



International Journal of **Paramedicine**

An Official Journal of the National EMS Management Association
Produced in collaboration with the Portuguese Prehospital Emergency Society
(Sociedade Portuguesa de Emêrgencia Pré-Hospitalar)



Number 14 — April-June, 2026

<https://internationaljournalofparamedicine.com/index.php/ijop/issue/view/N14>

<https://doi.org/10.56068/PRQM1802>



International Journal of Paramedicine

An Official Journal of the National EMS Management Association (USA)

Produced in collaboration with the Portuguese Prehospital Emergency Society

(Sociedade Portuguesa de Emergência Pré-Hospitalar)



Editorial and Production Team

Editor-In-Chief

Michael (Mic) Gunderson, EMT-P, FAEMS
— *President, Center for Systems Improvement; Chief Strategy Officer / Senior Advisor, Cambridge Consulting Group; Madisonville, TN, USA*

Managing Editor

Theron Becker, MPH, MPA, FACPE, EFO
— *Paramedic Lieutenant, Dorchester County EMS (DCEMS); Deputy Director of EMS Operations & Education, Raven Medical, Inc., Raven Advisory, LLC; Summerville, SC, USA*

Terry L. Payer Jr, MPSLA, NRP CCP — *Director of EMS, Indian Health Service (QNBMHCF); Adjunct Faculty, Career Technology Education, Turtle Mountain College; Adjunct Faculty, Healthcare Administration, Methodist University; Belcourt, ND, USA*

Associate Editor - Marketing

Andrew J. Steward, BS, NRP — *Paramedic, EMS, Wellspan Health; EMS Instructor, Harrisburg Area Community College; Taneytown, MD, USA*

Associate Editor - Peer-Review

Kevin T. Collopy, MHL, FP-C, NRP, CMTE
— *Director of Clinical Integrity, LifeLink III; Chair, Global Critical Care Transport Higher Education Council; Wilmington, NC, USA*

Jamie K. Jacobs, MS, NRP — *EMS Lead, Senior Consultant, Environmental Systems Research Institute (ESRI); Marshfield, MO, USA*

Ginny Kaplan, PhD, MHS, Paramedic, FAEMS — *Fire & EMS Administration Adjunct Faculty, Eastern Oregon University; Healthcare Administration Department Chair & Assistant Professor, Methodist University; EMS Program Director & Faculty, Brunswick Community College; Clayton, NC, USA*

Christine McGuire-Wolfe, PhD, CIC, CPH, EMT-P — *Assistant Professor, College of Public Health, University of South Florida; Director, Infection Control for Emergency Responders Collaborative & Training Hub (ICER); Tampa, FL, USA*

Scot Phelps, JD, MPH, Paramedic, FP-C — *Mobile Intensive Care, Englewood Hospital & Medical Center; Principal Researcher, NYC Ambulance History Project; Bordentown, NJ, USA*

Associate Editor - Production

James D. Dinsch, MS, NRP, CCEMTP — *Director, Cedar County EMS; Principal Consultant, Dinsch Consulting Group; Tipton, IA, USA*

Senior Editor - Statistics and Methodology

Eihab Khasawneh, DDS, PhD, RN, Paramedic — *Assistant Professor & Assistant Dean, Department of Applied Medical Sciences, Jordan University of Science & Technology; Irbid, Jordan*

Sonja Maria, PhD, Paramedic — *Associate Head of School, Head of Discipline for Paramedicine, School of Nursing, Paramedicine, & Healthcare Sciences, Charles Sturt University; Chair of the Australasian Paramedic Clinical Practice Guidelines SIG, Australasian College of Paramedicine; Bathurst, NSW, Australia*

Nikiah Nudell, MS, MPhil, NRP, FACPE — *Paramedic Scientist, Paramedic Foundation; Research Manager, University of Colorado Health (UCHealth); Wellington, CO, USA*

Assistant Editor - Copy and Proof

Laura L. Chadwick, NRAEMT, MLS(ASCP) CM — *Fairview Park Hospital; Centerville, GA, USA*

Allison G. S. Knox, MPH, MA, EMT-B — *Associate Professor, Disaster Management & Response, Paul Smiths College; Instructor, Political Science Department, Marist University; Instructor, Emergency Management Department, American Military University; Pawling, NY, USA*

Megan A. Mason, MPH, NRP, FFII, CADS — *Paramedic, Elite EMS; Firefighter/Paramedic, Fellows Club Fire & EMS; Conneaut Lake, PA, USA*

Section Editor - Benchmarks

John R. Clark, JD, MBA, NRP, FP-C, CCP-C, WP-C — *Chief Operating Officer, International Board of Specialty Certification (IBSC); Executive Dean, College of Remote & Offshore Medicine; Apollo, PA, USA*

Diane Flint — *Assistant Dean, School of Health Professions, Community College of Baltimore County (CCBC); Hampstead, MD, USA*

Ben Neal, BS, NRP — *Division Chief of EMS, Fern Creek Fire & EMS; Vice-Chair, Kentucky Board of EMS; Louisville, KY, USA*

Tanveer Ahmed Yadgir, PhD, MBA, PGDEMS — *Academic Faculty & EMS Researcher, Fatima College of Health Sciences; Al Ain, Abu Dhabi, UAE*

Section Editor - Case Scenarios

Becky J. Donelon, EdD, ACP — *Executive Director, Health Workforce Division, Alberta Health Services: Edmonton, AB, Canada*

Paul LeSage — *Founding Partner & Senior Analyst, SG Collaborative Solutions, LLC: Lake Oswego, OR, USA*

