Hospital Medicine Literature Review 2025

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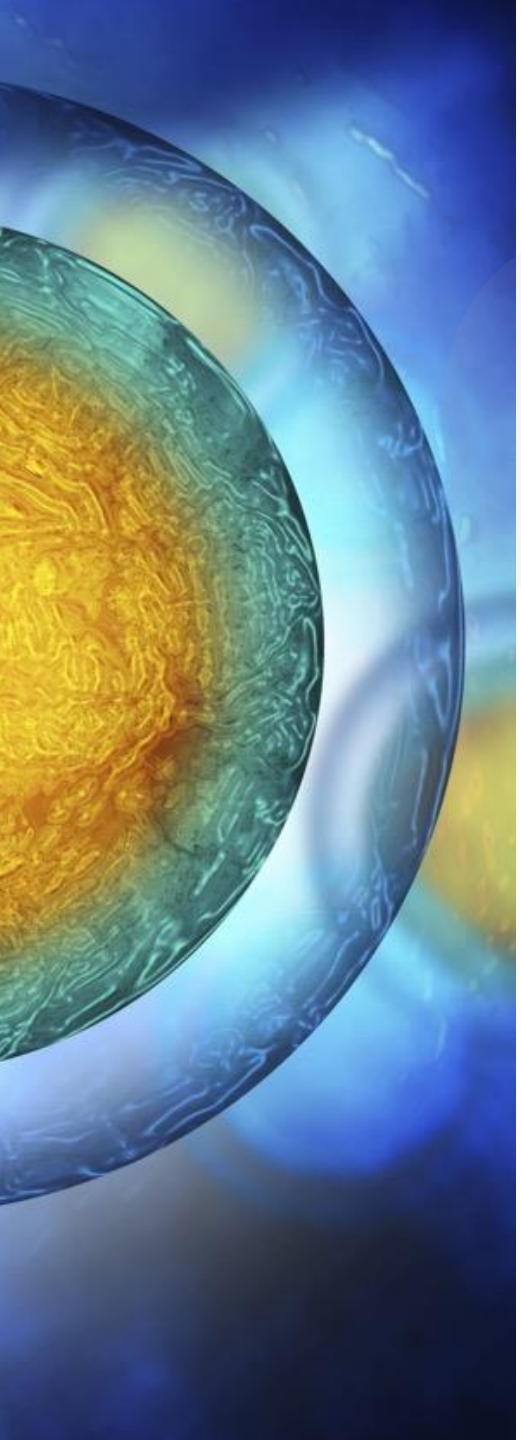
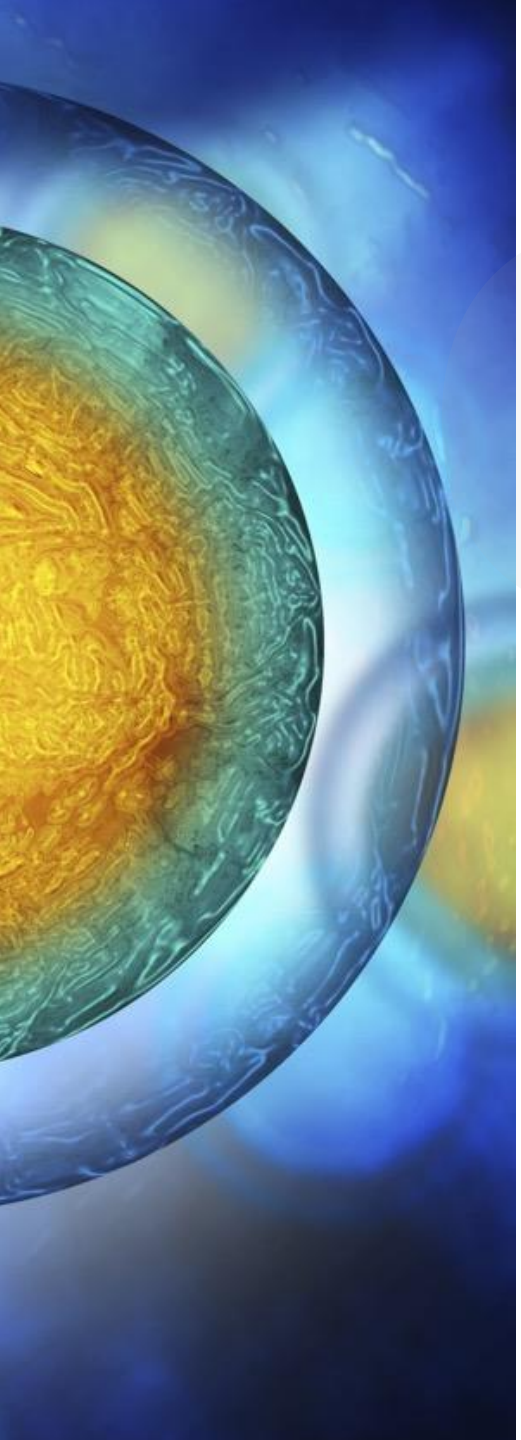
Sep 11th, 2025



Disclosure

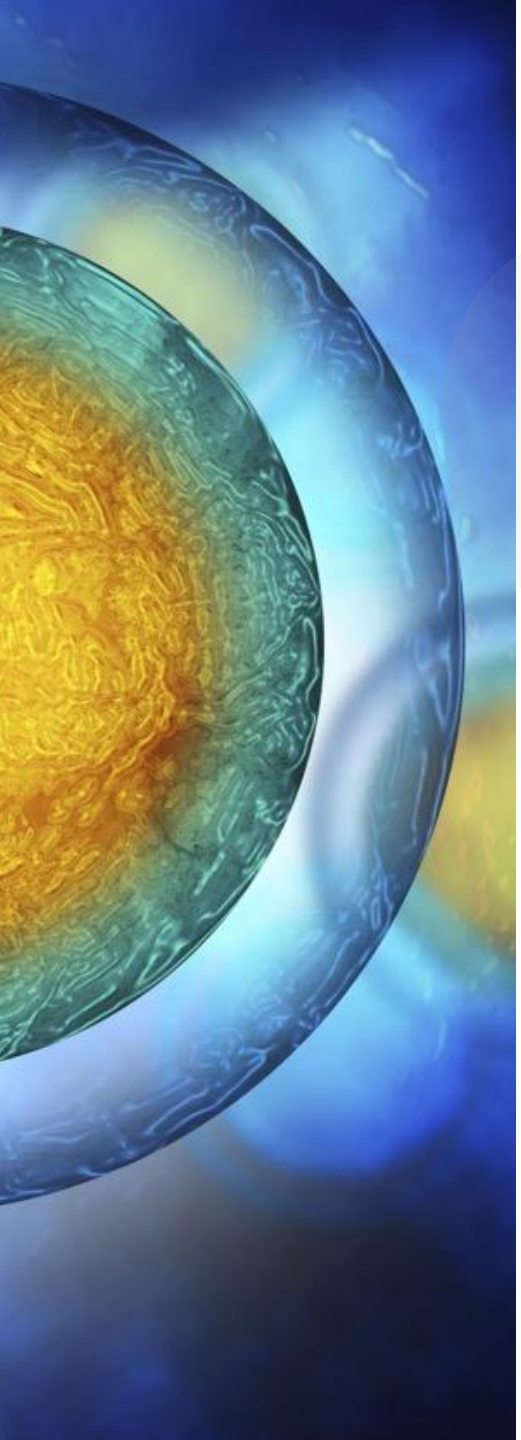
- No financial disclosures relevant to the contents of this talk



Objectives

- **By the end of the session…**
  - **Identify 3 key decisions with interventions** in hospitalized patients where new evidence may change practice
  - **Suggest 2 possible medications adjustment** for hospitalized patients that may be justified by new evidence
  - **Recognize 1 strategy to support early recognition of morbidity** in hospitalized patients based on new evidence

We will go through 9 scenarios/decision points



Literature Review Process

Process

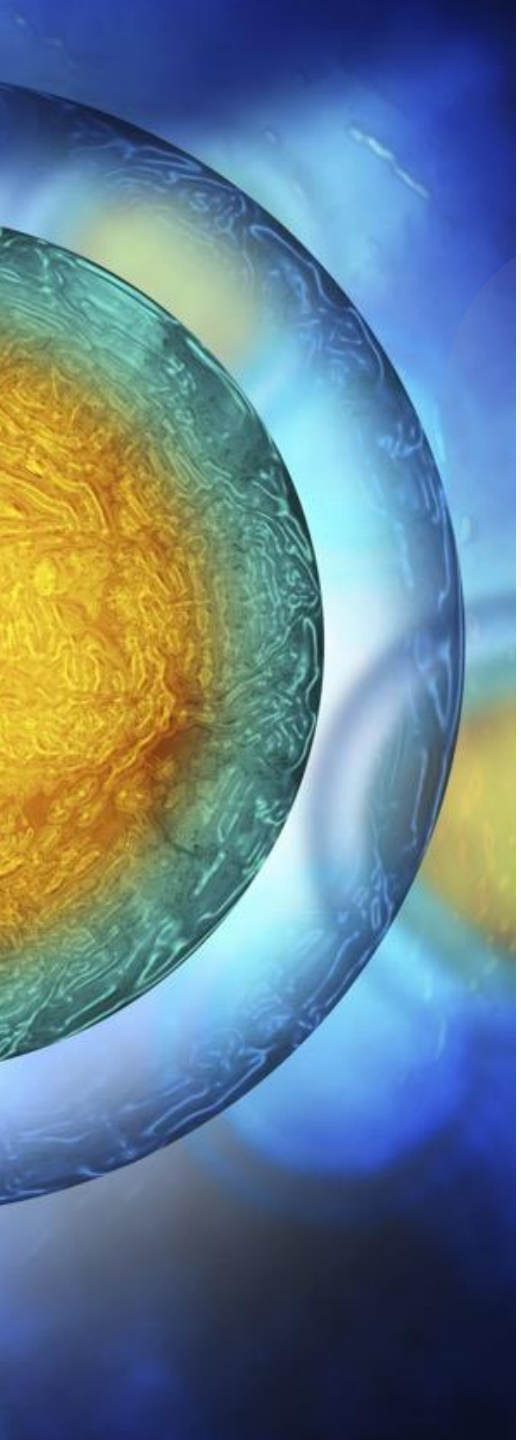
- September 2024- September 2025
- NEJM Journal Watch, ACP Journal Club, JHM Table of Contents

Criteria

- Change your practice or teaching
- Inform your practice or teaching

Format

- Case-based format
- Multiple choice questions (show of hands)



Case Presentation

After the 20th NW Hospital Medicine conference, you are excited to go to work and see some patients.

You are greeted by a team of junior doctors.

Allison, intern

Eric, intern

Robert, resident

James, junior attending who's shadowing

Case 1, Aliquot 1

82-year-old gentleman with hypertension, diabetes, CKD stage 3, prior stroke, mild cognitive impairment, presents with acute chest pain, found to have non-specific EKG changes and elevated troponin, consistent with **type 1 NSTEMI**.

He lives independently but has **falls, frailty** (slow gait, weak grip), polypharmacy, and **moderate bleeding risk**.

After initiation of medical therapy, **pain resolved**. Cardiology is consulted for potential cath. The patient and family are hesitant, asking about risks vs benefits.

Case 1, Aliquot 1

The team debates whether invasive or conservative strategy is more beneficial.

- **Allison (intern, interested in palliative care):** *“At his age and frailty, cath does more harm than good.”*
- **Eric (intern, flipping through his notes):** *“I recall a study showing outcomes were similar — so patient preference matters most.”*
- **Robert (resident, cardiology-bound):** *“Cath improves mortality in NSTEMI. We should push for it now.”*
- **James (hospitalist realist):** *“Cath might lower the risk of recurrent MI, but honestly, I don’t think it really change overall survival.”*

Case 1, Aliquot 1

- James has also come to this meeting with you, so his answer is closest to what new evidence suggest.
- You nodded and pulled out two articles from this past year.

SENIOR-RITA trial

Meta-analysis

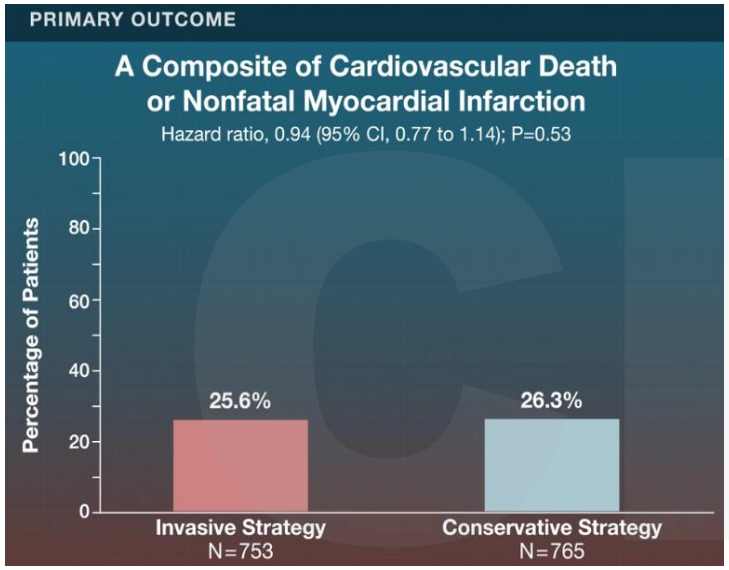
SENIOR-RITA trial (NEJM, Nov 2024)

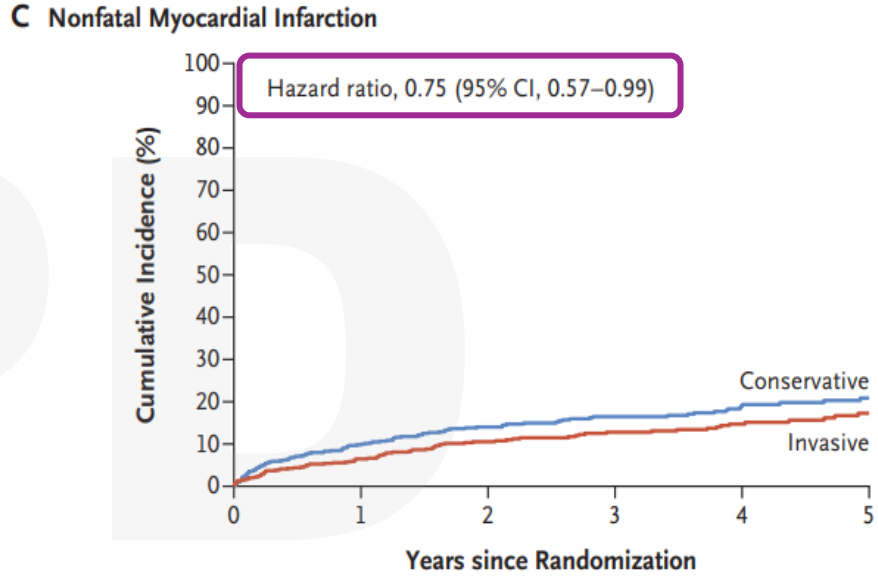
- **Question:** In older adults with NSTEMI, which treatment strategy is more beneficial - invasive or conservative?
  - Older patients are underrepresented in clinical trials
- **Design:** randomized controlled, multicenter (48 sites in UK)
  - Conservative vs. Invasive (intention to treat)
- **Patients:** 1518
  - Age: >=75 years, mean **82 years**
  - Patients with frailty, cognitive impairment, or high burden of comorbidites included
  - Life expectancy >= 1 year

Kunadian V et al. N Engl J Med. 2024 Nov 7;391(18):1673-1684.

