The Official Journal of The Society for Healthcare Epidemiology of America

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY

EDITORIAL

Why Are Antibiotic-Resistant Nosocomial Infections Spiraling Out of Control? CARLENE A. MUTO, MD, MS	10
ORIGINAL ARTICLES	
Nosocomial Infection and Multidrug-Resistant Bacteria Surveillance in Intensive Care Units: A Survey in France	
François L'Hériteau, MD; Corinne Alberti, MD; Yves Cohen, MD; Gilles Troché, MD; Pierre Moine, MD, PhD; Jean-François Timsit, MD, PhD	13
Implementation of Strategies to Prevent and Control the Emergence and Spread of Antimicrobial-Resistant Microorganisms in U.S. Hospitals MARCIA M. WARD, PhD; DANIEL J. DIEKEMA, MD; JON W. YANKEY, MS; THOMAS E. VAUGHN, PhD;	21
Bonnie J. BootsMiller, PhD; Jane F. Pendergast, PhD; Bradley N. Doebbeling, MD, MSc	
Variation in the Use of Procedures to Monitor Antimicrobial Resistance in U.S. Hospitals	
STEPHEN D. FLACH, MD, PHD; DANIEL J. DIEKEMA, MD, MSC; JON W. YANKEY, MS; BONNIE J. BOOTSMILLER, PHD; THOMAS E. VAUGHN, PHD; ERIKA J. ERNST, PHARMD; MARCIA M. WARD, PHD; BRADLEY N. DOEBBELING, MD, MSC	31
Three Surveillance Strategies for Vancomycin-Resistant Enterococci in Hospitalized	
Patients: Detection of Colonization Efficiency and a Cost-Effectiveness Model Todd A. Lee, Pharmd, Phd; Donna M. Hacek, MT (ASCP); Kevin T. Stroupe, Phd; Susan M. Collins, MT (ASCP); Lance R. Peterson, MD	39
Evaluating Vancomycin Use at a Pediatric Hospital: New Approaches and Insights Maureen K. Bolon, MD, MS; Alana D. Arnold, PharmD; Henry A. Feldman, PhD; David H. Rehkopf, MPH; EMILY F. Strong, MS; Donald A. Goldmann, MD; Sharon B. Wright, MD, MPH	47
Longitudinal Trends in Antimicrobial Susceptibilities Across Long-Term-Care	
Facilities: Emergence of Fluoroquinolone Resistance Melissa Viray, MD; Darren Linkin, MD; Joel N. Maslow, MD, PhD; Donald D. Stieritz, PhD; Lesley S. Carson, MD; Warren B. Bilker, PhD; Ebbing Lautenbach, MD, MPH, MSCE	56
Increased Mortality Associated With a Clonal Outbreak of Ceftazidime-Resistant	
Klebsiella pneumoniae: A Case-Control Study Abdul Qavi, MD; Sorana Segal-Maurer, MD; Noriel Mariano, MS; Carl Urban, PhD; Carl Rosenberg, PhD; Janice Burns, RN, CIC; Tom Chiang, MD; James Maurer, MD; James J. Rahal, MD	63
Concurrent Outbreak of Multidrug-Resistant and Susceptible Subclones of Acinetobacter baumannii Affecting Different Wards of a Single Hospital Joel N. Maslow, MD, PhD; Thomas Glaze, BA; Pamela Adams, BS, MT (ASCP); Max Lataillade, DO	69
Spread of Clones of Multidrug-Resistant, Coagulase-Negative Staphylococci Within	
a University Hospital Tor Monsen, MD, PhD; Carina Karlsson, MLT; Johan Wiström, MD, PhD	76
A Pilot Study of Antibiotic Cycling in the Community Hospital Setting Lou Ann Bruno-Murtha, DO; John Brusch, MD; David Bor, MD; Wenjun Li, PhD; Deborah Zucker, MD, PhD	81

Continued inside.





Preliminary Program

THE SOCIETY
FOR HEALTHCARE
EPIDEMIOLOGY
OF AMERICA

Mosy

April 9–12, 2005

15th Annual Scientific Meeting
The Century Plaza Hotel · Los Angeles, California
www.shea-online.org

Vol. 26 No. 1 January 2005

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY

CONTENTS

Continued from cover

ORIGINAL ARTICLES

Clinical Epidemiology of Ciprofloxacin Resistance and Its Relationship to Broad-Spectrum Cephalosporin Resistance in Bloodstream Infections Caused by Enterobacter Species

