2026 Update in Emergency Medicine Topics

For Northern Michigan Osteopathic Summer Conference, 2026

Christopher Rancont, DO, FACOEP

2026 Update in Emergency Medicine

Objectives

- Present and review AOA COLA Articles for 2026 for AOBEM/Emergency Medicine
- Intersperse a few interesting cases with learning objectives
- From the Legal Bench - Review current cases and trends/precedents involving Emergency Medicine

AMERICAN OSTEOPATHIC BOARD OF EMERGENCY MEDICINE

2026 COLA Article List

- Dark P, Hossain A, McAuley DF, et al.; ADAPT Sepsis Collaborators. Biomarker Guided Antibiotic Duration for Hospitalized Patients With Suspected Sepsis: The ADAPT Sepsis Randomized Clinical Trial. JAMA. 2024 Dec 9;333(8):682–693.
- RENOVATE Investigators; et al. High Flow Nasal Oxygen vs Noninvasive Ventilation in Patients With Acute Respiratory Failure: The RENOVATE Randomized Clinical Trial. JAMA. 2025 Mar 11;333(10):875–890.
- Vodstrcil LA, Muzny CA, Plummer EL, Sobel JD, Bradshaw CS, et al. Male Partner Treatment to Prevent Recurrence of Bacterial Vaginosis. N Engl J Med. 2025 Mar 5
- Sodhi M, Rezaeianzadeh R, Kezouh A, Etminan M. Risk of gastrointestinal adverse events associated with glucagon-like peptide-1 receptor agonists for weight loss. JAMA. 2023;330(18):1795-1797.
- Gibbs KW, Semler MW, Driver BE, et al; for the PREOXI Investigators and the Pragmatic Critical Care Research Group. Noninvasive ventilation for preoxygenation during emergency intubation. N Engl J Med. 2024;390(23):2165-2177.
- Couper K, Ji C, Deakin CD, et al; for the PARAMEDIC-3 Collaborators. A randomized trial of drug route in out-of-hospital cardiac arrest. N Engl J Med. 2025;392(4):336-348.
- Le Cornec C, Le Pottier M, Broch H, et al. Ketamine compared with morphine for out-of-hospital analgesia for patients with traumatic pain: a randomized clinical trial. JAMA Netw Open. 2024;7(1):e2352844.
- Shih RD, et al. A critical issue in the management of adult patients presenting to the emergency department with acute carbon monoxide poisoning. Ann Emerg Med. 2025;85:e45-e59.

AOA COLA Articles 2026

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Biomarker-Guided Antibiotic Duration for Hospitalized Patients With Suspected Sepsis

The ADAPT-Sepsis Randomized Clinical Trial

Paul Dark, MD, PhD; Anower Hossain, PhD; Daniel F. McAuley, MD; David Brealey, MD; Gordon Carlson, MD; Jonathan C. Clayton, MPhil, MSc; Timothy W. Felton, PhD, MD; Belinder K. Ghuman, BSc; Anthony C. Gordon, MBBS, MD; Thomas P. Hellyer, MD; Nazir I. Lone, MD; Uzma Manazar, MSc; Gillian Richards; Iain J. McCullagh, MD; Ronan McMullan, MD; James J. McNamee, MD; Hannah C. McNeil, BSc; Paul R. Mouncey, MSc; Micheal J. Naisbitt, MD; Robert J. Parker, MD; Ruth L. Poole, MPhil; Anthony J. Rostron, PhD; Mervyn Singer, MD; Matt D. Stevenson, PhD; Tim S. Walsh, MD; Ingeborg D. Welters, MD; Tony Whitehouse, MD; Simon Whiteley, MD; Peter Wilson, MD; Keith K. Young; Gavin D. Perkins, DSc; Ranjit Lall, PhD; for the ADAPT-Sepsis Collaborators

JAMA February 25, 2025; Volume 333 No. 8

DESIGN, SETTING, AND PARTICIPANTS A multicenter, intervention-concealed randomized clinical trial, involving 2760 adults (≥18 years), in 41 UK National Health Service (NHS) intensive care units, requiring critical care within 24 hours of initiating intravenous antibiotics for suspected sepsis and likely to continue antibiotics for at least 72 hours.

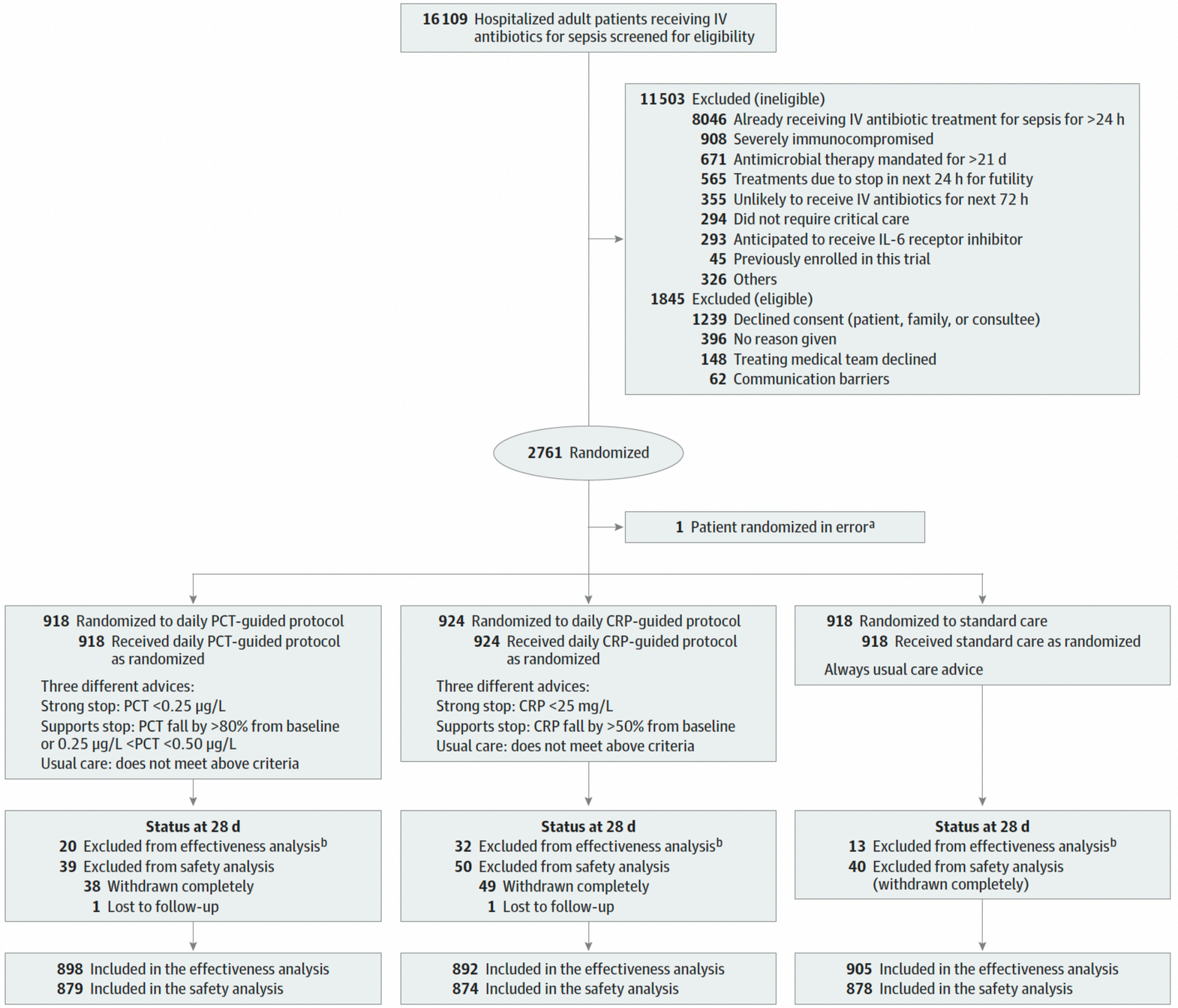
INTERVENTION From January 1, 2018, to June 5, 2024, 918 patients were assigned to the daily PCT-guided protocol, 924 to the daily CRP-guided protocol, and 918 assigned to standard care.

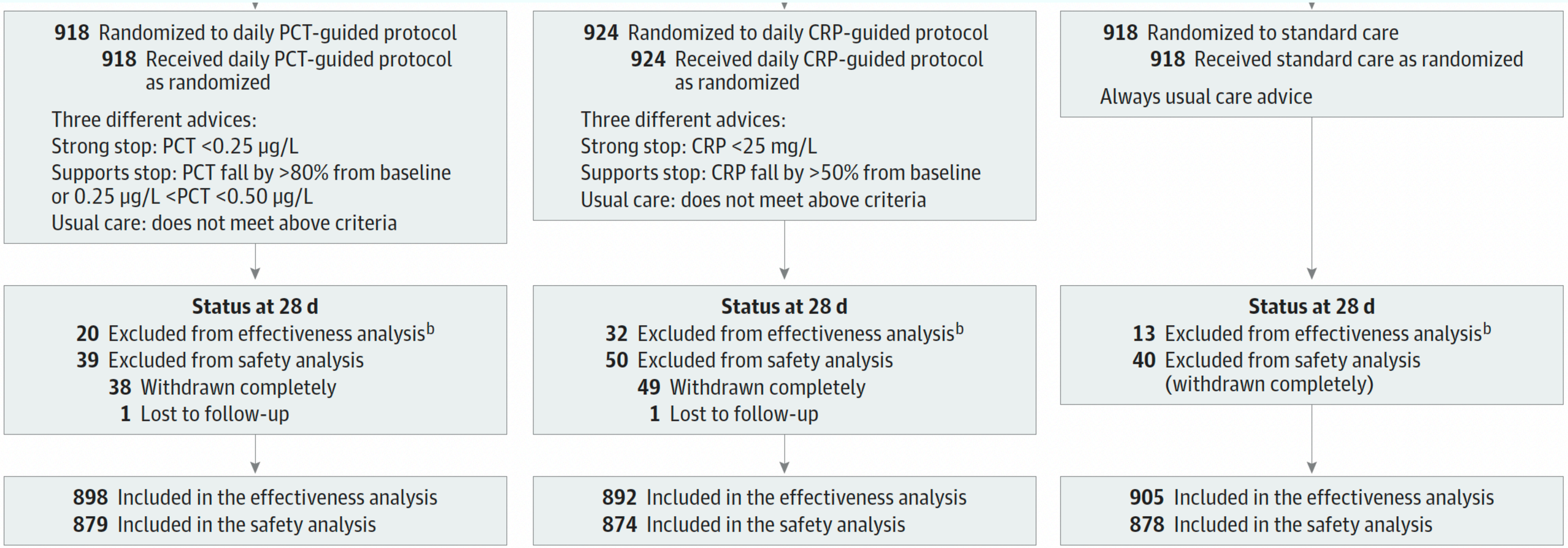
Intervention Concealment

Group assignment was available to the local laboratory service only through the trial-specific web-based system, concealed from patients, their relatives, clinical teams, and research staff. Research blood samples were allocated a unique research study number and were transported to the local hospital laboratory, until the antibiotics were discontinued. The research number did not reveal the identity of the patient, and biomarker measurement results were not recorded in the patient's care record form or shared with the clinical team.

Biomarker-Guided Antibiotic Duration for Hospitalized Patients with Suspected Sepsis
JAMA February 25, 2025; Volume 333 No. 8

Figure 1. Recruitment, Randomization and Follow-Up in the ADAPT-Sepsis Trial

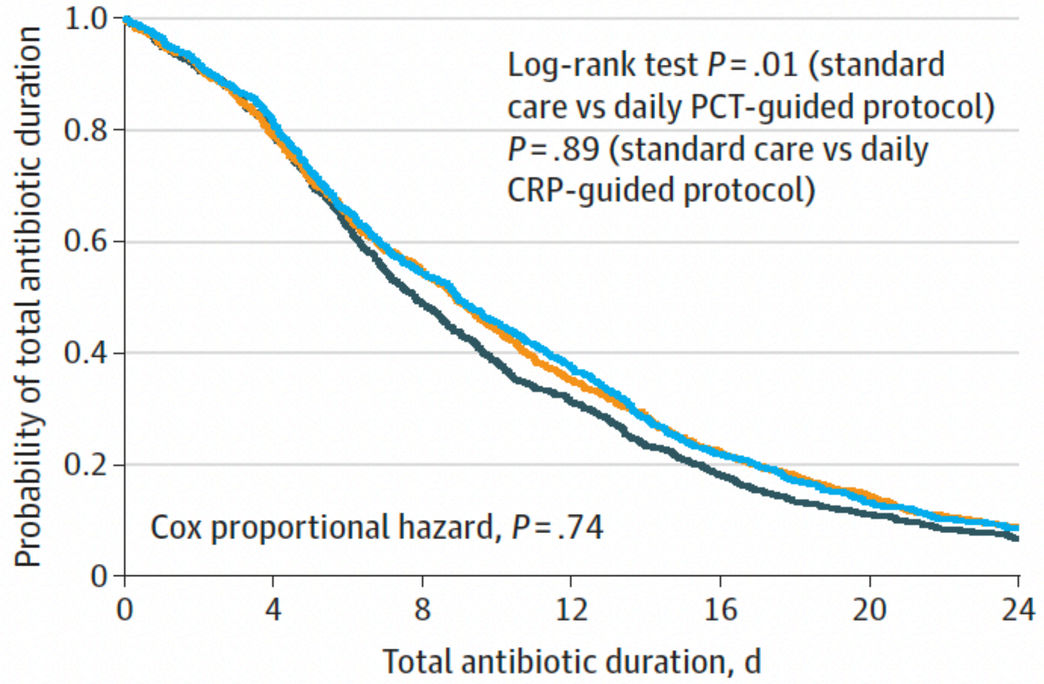




Biomarker-Guided Antibiotic Duration for Hospitalized Patients with Suspected Sepsis
JAMA February 25, 2025; Volume 333 No. 8

Figure 3. Kaplan-Meier Curves for Probability of Antibiotic Duration and Mortality to 28 Days

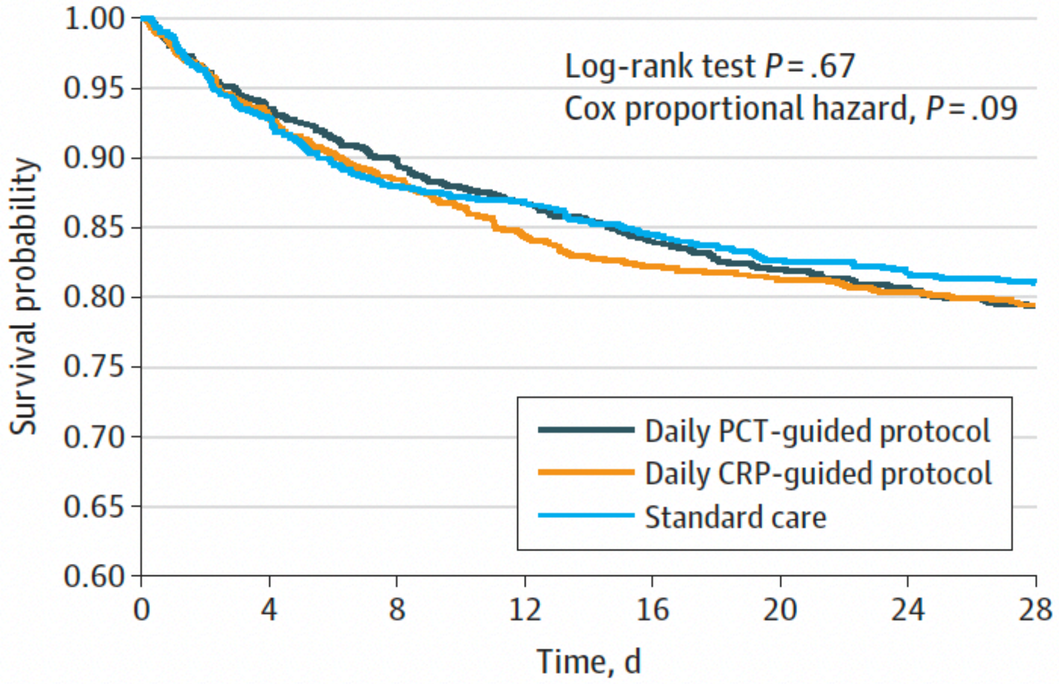
A Probability of total antibiotic duration (primary effectiveness outcome)



No. at risk

Guided protocol							
Daily PCT	897	713	438	280	163	99	61
Daily CRP	891	703	488	313	197	128	80
Standard care	904	737	491	339	199	119	78

B All-cause mortality up to 28 days (safety outcome)



No. at risk

Guided protocol								
Daily PCT	917	837	797	768	742	722	709	695
Daily CRP	923	831	783	742	720	710	701	691
Standard care	918	838	784	769	744	728	715	708

The medians of the total antibiotic treatment duration up to 28 days for each of the 3 groups are 7.8 (IQR, 4.5-13.6) days for the daily procalcitonin (PCT)–guided protocol, 8.9 (IQR, 4.5-14.9) days for the daily C-reactive protein (CRP)–guided protocol, and 9.0 (IQR, 4.7-14.6) days for standard care.

PCT - Guided Care reduced Total ABX days by an average of 1.13 Days

CONCLUSIONS AND RELEVANCE

Care guided by measurement of PCT reduces antibiotic duration safely compared with standard care, but CRP does not. All-cause mortality for CRP was inconclusive.

Biomarker-Guided Antibiotic Duration for Hospitalized Patients with Suspected Sepsis
JAMA February 25, 2025; Volume 333 No. 8

What role do biomarkers have in influencing clinical decision-making in patients with suspected or confirmed sepsis?

A. A single low procacitonin very early in the course of febrile illness reliably excludes bacterial sepsis.

B. Biomarkers are only useful in determining the need for vasopressors.

C. Biomarkers can help diagnose, assess severity, and monitor response to therapy.

D. Biomarkers do not affect treatment and are not useful in sepsis management.

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The ADAPT-Sepsis trial suggests the strongest evidence exists for which of the following biomarkers to be used as an adjunct in the management of sepsis to help de-escalate or stop antibiotics when combined with clinical assessment?

A. C-reactive protein (CRP)

B. Interferon-gamma

C. Lactate

D. Procalcitonin (PCT)

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A. C-reactive protein (CRP)

B. Interferon-gamma

C. Lactate

✓ **D.** Procalcitonin (PCT)

A 60-year-old man comes to the emergency department because of fever and confusion. Vital signs are:

Temperature	38.6 °C (101.5 °F)
Heart rate	123/min
Blood pressure	83/54 mmHg
Respiratory rate	30/min

On examination, the skin is warm. Auscultation of the chest reveals crackles in the left lower lung field. Laboratory studies show:

White blood cell count	17,0000/μL
Lactate	4.2 mmol/L
Creatinine	2.3 mg/dL

Blood cultures are obtained and broad-spectrum antibiotics are initiated. In this patient, elevated lactate confirms tissue hypoperfusion consistent with septic shock. Which of the following statements related to procalcitonin (PCT) and C-reactive protein (CRP) is correct?

A. Adequacy of tissue oxygenation and guiding fluid resuscitation goals can be assessed by either PCT or CRP.

B. An elevated CRP within the first 3 hours of sepsis indicates the need for vasopressor support.

C. CRP is a more reliable marker earlier in sepsis, as it will rise and peak more rapidly than PCT.

D. The duration and possible de-escalation of antibiotic therapy can be based on trended levels of biomarkers.

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✓ **D.** The duration and possible de-escalation of antibiotic therapy can be based on trended levels of biomarkers.

The Infectious Diseases Society of America and the Society of Critical Care Medicine, in the Surviving Sepsis Campaign guidelines, emphasize that any safe reduction in unnecessary antibiotic use is desirable, as overuse is a major driver of resistance and complications. The ADAPT-Sepsis trial's robust design and large sample size provides high-quality evidence that biomarker-guided protocols can achieve this reduction safely. Which of the following is an implication about the use of such bio-marker driven protocols?

A. Procalcitonin-guided protocols have been shown to increase 28-day mortality in critically ill patients due to undertreatment of sepsis.

B. Routine use of procalcitonin testing reduces the need for empiric antibiotic administration in patients with undifferentiated sepsis (no clear source).

C. Shortening antibiotic exposure, by even less than one day per patient, can cumulatively reduce risks of antimicrobial resistance, adverse drug events, and healthcare costs.

D. The primary goal of biomarker-guided antibiotic protocols is to ensure maximal microbial eradication prior to discontinuation of antibiotics.