Luke Persin, DO, PHP — *Resident Physician, Emergency Medicine, Geisinger Health System: Greensburg, PA, USA*

Section Editor - Comparisons

Luc de Montigny, MFR, PhD — *Conseiller en Analyse et Recherche Clinique (Clinical Analysis & Research Advisor), Urgences Santé; Adjunct Professor, McGill University: Montréal, QC, Canada*

Brian A. Donaldson, CCP, ASM, AAS — *Director, Peach County EMS: Fort Valley, GA, USA*

Mark Weiss, DHA, MHA, MEP, NRP/FF — *Training Officer, District of Columbia Fire Department; Principal, Expeditionary Medical Education & Training: Alexandria, VA, USA*

Section Editor - Externals

Jenifer A. Swab, PhD, Paramedic — *Deputy Chief, Foxwall EMS; Board Member & Peer Debriefer, Pittsburgh Critical Incident Stress Management Team: Pittsburgh, PA, USA*

Robert K. Waddell II — *Training Manager, SAM Medical: Beulah, WY, USA*

Section Editor - Literature Searches

Shaughn Maxwell, PsyM, EMT-P — *Deputy Chief, South County Fire & Rescue: Everett, WA, USA*

Brenda M. Morrissey, DPA, FP-C — *Senior Quality Improvement Specialist, Center for Transfers & Acute Care, Northwell Health; Owner, Second Chance Safety, LLC: Glen Oaks, NY, USA*

Section Editor - Paramedicine Contents

Brad Buck, BS, NRP, CP — *Community & Emergency Paramedic, Mayo Clinic Ambulance Service; Board Member, Board of Directors, American Paramedic Association (APA): Rochester, MN, USA*

Julius McAdams, BME, FP-C, CCP-C, NRP — *Manager of Compliance & Clinical Outcomes, AirLink/VitaLink, Novant Health; Item Writer, I-CAPP Li, International Board of Specialty Certification (IBSC): Wilmington, NC, USA*

Section Editor - Performance Indicators

Ian E Blanchard, PhD, ACP — *Scientist, Alberta Health Services; Adjunct Assistant Professor, University of Calgary: Calgary, AB, Canada*

Todd Hatley, PhD, MBA, MHA — *Chief Executive Officer, Integral Performance Solutions; Improvement Advisor, Institute for Healthcare Improvement: Wilmington, NC, USA*

Oren Wacht, PhD, EMT-P — *Head of Department, Emergency Medicine, Ben Gurion University of the Negev; Paramedic, Member of Medical Council, Magen David Adom (MDA): Be'er Sheba, South, Israel*

Section Editor - Perspectives

Albert Bouwer-Monroy, MS-1, NRP, FP-C — *Deputy Chief, Foxwall EMS; Medical Student, Lake Erie College of Osteopathic Medicine: Pittsburgh, PA, USA*

Elizabeth Lacy, MPS, BS, Paramedic — *EMS Outreach Coordinator, Louisiana Childrens Medical Center (LCMC) Health / Tulane Medical Center: New Orleans, LA, USA*

Edward "Ted" Lee, EdD, NRP — *Director of Emergency Medical Test Preparation, Impact EMS: Neosho, MO, USA*

Christopher Suprun, BS, NRP, FP-C — *Director, Clinical Operations, September 11 Foundation: Dallas, TX, USA*

Micheal D. Thomas, DrPH, MHA, FACPE — *Chief Government Affairs Officer, Jan-Care Ambulance, Inc.: Beckley, WV, USA*

Section Editor - Podcast and Vlog

Chris Cebollero, DBA, CCEMT-P — *Board Director, Great Plains Region, National Association of Emergency Medical Technicians (NAEMT); CEO, Cebollero Associates Consulting Group: Elmhurst, IL, USA*

Robert C. Lawrence, MCMI — *Executive Director, California Ambulance Association; Director, Pro EMS: Las Vegas, NV, USA*

Dean Percy — *Video Production Technician, Spokane Fire Department: Spokane, WA, USA*

Eoin Walker, MSc, BSc, Dip IMC RCSEd, FEWM — *Senior HEMS Marketing Manager, Airbus Helicopters: Augsburg, Bavaria, Germany*

Section Editor - Profiles

Sean Caffrey, MBA, FACPE, NR-P — *Chief Executive Officer & Commissioner, Crested Butte Fire Protection District; President, National EMS Management Association (NEMSMA): Crested Butte, CO, USA*

Christoph Redelsteiner, PHD, PhDr, MSW, MS — *Docent, Department of Health, Universität für Weiterbildung Krems (Danube University Krems): Nöchling, Lower Austria, Austria*

Section Editor - Reflections

Michael S. Gerber, MPH, NRP — *Paramedic, Bethesda-Chevy Chase Rescue Squad; Adjunct Instructor, George Washington University: Washington, DC, USA*

Scott A. Lancaster, PhD, MHA, NRP — *Clinical Education Manager, Dartmouth Hitchcock Advanced Response Team (DHART); Assistant Professor, Geisel School of Medicine, Emergency Medicine, Dartmouth College: Goffstown, NH, USA*

Section Editor - Social Media and Correspondence

Sean Ferguson, MCPPara, FdSc, MSc, PGCert — *Senior Lecturer, Fatima College of Health Sciences; Chief Education Officer, Alnawa Medical: Doha, Qatar*

Ginny Kaplan, PhD, MHS, Paramedic, FAEMS — *Fire & EMS Administration Adjunct Faculty, Eastern Oregon University; Healthcare Administration Department Chair & Assistant Professor, Methodist University; EMS Program Director & Faculty, Brunswick Community College: Clayton, NC, USA*

