Things We Do For No Reason
AL/MS ACP Meeting
Winter Williams, MD
6/4/22
Disclosures

• None
Roadmap

- Background
- High Value Cases

01 Mythbusters
02 Take Homes
Background

Value = \frac{Quality}{Cost}

Value can be increased by increasing quality while maintaining cost or by reducing cost while maintaining quality.
Six Categories of Healthcare Waste: New Data Updates Previous Findings

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Note: Figure uses mid-point estimates to contrast the contribution of each category of waste.
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Things We Do For No Reason
Case #1

• During bedside rounds, your intern presents a new patient with acute cholecystitis who has been NPO since midnight for the OR today.

• As they do so, your patient speaks up and says: “What do you mean ‘nothing by mouth’?”
How Do You Respond?

A. You can go ahead to surgery this morning.
B. Let’s delay surgery until the afternoon.
C. Let’s put off surgery until tomorrow.
D. Hmm, let me go give my intern some “feedback.”
E. We don’t have OR tech’s anyway, so just call IR for a drain…
**CHOOSING WISELY®: THINGS WE DO FOR NO REASON™**

**Things We Do for No Reason™: NPO After Midnight**

Meghan KM Black, MD¹, M Concetta Lupa, MD³, Laura W Lemley, MD⁴, Elizabeth B Dreesen, MD, FACS⁵, Alyssa M Deaton, MD, MPH⁶, Richard M Wardrop III, MD, PhD, FAAP, FACP⁷,⁸⁺

¹Division of General Internal Medicine, Department of Medicine, University of Alabama at Birmingham, Birmingham, Alabama; ²Section of General Internal Medicine, Birmingham VA Medical Center, Birmingham, Alabama; ³Departments of Anesthesiology and Pediatrics, University of North Carolina, Chapel Hill, North Carolina; ⁴Department of Pediatrics, North Carolina Children’s Hospital, UNC Health Care, Chapel Hill, North Carolina; ⁵Division of General and Acute Care Surgery, Department of Surgery, University of North Carolina, Chapel Hill, North Carolina; ⁶Department of Internal Medicine, UNC Health Care, Chapel Hill, North Carolina; ⁷Department of Medicine, University of Mississippi Medical Center, Jackson, Mississippi; ⁸Division of Hospital Medicine, St. Dominic’s Hospital, Jackson, Mississippi

Why You May be Tempted

• 1946 case series of 66 women who aspirated during delivery under general anesthesia
• Commonly done; often default in some EMR order sets
• Complex procedural scheduling
• Timing and efficiency pressures
Why to Reconsider

- Gastric emptying studies show that clear liquid transit is virtually complete within 2 hours, regardless of age or BMI.

- Cochrane review:
  - No difference in gastric volumes/stomach pH with standard fast vs. shortened liquid fast
  - Consuming fluids >90 mins pre-op confers negligible risk (0 events in 9 studies)

- Pediatric retrospective review: only 0.04% of emergency surgery patients aspirated; majority (54%) had bowel obstruction or ileus.

- ASA guidelines changed in 1998 to allow clear liquids until 2 hours preop for low-aspiration-risk patients.
  - Water, juice, black coffee, tea, clear carbohydrate drinks
Ensure® Pre-Surgery Clear Carbohydrate Drink

Formulated to help your body prepare for, and recover from, surgery

Each bottle of Ensure Pre-Surgery Clear Carbohydrate Drink, from the #1 doctor-recommended brand* Ensure, is formulated with carbohydrates and antioxidants to help your body prepare for, and recover from, surgery. Every drink has:

- 50 grams carbohydrates
- Antioxidants: zinc, selenium
- 200 calories
- Refreshing strawberry flavor

Additional information:

- Gluten-free
- Suitable for lactose intolerance†
- Halal
- Kosher

How to use:

- Drink 2 bottles the night before surgery during your fasting window, before you go to sleep for the night
- Drink 1 bottle the morning of surgery, up to 2 hours before surgery
Harms of Prolonged NPO

- Greater hunger, thirst, tiredness, weakness

- Pre-op carbohydrate-rich drinks associated with:
  - Decreased peri-operative insulin resistance
  - Decreased LOS
  - Improved peri-operative metabolic, cardiac, psychosomatic status

When Longer NPO times ARE Appropriate

- Conditions that delay gastric emptying increase the risk of aspiration/regurgitation and include:
  - Bowel obstruction
  - Lower esophageal sphincter incompetence
  - Gastroparesis
  - Trauma
  - Pregnancy

