The Top 10 EM Articles from 2024

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Disclosure

- My presentation will at times involve comments or discussion concerning unapproved or off label uses of a medical device or pharmaceuticals. When any unapproved or off-label uses of products is discussed, disclosure must be made.
- Sadly, I have no financial relationships or interest with industry or manufacturers represented in the presentation.

Objectives

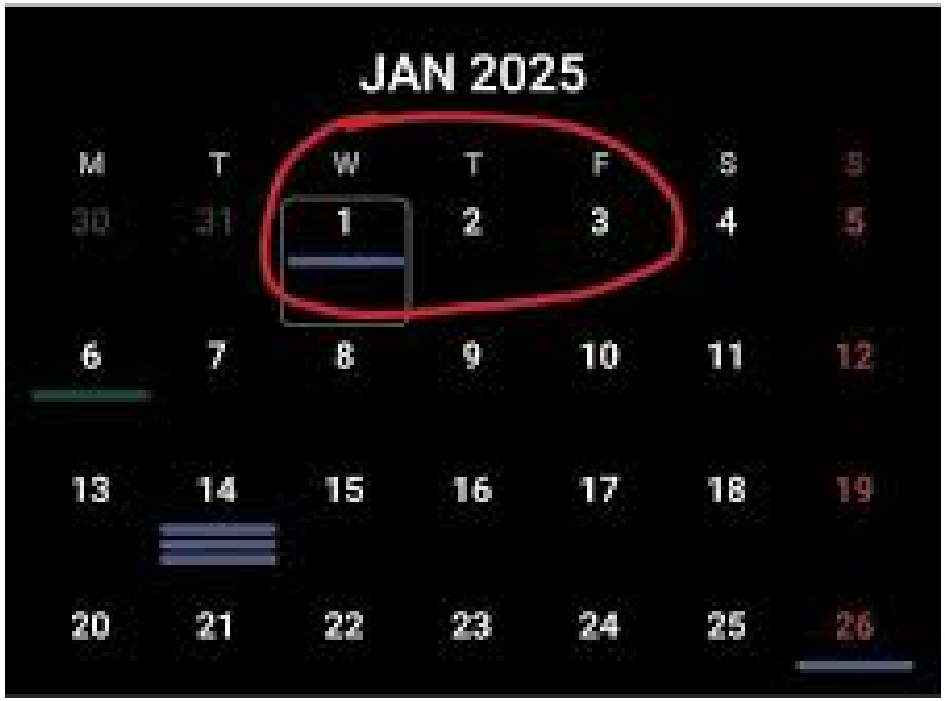
- Review current literature to outline important advances in emergency medicine.
  - Look at the most important “game changers” (IMHO) from 2024.
- Analyzing the implications and limitations of the studies on the practice of clinical emergency medicine.
  - Take away points for your practice.


ACCORDING TO OUR RESEARCH...
AND BY "RESEARCH", I MEAN GOOGLE

The Articles

- Large trials that are impactful
  - Good takeaways for the practicing EMP
- Represent my opinion as to those that are important
- From reputable journals
- Really hard to choose only 10!

Should we be worried that 2025 begins with "WTF"



Small versus large-bore thoracostomy for traumatic hemothorax: A systematic review and meta-analysis.

Lyons NB, et al. *J Trauma Acute Care Surg*. 2024; 97(4):631-638.

Small vs. Large CT

- 300,000 traumatic hemothoraces (HTX)/year in the US
  - Consensus to treat with tube thoracostomy (CT) but controversy on CT size.
- Traditionally large-bore tube thoracostomy (LBTT) has been used.
- Recently more routine use of small-bore tube thoracostomy (SBTT) has been employed.
- Is SBTT as effective as LBTT?

Small vs. Large CT

- Systematic review using PRISMA guidelines
- Four databases were searched and 2 investigators independently reviewed 200 studies
  - 11 studies selected
  - 3 RCTs, 3 prospective cohort trials, and 5 retrospective cohort trials.
  - Assessed for quality and bias
- Meta analysis performed using failure rate as the primary outcome.
- SBTT defined as ≤14 F and LBTT ≥20 F.

Small vs. Large CT

- No significant difference in the overall failure rate of SBTT and LBTT (17.8%-21.5%; p=0.166)
  - However less video-assisted thoracoscopy in SBTT (3.0% vs. 7.2%; p=0.001).
- Significant difference in initial drainage (SBTT 753 mL vs. LBTT 398 mL; p<0.001) and tube days (SBTT 4.3 vs. 6.2; p<0.001).
- No difference in mortality or complication rate.

Small vs. Large CT

- Recommendations
  - SBTT provided better initial drainage and less days of total drainage with similar rates of failure complications and mortality as compared with LBTT.


Hatred of people
Desire to help people
ER nurses

Pharmacokinetic and Pharmacodynamic Profile of Epinephrine Nasal Spray Versus Intramuscular Epinephrine Autoinjector in Healthy Adults.

Greenhawt M, et al.

J Allergy Clin Immunol Pract. 2024 Dec;12(12):3274-3282.

Intranasal Epi

- Epinephrine administered intramuscularly (IM) is the standard of care for treating anaphylaxis because oral administration has low bioavailability.
- Patients at a higher risk of anaphylaxis are often prescribed epinephrine IM autoinjectors as the majority of events occur at home or the community.
  - IM autoinjectors are suboptimal due to needle-phobia and not available in location of anaphylaxis.
- Nasally administered epi products (ENS) are under development as an alternative method of epi delivery.

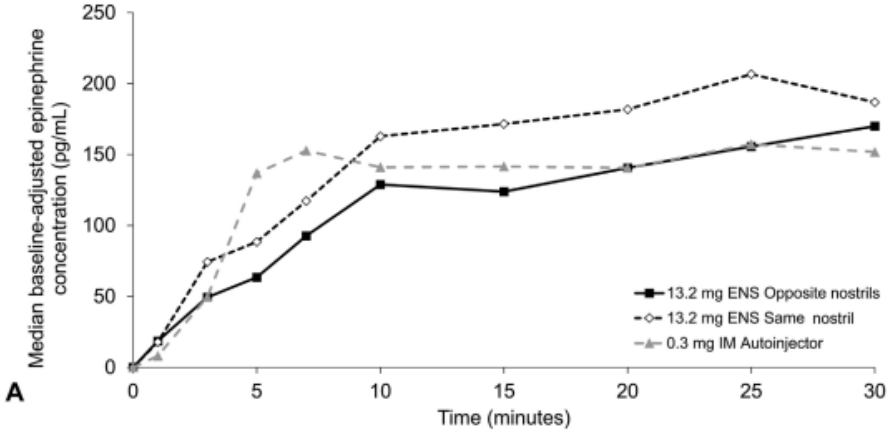
Intranasal Epi

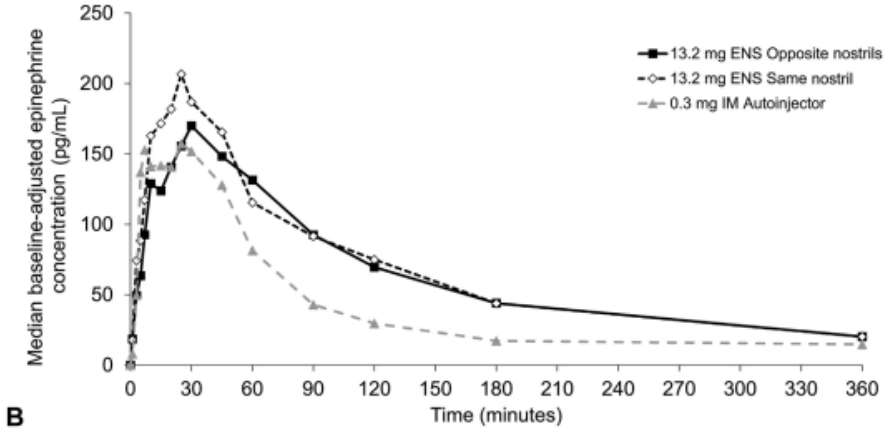
- Objective was to compare the pharmacokinetic (PK) and pharmacodynamic (PD) profile of ENS vs. IM epinephrine.
- Used data from 4 open-label phase 1 crossover studies of ENS were pooled for PK and PD analysis.
- Participants were all health adults (no anaphylaxis) and served as self-controls.
  - Each given 13.2 mg ENS epi (2 consecutive 6.6 mg sprays to opposite nostrils) then 0.3 mg IM epi.
- Plasma epi concentrations (PK) and vital sign data (PD).

Intranasal Epi

- No significant difference amongst patient demographics.
- ENS had a rapid increase in plasma epinephrine concentration that was greater than the IM autoinjector.
- Heart rate and blood pressure effects were similar in pattern and magnitude in all groups.

