LAST YEAR IN HOSPITAL MEDICINE

Utah ACP Hospital Medicine Newsflash

Stephen Jenkins, MD

May 6, 2022

LAST WEEK IN MEDICINE

True or False

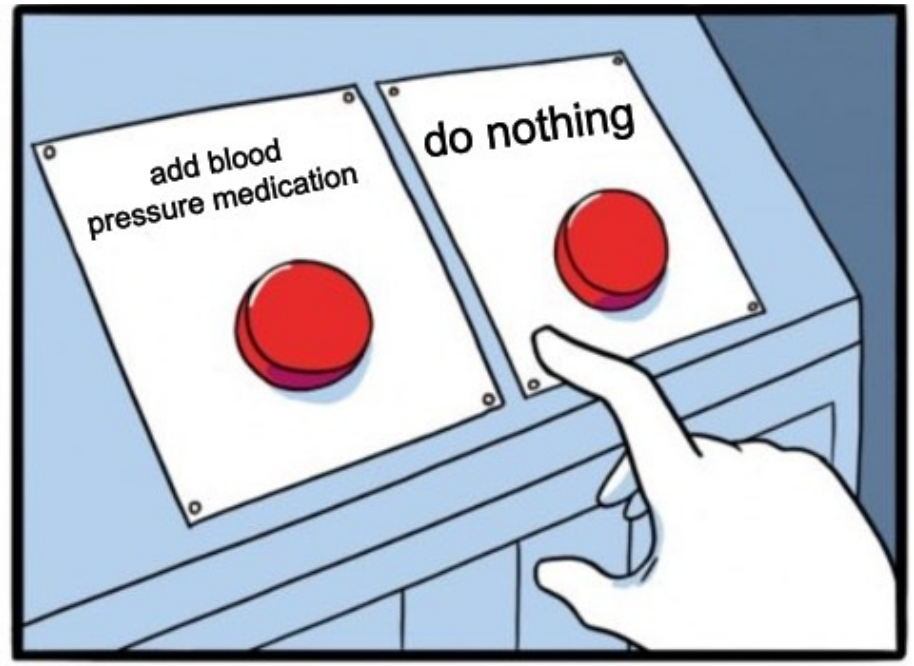
Intensification of blood pressure medications in patients hospitalized for non-cardiac diagnoses with elevated blood pressure is associated with improved BP control during the following year.

FALSE

Treatment and Outcomes of Inpatient Hypertension Among Adults With Noncardiac Admissions

- Retrospective study of 23,000 patients hospitalized for non-cardiac diagnoses
- 18,000 patients had at least one hypertensive systolic BP (>140) during hospitalization; 5900 received treatment
  - 66% treated with oral medication; 34% with IV medication
- In a propensity-matched analysis, treated patients had higher rates of acute kidney and myocardial injury
- 9% of patients were discharged with intensified regimens
  - 28% of those who also received antihypertensive medications in the hospital
- Intensification was NOT associated with improved BP control during the following year

JAMA Intern Med. 2021;181(3):345-352


add blood
pressure medication
do nothing


JAKE-CLARK.TUMBLR

Among patients with COPD admitted to the hospital with acute worsening of respiratory symptoms, what percentage were diagnosed with a pulmonary embolism?

