PREHOSPITAL and DISASTER MEDICINE

Volume 32, Number 3

June 2017







The Official Journal of the World Association for Disaster and Emergency Medicine

Cambridge Core

Access leading journals in your subject

Explore today at cambridge.org/core

Cambridge Core



VOLUME 32, NUMBER 3

JUNE 2017

Table of Contents

EDITORIAL

Tools for Disaster Research in the Model of the Sendai Framework	s
Samuel J. Stratton, MD, MPH	

ORIGINAL RESEARCH

DISASTER HEALTH AND MEDICINE Patricia M. Schwerdtle, MPH, Veronique De Clerck, MPH, Virginia Plummer, PhD A Qualitative Analysis of the Spontaneous Volunteer Response to the 2013 Sudan Floods: Amin Albahari, MBBS, Carl H. Schultz, MD Maximum Time-to-Rescue After the 1908 Messina-Reggio Calabria Earthquake was 20 Days: Natale Gaspare De Santo, MD, Carmela Bisaccia, Luca Salvatore De Santo, MD, FESC An Electronic Competency-Based Evaluation Tool for Assessing Humanitarian Competencies Andrea B. Evans, MDCM, MSc, Jennifer M. Hulme, MD, MPH, Peter Nugus, PhD, MA(Hons), Med, Hilarie H. Cranmer, MD, MPH, Melanie Coutu, MA, Kirsten Johnson, MD, MPH PREHOSPITAL CARE Courtney M.C. Jones, PhD, MPH, Erin B. Wasserman, PhD, Timmy Li, BA, Ashley Amidon, MPH, Marissa Abbott, MPH, Manish N. Shah, MD, MPH Michelle J. White, MD, Emefah C. Loccoh, BS, Monica M. Goble, MD, Sunkyung Yu, MS, Folafoluwa O. Odetola, MD, MPH, Mark W. Russell, MD Nee-Kofi Mould-Millman, MD, Julia M. Dixon, MD, Nana Sefa, MD, Arthur Yancey, MD, Bonaventure G. Hollong, MD, Mohamed Hagahmed, MD, Adit A. Ginde, MD, Lee A. Wallis, MBChB, MD A Descriptive Analysis of Tactical Casualty Care Interventions Performed by Law Enforcement Chad M. Stiles, RN, NREMT-P, CCEMT-P, Christopher Cook, RN, EMT-P/Tactical, Matthew D. Sztajnkrycer, MD, PhD Michael S. Westrol, MD, Susmith Koneru, MBBS, MPH, Norah McIntyre, MD, Andrew T. Caruso, AS, EMT, Faizan H. Arshad, MD, Mark A. Merlin, DO Impact of Early Vasopressor Administration on Neurological Outcomes after Prolonged Out-of-Hospital Michael W. Hubble, PhD, NREMT-P, Clark Tyson, MS, NREMT-P

James M. Burgert, DNAP, Arthur D. Johnson, PhD, Jose Garcia-Blanco, MD, Lawrence V. Fulton, PhD, MSStat, Michael J. Loughren, PhD

Assessment of the Knowledge of Blast Injuries Management among Physicians Working in Tripoli Hospitals (Libya) 311 Abdulhakim M. Oun, EMDM, Elmokhtar M. Hdida, PhD, Charles Stewart, MD
Evacuation Preparedness in the Event of Fire in Intensive Care Units in Sweden: More is Needed
COMPREHENSIVE REVIEW Disaster Preparedness among Health Professionals and Support Staff: What is Effective? An Integrative Literature Review
SPECIAL REPORTS Improving Data Quality in Mass-Gatherings Health Research
The Development of an Evacuation Protocol for Patients with Ventricular Assist Devices During a Disaster 333 Katherine J Davis, DNP, AGACNP-BC, Joseph Suyama, MD, Jennifer Lingler, PhD, CRNP, Michael Beach, DNP, ACNP-BC, PNP
BRIEF REPORTS Tetanus: A Potential Public Health Threat in Times of Disaster
Stop Stroke: A Brief Report on Door-to-Needle Times and Performance After Implementing an Acute Care Coordination Medical Application and Implications to Emergency Medical Services Robert Dickson, MD, FAAEM, FACEM, FACEP, Adrian Nedelcut, MD, Melissa McPeek Nedelcut, MD
ADDENDUM An Evaluation of the Effectiveness of the Australian Army's Aboriginal Community Assistance Program from a Military Participant Perspective—ADDENDUM
ERRATUM A Chain Approach to Risk Assessment for Regional Continuity of Care in Emergency and Disaster Medicine—ERRATUM

