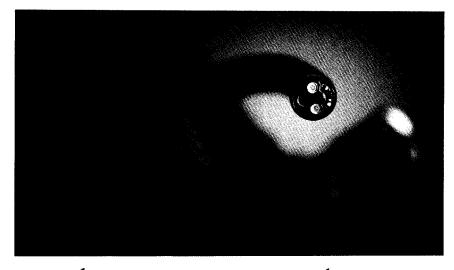
INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY®

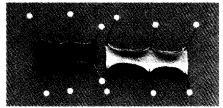
EDITORIAL	
Legionella Disinfection of Water Distribution Systems: Principles, Problems, and Practice	567
VICTOR L. YU, MD; ZEMING LIU, MS; JANET E. STOUT, SCD; ANGELLA GOETZ, RN, MNED	
ORIGINAL ARTICLES	
Prevention of Legionella Infections in a Bone Marrow Transplant Unit: Multifaceted Approach to Decontamination of a Water System URSULA MATULONIS, MD; CRAIG S. ROSENFELD, MD; RICHARD K. SHADDUCK, MD	571
Nosocomial Outbreak of Pseudomonas cepacia Associated with Contamination of Reusable Electronic Ventilator Temperature Probe J. JOHN WEEMS, JR., MD	583
BRIEF REPORTS	
Infection with Methicillin-Resistant Staphylococcus aureus Among Hospital Employees	576
ROBERT R. MUDER, MD; CAROLE BRENNEN, RN, MSN; ANGELLA M. GOETZ, RN, MNED	
Association Between Climate and Enterobacter Colonization in Swedish Neonatal Units	579
BIRGITTA A. FRYKLUND, RN; KJELL TULLUS, MD, PHD; LARS G. BURMAN, MD, PHD	
Outbreak of Candida tropicalis Fungemia in a Neonatal Intensive Care Unit R. FINKELSTEIN, MD; G. REINHERTZ, BA; N. HASHMAN, BSC; D. MERZBACH, PHD	587
TOPICS IN LONG-TERM CARE	
Tetanus and Tetanus Immunization in Long-Term Care Facilities JAMES P. RICHARDSON, MD	591
MOLECULAR HOSPITAL EPIDEMIOLOGY	
Molecular Epidemiology of Nosocomial Infection: Analysis of Chromosomal Restriction Fragment Patterns by Pulsed-Field Gel Electrophoresis	595
RICHARD V. GOERING, PHD	
LETTERS TO THE EDITOR	
New ASTM Barrier Test Methods NATHAN L. BELKIN, PHD	561
Guaiac Testing of IV Lines (with Response) PAMELA PATRICK; FARRIN A. MANIAN, MD, MPH; LYNN MEYER, RN, MPH, CIC; JOAN JENNE, RN, CIC	562
Port-a-Cath Needlestick Injuries YON FLEERACKERS; ROBERT COLEBUNDERS; JO VAN BROECKHOVEN; KOEN VAN DEN ABBEELE	562
Biological Indicators for a Liquid Chemical Sterilizer (with Response)	563
PAUL S. MALCHESKY, DENG; WALTER W. BOND, MS; MICHAEL D. DECKER, MD, MPH	
BOOKREVIEW	601
MEDICAL NEWS	605
GINA PUGLIESE, RN, MS	
SHEA NEWS	611

You May Not Realize The Scope Of The Problem.



When itcomes to processing endoscopes, the inside is just as important as the outside.

Biopsy channel section after repeated processing in glutaraldehyde.



Same channel after 5 STERIS PROCESS cycles.

You can't see the inside of your scope after processing. What remains inside may surprise you.

Glutaraldehyde cross-links proteins. Organic residues can be affixed to surfaces, potentially leading to contaminated channels and/or reduced optical clarity.

Conversely, the STERIS PROCESS uses STERIS 20" – a patented formulation of peracetic acid (a strong oxidizer and biocide), detergents, buffers, and anti-corrosives. This formulation, along with the directed flow of the STERIS SYSTEM 1 Processor, makes the STERIS PROCESS effective at reaching contaminated surfaces without promoting organic buildup.