A. 1.5%
B. 3.2%
C. 5.9%
D. 11.1%
E. 16.7%

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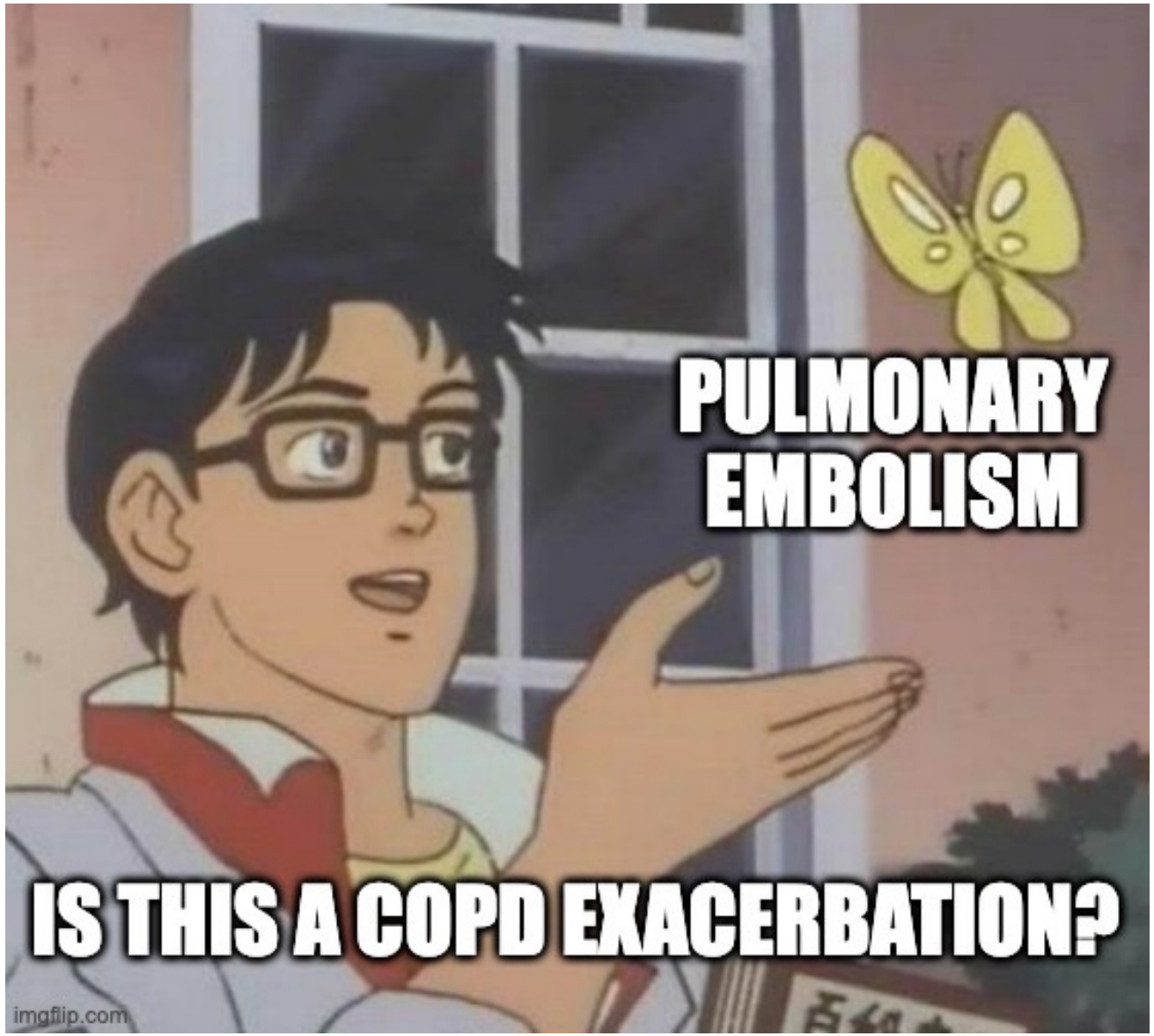
Prevalence of Pulmonary Embolism Among Patients With COPD Hospitalized With Acutely Worsening Respiratory Symptoms

- Cross-sectional study of 740 patients with COPD admitted for worsening respiratory symptoms
- All patients were assessed with revised Geneva score for probability of acute pulmonary embolism
  - High probability patients (2.3%) got CTPA
  - Low and intermediate probability patients got D-dimer
    - Negative D-dimer was considered ruled out (29%)
    - Positive D-dimer (> 500 ng/mL) got CTPA or V/Q (67.6%)
- 5.9% of patients were diagnosed with PE (44 out of 740 patients)
  - Among patients suspected of having a PE (clinician gestalt), 10% were positive
  - Among patients not suspected of having a PE, 3.9% were positive
- Patients with VTE had a higher mortality rate (25.9% vs 5.2%)
  - Higher rates of cancer

JAMA. 2021;325(1):59–68. doi:10.1001/jama.2020.23567


PULMONARY EMBOLISM
IS THIS A COPD EXACERBATION?
imgflip.com

True or False

Terlipressin was associated with a higher rate of hepatorenal syndrome reversal compared to placebo, with improved 90-day mortality.

