Updates in Hospital Medicine 2025

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Disclosures

- No financial disclosures

Objectives

- Identify, interpret and apply recently published literature and evidence into clinical practice to provide management for specific conditions in hospitalized patients.

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Room Number	Principal Problem	Level of Care
512	Unilateral weakness	Acute
514	Acute cholecystitis	Acute
515	Hypoxic respiratory failure	Progressive
517	Community acquired pneumonia	Acute
525	Alcoholic hepatitis	Progressive
531	UTI	Acute
540	Cellulitis	Acute
541	Atrial fibrillation	Tele

35 yo F admitted for evaluation of a suspected demyelinating disorder. She is scheduled for a lumbar puncture today with interventional radiology for CSF analysis.

You review her labs and note her platelet count is 40k and wonder if you should transfuse platelets prior to her LP…

Platelet Transfusion

2025 AABB and ICTMG International Clinical Practice Guidelines

- Meta-analysis of randomized trials and observational studies

- Compared restrictive versus liberal platelet transfusion

- What is the impact of a restrictive vs liberal strategy on mortality and bleeding?

- Restrictive platelet transfusion strategies probably did not result in increased in mortality or bleeding

Hypoproliferative	<10,000 µL if receiving chemo
Consumptive critical illness	<10,000 µL
CVC LP Interventional radiology	<10,000 µL <20,000 µL <20,000 µL for low risk <50,000 µL for high risk
Major non-spinal surgery	<50,000 µL
Intracranial hemorrhage	No transfusion if >100,000 µL

35 yo F admitted for evaluation of a suspected demyelinating disorder. She is scheduled for a lumbar puncture today with interventional radiology for CSF analysis.

You review her labs and note her platelet count is 40k and do not transfuse platelets prior to her lumbar puncture.

- Restrictive platelet transfusion threshold is likely safe for bleeding and mortality
- Surgery, high-risk IR, low-risk IR, LP and CVC platelet transfusion threshold

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541	Atrial fibrillation	Tele

79 yo M with PMH of chronic HFrEF, T2DM, CKDIII, cirrhosis and COPD who was admitted overnight for acute cholecystitis.

You consider the patients comorbid conditions as you contemplate if you should call IR for a cholecystostomy tube or general surgery for a cholecystectomy…

Operative vs Nonoperative Treatment of Acute Cholecystitis in Older Adults with Multimorbidity

- National retrospective comparative effectiveness study

- Patients >65 admitted with principal diagnosis of acute cholecystitis with multimorbidity

- Primary outcome
  - 30 day mortality
  - 90 day mortality

- Secondary outcome
  - 30 and 90 day readmission rate
  - 30 and 90 day ED revisit rate
  - Index admission, 30, 90 and 180 day cost

Operative

- Laparoscopic cholecystectomy (89%)
- Open cholecystectomy (11%)

Non-operative

- Percutaneous cholecystostomy tube (32%)

JAMA Surgery

A Nationwide Observational Study of Acute Cholecystitis in Older Adults with Multimorbidity

POPULATION

Older (age>65.5 years), **multimorbid** patients hospitalized emergently with **acute cholecystitis**

2016-2018

EXPOSURE

vs.

Operative | Non-operative

PRIMARY OUTCOME

30- and 90-day mortality
Secondary: 30- and 90-day readmissions and ED revisit

ANALYSIS

Inverse Propensity Score Weighting

Average treatment effect on the treated (**ATT**):

he effect of operative treatment on **all patients**

Instrumental Variable Analysis

Local average treatment effect (**LATE**):

the effect of operative treatment on **patients in clinical equipoise**

FINDINGS

Inverse Propensity Score Weighting

- 30-day mortality in the operative group
- 90-day mortality in the operative group
- 30- and 90-day readmissions and ED revisit in the operative group

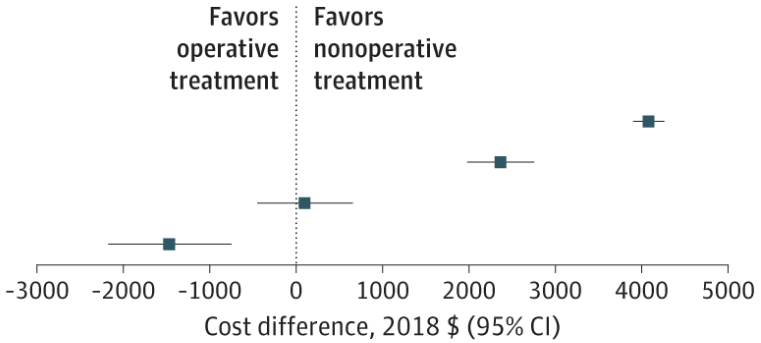
Instrumental Variable Analysis

No mortality differences between treatment groups

- 30- and 90-day readmissions and ED revisit in the operative group

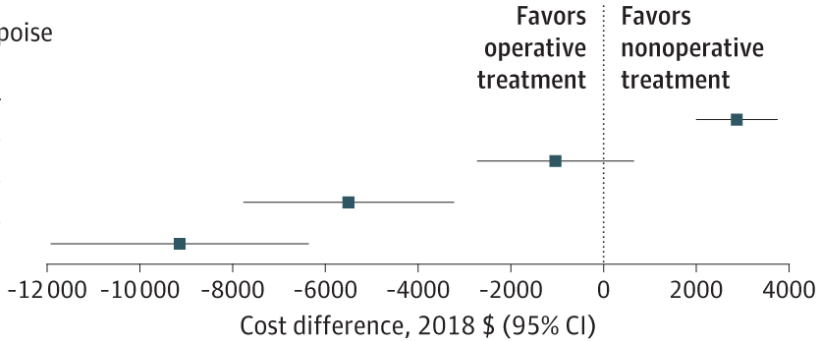
A Average treatment effect on all patients

Time point	Cost difference, 2018 $ (95% CI)
Index admission	4083.49 (1903.83 to 4263.14)
30 d	2371.20 (1985.88 to 2756.51)
90 d	106.07 (-448.58 to 660.71)
180 d	-1459.94 (-2177.42 to -742.45)



B Local average treatment effect for patients in equipoise

Time point	Cost difference, 2018 $ (95% CI)
Index admission	2870.84 (2000.78 to 3740.90)
30 d	-1041.45 (-2734.15 to 651.24)
90 d	-5495.39 (-7764.16 to -3226.61)
180 d	-9134.67 (-11917.07 to -6352.26)



79 yo M with PMH of chronic HFrEF, T2DM, CKDIII, cirrhosis and COPD who was admitted overnight for acute cholecystitis.