CHEOL-IN KANG, MD; SUNG-HAN KIM, MD; WAN BEOM PARK, MD; KI-DEOK LEE, MD; HONG-BIN KIM, MD; EUI-CHONG KIM, MD; MYOUNG-DON OH, MD; KANG-WON CHOE, MD

88

High Rate of Coadministration of Di- or Tri-valent Cation-Containing Compounds With Oral Fluoroquinolones: Risk Factors and Potential Implications

TODD D. BARTON, MD; NEIL O. FISHMAN, MD; MARK G. WEINER, MD; LORI A. LAROSA, PHARMD; EBBING LAUTENBACH, MD, MPH, MSCE

93

Prevalence of Nosocomial Infection and Antibiotic Use at a University Medical Center in Malaysia

Andrew J. Hughes, FRACP; Norliza Ariffin, MBBS; Tan Lien Huat, MBBS; Habibah Abdul Molok, RN; Salbiah Hashim, BSc; Juliana Sarijo, RN; Nor Harlida Abd Latif, RN; Yasmin Abu Hanifah, MBBS; Adeeba Kamarulzaman, FRACP

100

CONCISE COMMUNICATION

Assessment of Knowledge, Attitudes, and Practices Regarding Isolation Precautions Among Iranian Healthcare Workers

MEHRDAD ASKARIAN, MD, MPH; KAMRAN MIRZAEI, MD, MPH; LINDA M. MUNDY, MD; MARY-LOUISE MCLAWS, DPHTM, MPH, PHD

105

LETTER TO THE EDITOR

Caution Should Be Exercised When Using the Standardized Infection Ratio

MIGUEL DELGADO-RODRÍGUEZ, MD, PHD, MPH; JAVIER LLORCA, MD, PHD

8

INFORMATION FOR AUTHORS

.

Full-text articles available online at ICHEJournal.com

THE PUBLICATION OF ADVERTISING IN THE JOURNAL DOES NOT CONSTITUTE ANY GUARANTEE OR ENDORSEMENT BY THE SOCIETY FOR HEALTHCARE EPIDEMIOLOGY OF AMERICA OR SLACK INCORPORATED OF THE ADVERTISED PRODUCT OR SERVICE OR OF CLAIMS MADE BY THE ADVERTISER. THE PUBLICATION OF ARTICLES AND OTHER EDITORIAL MATERIAL IN THE JOURNAL DOES NOT NECESSARILY REPRESENT THE POLICY RECOMMENDATIONS OR ENDORSEMENT BY THE SOCIETY.

PUBLISHER: Infection Control and Hospital Epidemiology (ISSN-0195-9417, Canadian GST#129780466) is published exclusively by SLACK Incorporated 12 times a year. Address: 6900 Grove Road, Thorofare, NJ 08086. Telephone: (856) 848-1000.

SHEA: 66 Canal Center Plaza, Suite 600, Alexandria, VA 22314; telephone, 703-299-0200; fax, 703-299-0204; e-mail address, info@shea-online.org.

COPYRIGHT 2005 The Society for Healthcare Epidemiology of America, Inc., and SLACK Incorporated. All rights reserved. No part of this publication may be reproduced without written permission from the publisher. Printed in the USA.

SUBSCRIPTIONS: Requests should be addressed to the publisher (except Japan). In Japan, contact Woodbell Incorporated, 4-22-11, Kitakasai, Edogawaku, Tokyo 134, Japan. Subscription rates in the United States and possessions: Individual: One year-\$149.00; Two years-\$23.00; Three years-\$335.00; Institutional: One year-\$279.00; Two years-\$474.00; Three years-\$628.00. Fellows: \$54.50 per year with proof of training status. Canada: add 7% Goods & Services tax; Overseas: add \$49.00 each year for delivery by air service. Single copies of current issues may be obtained for \$24.00.

INSTRUCTIONS TO AUTHORS: Authors may submit electronic versions of their manuscripts prepared in accordance with the 2004 revision of the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals." An electronic version is available at www.icmje.org. Submit to RapidReview.com. All submissions must be accompanied by copyright form(s) signed by all authors.

REPRINTS: All requests to reprint or use material published herein should be addressed to John Kain, SLACK Incorporated, 6900 Grove Road, Thorofare, NJ 08086. For reprint orders and prices, contact Rebecca Fogarty at (856) 848-1000. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by SLACK Incorporated, provided that the base fee of \$1.00 per copy, plus \$2.00 per page is paid directly to Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923; phone (978) 750-8400. This consent does not extend to other kinds of copying, such as for general distribution, resale, advertising and promotional purposes, or for creating new collective works.