FALSE

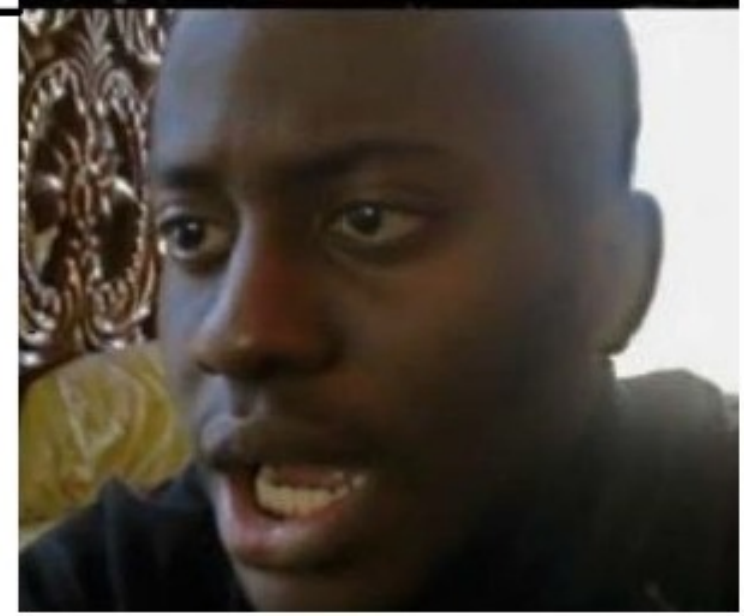
Terlipressin plus Albumin for the Treatment of Type 1 Hepatorenal Syndrome (CONFIRM Trial)

- Randomized, double-blind, placebo-controlled trial of 300 patients with type 1 HRS
  - Cirrhosis, ascites and rapidly progressive kidney failure, with a doubling of creatinine to at least 2.25
- Primary outcome was reversal of HRS
- 32% of patients on terlipressin had reversal of HRS compared to 17% who got placebo (p=0.006)
  - **No difference in 90-day mortality** (51% in terlipressin vs 45% in placebo)
  - Patients in terlipressin group were more likely to die from respiratory failure (11% vs 2%)

N Engl J Med 2021; 384:818-828

terlipressin reverses hepatorenal syndrome

no difference in 90-day mortality



True or False

Targeting an albumin level of 3.5 g/dL with infusions of IV albumin in patients with decompensated cirrhosis reduces infection, acute kidney injury and death.

FALSE

A Randomized Trial of Albumin Infusions in Hospitalized Patients with Cirrhosis (ATTIRE Trial)

- Randomized, open-label trial of 777 patients hospitalized with decompensated cirrhosis with an albumin < 3 g/dL
- Patients were randomized to daily 20% albumin infusion with a target of 3.5 g/dL or usual care
  - Patients in treatment arm got a median of 200 g of albumin vs 20 g in the usual care arm
- Primary outcome was composite of infection, kidney dysfunction or death at 15 days
  - No difference in the primary outcome between groups
- More severe or life-threatening adverse events in the albumin arm, especially pulmonary edema or fluid overload (23 vs 8 events)

N Engl J Med 2021; 384:808-817

GOMERBLOG.COM

With First Date Going Badly, ICU Fellow Tries Albumin I

True or False

Among patients admitted to the hospital with community-acquired pneumonia who met clinical stability criteria, discontinuing beta-lactam treatment after 3 days was non-inferior to 8 days of treatment.

TRUE

Discontinuing β-lactam treatment after 3 days for patients with community-acquired pneumonia in non-critical care wards

- Double-blind, randomized, placebo-controlled, non-inferiority trial with 310 adults admitted with community acquired pneumonia
- Patients were eligible if after 72 hours of antibiotics they met stability criteria, including temperature < 37.8, heart rate < 100, respiratory rate < 24, oxygen saturation 90% or higher, and normal mental status
- Randomized to 5 additional days of antibiotics (8 days total) vs 5 days of placebo
- Primary outcome was cure within 15 days of starting antibiotics.
  - Occurred in 77% of placebo patients vs 68% of the additional antibiotic group.
- No difference in cure at 30 days, death, LOS or adverse events
- Does not apply to “severe” pneumonia, ICU patients, patients with renal failure

Lancet 2021; 397:1195-1203

3 days of antibiotics

8 days of antibiotics

True or False

Treatment with antibiotics reduces the length of hospital stay in patients with uncomplicated diverticulitis.

