Myths in Medicine

Mythbusters

Kevin M. Klauer, DO, EJD, FACOEP, FACEP
CEO, American Osteopathic Association
Clinical Asst. Professor, University of Tennessee
Clinical Asst. Professor, Michigan State University University
College of Osteopathic Medicine
No Conflicts of Interest

- 40 Large North American Children’s Hospitals
- 2006-2008: 0-17 yrs
- Ovarian torsion v. Testicular torsion
  - Testicular: 0.03% (0.02%-0.09%)
  - Ovarian: 0.02% (0.01%-0.06%)
- Mean time of presentation: 36 hrs v. 72 hrs
- Imaging request to completion: 0.77 hrs v. 1.86 hrs
- Median time from Dx to Srgy: 2.3 hrs v. 6.3 hrs
- Salvage rate: 30% v. 14%
TOPICS

- LBP Myths
- Lactate v. HCO3?
- Orthostatic B.S.
- PCN All and Cephalosporins
- Water Your Stones
- Torsion: O v. T
- ETOH Levels
- Protect My Lungs
- ICH and BP Control
- Kayexalate Isn’t So Great
- A Cool ECG Pearl
- Contrast Allergies
- Let’s Be Prehn’s
- MB = Marker Bust
- D-dimer: Adjusted
- LR v. NS
- SVT is Benign?
- I (eye) + Anesthetics
- Are you Inferior?
- tPA and Intracranial Aneurysms

- Univ of TN
- Conditions with ST depression that may benefit from emergency reperfusion
- Diffuse ST-depression with ST-elevation in aVR
  - left main occlusion
  - proximal left anterior descending artery occlusion
  - MI in the setting of severe multi-vessel coronary artery disease
• Type 1 (A) (76%)
  – Deep symmetrically inverted T waves in precordial leads V2-V3

• Type 2(B) (24%)
  – Biphasic T waves in V2-V3 identified as a distinctive upsloping followed by a sharp downslope that differs from T-wave inversion due to other etiologies

- Univ of MD and Johns Hopkins
- Systematic review: 27 articles
- Cephalosporins in PCN allergic Pts
- PCN allergy in those reporting PCN allergy – < 10%
- Anaphylaxis after PCN: .015% to .004%
- Cross reactivity: 1% and 2.55%
- R1 side chain: 1st & 2nd generations (cefadroxil, cefatrizine, cephalexin, cephradine, cefaclor (2nd), and cefprozil (2nd).
- 3rd, 4th and 5th generation: Negligible
Orthostatic VS

Annals of Emergency Medicine
Volume 20, Issue 6, Pages 606-610, June 1991

132 euvolemic, patients

Wide variation in Orthostatic vital signs

HR range ↓ 5.0 to ↑ 39.4; SBP: ↓ 20 to ↑ 25.7; DBP: ↓ 6.4 to ↑ 24.9; 43% were “positive”
Orthostatic VS

Ability to predict intravascular depletion?


100 Blood donors v. 100 non donors

Alone: HR > 20/min most sensitive: 9%

HR > 20 or DBP decrease of 10, Sensitivity: 17%

Age: No clinically important differences

No combo of Ortho VS (spec 95%) sensitive to detect 450 cc blood loss
Shellfish?

- “Iodine is not an allergen!”
- Seafood = other food allergies and asthma
- Prior contrast reaction = 7-17% risk
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Iodine Content

- Beef: 173 mcg/kg
- Shrimp: 1000 mcg/kg
- Chikin: 1248 mcg/kg
Hydration and Stones

  1 Article: No difference in pain, surgical removal rates or cystoscopy rates
  58 Pts
  20ml/hr v. 1 L/hr x 2 hours
  No difference: Hourly pain scores, Opioid analgesic use or Passage rates
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Cremasteric reflex absent in 30% of normal individuals

Cremasteric reflex is absent in 25% with epididymitis

Mellick, L.B. (2012). Torsion of the testicle: it is time to stop tossing the dice. *Pediatric emergency care, 28 (1),* 80-6, January 2012.
CPK MB?