## Moving Beyond “NPO at Midnight”

<table>
<thead>
<tr>
<th>Healthy Patient of Any Age</th>
<th>Undergoing Elective Procedure</th>
<th>General or Regional Anesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i.e., not diabetic, obese, pregnant, ileus/5BO, difficult airway)</td>
<td>(i.e., not emergent)</td>
<td>(i.e., not merely local anesthesia)</td>
</tr>
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### Allowable Food or Beverage

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<th>Allowable Food or Beverage</th>
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<td>&gt;8</td>
<td>Heavy foods (fried/fatty) and meats</td>
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</table>
| 6            | Light meal (e.g., toast + clear liquid)  
               | Cow's milk (in moderation)  
               | Infant formula |
| 4            | Breast milk |
| 2            | Non-alcoholic clear liquids  (e.g., water, fruit juice without pulp, nutritional drinks, clear tea, black coffee) |
| 0-2          | NPO |

### Benefits of Clear Liquids up to 2 hours Pre-Op

- LESS patient thirst and hunger
- LOWER risk of aspiration

How Do You Respond?

A. You can go ahead to surgery this morning.
B. Let’s delay surgery until the afternoon.
C. Let’s put off surgery until tomorrow.
D. Hmm, let me go give my intern some “feedback.”
E. We don’t have OR techs anyway, so let’s just call IR for a drain…
Quick Aside – What About Bowel Prep?

- **Traditional colonoscopy dogma:**
  - Clear liquids for 1-2 days + 1-gallon GoLytely = misery

- **RCT of Low-Residue vs Clear Liquid Diet:**
  - LRD group had better bowel prep (81% vs 52%, p< 0.001)
  - Less Nausea p<.05, vomiting p< .01, headache p<.01, weakness p<.01, hunger p<.01

- **LRD vs CLD MetaAnalysis:**
  - LRD and CLD comparable bowel prep adequacy & polyp detection
  - Less nausea (p<.02), vomiting(p<.04), hunger (P<.001), headache (p<.02) with LRD
  - Higher patient satisfaction; increased willingness to repeat it (P >.005; OR, 2.23; 95% CI, 1.283.89)

**Gastrointest Endosc. 2020 Sep;92(3):508-518.
Quick Aside – What About Bowel Prep?

• Prospective Trial of Real-World Bowel Prep Effectiveness (n=4,339)

• More likely to be completed than GoLYTELY
  • SuPrep (p<.001)
  • MoviPrep (p<.001)
  • Miralax + Gatorade (p<.001)

• Superior to GoLYTELY for bowel cleansing:
  • SuPrep (P<.001)
  • MoviPrep (p<.004)
  • Miralax + Gatorade (P<.001)

“Bottom” Line

• Clear liquids > NPO for low-aspiration risk patients before surgery
• Low-residue diet > Clear liquids before colonoscopy
• Low volume colon prep > GoLYTELY prep
Case #2

• 88-yo F with dementia presents with acute dyspnea following 2 days of GI illness associated with nausea, vomiting, and diarrhea.
• T: 101.2, HR 108, BP 126/74, O2 sat 94% on 4L NC
• Exam: Edentulous, bibasilar lung crackles, abdomen nontender.
• Labs/Imaging: leukocytosis; CXR with R>L bibasilar opacities.

• With a presumed Dx of aspiration PNA, your medical student asks if we need to cover anaerobes.
How Do You Respond?

A. Yes – we might as well give “the Vosyn”
B. Yes – she’s sick; let’s cover everything – Vanc/Zosyn/Azithro
C. No – CAP gets CTX/Azithro
D. No – unless she has an abscess or empyema

88-yo F with acute dyspnea, sepsis, and CXR with bibasilar opacities.
CHOOSING WISELY: THINGS WE DO FOR NO REASON

Things We Do for No Reason™: Routine Coverage of Anaerobes in Aspiration Pneumonia

J Hosp Med. Published Online First September 23, 2020. DOI: 10.12788/jhm.3506 | 10.12788/jhm.3506
Aspiration

- Inhalation of gastric or oropharyngeal contents into the lung – can be micro, macro, or both.
- When to suspect: witnessed aspiration, dysphagia, diminished cough, infiltrates in dependent lung segments.