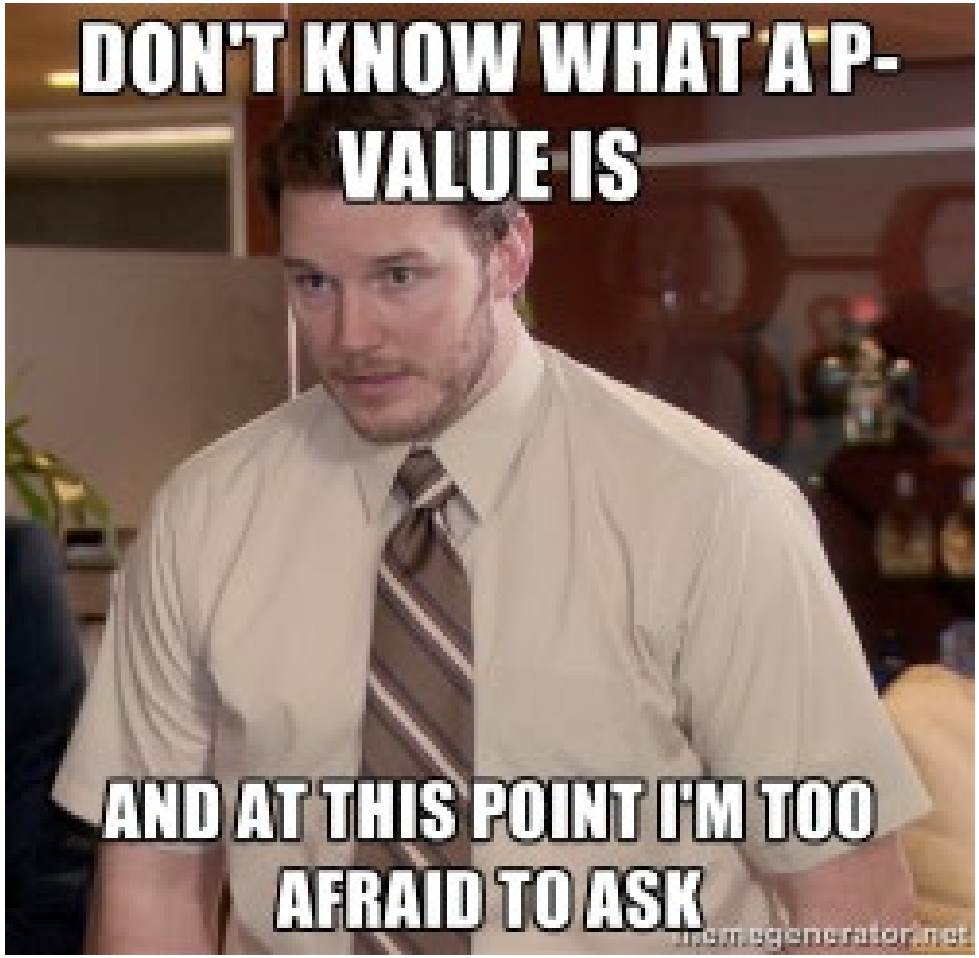
Intranasal Epi





Intranasal Epi

- Recommendations:
  - ENS epinephrine rapidly achieved plasma epinephrine levels greater and more sustained than the epinephrine IM autoinjector with a similar PD effect.


DON'T KNOW WHAT A P-VALUE IS
AND AT THIS POINT I'M TOO AFRAID TO ASK
memegenerator.net

Comparing Intubation Rates in Patients Receiving Parenteral Olazapine with and without a Parenteral Benzodiazepine in the Emergency Department.

Cole JB, et al.

Ann Emerg Med. 2024 Dec;84(6):658-667.

Olanzapine + Benzos

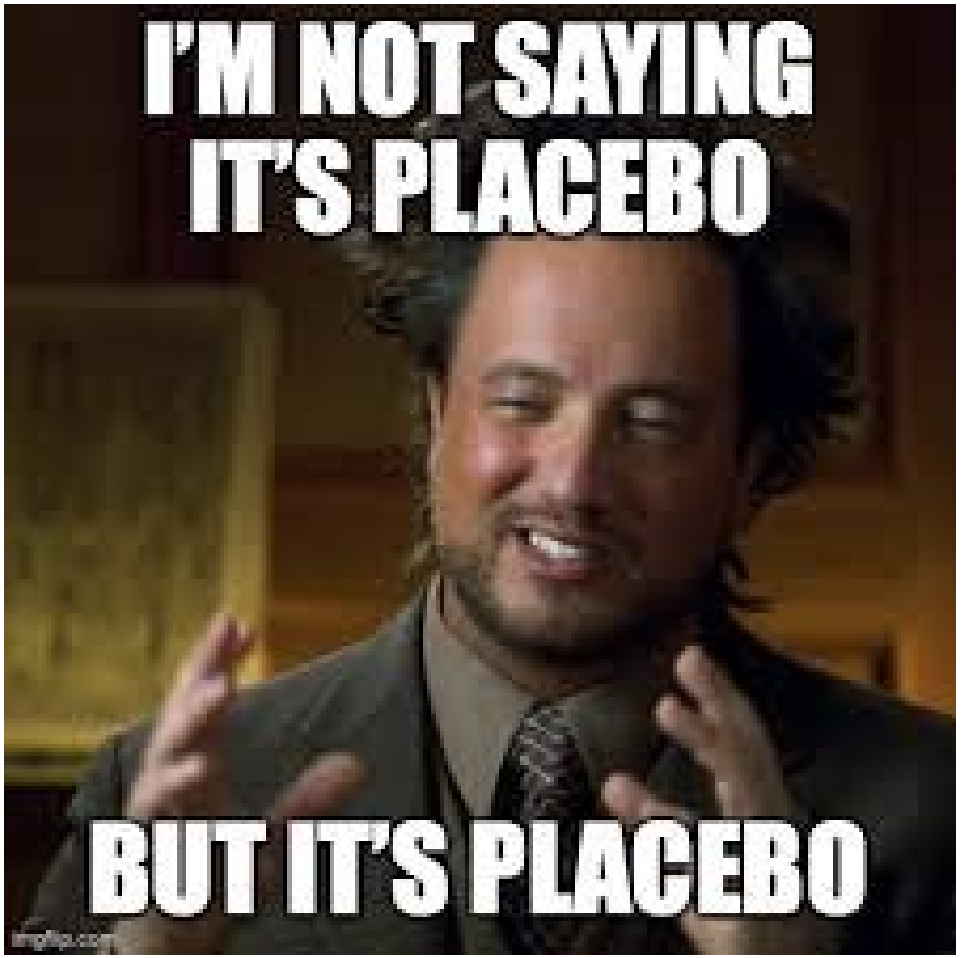
- Parenteral medication for control of agitation in the ED can be useful as a second line treatment
- Olanzapine was initially approved by the FDA for agitation associated with schizophrenia and bipolar type I, but has become an accepted treatment for general agitation in the ED.
  - It is often combined with a benzodiazepine.
- Olanzapine carries a warning to not combine with benzodiazepines, based upon some small retrospective studies demonstrating synergistic respiratory depression
  - More common when alcohol is also present.

Olanzapine + Benzos

- A structured retrospective chart review was conducted at Hennepin County Medical Center.
- Identified adults that received either 2 doses of parenteral olanzapine or 1 dose of olanzapine and 1 dose of a benzodiazepine within 60 minutes.
- Excluded those with more than 2 doses of olanzapine, more than 1 dose of a benzodiazepine, or received other sedating medications in the ED (i.e. droperidol, ketamine).
- Primary outcome was tracheal intubation.
- Secondary outcomes were hypoxemia, hypotension and death.

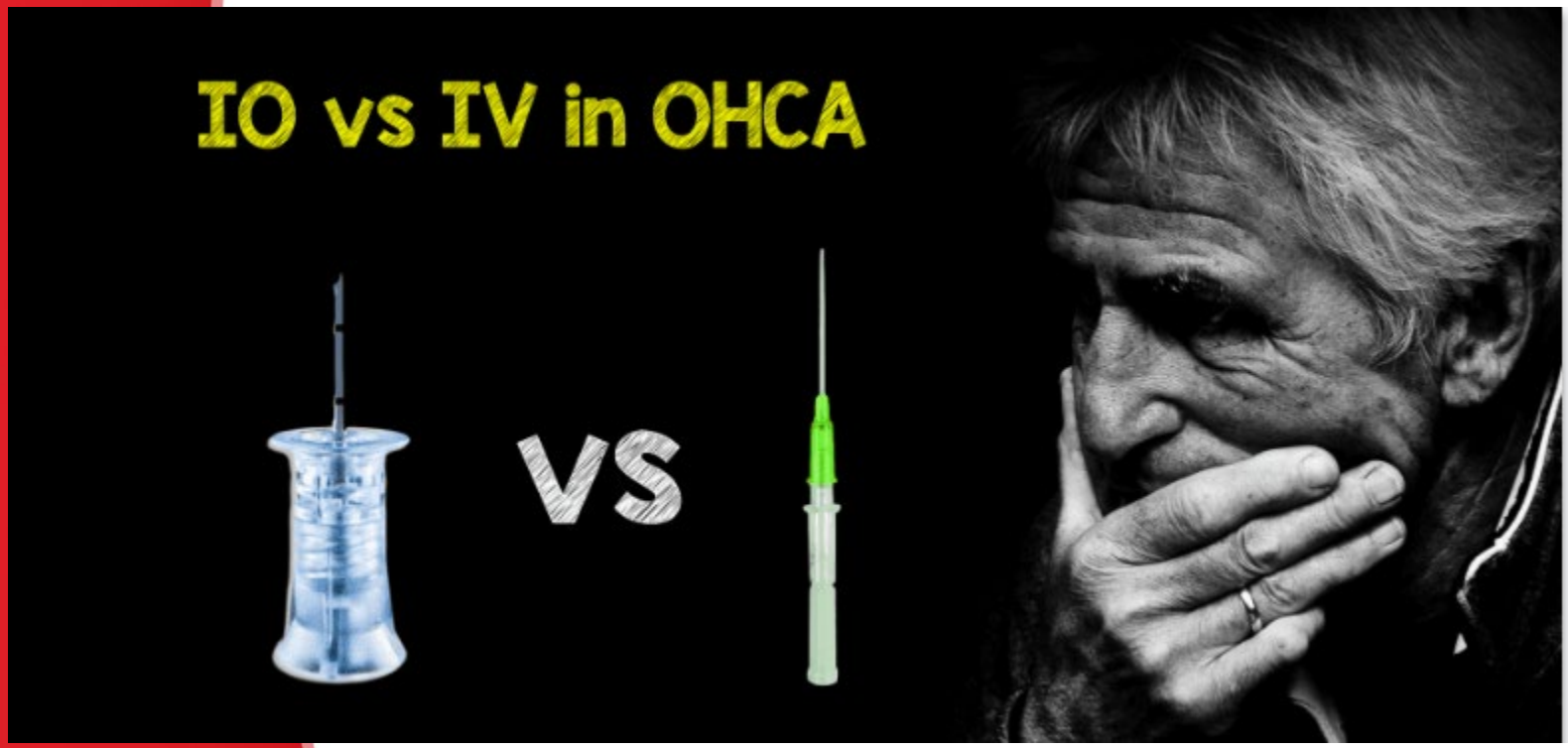
Olanzapine +Benzos

- Recommendations:
  - Even in patients with a high baseline risk of cardiopulmonary depression (alcohol and/or illicit substances present), there was no synergistic risk between injectable olanzapine and benzodiazepines.