Joshua Kimbrell, NRP, CCP-C — *Research Manager, Department of Pre-Hospital Care, MediSys Health Network; Medical Student, Albert Einstein College of Medicine: Brooklyn, NY, USA*

Section Editor - Toolbox

Charles A. Foat, PhD, NRP, FAEMS — *Director, Emergency Medical Science, Johnson County Community College: Olathe, KS, USA*

Emily R. Kaplan, DrPH, MPA, EMT-P — *Director, Clinical Practice Group, DocGo; Adjunct Faculty, Westchester Community College; New York Medical College: Mahopac, NY, USA*

Director of Sales and Marketing

Pat Songer — *Executive Director, National EMS Management Association (NEMSMA); Cascade Medical: Leavenworth, WA, USA*

Editorial Advisory Board Members

Mary Ahlers, MEd, BSN, ACP, NRP, CFC, FESI-II — *President, Paramedic Health Solutions; President, Paramedic Network, LLC; Air Care & Mobile Care Clinical Coordinator, UCHealth, University of Cincinnati*: Cincinnati, OH, USA

Ahed Al Najjar, PhD, MHE, FACRRM, PA — *Regional Faculty MENA, American Heart Association (AHA); Affiliated Faculty, National Association of Emergency Medical Technicians (NAEMT); Director of EMS Education Board MEAA, Australasian Registry of Emergency Medical Technicians*: Abu Dhabi, UAE

William K. Atkinson, PhD, MPH, MPA, FACHE, FACPE — *Senior Advisor, Cambridge Consulting Group*: Raleigh, NC, USA

Maria Beermann-Foat, PhD, MBA, NRP — *EMS Training Coordinator, Eugene Springfield Fire Department; Battalion Chief of Operations (ret.), Johnson County EMS (MED-ACT)*: Cottage Grove, OR, USA

Scott S. Bourn, PhD, RN — *Research Chair, Senior Quality Consultant, ESO*: Parker, CO, USA

Tom Bouthillet — *Battalion Chief of EMS (Ret.), Hilton Head Island Fire Rescue*: Hilton Head Island, SC, USA

Brooke Burton, NRP, FACPE — *Quality Improvement / Controlled Substance Manager, Unified Fire Authority*: Salt Lake City, UT, USA

Will Chappelle, Paramedic, RN, TNS — *Director, International Prehospital Medicine Institute*: Chicago Heights, IL, USA

Claire M. Corbett, MMS, MBA, Paramedic — *Director of Performance Excellence, Novant Health*: Wilmington, NC, USA

Bruce Evans, MPA, NRP, CFO — *Fire Chief, Upper Pine River Fire Protection District; Board Treasurer, National Association of Emergency Medical Technicians (NAEMT)*: Durango, CO, USA

Louis Gonzales, MPH, CPHQ, LP — *Director of Operations, Dell Medical School, Department of Pediatrics, EMS for Children Innovation & Improvement Center, University of Texas at Austin*: Georgetown, TX, USA

Rateb A. Abuzeid, PhD — *Researcher, EMS Faculty, Prince Sultan College for EMS; Head, Community Relations Unit, King Saud University*: Riyadh, Central, Saudi Arabia

Nawfal Aljerian, MD — *Chief Executive Officer, Medical Referrals Center, Saudi Arabia Ministries of Health; Associate Professor of Emergency Medicine, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS)*: Riyadh, Saudi Arabia

Michael W. Hubble, PhD, MBA, NRP — *Assistant Professor, EMS, Wake Technical Community College; Instructor, Healthcare Administration, Methodist University; Adjunct Faculty, Emergency & Disaster Health Systems, University of Maryland - Baltimore County (UMBC)*: Chapel Hill, NC, USA

Sam Hurley, MPH, EMPS, NRP — *Director, Maine Bureau of EMS*: Standish, ME, USA

Michael Jacobs, EMT-P — *Manager, EMS Specialty Systems of Care, County of Alameda*: San Leandro, CA, USA

Thomas Judge, EMT-P — *Founder, Director of Special Projects, Research, Government Relations, LifeFlight of Maine*: Port Clyde, ME, USA

Margaret A. Keavney, Esq, MHA — *Attorney at Law, Keavney & Streger, LLC*: Princeton, NJ, USA

Baxter Larmon, PhD, MICP — *Professor & Emeritus Director, David Geffen School of Medicine, University of California Los Angeles (UCLA)*: Ventura, CA, USA

William J. Leggio, EdD, NRP — *Operations Administrator, Mayo Clinic*: Round Rock, TX, USA

Glenn Leland, MBA — *Chief Growth Officer, Priority Ambulance, LLC; Principle Instructor, Priority Ambulance Leadership Foundation*: Knoxville, TN, USA

Brian J. Maguire, DrPH, MSA, EMT-P — *Epidemiology Consultant, Self Employed*: New London, CT, USA

Gregg Margolis, PhD — *Director, Health Policy Fellowships & Leadership Programs, National Academy of Medicine; Adjunct Professor, University of Pittsburgh*: Bethesda, MD, USA

Jennifer McCarthy, MAS, NRP, CHSE-A — *President, 579 Solutions; Director of Clinical Simulation, Seton Hall University*: Nutley, NY, USA

Mike McEvoy, PhD, NRP, RN, CCRN — *EMS Coordinator, Emergency Management, Saratoga County; Senior Staff RN, Cardiovascular Surgical ICU, Albany Medical Center*: Halfmoon, NY, USA