You discuss age, frailty and co-morbid conditions with the patient and surgeon and cholecystectomy during index admission is offered.

- Consider cholecystectomy during hospitalization, regardless of age/co-morbidities.
- Multidisciplinary discussion for patients “too sick” for surgery

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72 yo F who presented with a witnessed aspiration event and aspiration pneumonitis. She is persistently hypoxic despite increasing her supplemental oxygen to 6L NC.

You discuss with the patient and her daughter at bedside next steps in oxygen management with high flow nasal cannula. Her daughter asks if that will reduce the likelihood she will require intubation.

High-Flow Nasal Oxygen vs Noninvasive Ventilation in Patients with Acute Respiratory Failure: The RENOVATE Trial

- Multicenter, adaptive, randomized, noninferiority trial

- Rate of endotracheal intubation or death at 7 days

Hypoxia + respiratory effort or tachypnea

- Non-immunocompromised with hypoxia
- Immunocompromised with hypoxia
- COPD exacerbation with respiratory acidosis
- Acute cardiogenic pulmonary edema
- Hypoxemic COVID19

- 45 L/min & 50% FiO2
- 30 L/min & 50% for COPD

- 12-14/8
- 12-16/4 for COPD

88-92% AECOPD
92-98% for all others

ARF subgroup (*n* analyzed)	Event rates		Model-fitted median OR (95% CrI)
	HFNO	NIV	
Hypoxemic COVID-19 (882)	51%	47%	1.13 (0.94 to 1.38)
Nonimmunocompromised with hypoxemia (485)	32.5%	33.1%	1.02 (0.81 to 1.26)
Acute cardiogenic pulmonary edema (272)	10%	21%	0.97 (0.73 to 1.23)
COPD exacerbation with respiratory acidosis (77)	29%	26%	1.05 (0.79 to 1.36)
Immunocompromised with hypoxemia (50)‖	57%	36%	1.07 (0.81 to 1.39)
Serious adverse events occurred in 9.4% of patients in the HFNO group and 9.9% in the NIV group.			

72 yo F who presented with a witnessed aspiration event and aspiration pneumonitis. She is persistently hypoxic despite increasing her supplemental oxygen to 6L NC.

You discuss with the patient and her daughter at bedside next steps in oxygen management with high flow nasal cannula which is non-inferior to NIV to avoid intubation.

- Comfort and tolerability with HFNC
- HFNC in non-inferior to NIV for some groups of patients
- Consider NIV for AECOPD

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64 yo F with PMH of COPD was admitted overnight with acute hypoxic respiratory failure and sepsis with a right middle lobe infiltrate consistent with CAP. She is uncomfortable appearing in mild respiratory distress on supplemental oxygen, Ceftriaxone and Azithromycin.

You remember an Updates in Hospital Medicine 2024 talk about steroids for severe CAP… but can't remember how severe was defined…

Predicting Benefit from Adjuvant Therapy with Corticosteroids in CAP: A Data-Driven Analysis of Randomized Trials

- Individual patient data meta-analysis

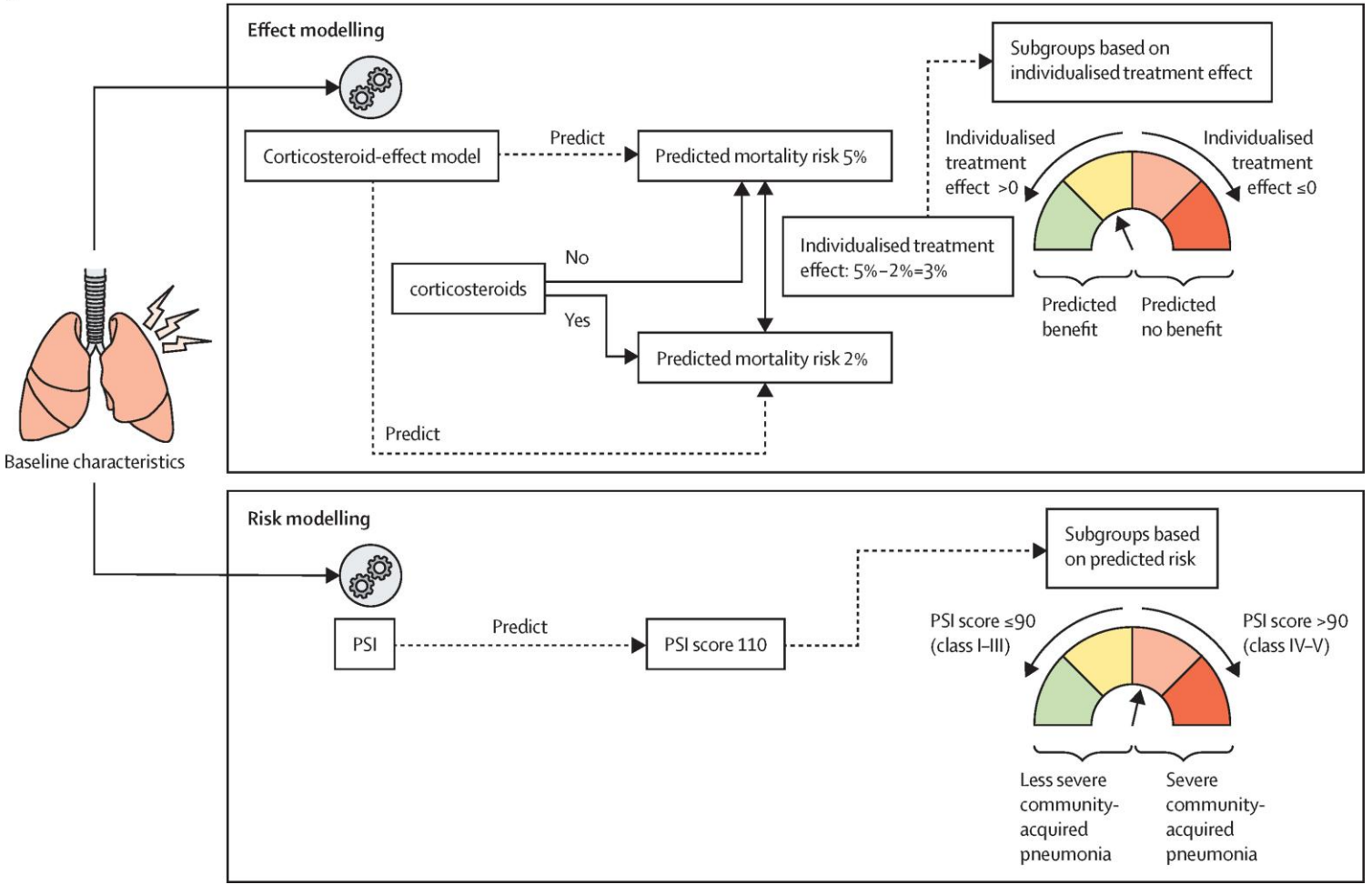
- Corticosteroids versus placebo in patients hospitalized with CAP