SENIOR-RITA trial: Results

- **Primary outcome: Composite (Cardiovascular death + nonfatal MI):** No difference
  - **Breakdown: Nonfatal MI:** less common with the invasive (11.7% vs. 15.0%)
- **Secondary outcome (incidence of stroke or major bleeding):** No difference



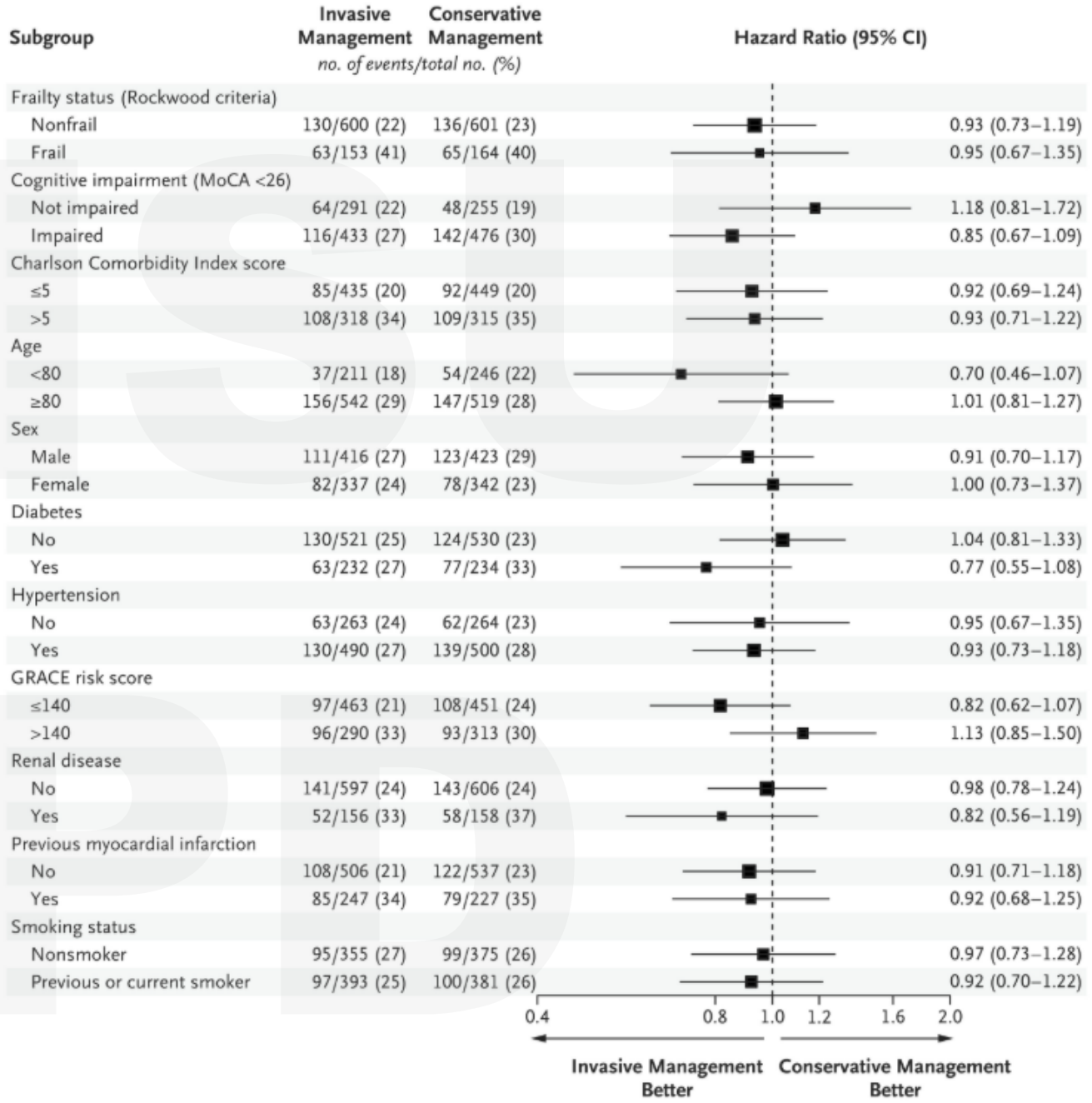


Median follow-up 4.1 yrs

Kunadian V et al. N Engl J Med. 2024 Nov 7;391(18):1673-1684.

Subgroup Analysis

No difference in frailty or age or any subgroup

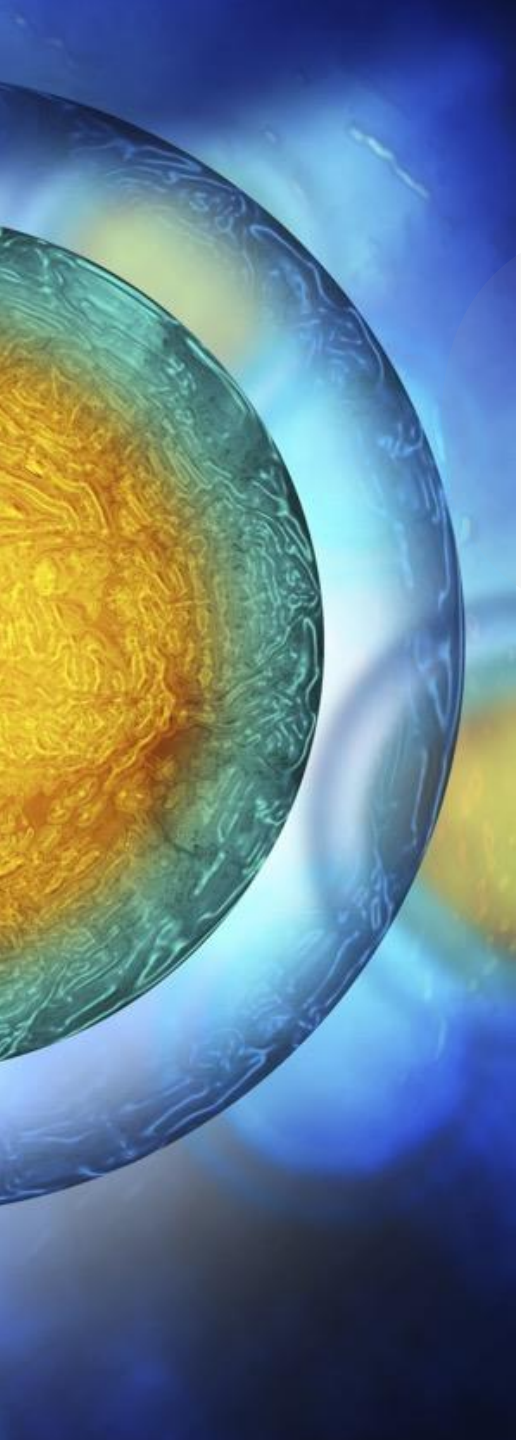


Kunadian V et al. N Engl J Med. 2024 Nov 7;391(18):1673-1684.

Meta-Analysis (July 2025)

- **Design:** Meta-analysis – 7 randomized controlled trials
- **Patients:** 3000 (Age: >= 70, mean 83 years)
- **Result:** average 4-year followup
  - **No difference**
    - **All-cause mortality** (28% vs. 27%)
    - Cardiovascular mortality, acute stroke, length of hospital stay
  - Invasive group
    - **Lower risks for recurrent MI** (RR, 0.8), **ischemia-driven revascularization** (RR, 0.3)
    - Trend toward fewer major adverse cardiac event

Hamed M et al. *J Am Heart Assoc* 2025 Jul 15; 14:e039601.



Take-Away

- Patients do not face a mortality “penalty” for choosing between invasive and non-invasive approaches.
- Patients' wishes and goals of care are what matter in the decision.
- Reasonable to continue advocating for invasive management, unless frailty or other comorbidities are a major concern.

NEJM JW Cardiol. Sep 4 2024

Case 1, Aliquot 2

Patient decided to undergo cath and was revascularized. Hemoglobin drifted from 9.6 → 8.5 g/dL. He is hemodynamically stable. No active bleeding or hemolysis. The team debates transfusion threshold.

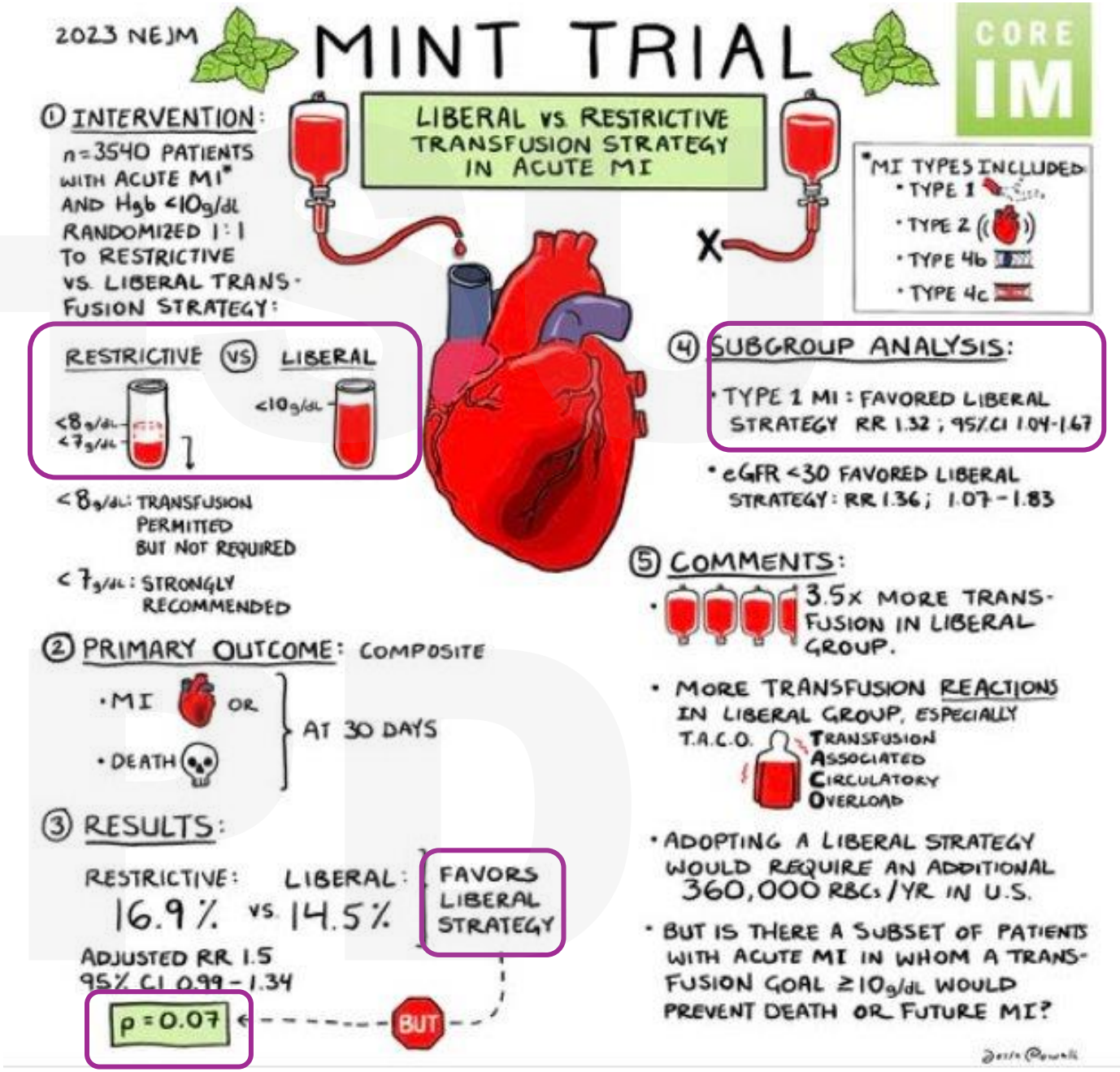
- **Allison:** *"Threshold is 7 for most, but MI patients risk overload — be cautious."*
- **Eric:** *"Transfuse if <8 — she just had an MI."*
- **Robert:** *"Nah, aim for 10. That's what newer data say."*
- **James:** *"Split the difference — go with 9."*

A Refresher on...

Eric pulled out this...

Myocardial Ischemia and Transfusion (MINT)

"A liberal transfusion strategy did not significantly reduce the risk of recurrent MI or death at 30 days. However..."

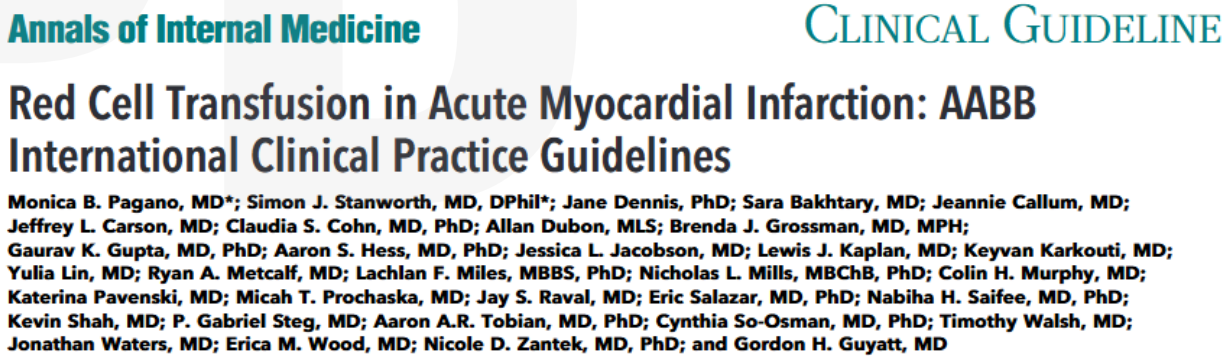


Meta-analysis (AABB guideline panel, Aug 2025)

- 4 RCTs, 4311 patients
  - Including REALITY trial (2021, opposite signal)
  - Driven largely by MINT trial (2023, 81% participants)
- **Liberal strategy**
  - **30-day mortality benefit:** Absolute risk reduction **1.2%** (> MID: 1%)*
  - **Severe adverse events:** Absolute risk increase **1.4%** (< MID: 2.5%)
    - TACO, TRALI, anaphylaxis

MID = minimal important differences (pre-defined by panel)
AABB = Association for the Advancement of Blood & Biotherapies

Monica B. Pagano, et al. Ann Intern Med. [Epub 19 August 2025].


Annals of Internal Medicine

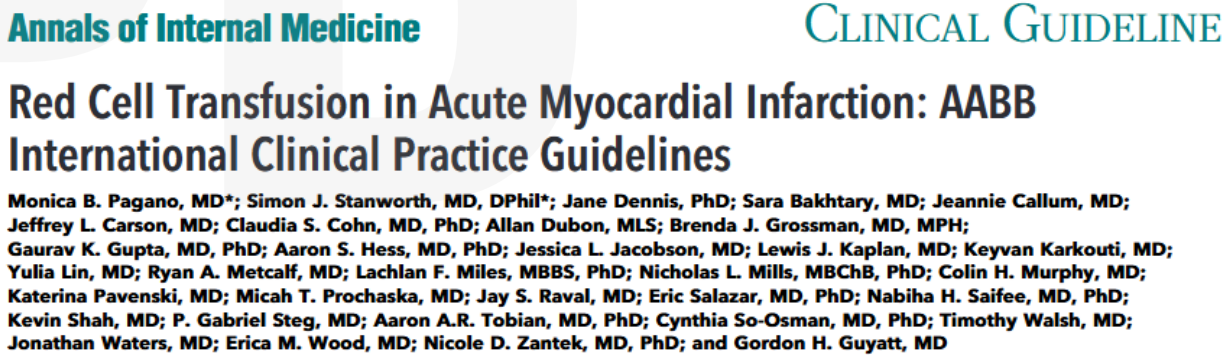
CLINICAL GUIDELINE

Red Cell Transfusion in Acute Myocardial Infarction: AABB International Clinical Practice Guidelines

Monica B. Pagano, MD*; Simon J. Stanworth, MD, DPhil*; Jane Dennis, PhD; Sara Bakhtary, MD; Jeannie Callum, MD; Jeffrey L. Carson, MD; Claudia S. Cohn, MD, PhD; Allan Dubon, MLS; Brenda J. Grossman, MD, MPH; Gaurav K. Gupta, MD, PhD; Aaron S. Hess, MD, PhD; Jessica L. Jacobson, MD; Lewis J. Kaplan, MD; Keyvan Karkouti, MD; Yulia Lin, MD; Ryan A. Metcalf, MD; Lachlan F. Miles, MBBS, PhD; Nicholas L. Mills, MBChB, PhD; Colin H. Murphy, MD; Katerina Pavenski, MD; Micah T. Prochaska, MD; Jay S. Raval, MD; Eric Salazar, MD, PhD; Nabiha H. Saifee, MD, PhD; Kevin Shah, MD; P. Gabriel Steg, MD; Aaron A.R. Tobian, MD, PhD; Cynthia So-Osman, MD, PhD; Timothy Walsh, MD; Jonathan Waters, MD; Erica M. Wood, MD; Nicole D. Zantek, MD, PhD; and Gordon H. Guyatt, MD

Updated AABB Guideline (Aug 2025)

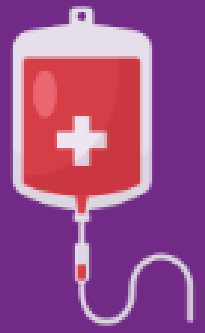
- Hemoglobin **transfusion threshold 10 g/dL** for patients hospitalized with acute MI
  - Conditional recommendation, low-certainty evidence
- Incorporate clinical context + patient preferences
  - Patients with Type 1 MI likely benefit more than type II
  - Patients with HF may benefit more (should not withhold solely for the fear of overload!)
- Practical tips
  - Prevent hospital-acquired anemia: minimize blood draws, investigate/treat underlying causes
  - Mitigate transfusion risks
    - Identify high-risk patients (heart failure, CKD)
    - Use diuresis to prevent TACO
    - Transfuse slowly/with dialysis



What Is the Optimal Transfusion Threshold in Acute Type 1 MI?