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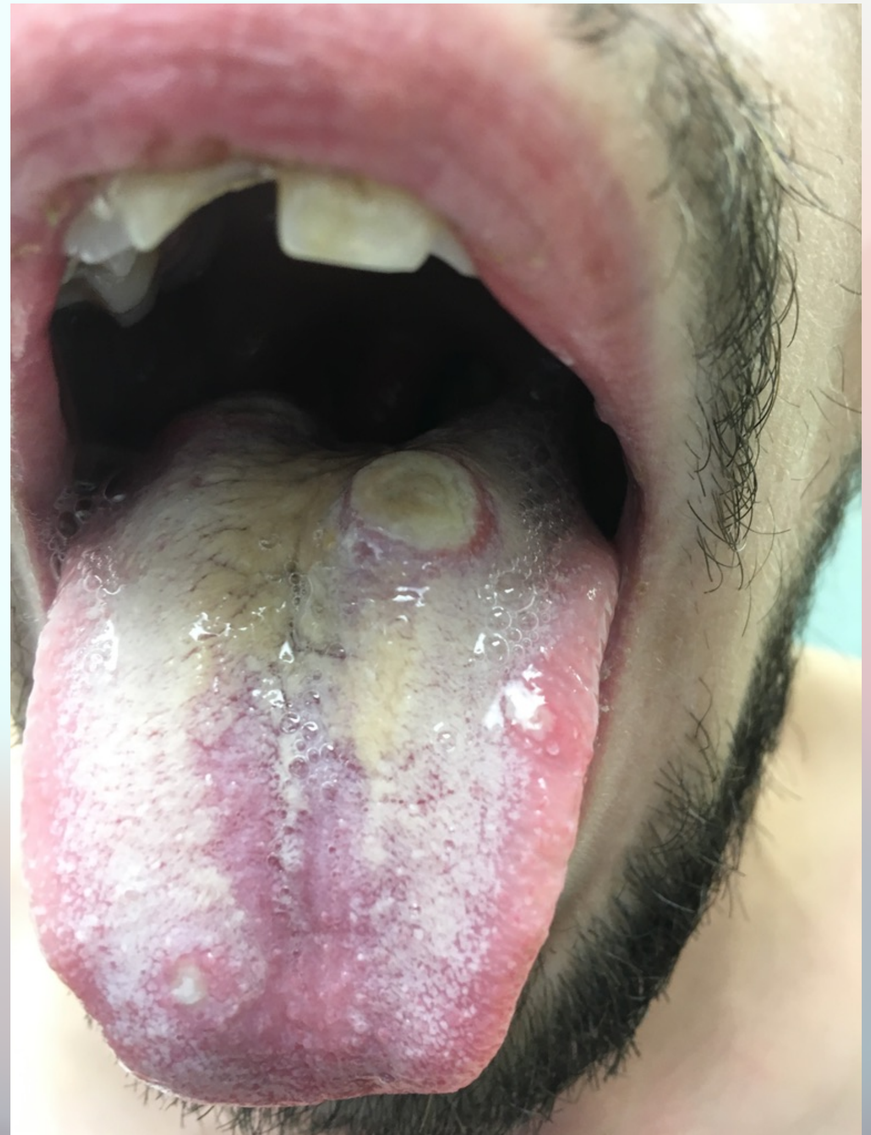
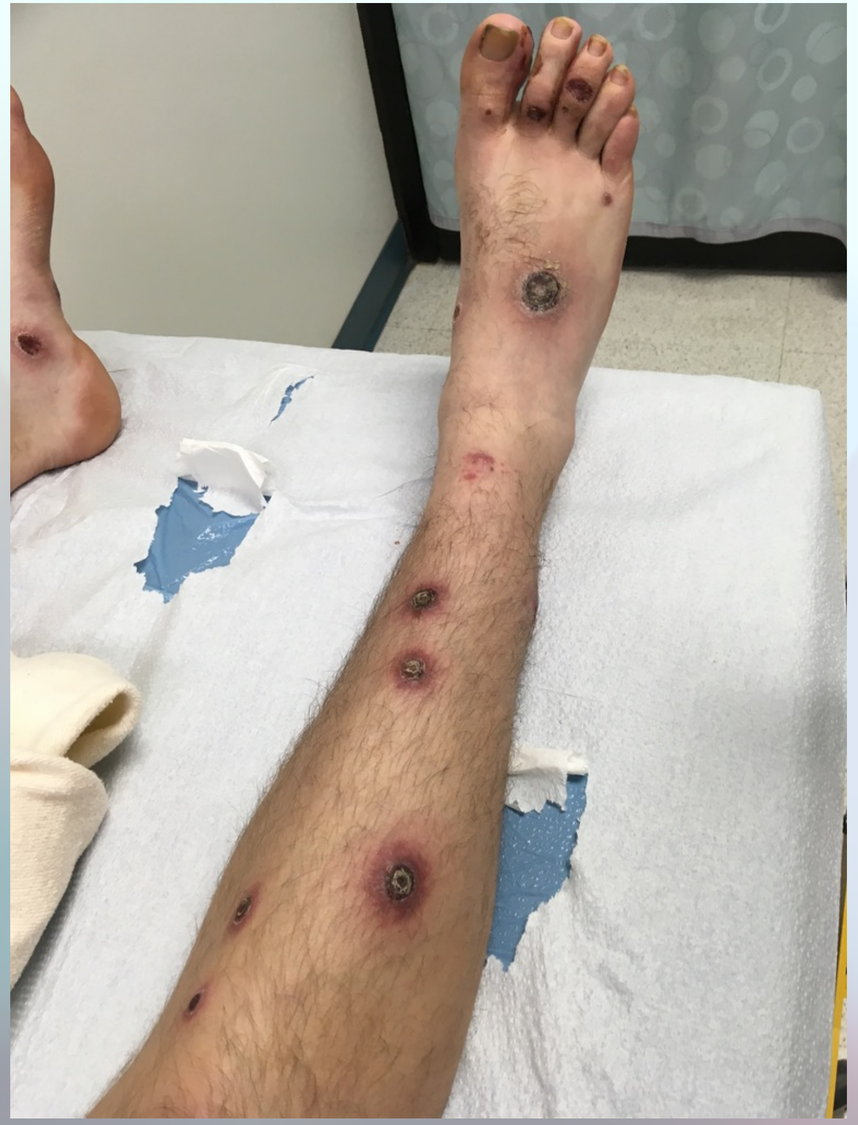
D. The primary goal of biomarker-guided antibiotic protocols is to ensure maximal microbial eradication prior to discontinuation of antibiotics.

What's new in Emergency Medicine?
Case Presentation





What's new in Emergency Medicine?
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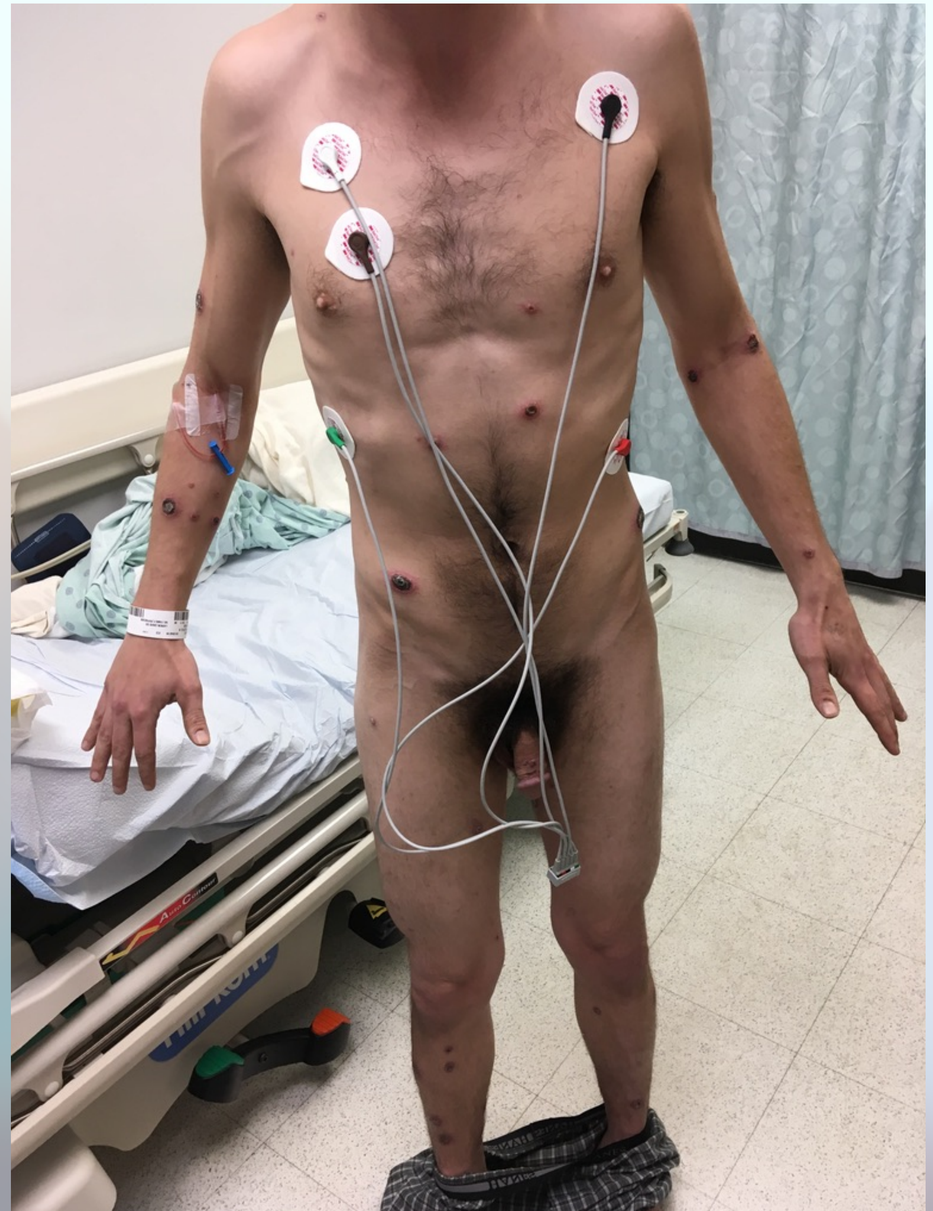
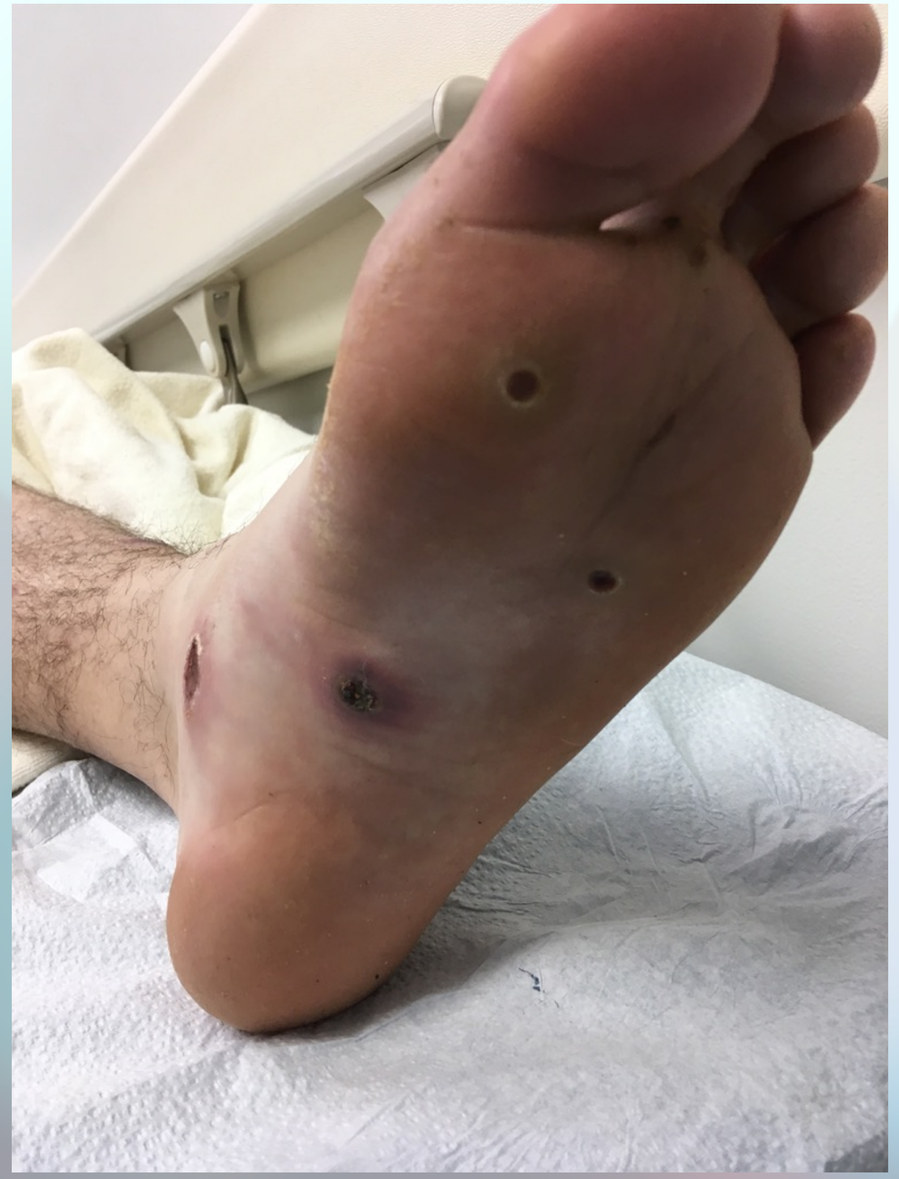


What's new in Emergency Medicine?

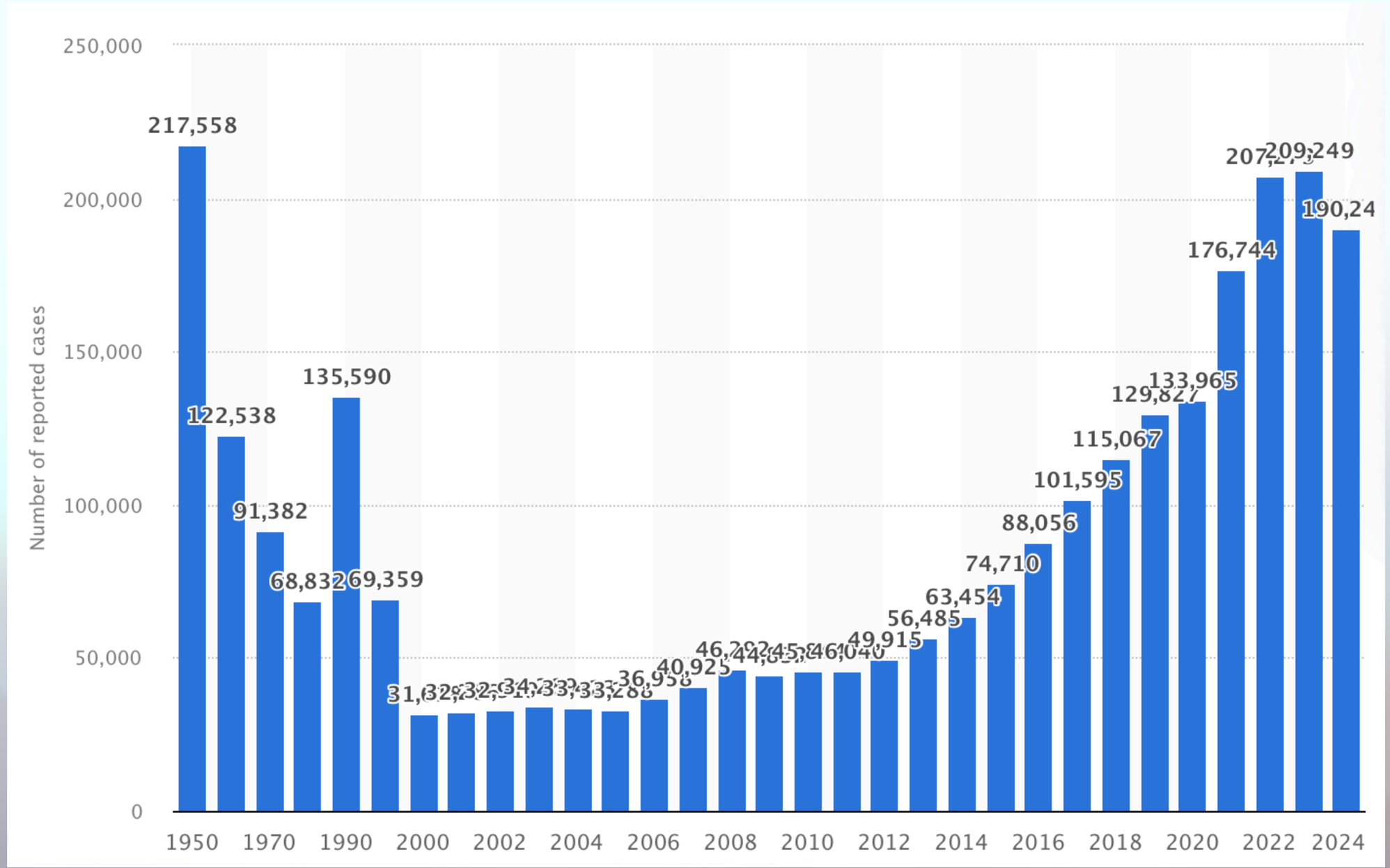
Syphilis!

- There is a Sexually Transmitted Infection affecting humans which is currently on the rise.
- Only recently described, during a Naples outbreak in 1494/1495.
- Originally called the "French Disease",

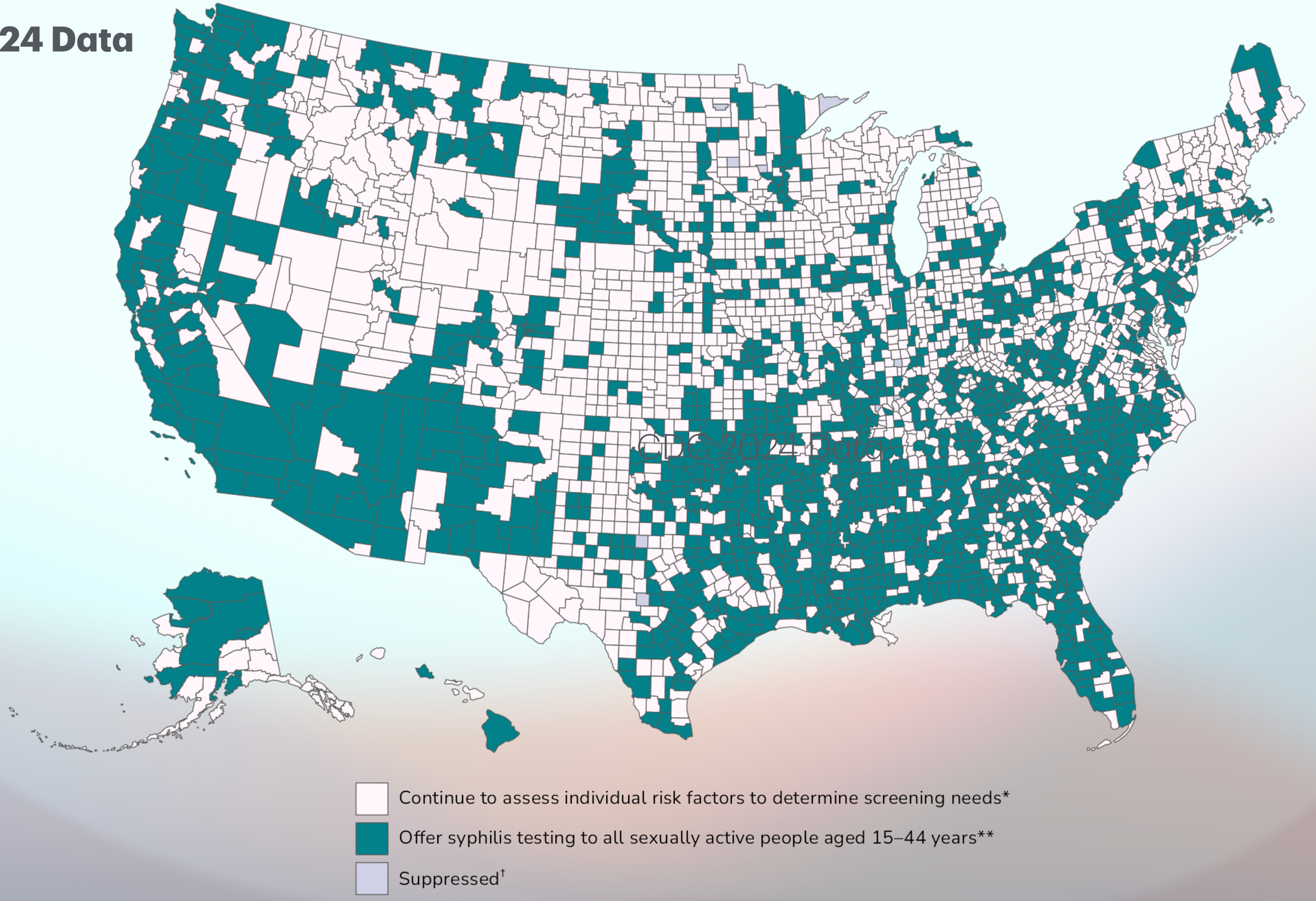



SYPH
HAPPENS.
MDHHS
Michigan Department of Health & Human Services
Bureau of HIV
and STI Programs

Syphilis Cases Increased for the 12th Consecutive Year in 2023!