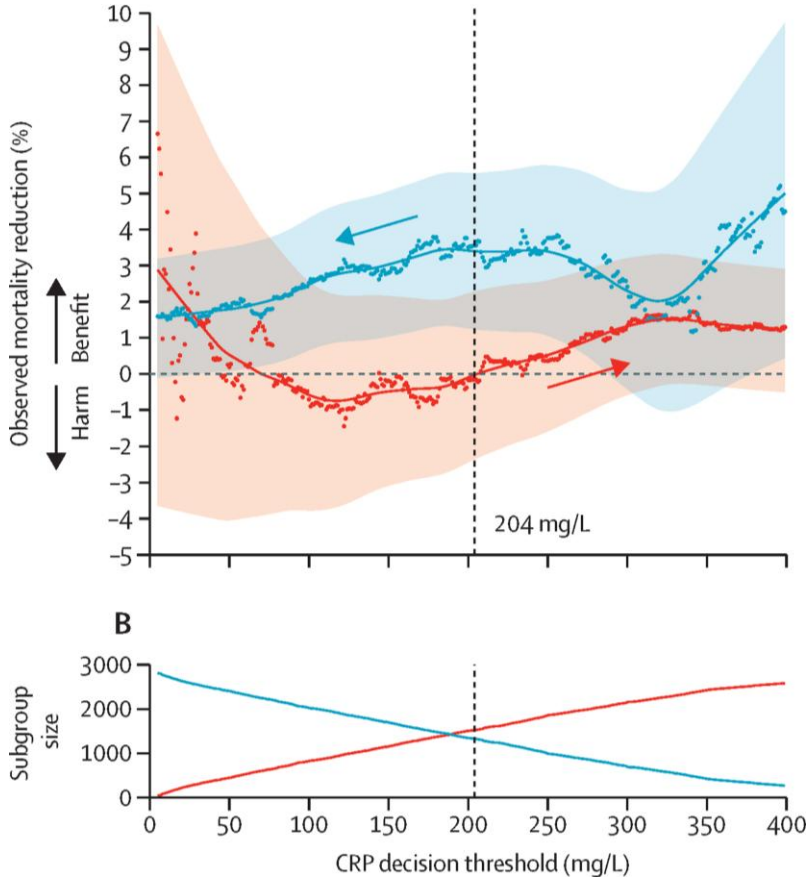
- Primary outcome

  30 day all cause mortality

- Analyzed heterogeneity of treatment effect using risk and effect modelling

B


Effect modelling
Subgroups based on individualised treatment effect
Corticosteroid-effect model
Predict
Predicted mortality risk 5%
Individualised treatment effect >0
Individualised treatment effect ≤0
corticosteroids
No
Yes
Individualised treatment effect: 5%−2%=3%
Predicted benefit
Predicted no benefit
Predicted mortality risk 2%
Predict
Baseline characteristics
Risk modelling
Subgroups based on predicted risk
PSI
Predict
PSI score 110
PSI score ≤90 (class I–III)
PSI score >90 (class IV–V)
Less severe community-acquired pneumonia
Severe community-acquired pneumonia



Patients with CRP >204mg/L corticosteroids lowered 30-day mortality compared to placebo

(6% vs 13%) NNT of 14

Patients with CRP <204 mg/L gained no survival benefit

Severe community-acquired bacterial pneumonia	Hydrocortisone 200 mg IV once, then 10 mg/hr IV infusion for 7 d
	Hydrocortisone 200 mg IV daily (for 4 or 8 d) then taper (for a total duration of 8 or 14 d)
	Methylprednisolone 0.5 mg/kg IV every 12 hr for 7 d
	Methylprednisolone 40 mg IV bolus, then • Days 1–7: 40 mg/d • Days 8–14: 20 mg/d • Days 15–17: 12 mg/d • Days 18–20: 4 mg/d

Guidelines on Use of Corticosteroids in Sepsis, Acute Respiratory Distress Syndrome, and Community-Acquired Pneumonia. Critical Care Medicine

64 yo F with PMH of COPD was admitted overnight with acute hypoxic respiratory failure and sepsis with a right middle lobe infiltrate consistent with CAP. She is uncomfortable appearing in mild respiratory distress on supplemental oxygen, Ceftriaxone and Azithromycin.

You add on a CRP which results at 250 mg/L and give 200mg IV Hydrocortisone.

- Steroids are recommended for patients with severe CAP
- Severe CAP is not well defined
- CRP >204 suggest severe infection

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36 yo M who presented with acute alcoholic hepatitis. His infectious workup is negative to date and his Maddrey Discriminant Function was calculated at 42.