FALSE

Antibiotics Do Not Reduce Length of Hospital Stay for Uncomplicated Diverticulitis (STAND Trial)

- Double-blind, randomized, non-inferiority trial of 180 patients hospitalized for uncomplicated acute diverticulitis (determined by CT)
- Patients randomized to antibiotics or placebo
- No difference in median hospital length of stay (40 hours vs 45.8 hours, p=0.2)
- No difference in adverse events, readmission within 1 week or 30 days

Clinical Gastroenterology and Hepatology 2021;19:503–510

Antibiotics for Uncomplicated Diverticulitis

- DINAMO Trial
  - Open-label noninferiority trial of 480 patients with uncomplicated diverticulitis randomized to outpatient treatment with amoxicillin/clavulanic acid or no antibiotics
  - No difference in hospitalization rates (primary outcome), return visits to the ED, or pain control. None of the patients required surgery

Ann Surg 2021 Nov; 274:e435


Bernie
I am once again asking
you to not use antibiotics
in uncomplicated diverticulitis
imgflip.com

True or False

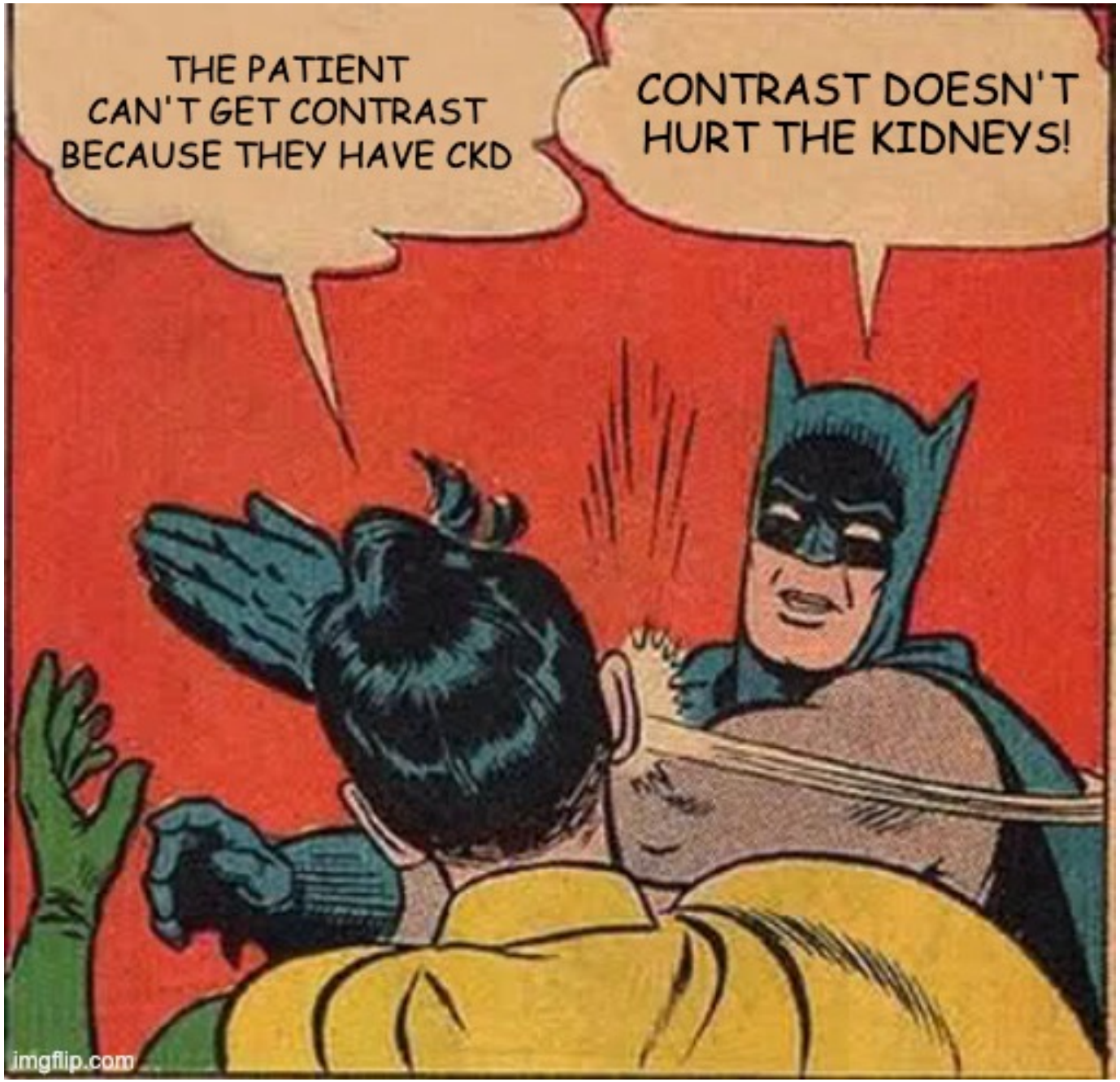
Exposure to radiocontrast dye from a CTPA is not associated with a decrease in eGFR, acute kidney injury, need for dialysis or death.