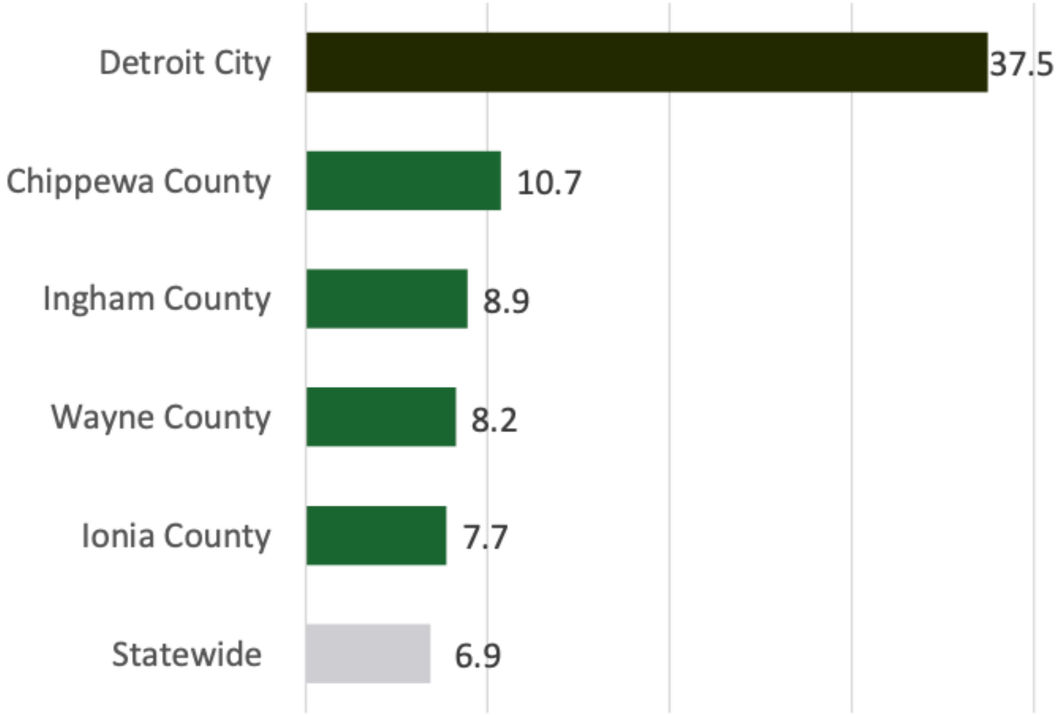


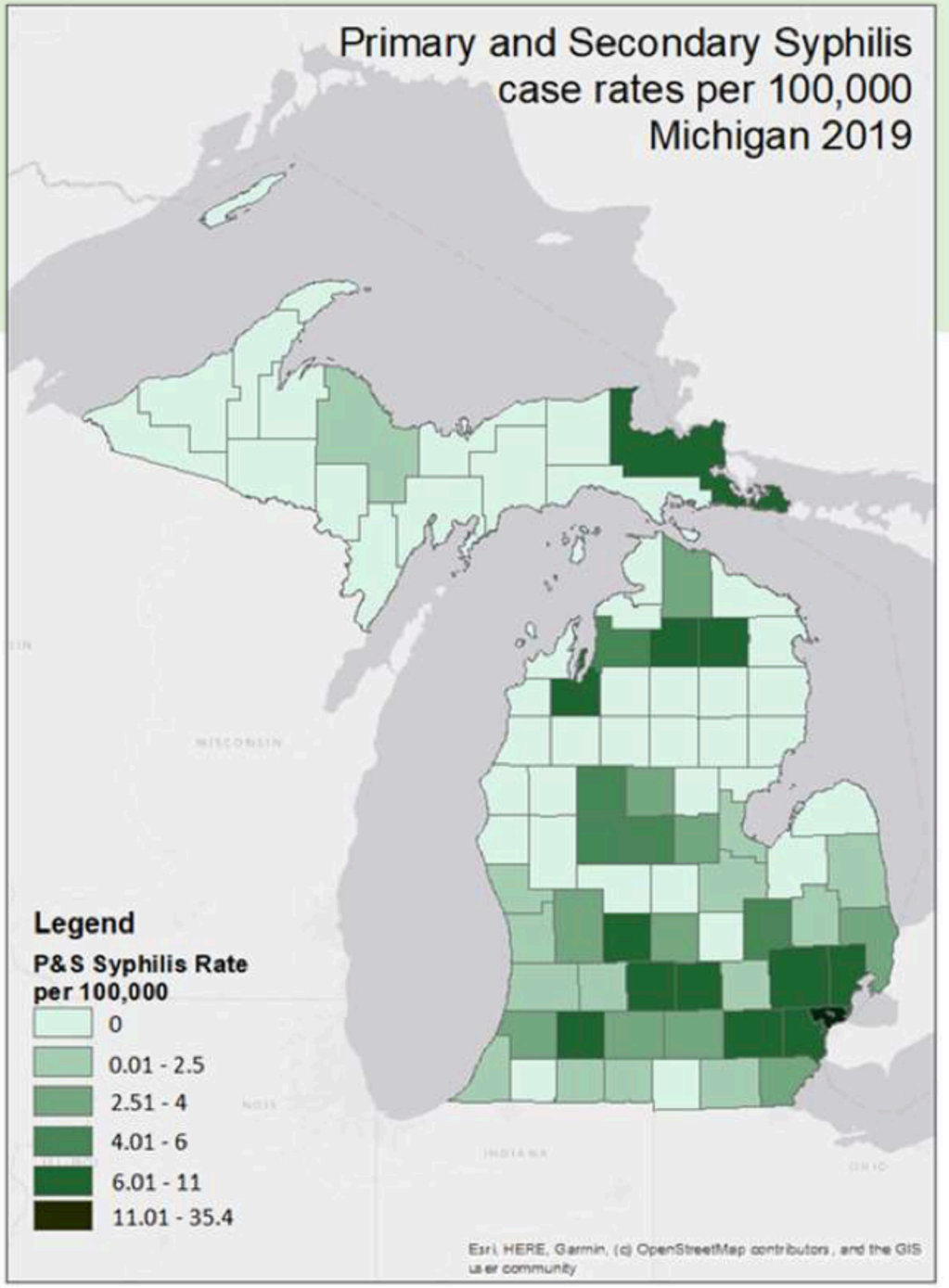
CDC 2024 Data



Primary and Secondary Syphilis

Five Local Health Jurisdictions with Highest Case Rate per 100,000





Syphilis[24]

Risk Category	Recommended Regimen	Alternatives
Primary, secondary, and early latent: adults (including pregnant women and people with HIV infection)	benzathine penicillin G 2.4 million units IM in a single dose	
Late latent adults (including pregnant women and people with HIV infection)	benzathine penicillin G 7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1-week intervals	
Neurosyphilis, ocular syphilis, and otosyphilis	aqueous crystalline penicillin G 18–24 million units per day, administered as 3–4 million units by IV every 4 hours or continuous infusion, for 10–14 days	procaine penicillin G 2.4 million units IM 1x/day **PLUS** probenecid 500 mg orally 4x/day, both for 10–14 days
For children or congenital syphilis	See Sexually Transmitted Infections Treatment Guidelines, 2021.	

24 The complete list of recommendations on treating syphilis among people with HIV infection and pregnant women, as well as discussion of alternative therapy in people with penicillin allergy, can be found in Sexually Transmitted Infections Treatment Guidelines, 2021.

Bicillin L-A®

On **March 6, 2026**, the FDA announced they are allowing the temporary importation of Lentocilin© due to the ongoing limited availability and extended recovery of Bicillin® L-A.

- Information for health care providers on the administration of Lentocilin© .
- Further details and priority actions for health departments and healthcare providers
- Availability of STI testing and treatment products

Lentocilin© Information for Clinicians

National Network of STD Clinical Prevention Training Centers

Lentocilin© (benzathine benzylpenicillin)

What is Lentocilin©?

Lentocilin© is benzathine benzylpenicillin tetrahydrate (penicillin G benzathine) injection powder for suspension that is being temporarily imported to address shortages of Bicillin® L-A (penicillin G benzathine injectable suspension) in the United States.

In what form is Lentocilin© available?

Lentocilin© (benzathine benzylpenicillin tetrahydrate) is a powder and diluent for reconstitution for injection of 1,200,000 units.

What are the key differences between Bicillin® L-A and Lentocilin©?

	Bicillin® L-A	Lentocilin©
Warnings	Bicillin® LA has a boxed warning. Bicillin® L-A carton labeling states that it is, "Fatal if given by other routes."	Lentocilin© does not have a boxed warning. Please refer to the Bicillin® L-A boxed warning. While not on the carton labeling, the product information states that Lentocilin© "must be administered EXCLUSIVELY by DEEP INTRA-MUSCULAR (IM) injection."
Soy Phospholipids	Bicillin® LA does not contain soy phospholipids.	Lentocilin© contains soy phospholipids and may cause hypersensitivity reactions (urticaria, anaphylactic shock) in people with a history of allergy to soybeans.
Lidocaine	Bicillin® LA does not contain lidocaine.	Lentocilin© contains lidocaine and may cause hypersensitivity reactions (urticaria, anaphylactic shock) in people with a history of allergy to lidocaine or local anesthetics of the amide type. It should be used with caution in patients with cardiovascular, hepatic or renal disease.
Additional Ingredients	Sodium citrate, povidone, carboxymethylcellulose sodium, lecithin, methylparaben, and propylparaben	Soybean lecithin, polysorbate 80, water, lidocaine hydrochloride, and monosodium citrate
Dosage form	Prefilled disposable syringes, injectable suspension	Powder and diluent for reconstitution

	Bicillin® L-A	Lentocilin©
Diluent	Not applicable	4 ml of 1.5% lidocaine hydrochloride solution contained in a glass ampule
Volume of administration	2 mL for 1,200,000 unit	4 mL for 1,200,000 unit dose after reconstitution
Storage	Store in a refrigerator, 2° to 8°C (36° to 46°F). Keep from freezing.	Store below 25°C (77°F). Store in the original package to prevent light and moisture. Following reconstitution, use immediately.

Alternative Treatments for Syphilis in PCN allergy:

1. Doxycycline (100 mg orally 2 times/day for 14 days)
2. Tetracycline (500 mg orally 4 times/day for 14 days)

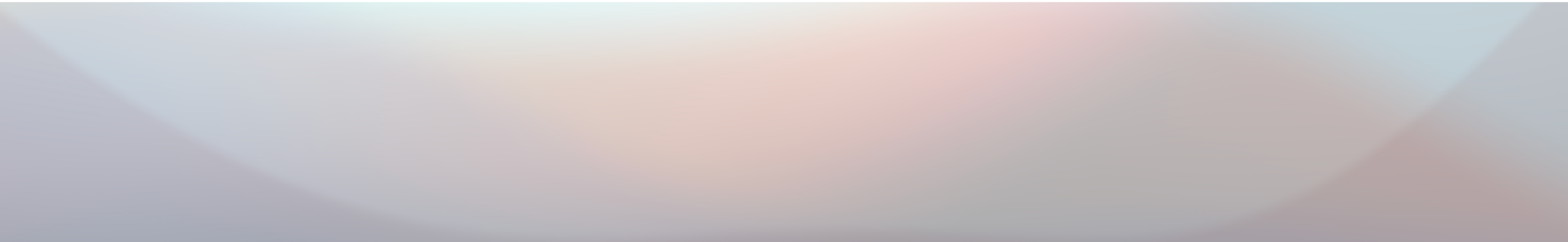
*Azithromycin 2 gm single dose **SHOULD NOT BE USED** because of T. pallidum chromosomal mutations associated with azithromycin and other macrolide resistance and documented treatment failures in multiple U.S. geographic areas*

Clinical Guidance for STIs

For Health Care Providers

JULY 18, 2025

CDC's website is being modified to comply with President Trump's Executive Orders.

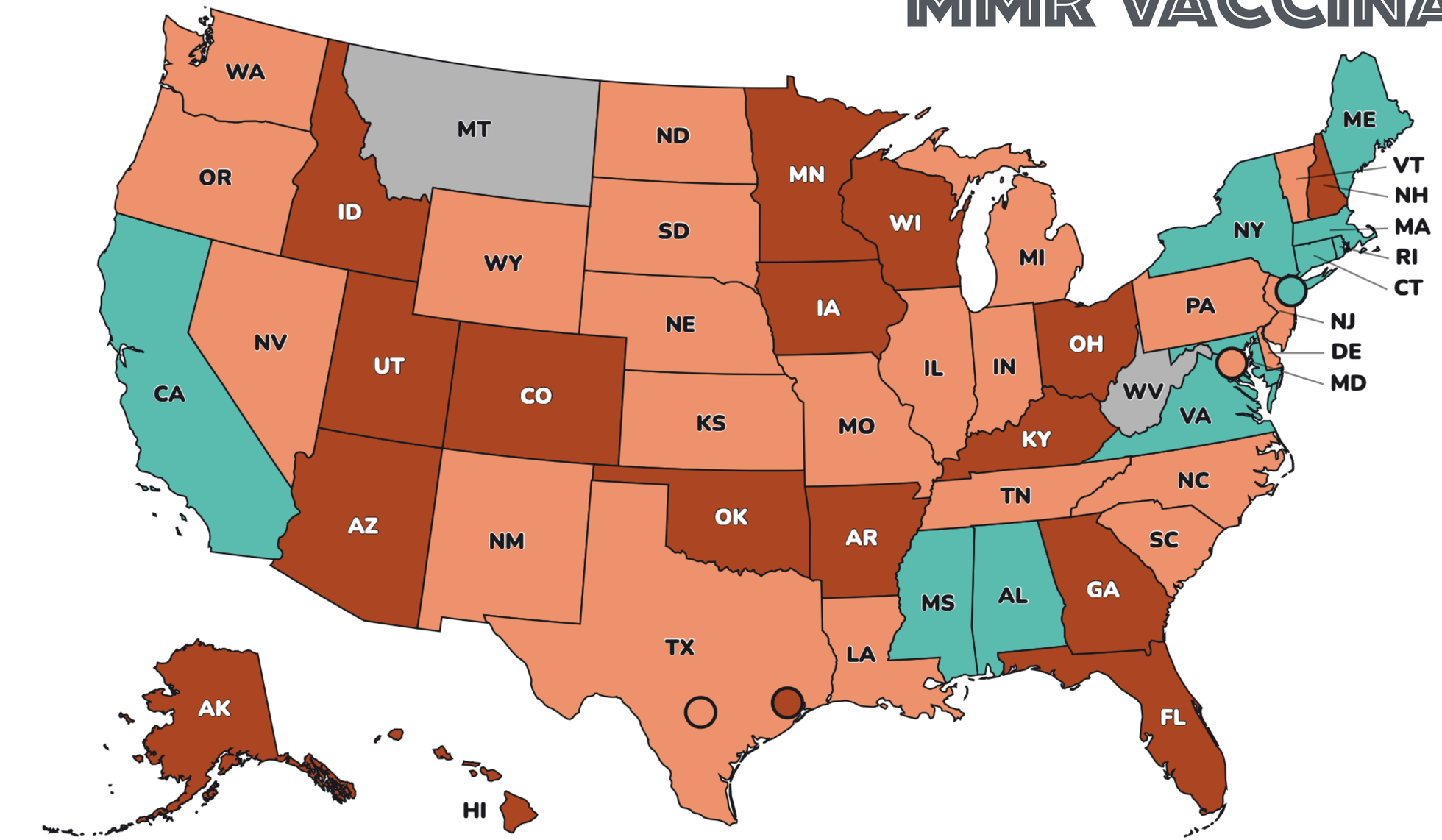


Sexually Transmitted Infections Treatment Guidelines, 2021

Search

Per a court order, HHS is required to restore this website to its version as of 12:00 AM on January 29, 2025. Information on this page may be modified and/or removed in the future subject to the terms of the court's order and implemented consistent with applicable law. Any information on this page promoting gender ideology is extremely inaccurate and disconnected from truth. The Trump Administration rejects gender ideology due to the harms and divisiveness it causes. This page does not reflect reality and therefore the Administration and this Department reject it.

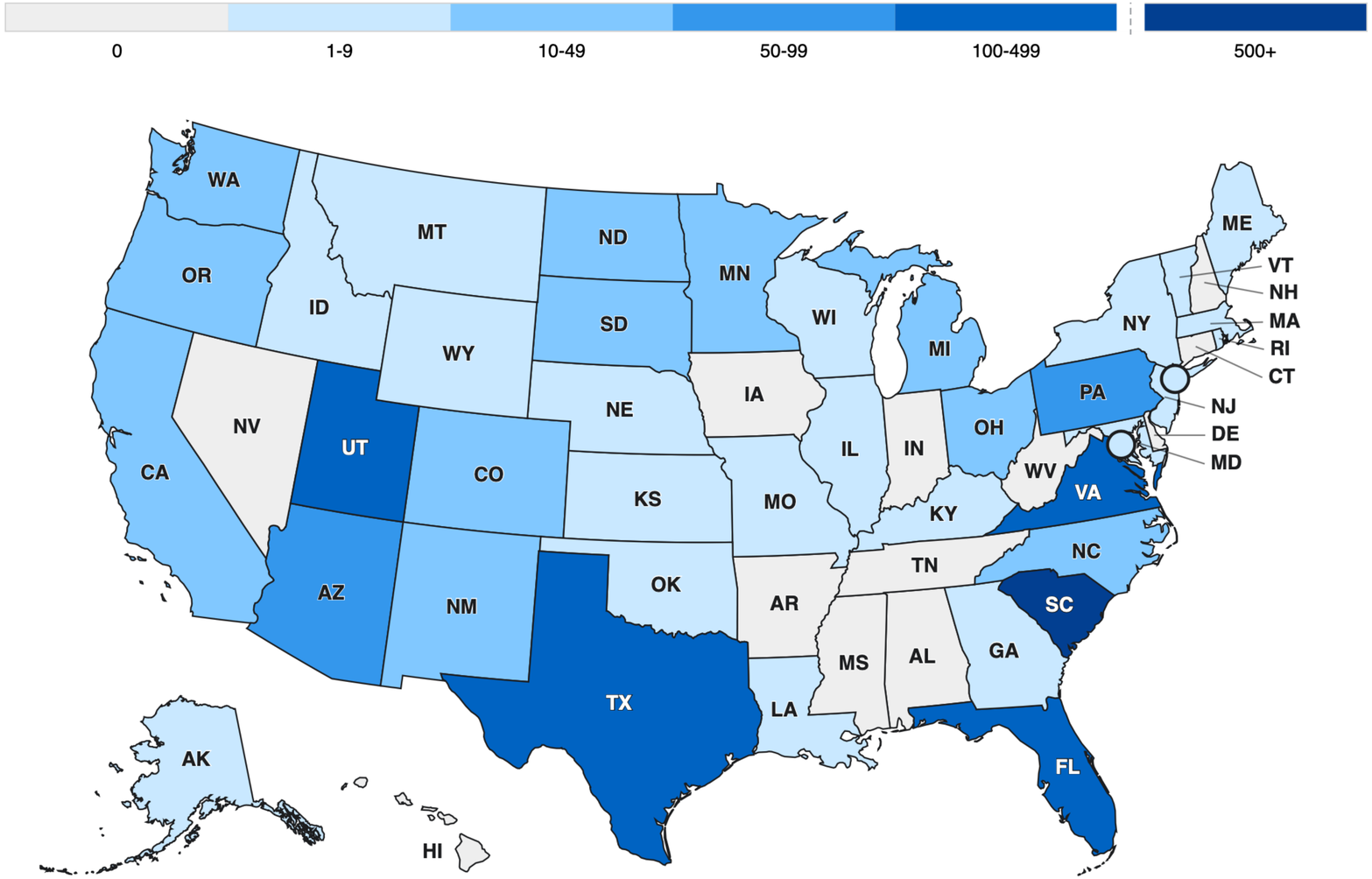
MMR VACCINATION



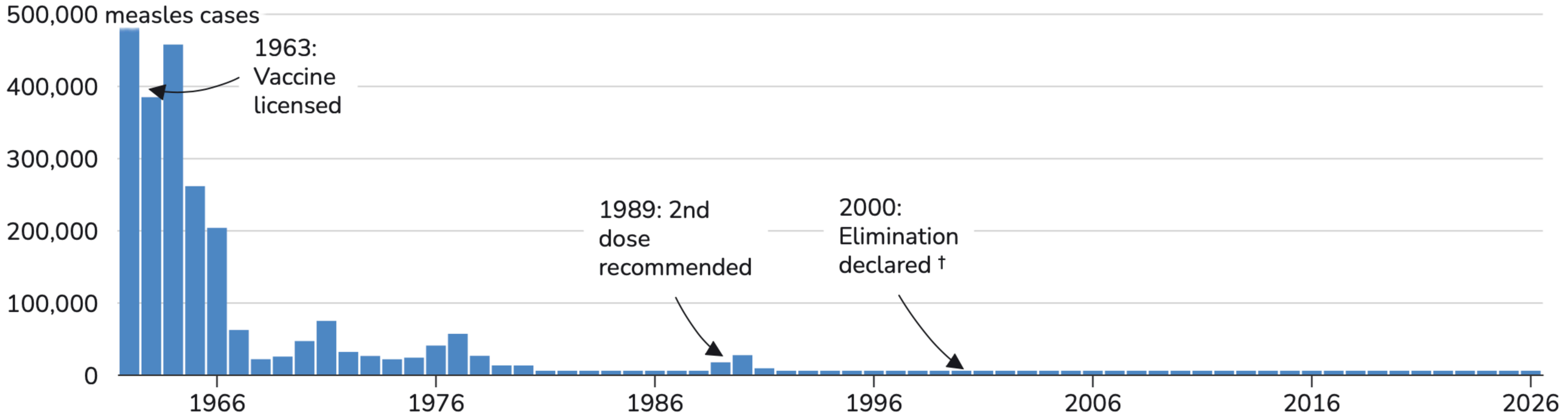
Map of measles cases among U.S. residents