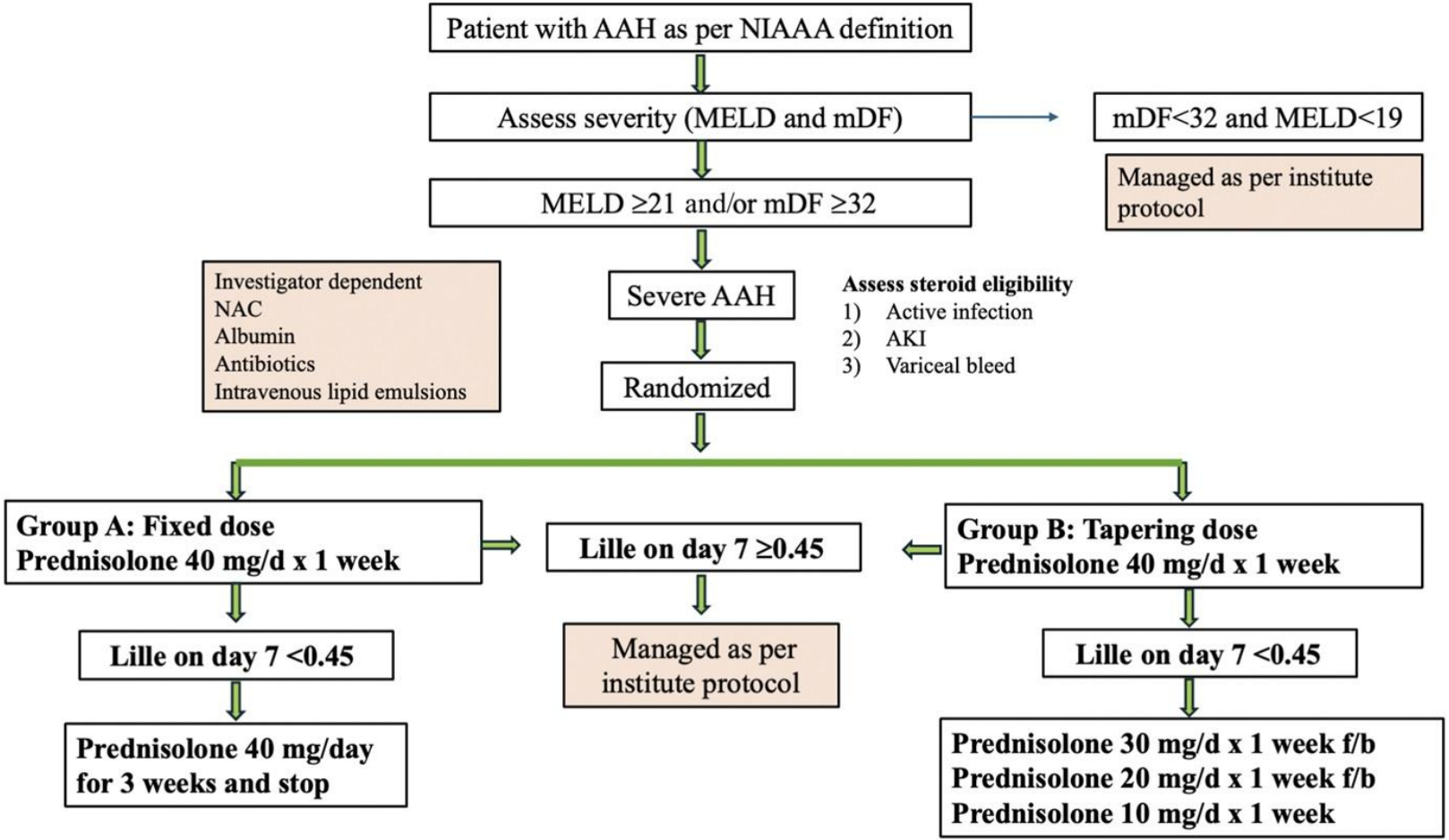
You decide this patient would benefit from Prednisolone therapy and wonder what the infectious risk is from this prolonged steroid therapy.

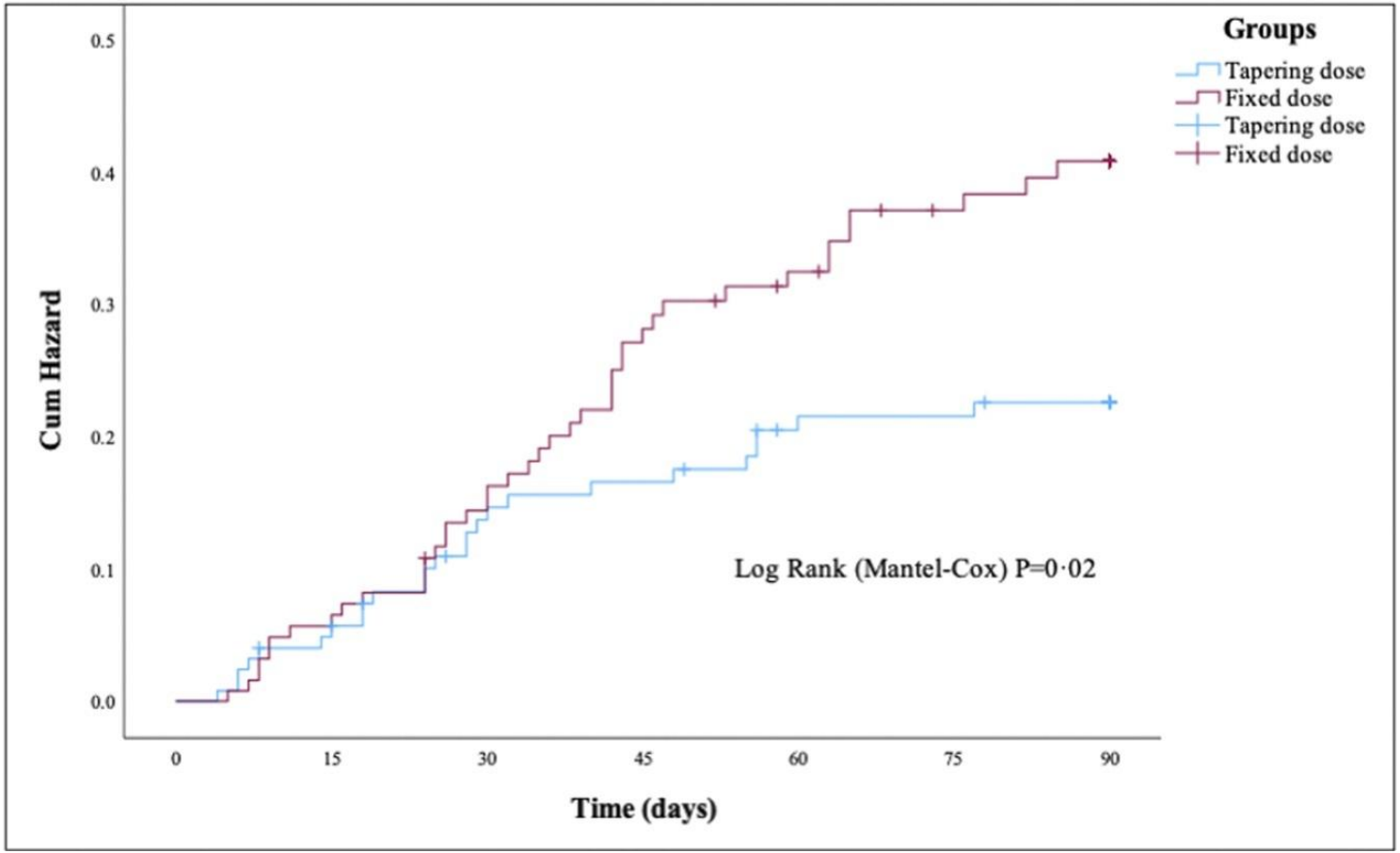
Infections in Standard or Tapered Dose of Prednisolone for Alcohol-Associated Hepatitis: A Randomized Trial (STASH Trial)