Write or call us today to find out why thousands of health professionals use the proven, rapid, and safe sterile processing of STERIS SYSTEM 1.



Vol. 14 No. 10 October 1993

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY

CONTENTS

EDITORIAL	
Legionella Disinfection of Water Distribution Systems: Principles, Problems, and Practice	567
VICTOR L. YU, MD; ZEMING LIU, MS; JANET E. STOUT, SCD; ANGELLA GOETZ, RN, MNEd	
ORIGINAL ARTICLES	
Prevention of <i>Legionella</i> Infections in a Bone Marrow Transplant Unit: Multifaceted Approach to Decontamination of a Water System	571
URSULA MATULONIS, MD; CRAIG S. ROSENFELD, MD; RICHARD K. SHADDUCK, MD	
Nosocomial Outbreak of <i>Pseudomonas cepacia</i> Associated with Contamination of Reusable Electronic Ventilator Temperature Probes	583
J. JOHN WEEMS, JR., MD	
BRIEF REPORTS	
Infection with Methicillin-Resistant Staphylococcus aureus Among Hospital Employees	576
ROBERT R. MUDER, MD; CAROLE BRENNEN, RN, MSN; ANGELLA M. GOETZ, RN, MNEd	
Association Between Climate and Enterobacter Colonization in Swedish Neonatal Units	579
BIRGITTA A. FRYKLUND, RN; KJELL TULLUS, MD, PHD; LARS G. BURMAN, MD, PHD	
Outbreak of Candida tropicalis Fungemia in a Neonatal Intensive Care Unit	587
R. FINKELSTEIN, MD; G. REINHERTZ, BA; N. HASHMAN, BSC; D. MERZBACH, PHD	
TOPICS IN LONG-TERM CARE	
Tetanus and Tetanus Immunization in Long-Term Care Facilities	591
JAMES P. RICHARDSON, MD	
MOLECULAR HOSPITAL EPIDEMIOLOGY	
Molecular Epidemiology of Nosocomial Infection: Analysis of Chromosomal Restriction Fragment Patterns by Pulsed-Field Gel Electrophoresis	595
RICHARD V. GOERING, PHD	
DEPARTMENTS	
Letters to the Editor	561
Book Review	601
Information for Authors	602
Medical News	605
SHEA News	611

THE PUBLICATION OF ADVERTISING IN THE JOURNAL DOES NUT CONSTITUTE ANY GUARANTEE OR ENDORSEMENT BY THE SOCIETY FOR HOSPITAL EPIDEMIOLOGY OF AMERICA OK 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-0899-823X, Canadian GST#129780466) is published exclusively by SLACK Incorporated 12 times a year. Address: 6900 Grove Rd., Thorofare, NJ 08086. Telephone: (609) 8481000.

COPYRIGHT 1993 The Society for Hospital 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—\$80,00; Two years—\$115.00; Three years—\$145.00; Institutional: One year-\$90,00; Two years—\$130.00; Three yearsS170.00. Fellows: \$20 per year with proof of training status. Canada: \$18.00 additional each year plus 7% for Canadian Goods & Services tax; all other countries: \$36.00 additional each year. Single copies of current issues may be obtained for \$15.00, United States and possessions; \$20.00 all other countries.

REPRINTS: All requests to reprint or use material published herein should be addressed to Lester Robeson, SLACK Incorporated, 6900 Grove Rd., Thorofare, NJ 08086. For reprint orders and prices, contact Lester Robeson at (609) 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 \$.15 per page is paid directly to Copyright Clearance Center, 27 Congress St., Salem, MA 01970. 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 six weeks in advance of effective date. Include old and new addresses with zip codes. The publisher cannot accept responsibility for undelivered copies. Second-class postage is paid at Thorofare, New Jersey 08086, and additional entry points. POSTMASTER: Send address changes to SLACK Incorporated, 6900 Grove Rd., Thorofare, NJ 08086.