TRUE

Association of Intravenous Radiocontrast With Kidney Function: A Regression Discontinuity Analysis

- Regression discontinuity analysis of 156,000 ED patients who received D-dimer tests for suspected PE
  - Individuals on just either side of D-dimer cutoff (500 mg/dL) have similar characteristics (reduces confounding,) but one group receives contrast, and the other does not.
- Primary outcome: change in eGFR up to 6 months after the ED visit
- CTPA contrast exposure was not associated with change in eGFR, acute kidney injury, need for RRT or death

JAMA Intern Med. 2021;181(6):767–774.


THE PATIENT CAN'T GET CONTRAST BECAUSE THEY HAVE CKD
CONTRAST DOESN'T HURT THE KIDNEYS!
imgflip.com

True or False

Morning discharges (before noon) are associated with a decrease in median hospital length of stay and ED length of stay.

FALSE

Morning Discharges and Patient Length of Stay in Inpatient General Internal Medicine

- Retrospective cohort study
- 190,000 patients admitted to internal medicine service
- No association between morning discharge (before noon) and the hospital's median LOS, ED LOS, 30-day readmission rate or in-hospital mortality.
- Increasing the number of morning discharges alone is unlikely to improve patient throughput

J Hosp Med. 2021 Jun;16(6):333-338


DISCHARGE
ORDERS SIGNED AT 7 AM
PATIENT'S RIDE
CAN'T COME TILL 5 PM
imgflip.com

True or False

Among hospitalized, noncritically ill patients with COVID-19, therapeutic anticoagulation was associated with increased organ-support free days.

TRUE

Therapeutic Anticoagulation with Heparin in Noncritically Ill Patients with COVID-19

- ATTACC/ACTIV4/REMAP-CAP Trials
  - Open-label, adaptive, multi-platform RCT
  - Excluded patients at ”high risk” of bleeding
  - Therapeutic AC vs usual care in critically ill and non-critically ill
  - Primary outcome was organ-support free days
    - Days without respiratory (HFNC, MV) or cardiovascular support (pressors, inotropes)
  - No benefit in critically ill patients; trial ended early for futility

N Engl J Med 2021 Aug 26; 385:777

Therapeutic Anticoagulation with Heparin in Noncritically Ill Patients with COVID-19

