

# PREHOSPITAL and DISASTER MEDICINE

Volume 35, Number 3

June 2020



CAMBRIDGE  
UNIVERSITY PRESS

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](https://www.cambridge.org/core)

Cambridge Core



CAMBRIDGE  
UNIVERSITY PRESS

# Table of Contents

## GUEST EDITORIAL

- Declining Public Health Protections within Autocratic Regimes: Impact on Global Public Health Security, Infectious Disease Outbreaks, Epidemics, and Pandemics** ..... 237  
*Frederick M. Burkle, Jr., MD, MPH, PhD (Hon.), DTM, FAAP, FACEP*

## ORIGINAL RESEARCH

### DISASTER HEALTH AND MEDICINE

- The Epidemiological Presentation Pattern of Ebola Virus Disease Outbreaks: Changes from 1976 to 2019** ..... 247  
*Pedro Arcos González, MD, PhD; Ángel Fernández Camporro, MD; Anneli Eriksson, RN, MSc; Carmen Alonso Llada, MD*
- Prehospital Vital Signs Accurately Predict Initial Emergency Department Vital Signs** ..... 254  
*Marc D. Trust, MD; Morgan Schellenberg, MD, MPH; Subarna Biswas, MD; Kenji Inaba, MD; Vincent Cheng, MD; Zachary Warriner, MD; Bryan E. Love, MD; Demetrios Demetriades, MD, PhD*
- Global Characteristics of Chemical, Biological, and Radiological Poison Use in Terrorist Attacks** ..... 260  
*Burc Aydin, MD*
- The Epidemiology of Extreme Weather Event Disasters (1969-2018)** ..... 267  
*Mark E. Keim, MD, MBA*

### EMERGENCY MEDICAL SERVICES

- Effect of Extreme Temperature on Naloxone Nasal Spray Dispensing Device Performance** ..... 272  
*Michael Estephan, MD; Carly Loner, MD; Nicole M. Acquisto, PharmD*
- The Efficacy of Novel Commercial Tourniquet Designs for Extremity Hemorrhage Control: Implications for Spontaneous Responder Every Day Carry** ..... 276  
*Joshua Ellis, MD; Melissa M. Morrow, PhD; Alec Belau, BS; Luke S. Sztajnkrycer; Jeffrey N. Wood, PA-C; Tobias Kummer, MD; Matthew D. Sztajnkrycer, MD, PhD*
- Utilizing End-Tidal Carbon Dioxide to Diagnose Diabetic Ketoacidosis in Prehospital Patients with Hyperglycemia** ..... 281  
*Christopher Hunter, MD, PhD; Monty Putman, MD; Jermaine Foster; Amy Souers, MD; Alexa Rodriguez, MD; Christian Zuver, MD; Linda Papa, MD, MSc*
- Prehospital Disposition and Patient Outcomes in Cardiac Arrest AFTER Resuscitation Termination Protocol Change in an Urban Setting** ..... 285  
*Brian H. Cheung, MD, PhD; Mary P. Mercer, MD, MPH*

### MASS-GATHERINGS

- Moshpit Medicine: The Experience of an Australian Event Resuscitation Team** ..... 293  
*Sean Wing, MBBS BHSc (Paramedic); Robert Johnson, BN BHSc (Paramedic); Leigh Fowler, MParaSci (CriticalCare)*

### SYSTEMATIC REVIEWS

- Drug and Alcohol Related Patient Presentations to Emergency Departments during Sporting Mass-Gathering Events: An Integrative Review** ..... 298  
*Catherine Delany, RN, BNurs, GradCert EmergNurs; Julia Crilly, BNurs, MEmergN(Hons), PhD, FCENA; Jamie Ranse, RN, FACN, FCENA, BNurs, GradCert ClinEd, GradCert ClinEpi, MCritCarNurs, PhD*