Editorial Office

World Association for Disaster and Emergency Medicine (WADEM), Madison, Wisconsin USA

> Editor-in-Chief Samuel J. Stratton, MD, MPH

> > Managing Editor Ellen Johnson, MS

Editorial Assistant Deidra A. Daugherty

Publisher Cambridge University Press One Liberty Plaza New York, NY 10006 Prehospital and Disaster Medicine (ISSN 1049-023X) is published bimonthly in the months of February, April, June, August, October, December, by Cambridge University Press for the World Association for Disaster and Emergency Medicine. Prehospital and Disaster Medicine incorporates the Journal of the World Association for Emergency and Disaster Medicine and the Journal of Prehospital Medicine.

Editorial Information: All manuscripts must be submitted through the Journal's online submission platform, ScholarOne Manuscripts: http://mc. manuscriptcentral.com/pdm.

2017 Subscription Information: Institutions print and electronic: US\$727.00 in the USA, Canada, and Mexico; UK£443.00+VAT elsewhere. Institutions electronic only: US\$536.00 in the USA, Canada, and Mexico; UK£328.00+VAT elsewhere. Individuals print and electronic: US\$211.00 in the USA, Canada, and Mexico; UK£129.00+VAT elsewhere. Individuals electronic only: US\$153.00 in the USA, Canada, and Mexico; UK£129.00+VAT elsewhere. Individuals electronic only: US\$153.00 in the USA, Canada, and Mexico; UK£87.00+VAT elsewhere. Single Part: US\$139.00 in the USA, Canada, and Mexico; UK£85.00+VAT elsewhere. Prices include postage and insurance. Airmail or registered mail is extra. Back volume prices are available upon request. Claims of non-receipt or damaged issues must be filed within three months of cover date.

Comprehensively indexed by the National Library of Medicine (MEDLINE), Cumulative Index to Nursing and Allied Health (CINAHL) and Health Star Cumulative Index. The database is available online via BRS, Data-Star, and DIA-LOG, and on CD-ROM through CD Plus, Compact Cambridge and Silver Platter. Abstracts and search capability available on the Internet at http://journals.cambridge.org/PDM.

Copyright \circledast 2017 by the World Association for Disaster and Emergency Medicine.

Cover Artwork

June 2017

Conflagration, painting by Jennifer Walton

Jennifer Walton's paintings capture the fragility of place in a rapidly changing global climate. Fire became a recurring theme in her work after her escape from a forest fire in North Ontario (Canada) while tree-planting in the late 1980s. *Conflagration* is part of a series of paintings entitled *Fire, Water, Ice and Snow*. In this series, she evokes mood and movement using layers of paint and the play of light and shadow.

Following her studies at Mount Allison University in Sackville, New Brunswick, Walton completed a Master of Fine Arts at Concordia University in Montreal. She was the first-place winner of the 1999 RBC Canadian Painting Competition. In 2007, she received an honorable mention from the Kingston Prize, Canada's National Portrait Competition. Her paintings have been exhibited widely across Canada and hang in numerous public and private collections throughout North America and the UK. Walton is represented by Abbozzo Gallery in Toronto.

Her work can be view at her website: jenniferwalton.com.

