

### **Editorial Office**

Communications should be addressed to the Editor, *Infection Control and Hospital Epidemiology*, 1427 E. 60th St., Chicago, IL 60637-2954; (e-mail: iche@press.uchicago.edu; telephone: 773-702-2538, fax: 773-753-4247). Contributors should consult the Information for Authors, which is available at the journal's Web site.

### Advertising

Please direct advertising inquiries to Paul Tucker, Breuning Nagle Associates, 59 Grove Street, New Canaan, CT 06840 (e-mail: paul@bna1.com; telephone: 847-669-1096, fax: 203-801-0011). Publication of an advertisement in *Infection Control and Hospital Epidemiology* does not imply endorsement of its claims by the Society for Healthcare Epidemiology of America, by the Editor, or by the University of Chicago. Correspondence regarding advertising should be addressed to the advertising office in Chicago.

### Permission

Articles may be copied or otherwise reused without permission only to the extent permitted by Sections 107 and 108 of the US Copyright Law. Permission to copy articles for personal, internal, classroom, or library use may be obtained from the Copyright Clearance Center (http://www.copyright.com). For all other uses, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale, please contact the Permissions Coordinator, Journals Division, University of Chicago Press, 1427 E. 60th St., Chicago, IL 60637 (e-mail: journalpermissions@press.uchicago.edu; fax:

773-834-3489). Articles in the public domain may be used without permission, but it is customary to contact the author.

### Subscriptions

Individual subscription rates for 2012 are \$191. Lower rates for fellows, residents, and students are available at http://www.journals.uchicago.edu/ICHE. Individuals have the option to order directly from the University of Chicago Press. Institutional print + electronic and e-only subscriptions are available through JSTOR's Current Scholarship Program and include unlimited online access; rates are tiered according to an institution's type and research output: \$425 to \$1,063 (print + electronic), \$340 to \$884 (e-only). Institutional print-only is \$425. Additional taxes and/or postage for non-U.S. subscription may apply. Subscription agent for Japan: Kinokuniya Company, Ltd. Free or deeply discounted access is available in most developing nations through the Chicago Emerging Nations Initiative (http://www.journals.uchicago.edu/ceni/).

Please direct subscription inquries, requests for back issues, and address changes to Journals Division, University of Chicago Press, P.O. Box 37005, Chicago, IL 60637 (e-mail: subscriptions@press.uchicago.edu; telephone: 773-753-3347 or toll-free in the United States and Canada 877-705-1878; fax: 773-753-0811 or toll-free 877-705-1879).

Postmaster: Send address changes to Infection Control and Hospital Epidemiology, University of Chicago Press, P.O. Box 37005, Chicago, IL 60637-2954.

Periodicals postage paid at Chicago, Illinois, and at an additional mailing office.

Published by the University of Chicago Press, Chicago, Illinois. © 2012 by the Society for Healthcare Epidemiology of America. All rights reserved. This publication is printed on acid-free paper.

# Call for Manuscripts: The Role of the Environment in Infection Prevention

Infection Control and Hospital Epidemiology (ICHE) is pleased to announce that it will publish a peer-reviewed, special topic issue devoted to the role of the environment in infection prevention and healthcare epidemiology. This issue will be published in conjunction with the spring meeting of the Society for Healthcare Epidemiology of America (<a href="www.shea-online.org">www.shea-online.org</a>) to be held in Atlanta, Georgia, May 2013. This conference will include a forum on the role of the environment that will bring together leaders from a variety of healthcare settings to discuss current research, effective strategies, and future research agendas.

Of particular interest are papers that address the following:

- Sterilization and disinfection: methods and technology, devices, quality and process improvement
- How to clean and disinfect the environment: methods and technology, quality and process improvement, daily vs. terminal cleaning
- The role of the environmental reservoir in transmission and outbreaks of specific organisms, and methods of control (e.g., MDROs, C. difficile, and Legionellae)
- Decolonization of patients to prevent specific infectious syndromes (e.g., BSI, SSI or VAP) and specific organisms (e.g., MRSA, C. difficile)
- Related issues in different patient populations (e.g., pediatrics, geriatrics) or special units (e.g., ICU, ER, hematology, transplant or non-acute care settings)
- Architectural design, construction, and renovation environmental considerations for infection prevention

Authors are invited to submit their work electronically via Editorial Manager (<a href="www.editorialmanager.com/iche">www.editorialmanager.com/iche</a>) no later than **October 1, 2012**. Research papers in the form of original articles (up to 3,000 words), concise communications (up to 1,200 words), and research briefs (up to 900 words) will be considered for review.



For manuscript preparation details, please see "For Contributors" at www.journals.uchicago.edu/ICHE or contact the editorial office at iche@press.uchicago.edu.

Suzanne Bradley, MD, Editor Infection Control and Hospital Epidemiology



# Find the latest in infection control research and practice information in **AJIC**



Official Publication of the Association for Professionals in Infection Control and Epidemiology, Inc.