<b>The Principles of Triage in Emergencies and Disasters: A Systematic Review</b> .....	305
<i>Jafar Baziyar; Mehrdad Farrokhi; Amir Salari; Hamid Reza Khankeh</i>	
<b>Ketamine as a Prehospital Analgesic: A Systematic Review</b> .....	314
<i>Akbil Bansal, BSc (Adv); Matthew Miller; Ian Ferguson; Brian Burns</i>	
<b>SPECIAL REPORTS</b>	
<b>Disaster Planning for Homeless Populations: Analysis and Recommendations for Communities</b> .....	322
<i>Stephen C. Morris, MD, MHP</i>	
<b>General Practitioner House Call Network (SOS Médecins): An Essential Tool for Syndromic Surveillance – Bordeaux, France</b> .....	326
<i>Laure Meurice; Thierry Chapon; Frédéric Chemin; Laurence Gourinchas; Stéphane Sauvagnac; Sébastien Uijtewaal; Stéphanie Vandentorren</i>	
<b>Prospective Study on the Potential Use of Satellite Data for Disaster Prevention, Preparedness, and Mitigation in Poland</b> .....	331
<i>Krzysztof Goniewicz; Maciej Magiera; Frederick M. Burkle Jr.; Mariusz Goniewicz</i>	
<b>Profile of Chest Injuries and Oxygen Therapy in Trauma Patients with Acute Respiratory Failure after the Jiangsu Tornado in China: A Retrospective Study</b> .....	335
<i>Gen hua Mu; Zhong qian Lu; Xing Li; Ping fa Chen; Lei He; Yun hao Sun; Shan shan Hou; Yi jun Deng</i>	
<b>Washington State Disaster Risk and Preparedness: A Primer for Health Care Providers</b> .....	341
<i>Stephen C. Morris, MD, MPH</i>	
<b>FIELD REPORT</b>	
<b>Operation Navajeevan: A Public-Private Partnership Model for Disaster Relief in Kozhikode, India</b> .....	346
<i>Sonia Haris, MBBS; Venugopalan Poovathumpambal, MBBS; Navveen Anaswara, MBBS, DCH; Samantha Noll, MD; Aditi Ghatak-Roy, MD; Nicholas Dreyer, MD; Nehal Naik, MD; Katherine Douglass, MD, MPH; Janice Blanchard, MD, MPH, PhD; Kevin Davey, MD</i>	
<b>LETTERS TO THE EDITOR</b>	
<b>Effect of Epinephrine Administration in Out-of-Hospital Cardiac Arrest</b> .....	351
<i>Ashish Kumar, MBBS; Rajkumar Doshi, MD, MPH; Mariam Shariff, MBBS</i>	
<b>Author Reply</b> .....	352
<i>W. Y. Teoh; K. T. Ng</i>	

**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**

**Bruria Adini, PhD**

Sackler Faculty of Medicine  
Tel Aviv University  
Tel Aviv, Israel

**Carol Amaratunga, PhD**

School of Child and Youth  
Development  
University of Victoria Research  
Association of the Justice  
Institute of British Columbia  
Victoria, British Columbia, 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-Dayan, MD, MHA**

Israeli Defense Forces Home  
Front Command  
Or-Yehuda, Israel

**Sue Anne Bell, PhD, FNP-BC**

School of Nursing  
University of Michigan  
Ann Arbor, Michigan, USA

**Tareq Bey, MD**

Saudi Arabia

**Joost Bierens, MD, PhD**

Amsterdam, The Netherlands

**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

**Joe Cuthbertson, MPH, MSc,**  
**MEH**

Disaster Resilience Initiative  
Monash University  
Australia

**Robert A. DeLorenzo, MD,**  
**MSM, FACEP**

Medical Corps  
United States Army  
San Antonio, Texas, USA

**Claude de Ville de Goyet,**  
**MD**

Brussels, Belgium

**R. Paul Farrell, CD, MB,**  
**BCH, BAO, DA, LMCC**

Kamloops, British Columbia,  
Canada

**Judith Fisher, MD**

Edgbaston, Birmingham, UK

**Erik S. Gaul**

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

**Carl Schultz, MD, FACEP**

Center for Disaster Medical  
Sciences  
University of California, Irvine  
Irvine, California, USA

**James M. Shultz, PhD**

Center for Disaster & Extreme  
Event Preparedness  
University of Miami  
Miami, Florida, USA