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

EDITORIAL OFFICES

Vanderbilt University School of Medicine A-1131 Medical Center North Nashville, TN 37232-2637 (615) 343-1095; (615) 343-1882 (FAX)

Email: iche@mcmail.vanderbilt.edu

Michael D. Decker, MD, MPH

MANAGING EDITOR

Susan Cantrell

STATISTICAL EDITOR

Beverly G. Mellen, PhD

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

Bryan P. Simmons, MD

Stephen B. Kritchevsky, PhD

Memphis, Tennessee

Wing Hong Seto, MD

Hong Kong

Disinfection and Sterilization

William A. Rutala, PhD, MPH

Chapel Hill, North Carolina

Emerging Infectious Diseases Larry J. Strausbaugh, MD

Portland, Oregon

Robert W. Pinner, MD

Atlanta, Georgia

From the Laboratory

Marcus Zervos, MD Royal Oak, Michigan

Fred C. Tenover. PhD

Atlanta, Georgia Information Management

John A. Sellick, DO

Buffalo, New York

The International Perspective

Mary D. Nettleman, MD, MS

Richmond, Virginia

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

SHEA News Murray D. Batt, MD

Clarksburg, West Virginia

Statistics for Hospital Epidemiology David Birnbaum, PhD, MPH

Sidney, British Columbia, Canada

Topics in Long-Term Care Philip W. Smith, MD

Omaha, Nebraska

Publisher

John C. Carter

Editorial Director Jennifer Kilpatrick

Production Editor

Shirley P. Strunk, ELS

Topics in Occupational Medicine

Vice President/Group Publisher Richard N. Roash

David Weber, MD, MPH

Chapel Hill, North Carolina

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY®

EDITORIAL ADVISORY BOARD

Jacques F. Acar, MD

J. Wesley Alexander, MD

Paris, France Cincinnati, Ohio

Paul Arnow, MD Graham A.J. Ayliffe, MD

Chicago, Illinois Birmingham, United Kingdom

Neil L. Barg, MD

Yakima, Washington Atlanta, Georgia

Elizabeth Ann Bolyard, RN, MPH, CIC

John M. Boyce, MD Providence, Rhode Island Professor Dr. Ilja Braveny

Charles Bryan, MD

Munich, Federal Republic of Germany Columbia, South Carolina Creteil, France

Christian Brun-Buisson, MD

Donald E. Craven, MD Boston, Massachusetts Shreveport, Louisiana

Sue Crow, MSN, RN, CIC

Franz Daschner, MD

Leigh G. Donowitz, MD

Charles E. Edmiston, Jr., PhD

Freiburg, Federal Republic of Germany

Charlottesville, Virginia

Milwaukee, Wisconsin

Denver, Colorado

Theodore C. Eickhoff, MD Bruce Farber, MD Victoria J. Fraser, MD

Manhasset, New York St. Louis, Missouri

Peter C. Fuchs, MD, PhD Black Butte, Oregon Richard A. Garibaldi, MD

Farmington, Connecticut Beer Sheva, Israel

Atlanta, Georgia Nashville, Tennessee

San Diego, California

Nashville, Tennessee

Nashville, Tennessee

Nashville. Tennessee

Brussels, Belgium

Madison, Wisconsin

Bethesda, Maryland

Atlanta, Georgia

Brussels, Belgium

Buffalo, New York

San Antonio, Texas

Iowa City, Iowa

Houston, Texas

Vienna, Austria

Jerusalem, Israel

Trenton, New Jersey

Mexico City, Mexico

Madison, Wisconsin New York City, New York

Prahran Victoria, Australia

New York, New York

Brentwood Tennessee Minsk, Republic of Belarus

Millwood, Virginia

Barcelona, Spain

Toronto, Ontario, Canada

Montreal, Quebec, Canada

Pittsburgh, Pennsylvania

Minneapolis, Minnesota

Winnepeg, Manitoba, Canada Helsinki, Finland

Munich, Federal Republic of Germany

Bronx, New York

Atlanta, Georgia

Taipei, Taiwan

Charlottesville, Virginia

David W. Gregory, MD Bethesda, Maryland Los Angeles, California Chapel Hill, North Carolina