### **American Journal of Infection Control**

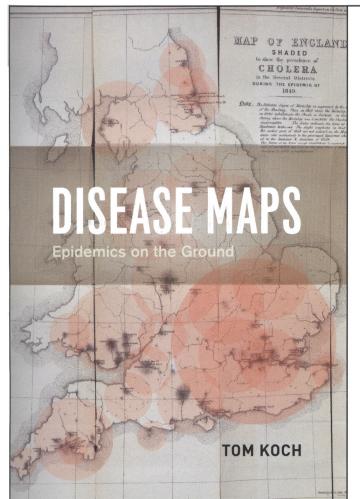
EDITOR: Elaine L. Larson, RN, PhD, FAAN, CIC

**AJIC** covers key topics and issues in infection control and epidemiology. Infection control professionals, including physicians, nurses, and epidemiologists, rely on **AJIC** for peer-reviewed articles covering clinical topics as well as original research. As the official publication of the *Association for Professionals in Infection Control and Epidemiology, Inc. (APIC)*, **AJIC** is the foremost resource on infection control, epidemiology, infectious diseases, quality management, occupational health, and disease prevention. **AJIC** also publishes relevant infection control guidelines. **AJIC** is included in Index Medicus and CINAHL.

Register at ajicjournal.org to receive free access to Tables of Contents and all article abstracts; free access to select full text articles; free e-alerts and search personalization, and more!



### Submit your manuscript at: http://ees.elsevier.com/ajic/



### FORTHCOMING IN MAY

"Disease Maps is an extraordinary visual and narrative treat. I have come to look forward to Tom Koch's books for the wonderful and unique way that he can synthesize data and present it visually and in the process tell us magnificent stories."

Dr. Abraham Verghese, Stanford University School of Medicine

"This is a masterful book in conception and structure. It is also extremely well written. What we find on reading is an exquisite telling of the history of the medical science of disease. The collection of medical maps, diagrams, and other illustrations is impressive in scope—there are many disease maps shown that have not been publicly available before or collected in one place."

Michael Friendly, York University

**CLOTH \$45.00** 

The University of Chicago Press www.press.uchicago.edu

Downloaded from https://www.cambridge.org/core. 12 May 2025 at 09:43:30, subject to the <del>Cambridge Core terms of u</del>s





### Clinical Governance

An International Journal

Clinical Governance: An International Journal aims to address the doubts, queries, triumphs and practical applications of introducing quality assurance mechanisms into the delivery of care.

The journal takes an international stance and covers key developments worldwide which can inform best practice in health care. Efficiency, effectiveness and economics are the main factors in the assessment of best practice and all are addressed in the research- audit- and evidence-based papers published. All papers are peer reviewed to ensure their validity and value to current debates.

For more information please visit the homepage: www.emeraldinsight.com/cgij.htm

To submit a paper visit: http://mc.manuscriptcentral.com/cgij

### The journal publishes:

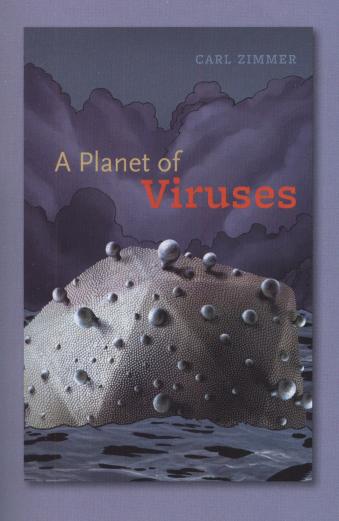
- Research articles which illustrate clear implications for practice
- Results-focused case studies which discuss problems and successes in clinical governance techniques
- · Special issues on topical themes



Research you can use

"An accessible and gripping narrative on a serious topic that manages to explain, in plain English, how viruses are changing the world."—NATHAN WOLFE, founder and CEO of Global Viral Forecasting

# A Planet of Viruses CARL ZIMMER



"A Planet of Viruses is an important primer on the viruses living within and around all of us—sometimes funny, other times shocking, and always accessible. Whether discussing the common cold and flu, little-known viruses that attack bacteria or protect oceans, or the world's viral future as seen through our encounters with HIV or SARS, Zimmer's writing is lively, knowledgeable, and graced with poetic touches."

—Reвесса Skloot, author of The Immortal Life of Henrietta Lacks

Cloth \$20.00

The University of Chicago Press www.press.uchicago.edu

# The Chicago IManual of Style

### SIXTEENTH EDITION

"The Sixteenth Edition of *The Chicago Manual of Style* is here, and it's hard for some of us to contain our excitement. . . . For those of us who spend our days worrying over words, there really is something thrilling—or at least comforting—about the arrival of the newest incarnation of this venerable guide."

-New Yorker Book Bench Blog

Cloth \$65.00

The Chicago Manual of Style Online is available by annual subscription. Sign up for a thirty-day FREE trial at www.chicagomanualofstyle.org

The University of Chicago Press www.press.uchicago.edu