I'M NOT SAYING
IT'S PLACEBO
BUT IT'S PLACEBO

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

Couper K, et al. *N Engl J Med*. 2025 Jan 23;392(4):336-338. doi: 10.1056/NEJMoa2407616. doi: 10.1056/NEJMoa2407780. Epub 2024 Oct 31.


IO vs IV in OHCA
vs

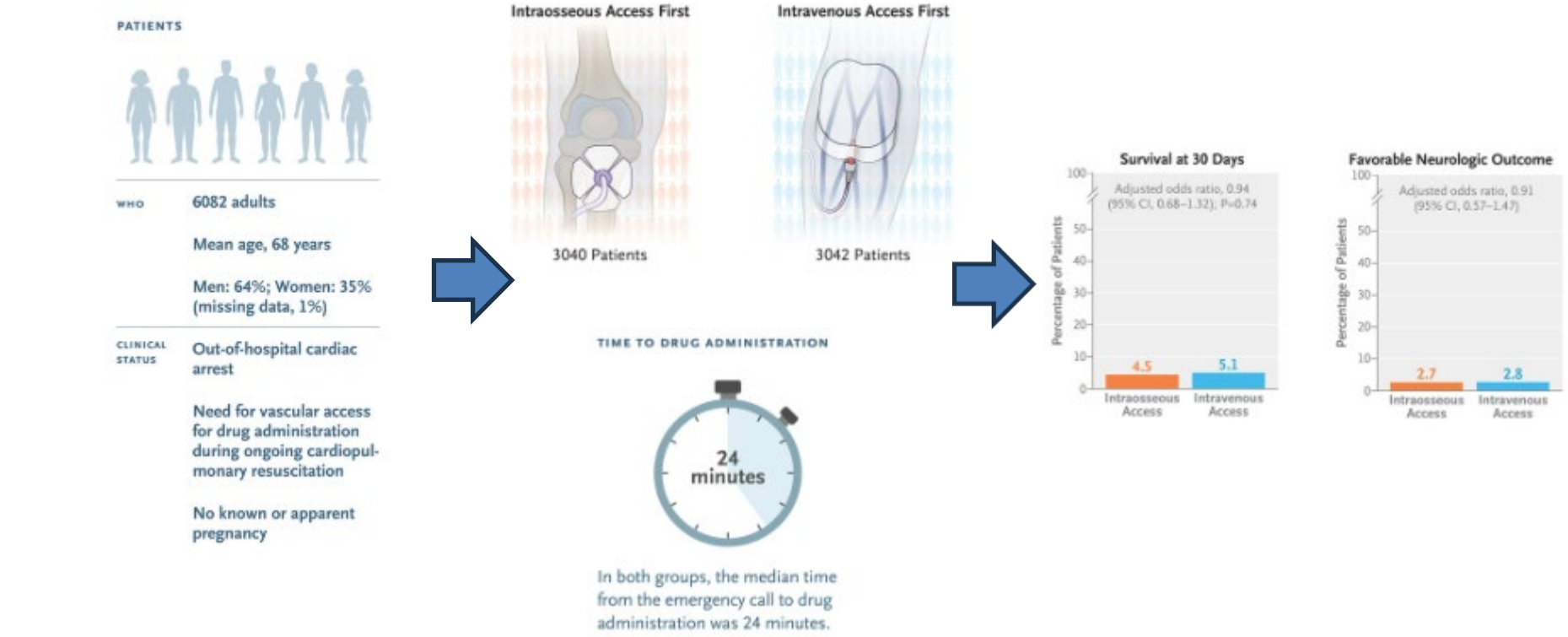
IO vs IV in OHCA

- 4 million out-of-hospital cardiac arrests (OHCA) occur worldwide with low survivability.
- Epinephrine and other ACLS medications are used for a variety of cardiac arrhythmias, but require vascular access in the prehospital setting.
- Both intravenous (IV) and intraosseous (IO) are routinely accepted modes for vascular access.
  - Conflicting data and recommendations.
- The PARAMEDIC-3 trial undertaken to determine the clinical effectiveness of an IO-first strategy as compared to an IV-first strategy for OHCA

IO vs IV in OOHCA

- The PARAMEDIC 3 trial is a pragmatic, open-label RCT from 11 EMS services in the United Kingdom.
- Randomly assigned OHCA patients to 1:1 ratio for IO-first vs IV first. Crossover if unable to achieve x2 attempts, could use paramedic choice.
- Primary outcome was survival to 30 days.
- Secondary outcomes were any ROSC, ROSC to ED, survival to hospital discharge, and neurologic function.
- Initial plan was for 15K enrolled subjects for a 1% difference.

IO vs IV in OHCA

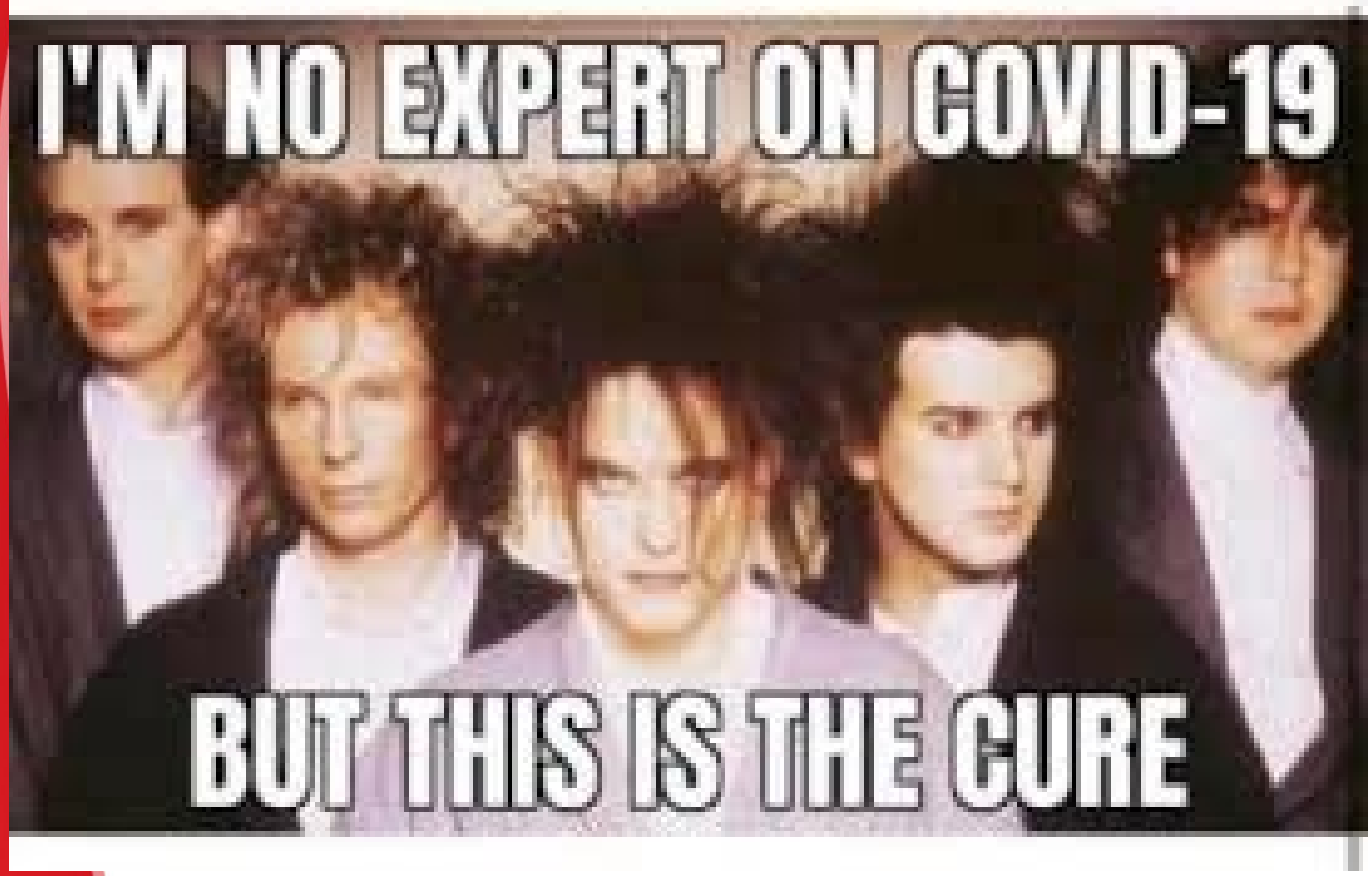


IO vs IV in OHCA

- Limitations:
  - Recruitment was terminated before the planned sample size was reached because of lower than-anticipated numbers of enrolled patients.
  - The researchers did not collect information on resuscitation quality (because of the pragmatic nature of the trial) or on subsequent care in the hospital.
  - Clinicians who provided prehospital care were aware of the route of vascular access.

IO vs IV in OOHCA

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


I'M NO EXPERT ON COVID-19
BUT THIS IS THE CURE

Tenecteplase vs. Alteplase in Acute Ischemic Stroke Within 4.5 Hours: A Systematic Review and Meta-Analysis of Randomized Trials.

Palaidimou MD, et al. *Neurology.* November 12, 2024; 103(9):e209903.