EDITORIAL BOARD Prehospital and Disaster Medicine

EDITOR-IN-CHIEF Samuel J. Stratton, MD, MPH

University of California-Los Angeles Los Angeles, California, USA

EMERITUS EDITOR-IN-CHIEF Marvin L. Birnbaum, MD, PhD

University of Wisconsin-Madison Madison, Wisconsin, USA

MANAGING EDITOR Ellen Johnson, MS

SECTION EDITORS Emergency Medical Services Darren Walter, FRCS(Ed) FCEM, FIMC University Hospital South Manchester Manchester, UK

Humanitarian Affairs Frederick M. Burkle, MD, MPH. DTM Harvard Humanitarian Initiative Harvard University Cambridge, Massachusetts, USA

Mass Gathering Medicine Paul Arbon, PhD School of Nursing and Midwifery Flinders University Adelaide, South Australia

Nursing Elaine Daily, RN, BSN, FCCM, FAHA Madison, Wisconsin, USA

Oceania Graeme McColl Christchurch, New Zealand

Psychosocial Gloria Leon, PhD University of Minnesota Minneapolis, Minnesota USA

ASSOCIATE EDITORS David A. Bradt, MD, MPH Royal Melbourne Hospital Melbourne, Australia

Wolfgang F. Dick, MD, PhD Mainz, Germany

Kimball Maull, MD, FACS Department of Surgery Hamad General Hospital Doha, Qatar

Steven Rottman, MD University of California-Los Angeles Los Angeles, California, USA

Geert Synaeve, MD Brussels, Belgium

EDITORIAL BOARD Carol Amaratunga, PhD

School of Child and Youth Development University of Victoria Research Association of the Justice Institute of British Columbia Victoria BC, Canada

Frank Archer, MD Department of Community Emergency Health & Paramedic Practice Monash University Melbourne, Australia

Jeffrey Arnold, MD Department of Emergency Medicine Santa Clara Valley Medical Center San Jose, California, USA

Yaron Bar-Davan, MD, MHA Israeli Defense Forces Home Front Command Or-Yehuda, Israel

Joost Bierens, MD, PhD Amsterdam, The Netherlands

Tareg Bey, MD Saudi Arabia

Richard A. Bissell, PhD Center for Emergency Education and Disaster Research University of

Maryland-Baltimore Baltimore, Maryland, USA

Felipe Cruz-Vega, MD Office of Social Security Mexico City, Mexico

Robert A. DeLorenzo, MD, MSM, FACEP Medical Corps United States Army San Antonio, Texas, USA

Claude de Ville de Goyet, MD Brussels, Belgium

Judith Fisher, MD Washington, DC, USA

Erik S. Gaull George Washington University Washington, DC, USA

Michael Gunderson American Heart Association Lakeland, Florida, USA

Pinchas Halpern, MD Critical Care and Emergency Medicine Tel Aviv University Tel Aviv, Israel

Keith Holtermann, MD George Washington University Washington, DC, USA

Mark Johnson, MPA Juneau, Alaska, USA

Mark Keim, MD Centers for Disease Control and Prevention Atlanta, Georgia, USA

Todd J. LeDuc, EMT-P Broward Sheriff Fire Rescue Ft. Lauderdale, Florida, USA

Lidia Mayner, PhD School of Nursing and Midwifery Flinders University Adelaide, South Australia

Andrew Milsten, MD, MS, FACEP University of Massachusetts **Emergency Medicine**

Worcester, Massachusetts, USA

Jerry Overton IAED Emergency Clinical Advice System & Standards Board Salt Lake City, Utah, USA

Paul Paris, MD

Center for Emergency Medicine University of Pittsburgh Pittsburgh, Pennsylvania, USA

Lynda Redwood-Campbell, MD, MPH

Department of Family Medicine McMaster University Hamilton, Ontario, Canada

Edward Ricci, PhD

Behavioral and Community Health Sciences University of Pittsburgh Pittsburgh, Pennsylvania, USA

Leonid Roshal, MD Institute of Pediatrics

Academy of Medical Sciences Moscow, Russia

Don Schramm Disaster Management Center University of Wisconsin-Madison Madison, Wisconsin, USA