CHANGE OF ADDRESS: Notice should be sent to the publisher 6 weeks in advance of effective date. Include old and new addresses with zip codes. The publisher cannot accept responsibility for undelivered copies. Periodicals postage paid at Thorofare, New Jersey 08086-9447 and at additional mailing offices. POSTMASTER: Send address changes to SLACK Incorporated, 6900 Grove Road, Thorofare, Nil 98086.

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY is listed in Index Medicus, Current Contents-Clinical Practice, Hospital Literature Index, Cumulative Index to Nursing & Allied Health Literature, Nursing Abstracts, Laboratory Performance Information Exchange System, and RNdex Top 100.

EDITORIAL OFFICE

SLACK Incorporated 6900 Grove Road Thorofare, NJ 08086 (856) 848-1000; (856) 848-6091 (FAX) E-mail: iche@slackinc.com

EDITOR

William R. Jarvis, MD

DEPUTY EDITOR

David P. Calfee, MD, MS

ASSISTANT EDITOR

Preeti N. Malani, MD, MSJ

SENIOR ASSOCIATE EDITORS

C. Glen Mayhall, MD Gina Pugliese, RN, MS William Schaffner, MD

ASSOCIATE EDITORS

Donald A. Goldmann, MD Didier Pittet, MD, MS

Andreas Widmer, MD, MS

SECTION EDITORS

Beyond Infection Control: The New Hospital Epidemiology

Wing Hong Seto, MD

Hong Kong

Disinfection and Sterilization

William A. Rutala, PhD, MPH

Chapel Hill, North Carolina

From the Laboratory

Marcus Zervos, MD

Royal Oak, Michigan

Infections in Immunocompromised **Patients**

Kent Sepkowitz, MD

New York City, New York

Information Management

John A. Sellick, DO

Amherst, New York

Issues in Surgery

James T. Lee, MD, PhD

St. Paul, Minnesota

Medical News

Gina Pugliese, RN, MS

Chicago, Illinois Martin S. Favero, PhD

Irvine, California

Practical Healthcare Epidemiology

Loreen A. Herwaldt, MD

Iowa City, Iowa

Statistics for Hospital Epidemiology

David Birnbaum, PhD, MPH

Sidney, British Columbia, Canada

Topics in Long-Term Care

Philip W. Smith, MD

Omaha, Nebraska

Topics in Occupational Medicine

David Weber, MD, MPH

Chapel Hill, North Carolina

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY®

EDITORIAL ADVISORY BOARD

J. Wesley Alexander, MD Miriam Alter, PhD Hilary Babcock, MD Elise M. Beltrami, MD, MPH Richard E. Besser, MD Marc J. M. Bonten, MD, PhD John M. Boyce, MD Christian Brun-Buisson, MD John P. Burke, MD Yehuda Carmeli, MD, MPH Carol Chenoweth, MD Sara E. Cosgrove, MD, MS Donald E. Craven, MD Erika D'Agata, MD, MPH Franz Daschner, MD Patch Dellinger, MD Charles E. Edmiston, Jr., PhD Theodore C. Eickhoff, MD

Jean Yves Fagon, MD, MPH Mark Farrington, MA, FRCPath Victoria J. Fraser, MD

Richard A. Garibaldi, MD Petra Gastmeier, MD Dale N. Gerding, MD Stephan Harbarth, MD, MS

Anthony D. Harris, MD, MPH David K. Henderson, MD Peter N.R. Heseltine, MD Karen Hoffmann, RN, CIC, MS

Janine Jagger, MPH, PhD John A. Jernigan, MD, MS Jacob L. Kool, MD, PhD Ebbing Lautenbach, MD, MPH

Allison McGeer, MD John E. McGowan, Jr., MD Leonard A. Mermel, DO, ScM

Robert R. Muder, MD Carlene A. Muto, MD, MS Joseph M. Mylotte, MD, CIC

Lindsay Nicolle, MD Juhani Ojajärvi, MD Michael T. Osterholm, PhD, MPH David L. Paterson, MBBS, FRACP

Jan Evans Patterson, MD Sindy M. Paul, MD David A. Pegues, MD

Michael A. Pfaller, MD Samuel Ponce de Leon, MD, MSc Isaam Raad, MD

Jordi Rello, MD, PhD Manfred L. Rotter, MD, DipBact Henning Rüden, MD Lisa Saiman, MD, MPH

Syed A. Sattar, PhD William E. Scheckler, MD Lynne M. Sehulster, PhD Andrew E. Simor, MD Denis W. Spelman, FRACP

V. Susan Springthorpe, BSc, MSc Jeffrey R. Starke, MD Janet E. Stout, PhD Clyde Thornsberry, PhD

Jerome Tokars, MD, MPH Timothy R. Townsend, MD Antoni Trilla, MD, PhD Robert A. Weinstein, MD