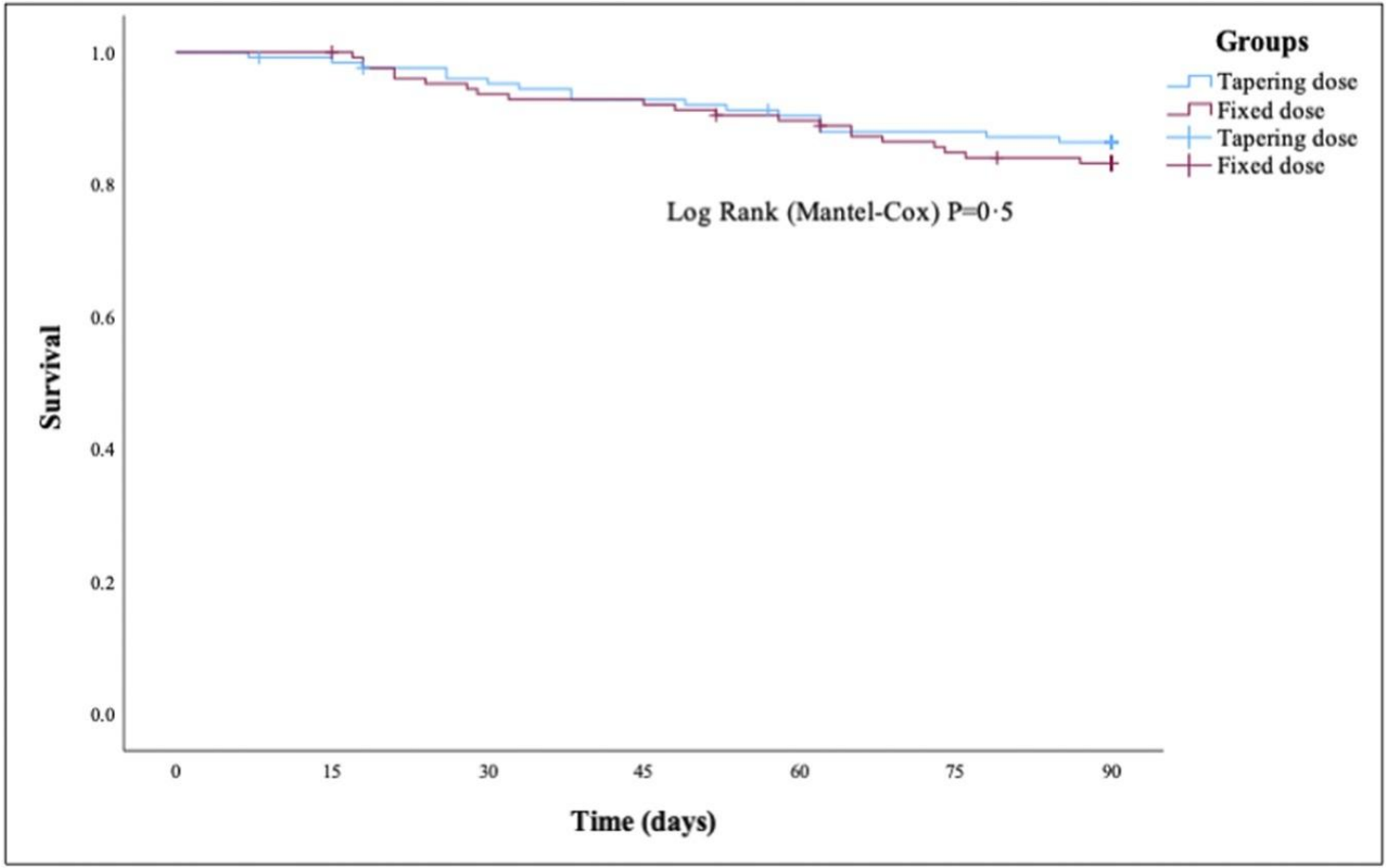
- Multicenter, randomized clinical trial

- Patients with severe alcohol associated hepatitis (MD >32 or MELD >21)

- Primary outcome
  - Infection at 28 days
  - Infection at 90 days
- Secondary outcome
  - Mortality at 90 days
  - Severity of liver disease
  - AKI
  - Hospitalization


Patient with AAH as per NIAAA definition
Assess severity (MELD and mDF)
mDF<32 and MELD<19
Managed as per institute protocol
MELD ≥21 and/or mDF ≥32
Investigator dependent
NAC
Albumin
Antibiotics
Intravenous lipid emulsions
Severe AAH
Assess steroid eligibility
1) Active infection
2) AKI
3) Variceal bleed
Randomized
Group A: Fixed dose
Prednisolone 40 mg/d x 1 week
Lille on day 7 ≥0.45
Group B: Tapering dose
Prednisolone 40 mg/d x 1 week
Lille on day 7 <0.45
Managed as per institute protocol
Lille on day 7 <0.45
Prednisolone 40 mg/day for 3 weeks and stop
Prednisolone 30 mg/d x 1 week f/b
Prednisolone 20 mg/d x 1 week f/b
Prednisolone 10 mg/d x 1 week


Groups
Tapering dose
Fixed dose
Tapering dose
Fixed dose
Cum Hazard
0.5
0.4
0.3
0.2
0.1
0.0
0
15
30
45
60
75
90
Time (days)
Log Rank (Mantel-Cox) P=0·02


Groups
Tapering dose
Fixed dose
Tapering dose
Fixed dose
Log Rank (Mantel-Cox) P=0·5
Survival
1.0
0.8
0.6
0.4
0.2
0.0
0
15
30
45
60
75
90
Time (days)

Infections in Standard or Tapered Dose of Prednisolone for Alcohol-Associated Hepatitis (AAH): A Randomized Trial (STASH Trial)

Five centers
254 patients
Age: 41.1 yrs
MELD: 25.6

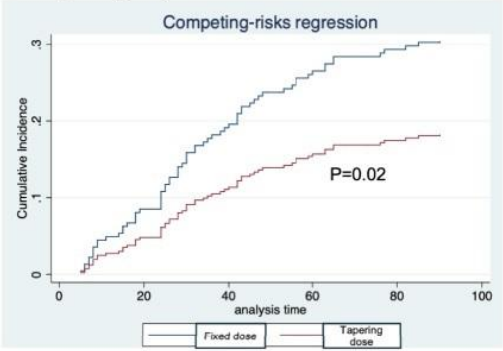
Fixed dose

Prednisolone
40 mg x 4 w
N=127

Tapered dose

Prednisolone
40 mg x 1 w
f/b tapering by
10 mg q1w

Tapering of prednisolone over 4 weeks



Infection at day 90

Proven infections at day 28 and 90
Adverse events

No impact on steroid response, AKI or mortality
Similar proportion achieved MELD<17 and <21

Conclusion

In patients with severe AAH, a tapered prednisolone regimen decreases infection risk without compromising efficacy.