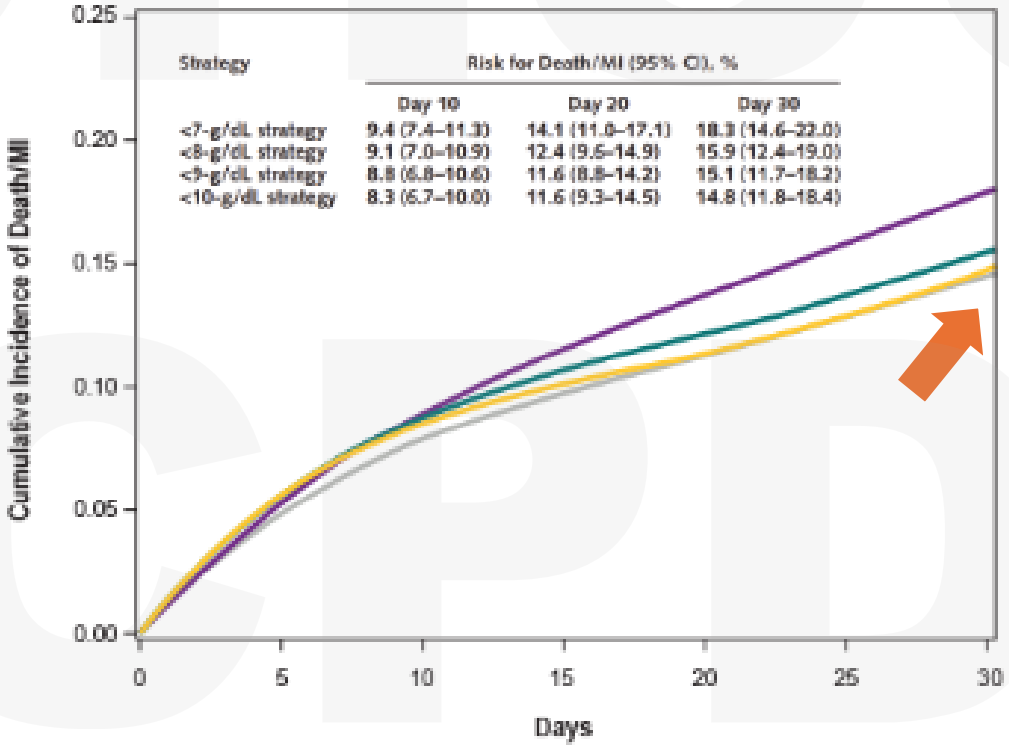
Target trial emulation using Myocardial Ischemia and Transfusion (MINT) trial data

3492 trial participants with acute MI and hemoglobin level <10 g/dL



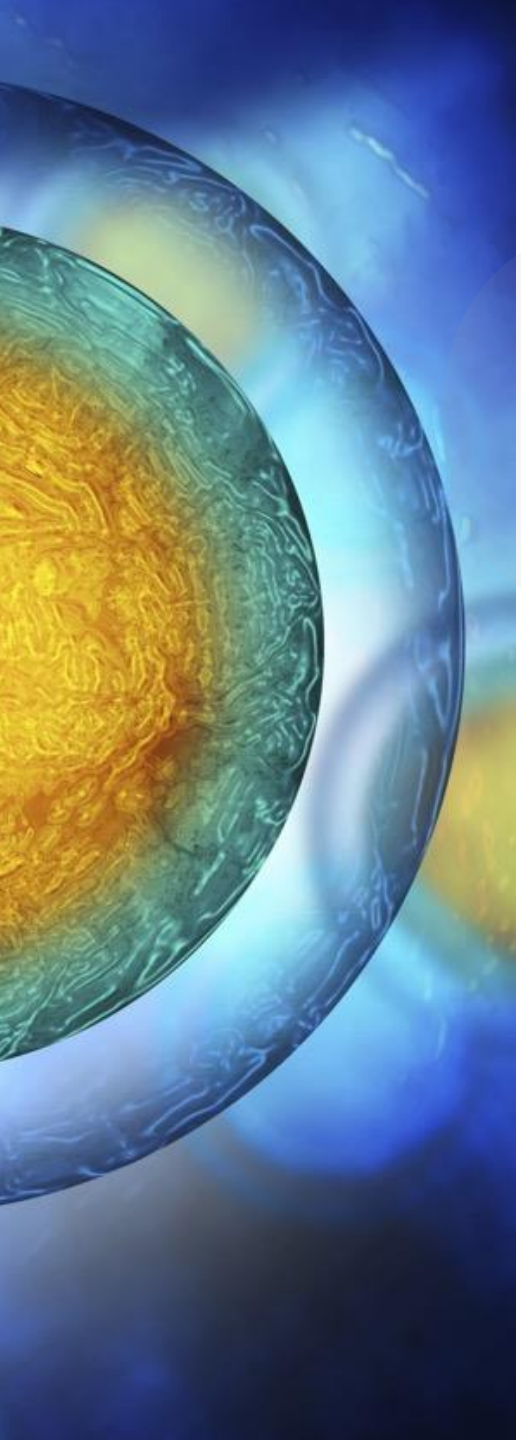
Leveraged trial data to emulate 4 transfusion strategies with hemoglobin thresholds:

<7 g/dL <8 g/dL <9 g/dL <10 g/dL



Hgb Threshold	Recurrent MI/Death at 30 days	Death at 30 days
<7 g/dL	18.3%	14.0%
<8 g/dL	15.9%	11.3%
<9 g/dL	15.1%	7.8%
<10 g/dL	14.8%	7.8%

Portela GT et al. Ann Intern Med. 2024 Nov;177(11):1489-1498.



Take Away

Hemoglobin transfusion threshold in acute MI

- Aim higher, but consider the context, and mitigate risks
- Don’t withhold in those with heart failure for the fear of volume overload – diurese them
- Transfusion threshold of 9 g/dL might be as beneficial as 10 g/dL

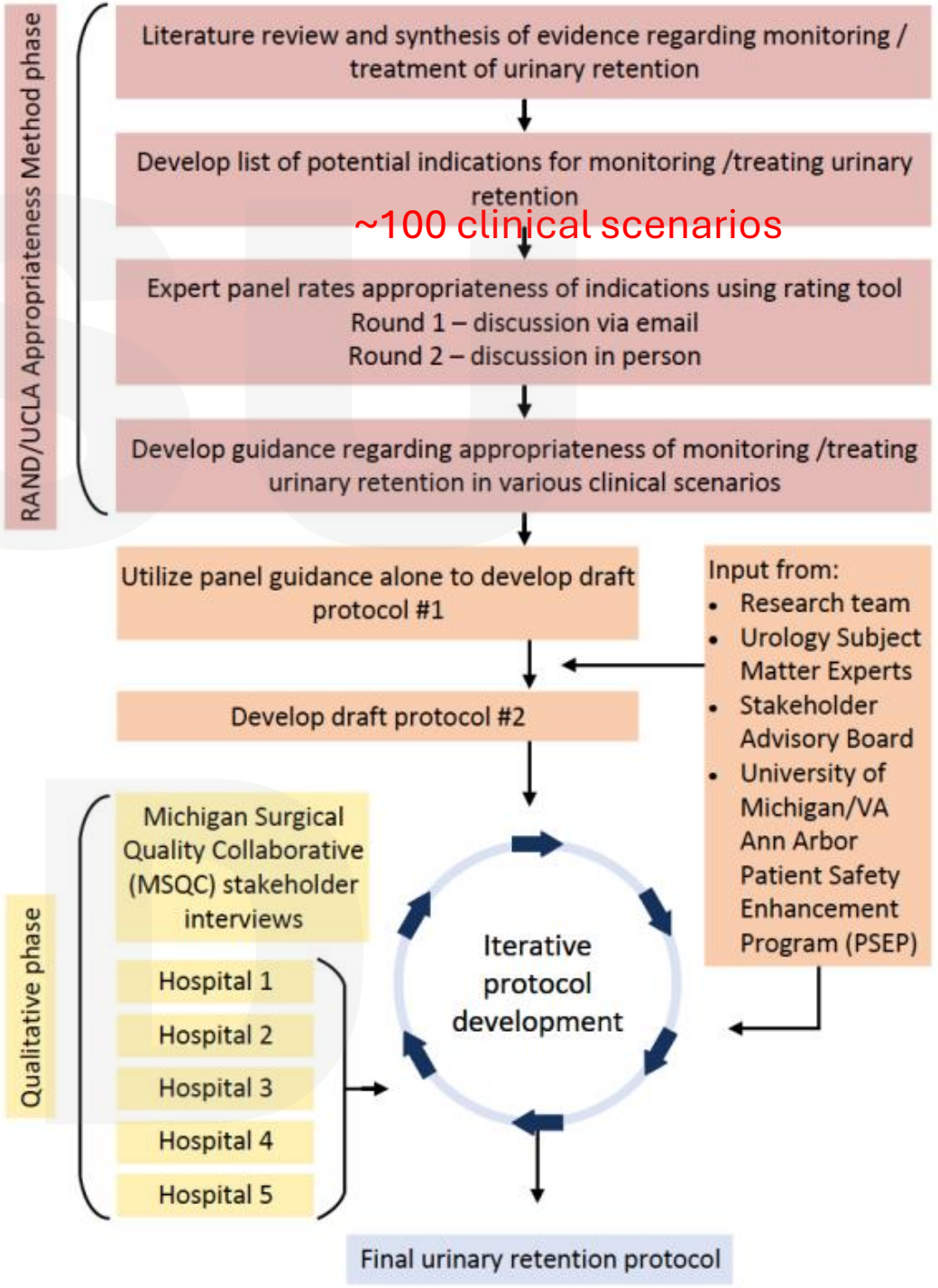
Case 1, Aliquot 3

Later, the nurse reports patient hasn't voided for 4 hours, and a bladder scan shows 380 mL. The team debates next steps.

- **Allison:** *"Check if he's symptomatic, then decide."*
- **Eric:** *"Let's rescan in 4 hours — he might void on his own."*
- **Robert:** *"Straight cath now, or the bladder will just get weaker."*
- **James:** *"No clear consensus, but definitely no Foley, until he requires cath more than 3 times in the next 24 hours."*

Urinary Retention Evaluation and Catheterization Algorithm (URECA)

- **Question:** How should urinary retention be managed in the inpatient setting?
- **Design:** mixed-methods study
  - RAND/UCLA Appropriateness Method
  - Qualitative interviews



Chrouser K et al. *JAMA Netw Open* 2024 Jul 16; 7:e2422281.

Bladder scanner volumes that should prompt intermittent straight cath (ISC)?

Clinical Scenario: Post void scanned volumes	Intermittent Straight Catheterization (ISC)	
	with symptoms	without symptoms
<100 ml	Inappropriate	Inappropriate
100-199 ml	Uncertain	
200-299 ml		
300-399 ml	Appropriate	
400-499 ml		Uncertain
500 ml and up		Appropriate

≥300 mL if symptomatic

≥500 mL if asymptomatic

Chrouser K et al. *JAMA Netw Open* 2024 Jul 16; 7:e2422281.

When to transition to Indwelling Urinary Catheter (IUC)?

- Appropriate only when
  - Requires straight cath more often than Q4H
  - Output ≥500 mL Q4H

- Initial retention volume that warrants IUC?
  - Inappropriate if < 500 mL
  - Otherwise disagreed on what volume warrants

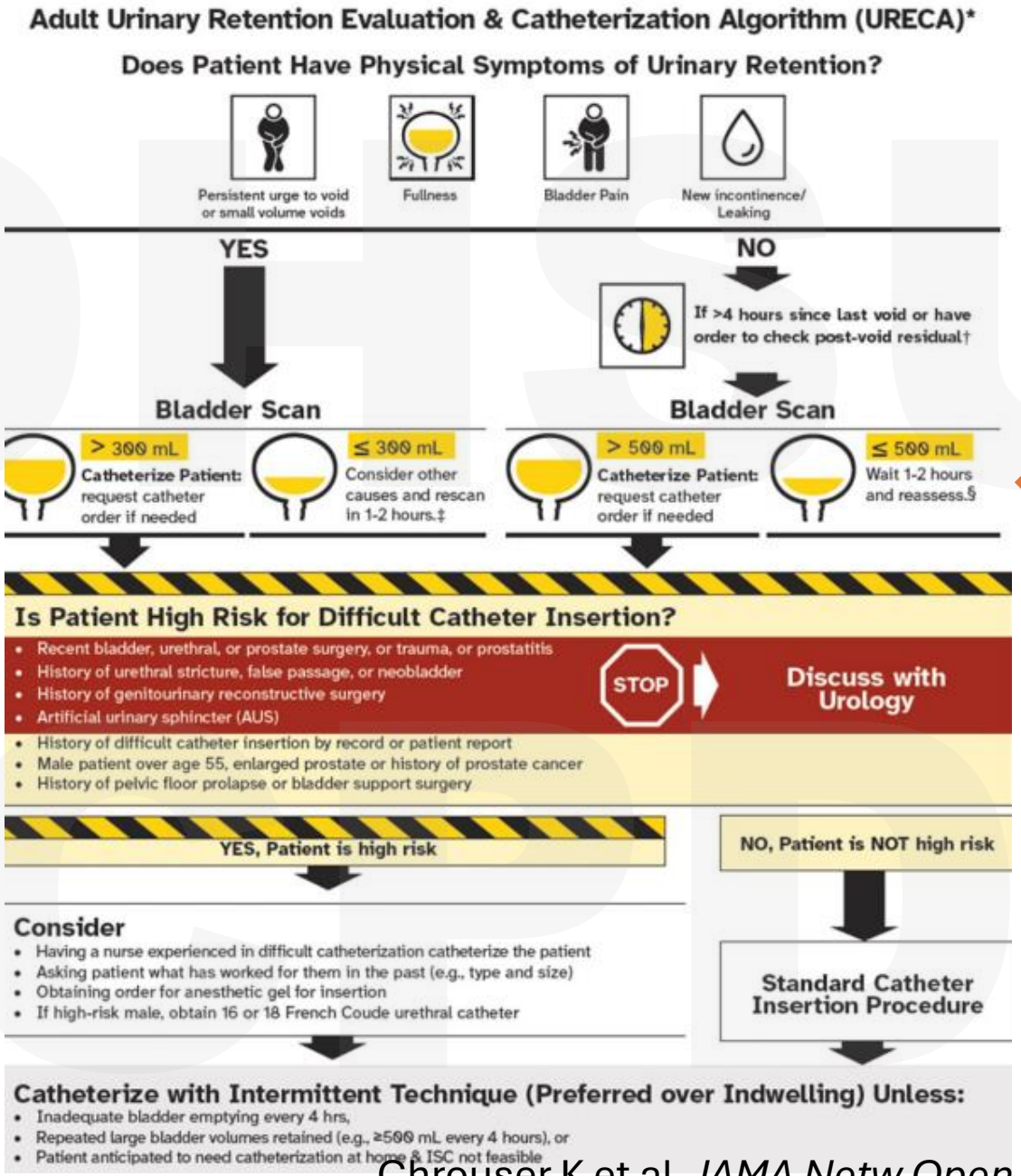
Clinical Scenarios	Transition from ISC to IUC
Patient requests indwelling catheter before any intermittent straight catheterization (ISC) attempted	Appropriate
Patient requests indwelling catheter after 1 ISC	
Patient requests indwelling catheter after 2 or more ISCs	
ISC needed once daily for 2 or more days	Inappropriate
ISC needed 2 times in 24 hours	
ISC needed 3 times in 24 hours	
ISC needed 4 times in 24 hours	
ISC needed bid for 2 or more days	
ISC needed >bid for 2 or more days	
ISC needed more often than q 4 hours	Appropriate
ISC output >500ml q 4 hours	
Initial ISC output <500ml	Inappropriate
Initial ISC output >500ml	Uncertain

Chrouser K et al. *JAMA Netw Open* 2024 Jul 16; 7:e2422281.