David K. Henderson, MD Peter N.R. Heseltine, MD

Karen Hoffmann, RN, CIC, MS Marguerite McMillan Jackson, RN, PhD

Velvl Greene, PhD, MPH

Robert Gaynes, MD

Janine Jagger, MPH, PhD

William R. Jarvis, MD Douglas S. Kernodle, MD Robert H. Latham, MD

Lewis B. Lefkowitz, MD Hsieh-Shong Leu, MD, MSc

Jack Levy, MD Victor Lorian, MD Dennis G. Maki, MD

Professor Dr. Walter Marget William J. Martone, MD

Allison McGeer, MD John E. McGowan, Jr., MD Jonathan L. Meakins, MD, DSc

Raf Mertens, MD Robert R. Muder, MD

Joseph M. Mylotte, MD, CIC Lindsay Nicolle, MD

Juhani Ojajärvi, MD Michael T. Osterholm, PhD, MPH

Jan Evans Patterson, MD Sindy M. Paul, MD Michael A. Pfaller, MD

Samuel Ponce de Leon, MD, MSc Isaam Raad, MD Manfred L. Rotter, MD, DipBact

Theodore Sacks, MD William E. Scheckler, MD

Kent Sepkowitz, MD Denis Spelman, MD Michael L. Tapper, MD

Clyde Thornsberry, PhD Professor Leonid P. Titov

Timothy R. Townsend, MD Antoni Trilla, MD, PhD

Professor Wang Shu-Qun J. John Weems, Jr., MD

Robert A. Weinstein, MD Professor Dr. W. Weuffen Sergio B. Wey, MD

Beijing, People's Republic of China Greenville, South Carolina

Chicago, Illinois Greifswald, Federal Republic of Germany São Paulo, Brazil

Rebecca Wurtz, MD Evanston Illinois

SLACK Incorporated 6900 Grove Road Thorofare, New Jersey 08086 (609) 848-1000

Assistant Editor Eileen C. Anderer

Joanne Patterson

Circulation Manager Lester J. Robeson, ČCCP

Production Director Christine Malin **Production Coordinator** **Publishing Director/ Advertising** Wayne McCourt

Pharmaceutical Group Sales Director

Michele Burch

Michael LoPresti Advertising Sales Representative

Classified/Recruitment Sales Manager

https://doi.org/10.1017/S0899823X00092229 Published online by Cambridge University Press



SHEA Annual Luncheon

TUESDAY, OCTOBER 19, 1993

12:00 - 2:00 PM

NEW ORLEANS HILTON RIVERSIDE AND TOWERS NEW ORLEANS. LA

The Society for Hospital Epidemiology of America will host its Annual Luncheon during the Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) at the New Orleans Hilton.

FEATURED LUNCHEON SPEAKER

Michael T. Osterholm, Ph.D. M.P.H.

State Epidemiologist & Chief, Minnesota Department of Health

Topic: Partners and Pump Handles

COST: **\$40**

No advanced reservations will be accepted after October 5, 1993

Limited number of tickets available on site -Reserve Now!

PLEASE PRINT OR TYPE NAME(S)				
I LEASE I MINI OR I II E NAME				
STREET	CITY	STATE ZIP		
Enclosed is payment to cove	er advanced registration for each pers	son listed above.		
\$T	Cotal Payment			
	· ·	oital Epidemiology of America, Inc.		
PAYMENT METHOD: Check	Credit Card: Visa MasterCard MasterCard	Please note we cannot process American Express		
Account No	Expiration Date	Signature		
Send Remittance To:	SHEA Annual Luncheon			
	875 Kings Higbway, Suite 2	200		
	Woodbury, NJ 080963172			
	609-845-l 636			
	609-8 5 3-041 I FAX			

will be available if requested on-site.