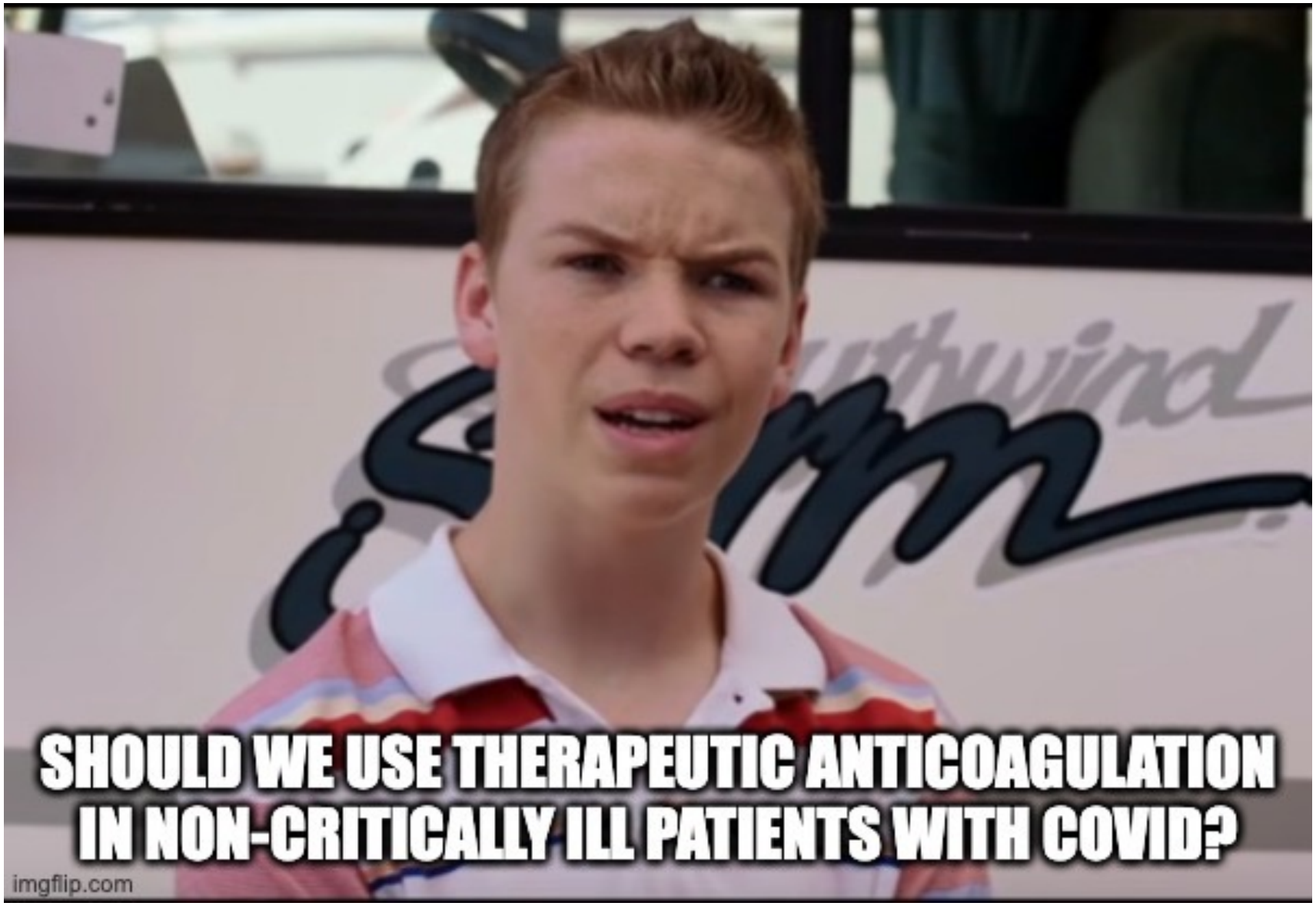
- 2219 non-critically ill patients included in analysis
- The posterior probability that therapeutic anticoagulation increased organ-support free days was 98.6%
  - 80.2% in therapeutic AC group survived until discharge without organ support vs 76.4% of usual care patients
  - Median value of organ support free days was 22 in both groups
- Similar overall survival (91.8% usual care vs 92.7% therapeutic AC, OR 1.21 with 95% credible interval of 0.87-1.68)
- Low rates of VTE (2.1% in usual care, 1.1% in therapeutic AC) and bleeding (0.9% in usual care, 1.9% in therapeutic AC)

N Engl J Med 2021 Aug 26; 385:790

Therapeutic Anticoagulation with Heparin in Noncritically Ill Patients with COVID-19

- HEP-COVID Trial
  - 257 COVID patients on oxygen with D-dimer > 4 ULN
    - 64% were on nasal cannula
    - 33% were in ICU
  - Therapeutic enoxaparin vs prophylactic
  - Screening lower extremity duplex at day 10-14
  - Primary outcome was composite of VTE, ATE and death within 30 days.
  - Outcome occurred in 41.9% of prophylactic and 28.7% of therapeutic (p=0.03), driven by reduction in VTE (29% vs 10.9%)
    - There was a reduction in symptomatic DVT in therapeutic arm (5.4% vs 15.3%)
    - No difference in rate of proximal DVT or symptomatic PE
  - No difference in deaths or major bleeding

JAMA Intern Med. 2021 Dec 1;181(12):1612-1620


SHOULD WE USE THERAPEUTIC ANTICOAGULATION
IN NON-CRITICALLY ILL PATIENTS WITH COVID?
imgflip.com

True or False

In the BaSICS trial, among critically ill patients requiring fluid resuscitation, treatment with balanced crystalloids reduced 90-day mortality compared to normal saline solution.

