Year in Review 2017-2018

- Updated literature
- March 2017* – March 2018

Process:
- CME collaborative review of journals
  - Including ACP J. Club, J. Watch, etc.
- Independent analysis of article quality
- Thank you to Brad Monash, Alfred Burger, Cynthia Cooper, Barbara Slawski

Year in Review 2017-2018

Chose articles based on 3 criteria:
1) Change your practice
2) Modify your practice
3) Confirm your practice

- Hope to not use the words:
  - Student's t-test, meta-regression, Mantel-Haenszel statistical method, etc.
  - Focus on breadth, not depth
Year in Review 2017-2018

Syllabus/Bookkeeping

- No conflicts of interest
- Final presentation available by email: sharpeb@medicine.ucsf.edu

Case Presentation

You are the attending and hearing about a holdover admission from the nightfloat.

She describes an 83 year-old woman with a history of chronic obstructive pulmonary disease (COPD) who presented with two days of shortness of breath and subjective fevers and then an acute syncopal episode.

She described mild shortness of breath and fevers and chills and then syncopized when walking to the bathroom at home.
Case Presentation

On examination, she was febrile, tachycardic, and hypoxic (86% on room air, 96% on 4 liters). She had crackles at the right base and diffuse wheezing and was alert and oriented.

Her white blood cell count was elevated and her chest x-ray showed a right lower lobe infiltrate. The nightfloat states she thinks this is community-acquired pneumonia and a COPD exacerbation and describes her plan for antibiotics, corticosteroids, and bronchodilators.

For the antibiotics, she says she has started ceftriaxone and doxycycline and will plan on treating for a total of 5 days.

She asks you, “For community-acquired pneumonia (CAP), do you think five days is enough for most patients?”

How do you respond to her question about the duration of antibiotics for community-acquired pneumonia?

Treatment Duration for CAP

How do you respond to her question about the treatment duration for CAP?

A. Usually it is just 3 days.
B. We usually do 5 days.
C. Most of the time it is 7 days.
D. Guidelines recommend 10 days.
E. Typically we do a full 14 days.
F. Do you think five days is enough?

Question: What is the optimal duration of antibiotics in patients hospitalized with CAP?

Design: Randomized, controlled; non-blinded, non-inferiority trial
Hospitalized for CAP, age > 18 years-old

- All patients treated for 5 days
- Randomized to stopping vs. continuing antibiotics

**Stop**
- No fever for 48h
- 0-1 abnormal vitals

**Continue**
- Duration determined by MD


Results

- A total of 312 patients, ~40% women, non-ICU
- Most received a fluoroquinolone (~80%)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>5 Days</th>
<th>Longer</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Success (10d)</td>
<td>56.3%</td>
<td>48.6%</td>
<td>0.18</td>
</tr>
<tr>
<td>Clinical Success (30d)</td>
<td>91.9%</td>
<td>88.6%</td>
<td>0.33</td>
</tr>
<tr>
<td>Mortality (30d)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median Duration of Abx</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Results

- A total of 312 patients, ~40% women, non-ICU
- Most received a fluoroquinolone (~80%)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>5 Days</th>
<th>Longer</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Success (10d)</td>
<td>56.3%</td>
<td>48.6%</td>
<td>0.18</td>
</tr>
<tr>
<td>Medical Success (30d)</td>
<td>91.9%</td>
<td>88.6%</td>
<td>0.33</td>
</tr>
<tr>
<td>Mortality (30d)</td>
<td>2.1%</td>
<td>2.2%</td>
<td>0.99</td>
</tr>
<tr>
<td>Median Duration of Abx</td>
<td>5 days</td>
<td>10 days</td>
<td>0.001</td>
</tr>
</tbody>
</table>

- A total of ~70% got 5 days in the intervention group
- No difference for sicker patients
- Readmissions at 30 days lower in shorter-course

Treatment Duration for CAP

Question: What is the optimal duration of antibiotics in patients hospitalized with CAP?
Design: Randomized, controlled; non-blinded; non-inferiority trial Hosp. for CAP, age > 18 yo
Conclusion: In CAP, if afebrile x 48h & stable vitals, 5 days non-inferior to longer course; No diff. in clinical outcomes; Less antibiotics
Comments: Well done RCT, generalizability? Confirms prior studies/guidelines For most patients, 5 days is enough Use your judgement, can treat longer

How do you respond to her question about the treatment duration for CAP?