When to do voiding trial in post-op patients?

Conducting the FIRST trial of void on this day in an **adult male** post-operative patient with any prior history of UR		
Post-operative day #0		Appropriate
Post-operative day #1		
Post-operative day #2		Inappropriate
Post-operative day #3		
Post-operative day #4 or later		
Initiating alpha blocker medication (e.g., doxazosin, terazosin, or tamsulosin), if not contra-indicated, to PREVENT acute UR in a post-operative **adult male or female** patient with a history of prior post-operative UR and not currently being treated for UR	Uncertain	

Chrouser K et al. *JAMA Netw Open* 2024 Jul 16; 7:e2422281.



Reassess in 1-2 hours

Chrouser K et al. *JAMA Netw Open* 2024 Jul 16; 7:e2422281.

Case 1, Aliquot 3

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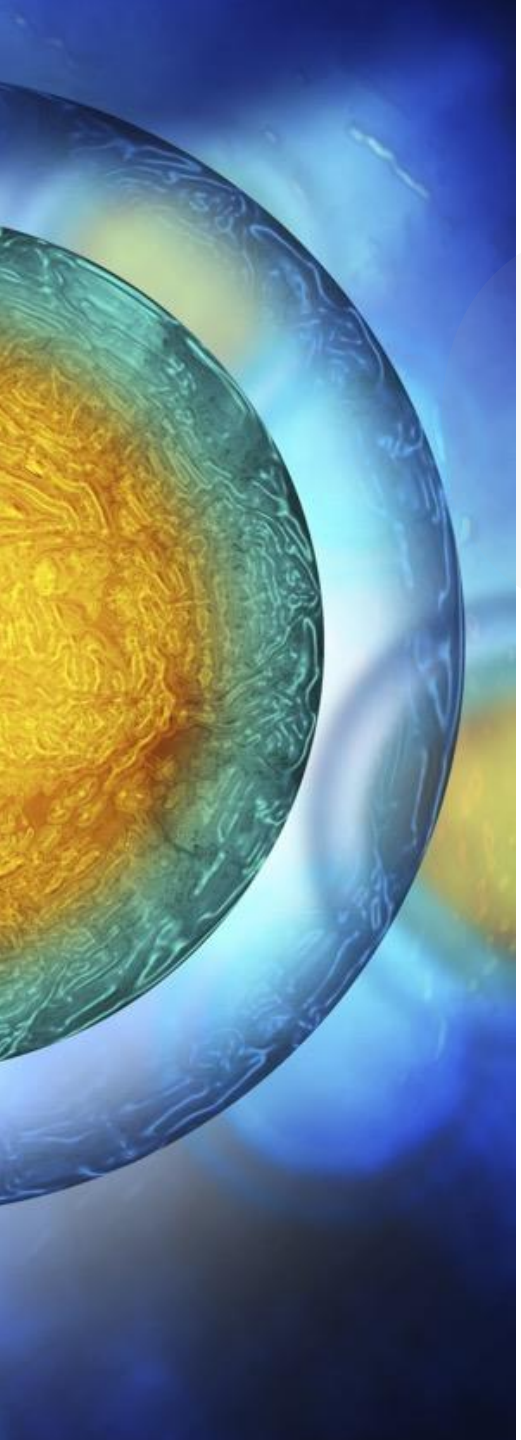


Take Away

Consensus in managing urinary retention in hospitalized patients

- Straight cath >=300 if symptomatic, >=500 if asymptomatic
- Foley only if more frequent than Q4H, or patient requests
- Uncertain with initial retention volume that warrants Foley
- Remove Foley and do voiding trial early (do not postpone to POD#2)

Next step: QI project? EHR integration?

Case 2, Aliquot 1

- Your team is admitting a 78-year old lady with hypertension, and history of colon cancer, who was brought in by her family for weakness for the past week. On exam, she is mildly confused and appears hypovolemic. Labs were notable for Na 120, K 3.3.
- ED started IV fluids. HCTZ was stopped, K repleted, and Q4H metabolic panel ordered.
- After 24 hours, Na rose to 128.

Case 2, Aliquot 1

The team debates about the target 24-hour Na correction rate.

- **Allison:** *“4–6 mEq/L in 24 hours — safest since duration is unknown.”*
- **Eric:** *“I’d say 6–8, not too fast, not too slow.”*
- **Robert:** *“I’d aim for 8–10, so I think we're okay”*
- **James:** *“Go up to 12. ODS risk is low — no need to prolong her stay.”*

Meta-analysis

- 16 studies (11,811 patients, mean age 68)
- severe hyponatremia (<120, or <125 with severe sx)
- 4 correction-rate categories
  - Most studies compared rapid vs slow or very slow rates

Category	Definition (per 24 hours)
Very rapid	>12 mEq/L
Rapid	≥8-10 mEq/L
Slow	<8 or 6 -10 mEq/L
Very slow	<4-6 mEq/L

Comparison	In-Hospital Deaths (per 1000)	Odds Ratio (95% CI)	30-Day Mortality (per 1000)	Length of Stay	ODS Incidence
Rapid vs Slow	32 fewer	0.67 (0.55 – 0.82)	61 fewer	1.2 days shorter	0.5% vs 0.2%
Rapid vs Very Slow	221 fewer	0.29 (0.11 – 0.79)	134 fewer	3.1 days shorter	0.5% vs <0.1%

Very rapid: 0.3%
No statistical difference

Ayus JC et al. *JAMA Intern Med* 2024 Nov 18; [e-pub].

Figure 2. Adjusted In-Hospital Mortality by Speed of Correction

Source	Log (OR)	SE	Total No. Faster correction	Total No. Slower correction	OR (95% CI)	Weight, %	Risk of bias
Very rapid vs rapid correction							
MacMillan et al,[9] 2023	-0.2485	0.2585	595	823	0.78 (0.47-1.29)	100	
Subtotal (95% CI)			595	823	0.78 (0.47-1.29)	100	
Heterogeneity: NA							
Test for overall effect: $z = 0.96$; $P = .34$							
Rapid vs slow correction							
Geoghegan et al,[22] 2015	0	0.4675	114	211	1.00 (0.40-2.50)	4.8	
Grim et al,[24] 2021	-0.7133	0.2676	91	197	0.49 (0.29-0.83)	14.6	
Kinoshita et al,[10] 2023	-0.4711	0.2288	451	573	0.62 (0.40-0.98)	20.0	
MacMillan et al,[9] 2023	-0.2390	0.1808	823	1538	0.79 (0.55-1.12)	32.0	
Seethapathy et al,[11] 2023	-0.4463	0.1912	1067	952	0.64 (0.44-0.93)	28.6	
Subtotal (95% CI)			2546	3471	0.67 (0.55-0.82)	100	
Heterogeneity: $\tau^2 = 0$; $\chi^2_4 = 3.05$; $P = .55$; $I^2 = 0\%$							
Test for overall effect: $z = 3.94$; $P < .001$							
Rapid vs very slow correction							
Grim et al,[24] 2021	-0.8440	0.2767	91	118	0.43 (0.25-0.74)	63.6	
Turkmen et al,[29] 2022	-1.8991	0.6155	18	145	0.15 (0.04-0.50)	36.0	
Subtotal (95% CI)			109	263	0.29 (0.11-0.79)	100	
Heterogeneity: $\tau^2 = 0.33$; $\chi^2_1 = 2.44$; $P = .12$; $I^2 = 59\%$							
Test for overall effect: $z = 2.42$; $P = .02$							
Slow vs very slow correction							
Geoghegan et al,[22] 2015	-0.7985	0.1698	114	211	0.45 (0.32-0.63)	71.3	
Grim et al,[24] 2021	-0.7133	0.2676	0	0	0.49 (0.29-0.83)	28.7	
Subtotal (95% CI)			114	211	0.46 (0.35-0.61)	100	
Heterogeneity: $\tau^2 = 0$; $\chi^2_1 = 0.07$; $P = .79$; $I^2 = 0\%$							
Test for overall effect: $z = 5.40$; $P < .001$							
Test for subgroup differences: $\chi^2_3 = 7.51$; $P = .06$; $I^2 = 60\%$							

Limitations

- Observational, unmeasured confounders
- Insufficient info for subgroup analyses (eg, acute vs. chronic, cause of the hyponatremia)
- Slow correction group may have more co-morbidities (eg, advanced liver disease, HF, cancer) making it harder to correct; and vice versa
- Unable to conclude that slow correction is the cause of increased mortality
- May not apply to patients with most-severe hyponatremia (Na<115)

Conclusion: faster correction rates are associated with lower mortality, and no excess risk for osmotic demyelination syndrome

An additional study…


Contents lists available at ScienceDirect

European Journal of Internal Medicine

journal homepage: www.elsevier.com/locate/ejim

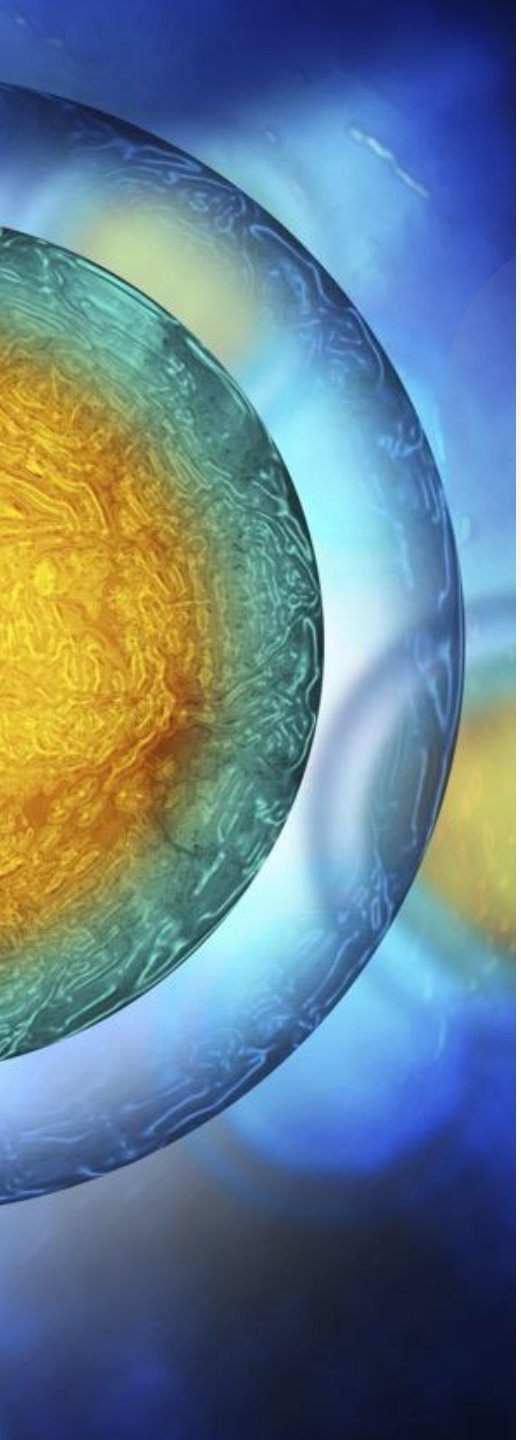
Original Article

Neurologic and psychiatric disorders following correction of profound hyponatremia - A cohort study

Henrik Falhammar [a,b,*], Mikael Andersson Franko [c], Jonatan D. Lindh [d,e], Jakob Skov [a,f], Buster Mannheimer [c,g]

- **Largest cohort so far**
- 7600 hospitalized adults, severe hyponatremia (Na <125)
  - 24-hour correction rates: ≤8 vs. >8 (half each group)
- **Only 7 patients** (0.09%) developed ODS, 6 with correction rates >8
  - **3 patients:** Na <105 mEq/L, correction rates >8, sx ODS within 3 weeks (linked to correction rate)
  - **4 patients:** Na 113/119/122/124, dx ODS several years later (direct relation between correction rate and ODS very unlikely)
- **Conclusion:** Rapid correction is a concern only in extreme cases (Na ≤105)

Falhammar H et al. *Eur J Intern Med* 2025 Jun 25; [e-pub].



Take Away

- It's time for the concern over **fast overcorrection** to shift to concern about **correcting too slowly** (particularly in patients with less-severe hyponatremia)?
- Other's opinions on 24-hr correction rate
  - **NEJM JW:** In non-extreme patients, should aim for 8-12
  - **UpToDate:** Target 4-6 (actual often exceeds intended)
    - If Na <120 or if additional risk factors of ODS, the max should be 8
  - **Nephrologist**
  - **My take:** I'll be less neurotic about going a bit faster than expected
  - **What is your take?**

Case 2, Aliquot 2

Allison received a page from the nurse about sepsis alert from EHR. She wondered, "are these EHR sepsis alerts really of any utility?"

- **Allison:** *“Just alert fatigue, no real benefit.”*
- **Eric:** *“Improves recognition, but not mortality.”*
- **Robert:** *“No, I thought it actually improves mortality.”*
- **James:** *“My prior institution actually turned it off — studies showed poor performance.”*

Case 2, Aliquot 2

James pulled out the article he mentioned (2021):

JAMA Internal Medicine | Original Investigation

External Validation of a Widely Implemented Proprietary Sepsis Prediction Model in Hospitalized Patients

Andrew Wong, MD; Erkin Otles, MEng; John P. Donnelly, PhD; Andrew Krumm, PhD; Jeffrey McCullough, PhD; Olivia DeTroyer-Cooley, BSE; Justin Pestrue, MEcon; Marie Phillips, BA; Judy Konye, MSN, RN; Carleen Penoza, MHSA, RN; Muhammad Ghous, MBBS; Karandeep Singh, MD, MMSc

How accurately does the **Epic Sepsis Model** (a proprietary sepsis prediction model) predict the onset of sepsis?

- Area under the curve 0.63 - substantially worse than reported performance by Epic
- "Its widespread adoption despite poor performance raises fundamental concerns about sepsis management on a national level"

Wong A, et al. JAMA Intern Med. 2021;181;(8):1065-1070.