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

AJG The American Journal of GASTROENTEROLOGY
OFFICIAL JOURNAL OF THE AMERICAN COLLEGE OF GASTROENTEROLOGY | ACG

36 yo M who presented with acute alcoholic hepatitis. His infectious workup is negative to date and his Maddrey Discriminant Function was calculated at 42.

You decide this patient would benefit from Prednisolone therapy and prescribe a tapered dose to reduce his risk of infection.

- Prednisolone is indicated for treatment of severe alcoholic hepatitis
- Tapered dosing 40mg decreased by 10mg/week is efficacious and reduces risk of infection

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540	Cellulitis	Acute
541	Atrial fibrillation	Tele

62 yo F who presented with e. coli bacteremia secondary to pyelonephritis. She has been clinically stable on IV Ceftriaxone for the last 3 days.

You walk into her room on rounds and she informs you her grandbaby's birthday party is this weekend and asks if there is any way she can be discharged to attend.

Antibiotic Treatment for 7 versus 14 Days in Patients with Bloodstream Infections (BALANCE trial)

- Multi-center, open-label, randomized, controlled, noninferiority trial

- Hospitalized patients with pathologic bacteremia

- Primary outcome

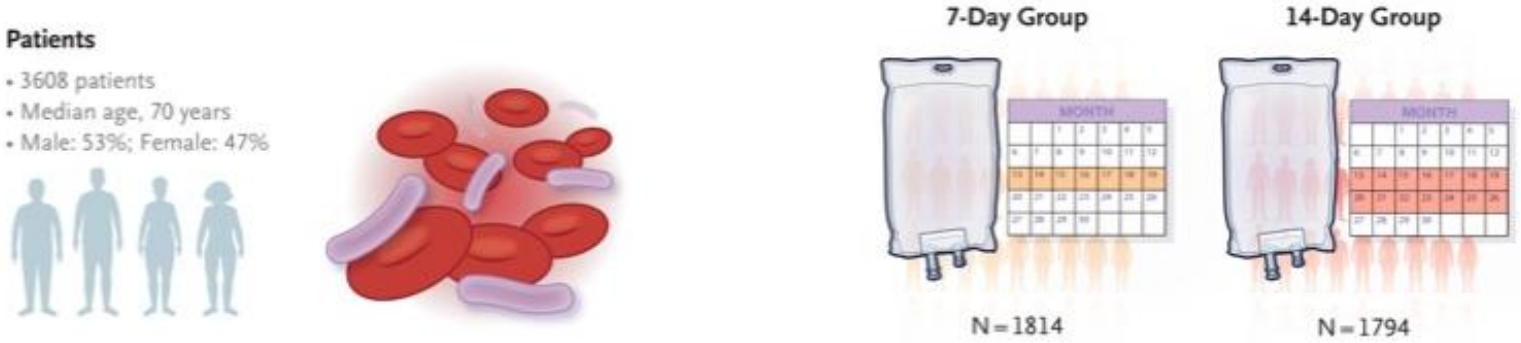
  All cause mortality at 90 days

- Secondary outcome

  In hospital and in ICU mortality

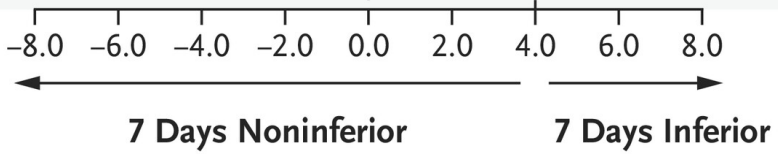
  Relapse of bacteremia with original organism

  Allergy, adverse event, cdiff, MDRO secondary infection



- Community-onset (75%)
- UTI (42%), intra-abdominal (18%), lung (13%)
- GN (71%), GP (17%), polymicrobial (11%)

Analysis	7 Days	14 Days	Risk Difference (95% CI)
	no. of events/total no.		*percentage points*
Intention-to-treat	261/1802	286/1779	−1.6 (−4.0 to 0.8)
Per-protocol	178/1370	222/1483	−2.0 (−4.5 to 0.6)
Modified intention-to-treat	247/1788	272/1765	−1.6 (−3.9 to 0.7)



- Slightly higher rate of relapse in 7 day group (47 vs 39 patients)
- Otherwise no difference in secondary outcomes of antimicrobial-related adverse outcomes, c diff infection, MDRO infection/colonization

62 yo F who presented with e. coli bacteremia secondary to pyelonephritis. She has been clinically stable on IV Ceftriaxone for the last 3 days.

You assure her that after completion of 7 days of ABX she will complete treatment for her infection and can be discharged to attend her grandbabys birthday party.

- 7 days of IV ABX is non-inferior to 14 for uncomplicated bacteremia excluding:
  - Immunocompromised patients, prosthetic valves, grafts, and prolonged tx
  - Staph aureus and lugdunensis

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You return to the hospitalist workroom for a coffee break and a junior colleague asks to debrief about a code blue on one of their patients this morning. They tell you about the patient, the event and their struggle to determine when to stop resuscitation efforts.

You debrief and help them process but wonder if there are any validated clinical decision guides for termination of resuscitation.