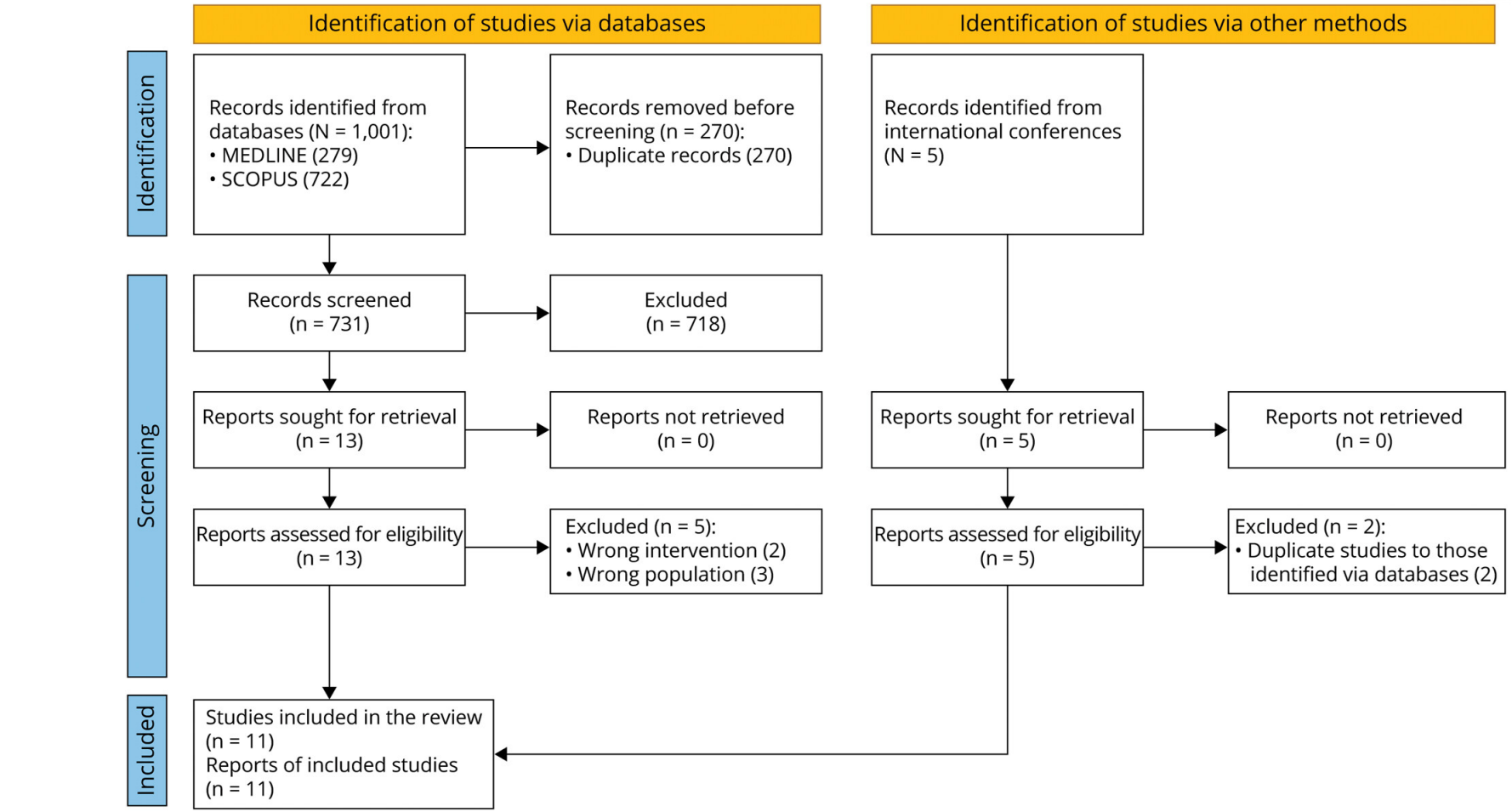
Tenecteplase vs Alteplase in CVA

- IV thrombolysis with alteplase is the only FDA approved systemic reperfusion treatment for acute ischemic stroke.
  - Requires an infusion at 0.9 mg/kg as the standard of care.
- Tenecteplase (TNK) is recommended by the European Stroke Organization/Australian/New Zealand guidelines.
  - TNK requires a single bolus may be more efficacious than TPA
- No major ongoing RCT comparing TNK and TPA in patients with an acute stroke within 4.5 hours of onset.
- This is an update systematic review and meta-analysis of all studies assessing the efficacy and safety of TNK vs. TPA

Tenecteplase vs Alteplase in CVA

- Systematic literature search of 2 online sources was performed:
  - Observational cohort studies, noncontrolled studies, case series, and case reports were excluded.
  - Quality control and bias assessment were performed using the Cochrane Collaboration risk-of-bias tool for RCTs.
- Primary outcome was excellent functional outcome at 3 months (mRS of ≤1).
  - Secondary outcomes:
    - Good functional outcome (mRS ≤2) at 3 months
    - Reduced disability (defined as ≥1 point reduction across all mRS strata) at 3 months
    - Symptomatic ICH
    - All-cause mortality at 3 months

Tenecteplase vs Alteplase in CVA

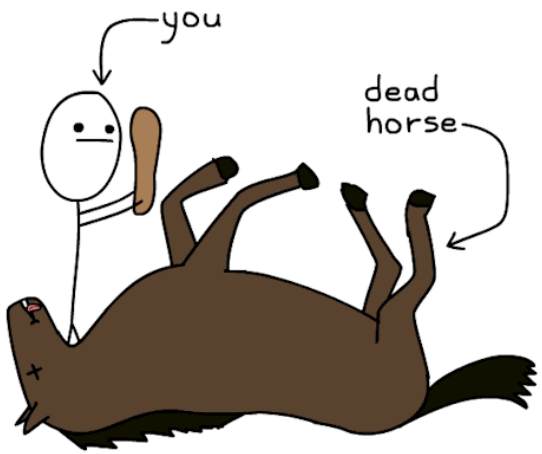


Tenecteplase vs Alteplase in CVA

- 11 RCTs enrolling 7545 patients
- Tenecteplase was associated with a higher likelihood of excellent (mRS scores 0-1) functional outcomes (RR=1.05; 95% CI 1.01-1.10; p=0.012).
- Tenecteplase was associated with reduced disability at 3 months (OR=1.10; 95% CI 1.01-1.19; p=0.034).
- Good functional outcome was similar (RR=1.03; 95% CI 0.99-1.07; p=0.142).
- Similar rates for symptomatic ICH and 3-month mortality.

Tenecteplase vs. Alteplase in CVA

- Recommendations:
  - Sufficient data to transition to Tenecteplase in clinical practice for the treatment of acute ischemic CVA within 4.5 hours.
  - Significant workflow advantages for Tenecteplase.




WHEN YOUR ABOUT TO EXPLAIN LAST NIGHT
TO THE DAY SHIFT

Emergency Department Evaluation of Young infants with Head Injury

Lyons TW, et al, *Pediatrics.* June, 2024; 153(6):e20230665037.

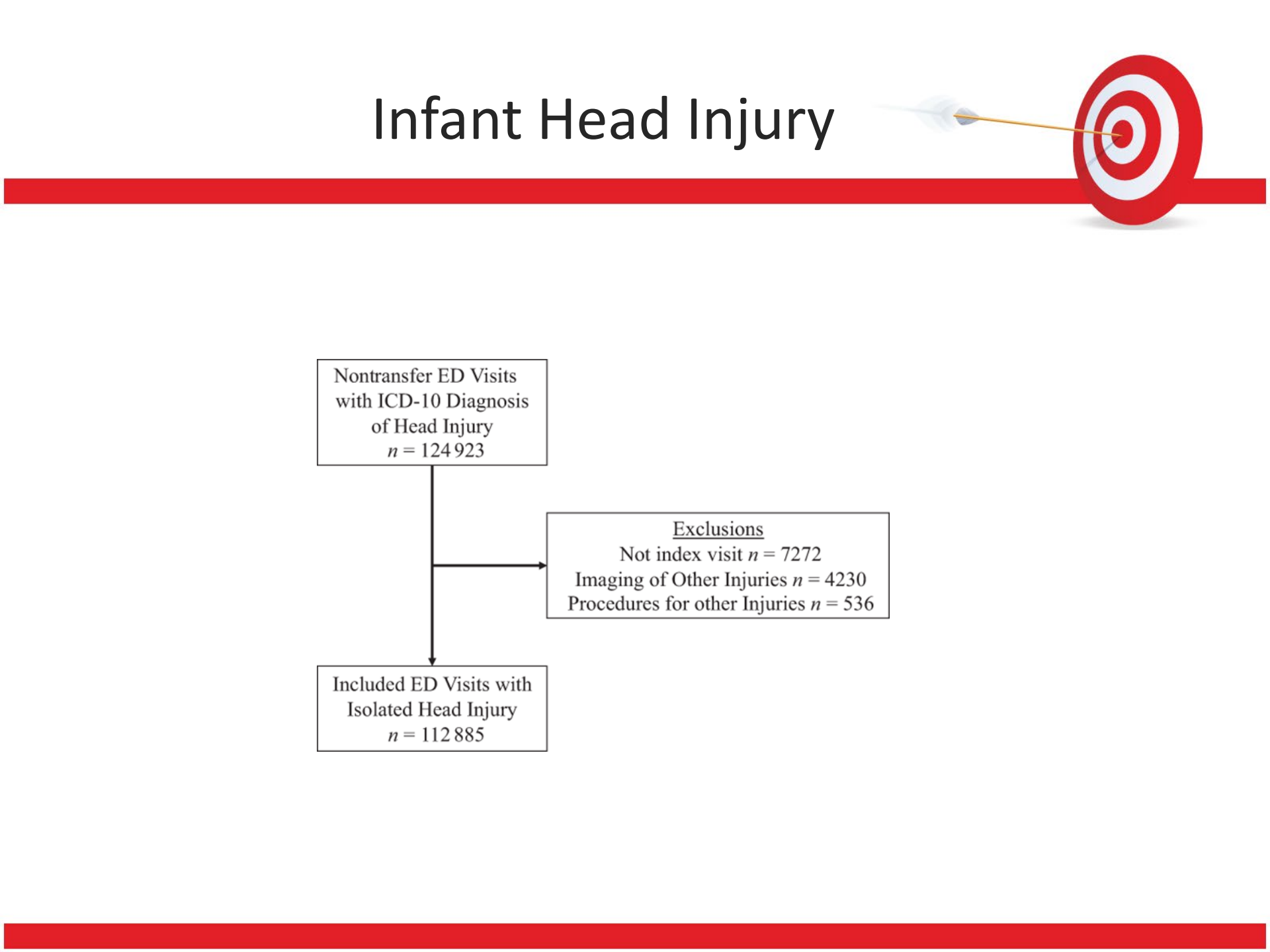
Infant Head Injury

- Clinically important traumatic brain injury (cTBI) is a leading cause of ED visits, morbidity and mortality in children.
- Concerns about the long-term effects of ionizing radiation have led to efforts to reduce CT utilization.
- Clinical Decision tools, such as PECARN decision rule, help to identify children at risk for cTBI.
- Evaluation of the young infants is challenging, because injuries can be masked.
  - Young infants also have the highest risk for radiation-induced injury.
- This study looked at the ED evaluation and outcomes of the youngest infants (<3 months old) compared to other children (3-24 months old).