- Important to distinguish aspiration PNA from pneumonitis
  - Pneumonitis: non-infectious ALI within hours of event
  - Asp PNA: gradual onset, typical signs of PNA
Why You May be Tempted

• Anaerobes live in the mouth (especially plaques)
• Several studies (in 1970’s) established anaerobes as major pathogen in pt’s thought to be at risk of aspiration (EtOH, drugs, Sz disorder)
  • However, most had significant pleuropulmonary disease (ex. 70% had abscess or necrosis)
• It is commonly done…

Anaerobic antibiotic usage for pneumonia in the medical intensive care unit
Why to Avoid

The Epi has changed:

- Population: NH residents, cognitive impairment, tube feeds, dysphagia, and GI motility disorders
- Bacteria: aerobes > anaerobes
- Anaerobic bacteria infrequently isolated and usually occur with aerobes

AP can be treated without anaerobic coverage:

- In uncomplicated AP, severity of illness lower and anaerobes play insignificant role in pathogenesis
- Elimination of aerobic pathogens alters local redox-potential which also treats anaerobes
Harms of anaerobic coverage:

- Targeting anaerobes can result in gut dysbiosis because they are majority of gut bacteria
- Increased incidence of VRE and resistant gram-negatives with the empiric use of anaerobic antibiotics
- High incidence of *C. diff* infections among patients receiving clindamycin/carbapenems.

References:

When You Should Cover Anaerobes

- Lung abscess
- Necrotizing pneumonia
- Empyema
- Severe periodontal disease
- Putrid/malodorous sputum production

Important Caveat: often takes 8-14 days before abscess/empyema develop after aspiration
FIG. Algorithm for Antibiotic Selection in Suspected Aspiration Pneumonia. Antibiotic selection for suspected aspiration pneumonia is based on clinical findings plus risk factors and radiographic findings.
How Do You Respond?

A. Yes – we might as well give “the Vosyn”
B. Yes – she’s sick; let’s cover everything – Vanc/Zosyn/Azithro
C. No – CAP gets CTX/Azithro every time
D. No – unless she has an abscess or empyema

88-yo F with acute dyspnea, sepsis, and CXR with bibasilar opacities.
Case #3

65 yo with obesity, HTN, HLD presents with 1 day of RLE pain, swelling, and redness. Admitted for IV antibiotics.

Temp: 100°F HR 89, BP 135/76
PE: RLE erythema and swelling from right leg from ankle to below knee
Labs: WBC: 11K

What is the most appropriate antibiotic regimen?
A. Cefazolin
B. Vancomycin
C. Vancomycin and Pip/Tazo
D. Vancomycin and cefepime

Slides courtesy of Dr. Ryan Kraemer
Overtreatment of Nonpurulent Cellulitis

- Non-purulent SSTI
  - Most common pathogen

- Purulent SSTI
  - Most common pathogen

- B-hemolytic streptococci

- Staph Aureus
Randomized, double-blind trial

- 153 patients with cellulitis but no abscess, DM, or immunosuppression

Cephalexin & Placebo  Cephalexin & Bactrim

Randomized, double-blind trial

- 153 patients with cellulitis but no abscess, DM, or immunosuppression

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<td>Cephalexin &amp; Placebo</td>
<td>82%</td>
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<tr>
<td>Cephalexin &amp; Bactrim</td>
<td>85%</td>
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P = 0.66
Effect of Cephalexin Plus Trimethoprim-Sulfamethoxazole vs Cephalexin Alone on Clinical Cure of Uncomplicated Cellulitis: A Randomized Clinical Trial

Gregory J. Moran, MD; Amuche Chukwudumel, PhD; William R. Mower, MD, PhD; Fredrick M. Abouharb, DO; Francis Lolaiacchio, DO; Mark T. Steele, MD; Richard E. Rothman, MD, PhD; David J. Karras, MD; Rebecca Hospgold, MS; Stephanie Pettitbon, BS; David A. Islam, MD

Importance
Emergency department visits for skin infections in the United States have increased with the emergence of methicillin-resistant Staphylococcus aureus (MRSA). For cellulitis without purulent drainage, β-lactam-resistant Staphylococcus aureus (MRSA) are presumed to be the predominant pathogens. It is unknown if antimicrobial regimens possessing in vitro MRSA activity provide improved outcomes compared with treatments lacking MRSA activity.

Objective
To determine whether cephalexin plus trimethoprim-sulfamethoxazole yields a higher clinical cure rate of uncomplicated cellulitis than cephalexin alone.

Design, Setting, and Participants
Multicenter, double-blind, randomized superiority trial in 5 US emergency departments among outpatients older than 12 years with cellulitis and no wound, purulent drainage, or abscess enrolled from April 2009 through June 2012. All participants had soft tissue ultrasound performed at the time of enrollment to exclude abscess. Final follow-up was August 2012.

Interventions
Cephalexin, 500 mg 4 times daily, plus trimethoprim-sulfamethoxazole, 320 mg/1600 mg twice daily, for 7 days (n = 248 participants) or cephalexin plus placebo for 7 days (n = 248 participants).