as of June 11, 2026

2026 2025 2024



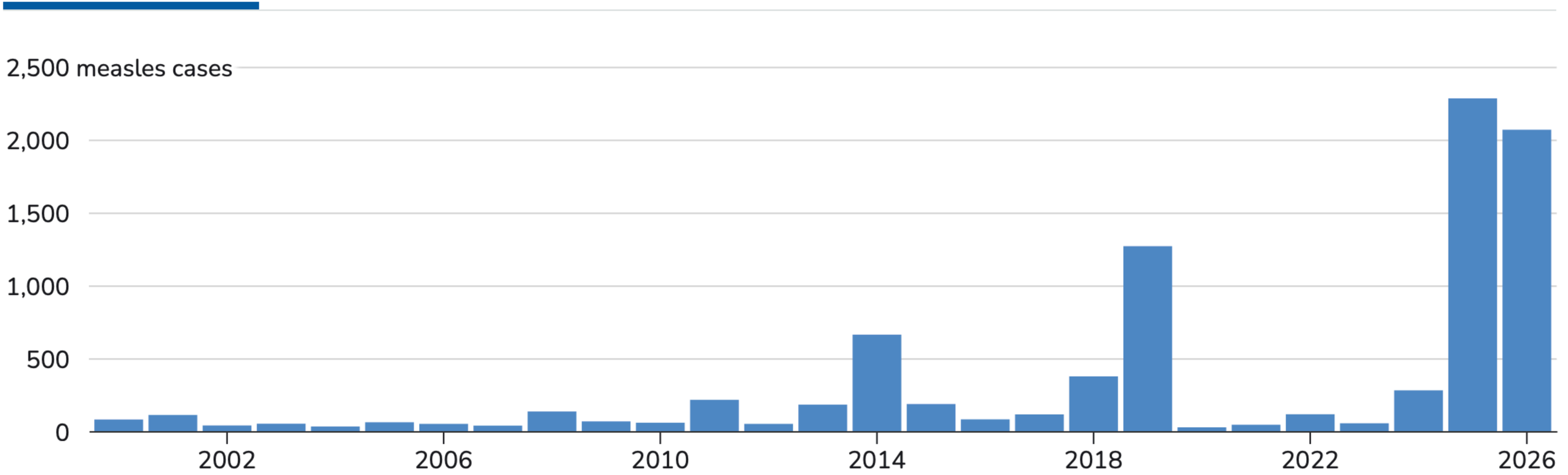
Reported Measles Cases in the United States from 1962-2026*



Yearly measles cases

as of June 11, 2026

2000-Present* 1985-Present*



Dashboard v2: Case Map

Michigan Measles Dashboard 2026

MDHHS Michigan Department of Health & Human Services

Additional Case Data

Updated: 06/11/2026

Exposure Map

Learn More

Age	Cases
0-4 yrs	2
5-17 yrs	10
18+ yrs	2

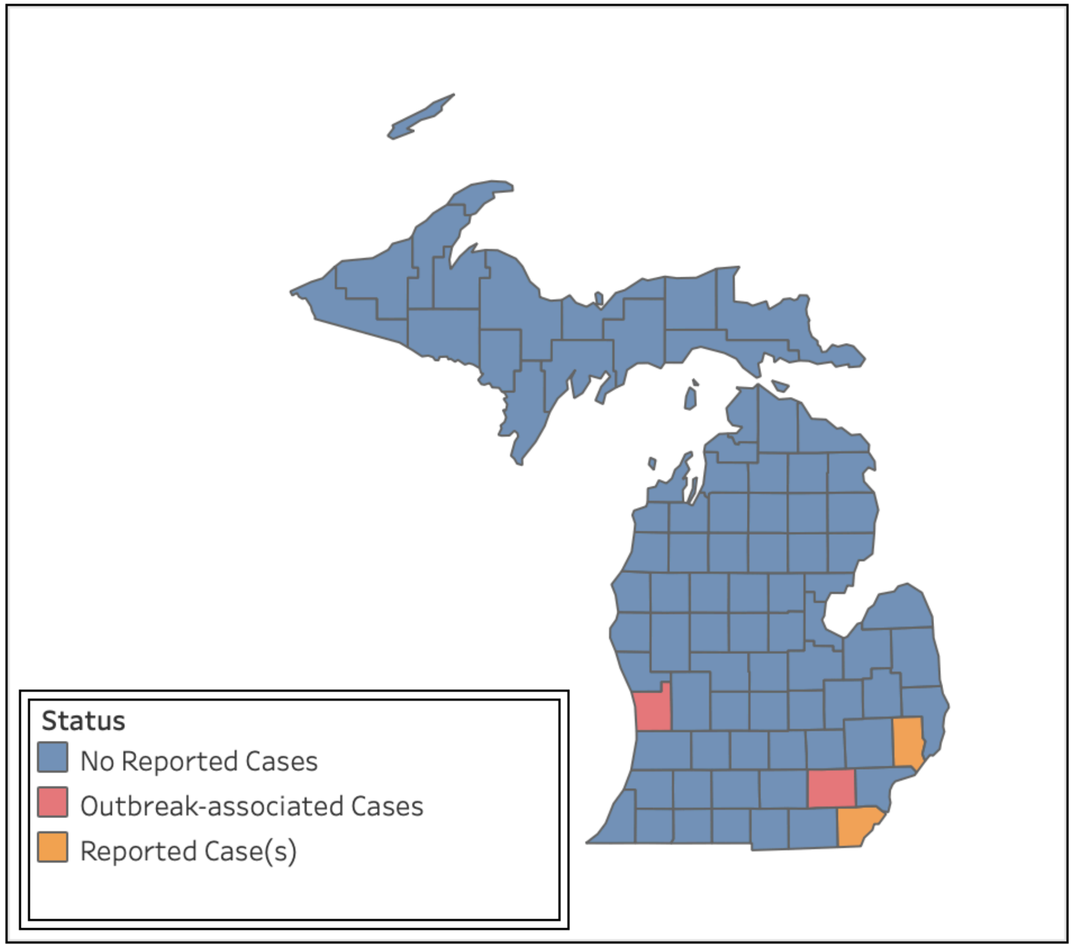
Vaccination Status	Cases
1 MMR	0
2+ MMR	0
Unvaccinated/unknown	14

Those classified as unvaccinated or unknown have no evidence of receipt of a measles-containing vaccine or have received MMR 0-13 days prior to measles exposure or symptom onset.

Travel History	Cases
No reported travel or unknown	7
Reported domestic travel	3
Reported international travel	4

Cases by County

County	Outbreak Case(s)	Total Case(s)
Macomb	0	2
Monroe	0	1
Ottawa	4	4
Washtenaw	7	7
Grand Total	11	14



Measles Characteristics

- Classic symptoms
  - Fever (up to 105F) + generalized maculopapular rash + one of the “3 C’s”
    - 3 C’s: Cough, coryza (runny nose), conjunctivitis
  - Clues to measles:
    - Prodrome of fever and at least 1 of 3 C’s often starts 2–4 days before rash
    - Rash starts on head or face and spreads downwards
    - Fever continues through onset of rash, often peaking around the time when the rash starts
- Measles is rare in vaccinated people, especially with 2 prior doses of MMR
  - 1 dose generally provides 93% protection, and 2 doses provides 97% protection from measles infection

Testing Recommendations

- ❑ Immediately contact the state or local health department to report a suspect measles case and arrange testing
- ❑ Collect a nasopharyngeal (NP) or oropharyngeal/throat (OP) swab for measles* RT-PCR
  - Follow state/local guidance for specimen collection (e.g., type of swab, media).
  - If directed by public health authorities, urine can also be obtained for measles PCR.
    - At least 50cc of urine should be voided into a sterile container and stored refrigerated (not frozen).
- ❑ Obtain serum for measles* IgM and IgG

*Measles virus is also referred to as “rubeola” in some lab orders, not to be confused with rubella virus

AOA COLA Articles 2026

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 6, 2025 VOL. 392 NO. 10

Male-Partner Treatment to Prevent Recurrence of Bacterial Vaginosis

Lenka A. Vodstrcil, Ph.D.,[1-3] Erica L. Plummer, Ph.D.,[1,2] Christopher K. Fairley, Ph.D.,[1,2] Jane S. Hocking, Ph.D.,[3] Matthew G. Law, Ph.D.,[4] Kathy Petoumenos, Ph.D.,[4] Deborah Bateson, M.D.,[5] Gerald L. Murray, Ph.D.,[6-8] Basil Donovan, M.D.,[4] Eric P. F. Chow, Ph.D.,[1-3] Marcus Y. Chen, Ph.D.,[1,2] John Kaldor, Ph.D.,[4] and Catriona S. Bradshaw, Ph.D.,[1-3] for the StepUp Team*

METHODS

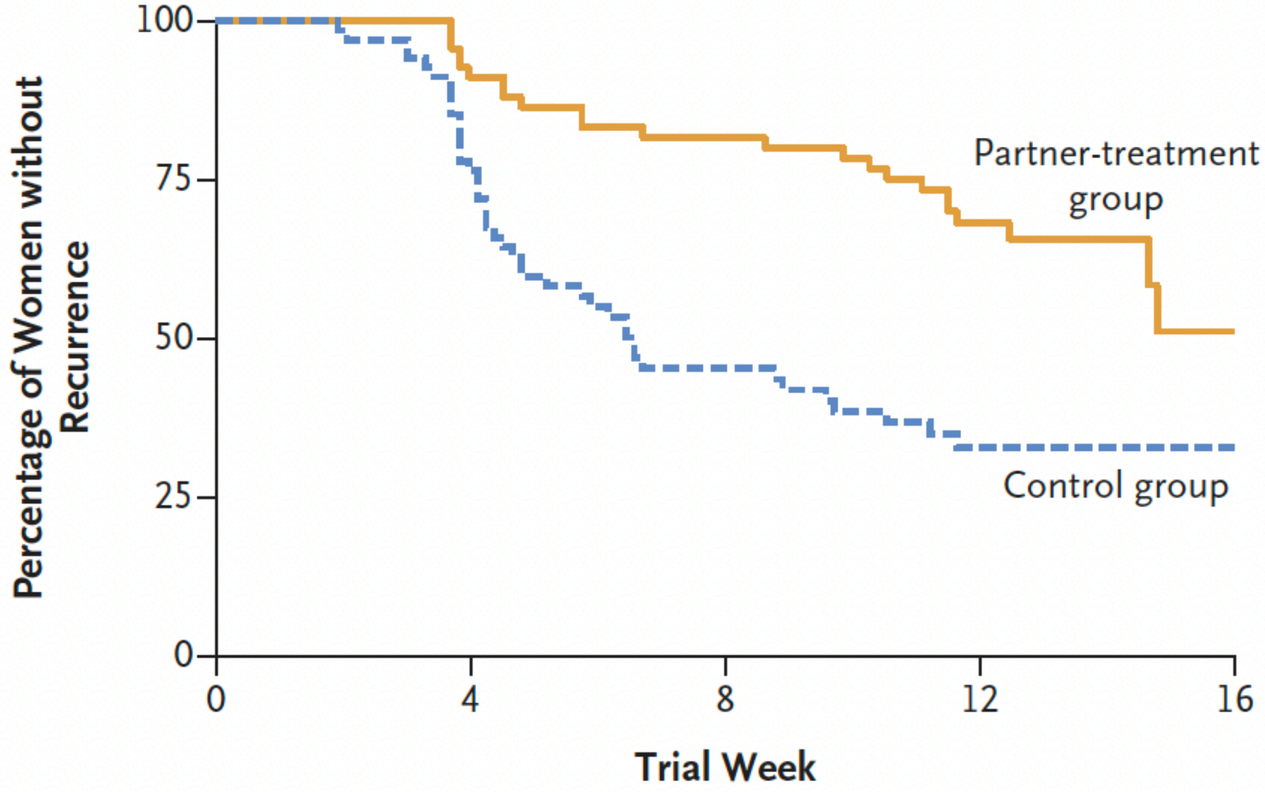
This open-label, randomized, controlled trial involved couples in which a woman had bacterial vaginosis and was in a monogamous relationship with a male partner. In the partner-treatment group, the woman received first-line recommended antimicrobial agents and the male partner received oral and topical antimicrobial treatment (metronidazole 400-mg tablets and 2% clindamycin cream applied to penile skin, both twice daily for 7 days). In the control group, the woman received first-line treatment and the male partner received no treatment (standard care). The primary outcome was recurrence of bacterial vaginosis within 12 weeks.

Male-Partner Treatment to Prevent Recurrence of Bacterial Vaginosis. NEJM March 6, 2025; 392 N10.

RESULTS

A total of 81 couples were assigned to the partner-treatment group, and 83 couples were assigned to the control group. The trial was stopped by the data and safety monitoring board after 150 couples had completed the 12-week follow-up period because treatment of the woman only was inferior to treatment of both the woman and her male partner. In the modified intention-to-treat population, recurrence occurred in 24 of 69 women (35%) in the partner-treatment group (recurrence rate, 1.6 per person-year; 95% confidence interval [CI], 1.1 to 2.4) and in 43 of 68 women (63%) in the control group (recurrence rate, 4.2 per person-year; 95% CI, 3.2 to 5.7), which corresponded to an absolute risk difference of −2.6 recurrences per person-year (95% CI, −4.0 to −1.2; P<0.001).

Male-Partner Treatment to Prevent Recurrence of Bacterial Vaginosis. NEJM March 6, 2025; 392 N10.



No. at Risk

Partner-treatment group	69	61	50	31
Control group	68	51	27	11

Figure 2. Kaplan–Meier Curves for Time to Recurrence of Bacterial Vaginosis (Modified Intention-to-Treat Population).

Male-Partner Treatment to Prevent Recurrence of Bacterial Vaginosis. NEJM March 6, 2025; 392 N10.

CONCLUSIONS

The addition of combined oral and topical antimicrobial therapy for male partners to treatment of women for bacterial vaginosis resulted in a lower rate of recurrence of bacterial vaginosis within 12 weeks than standard care.

Male-Partner Treatment to Prevent Recurrence of Bacterial Vaginosis. NEJM March 6, 2025; 392 N10.

Based on the NEJM article, "Male Partner Treatment to Prevent Recurrence of Bacterial Vaginosis" by Vodstrcil LA, et al, the use of which treatment regimen in males resulted in a lower rate of recurrence of bacterial vaginosis in female partners at 12 weeks?

A. Metronidazole 0.75% cream applied twice daily to penile skin for 7 days

B. Metronidazole 400 mg orally twice daily for 7 days

C. Metronidazole 400 mg orally twice daily plus topical clindamycin 2% twice daily to penile skin for 7 days

D. Single-dose metronidazole 2000 mg orally

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The exact etiology of bacterial vaginosis (BV) is unclear, but is theorized to be related to a reduction in lactobacilli coupled with an overgrowth of bacteria. Which of the following statements related to the treatment of BV is correct?

A. Antibiotics are generally unnecessary because the majority of BV cases resolve spontaneously within 2 weeks

B. Oral probiotic therapy alone has been shown to treat BV in most cases

C. Treatment is important as there is an increased risk of acquiring sexually transmitted infections after being diagnosed with BV

D. Treatment of BV is not recommended in pregnant patients, as it may be harmful to the fetus

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Previous trials of male treatment for bacterial vaginosis have not shown increased incidence of cure. What adjustments were made in this study protocol that were attributed to the positive study results?

A. Extending the treatment course to 2 weeks

B. Targeting the penile urethra and penile skin, including the subpreputial space

C. Targeting the perineum and scrotal area

D. Use of oral clindamycin instead of metronidazole increased compliance and reduced the risk of alcohol-induced disulfiram reactions

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In which of the following patients being treated for bacterial vaginosis should an alternative to metronidazole be used?

A. A 22-year-old man with documented IgE-mediated allergy to metronidazole

B. A 28-year-old woman who is breastfeeding her 2-week-old infant

C. A 31-year-old woman who is approximately 8 weeks pregnant

D. A 43-year-old man currently being treated with bictegravir/emtricitabine/tenofovir (Biktarvy)

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AOA COLA Articles 2026

JAMA

Risk of Gastrointestinal Adverse Events Associated With Glucagon-Like Peptide-1 Receptor Agonists for Weight Loss

Mohit Sodhi, MSc[1]; Ramin Rezaeianzadeh, BSc[1]; Abbas Kezouh, PhD[2]; et al

» Author Affiliations | Article Information

JAMA
Published Online: October 5, 2023
2023;330;(18):1795-1797.
doi:10.1001/jama.2023.19574

Study Compared 2 GLP 1 Agonists to buproprion-naltrexone

- **GLP-1 Agonists**
  - **Semaglutide (trade names: Ozempic, Wegovy, and Rybelsus)**
  - **Liraglutide (trade names: Saxenda, and Victoza)**
- **buproprion-naltrexone (trade name Contrave)**

Risk of Gastrointestinal Adverse Events Associated with GLP-1 Receptor Agonists for Weight Loss. JAMA 2023;330 (18), 1795-1797

Table 1. Characteristics of Semaglutide, Liraglutide, and Bupropion-Naltrexone Users

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	Semaglutide	Liraglutide	Bupropion-naltrexone
No.	613	4144	654
Age, mean (SD), y	53.5 (11.9)	51.3 (12.2)	45.2 (11.1)
Sex, %			
Male	55.8	61.0	82.4
Female	44.2	39.0	17.6
Follow-up, median (IQR), y	0.6 (0.2-1.1)	1.7 (0.8-3.1)	1.7 (0.7-2.9)
Covariates, %			
Alcohol[a]	2.9	0.4	0.6
Smoking[a]	8.7	12.5	9.9
Hyperlipidemia[b]	55.6	22.8	11.5
Abdominal surgery[c]	0	0.12	0
US region			
Northeast	18.3	25.8	18.3
Southeast	34.6	26.1	34.6
Midwest	33.1	30.3	33.1
Southwest	0.2	2.6	0.3
West	13.9	15.3	12.4
Incidence (No.)[d]			
Biliary disease	11.7 (5)	18.6 (162)	12.6 (16)
Pancreatitis	4.6 (2)	7.9 (71)	1.0 (1)
Bowel obstruction	0	8.1 (73)	1.7 (2)
Gastroparesis	9.1 (4)	7.3 (66)	3.1 (3)

[a] Alcohol and smoking were defined as any codes for alcohol use or smoking in 1 year prior to cohort entry.

[b] Hyperlipidemia was defined as any code for hyperlipidemia or dyslipidemia in 1 year prior to cohort entry.

[c] Any abdominal surgery in previous 30 days.

[d] Incidence per 1000 person-years.