Case 2, Aliquot 2

- Robert pulled out a more recent article from Dec 2024

Research

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Electronic Sepsis Screening Among Patients Admitted to Hospital Wards
A Stepped-Wedge Cluster Randomized Trial

Yaseen M. Arabi, MD; Abdulmohsen Alsaawi, MD, MSc; Mohammed Alzahrani, MD, MBA; Ali M. Al Khathaami, MBBS; Raed H. AlHazme, PhD; Abdullah Al Mutrafy, MD; Ali Al Qarni, MD; Ramesh Kumar Vishwakarma, PhD; Rasha Al Anazi, RN; Eman Al Qasim, RN, MSN; Sheryl Ann Abdukahil, RN; Fawaz K. Al-Rabeah, RPh, MHI; Huda Al Ghamdi, MSc; Abdulaleem Alatassi, MBBS; Hasan M. Al-Dorzi, MD; Fahad Al-Hameed, MD; Razan Babakr, MD; Abdulaziz A. Alghamdi, MBBS; Salih Bin Salih, MD; Ahmad Alharbi, MBBS; Mufareh Edah AlKatheri, MD, MBBS; Hani Mustafa, MD; Saad Al-Qahtani, MD, MAHA; Shaher Al Qahtani, MD; Nahar Alselaim, MBBS, MPH; Nabiha Tashkandi, BSN, RN, MSN; Ali H. Alyami, MD; Zeyad Alyousef, MD; Omar AlDibasi, PhD; Abdul Hadi Al-Qahtani, MD; Abdulaziz Aldawood, MD; Angela Caswell, RN, MSc, PhD; Nouf Al Ayadhi, BCS; Hadeel Al Rehaili, BSc; Ahmed Al Arfaj, MD; Hatami Al Mubarak, MD; Turki Alwasaidi, MD; Saleh Zahrani, MD; Yousef Alalawi, MD; Abdulrahman Alhadab, MD; Tariq Nasser, MD; Tagwa Omer, RN, MSN, PhD; Sameera M. Al Johani, MBBS; Abdulaziz Alajlan, MBBS; Musharaf Sadat, MBBS; Mohammed Alzunitan, MBBS; Saad Al Mohrij, MD; for the SCREEN Trial Group

SCREEN Trial

2/3 in 12-hr window:
hypotension, tachypnea, AMS

- **Question:** Does electronic sepsis screening based on **qSOFA**, compared with no screening, reduce the mortality of hospitalized patients?
- **Design:** a stepped-wedge, cluster randomized trial
  - 45 wards (clusters) in 5 hospitals in Saudi Arabia, randomized to **9 sequence**
  - Q2mo switch **from no screening --> screening**

The fist large RCT of EHR sepsis alerts!

Sequence (new wards allocated to intervention)	Sequence 1 (5)	Sequence 2 (5)	Sequence 3 (4)[a]	Sequence 4 (5)	Sequence 5 (5)[b]	Sequence 6 (5)	Sequence 7 (5)[b]	Sequence 8 (5)	Sequence 9 (4)[a]
Period 1 (Oct 2019-Nov 2019)	n=621; 124 (97)	n=731; 146 (132)	n=488; 122 (64)	n=724; 145 (133)	n=672; 134 (72)	n=620; 124 (77)	n=875; 175 (42)	n=705; 141 (37)	n=631; 158 (114)
Period 2 (Dec 2019-Jan 2020)	n=558; 112 (76)	n=776; 155 (135)	n=480; 120 (58)	n=640; 128 (121)	n=654; 131 (85)	n=588; 118 (84)	n=956; 191 (42)	n=734; 147 (50)	n=627; 157 (85)
Period 3 (Feb 2020-Mar 2020)	n=496; 99 (72)	n=706; 141 (124)	n=418; 105 (37)	n=530; 106 (102)	n=543; 109 (73)	n=598; 120 (76)	n=802; 160 (30)	n=570; 114 (51)	n=548; 137 (67)
Period 4 (Apr 2020-Jun 2020)[c]	n=465; 93 (43)	n=809; 162 (129)	n=454; 114 (61)[b]	n=658; 132 (82)	n=633; 127 (93)	n=514; 103 (130)	n=789; 158 (53)	n=816; 163 (110)	n=752; 188 (48)
Period 5 (Jul 2020-Sep 2020)[c]	n=554; 111 (62)	n=888; 178 (80)	n=759; 190 (77)[b]	n=1122; 224 (136)	n=789; 197 (159)	n=684; 137 (135)	n=668; 134 (113)	n=1049; 210 (98)	n=972; 243 (81)
Period 6 (Oct 2020-Nov 2020)	n=476; 95 (57)	n=716; 143 (77)	n=521; 130 (25)	n=739; 148 (62)	n=589; 147 (86)	n=594; 119 (85)	n=402; 101 (50)	n=679; 136 (54)	n=794; 199 (108)
Period 7 (Dec 2020-Jan 2021)	n=587; 117 (81)	n=856; 171 (125)	n=549; 137 (22)	n=730; 146 (90)	n=564; 141 (77)	n=681; 136 (94)	n=529; 132 (82)	n=720; 144 (48)	n=779; 195 (103)
Period 8 (Feb 2021-Mar 2021)	n=649; 130 (87)	n=920; 184 (182)	n=576; 144 (23)	n=846; 169 (99)	n=523; 131 (67)	n=641; 128 (95)	n=512; 128 (82)	n=773; 155 (63)	n=814; 204 (132)
Period 9 (Apr 2021-May 2021)	n=514; 103 (68)	n=991; 198 (192)	n=544; 136 (24)	n=878; 176 (81)	n=433; 108 (55)	n=532; 106 (71)	n=538; 135 (32)	n=591; 118 (44)	n=674; 169 (59)
Period 10 (Jun 2021-Jul 2021)	n=575; 115 (81)	n=980; 196 (159)	n=613; 153 (27)	n=784; 157 (91)	n=524; 131 (70)	n=600; 120 (89)	n=528; 132 (36)	n=658; 132 (46)	n=673; 168 (113)

- **Primary outcome:** 90-day in-hospital mortality

Arabi YM et al. *JAMA* 2024 Dec 10; 2025;333;(9):763-773.

SCREEN Trial: Results

FINDINGS

90-Day in-hospital mortality

Sepsis screening	3.2% (937 of 29 442 patients)
No sepsis screening	3.1% (961 of 30 613 patients)

Electronic sepsis screening compared with no screening resulted in a significantly lower in-hospital 90-day mortality:

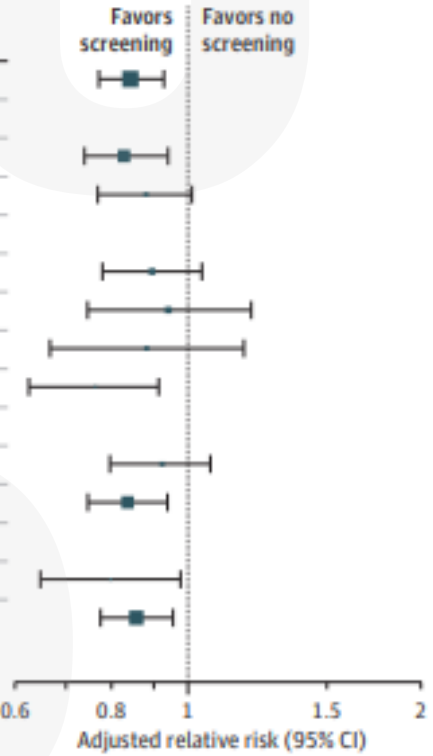
Between-group difference, 0.0%
(95% CI, -0.2% to 0.3%) (rounded to 1 decimal place from 0.04%)

Adjusted relative risk, 0.85
(95% CI, 0.77 to 0.93)

number needed to screen ≈200

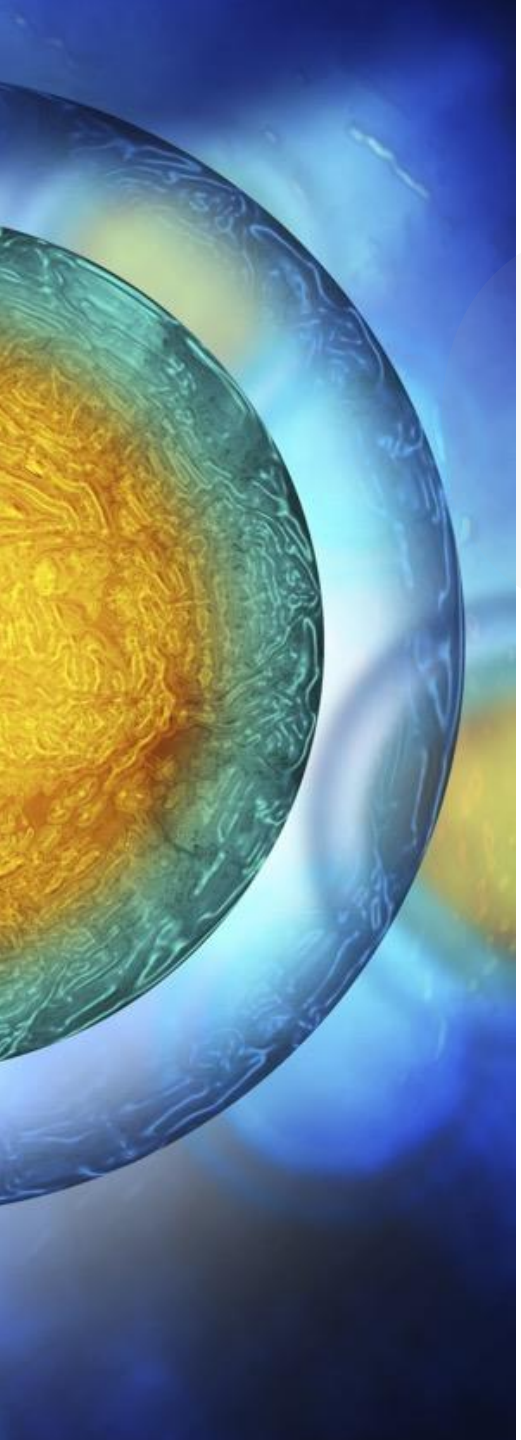
Figure 2. Results of Prespecified Subgroup Analyses of the Primary Outcome (90-Day In-Hospital Mortality)

Subgroup	No./total (%) Screening	No screening	Adjusted relative risk (95% CI)	P value for interaction	False discovery rate[a]
Overall	937/29442 (3.2)	961/30613 (3.1)	0.85 (0.77-0.93)		
Age group, y					
≤65	516/22447 (2.3)	536/22957 (2.3)	0.83 (0.74-0.94)	.37	.50
>65	411/6670 (6.2)	416/7206 (5.8)	0.89 (0.77-1.01)		
Admitting ward					
Medical	523/11682 (4.5)	405/10422 (3.9)	0.90 (0.78-1.04)		
Surgical	119/8294 (1.4)	159/12150 (1.3)	0.95 (0.75-1.20)	<.001	<.001
Mixed	128/6670 (1.9)	131/4635 (2.8)	0.89 (0.67-1.18)		
Oncology	167/2796 (6.0)	266/3406 (7.8)	0.76 (0.63-0.92)		
Documented infection source[b]					
Yes	408/7424 (5.5)	353/6896 (5.1)	0.93 (0.80-1.07)	.14	.28
No	529/22018 (2.4)	608/23717 (2.6)	0.84 (0.75-0.94)		
COVID-19[c]					
Yes	286/3462 (8.3)	153/1589 (9.6)	0.80 (0.65-0.98)	.66	.66
No	651/25980 (2.5)	808/29024 (2.8)	0.86 (0.77-0.96)		



- Importantly, no effect on mortality for patients **with an alert**
  - possible that intervention was exerting **broader effects on care patterns**

Arabi YM et al. *JAMA* 2024 Dec 10; 2025;333;(9):763-773.



Take Away

- EHR sepsis alert may improve mortality... perhaps through broader effect on care pattern.
- The next step is not widespread adoption. More "SCREEN"s — coupled with qualitative assessment — are needed to understand how EHR-based clinical decision support works across different hospitals and workflows, not just limited to sepsis screening.

SCREEN = Stepped-wedge Cluster Randomized Trial of Electronic Early Notification

Case 2, Aliquot 3

- Allison called back nurse, and found patient has new confusion and tachypnea, that triggered the alert.
- Vitals: T 35.8 °C, BP 100/60, HR 72, O_2 sat 93%
- Labs: lactate 2.5

- Eric flips through his notes and asks: I remember from last year, you taught us that rigors (shaking chills) has an 87% specificity for bacteremia. Our patient does not have rigor, but instead is **hypothermic. Does hypothermia carry outcome significance?**


Aita et al. BMC Medicine (2024) 22:240
https://doi.org/10.1186/s12916-024-03467-z

BMC Medicine

RESEARCH ARTICLE Open Access

Utility of shaking chills as a diagnostic sign for bacteremia in adults: a systematic review and meta-analysis

Tetsuro Aita[1,2*], Hiroaki Nakagawa[1], Sei Takahashi[1,3], Toru Naganuma[1,3], Keisuke Anan[4,5], Masahiro Banno[5,6] and Sugihiro Hamaguchi[1]

Case 2, Aliquot 3

Can temperature predict outcomes inpatients with sepsis?

- **Allison:** *“Hypothermia is rare, but I’d focus more on MAP and lactate.”*
- ***Eric:*** *“Rigors usually precede fever and is linked to bacteremia, so I’d think hypothermia is less concerning than fever with rigors.”*
- **Robert:** *“Not that rare — I’ve seen several septic, hypotensive patients like this in the ICU.”*
- **James:** *“I'm worried.”*

Exploring temperature trajectories in ED sepsis patients

4 distinct temperature patterns

Patterns	Frequency (%)
Hypothermic	0.9
Normothermic	74.1
Progressive Fever	10.7
Fever Resolver	14.4

	Hypothermic	Normothermic	Progressive Fever	Fever Resolver	P value
ICU admission	94%	45%	63%	52%	<0.001
Mortality	28%	11%	10%	6.8%	0.02

Kijpaisalratana N et al. *Am J Emerg Med* 2025 Sep; 95:235.

Table 2
Characteristics and outcomes in the validation cohort.