Infant Head Injury

- Retrospective cross-sectional study of children diagnosed with a head injury in the ED
  - Utilized data from the Pediatric Health Information System (PHIS)
  - PHIS is an administrative database clinical data from not-for-profit, tertiary care pediatric hospitals in the United States affilitated with the Children's Hospital Association.
  - Included 47 hospitals in a 5-year study period (2015-2019).
- Included children <2 years old with a first ED visit for an isolated head injury.
- The primary outcome was utilization of diagnostic cranial imaging.
- Secondary outcomes were diagnosis of a cTBI and mortality.

Infant Head Injury



Infant Head Injury

TABLE 1

Demographic Characteristics of Emergency Department Encounters for Children Aged Less Than 24 Months With Head Injury (*n* = 112 885)

Characteristic	*n* (%)
Age	
<3 mo	10 325 (9.1)
3–5 mo	13 302 (11.8)
6–11 mo	36 760 (32.6)
12–23 mo	52 498 (46.5)
Male sex	62 126 (55.1)
Insurance provider[a]	
Private	38 933 (35.3)
Public	65 939 (59.8)
Other	5372 (4.9)

[a] Insurance data missing for 2641 encounters (2.3%).

Infant Head Injury

- Compared with older age groups, the youngest infants (<3 months old) were:
  - more likely to have cranial imaging performed
  - more likely to be diagnosed with a TBI and ciTBI, and skull fracture (with or without TBI)
  - more likely to undergo evaluation for abusive head trauma
  - more likely to be admitted to the hospital (including to the ICU)
  - more likely to undergo neurosurgery
- The youngest infants were also at increased risk for mortality compared with the 6- to 11-month and 12- to 23-month-old age groups.

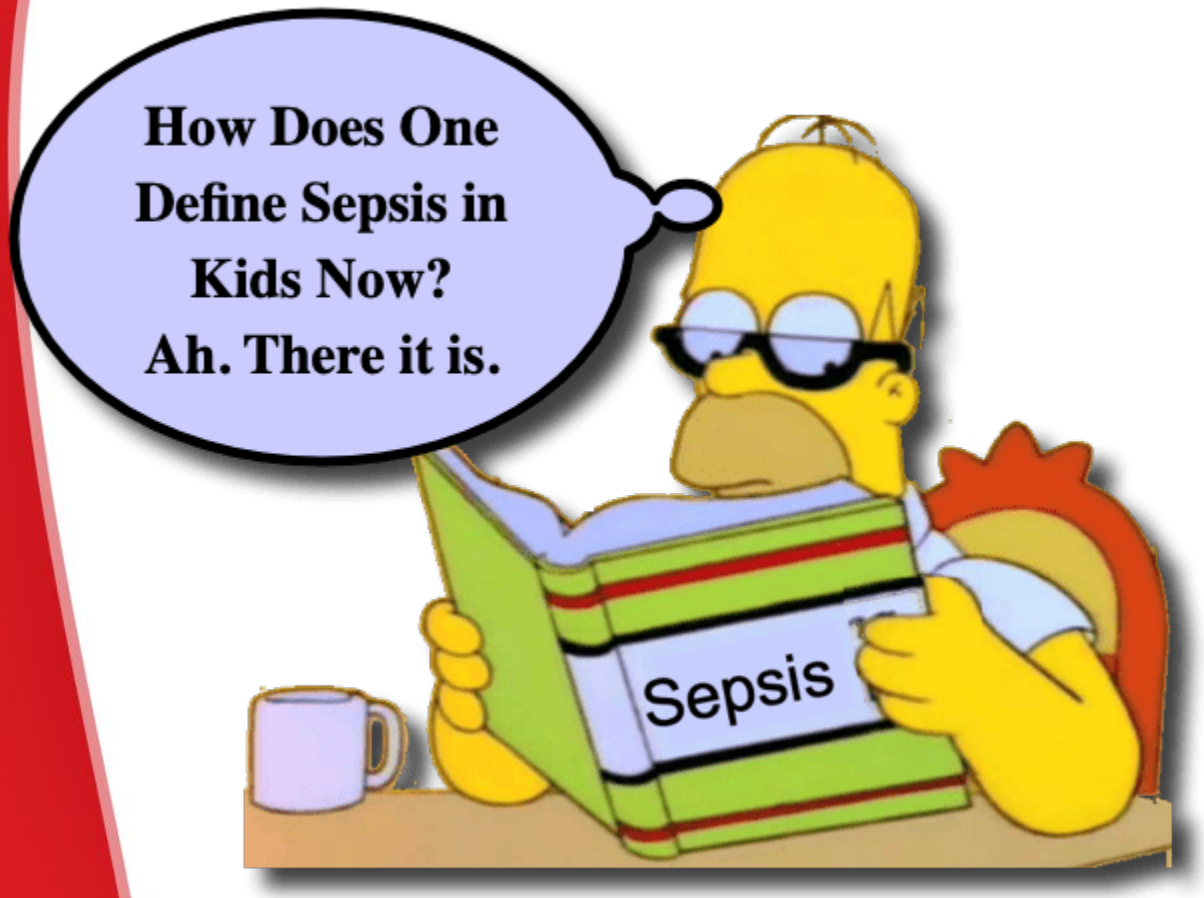
Infant Head Injury

- Recommendations:
  - In this multicenter study of children <2 years year old undergoing evaluation in the ED for head injuries, infants <3 months of age had:
    - markedly higher rates of cranial imaging
    - TBI and ciTBI
    - hospital admission
    - neurosurgery
    - abusive head trauma evaluation
    - Mortality
  - Maintain a low threshold to obtain cranial imaging in the youngest infants.


I FIND YOUR LACK OF EBM
DISTURBING

Development and Validation of the Phoenix Criteria for Pediatric Sepsis and Septic Shock.

Nelson Sanchez-Pinto L., et al. *JAMA*.
February 27, 2024; 331(8):675-686.


How Does One Define Sepsis in Kids Now? Ah. There it is.
Sepsis

Phoenix Criteria

- Each year, pediatric sepsis results in more than 3 million deaths globally
  - In children less than 5 years old, preterm birth and bacterial sepsis account for 50% of all deaths.
- Physicians are notoriously poor at determining which pediatric patients have sepsis.
- Prior pediatric sepsis mortality prediction scores such as SIRS and pediatric SOFA (pSOFA) have poor predictive characteristics.
- Correctly identifying pediatric patients that require rapid antimicrobial treatment is essential.

Phoenix Criteria

- Multicenter, international retrospective cohort study intended to develop new clinical criteria for pediatric sepsis and septic shock.
  - EHR data in 10 hospital-based sites in 5 countries.
- <18 years old with suspected infection within 24 hours of admission to the emergency department, inpatient, or ICU setting between 2010 and 2019.
  - Newborn birth hospitalizations and children with age <37 weeks were excluded.
- Analyzed each subgroup from 8 previously validated measures (Included IPSCC, PELOD-2, PODIUM, Proulx, pSOFA, DIC, VIS, SI scores).
- Primary outcome was in-hospital mortality.

Phoenix Criteria

- Screened 3,751,591 hospital encounters
  - 759,774 encounters used to determine best criteria for organ dysfunction
    - Derivation cohort: 129,584 patients with mean age 3.7 years
    - Internal validation cohort: 43,400 patients with mean age 3.7 years
- Best performing criteria identified by AUROC
  - 4-organ-system model translated into the Phoenix Sepsis Score had best mortality prediction characteristics
    - Included Respiratory, Cardiovascular, Coagulation, Neurologic components
  - Range of 0-13, with higher value indicating more severe infection
    - Median score in sepsis patients was 3 (IQR 2-4)
    - Score of 2+ points had best performance characteristics for primary outcome of death