Peter O'Meara BHA, GradCertAgHlthMed, MPP, PhD — *Adjunct Professor, Department of Paramedicine, Monash University; Board Member, Board of Directors, American Paramedic Association (APA)*: Kangaroo Flat, VIC, Australia

Jerry Overton, MPA — *President, International Academies of Emergency Dispatch (IAED)*: Salt Lake City, UT, USA

David Page, MS, NRP — *Director, Prehospital Care Research Forum, University of California Los Angeles (UCLA); Paramedic, EMS, Allina Health*: Los Angeles, CA, USA

Ernesto M. Rodriguez, MA, LP — *Chief (Ret), Austin-Travis County EMS*: Leander, TX, USA

Walt A. Stoy, PhD, EMT-P — *Director Emeritus, Center for Emergency Medicine of Western Pennsylvania, Inc.; Associate Advisor, Cambridge Consulting Group; Professor & Program Director - Emergency Medicine Program (Ret), School of Health & Rehabilitation Sciences, University of Pittsburgh*: Pittsburgh, PA, USA

Mike Taigman, MA, FAEMS — *Improvement Guide, FirstWatch; Associate Professor, School of Nursing, Community Health Systems, University of California San Francisco; Assistant Professor, Emergency Health Services Management, University of Maryland - Baltimore County (UMBC)*: Oxnard, CA, USA

Debbie Vass, RN, EMT-P — *VP of Quality Initiatives, PatientCare EMS Solutions*: Clearwater, FL, USA

David A. Wampler, PhD, LP, FAEMS — *Health Science Professor, University of Texas Health Science Center at San Antonio*: Boerne, TX, USA

Brett Williams, PhD — *Professor, Department of Emergency Medical Care, College of Applied Medical Sciences, Imam Abdulrahman Bin Faisal University*: Dammam, Saudi Arabia

David M. Williams, PhD — *Chief Executive, Medic Health; Principal, DavidMWilliamsPhD.com (DMWAustin, LLC)*: Austin, TX, USA

Reviewers

David Beckerley, MPA, NRP — *Commander, Emergency Communications, Austin-Travis County EMS*: Austin, TX, USA

Deepak L. Bhatt, MD, MPH, FACC, FAHA — *Director, Heart Institute, Mount Sinai Hospital; Professor of Cardiovascular Medicine, Icahn School of Medicine at Mount Sinai*: Boston, MA, USA

Matthew Black — *Area Manager, QuikMedic*: Salem, OR, USA

Ron Bowles, PhD — *Justice Institute of British Columbia*: New Westminster, BC, Canada

Jane H. Brice, MD, MPH — *Professor & Chair, Department of Emergency Medicine, University of North Carolina*: Chapel Hill, NC, USA

Elliot Carhart, EdD, RRT, NRP, FAEMS — Professor, Radford University: Seminole, FL, USA

Alix Carter, MD, MPH, FRCPC — Director, Division of EMS, Dalhousie University: Halifax, NS, Canada

Sally Cascio — Chief Flight Nurse, NorthSTAR, University Hospital: Monroe, NJ, USA

Julie D. Charbonneau, RN, MS — Executive Director, Sioux Falls Regional EMS Authority (REMSA): Sioux Falls, SD, USA

Jamie Chebra, MS, FACPE, NRP — Chief Executive Officer, Harris County ESD 11 Mobile Healthcare: Spring, TX, USA

Brad Chernock, MD, MS, PA-C, NRP — Surgical Critical Care Fellow, Robert Wood Johnson Medical School, Rutgers University: Morristown, NJ, USA

Sheldon Cheskes, MD, CCFP(EM), FCFP, DRCPSC — Medical Director, Sunnybrook Centre for Prehospital Medicine; Professor, University of Toronto: Toronto, ON, Canada

Vlad Chiriac, PhD, MEd, ACP — Professor, Durham College: Oshawa, ON, Canada

Lance Corey, BS, EMT-P, EMS I/C — New Era, MI, USA

Jon M. Crownover, NRP, EMSI, CCEMTP — Advanced Care Paramedic & EMS Instructor, University of Pittsburgh Medical Center (UPMC); Paramedic, Ross / West View EMS & Rescue: Pittsburgh, PA, USA

Carol A. Cunningham, MD, FAAEM, FAEMS — State Medical Director, Division of EMS, Ohio Department of Public Safety; Professor, Emergency Medicine, Northeast Ohio Medical University: Kirtland, OH, USA

Ian R. Drennan, ACP, PhD — Associate Professor, Department of Family & Community Medicine, University of Toronto; Professor, Georgian College: Toronto, ON, Canada

Rommie L. Duckworth, MPA, LP, EFO, FO — Board Director, Northeast Region, National Association of Emergency Medical Technicians (NAEMT); Chief, Ridgefield Fire Department; Director, New England Center for Rescue & Emergency Medicine, LLC: Sherman, CT, USA

Bram Duffee, PhD, EMT-P — Assistant Professor of Communication, School of Communication & Media, Norman J. Radow College of Humanities & Social Sciences, Kennesaw State University; Chair of Graduate Studies Research, Graduate Studies, First Responder Behavioral Health Institute: Houston, TX, USA

Peter I. Dworsky, MPH, NRP, CEM, FACPE — Paramedic, JFK EMS, Hackensack Meridian Health University Medical Center; Senior Risk Solutions Specialist, Risk Solutions, Markel Insurance: Edison, NJ, USA