A. Usually it is just 3 days.
B. We usually do 5 days.
C. Most of the time it is 7 days.
D. Guidelines recommend 10 days.
E. Typically we do a full 14 days.
F. Do you think five days is enough?
You both agree that it likely will be 5 days but will depend on how the patient responds to treatment.

The nightfloat finishes her presentation and you ask, “What did you think about the syncope?”

She pauses, rubs her chin, and says, “Well, I think it is probably orthostasis but she is short of breath. Do you think we need to worry about PE as a cause for her syncope?”

You respond that we probably don’t need to think about PE in this case given this was likely orthostatic hypotension based on the history.

You ask if orthostatics were performed before she received intravenous fluids. The nightfloat says they were “borderline” positive.

She asks, “Can you clarify how we’re supposed to do orthostatics? I have heard different things about how long you have to wait after the patient stands up.”

**Short Take: PE in Syncope**

- One meta-analysis and two retrospective studies
- Prevalence of PE in the setting of syncope is probably: 1-2%
- Multiple flaws with the prior study
- Consider PE as a cause for syncope
- A routine evaluation for PE in syncope is **not** warranted

Short Take: Orthostatic Vital Signs

- Prospective cohort study of 11,429 middle-aged adults (age 44-66 years)
- Orthostatic vital signs were checked every 30 seconds
- Orthostatic hypotension within one minute of standing was most strongly associated with:
  - Dizziness
  - Falls
  - Fracture
  - Syncope
  - Car crashes
  - Death


Case Presentation

You make this teaching point and the nightfloat finishes and leaves to get some sleep.

Later that day, you have a chance to review more of the patient’s history and see that she has a history of C diff infection.

She was in the hospital two weeks prior on broad-spectrum antibiotics for pyelonephritis and is on acid suppression.

Based on this, you feel like she is at very high risk for C diff as she is now hospitalized on antibiotics.

What can you do to prevent the development of C diff during this hospital stay?

A. Wash your hands with hand gel.
B. Use your own stethoscope but wash it with the little alcohol swab.
C. Start probiotics.
D. Start empiric fidaxomicin.
E. Donate some of your own stool for a fecal transplant.

Probiotics for C diff.

Question: What is the role for probiotics in the prevention of C difficile infection?

Design: Syst. review & meta-analysis of randomized, controlled trials

Probiotics vs. other to prevent C diff.

- Included any strain (16 types) & any dose of probiotic
- Some risk of bias in some studies

### Probiotics for C. difficile

- A total of 31 trials, 8672 patients

<table>
<thead>
<tr>
<th>Baseline Risk</th>
<th>Risk Ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2%</td>
<td>0.77</td>
<td>NS</td>
</tr>
<tr>
<td>3-5%</td>
<td>0.53</td>
<td>NS</td>
</tr>
<tr>
<td>&gt; 5%</td>
<td>0.30</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td></td>
<td>(3.1% v 11.6%)</td>
<td></td>
</tr>
</tbody>
</table>

#### Baseline Risk

- Antibiotic-associated diarrhea **less** in probiotics group
- Adverse events **lower** in probiotics group
- Detection of *C. difficile* in the stool was the same
- No difference with different probiotics
Probiotics for *C* diff.

**Question:** What is the role for probiotics in the prevention of *C* difficile infection?

**Design:** Syst. review & meta-analysis; probiotics vs. other to prevent *C* diff.

**Conclusion:** Probiotics prevent *C* diff main benefit in high-risk (>5%) patients
Less diarrhea, fewer side effects overall

**Comments:** Some risk of bias, moderate quality overall
Probiotics likely prevent *C* diff
Avoid in some patients (immunocompromised)
Unclear type or dose; cost-effectiveness?
Consider implementing protocols


What can you do to prevent the development of *C* diff during this hospital stay?

A. Wash your hands with hand gel
B. Use your own stethoscope but wash it with the little alcohol swab
C. Start probiotics
D. Start empiric fidaxomicin
E. Donate some of your own stool for a fecal transplant.

Case Presentation

You start probiotics and fortunately she does not develop *C* diff.

On the way home, you make a stool donation to the local “Stool Bank.”
Case Summary

Definitely

1. Recognize PE may **not** be that common in patients admitted with syncope.

Consider

1. Treating most patients with CAP for a total of 5 days of antibiotics.
2. Checking orthostatic vital signs at one minute.
3. Starting probiotics in patients at high-risk for *C diff.*
Case Presentation

A 78 year-old woman with a history of pancreatic cancer status-post biliary stent placement presented with fever and right upper quadrant pain.