Phoenix Criteria

Phoenix Sepsis Score

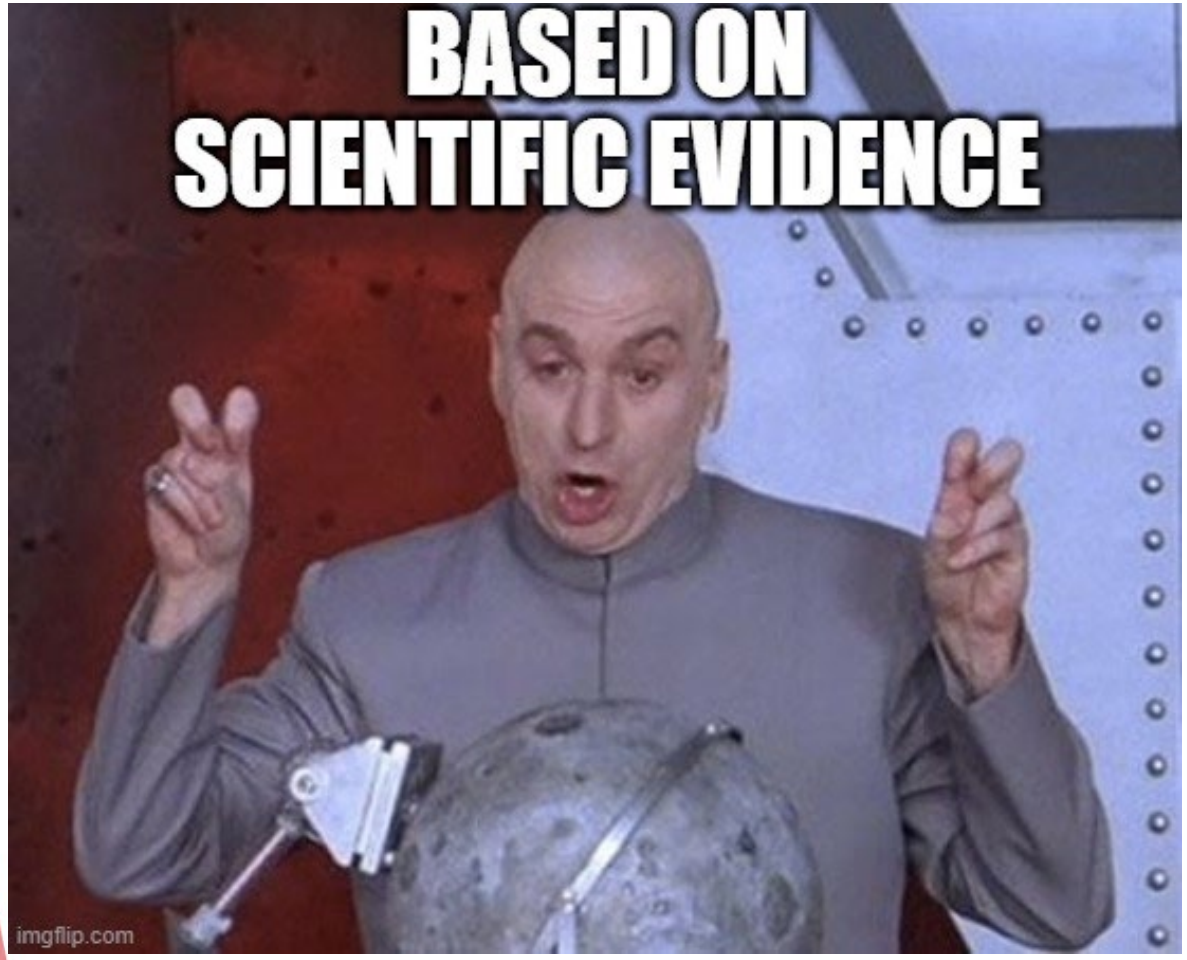
	1 point	2 points	3 points
Respiratory (0-3 points)	P/F <400 or S/F <292	P/F 101-200 and MV or S/F 149-220 and MV	P/F <100 and MV or S/F <148 and MV
Cardiovascular (0-6 points)	1 point each (up to 3 points) for: 1 Vaso-inotrope inf. Lactate 5-10.9 mmol/L MAP (mmHg) 17-30 25-38 31-43 32-44 36-48 38-51	2 points each (up to 6 points) for: ≥2 Vaso-inotrope inf. Lactate ≥11 mmol/L MAP (mmHg) <17 <25 <31 <32 <36 <38	
Age-based <1 mo. 1-11 mo. 12-23 mo. 24-59 mo. 60-143 mo. 144-216 mo.			
Coagulation (0-2 points)	1 point each (max. 2 points) for: Platelets <100 K/µL INR >1.3 D-Dimer >2 mg/L Fibrinogen <100 mg/dL		
Neurologic (0-2 points)	GCS ≤10	Fixed pupils	

Phoenix Criteria

- Strengths
  - Large sample size with robust statistical analysis.
  - Included domestic and international hospitals with diverse resource availability.
- Weaknesses
  - Complicated scoring system compared to other sepsis scores.
    - Some laboratory values may not be available at your facility.
      - Requires $PaO_2:FiO_2$ or $SpO_2:FiO_2$
    - Not cost-effective to obtain these labs on every suspected patient

Phoenix Criteria

- Recommendations
  - The new Phoenix Sepsis Criteria has improved performance for diagnosing pediatric sepsis and septic shock compared to existing criteria.
  - Robust data analysis applicable to broad range of hospitals with varied resources
  - Combined score of 2+ is positive for sepsis
  - Validation study needed before broad adaption


BASED ON
SCIENTIFIC EVIDENCE
imgflip.com

Noninvasive Ventilation for Preoxygenation during Emergency Intubation.

Gibbs KW, et al. *N Engl J Med*. June 20, 2024; 390:2165-77.

NIV Preceding Intubation

- Emergency intubation in the emergency department or ICU is common with >2 million events in the US annually.
- Emergency intubation is associated with high adverse event rate, thought to be up to 40%.
  - Hypoxemia in 10-20%.
- Pre-oxygenation denitrogenates the functional residual capacity of the lung.
  - Buffer against hypoxemia.
- Noninvasive ventilation can deliver positive pressure FIO_2 of 100% and support ventilation.
  - However, can insufflate the stomach and increase the risk of aspiration.

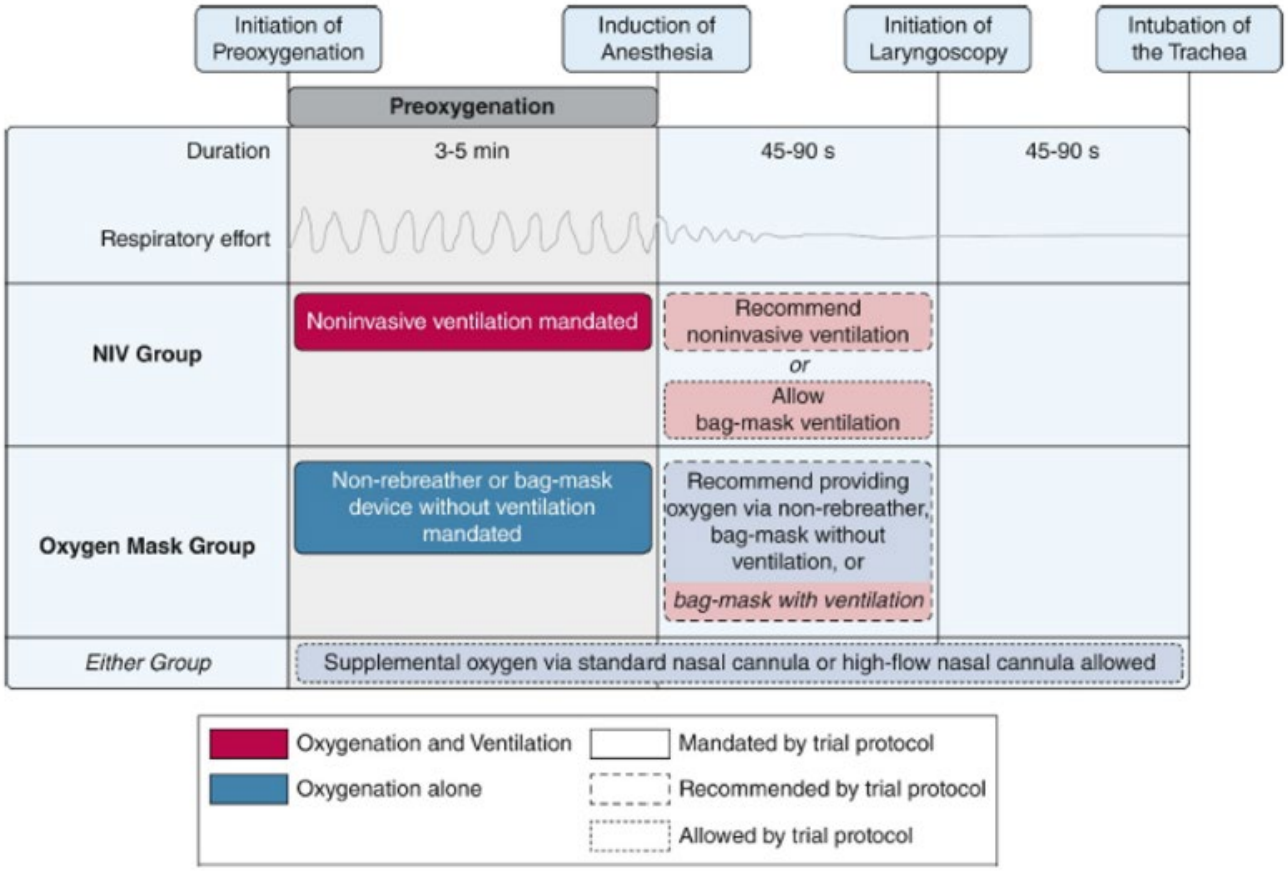
NIV Preceding Intubation

- The PRagmatic trial Examining Oxygenation prior to Intubation (PREOXI trial) hypothesized that BiPAP used for pre-oxygenation would reduce hypoxia during intubation.
- Multi-center, pragmatic, randomized controlled trial with 1:1 randomization.
  - NIV group: BiPAP was applied during pre-oxygenation for a minimum of 3 minutes; FIO_2 100%, IPAP/EPAP 10/5 cm
  - O2 mask group: FIO_2 100% by non-rebreather mask, HFNC, or bag mask O2 without ventilation.
- 24 sites (7 emergency departments and 17 ICUs in the US, in 15 different hospitals).
  - Operators had performed a median of 50 previous tracheal intubations

NIV Preceding Intubation

- 4567 patients were assessed, 1301 were randomized.
  - 645 patients in the NIV group; 656 in the O2 mask group.
  - The groups were well matched at baseline.
  - The median age was 61 years, 39.6% were female, BMI was 27.6 vs 26.6.
  - ICU Intubation in 73.8% vs 72.6% of cases; median APACHE II was 17
- Operators could administer ventilation with BVM to patients in either group.
  - O2 mask group: 30% got BVM with ventilations; 11.3% got BVM without ventilations during apneic period.
- Could provide supplemental oxygen through standard nasal cannula or HFNC to patients in either trial group
  - 3% NC in NIV group; 16% NC in O2 mask group