Katherine L. Elkins, MPH, CPH, NRP — DrPH Student, Bloomberg School of Public Health, Johns Hopkins University; Captain Lifemember Paramedic, Wheaton Volunteer Rescue Squad: Kensington, MD, USA

Craig Evans, DHSc Student, MEd, Paramedic — Assistant Professor, EMT Program Manager, School of Medicine & Health Sciences, George Washington University: Higganum, CT, USA

Mary E. Fallat, MD — Professor of Surgery, University of Louisville; Director of Surgical Quality, Norton Childrens Hospital: Louisville, KY, USA

Rob Farmer, MBA, FACPE — Tomball, TX, USA

Antonio R. Fernandez, PhD, NRP — Research Scientist, ESO; Adjunct Assistant Professor, University of North Carolina: Apex, NC, USA

Jay Fitch, PhD — Founding Partner, Fitch & Associates; Board Member, American College of Paramedic Executives: Natchez, MS, USA

Greg Friese, MS, NRP — Stevens Point, WI, USA

Paul M. Gallo, BS, EMT-P, EMSI — Assistant Chief (Ret), Reading Fire Department; Paramedic, UCHealth, University of Cincinnati: Reading, OH, USA

Erik S. Gaull, NRP, CEM — Paramedic/Firefighter III, Cabin John Park VFD: Cabin John, MD, USA

Mary George, MD, MSPH, FACS — Decatur, GA, USA

Daniel R. Gerard, MS, RN, NRP — President, International Association of EMS Chiefs; EMS Coordinator, Alameda Fire Department: Washington, DC, USA

Stacy Gerlich, MA, EMT-P — Battalion Chief (Ret), Los Angeles City Fire Department: Westlake Village, CA, USA

Judah P. Goldstein, PCP, PhD — Research Coordinator, Emergency Health Services, Department of Health & Wellness, Government of Nova Scotia; Assistant Professor, Dalhousie University: Halifax, NS, Canada

Sean Graham, BS, NRP, CCP-C — Bothell, WA, USA

Mike Grill, MS, NRP, EFO — Larkspur, CO, USA

Jacob E. Guillott-Creel, MS, FP-C, CMTE — Clinical Administration Coordinator, PHI Air Medical, LLC: Phoenix, AZ, USA

Todd Heffern, MD, FACEP, FAEMS, NRP — EMS Medical Director, Covenant Health; EMS Medical Director, Hawkins County EMS; EMS Medical Director, Grainger County EMS: Knoxville, TN, USA

Arthur Hsieh, MA, NRP — Faculty Coordinator, Santa Rosa Junior College: Windsor, CA, USA

Jeffrey L. Jarvis, MD, MS, EMT-P — Chief Medical Officer & System Medical Director, Metropolitan Area EMS Authority (MedStar911): Fort Worth, TX, USA

Jan L. Jensen, ACP, MAHSR — Executive Director, Emergency Health Services, Department of Health & Wellness, Government of Nova Scotia; Assistant Professor, Dalhousie University: Dartmouth, NS, Canada

Michael Kaduce, MPS, NRP — Director, Falck Health Institute; Board Director, West Coast Region, National Association of Emergency Medical Technicians (NAEMT)

Randy D. Kearns, DHA, MSA, FACHE, FRSPH — Dean, Henry Bernstein College of Business, University of New Orleans; Research Associate Professor (Gratis), Health Sciences Center, Department of Surgery, Louisiana State University (LSU); Clinical Assistant Professor Emeritus, School of Medicine, University of North Carolina: New Orleans, LA, USA

Adam Kipust — MD/MPH Candidate, Miller School of Medicine, University of Miami; EMT, Key Largo EMS: Miami, FL, USA

Judah A. Kreinbrook, BS, EMT-P — Medical Student, School of Medicine, Duke University: Durham, NC, USA

Jon R. Krohmer, MD, FACEP, FAEMS — CEO / EMS Physician, EMSMD, PLLC; Adjunct Associate Professor, College of Human Medicine, Department of Emergency Medicine, Michigan State University; Adjunct Clinical Associate Professor, Homer Stryker School of Medicine, Department of Emergency Medicine, Western Michigan University: Grandville, MI, USA

Brian LaCroix, BS, FACPE, CPPS, NRP (Ret) — Executive Advisor, Cambridge Consulting Group: Farmington, MN, USA

Alan J. Lieberman, MAS, MA, NRP(ret), CHEP — Old Bridge, NJ, USA

Jeffrey T. Lindsey, PhD, PM, EFO — Program Director, University of Florida: Gainesville, FL, USA

Cassie Longhart-Thomas, DHA, MHA/ED, EMT-I, LSSMBB — Assistant Academic Chair, School of Business & Information Technology, Purdue Global: Social Circle, GA, USA

Beth Lothrop Adams, MA, BSN, NRP, FAEMS — Quality Manager, Fairfax County Fire & Rescue Department; Adjunct Faculty, Bachelor of Applied Science Program, George Mason University: Fairfax, VA, USA

Jon Lovett, AS, NRP — *Manager, Prehospital EMS, Lawrence General Hospital; Senior Education Specialist, Boston Childrens Hospital: Plaistow, NH, USA*

Robbie MacCue, FP-C, MBA — *Founding Partner, EMS Leadership Academy; Assistant Chief, Town of Colonie EMS Department: Albany, NY, USA*

Russell D. MacDonald, MD, MPH, FCFP, FRCPC — *Medical Director, Toronto Paramedic Services; Professor of Emergency Medicine, Faculty of Medicine, University of Toronto; Transport Medicine Physician, Ornge Transport Medicine: Toronto, Ontario, Canada*