Table 2. Risks of Biliary Disease, Pancreatitis, Bowel Obstruction, and Gastroparesis Among Users of GLP-1 Agonists vs Bupropion-Naltrexone

Table 2. Risks of Biliary Disease, Pancreatitis, Bowel Obstruction, and Gastroparesis Among Users of GLP-1 Agonists vs Bupropion-Naltrexone

Outcomes	GLP-1 agonists, HR (95% CI)[a]		Bupropion-naltrexone
	Crude	Adjusted[b]	
Primary analysis			
Biliary disease	1.48 (0.88-2.47)	1.50 (0.89-2.53)	1 [Reference]
Pancreatitis	10.33 (1.44-74.40)	9.09 (1.25-66.00)	1 [Reference]
Bowel obstruction	5.16 (1.27-21.00)	4.22 (1.02-17.40)	1 [Reference]
Gastroparesis	3.31 (1.04-10.50)	3.67 (1.15-11.90)	1 [Reference]
Sensitivity analyses			
Exclusion of hyperlipidemia			
Biliary disease	1.50 (0.88-2.56)	1.46 (0.84-2.51)	1 [Reference]
Pancreatitis	9.80 (1.36-70.79)	7.99 (1.10-58.30)	1 [Reference]
Bowel obstruction	4.43 (1.08-18.20)	3.63 (0.87-15.10)	1 [Reference]
Gastroparesis	3.32 (1.04-10.60)	3.67 (1.14-11.80)	1 [Reference]
Analysis with less-restrictive obesity definition[c]			
Biliary disease	1.29 (0.92-1.80)	1.20 (0.85-1.69)	1 [Reference]
Pancreatitis	6.19 (1.99-19.30)	5.94 (1.90-18.60)	1 [Reference]
Bowel obstruction	3.11 (1.28-7.54)	2.44 (1.00-5.95)	1 [Reference]
Gastroparesis	2.11 (1.09-4.09)	2.35 (1.20-4.58)	1 [Reference]
E-values for adjusted HRs[d]			
Biliary disease	2.36		
Pancreatitis	17.67		
Bowel obstruction	7.91		
Gastroparesis	6.80		

Abbreviations: GLP-1, glucagon-like peptide 1; HR, hazard ratio.

[a] Either semaglutide or liraglutide user.

[b] Hazard ratios adjusted for by age, sex, alcohol use, smoking, hyperlipidemia, and abdominal surgery in the last 30 days.

[c] Analysis that included patients without a diabetes code with or without an obesity code.

[d] E-values represent the HRs for the association of an unmeasured confounder (in this study's case, body mass index) with GLP-1 agonists and the study's 4 outcomes. E-values with HRs at least 2 suggest that such confounders are unlikely to change study results.

Discussion

This study found that use of GLP-1 agonists for weight loss compared with use of bupropion-naltrexone was associated with increased risk of pancreatitis, gastroparesis, and bowel obstruction but not biliary disease.

Risk of Gastrointestinal Adverse Events Associated with GLP-1 Receptor Agonists for Weight Loss. JAMA 2023;330 (18), 1795-1797

A 36-year-old woman comes to the emergency department with nausea, vomiting, and epigastric pain that radiates into the back. She has no history of alcohol use. Results of a recent lipid panel were within normal limits. Six weeks ago, she began a new weight-loss medication; the dose was recently increased. Laboratory studies show a significantly elevated lipase level. Ultrasound of the right upper quadrant of the abdomen is unremarkable. Which of the following medications is most likely responsible for this patient's presentation?

A. Bupropion-naltrexone (Vivitrol)

B. Liraglutide (Victoza)

C. Orlistat (Alli)

D. Semaglutide (Ozempic)

A 36-year-old woman comes to the emergency department with nausea, vomiting, and epigastric pain that radiates into the back. She has no history of alcohol use. Results of a recent lipid panel were within normal limits. Six weeks ago, she began a new weight-loss medication; the dose was recently increased. Laboratory studies show a significantly elevated lipase level. Ultrasound of the right upper quadrant of the abdomen is unremarkable. Which of the following medications is most likely responsible for this patient's presentation?

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According to the JAMA article “Risk of Gastrointestinal Adverse Events Associated With Glucagon-Like Peptide-(GLP)-1 Receptor Agonists for Weight Loss” by Sodhi et al, which of the following adverse symptoms was NOT associated with GLP-1 use?

A. Biliary disease

B. Bowel obstruction

C. Gastroparesis

D. Pancreatitis

According to the JAMA article “Risk of Gastrointestinal Adverse Events Associated With Glucagon-Like Peptide-(GLP)-1 Receptor Agonists for Weight Loss” by Sodhi et al, which of the following adverse symptoms was NOT associated with GLP-1 use?

- ✓ **A.** Biliary disease
- **B.** Bowel obstruction
- **C.** Gastroparesis
- **D.** Pancreatitis

Glucagon-like peptide-1 (GLP-1) receptor agonists are increasingly used for diabetes mellitus and weight loss, with several recognized complications that emergency physicians must be able to recognize and manage. GLP-1 agonists potentiate the release of insulin when glucose levels are elevated after meals, reduce food intake due to decreased gastric emptying rate and increased feeling of satiety, and inhibit the release of post-meal glucagon, affecting the central nervous system to aid in hunger control and reduce inflammation. Which of the following patients is a POOR candidate for GLP-1 initiation?

A. A 38-year-old woman with hypertension and obesity who has a history of breast cancer

B. A 47-year-old man with type 2 diabetes mellitus and a BMI of 35 kg/m^2 in whom lifestyle interventions have been unsuccessful

C. A 50-year-old with a BMI of 33 kg/m^2 and a history of hypertriglyceridemia and irritable bowel syndrome diarrhea-predominant (IBS-D)

D. A 65-year-old woman with type 2 diabetes mellitus and obesity who underwent cholecystectomy 1 week ago

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✓ **D.** A 65-year-old woman with type 2 diabetes mellitus and obesity who underwent cholecystectomy 1 week ago

A 57-year-old man with obesity and type 2 diabetes mellitus comes to the emergency department (ED) due to intractable nausea and vomiting. He reports that he has been hospitalized twice and has now visited the ED 3 times in the past 2 months for the same symptoms. Semaglutide was initiated 9 months ago for weight management. He reports no alcohol use, gallbladder disease, or abdominal surgeries. Following administration of intravenous fluids and anti-emetics, the patient tolerates a trial of oral intake. What is the most appropriate initial management for this patient?

A. Administer metoclopramide (Reglan) every 6 hours to to prevent gastric dysmotility

B. Continue semaglutide at a decreased dose and prescribe ondansetron (Zofran) for symptom control

C. Hold semaglutide and have the patient follow up with his physician in a few weeks to discuss restarting semaglutide at a lower dose

D. Schedule a gastric emptying study

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AOA COLA Articles 2026

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

High-Flow Nasal Oxygen vs Noninvasive Ventilation in Patients With Acute Respiratory Failure

The RENOVATE Randomized Clinical Trial

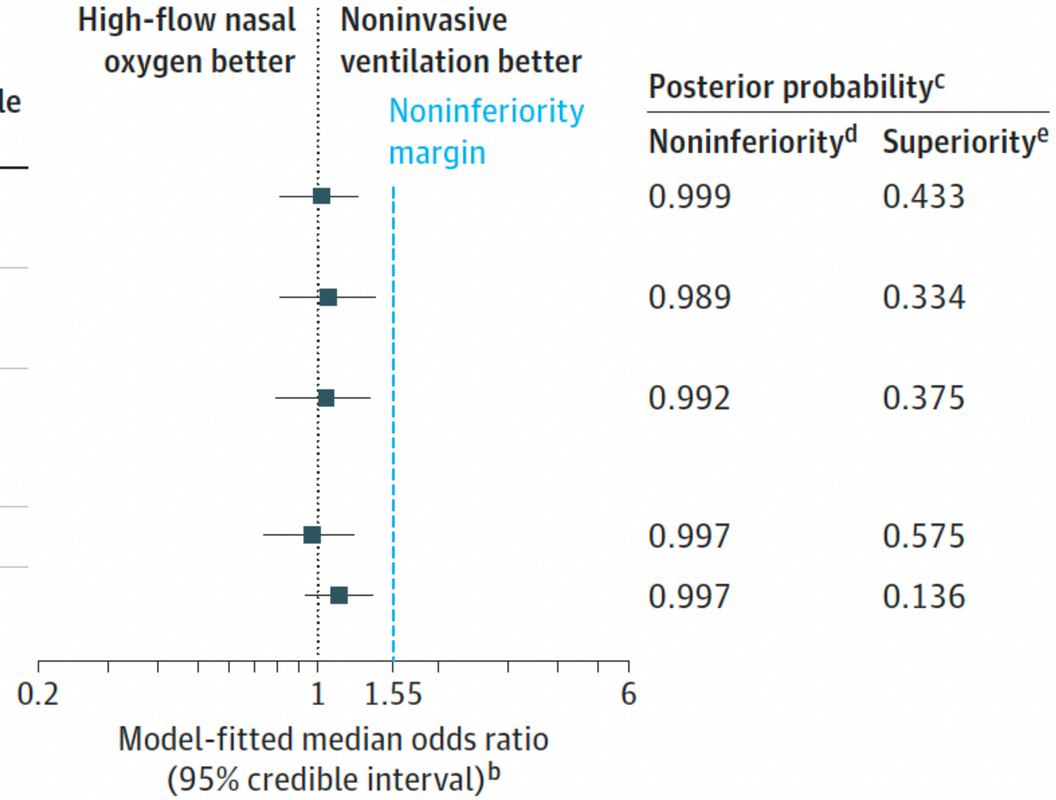
RENOVATE Investigators and the BRICNet Authors

JAMA March 11, 2025 Volume 333 No. 10

Figure 2. Primary Outcome of Endotracheal Intubation or Death Within 7 Days

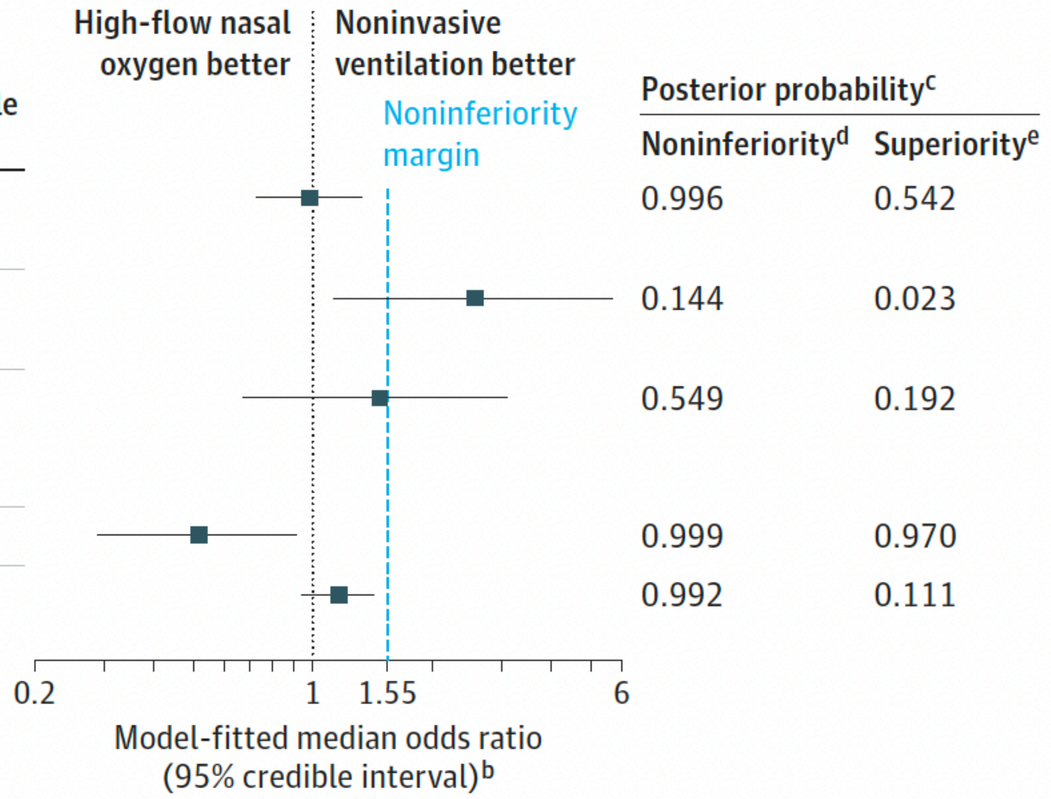
A Analysis of the primary outcome[a]

Patients with acute respiratory failure	No./total (%)		Model-fitted median odds ratio (95% credible interval)[b]	Posterior probability[c]	
	High-flow nasal oxygen	Noninvasive ventilation		Noninferiority[d]	Superiority[e]
Nonimmunocompromised with hypoxemia	81/249 (32.5)	78/236 (33.1)	1.02 (0.81-1.26)	0.999	0.433
Immunocompromised with hypoxemia	16/28 (57.1)	8/22 (36.4)	1.07 (0.81-1.39)	0.989	0.334
Chronic obstructive pulmonary disease exacerbation with respiratory acidosis	10/35 (28.6)	11/42 (26.2)	1.05 (0.79-1.36)	0.992	0.375
Acute cardiogenic pulmonary edema	14/136 (10.3)	29/136 (21.3)	0.97 (0.73-1.23)	0.997	0.575
Hypoxemic COVID-19	223/435 (51.3)	210/447 (47.0)	1.13 (0.94-1.38)	0.997	0.136



B Post hoc analysis of the primary outcome[f]

Patients with acute respiratory failure	No./total (%)		Model-fitted median odds ratio (95% credible interval)[b]	Posterior probability[c]	
	High-flow nasal oxygen	Noninvasive ventilation		Noninferiority[d]	Superiority[e]
Nonimmunocompromised with hypoxemia	81/249 (32.5)	78/236 (33.1)	0.98 (0.73-1.33)	0.996	0.542
Immunocompromised with hypoxemia	16/28 (57.1)	8/22 (36.4)	2.56 (1.14-5.68)	0.144	0.023
Chronic obstructive pulmonary disease exacerbation with respiratory acidosis	10/35 (28.6)	11/42 (26.2)	1.48 (0.67-3.09)	0.549	0.192
Acute cardiogenic pulmonary edema	14/136 (10.3)	29/136 (21.3)	0.52 (0.29-0.91)	0.999	0.970
Hypoxemic COVID-19	223/435 (51.3)	210/447 (47.0)	1.16 (0.94-1.43)	0.992	0.111



CONCLUSIONS AND RELEVANCE

Compared with NIV, HFNO met prespecified criteria for noninferiority for the primary outcome of endotracheal intubation or death within 7 days in 4 of the 5 patient groups with ARF. However, the small sample sizes in some patient groups and the sensitivity of the findings to the choice of analysis model suggests the need for further study in patients with COPD, immunocompromised patients, and patients with ACPE.

A 75-year-old man is brought to the emergency department by emergency medical services due to progressively worsening shortness of breath and wheezing. He has a history of chronic obstructive pulmonary disease and hypertension. He has a 60 pack-year history of smoking. On initial evaluation, the patient is alert and vital signs are:

Temperature	37 °C (98.6 °F)
Heart rate	130/min
Blood pressure	158/70 mmHg
Respiratory rate	32/min
Oxygen saturation	88% on 6 L of oxygen via nasal cannula

Based on the results of the RENOVATE clinical trial, what is the best choice for management of this patient?

A. Continuous nebulizer treatment for 1 hour

B. Endotracheal intubation

C. High-flow nasal oxygen

D. Noninvasive ventilation

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In which of the flowing categories from the RENOVATE clinical trial was high-flow nasal oxygen inferior to noninvasive ventilation for the outcomes of endotracheal intubation or death within 7 days?

A. Acute cardiogenic pulmonary edema

B. Chronic obstructive pulmonary disease with respiratory acidosis

C. COVID-19 with hypoxemia

D. Immunocompromised with hypoxemia

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A. Acute cardiogenic pulmonary edema

B. Chronic obstructive pulmonary disease with respiratory acidosis

C. COVID-19 with hypoxemia

✓ **D.** Immunocompromised with hypoxemia

A 65-year-old man presents to the emergency department because of shortness of breath. He has a history of heart failure with reduced ejection fraction and renal insufficiency. He has had a 4.5-kg (10-lb) weight gain during the past 2 weeks. Physical examination reveals tachycardia, tachypnea, and 3+ pitting edema bilaterally. Auscultation of the chest reveals rales bilaterally. Oxygen saturation is 88% on room air. According to the RENOVATE trial, with a posterior probability superiority score of .970, what is the best option to treat this patient with respiratory distress?

A. Endotracheal intubation

B. High-flow nasal oxygen

C. Noninvasive ventilation

D. Nonrebreather mask

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AOA COLA Articles 2026

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

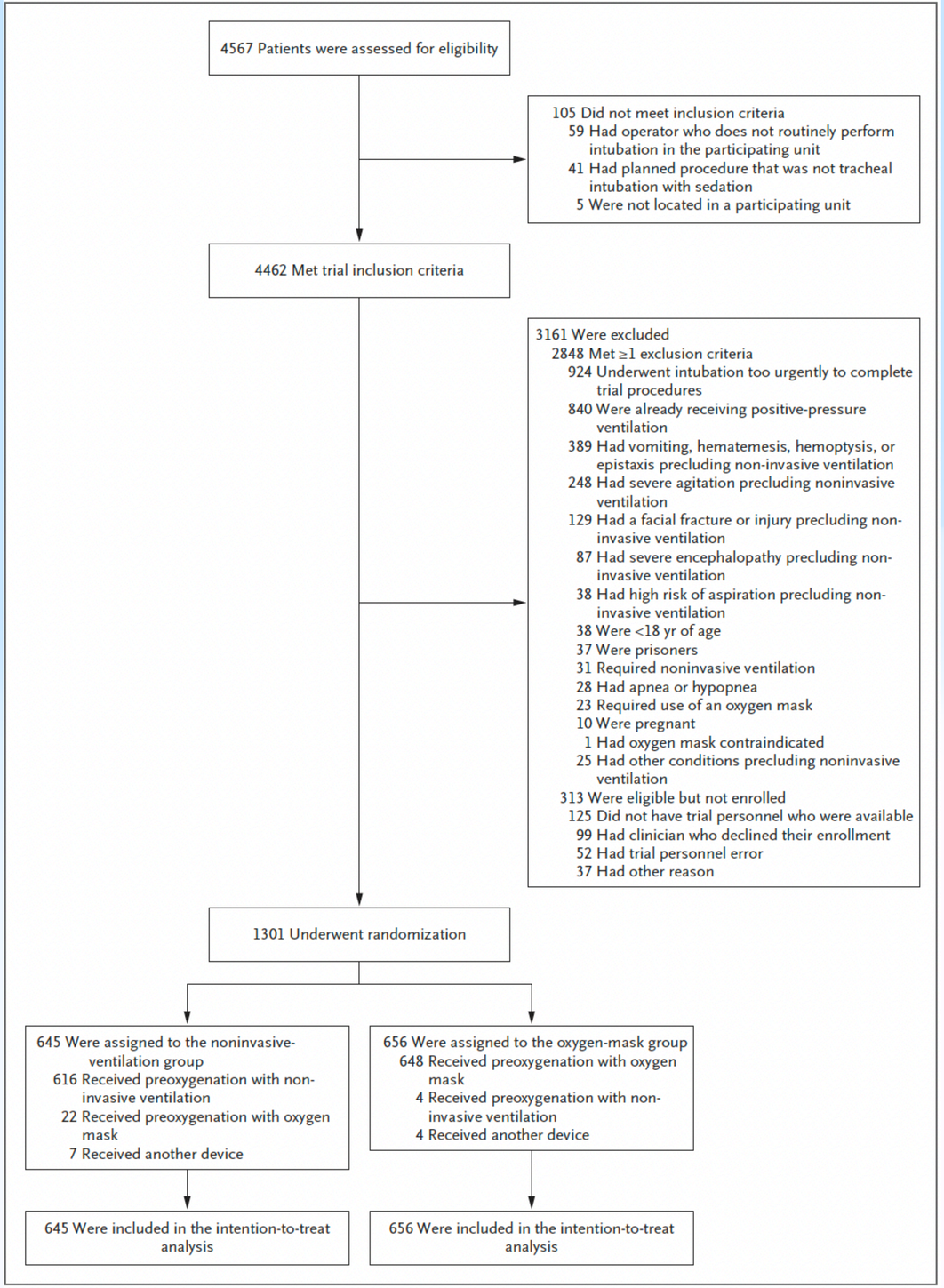
Noninvasive Ventilation for Preoxygenation during Emergency Intubation