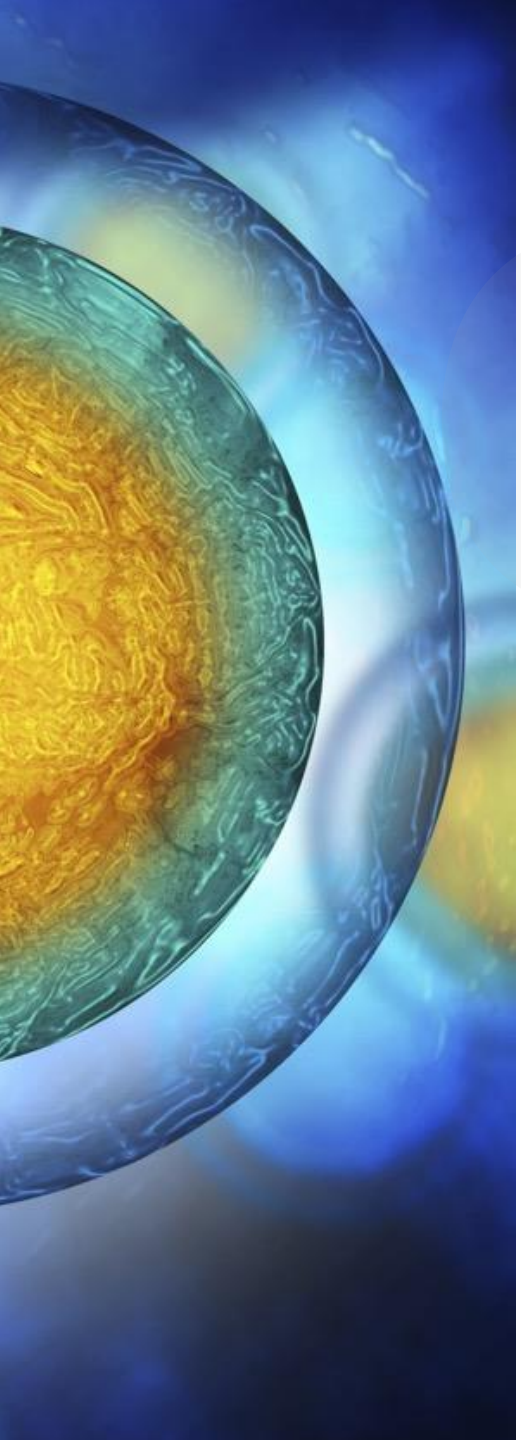
	Hypothermic	Normothermic	Progressive Fever	Fever Resolver	*p* value
Patient Characteristics	18	1272	120	250	
Age (years), median (IQR)	70 (64.0–80.75)	66 (54.0–78.0)	64 (53.75–73.0)	63 (53.0–76.0)	0.047
Female, No. (%)	9 (50)	565 (44.41)	45 (37.5)	90 (36)	0.05
Charlson Comorbidity Index, median (IQR)	7 (2.25–8.75)	6 (3.0–8.0)	5 (3.0–6.25)	5 (3.0–7.0)	0.0001
ESI Levels 1 and 2, No. (%)	15 (83.33)	904 (71.07)	81 (67.5)	250 (78)	0.06
Arrival by Ambulance, No. (%)	16 (88.89)	783 (61.56)	70 (58.33)	147 (58.8)	0.08
Triage Vital Signs					
Heart Rate, median (IQR)	72 (58.0–87.0)	90 (76.0–104.0)	98 (84.0–109.0)	106 (92.0–121.0)	<0.001
Systolic Blood Pressure, median (IQR)	115 (91.5–125.5)	113 (96.0–133.0)	116 (99.0–133.0)	120.5 (102.0–140.0)	0.0096
Diastolic Blood Pressure, median (IQR)	59 (50.0–61.0)	64 (52.0–77.0)	65 (52.0–77.5)	65 (56.0–79.0)	0.0809
Respiratory Rate, median (IQR)	17 (16.0–20.0)	18 (16.0–20.0)	18 (16.0–20.0)	18 (16.5–20.0)	0.0026
Body Temperature, median (IQR)	95 (94.85–95.43)	98 (97.5–98.7)	98.9 (98.3–99.6)	101 (100.5–102.1)	<0.001
Oxygen Saturation, median (IQR)	97 (97.0–99.75)	98 (95.0–99.0)	98 (96.0–99.0)	97 (96.0–99.0)	0.4033
Fever in ED (T > 100.4 F), No. (%)	–	72 (5.66)	108 (90.83)	233 (93.2)	<0.001
Time to Fever (T > 100.4 F), (hours), median (IQR)	–	3 (1.0–6.0)	3 (2.0–5.0)	0 (0.0–1.0)	<0.001
Maximum Temperature (F), median (IQR)	95 (94.18–95.68)	98.6 (98.1–99.3)	102.4 (101.6–103.0)	101.8 (101.0–102.8)	<0.001
Initial WBC Count (x10^3 /μL), median (IQR)	6.5 (4.0–9.85)	10.8 (7.02–15.7)	11.8 (7.48–17.35)	11.3 (6.8–15.8)	0.0526
Initial Serum Lactate (mmol/L), median (IQR)	2.5 (1.7–4.05)	2 (1.4–3.0)	2.2 (1.52–3.15)	2.1 (1.5–3.0)	0.0089
SOFA score, median (IQR)	3 (2.0–4.0)	2 (2.0–3.0)	2 (2.0–4.0)	2 (2.0–3.0)	0.4641
Time To Clinical Recognition* (mins), median (IQR)	20.5 (14.5–74.0)	43 (20.0–102.0)	47.5 (21.75–93.25)	31 (17.0–69.0)	0.0004
Time To Antibiotic in ED (mins), median (IQR)	64 (37.25–99.75)	80 (32.0–164.25)	70 (31.0–127.75)	63 (28.25–123.75)	0.0545
Time To Antipyretic in ED (mins), median (IQR)	–	202 (91.75–315.5)	182 (103.5–325.5)	79.5 (33.0–166.0)	<0.001
Vasopressor in ED, No. (%)	11 (61.11)	302 (23.74)	43 (35.83)	94 (37.6)	<0.001
ICU admission, No. (%)	17 (94.44)	573 (45.05)	76 (63.33)	129 (51.6)	<0.001
Clinical Outcomes					
In hospital Mortality, No. (%)	5 (27.78)	146 (11.48)	12 (10)	17 (6.8)	0.02

Kijpaisalratana N et al. *Am J Emerg Med* 2025 Sep; 95:235.

Table 3
Multivariate logistic regression analysis with adjusted odds ratios for in-hospital mortality in derivation cohort.

Characteristics	Multivariate OR (95 % CI)	p value
Age (per year)	1.02 (1.01–1.03)	<0.001
Charlson Comorbidity Index (per score)	1.14 (1.09–1.20)	<0.001
Heart Rate (per beat per minutes)	1.01 (1.01–1.02)	<0.001
Systolic Blood Pressure (per millimeter of mercury)	0.98 (0.97–0.99)	<0.001
Diastolic Blood Pressure (per millimeter of mercury)	1.02 (1.01–1.03)	<0.001
Respiratory Rate (per breath per minute)	1.02 (1.00–1.04)	0.03
Oxygen Saturation (per percentage)	0.99 (0.98–1.01)	0.7
SOFA (per score)	1.40 (1.31–1.50)	<0.001
Time To Antibiotic (per hour)	1.00 (0.99–1.00)	0.08
Temperature Patterns		
Hypothermic	3.0 (1.05–8.59)	0.04
Normothermic	Ref	
Progressive Fever	0.92 (0568–1.45)	0.73
Fever Resolver	0.63 (0.41–0.96)	0.03

Kijpaisalratana N et al. *Am J Emerg Med* 2025 Sep; 95:235.



Take Away

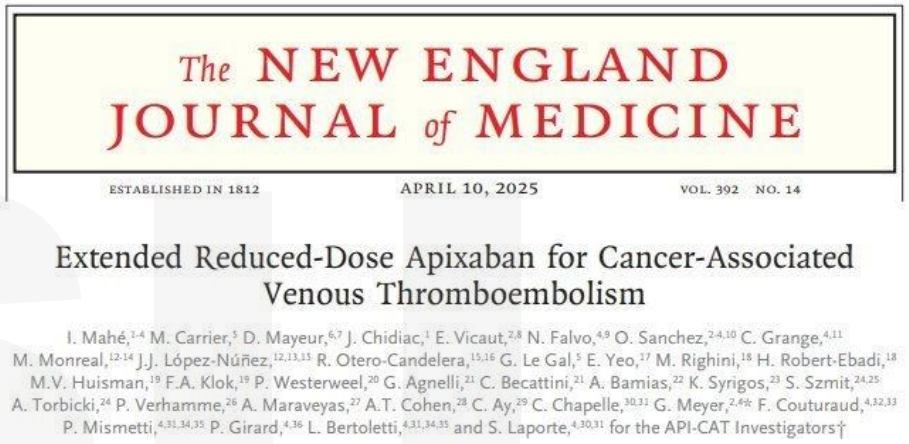
- In patients with sepsis, hypothermia is rare but is linked to poor outcomes — be wary about it!

Case 2, Aliquot 4

With timely management, patient has improved. Chart review shows she's on apixaban 5 mg BID for an incidental small PE since 6 months ago, related to active colon cancer. The team debates whether to continue full-dose or reduce to 2.5 mg BID.

- **Allison:** *"Low dose works just as well, and cuts bleeding risk — win-win."*
- **Eric:** *"Lower dose? More clots, sure, but hey, at least less bleeding."*
- **Robert:** *"Nah, more clots **and** no bleeding benefit — lose-lose."*
- **James:** *"Same clot protection, but bleeding risk doesn't budge."*

API-CAT trial (April 2025)


The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 10, 2025 VOL. 392 NO. 14

Extended Reduced-Dose Apixaban for Cancer-Associated Venous Thromboembolism

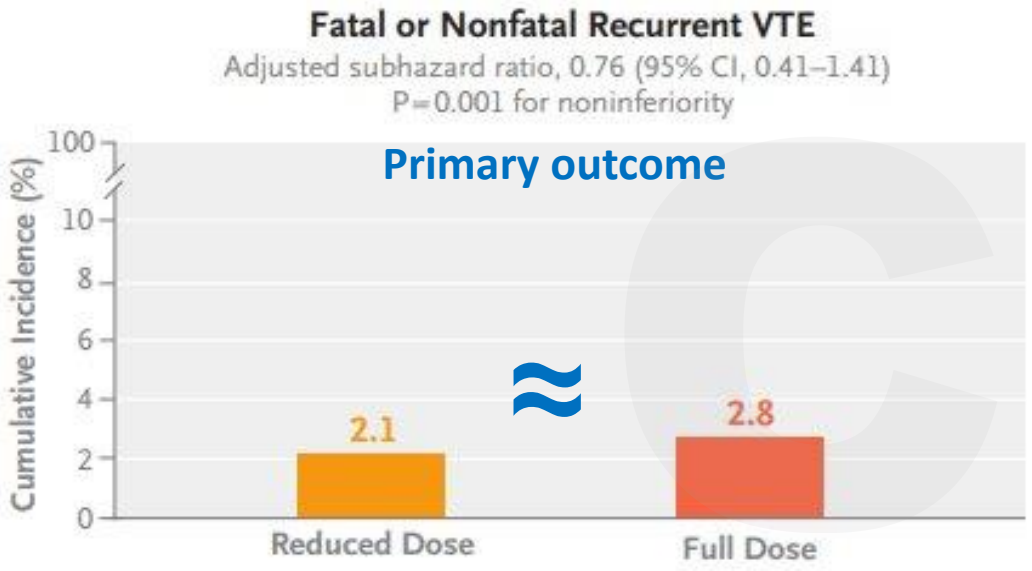
I. Mahé, M. Carrier, D. Mayeur, J. Chidiac, E. Vicaut, N. Falvo, O. Sanchez, C. Grange, M. Monreal, J.J. López-Núñez, R. Otero-Candelera, G. Le Gal, E. Yeo, M. Righini, H. Robert-Ebadi, M.V. Huisman, F.A. Klok, P. Westerweel, G. Agnelli, C. Becattini, A. Bamias, K. Syrigos, S. Szmit, A. Torbicki, P. Verhamme, A. Maraveyas, A.T. Cohen, C. Ay, C. Chapelle, G. Meyer, F. Couturaud, P. Mismetti, P. Girard, L. Bertoletti, and S. Laporte, for the API-CAT Investigators†

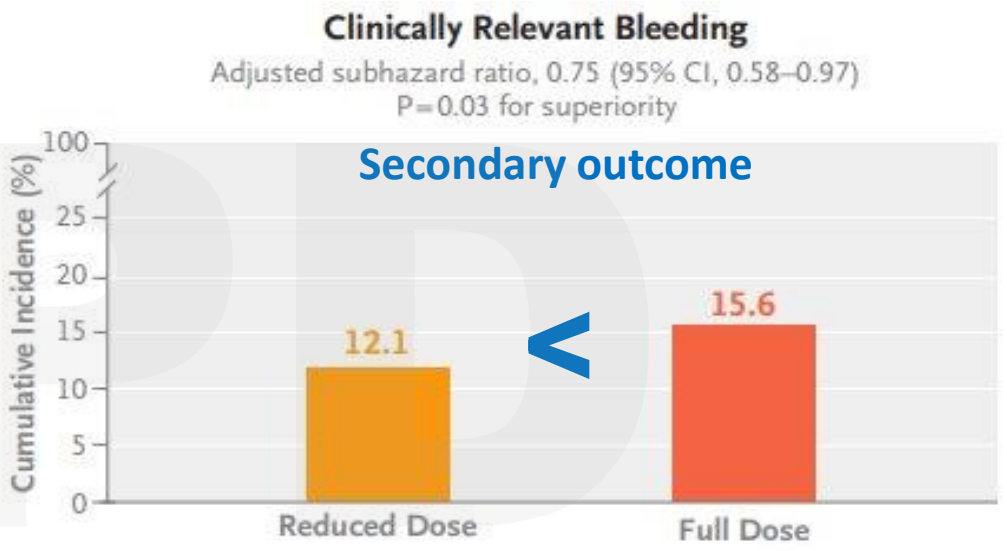
- **Question:** In patients with active cancer who completed 6 months of anticoagulation for VTE, is reduced-dose apixaban **noninferior** to full-dose apixaban for prevention of recurrent VTE?
- **Design:** industry-funded, double-blind, randomized, noninferiority trial
  - low-intensity (2.5 mg) vs full-intensity (5.0 mg) apixaban BID x 12 months
  - prespecified hazard ratio noninferiority margin of 2
- **Participants:** 1766 patients with active cancer
  - Proximal DVT or PE
  - completed at least 6 mo full-intensity anticoagulation

Mahe I et al. *N Engl J Med* 2025 Mar 29; 392:1363-1373.

API-CAT trial: Results

- Extended treatment with low-dose apixaban
  - Noninferior to full-dose apixaban for the prevention of recurrent VTE
  - The incidence of clinically relevant bleeding was lower





At 12 months (does not look beyond 12 months)

Mahe I et al. *N Engl J Med* 2025 Mar 29; 392:1363-1373.

Another study in cancer-associated VTE (March 2025)

How long to anticoagulate among patients with **low-risk PE** (incidental/small):

Compared with 6months of treatment, 18 months of anticoagulation significantly reduced its recurrence

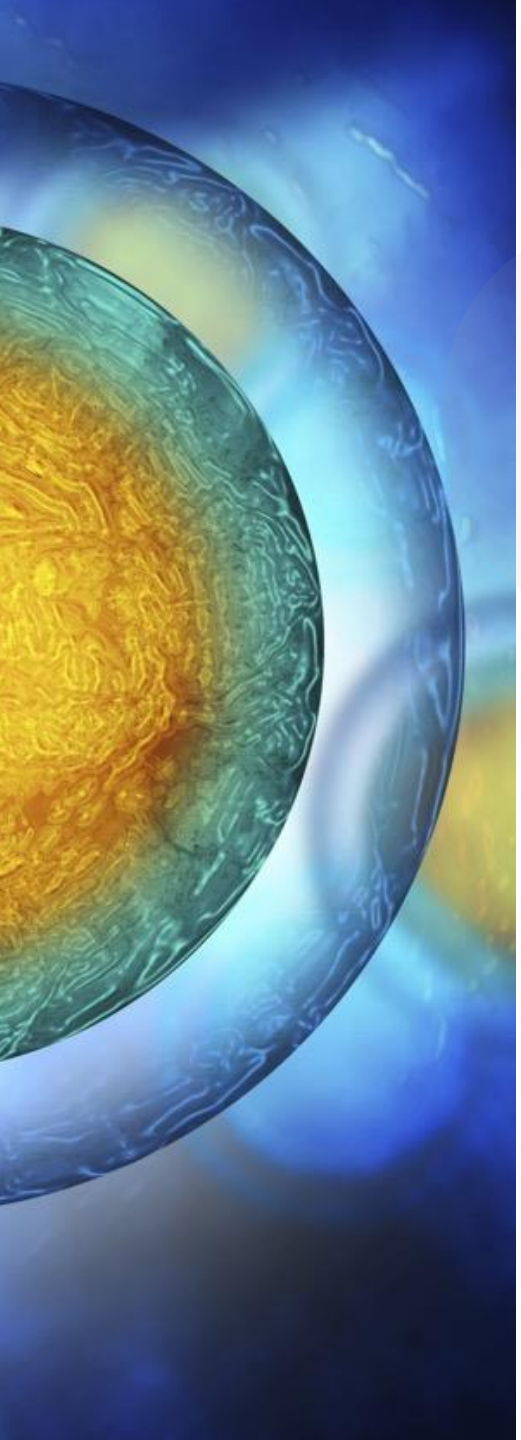
Circulation
Volume 151, Issue 9, 4 March 2025; Pages 589-600
https://doi.org/10.1161/CIRCULATIONAHA.124.072758

American Heart Association.

