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Ophthalmic  
Tomography

The real-world utility of this  
standard-of-care technique

by AILIN (IRENE) SONG, MHSC; ANTHONY KUO, MD

It is not uncommon for patients with eye and vision concerns to present initially to the emergency department (ED). Unfortunately, effective, reliable, and easy-to-use tools for eye examination are not readily available to the emergency physicians caring for these patients. Direct ophthalmoscopy, once an integral part of the physical examination, has become a dying art in recent decades.<sup>1</sup> Yet, the direct ophthalmoscope is the

current standard-of-care tool for emergency physicians to examine the posterior eye, including the retina and the optic nerve. For the best view, dilating drops should be used, but dilation takes time and dilating drops are often not available to emergency physicians. Even with dilation, the pupil offers a small viewing window, hence challenging the clinician to control the ophthalmoscope pre-

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An Open Letter  
from ACEP's  
Tactical and Law  
Enforcement  
Medicine Section

by BRIAN L. SPRINGER, MD, FACEP,  
ON BEHALF OF THE ACEP TACTICAL  
AND LAW ENFORCEMENT MEDICINE  
SECTION

I watched the traffic stop video of Tyre Nichols with an all-too-familiar mix of revulsion, sadness, and anger. Officers beat him brutally and once he is in custody, fail to render aid. Other recent cases, such as the deaths of Earl Moore, Jr., belittled by medics before being restrained prone on the stretcher, and of George Floyd suffocated under the knee of Derek Chauvin while other officers stood by, are examples of particularly callous disregard for the rights, health and safety of citizens during police contact. In-custody deaths sow division between our police and the citizens they are sworn to serve and protect.

These examples and similar cases expose a fundamental lack of recognition of medical emergencies and the need for acute interventions to alleviate risks of preventable injury and death. We must put a stop to the egregious failures we continue to see on the news. As emergency physicians and the clinical conscience of prehospital medicine,

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PERIODICAL

TOX Q&A

A Vision  
of Toxicity

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JASON HACK (CLEANDER PHOTOGRAPHY)





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The Official Voice of Emergency Medicine

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## NEWS FROM THE COLLEGE

### UPDATES AND ALERTS FROM ACEP

### Lawsuit Win Marks Important Step Toward Fair Implementation of No Surprises Act

ACEP fights for emergency physicians across all levels, including in the courts. In the past year, ACEP's litigation efforts have increased by 400 percent. In a special guest post for ACEP's regulatory blog, ACEP's Chief Legal Counsel Leslie Moore, JD, explains the significance of the surprise billing lawsuit win in Texas and what it means for ACEP's ongoing advocacy efforts to improve the implementation of the *No Surprises Act*. Read more at [acep.org/txlawsuitwin](http://acep.org/txlawsuitwin).

### Submit Your Research Forum Abstracts

The submission portal is open for the 2023 Research Forum, held annually in conjunction with the ACEP Scientific Assembly, and is emergency medicine's premier research event. The Research Forum typically selects more than 400 abstracts per year, presented live and virtually during the event. Submit your abstracts by May 3. Learn more at [acep.org/rf](http://acep.org/rf).

### What Happens When the Public Health Emergency Ends in May?

After three years, the COVID-19 public health emergency (PHE) is coming to an end May 11. Now that the end date has finally been set, ACEP's regulatory experts wrote an article reviewing the major telehealth and Medicaid policies and discussing other flexibilities and waivers that emergency physicians may not realize are expiring as well. Get all the information you need to feel prepared at [acep.org/covidPHE](http://acep.org/covidPHE).

### Grant Opportunity: Earn ED Pain Management Accreditation

ACEP's Pain and Addiction Care in the ED (PACED) accreditation program seeks to improve acute pain management for patients in the emergency department (ED) by accelerating the transfer of knowledge about acute pain management and addiction treatment and se-

cure appropriate resources for patients. PACED accreditation ensures quality, patient safety, communication, responsibility, and clarity in the management of ED patients suffering from pain and addiction. Through the support of the Substance Abuse and Mental Health Services Administration (SAMHSA), ACEP will accredit up to 50 EDs through its PACED program at no cost to the site. Rural hospitals and hospitals that experience high opioid misuse rates in the community where they are located are encouraged to apply. Learn more at [acep.org/PACED50](http://acep.org/PACED50).

### Resources to Help Educate Patients About COVID-19 Treatment Options

ACEP has new resources to help you speak with your patients about COVID-19 treatments. These free print and digital materials are available in both English and Spanish to help educate patients about:

- Who is at increased risk for severe illness from COVID
- The availability of COVID treatments
- The importance of getting treated early

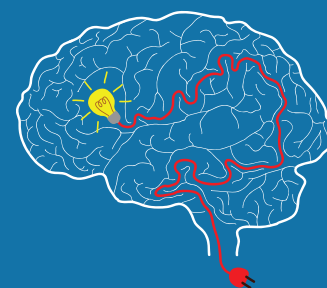
These resources include information from the U.S. Centers for Disease Control and Prevention and culturally tailored content from the *We Can Do This* campaign's team of multi-cultural experts. Learn more by visiting [acep.org/wecandothis](http://acep.org/wecandothis).

### ACEP and EMRA Honor Outstanding Medical Students

Congratulations to the 2023 National Outstanding Medical Student Award winners:

- **Grace Bunemann**, Campbell University School of Osteopathic Medicine
- **Caitlyn Johnson**, University of South Florida Morsani College of Medicine
- **Caroline Lee**, Harvard Medical School
- **William Miller**, East Tennessee State University Quillen College of Medicine
- **Mahan Naeim**, University of California Irvine School of Medicine
- **Tania Pena-Alfaro**, Baylor College of Medicine
- **Francesco Sergi**, University of California San Francisco School of Medicine

# WHAT ARE YOU THINKING?



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letters to ACEP NOW, P.O. Box 619911,  
Dallas, TX 75261-9911;

and faxes to 972-580-2816, attention ACEP NOW.



## RESIDENCY SPOTLIGHT

**What does your program offer that residents can't get anywhere else?**

Location, diverse patient population, education, and world-class partnership! Our program is located in beautiful Northern California and serves as the de facto county hospital in the state's capital city. We serve one of the most diverse patient populations in the country and this affords our residents the opportunity to care for patients from all walks of life. UC Davis Hospital is a co-located Adult and Pediatric Level I Trauma Center, a Comprehensive Stroke Center, STEMI receiving center, and serves as the regional Burn Center with a catchment area that extends to the southern Oregon border and into Western Nevada. Residents spend approximately 70 percent of their time at the UC Davis Hospital as well as rotate through several community hospitals and the Sacramento VA Medical Center. This provides them with a broader sense of diverse patient populations as well as the ability to practice in different clinical environments, which enables them to add nuance and adaptability to their clinical practice.

Many of the staff attending physicians in the department are nationally recognized subject matter experts and have additional training in areas ranging from geriatric emergency medicine, toxicology, ultrasound, critical care, research, health policy, disaster medicine, EMS, and global health. In 2017, the UC Davis Health System partnered with the United States Air Force to develop the Air Force's fourth and only fully integrated emergency medicine residency program. Military residents train alongside their civilian colleagues caring for critically ill and injured adult and pediatric patients. The training received here at UC Davis equips military residents with the clinical acumen and leadership skills necessary to arrive at their first duty station ready to care for military members and their families as well as provide world-class care to those deployed in harms way.

**What is the work-life balance like?**

One of the central pillars of the department is to help our residents "develop time and prac-

### UC DAVIS EMERGENCY MEDICINE SACRAMENTO, CA

**Social media handle(s):**  
@UCDavisEM

**Year founded:**  
1990

**Number of residents:**  
60 (20 per class)

**Program length:**  
Three years



PHOTOS: UC DAVIS SOCIAL MEDIA TEAM



**LEFT:** UC Davis EM residents and faculty enjoying a social event during ACEP2022.

**ABOVE:** UC Davis EM residents train during mass casualty training event.

tice management strategies and resiliency in order to maximize personal well-being." Wellness is at the core of the program. It is the very fabric that brings the program together and is evident on each and every shift. We take pride in truly making this a program for and about our residents. Shift length is 10 hours long with two hours of overlap to

allow for adequate patient disposition, sign-out, and to prevent residents having to stay beyond the end of their shift. This gives them more time and flexibility to get out and take in the beautiful sights, sunshine, and restaurants. They can hit the slopes in Tahoe, run, walk, jog, or bike one of the numerous hiking trails, visit one of the many national parks, or

go wine tasting in beautiful Napa Valley. Oh, and did I mention that we are the farm to fork capital of the world?

**How should potential applicants learn more about your program?**

Find our social media page by following us @UCDavisEM and our webpage [health.ucdavis.edu/emergency/education/residency/](https://health.ucdavis.edu/emergency/education/residency/)!

SEND YOUR THOUGHTS  
AND COMMENTS TO  
[ACEPNOW@ACEP.ORG](mailto:ACEPNOW@ACEP.ORG)

## THE BREAK ROOM



### Re: "Report on ED Diagnostic Errors Sparks Controversy"

What is needed here is not a response, but a retraction and a complete rewrite. Unfortunately, the damage has been done, and even a retraction will be mostly ignored. Bad science for the sake of headlines is worse than irresponsible.

— Myles Riner, MD

### Re: "The AHRQ Diagnostic Errors Study: A Peer Reviewer's Reaction"

Well, the more I read the responses of ACEP and other EM-associated organizations to the AHRQ/Hopkins study, the more embarrassed I am for emergency medicine. Even ac-

knowledging the flaws of the study, the defensive nature of many of those responses and the criticism of the messengers are what one might expect from the troglodytes at the AMA, not from our organization, that purports to have patient well-being and advocacy for them as a major focus.

In the interest of transparency, David Newman-Toker, one of the lead authors on the study, is a friend of mine as well as a former colleague on the board of the Society to Improve Diagnosis in Medicine. He and I have discussed the study on more than one occasion, and I conveyed to him that ACEP's and patients' interests would have been much better served by an acknowledgement of the magnitude of the problem of the frequency and severity of diagnostic errors and the associated harm in the course of emergency care, a description of what ACEP and others have been do-

ing to address the problem, our successes and our continuing focus on doing better.

A more reasoned response, like the one just published in *JAMA* (<https://jamanetwork.com/journals/jama/article-abstract/2801049>) would have been so much more responsible and helpful. What ACEP and its partners in this matter have done has only deepened animosity toward medicine and doctors while accomplishing nothing to improve diagnosis.

I think ACEP is on the wrong side of history in this matter, and I can't imagine that patients and families, so many of whom have stories about their own personal diagnostic misadventures in the ER (I do; do you?), will find the position of the College and its co-signers credible let alone admirable.

— David L Meyers, MD, MBE, FACEP





**Question:** A 67-year old man presents with painful red eye. What is the diagnosis?

- Acute angle-closure glaucoma
- Central retinal vein occlusion
- Dural venous sinus thrombosis
- Herpes zoster ophthalmicus
- Subconjunctival hemorrhage

**CONTINUED** on page 22

## TOXICOLOGY Q&A



# A Vision of Toxicity

by JASON HACK, MD

**Question:** Which plant's toxic sap causes mild conjunctivitis to severe keratouveitis and even blindness if contact occurs with your eyes?

**CONTINUED** on page 23

# Mild head injured patient expecting answers?



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# The New Mexico Bridge Program

Implementation of medication for opioid use disorder in rural emergency departments

by MARGARET GREENWOOD-ERICKSEN, MD, MSC;  
BRANDON WARRICK, MD; ERIC KETCHAM, MD;  
SALLYANNE WAIT, BSN; CINDY KETCHAM, BSN; JULIE  
SALVADOR, PHD

## New Mexico’s Struggle with Opioids

In 2020, New Mexico established the New Mexico (NM) Bridge—a new initiative to address the state’s rapidly rising opioid-overdose death rate. The NM Bridge partners with hospitals across New Mexico to initiate emergency department (ED) and hospital-based medication for opioid use disorder (MOUD) programs while assuring linkage to community treatment. MOUD programs improve long-term recovery and reduce risk of death by combining FDA-approved drugs with behavioral therapies for people diagnosed with opioid use disorder (OUD).<sup>1,2</sup> Brief intervention and facilitated referral to community-based treatment services is much needed in NM where the opioid overdose rate exceeds the national average, with overdoses reaching an all-time high in 2021 due to illicit fentanyl and exacerbated by the COVID-19 pandemic.<sup>3</sup> This is particularly concerning in NM, which is the fifth-largest state in the U.S. by land mass, is highly rural and poor, and has persistent behavioral-health workforce shortages.<sup>4,5</sup> We describe how NM Bridge partnered with rural hospitals to expand access for OUD treatment and behavioral-health workforce across a highly rural state with limited services.