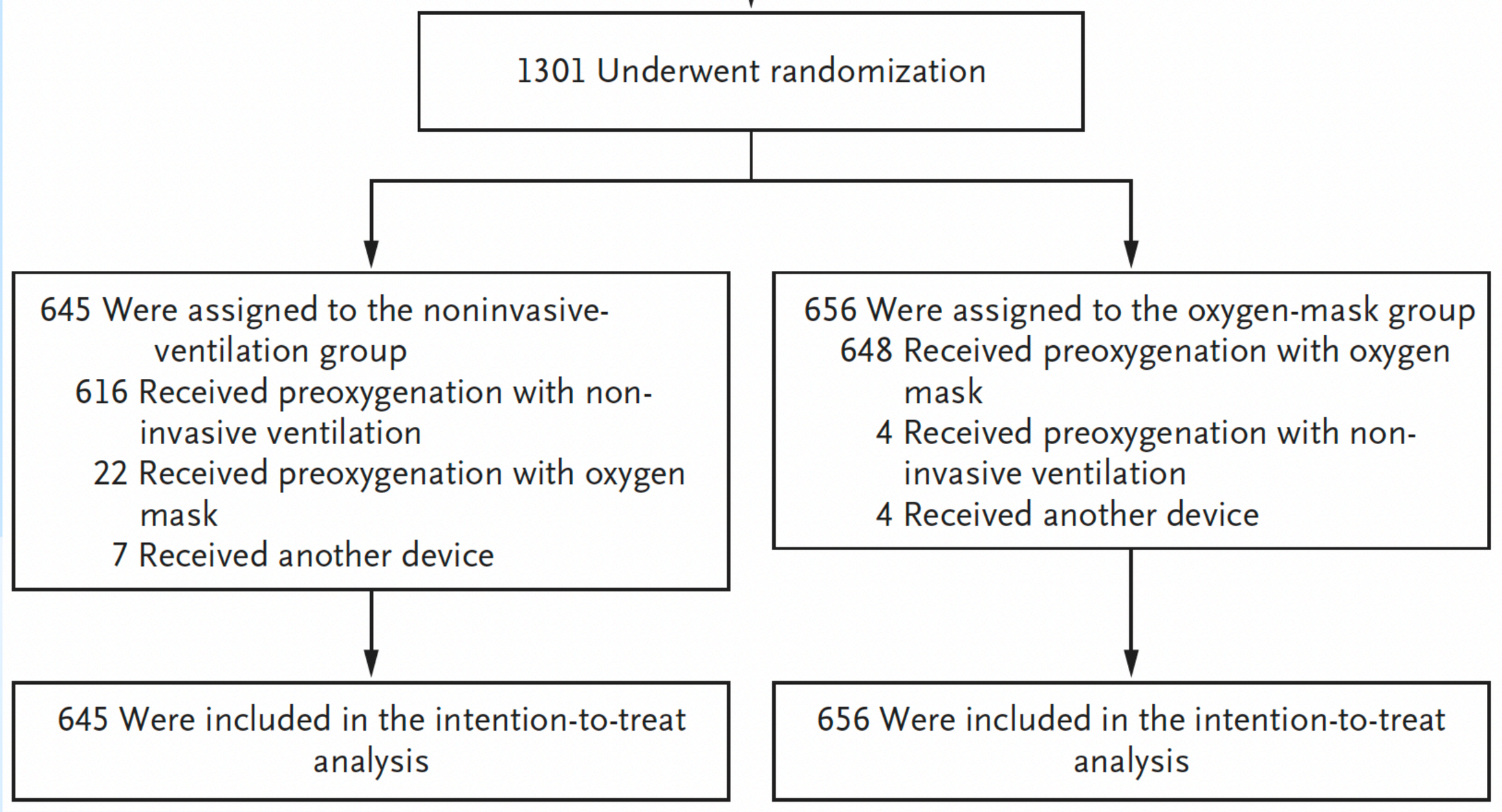
K.W. Gibbs, M.W. Semler, B.E. Driver, K.P. Seitz, S.B. Stempek, C. Taylor, D. Resnick-Ault, H.D. White, S. Gandotra, K.C. Doerschug, A. Mohamed, M.E. Prekker, A. Khan, J.P. Gaillard, L. Andrea, N.R. Aggarwal, J.C. Brainard, L.A.H. Barnett, S.J. Halliday, V. Blinder, A. Dagan, M.R. Whitson, S.G. Schauer, J.E. Walker, Jr., A.B. Barker, J.A. Palakshappa, A. Muhs, J.M. Wozniak, P.J. Kramer, C. Withers, S.A. Ghamande, D.W. Russell, A. Schwartz, A. Moskowitz, S.J. Hansen, G. Allada, J.K. Goranson, D.G. Fein, P.D. Sottile, N. Kelly, S.M. Alwood, M.T. Long, R. Malhotra, N.I. Shapiro, D.B. Page, B.J. Long, C.B. Thomas, S.A. Trent, D.R. Janz, T.W. Rice, W.H. Self, V.S. Bebarta, B.D. Lloyd, J. Rhoads, K. Womack, B. Imhoff, A.A. Ginde, and J.D. Casey, for the PREOXI Investigators and the Pragmatic Critical Care Research Group*

ABSTRACT

METHODS

In a multicenter, randomized trial conducted at 24 emergency departments and intensive care units in the United States, we randomly assigned critically ill adults (age, ≥18 years) undergoing tracheal intubation to receive preoxygenation with either noninvasive ventilation or an oxygen mask. The primary outcome was hypoxemia during intubation, defined by an oxygen saturation of less than 85% during the interval between induction of anesthesia and 2 minutes after tracheal intubation.


4567 Patients were assessed for eligibility
105 Did not meet inclusion criteria
59 Had operator who does not routinely perform intubation in the participating unit
41 Had planned procedure that was not tracheal intubation with sedation
5 Were not located in a participating unit
4462 Met trial inclusion criteria
3161 Were excluded
2848 Met ≥1 exclusion criteria
924 Underwent intubation too urgently to complete trial procedures
840 Were already receiving positive-pressure ventilation
389 Had vomiting, hematemesis, hemoptysis, or epistaxis precluding non-invasive ventilation
248 Had severe agitation precluding noninvasive ventilation
129 Had a facial fracture or injury precluding non-invasive ventilation
87 Had severe encephalopathy precluding non-invasive ventilation
38 Had high risk of aspiration precluding non-invasive ventilation
38 Were <18 yr of age
37 Were prisoners
31 Required noninvasive ventilation
28 Had apnea or hypopnea
23 Required use of an oxygen mask
10 Were pregnant
1 Had oxygen mask contraindicated
25 Had other conditions precluding noninvasive ventilation
313 Were eligible but not enrolled
125 Did not have trial personnel who were available
99 Had clinician who declined their enrollment
52 Had trial personnel error
37 Had other reason
1301 Underwent randomization
645 Were assigned to the noninvasive-ventilation group
616 Received preoxygenation with non-invasive ventilation
22 Received preoxygenation with oxygen mask
7 Received another device
656 Were assigned to the oxygen-mask group
648 Received preoxygenation with oxygen mask
4 Received preoxygenation with non-invasive ventilation
4 Received another device
645 Were included in the intention-to-treat analysis
656 Were included in the intention-to-treat analysis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656 Were included in the intention-to-treat analysis

RESULTS

Among the 1301 patients enrolled, hypoxemia occurred in 57 of 624 patients (9.1%) in the noninvasive-ventilation group and in 118 of 637 patients (18.5%) in the oxygen-mask group (difference, −9.4 percentage points; 95% confidence interval [CI], −13.2 to −5.6; P<0.001). Cardiac arrest occurred in 1 patient (0.2%) in the noninvasive-ventilation group and in 7 patients (1.1%) in the oxygen-mask group (difference, −0.9 percentage points; 95% CI, −1.8 to −0.1). Aspiration occurred in 6 patients (0.9%) in the noninvasive-ventilation group and in 9 patients (1.4%) in the oxygen-mask group (difference, −0.4 percentage points; 95% CI, −1.6 to 0.7).

CONCLUSIONS

Among critically ill adults undergoing tracheal intubation, preoxygenation with noninvasive ventilation resulted in a lower incidence of hypoxemia during intubation than preoxygenation with an oxygen mask. (Funded by the U.S. Department of Defense; PREOXI ClinicalTrials.gov number, NCT05267652.)

Intubation is being performed on a patient with chronic obstructive pulmonary disease (COPD) who has hypoxia. Which of the following interventions will minimize the incidence of hypoxemia during intubation?

A. Preoxygenation with dual nasal cannula and non-rebreather mask

B. Preoxygenation with noninvasive ventilation

C. Preoxygenation with non-rebreather mask

D. Ventilation with bag-valve mask

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✓ **B.** Preoxygenation with noninvasive ventilation

C. Preoxygenation with non-rebreather mask

D. Ventilation with bag-valve mask

During intubation of a patient with sepsis and acute respiratory failure secondary to pneumonia, the decision to use non-invasive ventilation for pre-oxygenation would lead to which of the following expected outcomes, when compared with pre-oxygenation with a standard oxygen mask?

A. Greater incidence of cardiac arrest

B. Increased risk of hypotension

C. Increased risk of vomiting

D. Less hypoxemia during intubation

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A. Greater incidence of cardiac arrest

B. Increased risk of hypotension

C. Increased risk of vomiting

D. Less hypoxemia during intubation

A 62-year-old man with a suspected variceal bleed is being evaluated in the emergency department after vomiting a large amount of blood. The patient is diaphoretic, and vital signs are:

Heart rate	145/min
Respiratory rate	32/min
Blood pressure	82/46 mmHg
Oxygen saturation	82% on non-rebreather mask

Despite aggressive attempts at resuscitation, his mental status deteriorates, and he becomes obtunded. As the team prepares for intubation, which of the following best explains why the patient is NOT an appropriate candidate for non-invasive ventilation (NIV) preoxygenation?

A. NIV preoxygenation is contraindicated in patients who are actively vomiting with high aspiration risk factors

B. NIV preoxygenation offers no difference in oxygenation when compared with non-rebreather mask

C. NIV preoxygenation provides insufficient oxygenation in patients with hypovolemic or hemorrhagic shock

D. NIV preoxygenation worsens ventilation-perfusion mismatch in patients with upper gastrointestinal bleeding

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AOA COLA Articles 2026

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Randomized Trial of Drug Route in Out-of-Hospital Cardiac Arrest

K. Couper, C. Ji, C.D. Deakin, R.T. Fothergill, J.P. Nolan, J.B. Long, J.M. Mason, F. Michelet, C. Norman, H. Nwankwo, T. Quinn, A.-M. Slowther, M.A. Smyth, K.R. Starr, A. Walker, S. Wood, S. Bell, G. Bradley, M. Brown, S. Brown, E. Burrow, K. Charlton, A. Claxton Dip, V. Dra'gon, C. Evans, J. Falloon, T. Foster, J. Kearney, N. Lang, M. Limmer, A. Mellett-Smith, J. Miller, C. Mills, R. Osborne, N. Rees, R.E.S. Spaight, G.L. Squires, B. Tibbetts, M. Waddington, G.A. Whitley, J.V. Wiles, J. Williams, S. Wiltshire, A. Wright, R. Lall, and G.D. Perkins, for the PARAMEDIC-3 Collaborators*

NEJM 392;4 January 23, 2025

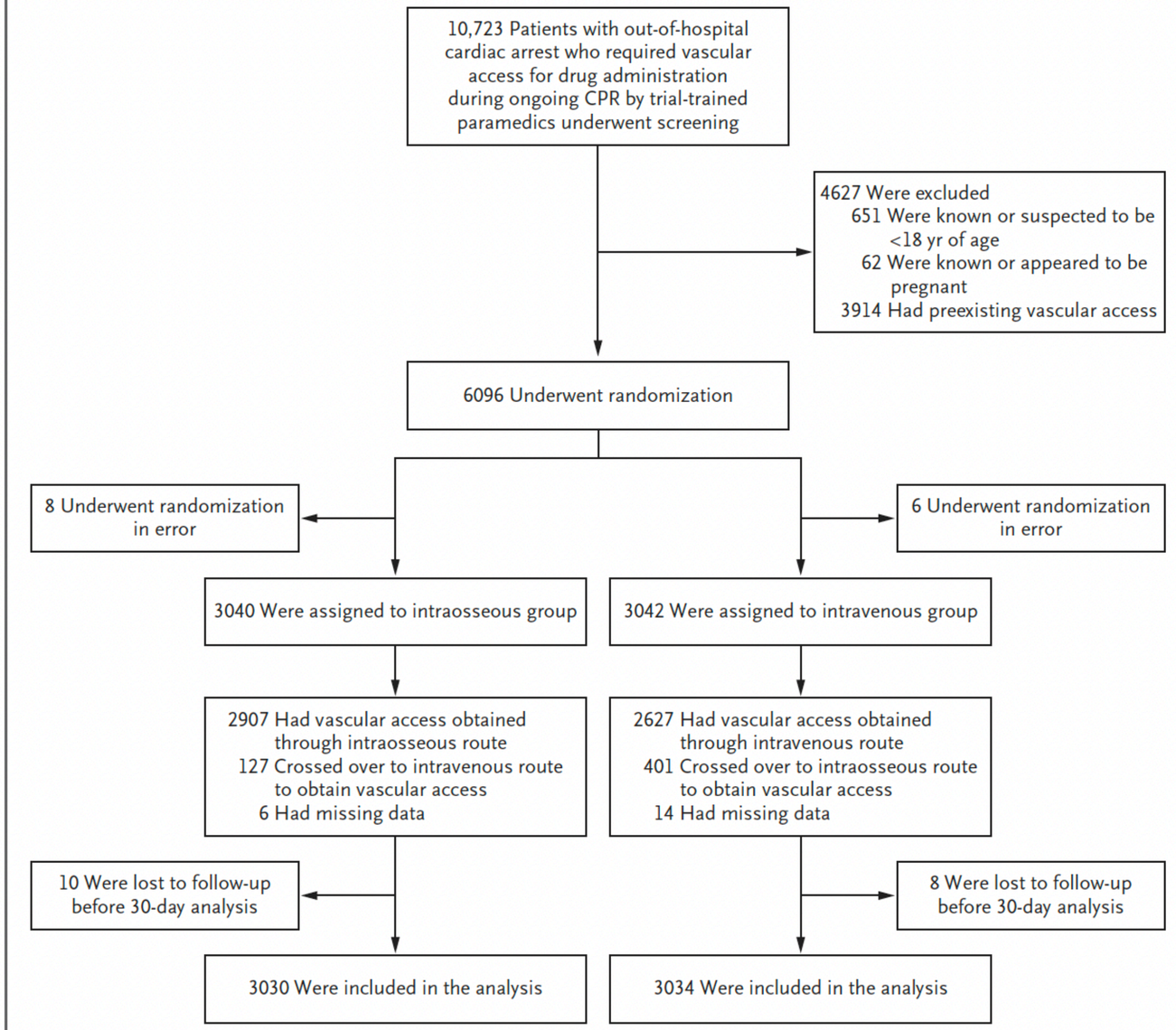

Figure 1. Screening, Enrollment, Randomization, and Inclusion in Analysis.

A total of 3914 patients were excluded from the trial owing to preexisting vascular access, which most likely occurred when a paramedic who was not trained in the trial protocol arrived on scene and secured vascular access before the arrival of a trial-trained paramedic. Crossover was defined as the use of the nonrandomized drug route before the completion of two unsuccessful attempts at establishing vascular access with the use of the randomized route. CPR denotes cardiopulmonary resuscitation.

Table 3. Primary and Secondary Outcomes.

Outcome	Intraosseous Route	Intravenous Route	Risk or Mean Difference (95% CI)*		Treatment Effect (95% CI)†	
			Unadjusted	Adjusted‡	Unadjusted	Adjusted
Primary outcome						
Survival at 30 days — no./total no. (%)	137/3030 (4.5)	155/3034 (5.1)	–0.6 (–1.7 to 0.5)	–0.2 (–1.1 to 0.8)	0.88 (0.70 to 1.11)	0.94 (0.68 to 1.32)§
Secondary outcomes						
Return of spontaneous circulation at any time — no./total no. (%)	1092/3031 (36.0)	1186/3035 (39.1)	–3.0 (–5.5 to –0.6)	–3.2 (–5.9 to –0.6)	0.88 (0.79 to 0.97)	0.86 (0.76 to 0.97)
Median time to return of spontaneous circulation (IQR) — min	33.0 (24.0 to 43.0)	32.0 (24.0 to 43.0)	0.76 (–1.06 to 2.58)	0.45 (–0.82 to 1.72)	0.90 (0.82 to 0.98)¶	0.89 (0.81 to 0.98)¶
Sustained return of spontaneous circulation at hospital handover — no./total no. (%)	654/3016 (21.7)	744/3023 (24.6)	–2.9 (–5.1 to –0.8)	–2.6 (–4.8 to –0.3)	0.85 (0.75 to 0.96)	0.85 (0.74 to 0.98)
Survival to hospital discharge — no./total no. (%)	112/3012 (3.7)	120/3012 (4.0)	–0.3 (–1.2 to 0.7)	0.0 (–0.9 to 0.8)	0.93 (0.72 to 1.21)	1.00 (0.68 to 1.46)
Median length of hospital stay (IQR) — days						
Patients who survived	18 (11.0 to 32.0)	16 (7.0 to 31.0)	3.12 (–4.70 to 10.94)	7.68 (–4.39 to 19.75)		
Patients who died	0 (0.0 to 0.0)	0 (0.0 to 0.0)	–0.23 (–0.48 to 0.02)	–0.18 (–0.45 to 0.10)		
Score on modified Rankin scale at hospital discharge — no./total no. (%)‖						
0–3: Favorable outcome	80/2994 (2.7)	85/2986 (2.8)	–0.2 (–1.0 to 0.7)	–0.1 (–0.8 to 0.6)	0.94 (0.69 to 1.28)	0.91 (0.57 to 1.47)
4–6: Unfavorable outcome	2914/2994 (97.3)	2901/2986 (97.2)				
Adverse events						
Any adverse event — no. per 1000 patients/total no. (%)	1/3040 (0.33)	0/3042 (0)			1.01 (0.86 to 1.18)**	
Serious adverse event — no. per 1000 patients/total no. (%)	0/3040 (0)	0/3042 (0)				

CONCLUSIONS

Among adults with out-of-hospital cardiac arrest requiring drug therapy, the use of an intraosseous-first vascular access strategy did not result in higher 30-day survival than an intravenous-first strategy.

Despite similarities in the time to drug administration, the percentage of patients with a return of spontaneous circulation appeared to be lower in the intraosseous group than in the intravenous group, a finding that suggests that drug efficacy was influenced by the route of administration.

NEJM 392;4 January 23, 2025

EMS is dispatched to an unresponsive 67-year-old man. On arrival, the patient is in cardiopulmonary arrest. According to the article “A Randomized Trial of Drug Route in Out-of-Hospital Cardiac Arrest” by Couper K et al, which of the following is true with respect to vascular access?

A. Intraosseous vascular access should be initiated due to higher 30-day survival.

B. Intraosseous vascular access should be initiated since it significantly reduces the time to drug administration.

C. Medications administered via intraosseous access typically require dose adjustment.

D. There is no significant increase in 30-day survival for receiving intraosseous-first access versus intravenous-first access.

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A patient who is in cardiac arrest after blunt trauma is treated by EMS staff using an interosseous line. After performing resuscitation, return of spontaneous circulation (ROSC) is achieved. What difference would be seen with the placement of a prehospital intraosseous line versus the placement of a prehospital intravenous line during cardiac arrest?

A. Faster time for ROSC

B. Increase in 30-day survival

C. Improved modified Rankin score at hospital discharge

D. No measurable difference in outcome

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C. Improved modified Rankin score at hospital discharge

✓ **D.** No measurable difference in outcome

Two weeks after hospital discharge following coronary artery bypass grafting, a 72-year-old man comes to the emergency department because of left leg pain. The patient was initially hospitalized for a myocardial infarction complicated by cardiac arrest, during which time an interosseous (IO) line was placed in the left lower leg. On examination today, there is mild leg tenderness along the proximal tibia with no erythema, warmth, or crepitus. What adverse event associated with prehospital placement of an intraosseous line is most likely to be observed in this patient?

A. Activity-mediated pain that is generally self-limited

B. Development of compartment syndrome from improper placement of the intraosseous line

C. Extravasation of resuscitation medications

D. Fat embolism traveling to the pulmonary arteries

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According to the article “A Randomized Trial of Drug Route in Out-of-Hospital Cardiac Arrest” by Couper K, et al, which of the following subgroups demonstrated the most favorable 30-day survival rate after intraosseous access placement by EMS?