Sergio B. Wey, MD

Cincinnati, Ohio Atlanta, Georgia St. Louis, Missouri Decatur, Georgia Atlanta, Georgia

Utrecht, The Netherlands New Haven, Connecticut

Creteil, France Salt Lake City, Utah

Tel Aviv, Israel Ann Arbor, Michigan Baltimore, Maryland

Burlington, Massachusetts Boston, Massachusetts

Freiburg, Germany Seattle, Washington Milwaukee, Wisconsin Denver, Colorado

Paris, France Cambridge, England, United Kingdom

St. Louis, Missouri Farmington, Connecticut Hanover, Germany

Hines, Illinois Geneva, Switzerland Baltimore, Maryland Bethesda, Maryland San Juan, California Chapel Hill, North Carolina

Charlottesville, Virginia Atlanta, Georgia Fort Collins, Colorado

Philadelphia, Pennsylvania Toronto, Ontario, Canada Atlanta, Georgia

Providence, Rhode Island Pittsburgh, Pennsylvania Pittsburgh, Pennsylvania Buffalo, New York

Winnepeg, Manitoba, Canada Helsinki, Finland

Minneapolis, Minnesota Pittsburgh, Pennsylvania San Antonio, Texas

Yardley, Pennsylvania Los Angeles, California Iowa City, Iowa

Mexico City, Mexico Houston, Texas Tarragona, Spain

Vienna, Austria Berlin, Germany New York, New York Ottawa, Ontario, Canada Madison, Wisconsin

Atlanta, Georgia Toronto, Ontario, Canada Melbourne, Victoria, Australia Ottawa, Ontario, Canada

Houston, Texas Pittsburgh, Pennsylvania Franklin, Tennessee

Atlanta, Georgia Baltimore, Maryland Barcelona, Spain Chicago, Illinois São Paulo, Brazil

SLACK Incorporated, 6900 Grove Road, Thorofare, New Jersey 08086. (856) 848-1000

AMP

Executive Vice President Richard N. Roash

Vice President, Publishing Operations John C. Carter

Editorial Director Jennifer Kilpatrick

Executive Editor Shirley P. Strunk, ELS Associate Editor Jaime Underwood

Circulation Manager Lester J. Robeson, CCCP

Production Director Christine Malin

Vice President, U.S. Advertising Wayne McCourt

Director of Association Services Kathy Huntley

Advertising Sales Representative Scotty Turner

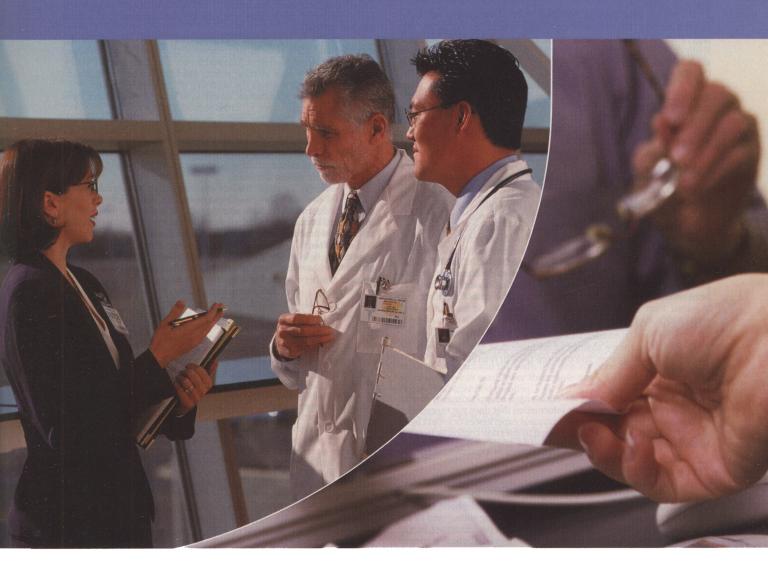
Advertising Sales Administrator Joanne Patterson

Sales Director, Classified/Recruitment Kristy Irwin

Classified/Recruitment Sales Elizabeth Roash Director of Reprint Sales John Kain

Improved Skin Quality - Reduced Risk of Infection

...AND MORE THAN JUST OUR WORD TO BACK IT UP



The Program of Solutions includes a regimen of hand hygiene products designed to improve skin quality, increase compliance, and lower infection rates. The Program of Solutions also includes a compliance measurement system and a financial model to measure the benefits of increased compliance.

Clinical data on file.

STERIS°



Applied Infection Control

1.800.548.4873 • www.steris.com