Luepker R.V., Apple F.S., Christenson R.H.. et al. Case definitions for acute coronary heart disease in epidemiology and clinical research studies: a statement from the AHA Council on Epidemiology and Prevention; AHA Statistics Committee; World Heart Federation Council on Epidemiology and Prevention; the European Society of Cardiology Working Group on Epidemiology and Prevention; Centers for Disease Control and Prevention; and the National Heart, Lung, and Blood Institute, Circulation 2003 108 () 2543-2549

- 12%-39%: Negative MBs with Positive Troponins
**ETOH: What’s Your Level?**


- **Cutoffs:** Do not account for individual tolerance and metabolic rates of clearance.
- **Alcohol-tolerant individuals:** BACs do not correlate with clinical assessments.
- **Dose-dependent effect of alcohol on humans:** there are far too many variables
“Attempting to relate observed signs of alcohol intoxication or impairment, or to evaluate sobriety, by quantifying blood alcohol levels can be misleading, if not impossible.”
• ARDS: Fatal in 40% of cases
• Univ of MD
• 34 Pts: Retrospective ED Cohort: 2009-2011
• ARDS within 48 hours of hospital admission
• Exceeded by a mean of 80 ml or 1.5ml/kg
  – 5 pts were correct at outset
  – 14: Never met
1. Tidal volumes of 6-8 ml/kg
2. Use of predicted body weight based on height and gender not actual patient weight
3. Predicted body weight can be estimated as:
   - Men: $50 + 0.91 \times (\text{height (cm)} - 152.4 \text{ cm})$
   - Women: $45.5 + 0.91 \times (\text{height (cm)} - 152.4 \text{ cm})$
4. Static inspiratory pressures of less than 30 cm H2O PLATEAU
5. Initial PEEP of 8 cm H2O or greater (avoid atelectasis with lower TV)
6. FiO2 < 60%
7. Respiratory rates of 20-30 breaths per minute to counteract low tidal volumes


Age-Adjusted = Age x 10 (above 50 yrs)

Age >75 years + unlikely probability + Age-adjusted D-dimer

Excluded PE: 6.4% to 29.7% No additional false-negatives

Traditional Clinical Trial: Superiority

“A new treatment is compared with a standard treatment or placebo with the goal of demonstrating that the new treatment has greater efficacy. The null hypothesis for such a trial is that the 2 treatments have the same effect. Rejection of this hypothesis, implying that the effects are different, is signaled by a statistically significant P value or, alternatively, by a 2-tailed confidence interval that excludes no effect.

“…intervention being evaluated achieves the efficacy of the established therapy within a predetermined acceptable noninferiority margin.”

Noninferiority Margin: Subjective

Appy: Surgical v. Antibx

\[ \text{NIM: } -24\% \]

\[ \text{Sx Tx efficacy (presumed): } 99\% \]

\[ \text{Actual: } 99.6\% \text{ v. } 72.7\%(\text{CI } 95\% \text{ -31.6\% to infinity}) \]

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• Systematic review
• Safety of proparacaine and tetracaine for corneal abrasions
  – 2 DBRCT ED (149 Pts)
    1: 33 Pts Tx with 0.05% proparacaine v. placebo: Improved pain
    2: 119 Pts Tx with 0.5% tetracaine v. placebo: No diff in pain scores
  Pt-rated effectiveness
  – 4 in Photorefractive Keratectomy (141 Pts)
• 6 studies: No diff in wound healing or complications; 1 Week

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IMPACT OF COMMON CRYSTALLOID SOLUTIONS ON RESUSCITATION MARKERS FOLLOWING CLASS I HEMORRHAGE: A RANDOMIZED CONTROL TRIAL


- 157 Pts: Prospective RCT
- Class 1 hemorrhage: <15% of blood volume (500 ml blood loss)
- 3 arms: 2L NS v. 2L LR v. Controls
- Sampling: Base deficit and Lactate
  - Post donation: All groups = Lactate 1.05-1.10
  - Post intervention: Mean Lactate: 1.54; 1.0; 1.36 (no IVF)
  - Base Deficit: NS 10x that of LR and 5x that of no IVF
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MYTHS IN EMERGENCY MEDICINE
Rooted in culture, based on tradition

Myth: Normal Saline is the IV Fluid of Choice
Which fluid is superior, normal (0.9%) saline or balanced crystalloids (i.e., lactated Ringer’s)? Balanced fluids, in theory, are defined as fluids that norms are physiologic in several parameters when compared to normal saline (NS).

It appears we have a critical mass of sufficient evidence suggesting NS needs to take a back seat to lactated Ringer’s (LR).