FALSE

Effect of Intravenous Fluid Treatment With a Balanced Solution vs 0.9% Saline Solution on Mortality in Critically Ill Patients: BaSICS Trial

- Double-blind randomized trial of 11,052 ICU patients who required fluid resuscitation
  - 48.4% were planned surgical admissions (not as sick)
  - 68% had received a fluid bolus before admission to ICU (contamination)
- Randomized to receive normal saline or Plasma-Lyte 148
  - Plasma-Lyte contains 140 mEq of sodium and 98 mEq of chloride
  - Patients received a median of 1.5 L of fluid during first day (not a lot!)
- No difference in primary outcome (90-day survival), need for renal replacement therapy, or acute kidney injury

JAMA. 2021;326(9):818–829

Balanced Solution vs Normal Saline

- SMART trial (2018)
  - Cluster-randomized, multiple-crossover trial of 15,802 ICU patients at a single center (Vanderbilt)
  - Units were randomized to use normal saline or balanced crystalloid (LR)
    - Median volume given was 1000 mL
  - More major adverse kidney events within 30 days in the normal saline arm (15.4% vs 14.3%, p=0.04) with no statistical difference in hospital mortality or renal replacement therapy
  - Difference in primary outcome more pronounced in patients who received large volumes and in patients with sepsis
    - 30-day hospital mortality was 25.2% with balanced vs 29.4% with saline (p=0.02)

Balanced Solution vs Normal Saline

- SALT-ED trial (2018)
  - Parallel study to SMART trial in 13,347 non-ICU patients admitted from ED
  - Type of crystalloid given in ED was based on calendar month
    - Median volume given 1079 ml
  - No difference in primary outcome (hospital-free days, i.e., days alive after discharge before day 28)
    - Median of 25 days in both groups
  - Lower incidence of major adverse kidney events with balanced crystalloids compared to saline (4.7% vs 5.6%, p=0.01)

Balanced Solution vs Normal Saline

- PLUS trial (NEJM, January 18, 2022)
  - 5,037 ICU patients randomized to Plasma-Lyte 148 or normal saline
  - 40% had sepsis
  - Patients received median volume of 3.8 L
  - No difference in death from any cause, renal-replacement therapy or maximum increase in creatinine during ICU stay
- Meta-analysis (NEJM Evidence, January 18, 2022)
  - 13 RCTs with 35,884 participants
  - RR for mortality with balanced crystalloids was 0.96 (0.91-1.01)
  - Posterior probability that balanced crystalloids reduce 90-day mortality was 89.5%

normal
saline

balanced
crystalloid

True or False

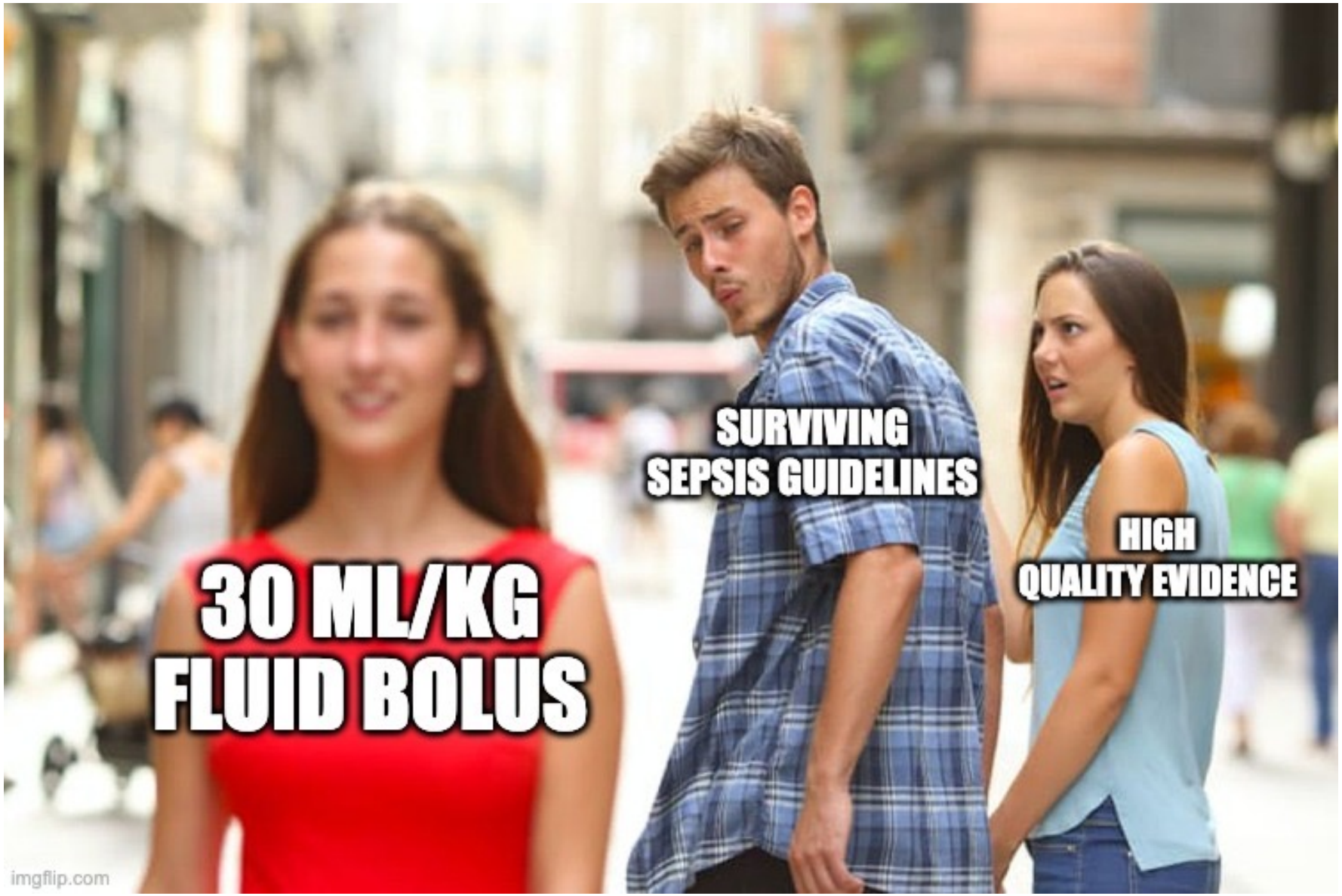
The Surviving Sepsis Guidelines update still recommends an initial fluid bolus of 30 ml/kg for patients with sepsis-induced hypoperfusion or septic shock.