Termination of Resuscitation Rule for In-Hospital Cardiac Arrest

- Prognostic study

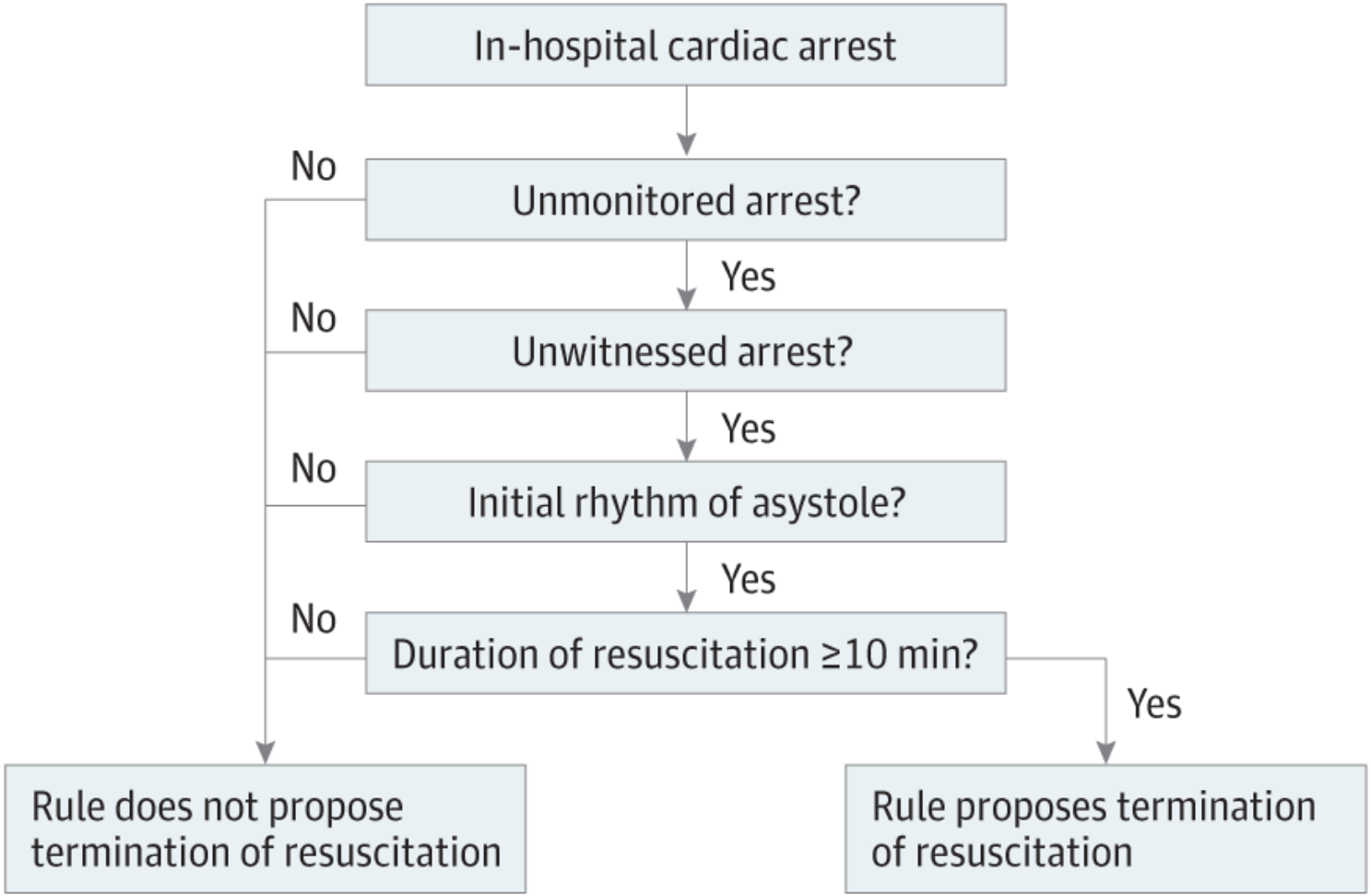
- Developed and validated using six metrics computed for all possible variable combinations

- Primary outcomes
  - Mortality at 30 days
- Secondary outcomes
  - No return of spontaneous circulation
  - Poor neurological status at hospital d/c
  - Mortality at 1 year

- Patient age
- Location of arrest (ICU or non-ICU)
- Monitored status
- Witnessed status
- Initial rhythm
- Duration of resuscitation

- Combinations of variables with
  - <1% false positive rate
  - >10% positive rate

- Ran precision samples by bootstrapping 100,000 random samples


In-hospital cardiac arrest
No
Unmonitored arrest?
Yes
No
Unwitnessed arrest?
Yes
No
Initial rhythm of asystole?
Yes
No
Duration of resuscitation ≥10 min?
Yes
Rule does not propose termination of resuscitation
Rule proposes termination of resuscitation

You return to the hospitalist workroom for a coffee break and a junior colleague asks to debrief about a code blue on one of their patients this morning. They tell you about the patient, the event and their struggle to determine when to stop resuscitation efforts.

You debrief and help them process – acknowledging the totality of the patients clinical picture and provide a basis for communication using shared decision making.

- Individualized decision to terminate resuscitation in cardiac arrest
- Propose termination for unmonitored, unwitnessed, asystole for >10 minutes

You decide to lighten the mood in the workroom and ask your colleagues for their thoughts on a complex case that you have. The room seems stumped by your management dilemma.

A wise cracking colleague tells you that you should ask ChatGPT and you wonder… is it capable of clinical decision making?

GPT-4 Assistance for Improvement of Physician Performance on Patient Care Tasks: A Randomized Controlled Trial

- Prospective, randomized, controlled trial

- Large language model impact on management reasoning balancing treatment decisions and testing strategies while managing risk

- Five de-identified and developed clinical vignettes

  Conventional resources alone or

  Conventional resources plus GPT-4

- Primary outcome

  Difference in total score between groups utilizing expert developed scoring rubric

If the decision was made to start the patient on therapeutic anticoagulation on hospital day #4 (i.e. immediately after the asymptomatic, 2 hour long episode of a-fib), what would be the best choice for anticoagulation?

This question has a total of 3 points.

Apixaban, rivaroxaban, edoxaban, dabigatran, therapeutic enoxaparin	3 points
Unfractionated heparin gtt	1 point

QUESTION 4:

This question has a total of 7 points.

The patient is about to be discharged. Would you discharge her with an ambulatory ECG monitor?

Yes	1 point

If so, what type of monitor would you choose?