## Multifaceted State Response

NM has significant need for OUD treatment, but an inadequate supply of prescribing clinicians.<sup>5</sup> To address high rates of opioid use and overdose, the state tripled spending and enacted significant policy changes to expand substance-use disorder (SUD) treatment providers, treatment, and harm-reduction strategies.<sup>6</sup> Yet, the number of prescribers remains low, particularly in rural NM. To address this, the state’s Behavioral Health Service Division allocated funding from the State Opioid Response (SOR) grant to establish the NM Bridge Program. NM Bridge focuses on training hospital physicians and nurses to identify and immediately treat patients using medications (e.g., buprenorphine) for opioid treatment in EDs and helping hospitals establish outpatient follow-up at time of discharge. As rural communities generally lack health care services, the local hospital is a primary treatment location.<sup>7</sup> Thus, NM Bridge’s focus on expanding prescribers in rural hospitals has an out-sized impact on access to medication-based OUD treatment in these communities.

## Medication for Opioid Use Disorder from the ED

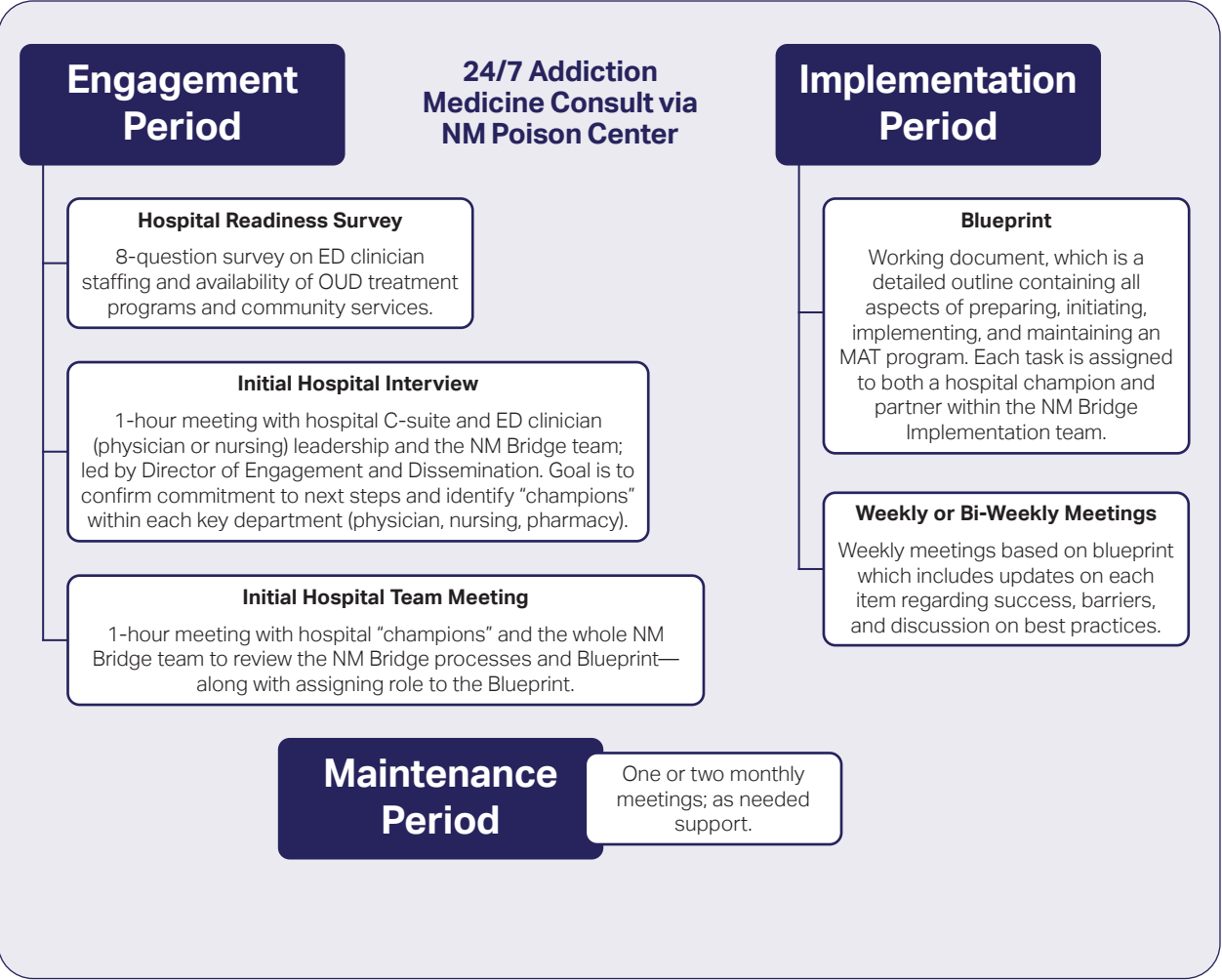
Core to the NM Bridge program is the implementation team, whose members have complementary knowledge within emergency medicine, primary care, addiction medicine, medical toxicology, billing/Medicaid reimbursement, nursing education, rural health, and peer support. Importantly, the majority of team members have expertise in providing care and implementing best treatment practices with rural clinicians. (Table 1). The implementation team guides partner hospitals from start to finish in establishing their ED-based MOUD program. The team engages other hospital units (e.g., inpatient and obstetrics) and establishes outpatient follow-up pathways for continued treatment with medication and therapy. Additionally, the NM Bridge established a 24/7 addiction-medicine consult service through the NM Poison Center, available to any clinician in New Mexico.

## The NM Bridge Process

Engaged hospitals were eligible for one year of funding to support the hospital and clinicians in establishing ED-based MOUD programs. Funding covered clinical time, educational opportunities, and trainings. One year of salary was available for a peer-support worker or social worker to link the patient to treatment in the community, improving follow-up.<sup>8</sup>

The NM Bridge process has three stages: engagement, implementation, and maintenance periods (Figure 1). Engagement

Figure 1. The New Mexico Bridge Process



focuses on initial outreach and confirmation of a hospital’s commitment to the program. Engaged hospitals demonstrate their commitment by completing an initial survey to identify current resources and gaps in care, assembling a team of champions including representatives from emergency physicians, nursing, social work, pharmacy, inpatient, and outpatient (Table 2), and submitting a budget to the Behavioral Health Service Division. In the implementation period, the implementation team and the hospital’s champions meet weekly, aligning their work to the NM Bridge’s blueprint (Table 3). During the maintenance phase, meetings typically move to once monthly, with the option to meet more often as needed to address any issues as they arise.

## Addressing Rural Disparities

The NM Bridge is designed to increase the number of prescribers and hospital staff who can treat OUD, increasing access to these services in rural New Mexico. Rural communities in NM face the highest rates of OUD overdose, which is increasingly impacting indigenous communities and rates are disproportionately high among the American Indian/Alaska Native (AI/AN).<sup>3,9</sup> Implementing MOUD programs at rural hospitals is challenging due to limited workforce, a lack of dedicated personnel for quality improvement, thin financial margins, and OUD-related stigma. NM Bridge addresses all of these barriers by supporting rural hospitals with a dedicated team using a hands-on approach of MOUD implementation with financial support and robust training.

Grant support is key and brings needed resources to rural hospitals. This includes the implementation team’s expertise, along with financing to hire a peer-support position or a social worker and to cover clinician and staff education time. Trainings address stigma and education across all clinician groups and are designed for the rural context. Through weekly meetings and hands-on partnership, the implementation team directly facilitates the local hospital’s implementation. As the rural outpatient ecosystem is fragile, a critical aspect of the program is assuring continued MOUD following ED or hospital discharge. The clinic/outpatient champion role is designed to address this rural-specific consideration by confirming outpatient follow-up. Further, hospitals identify a backup, communi-

## The NM Bridge Mission:

To assist New Mexico hospitals in creating a better life for people with opioid use disorder (OUD) by supporting development, implementation, and sustainability of programs that use medications for the treatment of OUD.

ty-based, OUD treatment program, and at minimum establish a relationship with a telemedicine service.

The maintenance period of the program brings an ongoing support system and 24/7 access to addiction-medicine consultation for difficult cases. The funding, training, comprehensive team approach, and the ongoing support makes NM Bridge effective in the rural space. Other largely rural states may wish to follow New Mexico’s lead, using (or applying for) SOR funding to expand rural SUD workforce through hospital- and ED-based treatments. The SOR grants address the opioid overdose crisis by increasing access to MOUD and support the continuum of care for OUD services.<sup>10</sup>

## Achievements

In the first two years of its funding, the NM Bridge successfully partnered with five hospitals and was written into the state’s 2022-2024 SOR initiative funding to continue their work. These five hospitals include three critical access hospitals, one Indian Health Service hospital, and one acute-care suburban hospital with a large rural catchment area. Several are highly rural—over 100 miles from the nearest tertiary care facility—and serve communities ranging from 20,000 to 70,000 persons. As NM Bridge enters its third year, three more hospitals—two rural referral hospitals and one Indian Health Service facility—have been confirmed.

## Pitfalls

Hospitals which initially engaged with NM Bridge but declined to fully pursue the program included one with an already ro-



bust MOUD program and two who felt they did not have front-line clinician support. One declined to engage, reporting disagreement that MOUD from the ED is standard of care. 📍

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**DR. KETCHAM** is board certified in both emergency medicine (ABEM) and addiction medicine (ABPM). He serves the New Mexico Bridge Project as the director of clinical implementation, and as an on-call addiction expert for the New Mexico Poison Control Center Opioid Use Disorder Helpline.

**SALLYANNE WAIT** is a board-certified nurse practitioner.

**CINDY KETCHAM** has been a registered nurse, practicing in New York, California, and New Mexico since 1989. She is also the director of nursing education for the New Mexico Bridge.

**JULIE SALVADOR** is an associate professor in the department of psychiatry and behavioral sciences, division of community behavioral health. she serves as the division's associate director, director of implementation science research, and director of team science.

Table 1. Implementation Team Roles and Responsibilities

ROLES	RESPONSIBILITIES
Engagement and Dissemination Director	Recruits hospitals to NM Bridge Website oversight and design Publication and dissemination of NM Bridge program
Director of Nursing Education	Nursing education and training on MOUD Education to implement train-the-trainer services
Director for Clinical Implementation	Leads hospital-NM Bridge meetings Directs the implementation of each partner hospital's MOUD program Primary contact for clinical questions
Director for Statewide Infrastructure Development	Oversees integration of NM Bridge within the related statewide institutions including the Poison Center to provide 24/7/365 free medical advice to the public and clinicians for SUD Collaboration with the Department of Health, DEA, Governor's Advisory Council, and City of Albuquerque crime taskforce
Director of Community Outreach	Guides hospitals in establishing outpatient pathways Assists hospital in creation of Peer Support Worker (PSW) position, including hiring, billing, supervision.
Clinical Director of Women's Health and Obstetrical Care	Guides hospitals in establishing obstetric-related treatment pathways and best practices
Project Director and Project Coordination	Oversees administration of NM Bridge Program Contracts to support Implementation Team and Hospitals Expertise working with rural providers Facilitates project communications, maintains website

Table 2. Implementation Team Roles and Responsibilities

ROLES	RESPONSIBILITIES
Project Champion	Guides entire project Liaison between champions, hospital administration, and NM Bridge.
ED Physician or APP Champion	Clinician lead in ER Clinician training coordination Can also be Project Champion
ED Nurse Champion	Nursing training coordination Leads nursing staff in education and supporting initiative
Pharmacy Champion	Buprenorphine (stocking, pharmacy and therapeutics) Order set building with project, provider, and nursing champion.
Inpatient Champion	Link hospital to outpatient
Clinic/Outpatient Champion	Link to outpatient setting from ED/hospital Establish pathways from ED/hospital to outpatient setting
Social Work/Peer Support Lead	Liaison between ED and outpatient setting Build interface with patient in the ED setting to assure support/warm hand-off for follow-up Oversee Peer Support Worker (PSW).