LR has been criticized for being physiologically hypotonic, (reduced “actual osmolarity” or toxicity) and thus may diffuse to extracellular spaces too quickly, limiting their effectiveness for volume expansion. Such diffusion results in intracranial pressure (i.e., solutions and their associated osmotic coefficients). As an example, sodium and chloride only partially dissociate when dissolved and thus the solutions are only partially osmotically active (osmotic coefficient 0.93), The osmolarity of 0.9% NaCl is 306 mOsm/l, but its actual osmolarity is 306 mOsm/l (1.0). The osmolarity of LR is 273 mOsm/l, but its actual osmolarity is 254 mOsm/l.

This difference in toxicity may result in a shorter half-life for LR.

Kabat et al reported, “The T1/2 for crystalloids is usually 20 to 40 min in conscious humans but may extend to 60 min or longer in the presence of preoperative stress, dehydration, blood loss of 50% or pregnancy.”

In addition, published data from 20 healthy male subjects, noting the half-life for NS and LR was 20 min and 50 min, respectively. The data is not without significant limitations. However, it does imply a longer half-life for NS, which is threatened to be, in part, from the renal vasodilation from the high chloride content of NS.”

Although the individual properties of the fluids (i.e., toxicity) cannot be isolated, outcomes appear to be better with balanced fluids. For instance, a meta-analysis of 14 randomized controlled trials including 8656 patients treated for sepsis noted a mortality benefit...
“Recently, a phase III randomized controlled trial (INTERACT2) was published comparing early aggressive SBP goal of < 140 mm Hg versus conservative SBP control < 180 mm Hg. Results of this study suggested that aggressive SBP control led to a 13% reduction in poor outcome (defined as modified Rankin Scale 3–6) and a trend toward a decrease in hematoma growth, although both of these outcomes did not reach statistical significance”
Lowering the blood pressure (BP) reduces hematoma expansion but increases the risk of brain tissue ischemia. A **target systolic BP of 140 mmHg is probably safe** when the presenting systolic BP is 150-220 mmHg.
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Anderson Interact 2: “In patients with intracerebral hemorrhage, intensive lowering of blood pressure did not result in a significant reduction in the rate of the primary outcome of death or severe disability.”
Prospective, observational study that included 1,398 acute ischemic stroke patients who received IV thrombolysis and underwent neurovascular imaging.

Multicenter study, 3.0% of patients had unruptured intracranial aneurysms. There was only one case of symptomatic intracranial hemorrhage and it was not due to aneurysmal rupture. The in-hospital mortality rate was 2.4%. Favorable functional outcomes occurred in 50%. In the comprehensive meta-analysis of 120 patients with aneurysms treated with thrombolysis, symptomatic hemorrhage occurred in 6.7%, and the relative risk in these patients was not different from patients without intracranial aneurysms.
• Hyperkalemia in 43 patients, acute kidney injury in 69 patients
• Overall mean index serum potassium level was 5.8mEq/L
• First drug to be administered for hyperkalemia in 60.3%
• Avg time of 8.45 hours from the start of treatment, the mean first serum potassium was 4.87mEq/L
• 10 cases of new-onset hypernatremia, 31 cases of new-onset hypokalemia, 2 cases of new-onset bowel necrosis, 25 cases of nausea or vomiting, and 6 cases of hypoglycemia
CO2/Bicarb

- AG
- CO2
- Lactate
CO2/Bicarb

- AG
- CO2
- Lactate

22.2% v. 25% for 4.0-6.9 mmol/L
• **Standard:** Low back pain resolves within 6 weeks which has prompted conservative management.

• **May persist at 1 yr in 42%-75% of Pts with acute low back pain.**

• **Dutch Systematic Review**
  - 11 Prospective studies (1990-2010)
  - 3,118 adult primary care patients
  - Onset within 3 months
  - Objective: Assess rates of persistent pain at 1 year
  - 1 month:  80%; 2 months:  67%; 3 months:  65%; 1 yr. (71% for total absence of pain 57% for partial)
Compression of the sciatic nerve by the piriformis muscle (possibly caused by gluteal trauma that is often mild)

Sciatic nerve may pass through the piriformis muscle rather than above or below it

6-8%: Common cause of persistent sciatica (not responding to spine-centered care)

Sxs: Gluteal pain with or without ipsilateral radiation, from sacrum to greater trochanter or down the posterior thigh to the knee.

Prolonged sitting exacerbates the pain

Signs: Leg length discrepancy, Tenderness over the sciatic notch, atrophy of the gluteus maximus, Dysesthesia of the posterior thigh, Rectal wall tenderness

Tx: Piriformis stretching exercises, massage, heat, ultrasound, nonsteroidal anti-inflammatory drugs (NSAIDs) and “muscle relaxants,” injection with anesthetics and steroids.