Main Outcomes and Measures
The primary outcome determined a priori in the per-protocol group was clinical cure, defined as absence of these clinical failure criteria at follow-up visit: fever; increase in erythema (>50%); swelling, or tenderness (days 3-4); no decrease in erythema, swelling, or tenderness (days 8-10); and more than minimal erythema, swelling, or tenderness (days 14-21). A clinically significant difference was defined as greater than 10%.

Results
Among 500 randomized participants, 496 (99%) were included in the modified intention-to-treat analysis and 411 (82.2%) in the per-protocol analysis (median age, 40 years; range, 15-97 years). 50.4% male, 10.9% had diabetes. Median length and width of erythema were 13.0 cm and 10.0 cm. In the per-protocol population, clinical cure occurred in 182 (83.5%) of 218 participants in the cephalexin plus trimethoprim-sulfamethoxazole group and 155 (85.5%) of 183 in the cephalexin group (difference, −2.0%; 95% CI: −9.7% to 5.7%; P = .50). In the modified intention-to-treat population, clinical cure occurred in 189 (78.2%) of 248 participants in the cephalexin plus trimethoprim-sulfamethoxazole group and 160 (89.0%) of 181 in the cephalexin group (difference, 7.8%; 95% CI: −1.0% to 15.5%; P = .27). Between-group adverse event rates and secondary outcomes through 7 to 9 weeks, including overnight hospitalization.

Editorial
May 23/30, 2017
Empirical MRSA Coverage for Nonpurulent Cellulitis Swinging the Pendulum Away From Routine Use

Emily K. Shuman, MD; Preeti N. Malani, MD, MS


Inpatient Management of Uncomplicated Skin and Soft Tissue Infections in 34 Veterans Affairs Medical Centers: A Medication Use Evaluation

Jesse D. Sutton,1,2,3 Ronald Correa,4 Muriel Burk,5 Makoto M. Jones,1,2,3 Xiangming Wei,1,2,3 Melinda M. Nechaeus,1,2 Matthew Bidwell Coetzee,5,6 Kelly E. Ebchevarir,3 Emily S. Spink,2,3 and Francesca E. Cunningham5,6 for the Skin and Soft Tissue Infection Medication Use Evaluation Group

Veterans Affairs Salt Lake City Healthcare System, Salt Lake City, Utah, USA; VA Salt Lake City Informatics Decision-Enhancement and Analytic Sciences Center (IDEAS 2), Salt Lake City, Utah, USA; VA Primary Healthcare Management Services, Miami VA, Miami, Florida, USA; VA Primary Healthcare Management Services, Hines VA, Hines, Illinois, USA; Department of Medicine, Division of Epidemiology, University of Utah School of Medicine, Salt Lake City, Utah, USA; Veterans Affairs Greater Los Angeles Healthcare System, Los Angeles, California, USA; David Geffen School of Medicine at University of California Los Angeles, Los Angeles, California, USA; and Department of Medicine, Division of Infectious Diseases, University of Utah School of Medicine, Salt Lake City, Utah, USA.

Background. Skin and soft tissue infections (SSTIs) are a key antimicrobial stewardship target because they are a common infection in hospitalized patients, and non-guideline-concordant antibiotic use is frequent. To inform antimicrobial stewardship interventions, we evaluated the proportion of veterans hospitalized with SSTIs who received guideline-concordant empiric antibiotics or an appropriate total duration of antibiotics.

Methods. A retrospective medication use evaluation was performed in 34 Veterans Affairs Medical Centers between 2016 and 2017. Hospitalized patients who received antibiotics for uncomplicated SSTI were included. Exclusion criteria were complicated SSTI, severe immunosuppression, and antibiotics for any non-SSTI indication. Data were collected by manual chart review. The primary outcome was the proportion of patients receiving both guideline-concordant empiric antibiotics and appropriate treatment duration, defined as 5-10 days of antibiotics. Data were analyzed and reported using descriptive statistics.

Results. Of the 3890 patients manually evaluated for inclusion, 1828 patients met inclusion criteria. There were 1299 nonpurulent (71%) and 529 purulent SSTIs (29%). Overall, 250 patients (14%) received guideline-concordant empiric therapy and an appropriate duration. The most common reason for non-guideline-concordance was receipt of antibiotics targeting methicillin-resistant Staphylococcus aureus (MRSA) in 906 patients (70%) with a nonpurulent SSTI. Additionally, 819 patients (45%) received broad-spectrum Gram-negative coverage, and 860 patients (48%) received an antibiotic duration >10 days.