Table 3. Abbreviated NM Bridge Blueprint

ACTIVITY	HOSPITAL CHAMPION	IMPLEMENTATION TEAM MEMBER	DUE BY DATE
Identify project champions			
Develop project budget			
Identify hospital departments to be included			
Develop tracking mechanism for clinician X-waivers			
Schedule trainings—prescribers			
Schedule trainings—nursing			
Identify referral sites and processes for referral/linkage			
Decide on peer support hire—establish job description, job posting, supervision plan, integration with social work			
ED workflow—develop EMR order sets, take-home packets, peer support and referral/linkage orders			
Pharmacy—Approve buprenorphine via P&T committee, stock in ED with naloxone, update formulary			
Develop internal data tracking mechanism—patients approached, initiated, followed-up			
Billing—update chargemaster for MOUD treatment and billing codes for PSW			



# MOVING EMERGENCY MEDICINE AHEAD

The Emergency  
Medicine  
Data Institute

by JAMES AUGUSTINE, MD, FACEP;  
PAWAN GOYAL, MD, FAMI

Over the last 50 years, emergency departments (EDs) have become the hub of acute care, with relentless increases in patient volumes and unprecedented access to high level diagnostic technology and hospital resources, with the majority of patient visits paid by public funds. EDs have evolved in a relatively short time to become the *de facto* site for acute, unscheduled care. The development of data sources and recordkeeping has struggled to keep pace, with a resulting gap in the ability of policymakers and payors to structure surveillance methods, measure quality, and determine fiscal effectiveness.

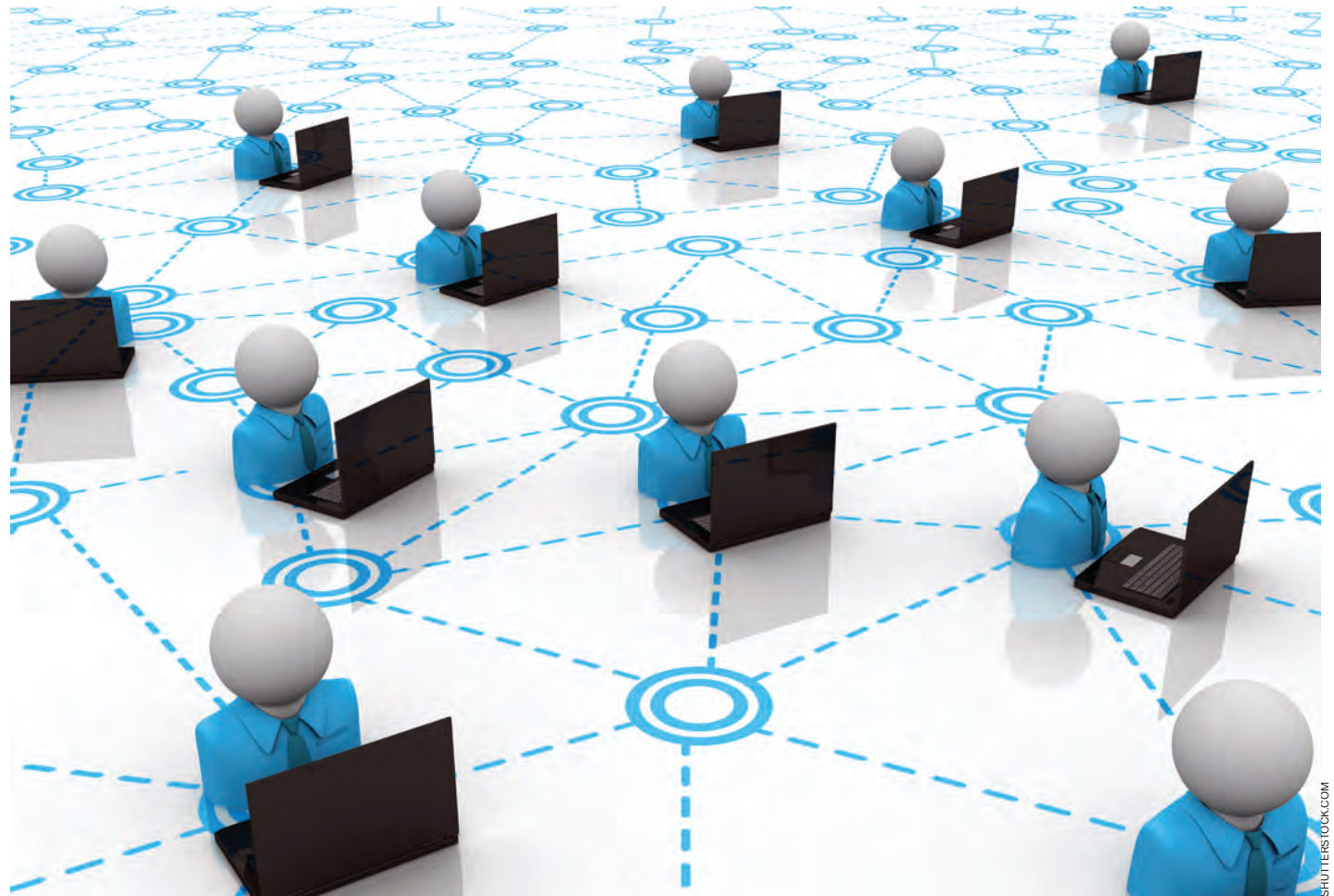
There are two sources of national data on ED visits. The Nationwide Emergency Department Sample (NEDS), performed by the Agency for Healthcare Research and Quality (AHRQ), is a portion of the Healthcare Cost and Utilization Project (HCUP). NEDS data is available from 2006 through 2020. The 2020 NEDS database year includes discharge data for ED visits from 995 hospitals located in 40 states and the District of Columbia, approximating a 20-percent stratified sample of U.S. hospital-owned EDs.

The other source is the Center for Disease Control and Prevention's (CDC's) National Center for Health Statistics (NCHS), which has conducted and released data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) since 1992. The ED component of the National Ambulatory Medical Care Survey (NHAMCS) has been a nationally representative survey of nonfederal, general, and short-stay hospitals that is conducted annually. NHAMCS uses a multistage probability design with samples of geographic primary sampling units (PSUs), hospitals within PSUs, and patient visits within EDs. The latest NHAMCS ED survey report is from 2020 and consists of 26 data tables that were constructed from NHAMCS data. The survey is based on a sampling of 14,860 ED patient case reports from 294 emergency departments

## Major Changes to Come: ACEP Working for You

The CDC's NCHS announced plans to update their ED data collection in coming years with the expansion of its NHCS, which collects ED data from a national sample of hospitals through the submission of UB-04 claims and EHR encounters for the entire calendar year. This is a change which reflects the importance of ED data. It has become even more important in following pandemic effects on ED visits, and creating dashboards that continue to track troubling impacts of infectious diseases, mental health care gaps, and increasing health care implications of substance use.

ACEP has been a driver of this change. ACEP has strongly supported the efforts of the CDC for the timely collection, analysis, and reporting of NHAMCS data, which supports emergency physicians and the changing practice of emergency medicine. The ACEP Qualified Clinical Data Registry—Clinical Emergency Data Registry (CEDR)—was launched in 2015



and has built secure data pipelines to a large nationwide network of EDs. The network has compiled structured and blinded data on more than 100 million ED visits and has become the primary submission source of standardized ED patient care data to the NCHS. The CDC has realized the efficiency and quality of this data source, and has begun to use this as a supplemental data source for their NHCS.

The NHAMCS ED component has been the national source of data on ED visit demographics, reason for visit, diagnostic or screening services, procedures, medication therapy, type of clinicians seen, diagnoses, and expected sources of payment. These data support trend analyses and are used to support national health care strategies, track gaps in health care delivery, and drive policies developed by the Centers for Medicare & Medicaid Services (CMS). For over 28 years, the survey clearly has tracked increasing use by vulnerable populations and socioeconomic barriers to the use of other sources of health care. Groups that have had significant increase in the use of emergency services include persons of color, Medicare and Medicaid beneficiaries, residents of the South and West, and women.

Despite incredible work in adapting to increased volumes and acuties, payers have exploited opportunities to discredit emergency physicians and other health care practitioners and reduce reimbursement for emergency care. This year alone, emergency medicine and emergency physicians are facing major practice challenges related to decreasing reimbursement, with the implementation of the *No Surprises Act* (NSA). Emergency physicians are working to develop models for value-based purchasing, including the Merit-based Incentive Payment System (MIPS) and MIPS

Value Pathways (MVP). There are also major coding and documentation guideline changes to ED evaluation and management services. Further, emergency physicians have had very inconsistent guidance on the application and reimbursement of telehealth in emergency care.

There must be a timely, reliable, and effective source of data for researchers, planners, and policymakers for the critical issues facing emergency medicine. NCHS has recognized that data in CEDR and other data collected by ACEP can be used as an important supplementary data source for their NHCS. ACEP members will recognize this as a huge testimonial to the College and will find value in how it ultimately supports bedside practice. As patients become older, sicker, and burdened by more chronic diseases, emergency physicians have been adaptable in using a broader range of diagnostics and treatments to deliver quality care. As mental health patients and those suffering ill effects of substance use have crowded into EDs, new strategies have evolved to guide care and increase the community application of out-of-hospital resources. And, emergency physicians have been extraordinarily resourceful in finding and sharing best practice information as COVID abruptly impacted communities.

The amalgamation of CDC and ACEP resources reflects the exciting transformation of CEDR into the Emergency Medicine Data Institute (EMDI). The Institute will offer insights for clinicians, researchers, and the administrators who oversee ED resources.

What are the early impact areas of the Institute collaboration?

- **Practice Trends:** Aging ED population and other demographic drifts
- **Surveillance:** Only possible with NCHS

and state/regional data source collaboration

- **Quality Improvement:** Adherence to quality measures, clinical protocols, and best practices across sites and over time
- **Clinical Decision Support:** For use of diagnostics, and treatment modalities, with bedside development and application
- **Linkages to other Datasets:** Including data registries for time-sensitive conditions

This is a dramatic opportunity for improving the future of emergency medicine by the application of digital tools, and the 160 million ED patients who are served each year. +



**DR. AUGUSTINE** is national director of pre-hospital strategy for US Acute Care Solutions based in Canton, Ohio; clinical professor of emergency medicine at Wright State University in Dayton, Ohio; and vice president of the Emergency Department Benchmarking Alliance.



**DR. GOYAL** is the Senior Vice President for Quality at the American College of Emergency Physicians.

**Stay updated on the development of the EM Data Institute by signing up for the interest list at [acep.org/emdi](https://acep.org/emdi).**



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- ACEP Guidelines 2022: Acute Heart Failure Management
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- Strokes, Mini-Strokes, and TIAs
- Holding Admitted Patients Worsens Outcomes
- Pearls from *Risk Management Monthly* - Part 1
- Pearls from *Risk Management Monthly* - Part 2
- Management of the SOB Child
- Airway Updates 2022
- ENT Pearls – I/D, Steroids, Antibiotics
- Procedures 2023
- Visual Diagnosis Challenges - Part 1
- Visual Diagnosis Challenges - Part 2
- Important Recent EM Literature - Part 1\*
- Important Recent EM Literature - Part 2\*
- ED Staffing and Operations Forum\*
- Diagnostic and Therapeutic Controversies\*

\*Topics listed with an asterisk (\*) are 90-minute faculty panel discussions; all other topics are 30 minutes.