Renée S. MacPhee, PhD — *Associate Professor, Wilfrid Laurier University: Waterloo, ON, Canada*

Matthew McElhenie, DPA, NRP — *General Manager, Cambria Community Services District; Professor, Hartnell College: Cambria, CA, USA*

Kim D. McKenna, PhD, RN, NRP — *Director of Education (Ret), Saint Charles County Ambulance District: Kirkwood, MO, USA*

Russell D. Metcalfe-Smith, MSc, BSc(Hons), FRSPH, FHEA — *Associate Professor, Department of Surgery, Cedars-Sinai Medical Center: Los Angeles, CA, USA*

Anthony Minge — *Fitch & Associates: Platte City, MO, USA*

Dennis M. Mitterer, PhD, BSN, CSP, ARM — *Instructional Professor/Advisor, University of Florida: Gainesville, FL, USA*

Carl Moen, MPM, EMT-P — *Executive Director (Ret), Southern Alleghenies EMS Council: Everett, PA, USA*

Anne Montera, MHL, BSN, RN — *President / Chief Executive Officer, Caring Anne Consulting, LLC; Senior Advisor, Cambridge Consulting Group; Director of Nursing, VRpatients: Oxford, FL, USA*

Scott Moore, Esq — *Partner, Werfel, Moore & Kelly Law Group, LLP: Middleton, MA, USA*

Graham George Munro, PhD, MHSM, BHSc, GradDip — *Adjunct Senior Lecturer, School of Nursing, Paramedicine, & Healthcare Sciences, Charles Sturt University: Toronto, Ontario, Canada*

Kenneth Navarro, MEd, LP — *Training Specialist III, Emergency Medicine, University of Texas Southwestern Medical Center: Hurst, TX, USA*

Jeannie Newton-Riner, EdD, MHS/MHSA, CP-C — *Board Member, Board of Directors, American Paramedic Association (APA); Part-Time Faculty, Kennesaw State University: Acworth, GA, USA*

Nicholas North, MSNc, RN, NRP, CMTE — *Flight Nurse / Outreach Coordinator, Life Flight, UMass Memorial Health: Belchertown, MA, USA*

Richard W. Patrick, MS, Paramedic, EFO — *Director, National Fire & EMS Programs Division, U.S. Fire Administration (USFA): Fredrick, MD, USA*

Blaine Patterson, RN, FP-C — *Director, EMS, St Lukes Health System: Boise, ID, USA*

P. Daniel Patterson, PhD, NRP — *Associate Professor, University of Pittsburgh: Pittsburgh, PA, USA*

Debra G. Perina, MD, FAEMS — *Professor Emeritus, Emergency Medicine, University of Virginia; Operational Medical Director, Thomas Jefferson EMS Council, Inc.: Ruckersville, VA, USA*

Les Polk, MS, FACPE, CEMSO, NRP — *National Director, Clinical Excellence, DocGo; Public Educator, Mobile Health, RWJBarnabas Health; Certified Instructor Coordinator, Paramedic Science, City University of New York (CUNY) LaGuardia Community College: Cranbury, NJ, USA*

Mark A. Potts, MPA, NRP, CEMSO, FP-C — *Critical Care Paramedic, LifeLink, Cape Fear Valley Hospital: Pinehurst, NC, USA*

Jonathan Pritchard, RN, MN, CCRN, NRP — *Fire/EMS Chief, Cottage Grove Fire Department; Staff Nurse, Emergency Department, Regions Hospital: Cottage Grove, MN, USA*

Benjamin Proctor, BS, NRP, TP-C — *Combat Medic, US Army; Board of Directors, American Paramedic Association (APA): Richmond Hill, GA, USA*

Aarron Reinert, MA — *Partner, SafeTech Solutions, LLP; Executive Director & Chief of EMS, Lakes Region EMS: North Branch, MN, USA*

Louise Reynolds, RP, PhD, FACP — *Chief Paramedic Officer, Department of Health Victoria, Safer Care Victoria; Associate Professor in Paramedicine, School of Nursing, Midwifery, & Paramedicine, Australian Catholic University: Wallan, VIC, Australia*

Kayla Riel — *Research Consultant, Department of Emergency Medicine, University of Missouri; EMS Research Fellow, Research Department, National Registry of Emergency Medical Technicians (NREMT): Columbus, OH, USA*

Sattha Riyapan, MD, MPH — *Assistant Professor in Emergency Medicine, Mahidol University Siriraj Hospital: Bangkok, Thailand*

Vincent D. Robbins, MSc, FACPE, LFACEH — *Founder, President, & Chief Executive Officer, Cambridge Consulting Group: Cambridge, MD, USA*

Eric A. Rosen, MA, BS, NRP, FP-C — *Clinical Educator, MedFlight, Temple University Health System; Paramedic, Community Ambulance Association of Ambler; Principal, EMS Consultant Group: Jenkintown, PA, USA*

Wayne W. Ruppert, CVT, CCCC, NRP — *Director of Clinical Outreach, Tampa General Hospital Spring Hill (formerly Bravera Health Hospital): Wesley Chapel, FL, USA*

Isaac Ryals, BS, NRP, CHSOS — *Paramedic, Carle Arrow Ambulance Services: Champaign, IL, USA*

Ritu Sahni, MD, MPH, FAEMS, FACEP — *Medical Director, Clackamas County EMS; Medical Director, Washington County EMS: Lake Oswego, OR, USA*

Jose V. Salazar, MPH, NRP, FACEP, LMC — *Founder/Owner, High Performance Coaching & Consulting, LLC; Deputy Chief of EMS (Ret), Loudoun County Fire & Rescue: Sterling, VA, USA*