TRUE

Surviving Sepsis Guidelines Update

- “For patients with sepsis-induced hypoperfusion or septic shock we suggest that at least 30 mL/kg of IV crystalloid fluid should be given within the first 3 hours of resuscitation.”
  - The recommendation for an initial fluid bolus of 30 mL/kg was downgraded from a strong recommendation to a weak recommendation, based on the low quality of evidence. No prospective trials.
- “For adults with sepsis or septic shock, we suggest using balanced crystalloid instead of normal saline for resuscitation.”
- “For adults with septic shock, we suggest starting vasopressors peripherally to restore mean arterial pressure rather than delaying initiation until a central venous access is secured.”

Crit Care Med 2021 Nov; 49:1974


30 ML/KG
FLUID BOLUS
SURVIVING
SEPSIS GUIDELINES
HIGH
QUALITY EVIDENCE
imgflip.com

True or False

Ultrasound jugular venous pressure correlates well with invasive measurement of right atrial pressure by right heart catheterization.

TRUE

Accuracy of Ultrasound Jugular Venous Pressure Height in Predicting Central Venous Congestion

- Prospective observational study of 100 patients referred for invasive right heart catheterization for heart failure indications
- Estimation of JVP height with handheld ultrasound device was performed prior to right heart cath
- uJVP correlated with right atrial pressure (r=0.79), with an area under the curve of 0.84 (95% CI, 0.76-0.92)
- uJVP of greater than 8 cm was optimal threshold for detecting RAP of 10 mmHg, with a sensitivity of 72.7%, specificity of 78.6%

Ann Intern Med. 2022 Mar;175(3):344-351


NYPD
RIGHT HEART CATH
ULTRASOUND JVP
imgflip.com

2021 Hospital Medicine Summary

- Don’t intensify hypertension treatment in inpatients
- 6% of COPD exacerbations are a PE
- Terlipressin reverses type 1 HRS but does not improve mortality
- Targeting serum albumin > 3 g/dL in cirrhosis does not improve outcomes
- 3 days of antibiotics is enough for pneumonia if patients meet clinical stability criteria
- Most uncomplicated diverticulitis does not need antibiotics
- IV contrast does not cause cause AKI
- Morning discharges alone do not decrease hospital LOS
- Therapeutic anticoagulation decreases organ-support free days in hospitalized COVID patients, but doesn’t improve overall survival
- Plasma-Lyte 148 did not have a mortality benefit over normal saline
- Surviving Sepsis Guidelines downgraded the fluid bolus to a weak recommendation
- Ultrasound JVP correlates well with invasive measurement of right atrial pressure