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**Course Has Passed**

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# ACEP4U: What Are We Fighting for in 2023?

## ADVOCACY TEAM OUTLINES LEGISLATIVE PRIORITIES FOR THE 118TH CONGRESS

by RYAN MCBRIDE, ACEP CONGRESSIONAL AFFAIRS DIRECTOR

Every year, ACEP's Federal Government Affairs Committee and the ACEP federal advocacy team work together to establish an expansive list of goals and priorities that guide ACEP's work on Capitol Hill for the upcoming legislative session. When a new Congress convenes every two years, we reach out to every Member of Congress to share our top legislative priorities, which also form the basis for our in-person advocacy during the upcoming Leadership & Advocacy Conference (acep.org/lac).

For the 118th Congress, ACEP shared five key priorities with legislators:

### ED Boarding Crisis

We've heard from emergency physicians across the country about the emergency department (ED) boarding crisis. To illustrate the stark reality of this problem, we asked members to share examples of the life-threatening impacts of ED boarding. Your stories paint a picture of an emergency care system already near collapse, gridlocked, and overwhelmed with patients waiting to be seen. Those testimonials formed the basis of the advocacy campaign ACEP launched in December 2022 (acep.org/boarding), and helped inform a letter ACEP and 34 other organizations sent to President Biden in November 2022 urging the Administration to convene a summit of stakeholders from across the health care system to address this crisis.

There are many factors that contribute to ED boarding, but unprecedented and rising staffing shortages throughout the health care system have recently brought this issue to a crisis point, further spiraling the stress and burnout driving the current exodus of excellent physicians, nurses, and other health care professionals. We need a health care system that can accurately track available beds and other relevant data in real time, appropriate metrics to measure ED throughput and boarding, contingency plans and "load balancing" plans for boarding/crowding scenarios, fewer regulatory or other "red tape" burdens that delay necessary care, and more options for patients to receive the care they need and deserve in their communities.

ACEP's advocacy team knows all EDs are different, and there is no one-size-fits-all solution to this multifactorial problem. The College is developing a broad range of potential legislative and regulatory solutions to alleviate the burdens and overall strain on EDs caused by patient boarding. ACEP strongly urges Congress to facilitate urgent collaboration by bringing together key stakeholders through roundtables, committee hearings, and legislation to provide both short- and long-term solutions to this public health crisis.

### Workplace Violence

An August 2022 ACEP survey shows that ED violence is on the rise, and in addition to the physical, mental, and emotional toll of violence, contributes to growing job dissatisfaction and burnout and harms patient care. Unfortunately, public awareness of this problem remains a challenge. Videos of violent or unruly airline passengers often make their way across social media before the plane even takes off or lands, and authorities at all levels have stepped up enforcement of these crimes as a result, yet violence against emergency physicians and other health care workers remains essentially invisible to the public. But we cannot accept ED violence as "just part of the job"—violence in any other workplace is not tolerated, and it should not be tolerated in health care settings.

During the 117th Congress, ACEP supported two bipartisan bills to address workplace violence: the "Workplace Violence Prevention for Health Care and Social Service Workers Act," (H.R. 1195/S. 4182) as well as the "Safety From Violence for Healthcare Employees (SAVE) Act," (H.R. 7961). The *Workplace Violence Prevention for Health Care and Social Service Workers Act* would ensure that health care workplaces implement violence prevention plans and techniques and are prepared to respond to acts of violence, while the *SAVE Act* would establish federal legal penalties for individuals who knowingly and intentionally assault or intimidate health care workers and provide grants to help hospitals and medical facilities establish and improve workplace safety, security, and violence prevention efforts. ACEP is hopeful these bills will be reintroduced soon, and continues working to identify other possible policy solutions to address this growing problem.

### Mental Health Care Access

At the end of the 117th Congress in December 2022, Congress took some important steps to improve access to mental health and substance use disorder services and care. Unfortunately, far too many Americans still have limited options for the longer-term follow-up mental health treatment they need and deserve, leaving many individuals with nowhere else to turn but the ED. Recognizing these challenges, many communities have adopted alternative models to improve emergency psychiatric care and reduce psychiatric patient boarding.

To ensure that communities can implement models that best fit their needs, ACEP helped develop and supports the bipartisan "Improving Mental Health Access from the Emergency Department Act." This legislation would provide funding to help communities implement and expand programs to expedite transition to post-emergency care through expanded coordination with regional service providers, increase the supply of inpatient psychiatric beds and al-

ternative care settings, and expand approaches to psychiatric care in the ED to include telepsychiatry, peak period crisis clinics, or dedicated psychiatric emergency service units. This legislation was passed by the House of Representatives during the 117th Congress, but was not considered by the Senate. ACEP is working with the sponsors of this bill and are hopeful it will be reintroduced in the very near future.

ACEP is also strongly urging Congress to continue working to address physician mental health as part of larger policy efforts. Thanks to your advocacy, in 2022, the *Dr. Lorna Breen Health Care Provider Protection Act* (P.L. 117-105) was signed into law, establishing new programs and providing critical resources to address physician and health care worker mental health and burnout. ACEP continues working with legislators to keep up this critical effort, and is urging Congress to ensure this law honoring the life and legacy of Dr. Breen receives the funding it needs.

### Reauthorizing the Pandemic and All-Hazards Preparedness Act

If there is one thing the experience of the COVID-19 response has shown, it's that more steps are needed to improve our emergency preparedness infrastructure on all fronts. Congress addressed many pandemic-related needs in the recent year-end package, but the upcoming reauthorization of the *Pandemic and All-Hazards Preparedness Act* (PAHPA) provides another opportunity to improve our nation's disaster preparedness plans and infrastructure. As Congress begins the reauthorization effort (its current authorization expires Sept. 30), we are asking them to consider:

- Developing a robust, coordinated national trauma and emergency preparedness system that can provide awareness of resources and surge capacity throughout the health care system;
- Additional efforts to incentivize and operationalize domestic production of essential emergency medications, equipment, and PPE and ensure that distribution of these resources is prioritized for frontline clinicians and first responders;
- Reauthorization of the successful MISSION ZERO program that awards grants to enable military trauma care teams to provide care at civilian trauma centers;
- Protecting our emergency response systems and infrastructure from cyberattacks and other potential vulnerabilities; and
- Promoting research through the NIH's Office of Emergency Care Research (OECR) to foster basic, translational, and clinical research and research training for the emergency setting.

### Medicare's Promise to Seniors

The annual issue of steep cuts to Medicare physician payments cuts threatens the viability of the health care safety net and puts patient ac-

## Come to LAC23 to Give Voice to These Issues

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You may think your individual voice can't move the needle. In reality, your firsthand stories and experiences make our key advocacy issues come to life for legislators. When they hear from you, it stops being an abstract problem and becomes a real, tangible issue they need to address. LAC training teaches you how to share your personal experiences in a way that makes a positive impact for your specialty. You'll come home empowered to keep advocating for change at every level, from your facility to your state and beyond. Register today at [acep.org/lac](https://acep.org/lac). Save \$100 with promo code POWERUP. ➕

cess at risk. We support efforts to provide greater stability and certainty in this system instead of the current perennial task of finding costly, short-term fixes for long-term problems.

ACEP believes the physician community can help deliver on the promise of the *Medicare Access and CHIP Reauthorization Act* (MACRA) that repealed the flawed Sustainable Growth Rate (SGR) formula, and that with improvements, MACRA can be significantly more effective in facilitating the transition to value-based care delivery. It does not necessitate the wholesale dismantling of the current system, it but does require more regular oversight and iteration to attain a sustainable payment system that truly incentivizes high-quality, cost-effective care—and importantly, it must ensure that emergency physicians and other physician specialties are meaningfully integrated as collaborators.

ACEP shared our recommendations for improving the Medicare physician payment system and MACRA in a response to a congressional request for information (RFI) in October 2022. We will continue to work with Congress to identify long-term, substantive reforms and have urged Congress to hold hearings and roundtables to explore potential solutions that will guarantee the stability and security of the Medicare program for future generations. ➕

**RYAN MCBRIDE** is Director of ACEP's Congressional Affairs.





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**PAUL E. PEPE, MD, MPH, FACEP, MCCM, MACP, FAEMS, FRCP**  
Division Lead for Health Security and Event Medicine, Sequel Tour Solutions

**D**uring the day, Dr. Paul E. Pepe focuses on directing EMS medical response for Dallas County, Texas, and several special operations/tactical agencies. But at night, Dr. Pepe's medical expertise extends to a new arena—literally. He is a trailblazer and expert in the field of mass-gathering medicine, including serving as the lead physician for global tours with rock bands such as U2.

There's no typical day when responsible for hundreds of touring personnel traveling from one country to the next. Sometimes he's supporting efforts at local hospitals to treat ill or injured crew members. Other times, he's creating advance plans to optimize preparedness and response for any number of incidents that could happen during a show, whether that's stroke or heart attack, trauma, burn, crowd crush, lightning strike, mass casualty incident, or countless other scenarios.

Early in his career, he became the first full-time EMS medical director in Houston and published a significant portion of the research that informed EMS best practices as it evolved into the largest recognized sub-specialty of emergency medicine.

He also held roles in disaster and tactical response for Hurricane Katrina, the Parkland, Florida school shootings, and other activities that led to the opportunities to be part of the concert tours and career-spanning alliances with the U.S. Secret Service and White House medical unit.

"EMS and tactical backgrounds make crowd management and mass casualty incident preparedness second nature," Dr. Pepe said. His work with the concert tours is unpredictable, and he said it's important to remain nimble. "I could be navigating air quality concerns, altitude challenges, and even emerging infectious disease threats."

This aspect of event medicine can be challenging. There's little, if any, ready-made guidance for mass gathering events that travel around the globe, and it's hard work that involves a major time commitment away from family and friends. Would-be touring physicians should con-



PAUL E. PEPE

sider extended apprenticeships and be sensitive to the unique cultural and philosophical differences that can impact medical response in different countries, Dr. Pepe advises.

On tour, he can face health risks of his own—many sleepless nights, regular contact with hundreds of people and traveling in close quarters. The rewards outweigh those risks, he said. Being part of the team that facilitates iconic musical performances is the thrill of a lifetime. As he walks the barricade separating thousands of jubilant fans from their musical heroes, he gets to witness sheer elation.

"Being part of a team that brings such joy to others is priceless," he said. 🎧

## Career Path

Before he started specializing in event medicine, disaster response and homeland security in the 2000s, Dr. Pepe got experience in other areas of emergency medicine:

- » **1970s**—Worked as an ICU physician before transitioning to "street doctor."
- » **1980s**—Became the nation's first full-time EMS medical director.
- » **1990s**—Worked as an EM professor and chair.

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# ACEP Clinical Policy on Mild Traumatic Brain Injury

Answering three critical questions representing current interest or controversy

by JONATHAN VALENTE, MD, FACEP

**O**n February 1, 2023, the ACEP Board of Directors approved a clinical policy developed by the ACEP Clinical Policies Committee on critical issues in the management of adult patients presenting to the emergency department (ED) with mild traumatic brain injury (mTBI). This clinical policy will be published in the May 2023 issue of the *Annals of Emergency Medicine*, and can be found on ACEP's website, [acep.org/patient-care/clinical-policies/](https://acep.org/patient-care/clinical-policies/), and will also be included in the ECRI Guidelines Trust, [ecri.org/solutions/ecri-guidelines-trust](https://ecri.org/solutions/ecri-guidelines-trust), upon its acceptance.

Traumatic brain injuries affect the lives of millions of Americans and represent a serious healthcare challenge for emergency department clinicians. Approximately 70 percent to 90 percent of patients presenting to the ED with a head injury and traumatic brain injury will be diagnosed with mTBI. While most patients with mTBI are treated and discharged from the ED, an estimated five percent to 15 percent of patients with head injury will have intracranial injuries on imaging and be classified as having moderate or severe traumatic brain injury. Roughly one percent of patients classified as having more severe traumatic brain injury will require surgical intervention and 0.1 percent will die. This clinical policy is intended to help improve the evaluation and management of patients with mild traumatic brain injury who present to an emergency department by answering three critical questions representing current interest or controversy.