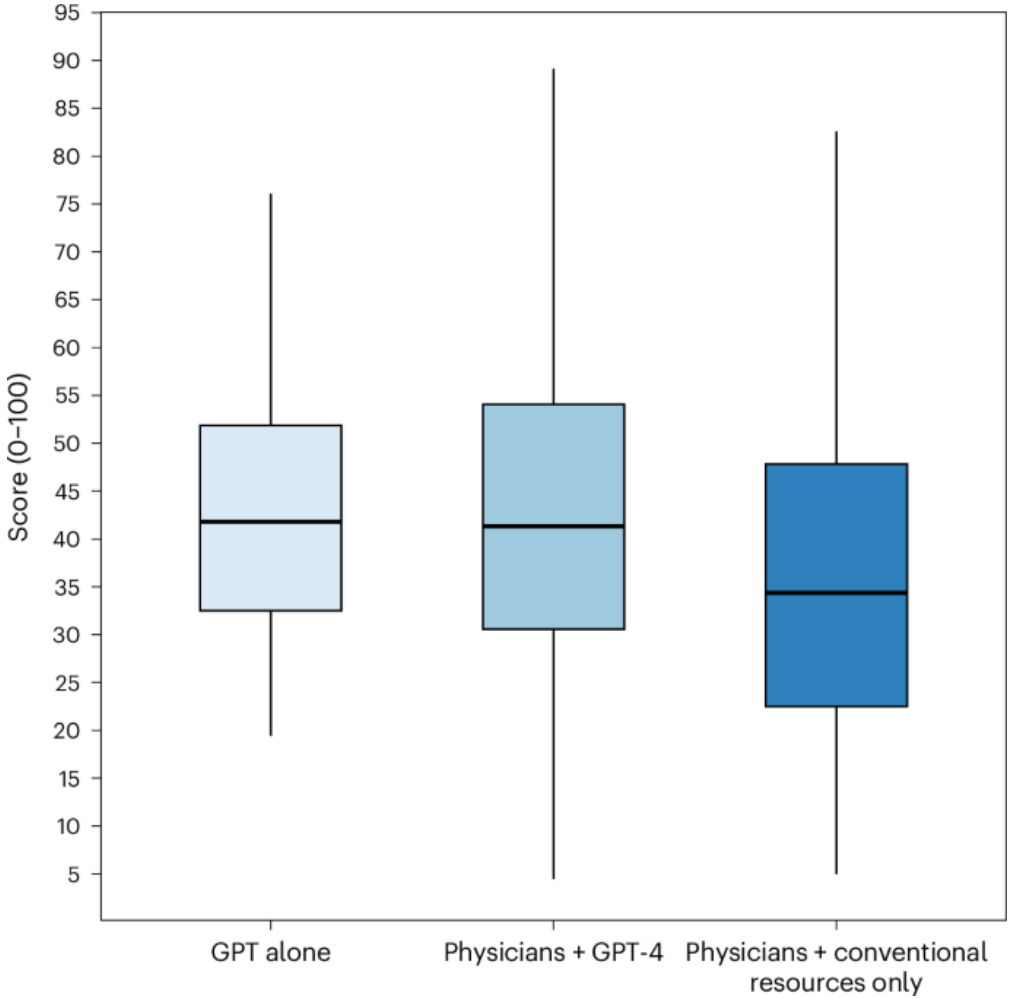
Holter and/or Ziopatch (i.e. "14 day Holter")	1 point

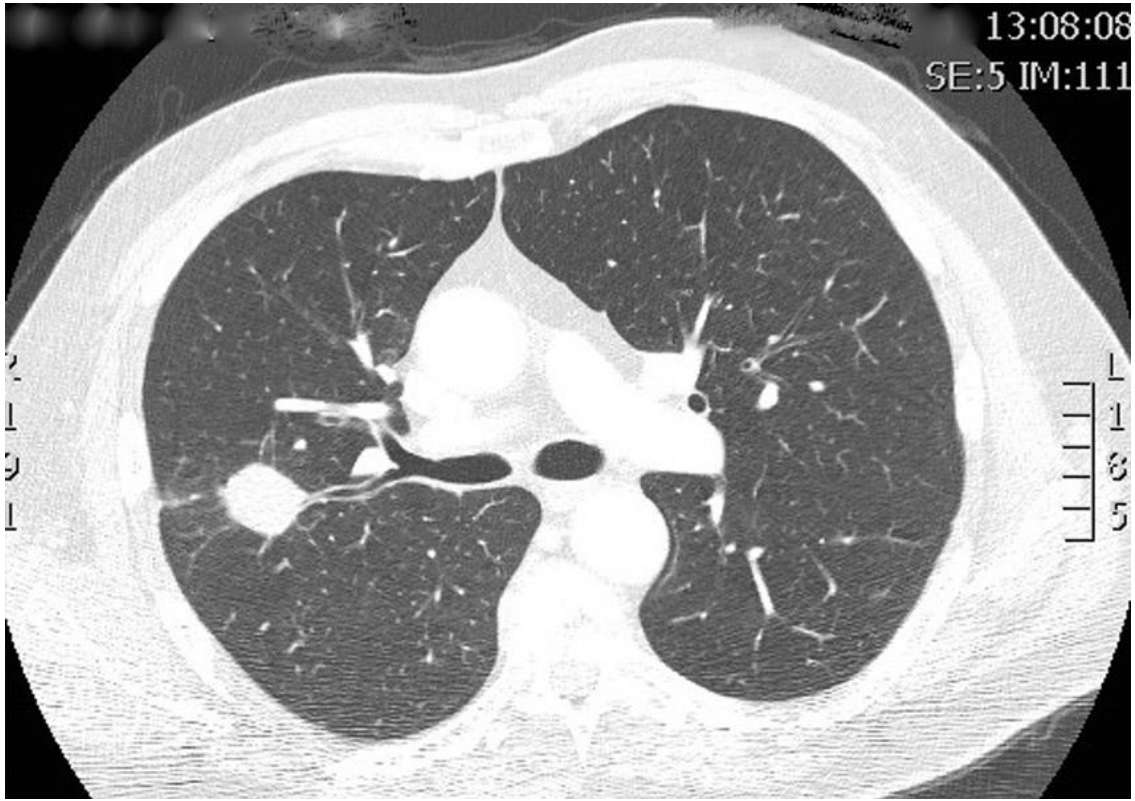
What factors should be considered in the choice of monitor for this patient?

Inclusion of up to 2 of the following: • Cost of monitor • Ease of insurance approval • Duration of monitoring period • Likelihood of the patient experiencing a lethal arrhythmia	2 points max (1 point each)

What would you do with the information from the monitor?

Determine anticoagulation plan (i.e. whether or not the patient requires anticoagulation, or the duration of anticoagulation)	1 point
Inclusion of up to 2 of the following: • Determine if the patient requires rate control	2 points max (1 point each)


Score (0–100)
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
GPT alone
Physicians + GPT-4
Physicians + conventional resources only



Lung nodule -> biopsy

Inpatient
Outpatient
PET
Serial imaging

You decide to lighten the mood in the workroom and ask your colleagues for their thoughts on a complex case that you have. The room seems stumped by your management dilemma.

You run the case through GPT-4, OpenEvidence and UptoDate, confer with your colleagues and choose the next best step in management.

- LLM might be a useful tool for clinical decision making
- Diagnostic reasoning – often a “next best step” or “appropriate test”
- Management reasoning requires context-dependent concepts

Room	Principal Problem	
512	Unilateral weakness	Transfuse <50 surgery/IR, <20 IR/LP
514	Acute cholecystitis	Consider CCY in multimorbid pts
515	Hypoxic respiratory failure	HFNC non-inferior to NIV for most
517	Community acquired pneumonia	CRP to stratify severity in CAP
525	Alcoholic hepatitis	Taper Prednisolone to reduce infxn
531	UTI	7 days of ABX
540	Cellulitis	Unwitnessed/monitored asystole >10 minutes
541	Atrial fibrillation	LLM management adjunct

University of Kentucky