Conclusions. We identified 3 common opportunities to improve antibiotic use for patients hospitalized with uncomplicated SSTIs: use of anti-MRSA antibiotics in patients with nonpurulent SSTIs, use of broad-spectrum Gram-negative antibiotics, and prolonged durations of therapy.

Keywords. abscess; cellulitis; antibiotic stewardship; skin and soft tissue infections.

When Do I Need Broader Coverage?

MRSA + GNR COVERAGE

• Necrotizing soft tissue infections
• Immunocompromised patients
• Animal bites
• Failed limited spectrum antibiotics

MRSA COVERAGE

• Non-purulent + severe illness (fever, tachycardia, low BP)
• Nasal colonization with MRSA
• Penetrating trauma
• IVDU associated infections
Bottom Line

- If cellulitis not improved in 48 hours, consider change to broad-spectrum antibiotics

Practice Guidelines for the Diagnosis and Management of Skin and Soft Tissue Infections: 2014 update by the Infectious Diseases Society of America.
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MYTHBUSTERS
Can You Spot the Medical Myth?

A. Epinephrine should never be given in the fingers/toes.
B. Patients on Metronidazole cannot drink alcohol.
C. Pernicious anemia must be treated with B12 injections.
D. Narcotics should be avoided before surgical evaluation of acute abdomen.
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Quick Hits

• A review of 39 studies of Epinephrine digital blocks in fingers/toes found no cases of digital necrosis or gangrene.
  • Podiatrists and hand surgeons use routinely
• EtOH/Metro: based on case reports in 1960’s without evidence of elevated acetaldehyde levels.
  • More recent randomized trial of med students: no difference

Metronidazole does not inhibit acetaldehyde dehydrogenase, as occurs with disulfiram. Ethanol alone or ethanol-independent side effects of metronidazole might explain the suspicion of disulfiram-like effects. Thus, refraining from alcohol use while taking metronidazole (or tinidazole) is unnecessary. Clindamycin cream is oil based and...

• MMWR.2021;Jul 23:70(4):187
• https://acphospitalist.org/archives/2019/06/im-top-10-medical-myths-busted.htm
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• Myth from tiny oral doses in studies from the 1940’s and 50’s
  • Cochrane Review 2018: low-quality evidence that oral and IM B12 have similar effect to normalize B12 levels (oral B12 cheaper and easier to take)
  • Oral B12 also preferred for gastrectomy patients

• 100 patients randomized to either IM opiates or IM saline - surgeons felt equally confident in diagnostic and management decisions in both groups.
Take Homes

• Don’t:
  • Overtreat non-purulent cellulitis
  • Cover anaerobes unless abscess, empyema or necrosis

• Do:
  • Liberalize diets with clear liquids up to 2 hours before surgery if low risk
  • Prioritize low volume preps and low-residue diets
  • Look out for medical myths and things we do for no reason
Prescribing Docusate for Constipation in Hospitalized Adults

CHOOSING WISELY: THINGS WE DO FOR NO REASON

Why you think Docusate is helpful for constipation...

Why there is no reason to prescribe Docusate for Constipation...

What you should do instead...

- Early studies in 1950-60s established its use.
- Endorsement in formularies & order sets propagated its use.
- Multiple RCT have failed to show any significant efficacy of this drug over placebo.
- Prescribe agents that have been shown to work; PEG, psyllium & lactulose.

Fakheri RJ & Volpicelli FM. Feb 2019
Visual Abstract by @WrayCharles

Echocardiogram in Unselected Patients with Syncope

CHOOSING WISELY®: Things We Do For No Reason

Across studies, patients with normal cardiac history, exam, & EKG, echo found significant abnormalities...

- 0% in 3 studies
- 2% in 1 study
- 2.1% in 1 study
- 4.2% in 1 study

Given $1,000-$2,220 cost per study, routine echo in patient with normal findings would require:

$60,000-$132,000 in spending to find 1 new significant abnormality

Madiera CL et al. Dec 2017

Routine Chest Radiographs after Uncomplicated Thoracentesis

CHOOSING WISELY: Thing We Do For No Reason

Why you might think CXR are helpful after thoracentesis...

Why routine CXR after thoracentesis is not helpful...

- Prior to US-guided thoracentesis, complication (pneumothorax; PNX) rates ranged from 9-14%.
- When US-guidance is used, PNX rates are ~1% & if no symptoms following procedure - only 1% found to have a PNX.

Order CXR if patient has new chest pain, dyspnea, or persistent cough or if procedure had high risk features (multiple sticks, air aspiration, etc.)

2018
WrayCharles
Questions
Thank you!