James M. Shultz, PhD Center for Disaster & Extreme Event Preparedness University of Miami Miami, Florida, USA

Wayne Smith, BSC, MBChB, EMDM, FCEM(SA)

Division of Emergency Medicine University of Cape Town Cape Town, South Africa

Knut Ole Sundnes, MD **Baerum Hospital** Solo, Norway

Takashi Ukai, MD Hyogo Emergency Medical Center Hyogo, Japan

Michael Van Rooven, MD

Harvard Humanitarian Initiative and Department of Emergency Medicine, Brigham and Women's Hospital Boston, Massachusetts, USA

Richard Zoraster, MD, MPH Kaneohe, Hawaii, USA

Aims and Scope: The mission of *Prehospital and Disaster Medicine* (PDM) is the distribution of information relevant to the practice of out-of-hospital and in-hospital emergency medical care, disaster health, and public health and safety. PDM provides an international forum for the reporting and discussion of scientific studies, both quantitative and qualitative, that have relevance to the above practices. The major objectives are: (1) the improvement of the types and quality of the care delivered to patients with perceived medical emergencies and to victims of multi-casualty accidents or disasters, including the public health and safety aspects of such events; and (2) the prevention and/or mitigation of the occurrence of such events and of the effects of these events upon the human population and environment.

Editorial Office: Prehospital and Disaster Medicine, 3330 University Avenue, Suite 130, Madison, Wisconsin 53705, USA. Telephone: (+1) (608) 819-6604; Facsimile (+1) (608) 819-6055; E-mail: pdm@wadem.org

Publishing, Production, and Advertising Office: Cambridge University Press, One Liberty Plaza New York, NY 10006, United States; USAdSales@cambridge.org.

Subscription Offices: (for USA, Canada, and Mexico) Cambridge University Press, One Liberty Plaza New York, NY 10006, United States; (for UK and elsewhere) Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK.

2017 Subscription Information: Prehospital and Disaster Medicine (Print ISSN 1049-023X; Electronic ISSN 1945-1938) is published bimonthly in the months of February, April, June, August, October, and December by Cambridge University Press, One Liberty Plaza New York, NY 10006, United States/Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK for the World Association for Disaster and Emergency Medicine. 2014 Annual subscription rates: Institutions print and electronic: US\$727.00 in the USA, Canada, and Mexico; UK£443.00+VAT elsewhere. Institutions electronic only: US\$536.00 in the USA, Canada, and Mexico; UK£328.00+VAT elsewhere. Individuals print and electronic: US\$211.00 in the USA, Canada, and Mexico; UK£129.00+VAT elsewhere. Individuals electronic only: US\$153.00 in the USA, Canada, and Mexico; UK£85.00+VAT elsewhere. Individuals electronic only: US\$153.00 in the USA, Canada, and Mexico; UK£85.00+VAT elsewhere. Prices include postage and insurance. Airmail or registered mail is extra. Back volume prices are available upon request.

Submissions: All manuscripts must be submitted through the Journal's online submission platform, ScholarOne Manuscripts, at http://mc.manuscriptcentral.com/pdm. Please review the Author Instructions and Author Checklist available online before finalizing a submission.

Indexing: National Library of Medicine (MEDLINE), Cumulative Index to Nursing and Allied Health (CINAHL), and Heath Star Cumulative Index.

© World Association for Disaster and Emergency Medicine 2017. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying, or otherwise, without permission in writing from Cambridge University Press. Policies, request forms, and contacts are available at: http://www.cambridge.org/rights/permissions/permission. htm. Permission to copy (for users in the United States) is available from Copyright Clearance Center Transactional Reporting Service, 222 Rosewood Drive, Danvers, MA 01923, USA. http://www.copyright.com, email: info@copyright.com.

Printed in United States of America on acid-free paper.

Postmaster: Send address changes in the USA and Canada to *Prehospital and Disaster Medicine*, Subscription Department, Cambridge University Press, One Liberty Plaza New York, NY 10006, USA.

Periodical postage rate paid at New York, NY and additional mailing offices.