Based on feedback from ACEP membership, the Clinical Policies Committee conducted an updated systematic review of the literature to assess any needed changes to the 2008 clinical policy and to determine whether there was a need for additional evidence-based recommendations. After a thorough review of the literature, the topics of the 2008 clinical policy were updated or readdressed for this 2023 clinical policy. This 2023 clinical policy focuses on emergent mTBI research related to clinical decision tools, patients using anticoagulant or antiplatelet medication, and postconcussive syndrome (PCS).

## Critical Questions and Recommendations

**1. In the adult ED patient presenting with minor head injury, are there clinical decision tools to identify patients who do not require a head CT?**

### Patient Management Recommendations

**Level A recommendations.** Use the Canadian CT Head Rule (CCHR) to provide decision support and improve head CT utilization in adults with a minor head injury.

**Level B recommendations.** Use the Na-

tional Emergency X-Radiography Utilization Study (NEXUS) Head CT decision tool (NEXUS Head CT) or the New Orleans Criteria (NOC) to provide decision support in adults with minor head injury; however, the lower specificity of the NEXUS Head CT and NOC compared with CCHR may lead to more unnecessary testing.

**Level C recommendations.** Do not use clinical decision tools to reliably exclude the need for head CT in adult patients with a minor head injury on anticoagulation therapy or antiplatelet therapy exclusive of aspirin.

### Resources

- Canadian CT Head Rule: <https://www.mdcalc.com/canadian-ct-head-injury-trauma-rule>
- New Orleans/Charity Head Trauma/Injury Rule: <https://www.mdcalc.com/new-orleans-charity-head-trauma-injury-rule>
- NEXUS Head CT: <https://bit.ly/NEXUSH-eadCT>

**2. In the adult ED patient presenting with minor head injury, a normal baseline neurologic examination, and taking an anticoagulant or antiplatelet medication, is discharge safe after a single head CT?**

### Patient Management Recommendations

**Level A recommendations.** None specified.

**Level B recommendations.** Do not routinely perform repeat imaging in patients after a minor head injury who are taking anticoagulants or antiplatelet medication and are at their baseline neurologic examination, provided the initial head CT showed no hemorrhage.

Do not routinely admit or observe patients after a minor head injury who are taking anticoagulants or antiplatelet medications, who have an initial head CT without hemorrhage, and who do not meet any other criteria for extended monitoring.

**Level C recommendations.** Provide instructions at discharge that include the symptoms of rare, delayed hemorrhage after a head injury (consensus recommendation).

Consider outpatient referral for assessment of both fall risk and risk/benefit of anticoagulation therapy (consensus recommendation).

### Resources

Discharge instructions and other materials for patients

- CDC Mild Traumatic Brain Injury and Concussion: Information for Adults: [https://www.cdc.gov/traumaticbraininjury/pdf/TBI\\_Patient\\_Instructions-a.pdf](https://www.cdc.gov/traumaticbraininjury/pdf/TBI_Patient_Instructions-a.pdf)
- CDC educational materials for adults with mTBI: [https://www.cdc.gov/traumatic-braininjury/mtbi\\_guideline.html](https://www.cdc.gov/traumatic-braininjury/mtbi_guideline.html)

Fall risk screening and assessment for clinicians and fall prevention materials for patients

- CDC Algorithm for Fall Risk Screening, Assessment & Intervention: <https://www.cdc.gov/steady/pdf/STEADI-Algorithm-508.pdf>
- CDC fall prevention materials for patients: <https://www.cdc.gov/steady/patient.html>
- CDC Stay Independent Brochure: <https://www.cdc.gov/steady/pdf/STEADI-Brochure-StayIndependent-508.pdf>

**3. In the adult ED patient diagnosed with mild traumatic brain injury or concussion, are there clinical decision tools or factors to identify patients requiring follow-up care for PCS or to identify patients with delayed sequelae after ED discharge?**

### Patient Management Recommendations

**Level A recommendations.** None specified.

**Level B recommendations.** None specified.

**Level C recommendations.** Consider refer-

ral for patients with PCS and the following potential risk factors: female sex; previous preconcussive psychiatric history; GCS score <15; etiology of assault, acute intoxication; loss of consciousness; and pre-injury psychological history such as anxiety/depression.

Do not use current diagnostic tools (including biomarkers) to reliably predict which patients are at risk for PCS.

Provide concussion-specific discharge instructions and selected outpatient referrals of patients at high risk for prolonged PCS (consensus recommendation).

### Resources:

Discharge instructions and other materials for patients

- CDC Mild Traumatic Brain Injury and Concussion: Information for Adults: [https://www.cdc.gov/traumaticbraininjury/pdf/TBI\\_Patient\\_Instructions-a.pdf](https://www.cdc.gov/traumaticbraininjury/pdf/TBI_Patient_Instructions-a.pdf)
- CDC educational materials for adults with mTBI: [https://www.cdc.gov/traumatic-braininjury/mtbi\\_guideline.html](https://www.cdc.gov/traumatic-braininjury/mtbi_guideline.html)

## Translation of Classes of Evidence to Recommendation Levels

In accordance with the strength of evidence for each critical question, the subcommittee drafted the recommendations and supporting text synthesizing the evidence using the following guidelines:

**Level A recommendations.** Generally accepted principles for patient care that reflect a high degree of scientific certainty (eg, based on evidence from one or more Class of Evidence I or multiple Class of Evidence II studies that demonstrate consistent effects or estimates).

**Level B recommendations.** Recommendations for patient care that may identify a particular strategy or range of strategies that reflect moderate scientific certainty (eg, based on evidence from one or more Class of Evidence II studies or multiple Class of Evidence III studies that demonstrate consistent effects or estimates).

**Level C recommendations.** Recommendations for patient care that are based on evidence from Class of Evidence III studies or, in the absence of adequate published literature, based on expert consensus. In instances where consensus recommendations are made, "consensus" is placed in parentheses at the end of the recommendation. Ⓢ



**DR. VALENTE** is an emergency physician and a national committee member of both the ACEP Pediatric Emergency Medicine Committee and ACEP Clinical Policies Committee.



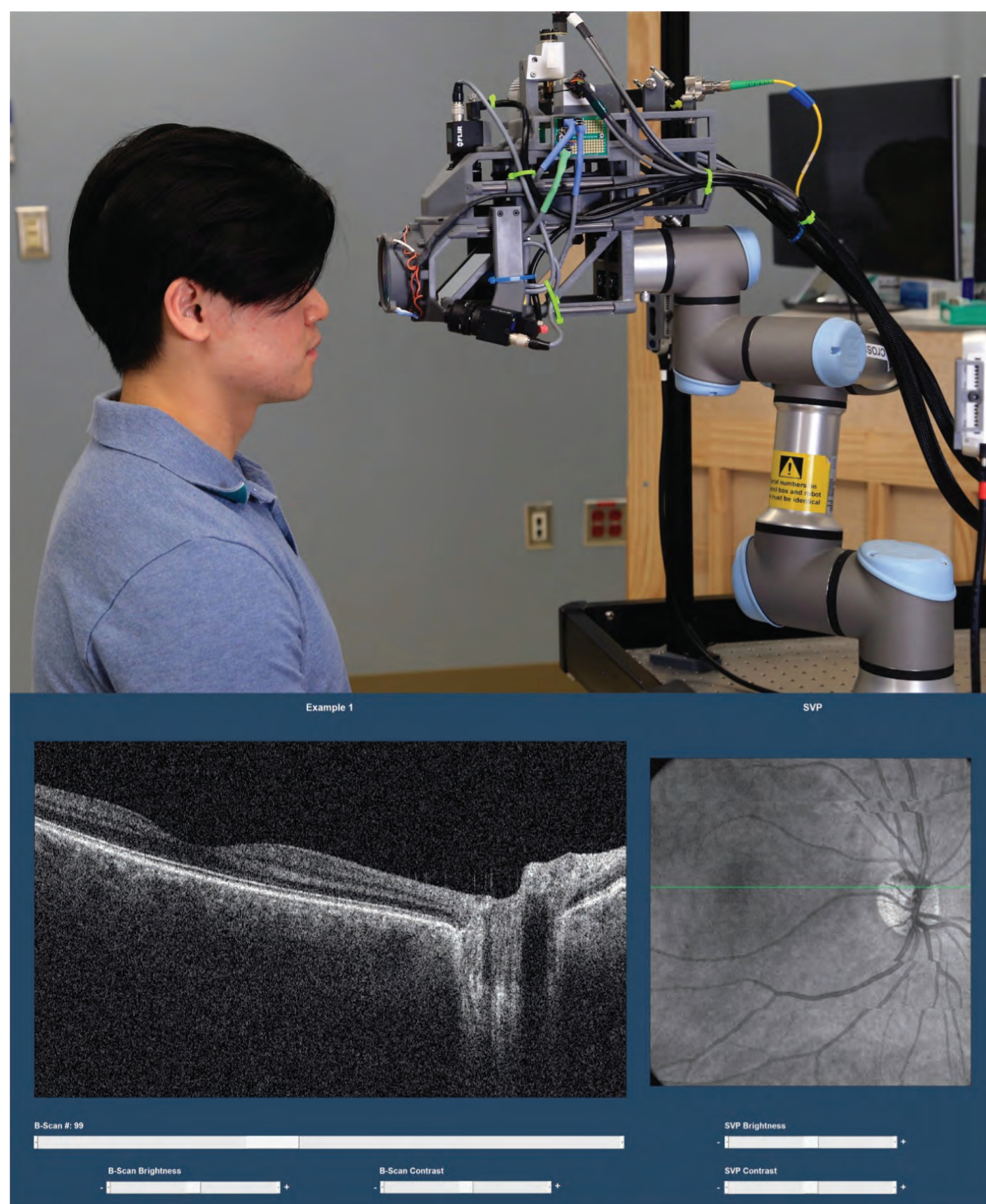
cisely to get a glimpse of the posterior eye. The examination also requires the clinician to get very close to the patient's face, and the bright light can cause discomfort to patients who are photosensitive.

The difficulty of performing the examination and the difficulty of interpreting the findings together limit the real-world utility of this standard-of-care examination technique. Some emergency physicians have adopted newer methods such as fundus photography and ocular ultrasound, but these techniques take time and practice to master. A method of evaluating the posterior eye which could be reliably interpreted by emergency physicians without necessitating extensive prior training would fill an important practice gap.

A pilot study conducted by Song, et al., potentially offers hope to emergency physicians struggling to evaluate the posterior eye, through the use of a robotic eye-imaging device.<sup>2</sup> This device was developed by a collaborative team of clinicians and researchers in biomedical engineering, emergency medicine, and ophthalmology at Duke University, and the robotic eye imaging is based on optical coherence tomography (OCT). OCT is an imaging technique widely used in ophthalmology for high-resolution, cross-sectional imaging of the eye. Historically, the use of OCT has been confined to ophthalmology clinics, as manual OCT image acquisition is a fine skill that requires specialized personnel such as ophthalmic photographers. Now with the help of a robot, emergency physicians may also be able to leverage the power of this state-of-the-art imaging technology to diagnose eye diseases.

Image acquisition with the robotic OCT device is as simple as taking a picture with a digital camera: with the press of a button, the robotic OCT device can find the eye autonomously, track any patient and eye movement in real time, and take an image of the posterior eye. Users can visualize cross-sectional views of the retina and optic nerve easily on a computer (Figure 1). Overall, the need for human operation is minimized. In fact, the study reports that the operator was able to control the system remotely (in a separate room from the patient), suggesting the potential for telehealth capabilities in the future. In a busy emergency department, the robotic OCT device could be used to obtain high-quality images of the posterior eye quickly without requiring dedicated, specially trained staff to operate the device. The telehealth capabilities of the device also raise the possibility that these devices could be deployed to rural or outlying EDs where access to both specialized equipment and personnel for ophthalmic examinations are especially limited.