A. EMS-witnessed cardiac arrest

B. Female gender

C. Initial cardiac arrest that was medically caused

D. Initial cardiac rhythm that was non-shockable

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- ✓ **A.** EMS-witnessed cardiac arrest
- **B.** Female gender
- **C.** Initial cardiac arrest that was medically caused
- **D.** Initial cardiac rhythm that was non-shockable

Case Presentation: 5 y/o unable to walk, falling into walls

Triage report: normally healthy 5-year old “can’t walk”

- 5 y/o has had fever, chills, congestion, and body aches for 4 days, diagnosed with influenza-A 2 days ago
- Body aches worse last night, and he began crawling last night instead of walking
- This morning, walking into walls, crying, falling over
- VS: P 92, BP 108/65, R 18, T 99.5 F


ROOM H

Differential Diagnoses

5 y/o unable to walk

- Acute Cerebellitis
- Intracranial neoplasm
- Encephalitis
- Transverse myelitis
- Tabes dorsalis
- Viral myositis
- Guilain-Barre Syndrome
- Trauma or non accidental injury
- Rhabdomyolysis
- Juvenile rheumatoid arthritis
- Polymyositis
- Muscular dystrophy
- Septic arthritis

Initial Results

5 y/o Unable to walk

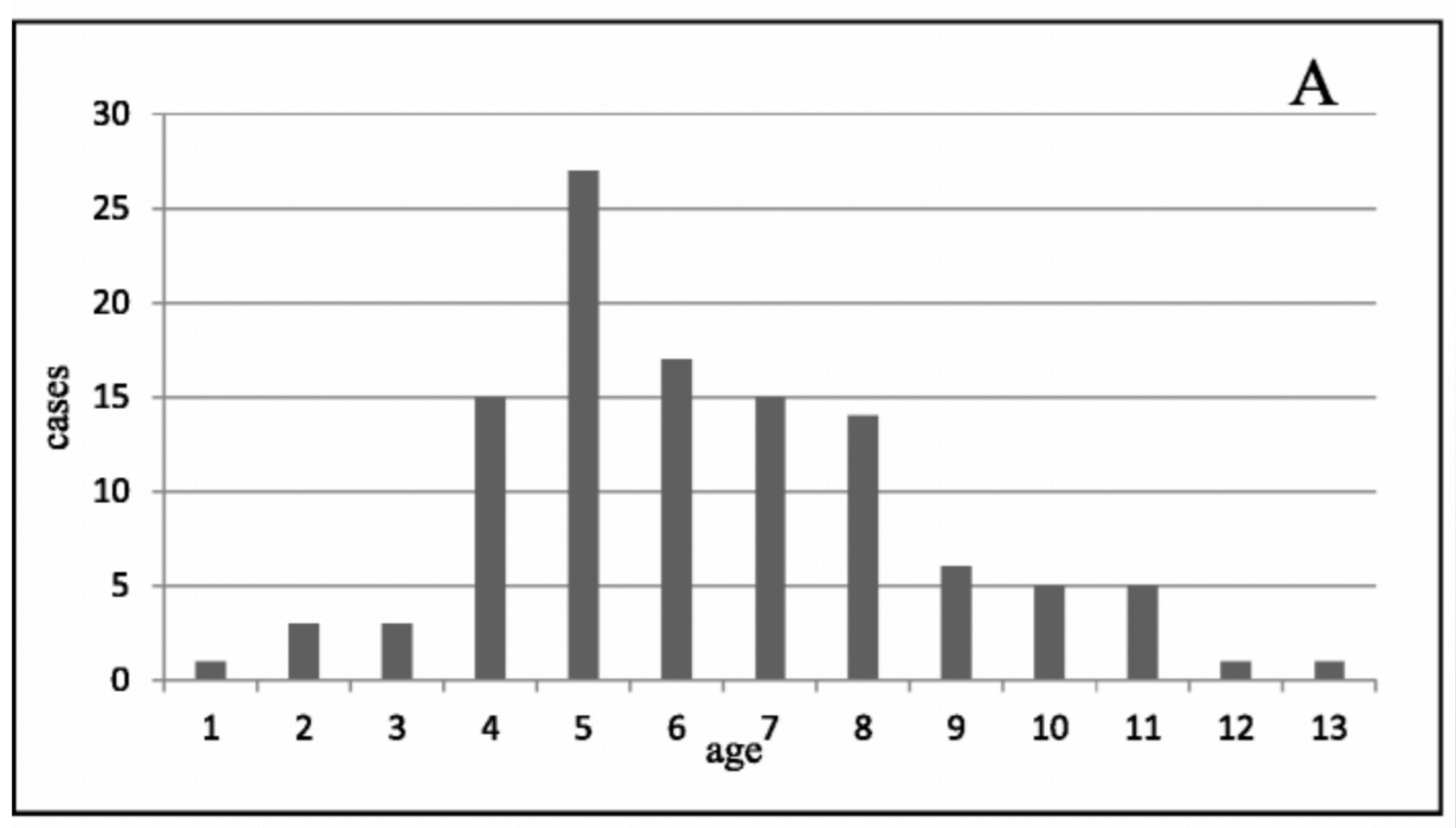
- **Non-contrast Head CT: normal**
- **CBC: WBC 11.5, Hgb 14.5, HCT 44, PLT 208**
- **BMP: Na 144, K 4.5, Cl 101, BUN 9, Cr 0.7**
- **AST 22, ALT 28, Alk Phos 62, Bili 0.6, Alb 3.9**
- **ESR 4.5, CRP: 65, CK 1,453**
- **Influenza A +, Influenza B - , RSV -, COVID -**

Benign Acute Childhood Myositis

Rare, self-limiting post-viral condition

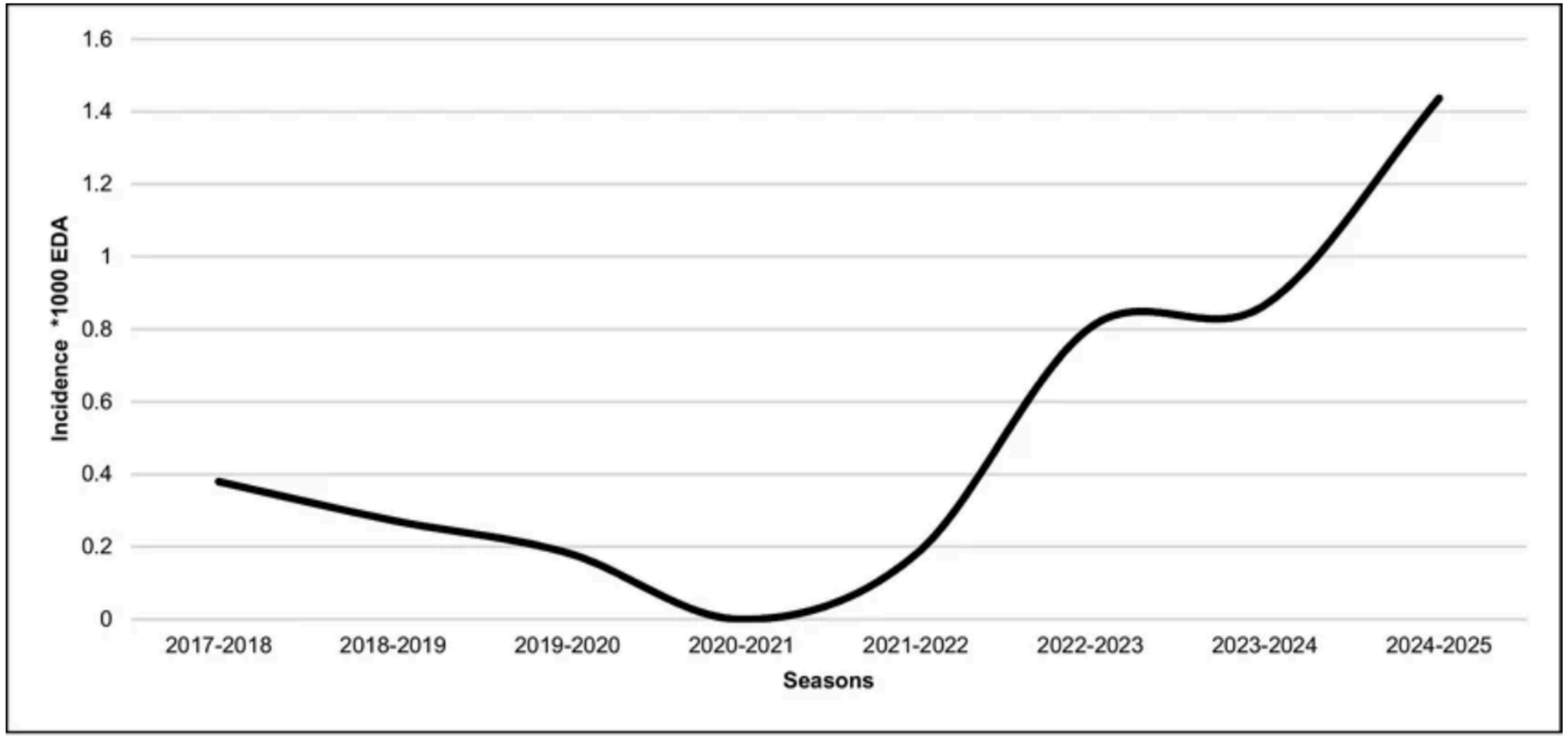
- Often following influenza or influenza like illness (ILI)
- Presentation may be a tip-toe gait, refusal to walk, to severe lower-extremity pain
- Usually resolves in 3 days
- Predominantly in school-aged children 4-8
- Male to female predominance 2:1
- Cases are on the rise

Incidence of BACM by Age



Italian Journal of Pediatrics, March 2021, V47 Article N 57

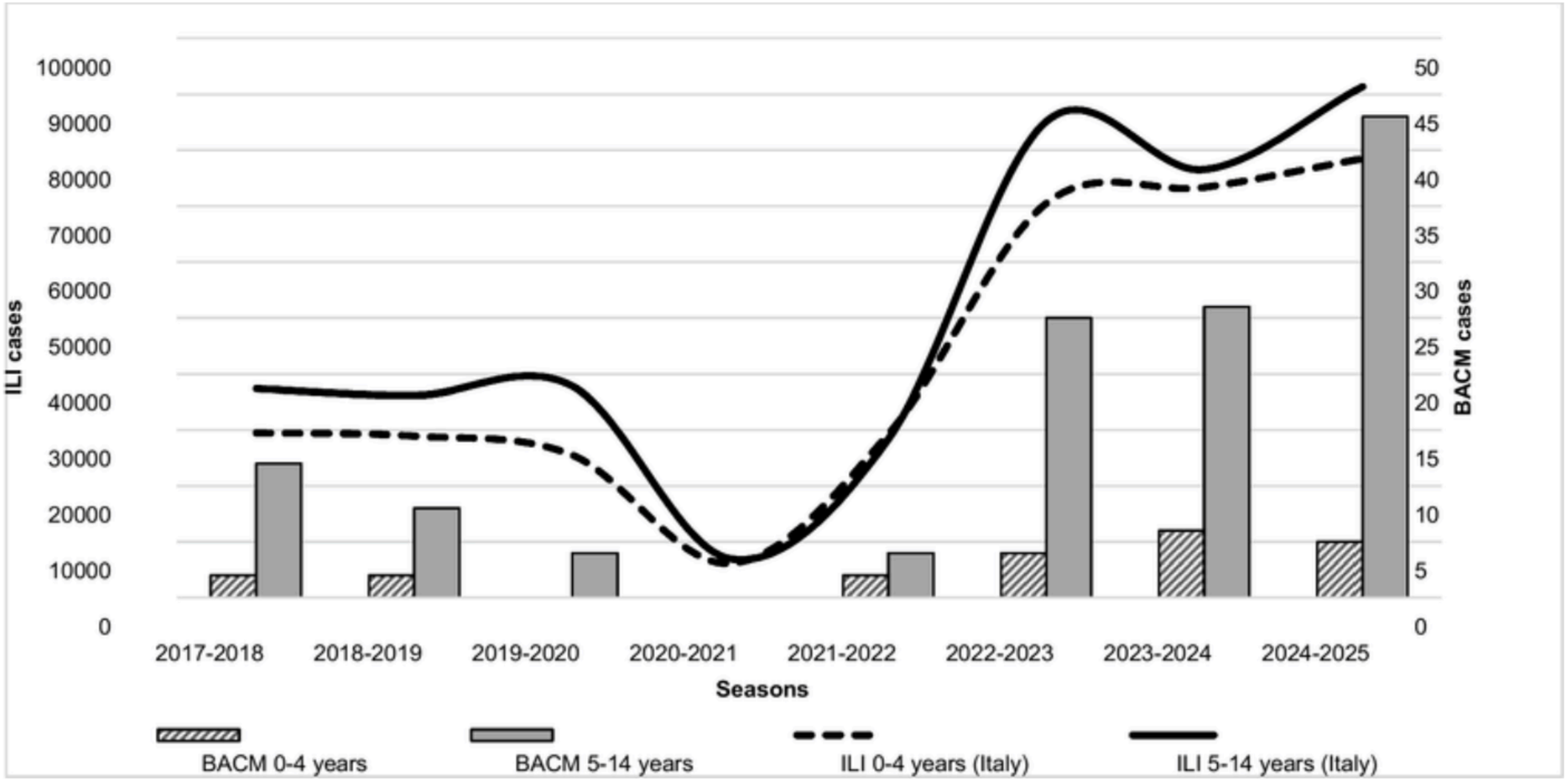
ANNUAL INCIDENCE TRENDS IN BACM



Annual incidence trends of benign acute childhood myositis by age group, expressed as rates per 1,000 Emergency Department admissions, at the Istituto Giannina Gaslini. EDA, Emergency Department admissions

Increase in benign acute childhood myositis in the post-COVID era: a retrospective study from a tertiary pediatric center. September 2025 European Journal of Pediatrics 184(9):599

BACM AND ILI TRENDS



Parallel trends of benign acute childhood myositis incidence at Gaslini Institute and influenza-like illness rates among Italian children in the post-COVID era, showing a comparable temporal increase from 2021 to 2025. ILI, influenza-like illness; BACM, Benign acute childhood myositis

Increase in benign acute childhood myositis in the post-COVID era: a retrospective study from a tertiary pediatric center. September 2025 European Journal of Pediatrics 184(9):599

AOA COLA Articles 2026

Original Investigation | Emergency Medicine

Ketamine Compared With Morphine for Out-of-Hospital Analgesia for Patients With Traumatic Pain

A Randomized Clinical Trial

Clément Le Cornec, MD; Marion Le Pottier, MD; Hélène Broch, MD; Alexandre Marguinaud Tixier, MD; Emmanuel Rousseau, MD; Said Laribi, MD, PhD; Charles Janière, MD; Vivien Brenckmann, MD, PhD; Anne Guillerm, MD; Florence Deciron, MD; Amine Kabbaj, MD; Joël Jenvrin, MD; Morgane Péré, MSc; Emmanuel Montassier, MD, PhD

JAMA 2024;7(1), January 29, 2024

Figure 1. Study Flow Diagram

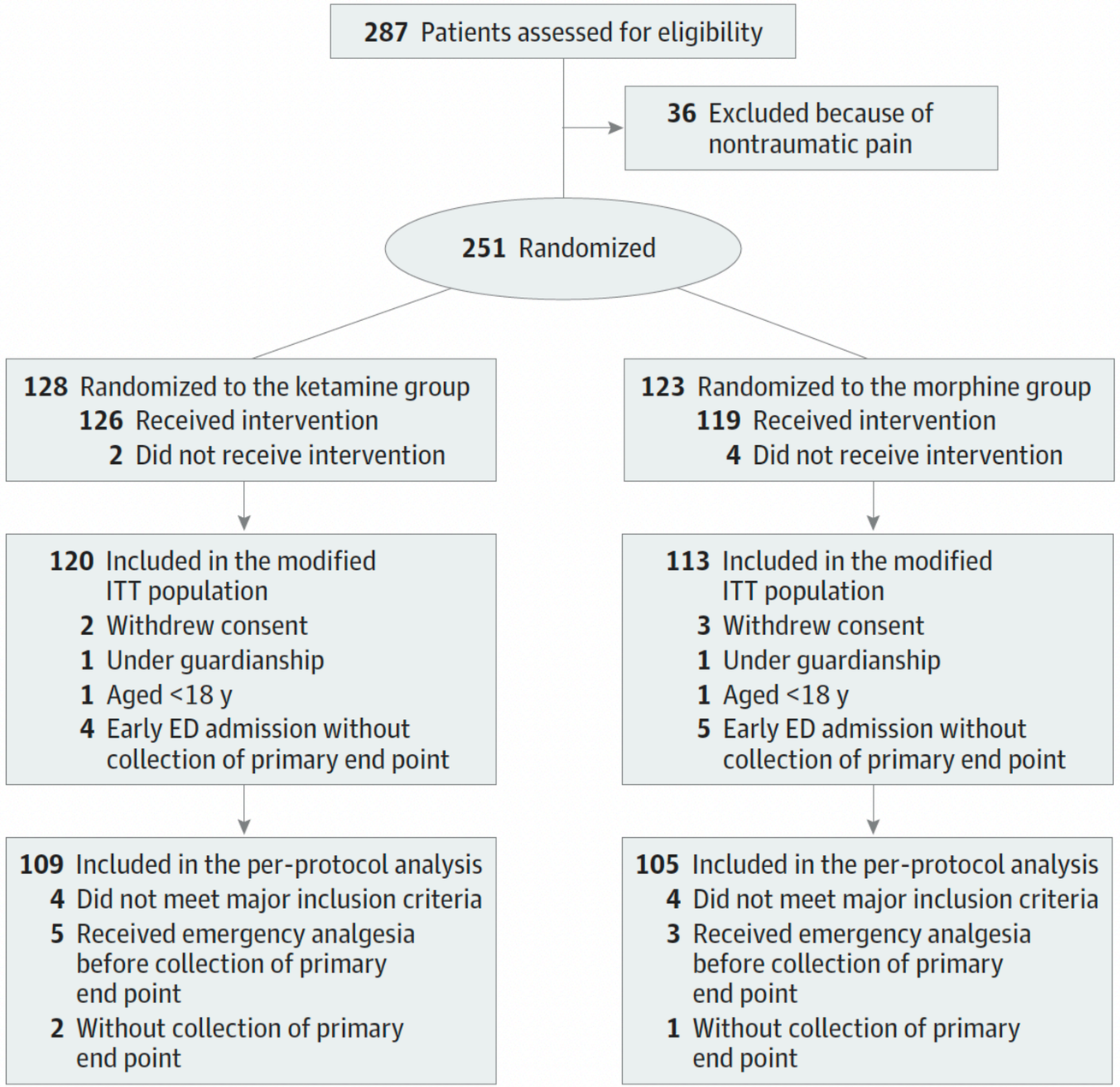


Table 2. Vital Sign Changes During Out-of-Hospital Management for Pain by Study Group (continued)

Parameter[a]	Patient group		Risk difference[b]	*P* value
	Ketamine (n = 120)	Morphine (n = 113)		
T60	15.0 (15.0 to 15.0)	15.0 (15.0 to 15.0)	NA	NA
Mean change (95% CI)	−0.2 (−0.6 to 0.3)	0	NA	NA
Ramsay Sedation Scale score, median (IQR)[d]				
T0	2.0 (1.0 to 2.0)	2.0 (2.0 to 2.0)	NA	NA
T15	2.0 (2.0 to 3.0)	2.0 (2.0 to 2.0)	NA	NA
Mean change (95% CI)	0.5 (0.3 to 0.7)	0.2 (0.1 to 0.3)	0.3 (0.1 to 0.5)	.07
T30	2.0 (2.0 to 2.0)	2.0 (2.0 to 2.0)	NA	NA
Mean change (95% CI)	0.4 (0.2 to 0.6)	0.3 (0.2 to 0.4)	0.1 (−0.1 to 0.3)	.40
T45	2.0 (2.0 to 3.0)	2.0 (2.0 to 2.0)	NA	NA
Mean change (95% CI)	0.5 (0.1 to 0.9)	0.5 (0.3 to 0.7)	0.0 (−0.4 to 0.4)	.87
T60	2.0 (2.0 to 2.0)	2.0 (2.0 to 2.0)	NA	NA
Mean change (95% CI)	0.2 (−1.6 to 2.0)	0.1 (−0.2 to 0.4)	NA	NA

Table 3. Frequency of Adverse Effects Observed by Study Group

Adverse effect	Patient group				Risk difference (95% CI), %
	Ketamine (n = 120)		Morphine (n = 113)		
	No. of patients	Risk (95% CI), %	No. of patients	Risk (95% CI), %	
Nausea	8	6.7 (2.2 to 11.1)	12	10.6 (2.9 to 16.3)	−3.9 (−11.2 to 3.3)
Vomiting	6	5.0 (1.1 to 8.9)	5	4.4 (0.6 to 8.2)	0.6 (−4.9 to 6.0)
Decreased consciousness (GCS score ≤13)[a]	8	6.7 (2.2 to 11.2)	3	2.7 (0.0 to 5.7)	4.0 (−1.4 to 9.5)
Visual disturbance	21	17.5 (10.7 to 24.3)	5	4.4 (0.6 to 8.2)	13.1 (5.3 to 20.9)
Emergence phenomenon[b]	24	20.0 (12.8 to 27.2)	1	0.9 (0.6 to 8.2)	19.1 (11.7 to 26.5)
Hypertension	5	4.2 (0.6 to 0.8)	1	0.9 (0.0 to 2.6)	3.3 (−0.7 to 7.3)
Total	49	40.8 (32.0 to 49.6)	19	16.8 (10.4 to 25.0)	24.0 (12.8 to 35.2)

CONCLUSIONS AND RELEVANCE

In the KETAMORPH study of patients with out-of-hospital traumatic pain, the use of intravenous ketamine compared with morphine showed noninferiority for pain reduction. In the ongoing opioid crisis, ketamine administered alone is an alternative to opioids in adults with out-of-hospital traumatic pain.