ORIGINAL RESEARCH ARTICLE

Rivaroxaban for 18 Months Versus 6 Months in Patients With Cancer and Acute Low-Risk Pulmonary Embolism: An Open-Label, Multicenter, Randomized Clinical Trial (ONCO PE Trial)

Yugo Yamashita, MD, Takeshi Morimoto, MPH, MD, Nao Muraoka, MD, Wataru Shioyama, MD, Ryuki Chatani, MD, Tatsuhiro Shibata, MD, Yuji Nishimoto, MD, Yoshito Ogihara, MD, Kosuke Doi, MD, Maki Oi, MD, Taro Shiga, MD, Daisuke Sueta, MD, Kitae Kim, MD, Yasuhiro Tanabe, MD, Norimichi Koitabashi, MD, Takuma Takada, MD, Satoshi Ikeda, MD, Hitoshi Nakagawa, MD, Kengo Tsukahara, MD, Masaaki Shoji, MD, Jiro Sakamoto, MD, Shinji Hisatake, MD, Yutaka Ogino, MD, Masashi Fujita, MD, Naohiko Nakanishi, MD, Tomohiro Dohke, MD, Seiichi Hiramori, MD, Ryuzo Nawada, MD, Kazuhisa Kaneda, MD, Koh Ono, MD, and Takeshi Kimura, MD on behalf of the ONCO PE Trial Investigators



Take Away

- In cancer-associated VTE, continue apixaban but reduce dose to 2.5 mg BID after 6 months (unless very high risk)
- Clearly practice-changing!

Case 3, Aliquot 1

The team admitted a 42-year-old man with cirrhosis from alcohol use, presents with jaundice and abdominal pain. His MELD score is 23 (>20), indicating **severe alcohol-associated hepatitis**.

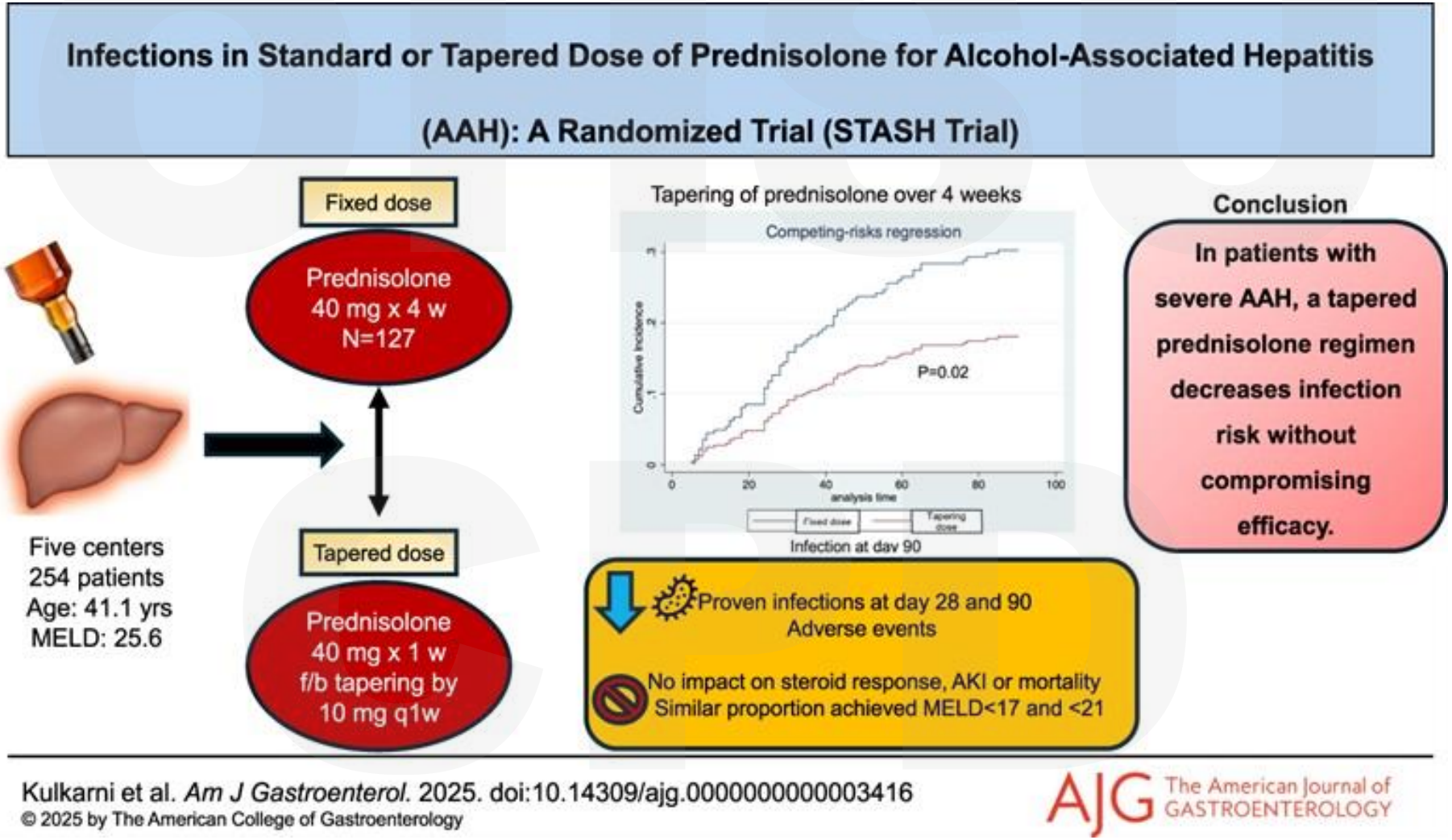
While the team is evaluating for infections, patient's daughter (a nurse working in a hepatology unit) asks if a **tapered steroid regimen** is better than the standard **fixed-dose course**.

Case 3, Aliquot 1

In severe alcohol-associated hepatitis, what is the effect of a **tapered steroid regimen** compared with fixed-dose?

- **Allison:** *"Lower treatment response, but similar mortality."*
- **Eric:** *"Lower treatment response, but fewer infections."*
- **Robert:** *"Similar treatment response, but fewer infections."*
- **James:** *"Similar mortality, treatment response, and infections."*

STASH Trial (AJG, March 2025)



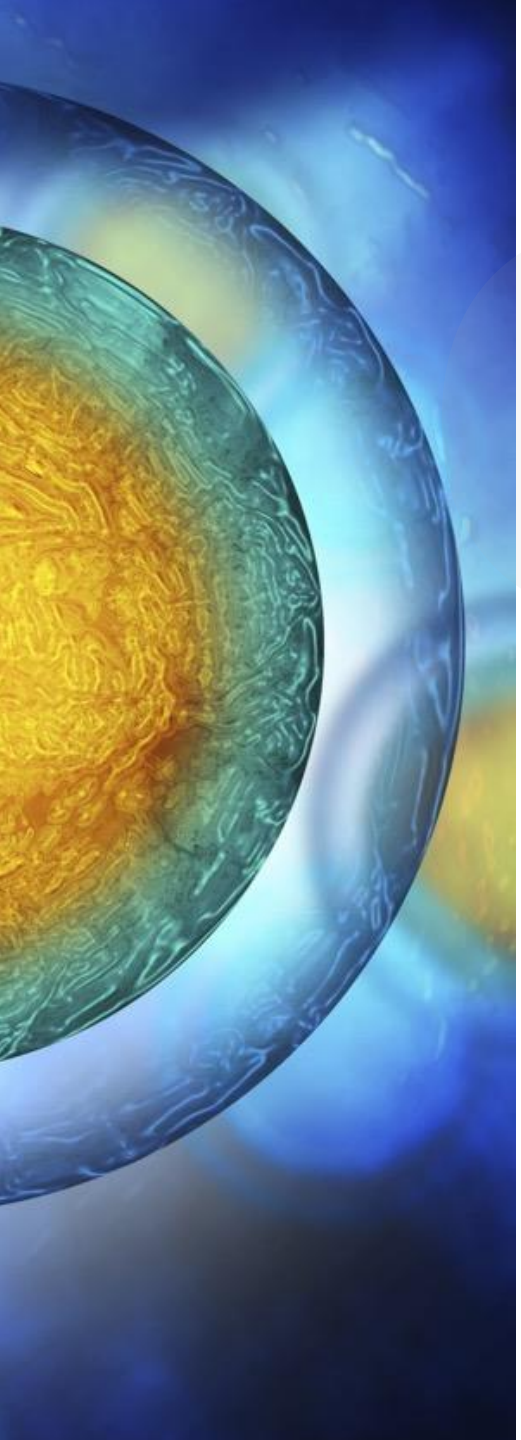
Kulkarni et al. *Am J Gastroenterol.* 2025. doi:10.14309/ajg.0000000000003416

AJG The American Journal of GASTROENTEROLOGY

Case 3, Aliquot 1

In severe alcohol-associated hepatitis, what is the effect of a **tapered steroid regimen** compared with fixed-dose?

- **Allison:** *"Lower treatment response, but similar mortality."*
- **Eric:** *"Lower treatment response, but fewer infections."*
- **Robert:** *"Similar treatment response, but fewer infections."* 
- **James:** *"Similar mortality, treatment response, and infections."*



Take Away

- Consider prednisolone tapering instead of fixed dose for severe alcoholic hepatitis

Case 3, Aliquot 2

But hold on – the patient is found to have moderate ascites. With the service getting very busy, the team debates whether it's worth pursuing paracentesis today.

- **Allison:** *"We can start empiric antibiotics for SBP; doing paracentesis today won't really change our management."*
- **Eric:** *"As long as we get it done within 24–48 hours, that should not change outcome."*
- **Robert:** *"No, we should aim to do it within 24 hours."*
- **James:** *"We should prioritize this and do it within 12 hours."*

Beran A et al. *Am J Gastroenterol* 2024 Nov; 119:2259.

Meta-analysis

- **Question:** Does early diagnostic paracentesis lead to better outcomes in hospitalized patients with cirrhosis and ascites?
- **Design:** 7 observational studies (>78,000 patients)
  - Early (within 12-24 hours of admission) vs. Delayed

CME

Early Diagnostic Paracentesis Improves Outcomes of Hospitalized Patients With Cirrhosis and Ascites: A Systematic Review and Meta-Analysis

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LIVER

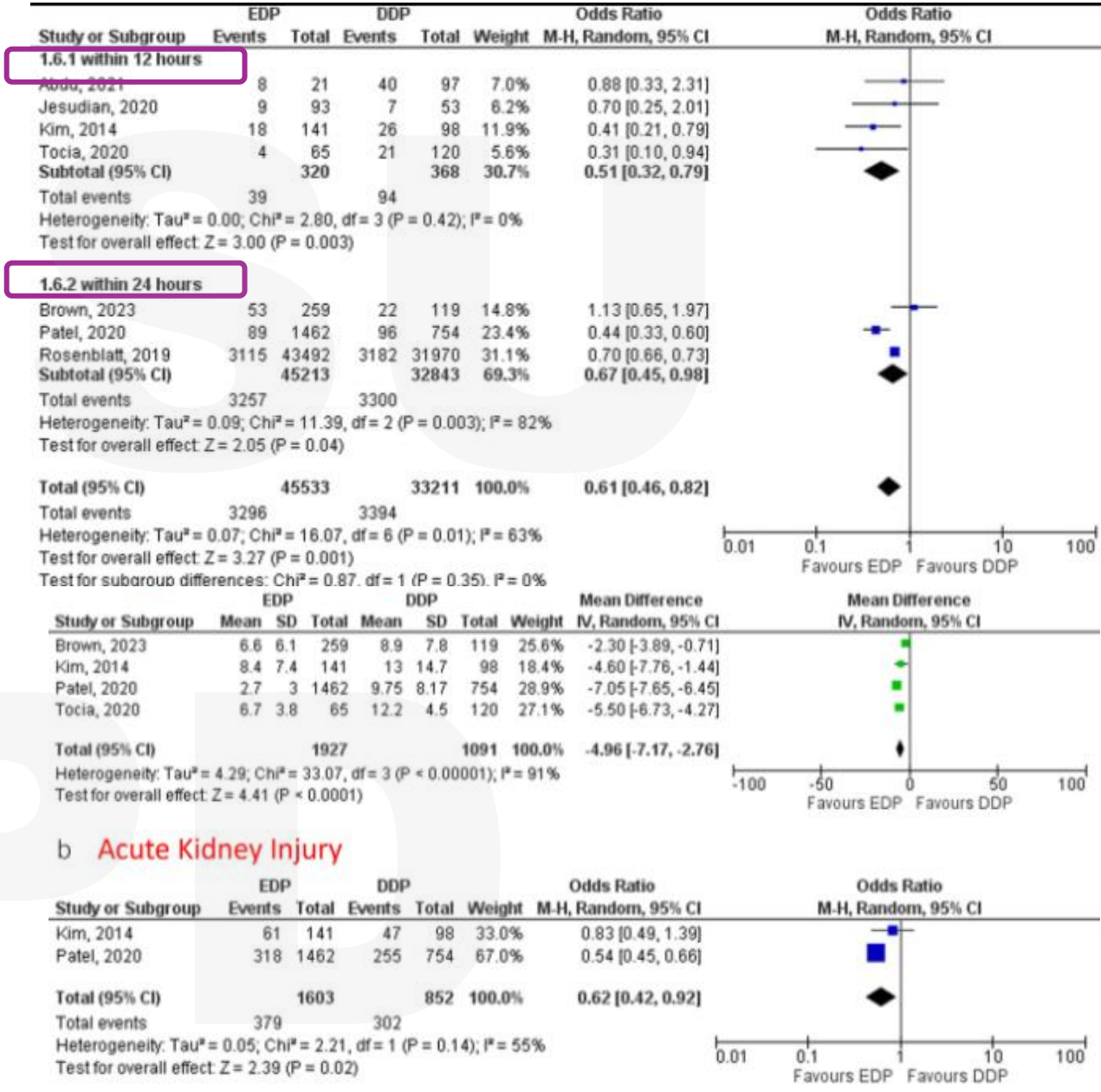
Beran A et al. *Am J Gastroenterol* 2024 Nov; 119:2259.

Results

- Early diagnostic paracentesis - significantly better outcomes
- Primary outcome
  - Lower in-hospital mortality (7% vs.10%)
  - Especially within 12 hours
- Secondary outcome
  - Lower rate of AKI (24% vs. 35%)
  - Shorter hospital length of stay (5 fewer days)

--> Enables timely administration of albumin infusion

In-Hospital Mortality



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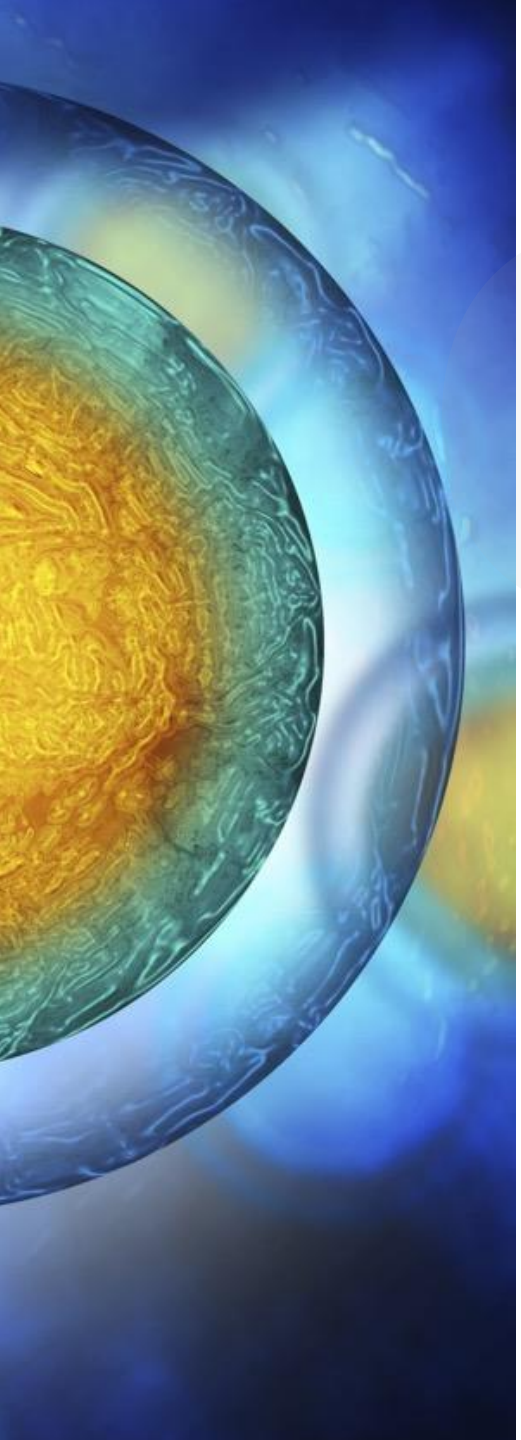


Take Away

- I will try to perform diagnostic paracentesis within 12 hours (and definitely within 24 hours) of admission, so as to start necessary antibiotics and IV albumin timely when SBP is diagnosed.