Brian Schaeffer, MPA, EMT-P — *Fire Chief, Columbia Fire Department: Columbia, MO, USA*

Ahmad Sharayah, PhD, MHS, Paramedic, FAEMS — *Department Head / Adjunct Assistant professor, Royal Jordanian Medical Services College : Amman, AMM, Jordan*

Travis A. Sheeder, NRP, CP-C — *EMS Officer, Mobile Integrated Health Division, Tulsa Fire Department: Muskogee, OK, USA*

Carlos J.A. Silva, Paramedic — *Guimarães Fire Department; International Prehospital Medicine Institute; Sociedade Portuguesa de Emergência Pré-Hospitalar (Portuguese PreHospital Emergency Society): Guimarães, Portugal*

Hezedean Smith, DM, CFO, FACPE — *Founder / Chief Executive Officer, Global Emergency Services Consulting Group, LLC; Adjunct Faculty, Embry Riddle Aeronautical University: Orlando, FL, USA*

Larry M. Starr, PhD — *Director of Applied Research, Lee Iacocca Institute for Global Leadership, Lehigh University; Adjunct Assistant Professor of Pharmacy Systems Science, Department of Medical Education, Geisinger Commonwealth School of Medicine; Managing Director, Systems Wisdom, LLC: Wynnwood, PA, USA*

Robert E. Suter, DO, MHA — *Professor, University of Texas Southwestern Medical Center; Reserve Brigadier General, US Army: Dallas, TX, USA*

Simon Taxel, MPH, NRP — *Crew Chief, City of Pittsburgh Bureau of EMS; Lecturer, School of Public Health, University of Pittsburgh: Pittsburgh, PA, USA*

Stephen E. Taylor, Paramedic, PhD, FAEMS — *EMS Specialist, East Carolina University; Pitt County EMS: Washington, NC, USA*

Sean M Teed, CCP, MEd(c) — *Paramedic Educator, Nova Scotia Health: Halifax, NS, Canada*

John Todaro, BA, NRP, RN, TNS — *Director, Eagle Emergency Education Consultants; Associate Advisor, Cambridge Consulting Group: Land O Lakes, FL, USA*

Tara Tucker, MS, EMT-P, CP-C — *Lead Community Paramedic, Cape Fear Valley Hospital: Madison, NC, USA*

Robert S. Wales, BS, NRP, ALM — *Medical Education Program Manager, Medtronic, Inc: Plano, TX, USA*

James J Warin, MPA, NRP, CHSE, CHSOS — *Simulation Operations Specialist, Simulation Center, Valley Health System; Paramedic, Mobile Intensive Care Unit, Hackensack Meridian Health University Medical Center; EMT Instructor, Bergen County Technical Schools: Hopatcong, NJ, USA*

Jonathan D. Washko, MBA, FACPE, NRP, AEMD — *Assistant Vice President, Center for EMS, Northwell Health: Northport, NY, USA*

Siegfried Weinert, NKV, EMD, SFK — *Cross Border EMS Management, Notruf Niederösterreich (Emergency Call Lower Austria); NKV, LBA-EH, LBA-San, PAS, Austrian Red Cross: Wiener Neudorf, Lower Austria, Austria*

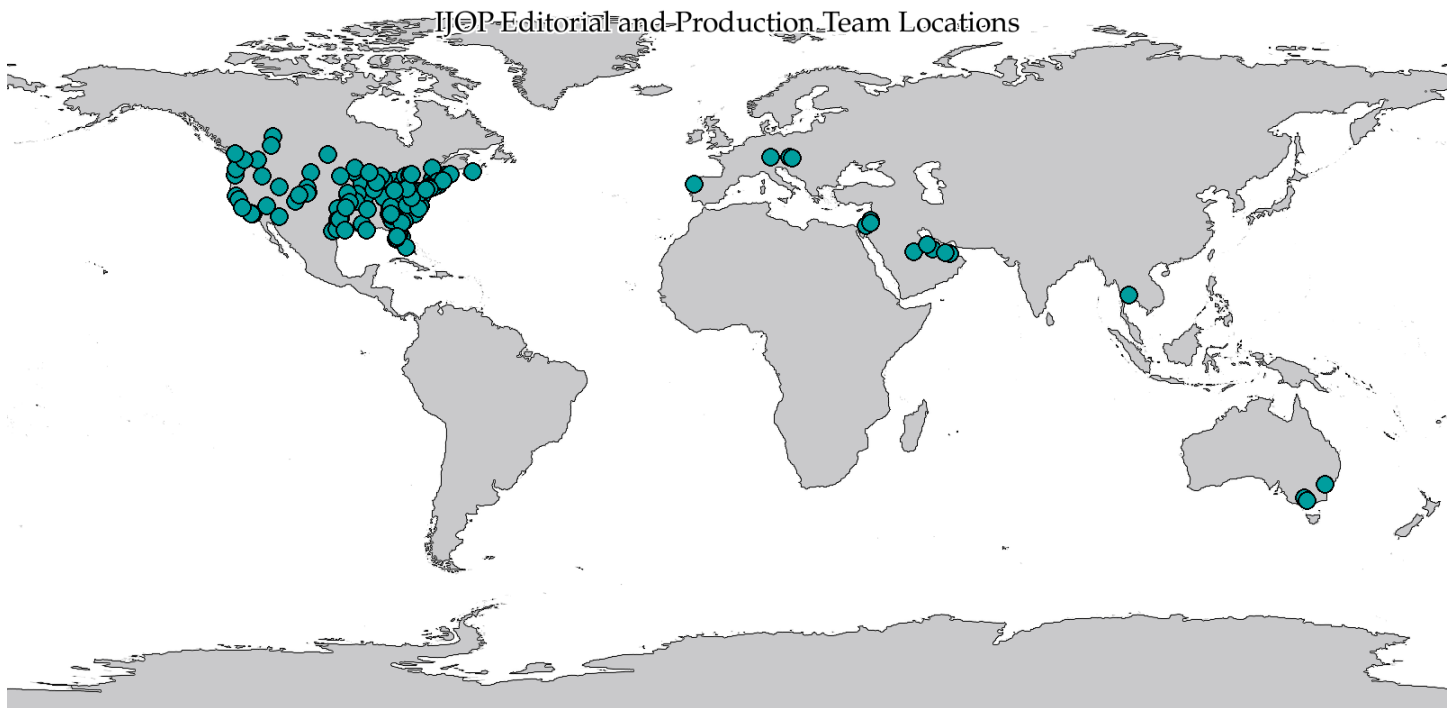
Katherine H. West, RN, BSN, MEd — *Consultant, Infection Control Emerging Concepts, LLC: Palm Harbor, FL, USA*