JAMA 2024;7(1), January 29, 2024

EMS is dispatched to the scene of a motor vehicle collision. The patient is a 39-year-old man with an obvious open fracture of the right ankle. Vital signs are:

Temperature	36.7 °C (98 °F)
Heart rate	110/min
Blood pressure	110/65 mmHg
Respiratory rate	18/min

Glasgow Coma Scale score is 15. The patient rates his pain as an 8 on a 10-point scale. When selecting an agent for management of this patient's pain, which of the following should be considered?

A. An intravenous subdissociative dose of ketamine is superior to intravenous morphine.

B. Intravenous morphine is more effective in treating the patient's pain than intravenous subdissociative ketamine.

C. Intravenous subdissociative ketamine is non-inferior to intravenous morphine in reducing the patient's pain.

D. To be effective for analgesia, the dose of intravenous ketamine must be in the 0.5-1.0 mg/kg range.

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Paramedics consider analgesia for a 29-year-old man involved in a high-speed motorcycle accident. The patient is alert but in severe pain due to a deformity of the right femur and multiple abrasions. Vital signs are:

Heart rate	122/min
Blood pressure	100/64 mmHg
Respiratory rate	24/min

The patient rates his pain as a 10 on a 10-point scale. Which of the following is a benefit of using ketamine over morphine for out of hospital traumatic pain?

A. Ketamine has a faster reduction in pain intensity than morphine.

B. Ketamine is less likely to cause a significant change in vital signs compared to morphine.

C. Morphine has more adverse reactions compared to ketamine.

D. Morphine is more likely to cause a decreased level of consciousness than ketamine.

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Paramedics arrive with a 24-year-old woman who fell from an electric scooter and sustained a right shoulder dislocation. She is in severe pain and holding her arm across her chest. Due to the level of the patient's pain, intravenous access is difficult to obtain. Intramuscular ketamine is then administered for pain. During transport, the patient becomes anxious, is crying, and is attempting to push away unseen objects. She repeatedly says "something is wrong" and pulls at her monitor leads. Which of the following is the most appropriate management?

A. Administer intramuscular midazolam

B. Adminster intravenous haloperidol

C. Admister an intraveous infusion of cyproheptadine

D. Provide verbal reassurance and a quiet, dim environment

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✓ **D.** Provide verbal reassurance and a quiet, dim environment

EMS is transporting a 57-year-old man who fell 8 feet from a ladder. He has right-sided chest tenderness and crepitus. The paramedics contact the emergency department with a prehospital report and ask for recommendations for analgesia. Both morphine and ketamine are available. If the patient receives ketamine rather than morphine, which of the following outcomes is most likely?

A. An age-dependent correlation between adverse reactions in both ketamine and morphine.

B. Fewer adverse reactions to ketamine compared to morphine.

C. More adverse reactions to ketamine compared to morphine.

D. Similar number of adverse reactions to ketamine compared to morphine.

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AOA COLA Articles 2026

CLINICAL POLICY

A Critical Issue in the Management of Adult Patients Presenting to the Emergency Department With Acute Carbon Monoxide Poisoning

Approved by the ACEP Board of Directors January 22, 2025

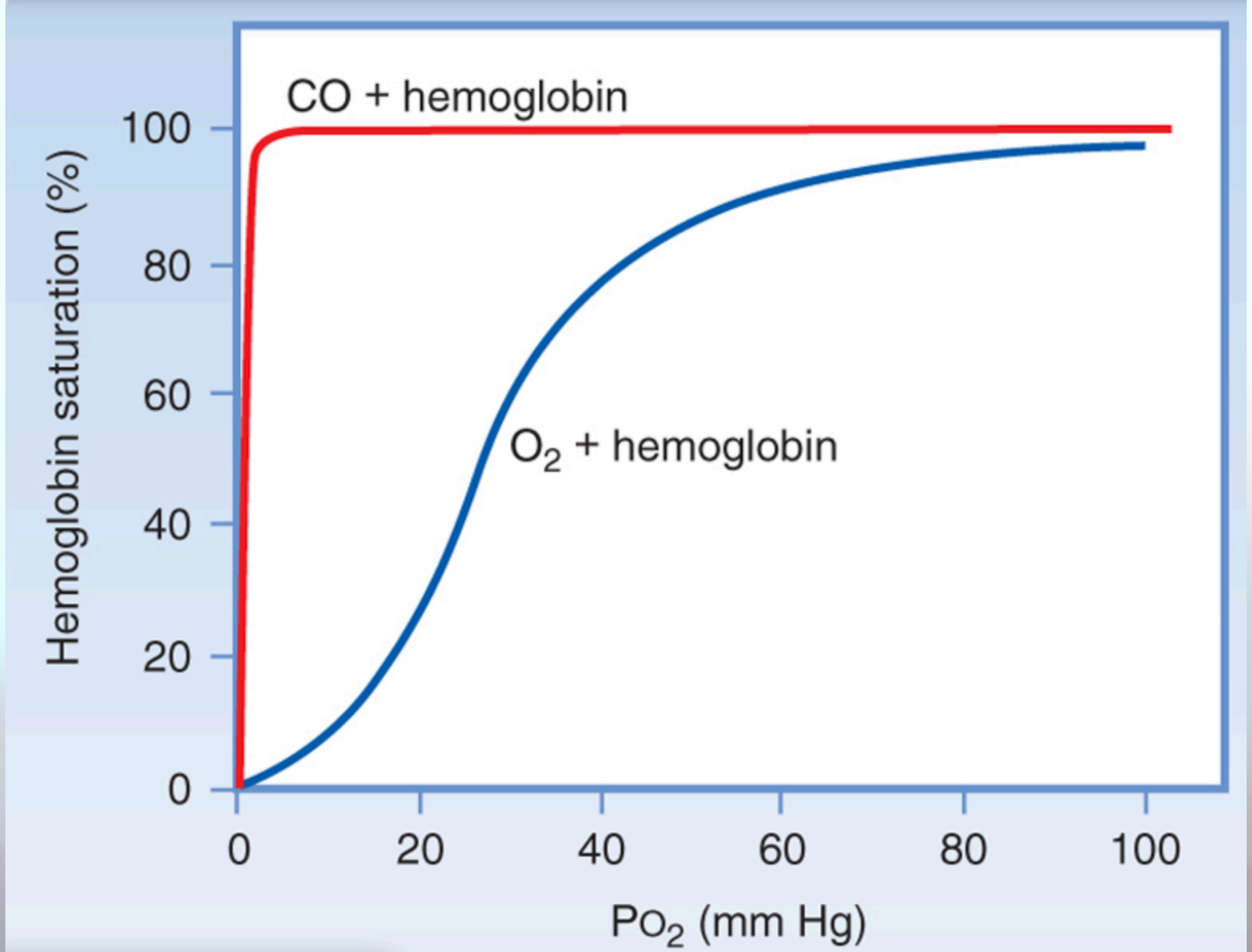
From the American College of Emergency Physicians Clinical Policies Subcommittee (Writing Committee) on Carbon Monoxide Poisoning:
Richard D. Shih, MD (Writing Committee Chair)
Christian A. Tomaszewski, MD, MS, MBA
Amy Kaji, MD, MPH, PhD (Methodologist)
Deborah B. Diercks, MD, MSc (Committee Chair)

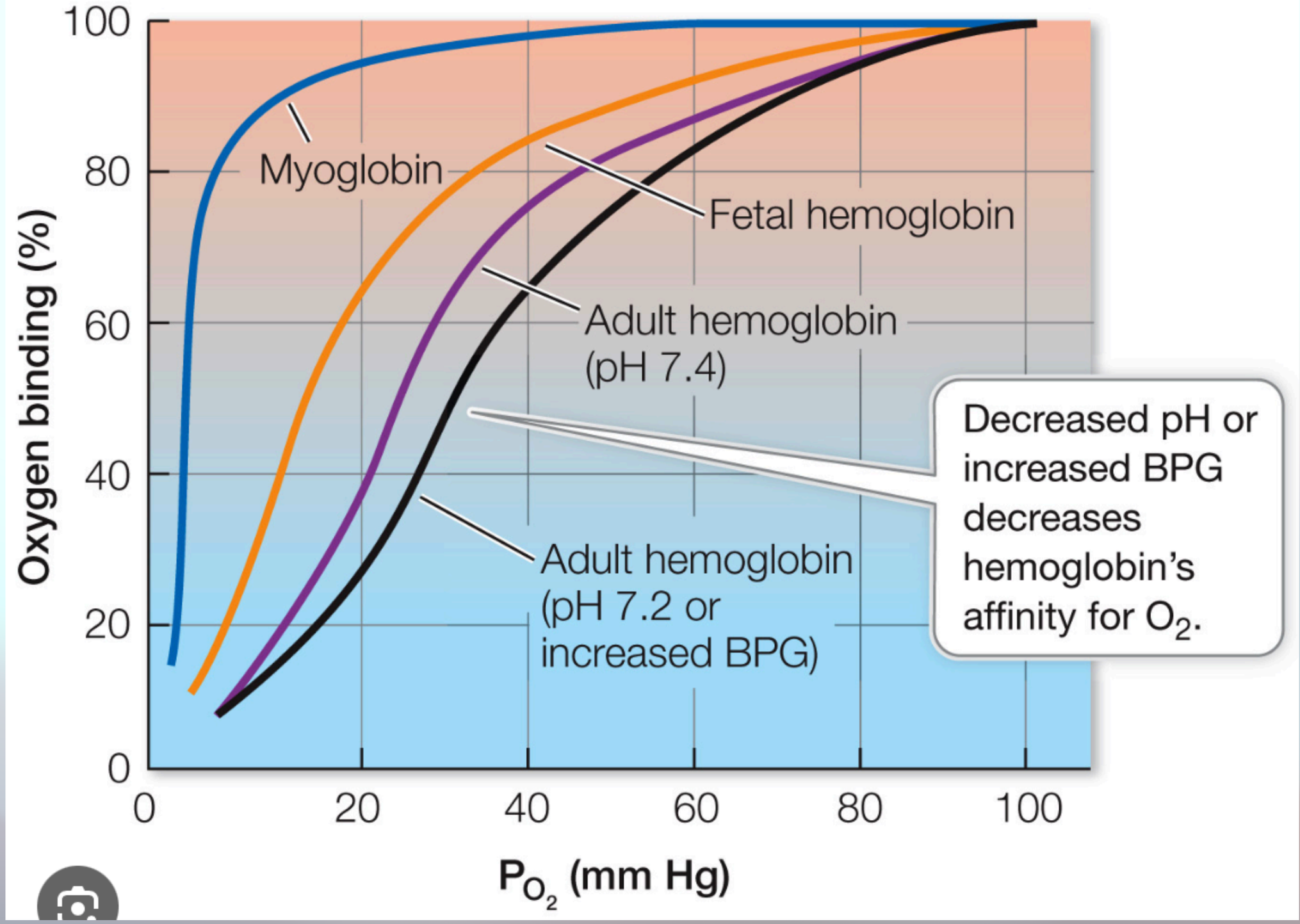
Annals of Emergency Medicine. 2025;85(e45-e59)

Key Question

In emergency department patients diagnosed with acute carbon monoxide poisoning, does hyperbaric oxygen therapy compared with normobaric (room pressure) oxygen therapy improve long-term neurocognitive outcomes?

Annals of Emergency Medicine. 2025;85(e45-e59)


CO + hemoglobin
O_2 + hemoglobin
Hemoglobin saturation (%)
100
80
60
40
20
0
0
20
40
60
80
100
P_{O_2} (mm Hg)


100
80
60
40
20
0
Oxygen binding (%)
Myoglobin
Fetal hemoglobin
Adult hemoglobin (pH 7.4)
Adult hemoglobin (pH 7.2 or increased BPG)
Decreased pH or increased BPG decreases hemoglobin's affinity for O_2.
0
20
40
60
80
100
P_{O_2} (mm Hg)

Without treatment, CO has an elimination halflife of approximately 5 hours.[4] In the presence of oxygen, this is decreased to 85 minutes and 20 minutes for highflow nonrebreather mask and hyperbaric oxygen (HBO2) therapy, respectively.[5]

Annals of Emergency Medicine. 2025;85(e45-e59)

In addition to the effects on hemoglobin, CO can cause a cascade of inflammatory and immunologic damage at the cellular level. Nitric oxide generation, free radical formation, lipid peroxidation, apoptosis, and immune mediated injury can occur.[6,7] These effects can lead to damage in almost every organ system; however, the most consequential are cardiac and neurologic.

Clinical Policies
Committee's conclusions are similar to those made in the 2017 clinical policy that HBO2 may provide a modest benefit, especially in memory impairment.

Annals of Emergency Medicine. 2025;85(e45-e59)

CRITICAL QUESTION

1. In ED patients diagnosed with acute CO poisoning, does HBO_2 therapy, compared with normobaric oxygen therapy, improve long-term neurocognitive outcomes?

Patient Management Recommendations

Level A recommendations. *None.*

Level B recommendations. *None.*

Level C recommendations. In symptomatic CO poisoning, selected patients may benefit from HBO_2 treatment based on severity of symptoms and availability (distance and time).

Potential Benefit of Implementing the Recommendations:

- Improved neurologic outcomes.

Potential Harm of Implementing the Recommendations:

- Hyperbaric-induced middle ear barotrauma.
- Oxygen toxicity (seizure).
- Risks and costs associated with transport to a hyperbaric chamber.
- Clinical deterioration during transport.
- Need for significant (>50 miles) travel to a hyperbaric chamber.
- Chamber-induced claustrophobia.

Which of the following patients is most likely to have a poor neurologic outcome when considering acute carbon monoxide poisoning?

A. A 25-year-old man with a headache and dizziness

B. A 28-year-old woman with nausea, transient confusion, and stable vital signs

C. A 30-year-old man with syncope at the scene who is now awake

D. A 42-year-old woman with fatigue and tachycardia

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The consensus among multiple retrospective studies suggests that early hyperbaric oxygen therapy initiated within several hours post-exposure, versus late initiation, leads to

A. increased incidence of hyperbaric-induced middle ear barotrauma.

B. increased long-term neurologic complications.

C. lower incidence of cognitive defects.

D. lower incidence of oxygen toxicity.

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B. increased long-term neurologic complications.

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D. lower incidence of oxygen toxicity.

A 47-year-old man is brought to the emergency department after using a gas-powered generator indoors since a power outage occurred 2 days ago. He reports chest pain, a severe headache, and confusion. On arrival, his carboxyhemoglobin level is 28%. On examination, vital signs are stable; he is oriented only to person and is ataxic. The nearest hospital with hyperbaric oxygen therapy is 75 miles away. A nonrebreather mask with 100% oxygen is introduced. Which of the following factors would provide strong support for transfer despite the transport distance?

A. No ischemic changes on MRI of the brain

B. Patient age

C. Persistent confusion and electrocardiogram changes suggesting mild ischemia

D. Repeat carboxyhemoglobin of 21% despite treatment

A 47-year-old man is brought to the emergency department after using a gas-powered generator indoors since a power outage occurred 2 days ago. He reports chest pain, a severe headache, and confusion. On arrival, his carboxyhemoglobin level is 28%. On examination, vital signs are stable; he is oriented only to person and is ataxic. The nearest hospital with hyperbaric oxygen therapy is 75 miles away. A nonrebreather mask with 100% oxygen is introduced. Which of the following factors would provide strong support for transfer despite the transport distance?

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D. Repeat carboxyhemoglobin of 21% despite treatment

A 28-year-old woman comes to the emergency department because of a 3-week history of frequent nighttime headaches, forgetfulness, and depression. Her symptoms started when she moved into her new apartment at the beginning of the winter. Urine pregnancy test is negative. Workup should include which of the following?

A. Complete blood count, comprehensive metabolic panel, and carbon monoxide level

B. Erythrocyte sedimentation rate and CT scan of the head

C. Urine mycotoxin testing and screening for seasonal affective disorder

D. Vitamin B12 level, rapid plasma reagin testing, and MRI of the brain

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From the Medical-Legal World

Wrongful Death Suit Filed After Patient Waited Hours in Emergency Room Lobby

— Death of 41-year-old mother of three was preventable, husband says

by Jennifer Henderson, Enterprise & Investigative Writer, MedPage Today

October 13, 2023 · 3 min read

$6.75 Million for Wrongful Death of Man Who Died in the Hospital Waiting Room

60-year-old male presented to the ER with chest pain. An ECG showed ST depression in leads V2-V4, blood draw found troponin levels to be positive at .21

The patient suffered cardiac arrest while in the waiting room and died.

Can You Sue a Michigan Hospital for Understaffing That Leads to Patient Harm?

March 19, 2026

- **Delayed Diagnosis and Treatment:** Long waits in the ER or on the floor can allow strokes, infections, internal bleeding, and other conditions to worsen before anyone notices.

Garden City Hospital EMTALA Violation

Result - Hospital ineligible to receive CMH Funding

- Patient only seen by registration clerk, who completed a quick registration (name, birthdate, CC).
- Two patients who arrived at the same time with chest pain were taken back first.
- Pt left with mother to go to another ER.
- Filed a complaint with CMH

Emergency Department (ED) physician liability for patients in the waiting room is a critical area of medical malpractice law, often stemming from overcrowding and delays in care. While EMTALA (Emergency Medical Treatment and Active Labor Act) specifically holds hospitals accountable for screening and stabilization, courts increasingly find that an ED physician-patient relationship—and thus, liability—begins once a patient checks in and a "delegation of duty" occurs. National Institutes of Health (NIH) | (.g... +3

Medical Malpractice in the Waiting Room: Who Is at Risk?

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Section Editor: Melanie Heniff, MD, JD
Submission history: Submitted January 27, 2025; Revision received May 4, 2025; Accepted May 28, 2025
Electronically published September 10, 2025
Full text available through open access at http://escholarship.org/uc/uciem_cpcem
DOI: 10.5811/cpcem.42039

Introduction: Prolonged emergency department (ED) wait times pose problems for both patients and ED staff. Poor patient outcomes can result in litigation that could have been prevented by faster access to care.

Case Series: We present 10 lawsuits involving patients who experienced poor outcomes allegedly due to inappropriate management in the waiting room. These cases involved allegations of violations of the Emergency Medical Treatment and Labor Act (EMTALA) or general negligence and were levied against both the physicians and hospitals involved.

Conclusion: Both common law and EMTALA's medical screening exam requirements impose significant obligations on physicians and hospitals to proactively manage patients in the waiting room. Being familiar with these requirements may help minimize legal risks. [Clin Pract Cases Emerg Med. 2025;9(4):361-364.]

Keywords*: malpractice; waiting room; EMTALA; negligence.*

Complaint (NOI) Against Hospital, ED Group, and ED Providers Individually

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF KENT

Vickie Runyon
Plaintiff
v

25- 21241- NH
Hon.

Corewell Health;
Spectrum Health Hospitals;
d/b/a/ Corewell Health Grand Rapids Hospitals Butterworth Hospital,
and Emergency Care Specialists, PC;
Individually and Jointly.
Defendants

Culture Change in ER’s

- Patients need to be seen and initially triaged right away - first contact should be nurse, or designated medical professional
- Door to provider time decrease: provide initial Medical Screening Examination (MSE) ASAP (<10 minutes)
- Hospitals, hospitalists, house supervisors and nurse managers and all staff have to adapt and respond to ER critical capacity surges to allow the front-end process to be decompressed and run efficiently.