Importantly, the study suggests that OCT may be of real diagnostic value to emergency physicians. Though most emergency physicians are likely not familiar with the interpretation of OCT images, the nine emergency physicians who participated in the study quickly learned to differentiate abnormal from normal images after a 30-minute training session on the basics of ocular OCT. They were able to interpret the OCT images with 100 percent sensitivity for urgent or emergent abnormalities and 69 percent sensitivity for any posterior eye abnormality when evaluated against reference-standard diagnosis based on a com-



**Figure 1:** Robotic optical coherence tomography (OCT) device (top) and screenshot of OCT viewing software (bottom) showing a cross-sectional OCT image (left) at the level of the green line in the head-on projection (right), which shows the view of fundus examination.

bination of ophthalmology-consultation diagnosis and retina-specialist OCT review. These results were in stark contrast to emergency physician-performed direct ophthalmoscopy, which did not detect any abnormalities in the same patients. As patients with urgent and emergent eye conditions often experience delays in care and subsequent worse outcomes in current clinical practice, these pilot study results indicate that this new technology has the potential to substantially improve the quality of acute eye care by facilitating more accurate ophthalmology referral decisions.

Among the 72 eyes imaged with the robotic OCT device, emergency physicians assessed a broad range of urgent and emergent retinal and optic nerve pathologies such as papilledema, retinal detachment, and retinal vascular occlusion. The three-dimensional nature of OCT imaging makes the detection of these pa-

thologies substantially easier, compared with the two-dimensional view provided by fundus examination. For example, optic disc edema that looks subtle on fundus examination can be obvious on OCT, as elevation of the optic nerve head caused by swelling is readily appreciable in cross sections.<sup>3</sup>

Currently, the robotic OCT device is still investigational and not commercially available, but this novel technology shows promise in expanding the ability of emergency physicians to diagnose conditions affecting the posterior eye accurately and efficiently. 📌

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**Dr. Song** is a fourth-year medical student at Duke University. Her research focuses on developing and translating innovative technologies such as robotics and machine learning to improve eye care in non-ophthalmology settings including the emergency department.



**Dr. Kuo** is an associate professor of ophthalmology and assistant professor of biomedical engineering at Duke University.

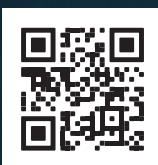


# Hidradenitis suppurativa

## HS hides in the shadows

### TOGETHER, WE CAN CHANGE THAT

Under-recognized and undiagnosed, patients with HS may suffer an average of up to 10 years before accurate diagnosis.<sup>1-3</sup> Meanwhile, HS may wreak havoc, causing irreversible scarring, debilitating pain, and emotional burden.<sup>2-5</sup> If your patient suffers from recurring or persistent abscesses at flexural sites, consider referring them to a dermatologist. This may be HS.



Learn more about recognizing  
HS and referral options at  
[HS-Awareness.com](https://www.hs-awareness.com)



 NOVARTIS

Patient portrayal.

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# Resident Intensive Care Unit Stories

As the senior resident physician in the ICU, my moral compass spins wildly every day

by ABRAHAM TAUB, DO

## Mr. Rogers\*

Today, I am leading the team this morning in the intensive care unit (ICU) when we walk into the room of Mr. Rogers. Mr. Rogers is a 64-year-old gentleman with a past medical history of sarcoidosis, a disease that damaged his lungs over the course of many years to the point where he can no longer walk more than a few steps before running out of breath. Mr. Rogers has been living in a nursing home for the past few years, tired and fatigued, stuck in bed all day, with trips in and out of the hospital becoming more frequent every time his breathing worsens. In fact, he has been to the ICU several times over the past three months, and it has always been the same routine: Mr. Rogers has trouble breathing, is taken to the hospital where he needs to be sedated to have a breathing tube placed down his throat, is connected to a ventilator for the machine to breathe into his lungs, and then feels better after a few days. At this point we wake him up and take out the tube so he can breathe again without the machine ... until the next time he runs out of breath.

But this time it is different. Mr. Rogers has already been on the ventilator for more than a week and his breathing is not getting any better. His body is fatigued, and his lungs are so stiff that he is simply unable to take a breath on his own. We have stopped the sedatives and have woken him up, and we are testing his strength by pausing the machine for a few seconds, but Mr. Rogers is not taking any breaths on his own. He is alert, awake, with the tube in his throat, the machine pushing air into his lungs, and too fatigued to simply take a breath.

Mr. Rogers can communicate by nodding his head or moving his hands, and his misery is apparent from his facial expressions. The next step in his care would be to perform a surgical tracheostomy, cutting a hole into his neck so that a breathing tube can go directly into the lungs, but Mr. Rogers makes it very clear that he does not want the surgery. Having been stuck in bed for the past few months, he does not want to be kept alive by a breathing machine.

This morning Mr. Rogers's family gathered around his bed. The priest administered last rites, and his daughter held his hand as I motioned for the respiratory therapist to follow the wishes of Mr. Rogers and his family to pull out the breathing tube from his mouth. Together we stand there as the machine gives Mr. Rogers one last breath before the tube is pulled out. Mr. Rogers does not have the strength to take any breaths on his own. I ask the nurse to increase the dose of his intravenous pain medications so he does not suffer any discomfort gasping for air, and 10 minutes later I pronounce Mr. Rogers dead.

You see, this is the United States, where patients have rights and physicians are obligated to follow the goals of care outlined by their patients. Mr. Rogers's mental status was sharp. He had good insight into his condition and his poor prognosis. He had the capacity to make medical decisions, and he very specifically requested to be liberated from this misery rather than staying alive, dependent on machines.



## Mrs. Rosenberg

Moving onto the next room is our patient Mrs. Rosenberg. Mrs. Rosenberg is a 93-year-old great-grandmother who suffered a massive stroke that paralyzed her whole body and took away her consciousness, so she is being kept alive by a ventilator. Mrs. Rosenberg's family is Orthodox Jewish, and their Rabbi advised them that every moment lived on this earth is a precious gift from God and all human life is equally sacred regardless of the quality of life experienced by the individual. Mrs. Rosenberg's children would like for their mother to have a surgical tracheostomy for a tube placed in her neck so that she can stay alive on the breathing machine for as long as possible.

Unfortunately, Mrs. Rosenberg has an unusually short neck, and the surgeon at our hospital is uncomfortable performing the procedure because the anatomy of her neck will require the tracheostomy to be placed almost into her chest. She will need to be transferred to a larger tertiary-care center, where a thoracic surgeon can cut down a part of her breastbone to make room for the permanent breathing tube. After that, Mrs. Rosenberg will be transferred to a long-term-care facility, where she will be in bed on a breathing machine for the rest of her life, unable to move any part of her body, unresponsive.

You see, this is the United States, where patients have rights and physicians are obligated to follow the goals of care outlined by the family of their patient who is unable to make decisions on their own. Mrs. Rosenberg is in a coma, unable to speak for herself, and her family members at the bedside all unanimously agree that she should undergo any procedure available to prolong her life.

## Mrs. Jones

Continuing our rounds, we move down the hallway and enter the room of Mrs. Jones. Mrs. Jones is only 29 years old, mother of two little children and wife to a dedicated husband. She is here in the ICU for internal bleeding. We fi-

nally stopped the bleeding this morning, but Mrs. Jones lost a lot of blood. Her blood levels remain critically low, and we are unable to replace it with a blood transfusion. Mrs. Jones is a Jehovah's Witness, and her religion teaches that blood is a gift of life from God that cannot be accepted from another human being. Mrs. Jones will not sacrifice her religious beliefs, and her blood levels have dropped too low for any treatments other than a transfusion to be effective.

You see, this is the United States, where patients have rights and physicians are obligated to follow the goals of care outlined by their patients. Mrs. Jones has good insight into her condition and understands her poor prognosis. She has the capacity to make medical decisions, and she is requesting to exercise her right to religious freedom. Friends and family are at the bedside holding her hand while Mrs. Jones takes her last breath before we put her on a breathing machine. Later that afternoon, we watch as her young children become orphans because there is no longer anything else we can do to save her life without giving her blood.

## Mr. Scott

Finally, we enter the room of Mr. Scott. Mr. Scott is a 53-year-old who is here in the ICU after shooting himself in the face. Mr. Scott has been struggling with depression exacerbated by other mental illnesses. He spent many of his teenage years in juvenile detention and most of his adult life going in and out of prison for a variety of petty crimes. He has no family to support him. He spends most of his time alone in an abandoned apartment. After two unsuccessful attempts at suicide by overdosing on his medications, he shot himself instead. The bullet took a wrong turn and destroyed his face, while his brain remained intact. A neighbor called the police after hearing the gunshot, and Mr. Scott now is kept alive on a breathing machine through a tube in his neck. He still has some remnants of what used to be a nose and cheeks, and the surgeon expects six to eight surgeries over the next few months to

restore what will again resemble a face.

Mr. Scott is awake. He has good insight into his condition and understands his prognosis. He is expected to make a good recovery after all the surgeries, although with a distorted face, a hole in his neck for breathing, and a hole over his stomach for feeding. He is begging us to remove the breathing machine now, while his body still depends on it, so that he can pass away in peace, but we are keeping him alive because he does not have the capacity to make medical decisions.

You see, this is the United States, where patients have a right to live and physicians are obligated to preserve life for patients who do not have the capacity to make their own decisions. Mr. Scott's suicidal thoughts indicate *by definition* that his mind is not functioning properly, and he therefore does not have the capacity to make medical decisions. We are keeping Mr. Scott alive until he recovers and can be removed safely from the machines to experience the precious gift of life. Or would it be more humane to follow his wish and remove him from the ventilator now?

## Difficult Decisions

My moral compass's needle can't find true North in these cases. My training taught me that there is a correct solution to every question, even the hardest ones. But sometimes, in the United States, we physicians must aid patients and their families in carrying out solutions that we would never choose for ourselves. ☹



**DR. TAUB** is an emergency physician at Ezras Cholim Health Center.

*\*All the names in this article have been changed to protect patient privacy.*



**OPEN LETTER** | CONTINUED FROM PAGE 1

we have a responsibility to help make that happen. Though I sincerely doubt anything would have changed the outcome from the protracted and deliberate attack on and withholding of care from Mr. Nichols, our advocacy now could prevent future similar deaths.

Medical oversight of EMS is part of the core curriculum of emergency medicine. The recognition of EMS Medicine as a subspecialty of emergency medicine shows clearly that pre-hospital care standards are directly created by our expertise. This promotes best practices and evidence-based care for the millions of patients treated each year by EMS, while creating ongoing quality assurance and improvement.

According to the United States Department of Justice, every year close to a quarter of the U.S. population have contact with the police. Initiated by citizens, police officers, or some other factor, these interactions revolve around criminal activity, traffic accidents, calls for law enforcement aid, and medical emergencies, among a myriad of other societal incidents. While most law enforcement officers are trained in basic first aid, CPR, and AED use, many lack a more formalized medical skill-set to recognize and address significant illness or injury.

Though many private and government agencies offer tactical medical training (designed to optimize treatment in the austere environment) there is no broad consensus on what that training best entails. To summarize: despite often being the first point of patient



contact in medical and high-threat emergencies such as overdoses, shootings, domestic violence, and mass casualty events, law enforcement officers have limited medical training, often with little to no medical oversight.

The ACEP Tactical Emergency Medicine Section, with over 400 members, has served as an enthusiastic resource for emergency physicians working to improve medical care

during law enforcement training and operations. Policing, like medicine itself, is a noble profession where men and women in uniform put themselves at risk to help others. Our section members have long recognized that the medical opportunities towards optimizing law enforcement officer medical aid abilities go far beyond the support of SWAT and other police special operations units.

Based on our input, the ACEP Board of Directors approved a change in the section name to Tactical and Law Enforcement Medicine, better reflecting this breadth to include self- and buddy-care development and training, patrol officer medical needs, officer health and wellness, recognizing and managing psychiatric and other emergencies to include hyperactive delirium with severe agitation, and the medical role of law enforcement in mass killing events.