NIV Preceding Intubation

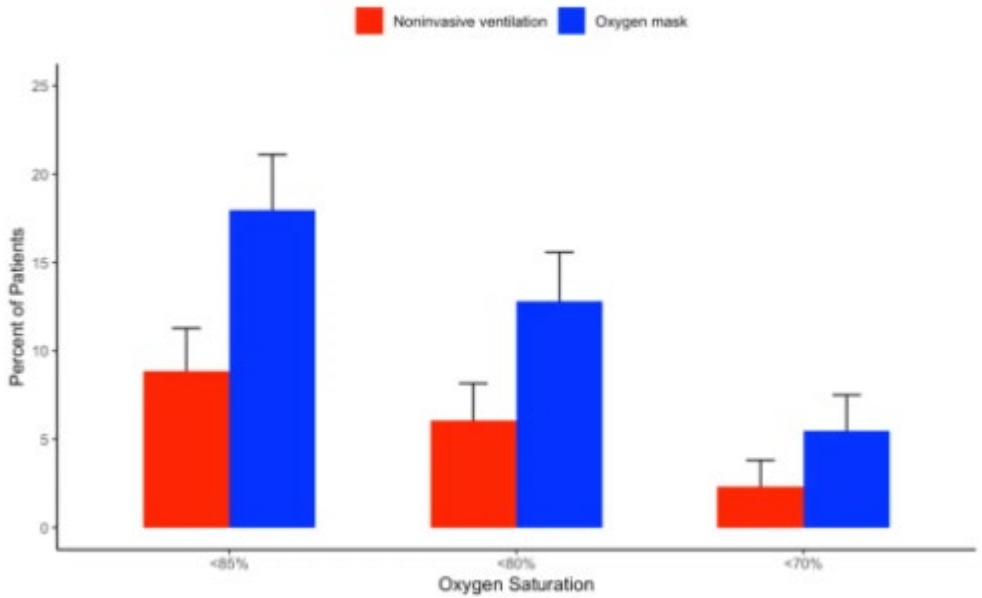


NIV Preceding Intubation

- Less subjects in the NIV group had hypoxemia compared to the O2 mask group (9.1% vs. 18.5%; 95% CI −13.2 to −5.6; P<0.001).
- All pre-specified subgroups favored NIV (
  - high BMI
  - intubation in the ICU
  - those with hypoxemic respiratory failure as cause of intubation
  - FiO2 in hour before intubation
  - high APACHE II scores
- Aspiration as assessed by clinical, physiological and radiological variables; no difference between groups (0.9% vs. 1.4%; 95% CI -1.6 to 0.7)

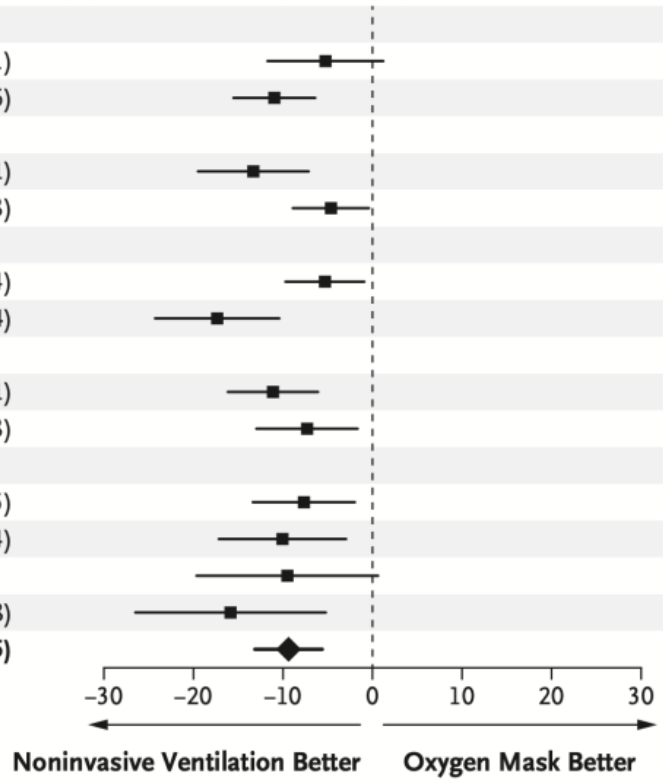
NIV Preceding Intubation

Figure S4. Lowest oxygen saturation



NIV Preceding Intubation

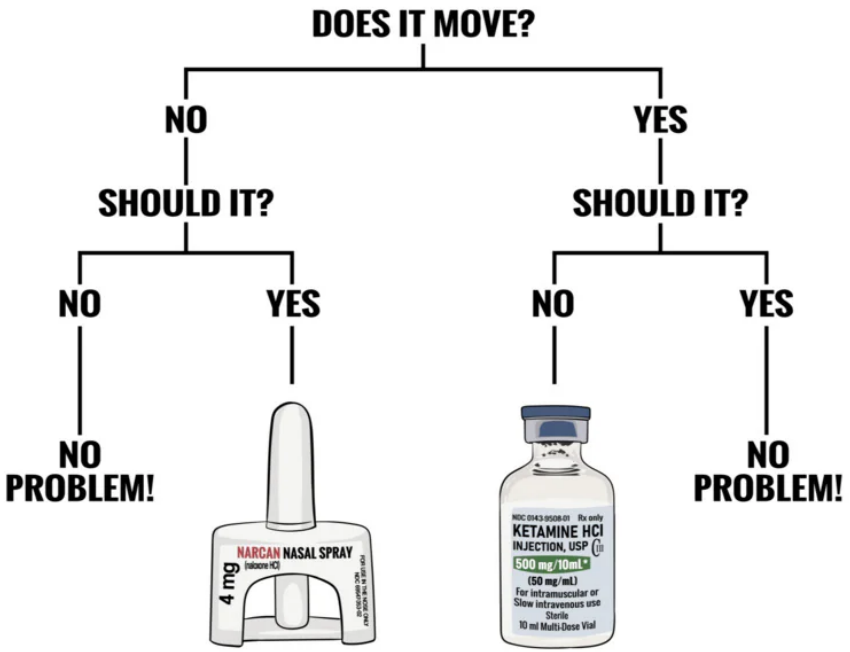
Subgroup	Noninvasive Ventilation	Oxygen Mask
	no. of patients with event/total no. of patients (%)	
Location		
Emergency department	13/165 (7.9)	23/175 (13.1)
Intensive care unit	44/459 (9.6)	95/462 (20.6)
Acute hypoxemic respiratory failure		
Yes	36/282 (12.8)	84/322 (26.1)
No	21/342 (6.1)	34/315 (10.8)
Body-mass index		
<30	36/397 (9.1)	59/410 (14.4)
≥30	20/222 (9.0)	58/220 (26.4)
APACHE II score		
<17	27/337 (8.0)	67/350 (19.1)
≥17	30/287 (10.5)	51/287 (17.8)
FIO_2 in previous 1 hr		
0.21	4/142 (2.8)	15/143 (10.5)
0.22–0.40	18/192 (9.4)	35/180 (19.4)
0.41–0.70	9/100 (9.0)	15/81 (18.5)
>0.70	18/106 (17.0)	45/137 (32.8)
Overall	**57/624 (9.1)**	**118/637 (18.5)**



NIV Preceding Intubation

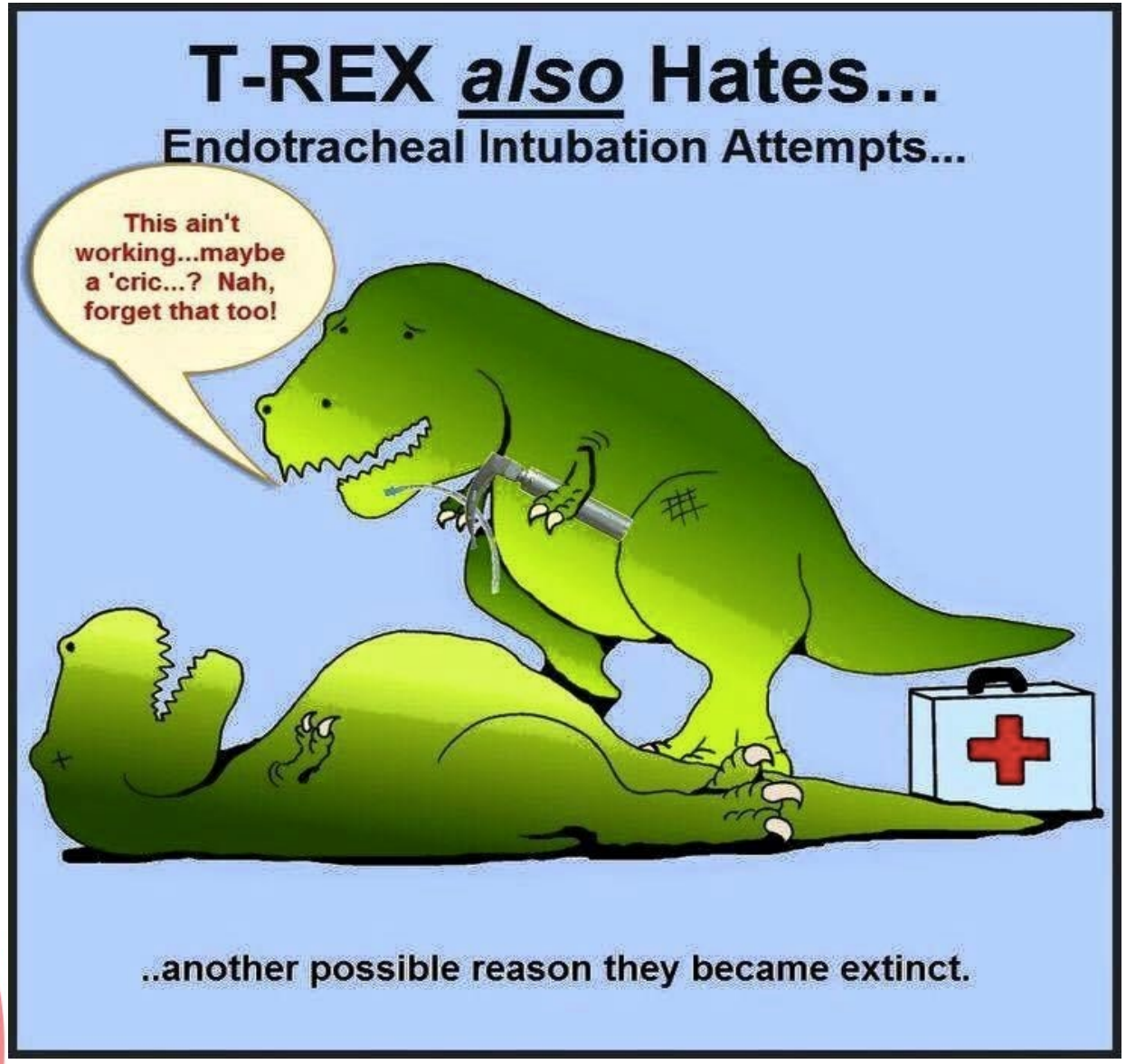
- Recommendations:
  - Among critically ill adults undergoing tracheal intubation, preoxygenation with noninvasive ventilation resulted in a lower incidence of hypoxemia during intubation than preoxygenation with an oxygen mask.
  - We should be using some form of PPV/PEEP for preoxygenation in critically ill patients.