Case 3, Aliquot 3

Paracentesis confirmed **SBP**. With timely antibiotics and albumin, the patient improved. On discharge, the team debates whether to prescribe **long-term antibiotic prophylaxis**.

You share results from a recent study of 2 U.S. cohorts and ask the team to predict the effect of prophylaxis after initial SBP.

- Allison: *"Lower SBP recurrence, and less resistance."*
- Eric: *"Lower SBP recurrence, but more resistance."*
- Robert: *"Higher SBP recurrence, and more resistance."*
- James: *"No effect on recurrence, but higher resistance."*

Silvey et al. *Am J Gastroenterol.* 2024. doi:10.14309/ajg.0000000000003075

AJG The American Journal of GASTROENTEROLOGY

Current Guideline

Primary prophylaxis	Patients with cirrhosis and upper GI bleeding	Ceftriaxone 1 g IV q24h up to 7 days
	Patients with advanced cirrhosis (Child-Pugh score ≥9 and serum Bi ≥3 mg/dL) and low ascitic fluid protein (<1.5 g/dL) with either impaired renal function (Cr ≥1.2 mg/dL or BUN ≥ 25 mg/dL) or hyponatremia (Na < 130 mmol/L)	Norfloxacin 400 mg daily or Ciprofloxacin 500 mg daily or Trimethoprim-sulfamethoxazole 1 double-strength tablet daily, until liver transplantation or death
Secondary prophylaxis	Cirrhosis and first episode of SBP	Norfloxacin 400 mg daily or Ciprofloxacin 500 mg daily or Trimethoprim-sulfamethoxazole 1 double-strength tablet daily, until liver transplantation or death

Norfloxacin: discontinued in the U.S. by the manufacturer in 2015

Ciprofloxacin, Bactrim: lots of side effects

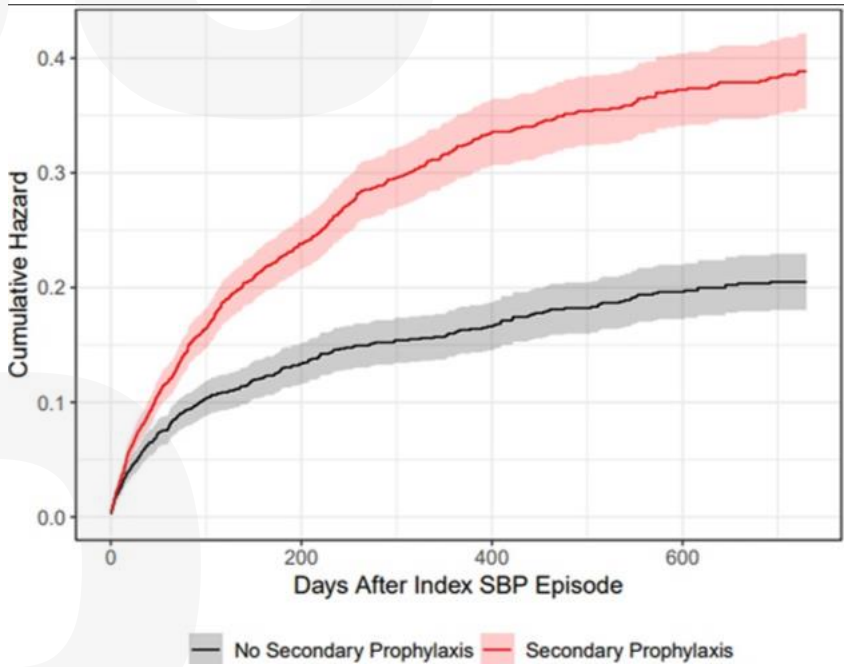
Biggins SW et al.AASLD guidelien. *Hepatology* 2021 Aug; 74:1014.

- **Question:** Does antibiotic prophylaxis after SBP prevent recurrence?
- **Design:** Retrospective, cohort database
  - 2 national cirrhosis cohorts (VA, commercially insured)
  - 11,300 inpatients/outpatients
- **Primary outcome:** SBP recurrence, mortality
- **Secondary outcome:** antibiotic resistance

Silvey S et al. *Am J Gastroenterol* 2025 May; 120:1066.

Higher Rate of SBP with Prophylaxis

- **SBP recurrence more common among antibiotic recipients** (24% vs 15%) at 2 years
  - Even after adjustment for baseline differences (hazard ratio ≈1.6).
- Trend towards higher recurrence over time likely due to **resistance**
  - Fluoroquinolone resistance more common in those who received fluoroquinolone prescriptions (68% vs 46%)
  - Available for only ≈1% of patients



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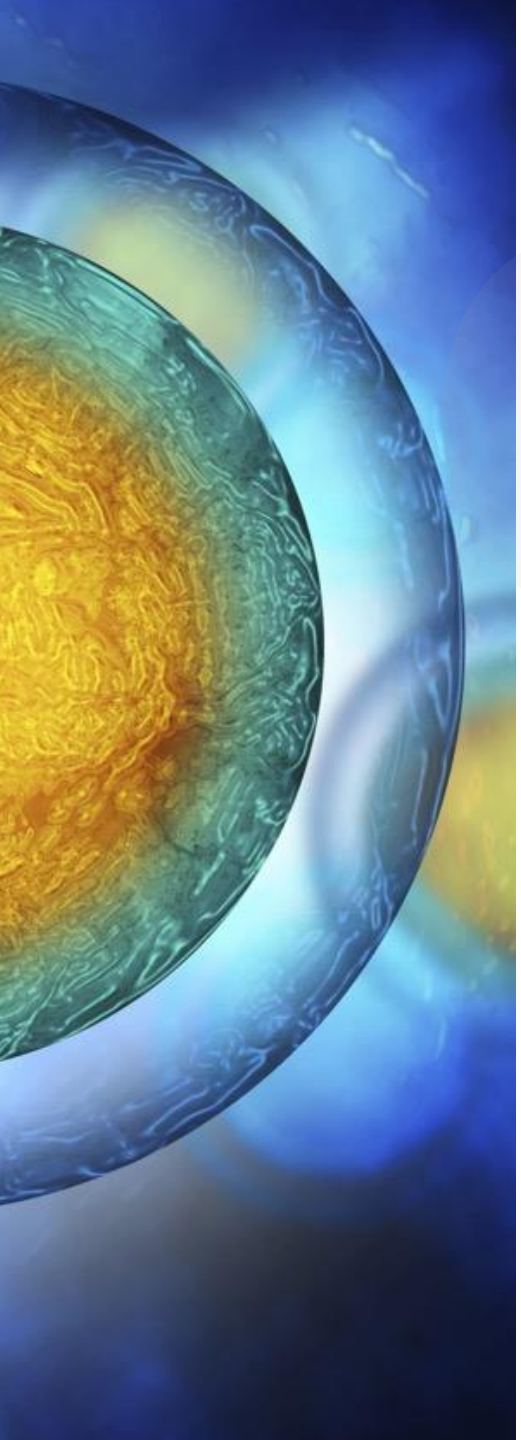
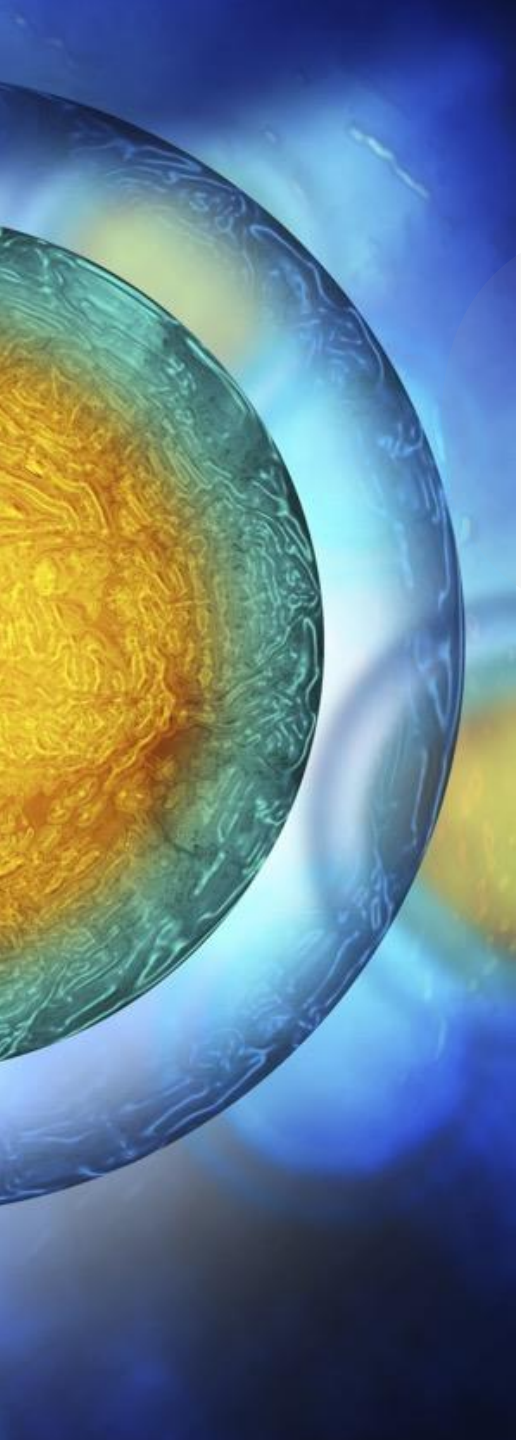


Take Away

- The initial recommendation for universal secondary prophylaxis was not robust, and new evidence suggest it may paradoxically increase recurrence due to resistance
- Until updated guidelines are available, I might have to collaborate with specialists to make individualized decisions, and look for ascitic fluid cultures to help me decide



Case Summary

Case 1

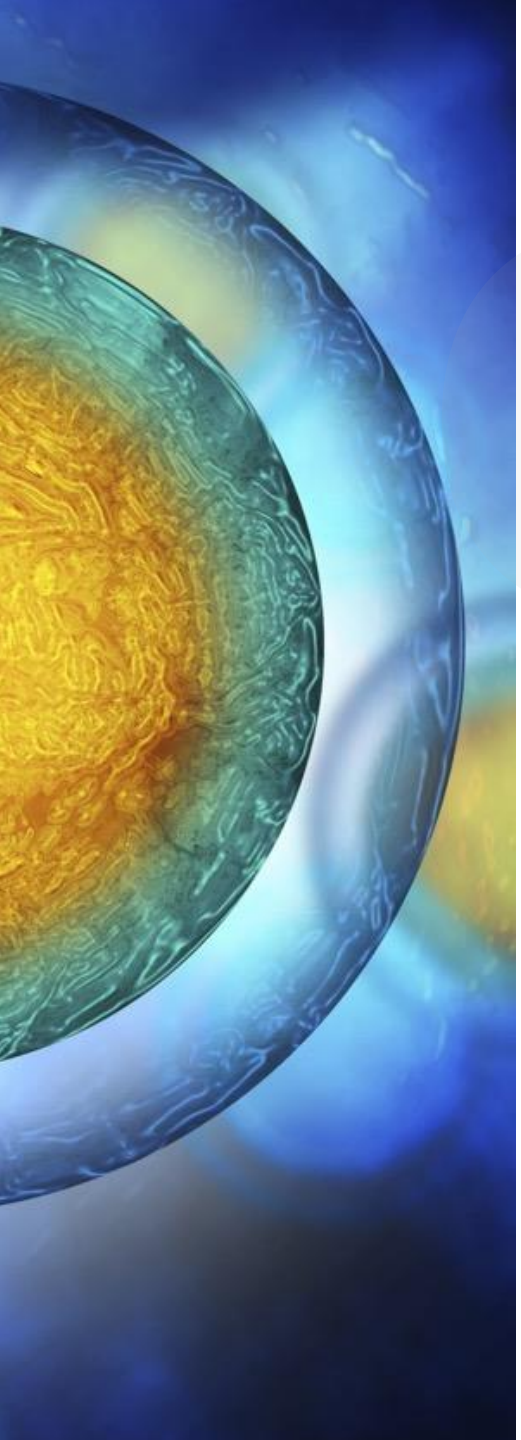
- NSTEMI in the elderly: to cath or not? Patient preference matters
- Transfusion threshold in MI: Aim higher, mitigate risk
- Urinary retention: Straight cath if asymptomatic PVR > 500

Case 2

- Hyponatremia correction: don't go too slow?
- Sepsis EHR alert: may be useful
- Hypothermia in sepsis: be wary
- VTE in cancer: lower dose apixaban noninferior

Case 3

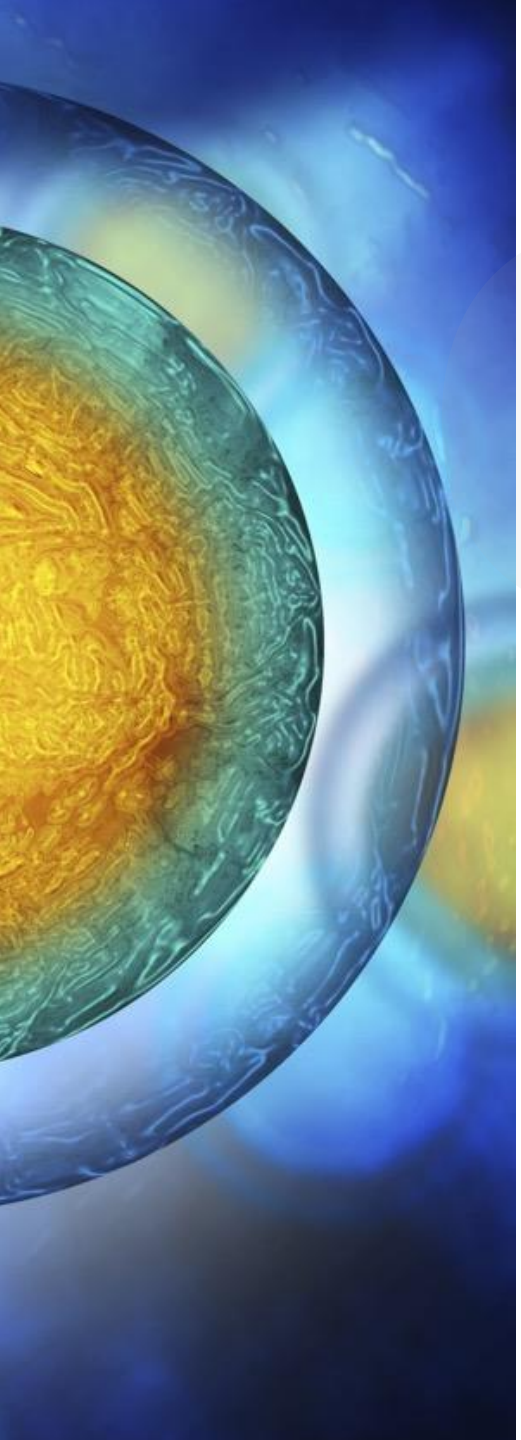
- Alcoholic hepatitis: consider steroid taper
- Cirrhosis with ascites: don't delay paracentesis
- SBP secondary prophylaxis: more harm than good?



Objectives

- **By the end of the session…**
  - **Identify 3 key decisions with interventions** in hospitalized patients where new evidence may change practice
  - **Suggest 2 possible medications adjustment** for hospitalized patients that may be justified by new evidence
  - **Recognize 1 strategy to support early recognition of morbidity** in hospitalized patients based on new evidence

Pair & Share



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