While we do not know how it will ultimately manifest (fellowship, focused practice designation, etc.), we have already initiated the journey towards Tactical and Law Enforcement Medicine becoming formally recognized as a unique subspecialty of emergency medicine. It is our belief that law enforcement agencies should integrate physician medical directors in the manner of EMS, to the benefit of the agency, the individual officers, and ultimately the citizens they serve.

Emergency physicians assess many determinants of health daily, including poverty, racism, addiction, gun violence, and other conditions, exploring how we can best address these issues towards ensuring a safer, healthier, and more just society. Police officers deal first-hand with these same social determinants of health every day in their duties. What better place for ACEP to start making a difference than at this shared ground level? We owe it to police, to the citizens they serve, and to our patients to assume the needed leadership role in Law Enforcement Medicine and put a stop to any preventable in-custody deaths. +



**DR. SPRINGER** is Chair of the ACEP Tactical and Law Enforcement Medicine Section, and Director of the Wright State University Division of Tactical Emergency Medicine in Dayton, Ohio.

# By the Numbers

## PEDIATRIC MENTAL HEALTH VISITS

**107** emergency departments (EDs) sampled by the Clinical Emergency Data Registry (CEDR)

IN 29 STATES MEDIAN ED VISIT VOLUME IN 2020 WAS

**29,662**

### MOST COMMON DIAGNOSTIC CATEGORIES INCLUDE:

- ▶ Suicide or self-injury
- ▶ Depressive disorders
- ▶ Mental health symptom
- ▶ Disruptive, impulse control, and conduct disorders
- ▶ Anxiety disorders
- ▶ ADHD
- ▶ Trauma and stressor-related disorders

LENGTH OF STAY (LOS) GREATER THAN 24 HOURS

**7.3%**

Pediatric mental health visits

VERSUS

**0.2%**

Pediatric non-mental health visits

OUT OF 2.9 MILLION ED VISITS

**11%**

Pediatric

**7%**

Pediatric mental health-related

MEDIAN PEDIATRIC AGE

**15** YEARS OLD

SOURCE: Janke A, MD, Nash K, Goyal P, et al. Pediatric mental health visits with prolonged length of stay in community emergency departments during COVID-19. *JACEP Open*. 2022;(3)6.

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# ACEP Urges FTC to Ban Noncompete Clauses

More study needed to understand the impact of noncompetes on emergency care in rural and underserved communities

**On** Jan. 5, the Federal Trade Commission released its proposed ban on noncompete clauses in employment contracts. Knowing this could potentially have a significant impact on emergency physicians, ACEP immediately started collecting firsthand perspectives from its members. ACEP's advocacy team analyzed 75 responses to its questionnaire, looking for commonalities to inform its official response to the proposed ban.

In its response to the FTC, ACEP urged the Commission to finalize the proposed ban on noncompetes to help address the current anti-competitive conditions in the emergency medicine labor market, while also encouraging the agency to study how noncompetes are used in rural and underserved areas as a way to recruit and maintain a stable workforce. ACEP also raised concerns about the potential for unintended consequences should non-profit health systems be exempt from a ban, as appears to be the case under the proposed rule's structure.

These are just a few of the takeaways from ACEP's survey results:

- Three-quarters of emergency physicians who responded have had noncompete clauses in their contracts in the last five years.

- Of respondents who have had a noncompete clause in their contract in the last five years:
  - » 10 out of 12 said that the noncompete clause had some impact on their employment search, and more than two-thirds said that the impact was generally negative.
  - » More than half said that they have felt limited geographically and/or were unable to seek a local job as per their noncompete clause.
- More than a third of total of all respondents have had to move away to find a job because of the limitations of their noncompete clause.
- Responses from emergency physician employers indicated that more than half thought a ban on noncompete clauses would have a positive effect on their practice.
  - » Slightly more than one-third of employers said a ban would have minimal or no effect on their practice.
  - » 10 percent said that a ban would have a negative effect on their practice.

The member stories collected by ACEP help demonstrate that restrictive covenants have an impact beyond economics. Contract limitations can impact physician wellness



and contribute to burnout.

*"My non-compete is geographically quite broad, and basically means that if I leave my current employer, I will have to move my special needs kids out of the school system we moved here for."*

*"It has caused physicians in my group to have prospective employees decline to work with us as their non-compete clause from a previous job prevents them from working in our sites, or to have new employees limited in what sites they can cover due to distance from previous jobs."* 🗳️

## Tell Your Story, Make an Impact

Responding to ACEP's calls for advocacy stories is one way to make sure your voice is heard. Take your involvement to the next level at the 2023 Leadership & Advocacy Conference in Washington, DC. This intimate educational and networking event will provide leadership and lobbying instruction, and you'll meet with legislators to talk about the issues that affect EM physicians every day. Register today at [acep.org/LAC](https://acep.org/LAC).

# ACEP Clinical Policy on Acute Appendicitis

**On** February 1, 2023, the ACEP Board of Directors approved a clinical policy developed by the ACEP Clinical Policies Committee on critical issues in the evaluation and management of emergency department (ED) patients with suspected appendicitis. This clinical policy will be published in the June 2023 issue of the *Annals of Emergency Medicine*, and can be found on ACEP's website, [acep.org/patient-care/clinical-policies/](https://acep.org/patient-care/clinical-policies/), and will also be included in the ECRI Guidelines Trust, [ecri.org/solutions/ecri-guidelines-trust](https://ecri.org/solutions/ecri-guidelines-trust), upon its acceptance.

Abdominal pain is a high-volume, high-risk chief complaint. In 2016, patients with abdominal pain composed 8.6 percent of ED visits. Almost 200,000 patients are diagnosed with appendicitis each year. Missed diagnosis of appendicitis remains an area at high risk of litigation. Among children, appendicitis is the fifth most common cause of malpractice litigation against emergency physicians. The diagnosis of appendicitis can be challenging even in the most experienced of clinical hands.

This policy is an update of the 2010 ACEP "Clinical Policy: Critical Issues in the Evaluation and Management of Emergency Department Patients with Suspected Appendicitis." This clinical policy is intended for patients presenting to the ED with acute, nontraumatic abdominal pain and possible or suspected appendicitis.

Based on feedback from ACEP membership, the Clinical Policies Committee conducted an updated systematic review of the literature to assess any needed changes to the 2010 clinical policy and to determine whether

there was a need for additional evidence-based recommendations. After a thorough review of the literature, the topics of the 2010 clinical policy were updated or readdressed for this 2023 clinical policy. This 2023 clinical policy focuses on the identification of patients who are so unlikely to have appendicitis that they do not warrant imaging to confirm the diagnosis and patients with high clinical suspicion of appendicitis may be referred to a surgeon with minimal or no testing.

## Critical Questions

**1. In ED patients with possible acute appendicitis, can a clinical prediction rule be used to identify if no advanced imaging is required?**

### Patient Management Recommendations

**Level A recommendations.** None

**Level B recommendations.** In pediatric patients, clinical prediction rules can be used to risk stratify for possible acute appendicitis. However, do not use clinical prediction rules alone to identify patients who do not warrant advanced imaging for the diagnosis of appendicitis.

**Level C recommendations.** In adult patients, due to insufficient data, do not use clinical prediction rules to identify patients for whom no advanced imaging is required.

**2. In ED patients with suspected acute appendicitis, is the diagnostic accuracy of ultrasound comparable to CT or MRI for the**

**diagnosis of acute appendicitis?**

### Patient Management Recommendations

**Level A recommendations.** None

**Level B recommendations.** In pediatric patients with suspected acute appendicitis, if readily available and reliable, use right lower quadrant (RLQ) ultrasound (US) to diagnose appendicitis.

An unequivocally\* positive RLQ US with complete visualization of a dilated appendix has comparable accuracy to a positive CT or MRI in pediatric patients.

**Level C recommendations.** In adult patients with suspected acute appendicitis, an unequivocally\* positive RLQ US has comparable accuracy to a positive CT or MRI for ruling in appendicitis.

\*A non-visualized or partially-visualized appendix should be considered equivocal. Reasonable options for pediatric patients with an equivocal ultrasound and residual suspicion for acute appendicitis include MRI, CT, surgical consult, and/or observation, depending on local resources and patient preferences with shared decision making.

**3. In ED patients who are undergoing CT of the abdomen and pelvis for suspected acute appendicitis, does the addition of contrast improve diagnostic accuracy?**

### Patient Management Recommendations

**Level A recommendations.** None

**Level B recommendations.** In adult and pediatric ED patients undergoing CT for suspected acute appendicitis, use IV contrast when feasible. The addition of oral or rectal

contrast does not improve diagnostic accuracy.

**Level C recommendations.** In adult ED patients undergoing CT for suspected acute appendicitis, non-contrast CT scans may be used for the evaluation of acute appendicitis with minimal reduction in sensitivity.

### Translation of Classes of Evidence to Recommendation Levels

Based on the strength of evidence grading for each critical question, the subcommittee drafted the recommendations and the supporting text synthesizing the evidence using the following guidelines:

**Level A recommendations.** Generally accepted principles for patient care that reflect a high degree of clinical certainty (e.g., based on evidence from one or more Class of Evidence I or multiple Class of Evidence II studies).

**Level B recommendations.** Recommendations for patient care that may identify a particular strategy or range of strategies that reflect moderate clinical certainty (e.g., based on evidence from one or more Class of Evidence II studies or strong consensus of Class of Evidence III studies).

**Level C recommendations.** Recommendations for patient care that are based on evidence from Class of Evidence III studies or, in the absence of adequate published literature, based on expert consensus. In instances in which consensus recommendations are made, "consensus" is placed in parentheses at the end of the recommendation. 🗳️



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## EM CASES



**DR. HELMAN** is an emergency physician at North York General Hospital in Toronto. He is an assistant professor at the University of Toronto, Division of Emergency Medicine, and the education innovation lead at the Schwartz/Reisman Emergency Medicine Institute. He is the founder and host of Emergency Medicine Cases podcast and website ([www.emergencymedicinecases.com](http://www.emergencymedicinecases.com)).

# The Challenges of Bronchiolitis: Less is More

## Tackling a common condition in all ages

by ANTON HELMAN, MD, CCFP(EM), FCFP

**B**ronchiolitis is the most common lower respiratory tract infection in patients under two years of age and the leading cause of hospital admission for those under six months of age.<sup>1</sup> This past winter saw a huge rise in pediatric respiratory illness in North America as well as an increased admission rate for children with bronchiolitis.<sup>2</sup> There is a wide spectrum of severity of illness as well as a huge variation in practice in treating these children.<sup>3</sup> Complicating the approach



to bronchiolitis further, the definition of bronchiolitis varies across guidelines, and while about 60 percent of bronchiolitis is caused by respiratory syncytial virus, 20 percent is caused by rhinovirus, which confers a 59 percent risk of developing asthma.<sup>4</sup> While most children with

bronchiolitis can be diagnosed without any workup and will improve with simple interventions and be discharged home, we need to know when to worry about the few who will require complex care, and this is sometimes challenging to sort out.