EMERGENCY DEPARTMENT FLOWCHART



Video Laryngoscopy may Improve the Intubation Outcomes in Critically Ill Patients: A Systematic Review and Meta-Analysis of Randomized Controlled Trials.

Zhang K, et al. *Emerg Med J*. 2024; 0:1-9.


T-REX also Hates...
Endotracheal Intubation Attempts...
This ain't working...maybe a 'cric...? Nah, forget that too!
..another possible reason they became extinct.

Video Laryngoscopy

- The first-attempt success rate of emergency tracheal intubation in critically ill patients is relatively low, and unsuccessful or prolonged tracheal intubation can be life-threatening.
  - Esophageal intubation may be as high as 19%
- 80% of intubations in ED and ICUs (worldwide) are performed with DL.
- Previous systematic reviews have focused more of the operating room and newer trials have suggested VL is superior in the ER and ICU.

Video Laryngoscopy

- Included only RCT trials:
  - In the ED or ICU patients (both in-hospital and prehospital setting).
  - DL vs. VL technique.
  - Primary outcome of fist-attempt success rate.
- 381 articles from 4 databases
  - 76 for full text review
  - Final selection was 26 trials

Video Laryngoscopy

- 5952 patients analyzed
  - 3007 undergoing VL intubation
  - 2945 undergoing DL intubation
- Six studies in the prehospital setting, 19 conducted in hospital setting.
- Overall risk of bias was low

Video Laryngoscopy

- Overall, VL did not improve the first attempt success rate compared to DL (RR 1.05, 95% CI 0.97 to 1.13; p=0.24).
  - VL did improve the first-attempt success rate in the ED setting (RR 1.16 95% CI 1.03 to 1.23; p=0.007).
  - VL did improve the first attempt in the ICU setting (RR 1.16, 95% CI 1.05 to 1.29; p=0.003).
  - VL did not improve first-attempt success rate in the prehospital setting (RR 0.75, 95% CI 0.57 to 0.99; p=0.04).

Video Laryngoscopy

- Recommendations
  - In the hospital setting (ED and ICU) VL improves the first-attempt success rate.
  - Doesn’t hold for the prehospital setting.


SPIRIT
Emergency Department Professional
Includes:
- Scrubs
- Listening noodle
- Graham crackers
- Peanut butter
- Existential crisis
- Turkey sammich
It is what it is..
LOL
Honey Maid
JIF
ADULT
Size Costume
ONE SIZE FITS MOST

Guidelines for Reasonable and Appropriate Care in the Emergency Department (GRACE-4): Alcohol Use Disorder and Cannabinoid Hyperemesis Syndrome Management in the Emergency Department.

Borgundvaag B, et al. *Acad Emerg Med*. May, 2024;31(5):425-455.

GRACE-4

- SAEM GRACE Team focused upon alcohol withdrawal syndrome (AWS), alcohol use disorder (AUD), and cannabinoid hyperemesis disorder (CHD).
- Focuses their efforts on a series of PICO questions and review of the topics.
  - Literature and group rating of the available evidence
  - Ranked the literature based upon quality of the evidence based upon the lowest quality of critical outcomes.
  - Guidelines are then formulated.

GRACE-4

- In adult patients (over the age of 18) with moderate to severe alcohol withdrawal in the ED, is phenobarbital (by any route or dose) in addition to benzodiazepines (by any route) lead to improvement in outcomes?
  - Use phenobarbital in addition to benzodiazepines compared to using benzodiazepines alone. (Conditional recommendation, FOR; very low to low certainty of evidence).
  - Multiple retrospective studies from non-ED settings found using phenobarbital with benzodiazepines resulted in a decreased need for intubation and ICU utilization.
  - A small RCT found a single dose of 10 mg/kg of phenobarbital plus symptom-driven lorazepam led to significant decreases in patients admitted to an ICU from 25% to 8% (NNT = 6).

GRACE-4

- In patients 18 years of age or older who present to the ED with AUD who are discharged home, does the prescription of an anticraving medication, compared to no prescription, improve outcomes?
  - Suggest a prescription for an anticraving medication for the management of AUD for patients who desire alcohol cessation. (Conditional recommendation, FOR; very low to low certainty of evidence).
  - Naltrexone is associated with increased abstinence from alcohol, decreased binge drinking, decreased heavy drinking days, lower risk of hospitalization due to any alcohol related causes, and higher follow up rates in formal substance use disorder treatment.
  - Acamprosate compared to placebo had an increased probability of abstinence at 12 months.

GRACE-4

- In patients 18 years of age or older who present to the ED and are suspected to have CHS, does the use of dopamine antagonists (e.g., haloperidol, droperidol) or capsaicin compared to usual care (or no treatment) lead to improved outcomes?
  - Suggest the use of haloperidol or droperidol (in addition to usual care/serotonin antagonists, e.g., ondansetron) to help with symptom management. (Conditional, FOR; very low certainty of evidence)
  - Suggest offering the use of topical capsaicin (in addition to usual care/serotonin antagonists, e.g. ondansetron) to help with symptom management. (Conditional, FOR; very low certainty of evidence)."

GRACE-4

- Recommendations:
  - AS stated.


using this meme format
making a stats version
p > .05
p < .05

Summary

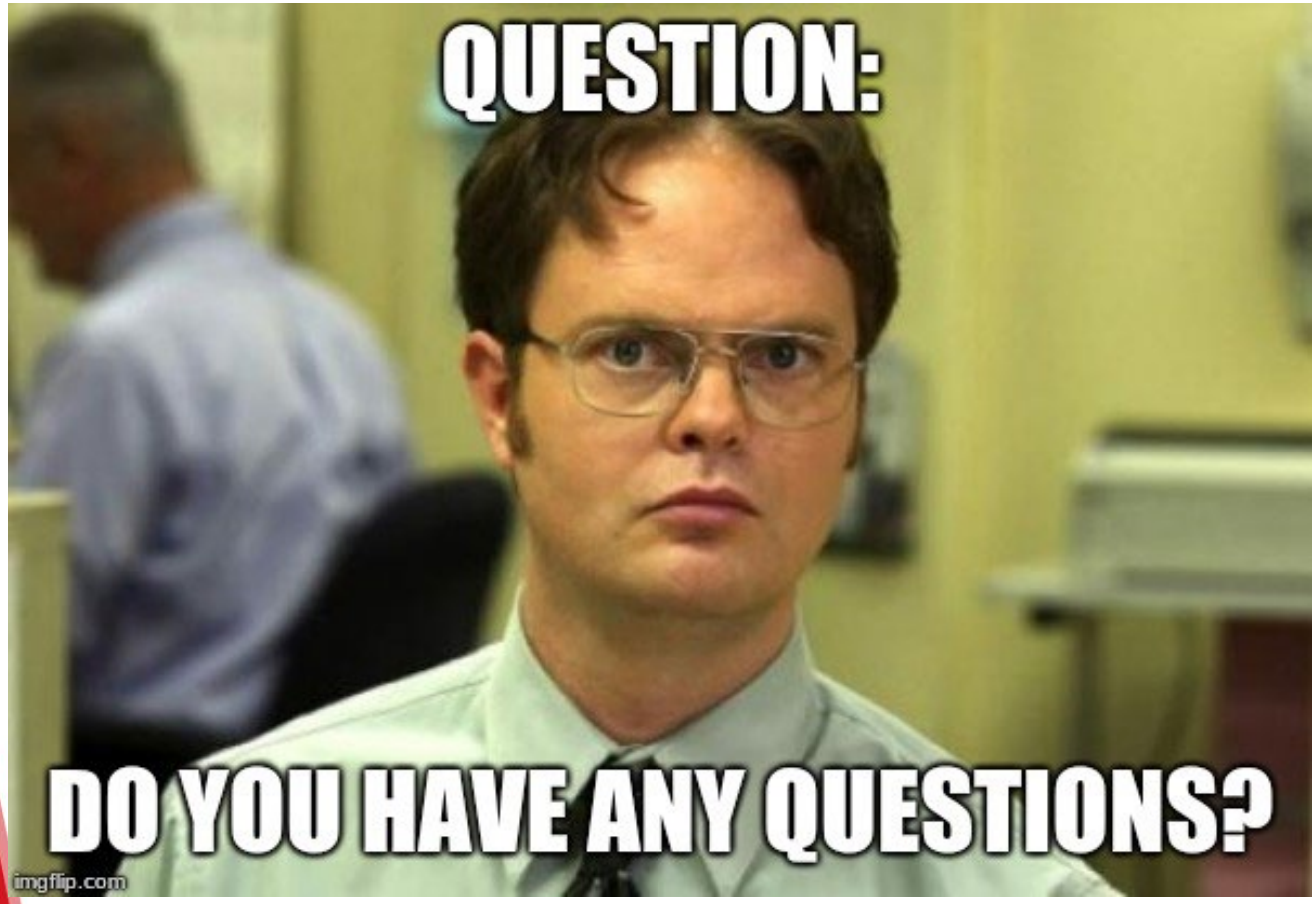
- ✓ Small bore chest tubes improved drainage and had less complications that larger bore chest tubes.
- ✓ Nasally administered epinephrine had higher and more sustained concentrations than IM epinephrine.
- ✓ Olanzipine is fine to add to benzodiazepine, even in those with alcohol or illicits onboard.
- ✓ IO did not improve 30 day outcomes compared to IV in patients with OOHCA.

Summary

- ✓ Tenecteplase wins over Alteplase when treating strokes <4.5 hours.
- ✓ Have a low threshold in neuroimaging infants <3 months with head trauma.
- ✓ Phoenix criteria is useful when diagnosing pediatric sepsis (not for screening for sepsis).

Summary

- ✓ We should be using some form of PPV/PEEP for preoxygenation in critically ill patients needing intubation.
- ✓ VL is better than DL in the ED and ICU setting but not the prehospital setting.
- ✓ Grace-4 addresses recommendations for AWS, AUD and CHS


QUESTION:
DO YOU HAVE ANY QUESTIONS?
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