**Erin Smith, PhD, MPH,**  
**MClinEpi**

Edith Cowan University  
Joondalup, Western Australia

**Wayne Smith, BSc, MBChB,**  
**EMDM, FCEM(SA)**

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

**Caroline Spencer, BA, PhD**

Accident Research Centre  
Monash University  
Melbourne, Australia

**Knut Ole Sundnes, MD**

Baerum Hospital  
Solo, Norway

**Takashi Ukai, MD**

Hyogo Emergency Medical Center  
Hyogo, Japan

**Michael Van Rooyen, MD**

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

**Richard Zoraster, MD, MPH**

Kaneohe, Hawaii, USA

**Editorial Office**

World Association for Disaster and Emergency Medicine,  
3330 University Avenue, Suite 130, Madison, WI 53705 USA  
Telephone: (+1) (608) 819-6604; Facsimile (+1) (608) 819-6055;  
E-mail: pdm@wadem.org

**Editor-in-Chief**

Samuel J. Stratton, MD, MPH

**Managing Editor**

Ellen Johnson, MS

**Editorial Assistant**

Sara Vega

**Publishing and Production Office**

Cambridge University Press  
One Liberty Plaza  
New York, NY 10006 USA

**Advertising Sales**

M. J. Mrvica Associates, Inc.  
2 West Taunton Avenue  
Berlin, NJ 08009  
(856) 768-9360  
mjmrsvica@mrsvica.com

**Copyright © 2020 by the World Association for Disaster and Emergency Medicine.** 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>.

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

POSTMASTER: Send address changes in the USA, Canada, and Mexico to *Prehospital and Disaster Medicine*, Cambridge University Press, Journals Fulfillment Department, One Liberty Plaza, 20th floor, New York, NY 10006. Send address changes elsewhere to *Prehospital and Disaster Medicine*, Cambridge University Press, Journals Fulfillment Department, UPH, Shaftesbury Road, Cambridge CB2 8BS, England.

*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 for the World Association for Disaster and Emergency Medicine. by Cambridge University Press, One Liberty Plaza, 20th floor, New York, NY 10006. Periodicals postage rate paid at New York, NY, and at additional mailing offices. PDM incorporates the Journal of the World Association for Emergency and Disaster Medicine and the Journal of Prehospital Medicine.

**Aims and Scope:** The principal mission of *Prehospital and Disaster Medicine* is the distribution of information relevant to the practice of out-of-hospital and in-hospital emergency medical care, disaster medicine, emergency public health and safety, and disaster mental health and psychosocial support.

**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. All studies that include human subjects must be submitted for review or exemption to a formal human subjects ethics committee.

**2020 Subscription Information:** Institutions print and electronic: US\$844.00 in the USA, Canada, and Mexico; UK£515.00+VAT elsewhere. Institutions electronic only: US\$622.00 in the USA, Canada, and Mexico; UK£382.00+VAT elsewhere. Individuals print and electronic: US\$246.00 in the USA, Canada, and Mexico; UK£151.00+VAT elsewhere. Individuals electronic only: US\$179.00 in the USA, Canada, and Mexico; UK£102.00+VAT elsewhere. Single Part: US\$162.00 in the USA, Canada, and Mexico; UK£99.00+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.

**Indexing:** PDM is covered by Clarivate Analytics services and indexed and abstracted in the Science Citation Index (also known as SciSearch®) and the Journal Citation Reports/Science Edition. PDM is comprehensively indexed by the US National Library of Medicine (MEDLINE), Scopus®, Cumulative Index to Nursing and Allied Health (CINAHL), and Health Star Cumulative Index. Abstracts and search capability available at <https://www.cambridge.org/core/journals/prehospital-and-disaster-medicine>.

**Statement of Peer Review Policy:** PDM is a signatory with the International Committee of Medical Journal Editors (ICMJE) and the Committee On Publication Ethics (COPE). All scientific papers published in PDM are submitted to subject content and methods experts for peer review. Authors and reviewers are blinded (not aware of the identity of each other). Peer reviewers must declare that there is not a conflict of interest with any manuscript they agree to review. Peer review is accomplished by means of a standard scoring system and specific comments, the results and contents of which are returned to authors for their review.