### The Clinical Diagnosis

Bronchiolitis is a clinical diagnosis based on patient age, time of year, and clinical presentation. The typical patient with bronchiolitis is a child under 12 months of age who, during fall and winter months in northern climates, has a two- to three-day upper-respiratory-tract-infection prodrome and then develops symptoms of a lower respiratory tract infection with increased work of breathing, crackles, and wheezes, as well as poor feeding.<sup>5</sup> It is important for clinicians and families to understand that acute symptoms usually last for approximately 10 days, but that the cough can last up to three weeks. Neonates may present with apnea and/or cyanosis.<sup>6</sup>

During the initial ED assessment, it can sometimes be difficult or even impossible to distinguish bronchiolitis from upper respiratory infection with asthma and bronchiolitis from bacterial pneumonia, as their clinical presentations overlap.<sup>7</sup> Clinical presentations that suggest an alternative diagnosis to bronchiolitis include prolonged wheeze (three weeks or more), failure to thrive, recurrent feeding issues, choking with feeds, previous bacterial pneumonia, and the critically ill patient.<sup>5</sup> Multiple wheezing episodes at any age increases the likelihood of asthma.<sup>4</sup> The diagnosis of asthma can be tentatively made in otherwise healthy children as early as 12 months of age, using the following criteria: two or more episodes of wheezing, emergency department (ED) presentation of wheeze needing treatment, reversibility of respiratory distress after therapy, or first-time wheeze with response to therapy.<sup>8</sup> The early diagnosis of asthma is important because literature suggests that a subset of patients with bronchiolitis develop abnormal lung function by the age of five years and long-term lung disease, and that this may be prevented with three-month courses of corticosteroids following each acute exacerbation.<sup>9</sup> Bacterial pneumonia, which can occur concurrently with bronchiolitis, can be distinguished from bronchiolitis by the following clinical findings: high fever, toxic appearance, absence of wheeze, and unilateral chest findings.<sup>10</sup>

### Pediatrics

Children with bronchiolitis are often over-investigated in EDs in the U.S.<sup>11</sup> For a child who presents typically, no investigations are necessary. The American Association of Pediatricians (AAP)



Clinical Practice Guideline for the Management and Diagnosis of Bronchiolitis states: “clinicians should diagnose bronchiolitis and assess disease severity on the basis of history and physical examination. Clinicians should not routinely order laboratory and radiologic studies for diagnosis.”<sup>12</sup> The chest x-ray (CXR) findings of bronchiolitis are often nonspecific patchy infiltrates and hyperinflation that can often be misinterpreted as consolidation and lead to inappropriate antibiotic use.<sup>13</sup> Routine CXR for bronchiolitis is not recommended, as this often leads to unnecessary use of antibiotics.<sup>5</sup> One study found that pediatric emergency physicians over-read CXRs at a rate of five to one compared to radiologists.<sup>14</sup> Testing for respiratory viruses should be reserved for neonates, immunocompromised patients, those with a prolonged fever, and those with atypical presentation.<sup>15</sup>

It is incumbent upon the ED physician to identify high-risk bronchiolitis patients who should be considered for admission to hospital. Factors considered high-risk in patients with bronchiolitis include heart rate greater than 180, respiratory rate greater than 70, awake persistent saturations less than 90 percent, age less than two months, prematurity less than 32 weeks, chronic lung disease, cyanosis or history of apnea, hemodynamically significant congenital heart disease, immunodeficiency, and neuromuscular disease.<sup>16</sup> In the decision of whether or not to admit a child with bronchiolitis, it is important to understand that 30 percent of hospitalized infants receive no therapies needing hospitalization.<sup>13</sup> Hospitalization for otherwise healthy children with mild bronchiolitis has been described as “expensive baby-sitting.”<sup>17</sup> Remember that bronchiolitis symptoms usually peak around days three to five. If the patient presents on day two, you can expect the patient may get worse before they get better. This should be factored into your disposition decision.

Bronchiolitis is a self-limited disease, which can be managed at home with supportive care in the majority of cases. Parental education is vital. Explain the duration of illness and dynamic nature of symptoms. Explain why drugs are ineffective. Suggest frequent feeding (every two hours) to maintain

adequate hydration. Explain the red flags of poor feeding and behavioral change as reasons to return.

### Medications for Children

Pharmacotherapy is generally ineffective in children with bronchiolitis. There is no compelling evidence that bronchodilators, steroids, or epinephrine improves outcomes. While nasal suctioning is frequently employed with the goal of improving feeding in the child with nasal obstruction, its efficacy is unknown. One large bronchiolitis study suggests that in-hospital nasal suctioning significantly increases hospital length of stay.<sup>18</sup> Given that pharmacotherapy and nasal suctioning are not backed by strong evidence, management should concentrate on three things: maintaining adequate volume status/feeding, oxygenation, and airway support.

Most children with bronchiolitis and volume depletion can be repleted by increasing the frequency and length of feeds. Those that have evidence of severe dehydration or require admission to hospital for another reason may require intravenous or nasogastric volume repletion.

Many healthy infants exhibit typical transient oxygen-saturation dips during sleep. A study of children discharged from the ED with bronchiolitis showed that 62 percent desaturate during sleep, some with prolonged desaturations, and the outcomes were the same regardless of whether desaturations were detected or not.<sup>19</sup> There is in-hospital evidence to suggest that continuous oximetry may prolong length of stay,<sup>20</sup> particularly if staff react to normal transient dips in oxygen saturation or changes in heart and respiratory rates with interventions such as restarting oxygen therapy. The rationale for respiratory monitoring is to detect episodes of apnea requiring intervention. In a study of 691 infants under six months of age, only 2.7 percent had documented apnea, and all had risk criteria of either a previous apneic episode or young age under one month or under 48 weeks post-conception in premature infants).<sup>5</sup> A randomized controlled trial (RCT) of 161 bronchiolitis inpatients

CONTINUED on page 21



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EM CASES | CONTINUED FROM PAGE 19

at four U.S. hospitals randomized patients to continuous oximetry versus spot checks with vital signs and found no difference in outcomes. Continuous respiratory monitoring is indicated for high-risk patients in the ED, primarily to detect apneic episodes, but is not necessary for the vast majority of patients with bronchiolitis.<sup>21</sup> The majority of children with bronchiolitis require only intermittent “spot check” oximetry. Use continuous oximetry selectively in those with marked respiratory distress and/or requiring supplemental oxygen.

High-flow nasal cannula (HFNC) for bronchiolitis has gained popularity in recent years after a multi-center RCT in 2018 showed lower rates of treatment failure in bronchiolitis patients treated with HFNC in a non-intensive-care setting compared to standard nasal cannula with a number needed to treat (NNT) of 9.<sup>22</sup> However, with the increasing popularity of HFNC for children with bronchiolitis, there has been a doubling of ICU care for bronchiolitis in the U.S over the past two decades, independent of age, co-morbidities, and hospitalization rates.<sup>23</sup> This increase in ICU admissions corresponds to the surging rate of HFNC use. The main impetus for HFNC in hospital wards is to offload the ICU and to reduce ICU length of stay, however the evidence does not support this outcome. Two RCTs comparing early HFNC to rescue HFNC found the same rate of ICU transfers, that 75 percent of patients needed no escalation of care, and that HFNC costs 16 times more than standard nasal can-

nula.<sup>24,25</sup> These studies suggest that early HFNC provides costly therapy to many children who will not benefit and that HFNC should be used as rescue therapy for patients failing standard treatment, rather than initiated early. While there are no evidence-based clear guidelines on the indications for HFNC in bronchiolitis, reasonable indications include: failure of standard low-flow oxygen therapy (awake O<sub>2</sub> saturations less than 90–92 percent), increasing oxygen requirements above 40 percent fraction of inspired oxygen, increasing lethargy, and persistent severe respiratory distress. Failure of HFNC is usually an indication for non-invasive ventilation (with continuous positive airway pressure) and ICU admission.

Less is More

Remember that for the vast majority, less is more. A workup is usually not indicated, pharmacotherapy is generally ineffective, spot check oximetry rather than continuous oximetry is usually adequate, and supportive care with simple nasal-prong oxygenation when indicated, HFNC only for treatment failures, increased feeding, and good parent education is usually all that is required.

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**Answer: A—Acute angle-closure glaucoma**

Angle-closure glaucoma (ACG) is an uncommon, but emergent condition; although far less common than open-angle glaucoma, it has a much greater chance of causing permanent vision loss due to its acute nature. Individuals of Northern European descent have a 0.1 percent incidence of acute ACG, while those of Inuit or Eskimo descent have up to 40 times this rate. ACG is also more common in persons aged 55–70, women, those of Asian descent, individuals

with hyperopia/thin cornea, and those with a family history of the disease. People who have had ACG in one eye are also more likely to get it in the other eye. Many drugs, including anticholinergic agents, tricyclic antidepressants, selective serotonin reuptake inhibitors, and adrenergic agonists can precipitate ACG by shifting the lens iris diaphragm anteriorly.

An attack of acute ACG occurs when there is a sudden obstruction of aqueous humor outflow through the drainage angle of the eye, causing a rapid increase in intraocular pressure. Primary angle closure may be caused by

pupillary block, angle crowding, or both. Pupillary block occurs when the increased iris convexity brings the iris into apposition with the trabecular meshwork, thereby blocking drainage of the aqueous fluid. With angle-crowding mechanism, anteriorly positioned ciliary processes push the iris anteriorly so that the peripheral iris lies against the trabecular meshwork. Secondary angle closures are associated with angle blockage from other ocular diseases such as iris neovascularization, uveitis, trauma, tumors, ectopic lens, cataract, or lens protein leakage.

Patients often present with acute onset of extremely painful, decreased vision associated with a red eye and a mid-dilated pupil along with headache, seeing rainbow-colored halos around lights, nausea, and vomiting.

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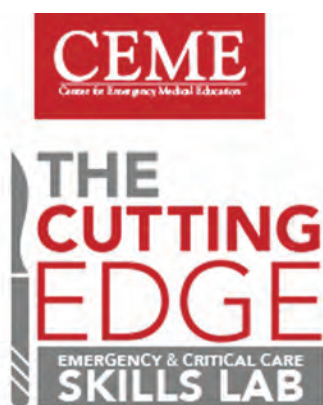
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# TOXICOLOGY Q&A ANSWER

QUESTION ON PAGE 5

**Answer:** Wart spurge (*Euphorbia helioscopia*, also known as umbrella milkweed, wartweed, or madwoman’s milk)

Wart spurge (*Euphorbia helioscopia*, also known as umbrella milkweed, wartweed, or madwoman’s milk), is one of the group of plants called spurges. The term “spurge” is medieval French from *epurger*, referring to the purgative properties of the plant. *Euphorbiaceae* is one of the largest families of flowering plants and has 300 genera and more than 7,000 species.

**Plant Description**

It is an annual succulent plant that flowers from May to October and is pollinated primarily by flies. It grows in well-drained sandy or loamy soils on all five continents. It does not grow well in the shade.

**Toxins**

The sap of the plant is a thick milky liquid,

rich in alkaloids and terpenoid compounds (diterpene esters). In nature, these are used by the plant for defense against herbivores and herbivorous insects.

**Toxic Effects**

The primary toxic effect is to the skin and occurs via a variety of mechanisms, depending upon which genera one is touching. All parts

of the plant are toxic.

**Skin**

A contact urticaria can occur in some of the subfamilies (*Acalyphoideae* and *Crotonoideae*) from stinging hairs. These hair complexes include a crystal spike complex, called a druse, that penetrates the skin and injects an irritant compound (undefined but causing histamine release).

Chemical irritation also can occur from contact with the milky sap during pruning or plant removal. This results in red, swollen skin lesions that can develop blistering and bullae, which may scar.

A 2005 case report by Wilken and Schempp has illustrative dermal-injury photographs showing linear facial bullae in a six-year-old exposed to the plant’s sap.<sup>1</sup>

**Eyes**

Serious injury to the eyes can occur if the sap comes in contact or is brought in contact by inadvertent transfer (hands to eyes). These ocular reactions range from mild conjunctivitis to severe keratouveitis—there are several documented cases of permanent blindness after exposure.<sup>2</sup>

**Ingestion**

Oral ingestions can lead to painful local mucosal irritation, salivation, and swelling of the mouth and throat; acute vomiting, diarrhea, cramping, and severe abdominal pain have also been described.

**Treatment**

There is no antidote.

If exposed, the eyes or skin should be rinsed immediately with water. A medical evaluation for eye exposures with significant symptoms is recommended.

Treatments for ingestion include dilution with water. Activated charcoal has been suggested but not validated.

**Historical Herbal Uses**


Because of the disruption of skin and blister formation, dermal application of the milky sap has been used as a remedy for skin warts, ringworm rashes, and for podiatric corns.

Its gastrointestinal effects have also been used for the treatment of cholera, and as a purgative, an anthelmintic, and a cathartic, and also for purported anticancer properties.<sup>3</sup>

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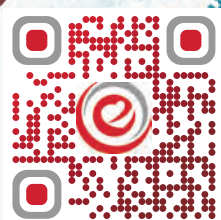


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