Marquita F. Whisonant, EdD(c), MS, CNS, NRP — *Assistant Director, Center for Trauma & Critical Care Education, Virginia Commonwealth University; Assistant Professor, Reynolds Community College: Henrico, VA, USA*

Joseph Williams, IV — *National Director, Healthcare IT Products, Quality Outcomes Research Analytics, American Heart Association (AHA): Detroit, MI, USA*

Matthew M. Womble, EMT-P(Ret), MHA — *Regional Chief Operating Officer, American Red Cross (ARC): Edenton, NC, USA*

Joshua A. Worth Sr., MPA, NRP, CEMSO — *Director of Clinical Services, AmeriPro Health; Program Director, Public Safety Institute, Community College of Allegheny County: Pittsburgh, PA, USA*



International Journal of Paramedicine (online ISSN 2831-6967) is an official journal of the National EMS Management Association. It is published quarterly by the National EMS Management Association, 2901 Williamsburg Terrace, Suite G, PO Box 472, Platte City, MO 64079. This journal is published exclusively online as an open-access resource at <https://internationaljournalofparamedicine.com>. Information on submissions is available at <https://internationaljournalofparamedicine.com/index.php/ijop/about/submissions>. Editorial query letters may be addressed to Mic Gunderson, Editor-In-Chief, at mic.gunderson@internationaljournalofparamedicine.com. For inquiries about sponsorships or advertising, please contact Pat Songer, Executive Director, National EMS Management Association; +01 816-858-6172; info@nemsma.org. Copyright © 2026 National EMS Management Association under Creative Commons Attribution 4.0 International (CC BY-ND 4.0) licensing. Additional terms apply and can be accessed at <https://creativecommons.org/licenses/by-nd/4.0/>.

Copyright © 2026 National EMS Management Association. All rights reserved.

Table of Contents

April-June, 2026

Number 14

RESEARCH REPORTS

Longitudinal Evaluation Use of a Multi-Modal

Toolkit to Support Prehospital Pediatric Readiness..... 10
Jaeger L, Runkle A, Dorosz E, Dietrich A, Cheng T, Alter R, Saucedo J, & Adelgais K

Peer-to-Peer Feedback Among Ambulance Clinicians:

A Cross-Sectional Study in the Out-of-Hospital Setting.....22
Foster J & Williams B

Evaluating Auditory Feedback for Accurate Compression Rates

.....44

Horan Jr P, Breneman K, & Martin V

Assessing Australian and New Zealand Prehospital Clinicians' Training, Experience, and

Confidence with Out-of-Hospital Childbirths: A Mixed Methods Online Questionnaire.....50
Hill M, Flanagan B, Hansen S, Hopper L, & Mills B

Educating for the Paramedicine of Today: Exploratory Findings

Related to Primary Care Paramedic Training in Northern Ontario..... 71
Starkes A & Møller H

Zoom Fatigue Among Paramedicine Students: A Cross-Sectional Study

.....87

AlShammari T, King C, Oteir A, Alqahtani S, Chang Y, Aldossary S, & Williams B

Attitudes of First Responders Towards Supervised Consumption Services

.....98

Pijl E, McDonald N, Weldon E, Dryden R, Golding M, Fries C, Serieux J, Shaw S, Souleymanov R, Guest C, & Mexico J

Self-Reported ADHD in a Convenience Sample of EMS Clinicians

113

Hansen N & Foat C

REVIEWS

The Evolving Professionalization of Paramedicine: A Scoping Review

.....128

Feerick F, Coughlan E, Knox S, Murphy A, O'Grady I, & Deasy C

CONCEPTS

Implementation of Mental Health Supports for

Canadian Paramedic Students During Practicum Placements..... 150
Newman S, Kayanja J, Rimstad C, & Violato E

Mass Opioid Exposure: Enhancing Medical Countermeasure Preparedness

..... 159

Lord G, Byun N, & Laney

LITERATURE SURVEILLANCE

Paramedicine Contents: December 2025 - March 2026..... 166
McAdams J & Buck B

Paramedicine Literature Search: December 2025 - February 2026..... 175
Maxwell S & Morrissey B

GUIDELINES

Guidelines for Authors268

CORRESPONDENCE

Dialogs 231

ADDENDUM, CORRIGENDUM, AND ERRATUM

Addendum, Corrigendum, and Erratum279