She has severe sepsis based on her vitals and labs and you are worried about a biliary source.

In the ED, you order cultures, intravenous fluids, and antibiotics.

The ED nurse asks, “Hey, are you going to give her that Vitamin C cocktail as well?”

Case Presentation

You ask, “What Vitamin C cocktail is that?”

Short take: Hydrocortisone, Vit C, Thiamine

- Retrospective before-after study, 94 patients with severe sepsis or septic shock
- Half (47 pts) received hydrocortisone, vitamin C, and thiamine; 47 pts received usual care
  - Hospital mortality
    - Usual practice 40.4% (19/47)
    - Vitamin C cocktail 8.5% (4/47)
- SOFA scores decreased faster, less RRT for AKI, and they had shorter duration of vasopressors

Case Presentation
You decide to wait for more evidence. She is treated for severe sepsis with the usual care and receives biliary stent replacement.

On hospital day two, her blood cultures return positive for *E. coli*. Her fevers resolve and her vital signs stabilize.

The following morning you wonder if you need to order repeat blood cultures to make sure she has cleared the *E. coli*.

Do we need to repeat blood cultures in gram-negative rod bacteremia?
A. Yes, definitely.
B. Yes, but only if it is *Pseudomonas aeruginosa*.
C. Probably not under most circumstances.
D. No, never.
E. I’m not sure. Can I ask Alexa?

Cultures in GNR Bacteremia
Question: What is the value of follow-up blood cultures (FUBC) in GNR bacteremia?
Design: Retrospective analysis, 500 pts w/ true bacteremia; examined FUBC & predictors of persistent bacteremia

Results
- ~45% women, 383 patients had FUBC drawn (77%)
- Total of 37% of GNR bacteremia had FUBC

<table>
<thead>
<tr>
<th></th>
<th>Positive FUBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td></td>
</tr>
<tr>
<td>Gram positive cocci</td>
<td></td>
</tr>
<tr>
<td>Gram negative rods</td>
<td></td>
</tr>
</tbody>
</table>

Results

- ~45% women, 383 patients had FUBC drawn (77%)
- Total of 37% of GNR bacteremia had FUBC

<table>
<thead>
<tr>
<th></th>
<th>Positive FUBC</th>
</tr>
</thead>
<tbody>
<tr>
<td>All patients</td>
<td>14% (55/383)</td>
</tr>
<tr>
<td>Gram positive cocci (GPC)</td>
<td>20.9% (43/206)</td>
</tr>
<tr>
<td>Gram negative rods (GNR)</td>
<td>5.7% (8/140)</td>
</tr>
</tbody>
</table>

Question: What is the value of follow-up blood cultures (FUBC) in GNR bacteremia?

Design: Retrospective analysis, 500 pts w/ true bacteremia; examined FUBC & predictors of persistent bacteremia

Conclusion: FUBC are common in GNR bacteremia; Low yield in GNR – only 5.7% positive; fever at time of FUBC predictive for GNR

Comment: Retrospective, single center, indications for initial and FUBC unknown

In general, do not repeat blood cultures in GNR bacteremia

Consider if persistent fever, lack source control

Year in Review
Case Presentation

You decide not to repeat cultures as she is afebrile and improving.

She has been on ertapenem and you note the *E. Coli* is pan-sensitive. You pause and think about narrowing the antibiotics.

Specifically you wonder if you can change to an oral antibiotic to treat the gram-negative rod bacteremia.

Short take: Oral Antibiotics & Bacteremia

- Goal: use “bioavailable agents whenever possible” (*Choosing Wisely*)
- Narrative review of the literature
- Variable results depending on organism:
  - MSSA/MRSA: Two weeks of IV treatment
  - Strep pneumonia: probably safe
  - GNRs: probably safe

Case Presentation

You switch to an oral fluoroquinolone.

On hospital day 4, you arrive in the AM to learn that she developed a fever to 38.5°C (101.3°F) overnight. Her other vitals were in the normal range and she felt fine.

During signout the nocturnist says, “Since the patient did not have shaking chills and ate all of her dinner, I didn’t order repeat cultures.”

You pause, “Hmm, interesting. Is there some new study I should know about?”

Short Take: Blood Culture Yield

In a prospective multicenter observational cohort study, 1,943 hospitalized patients who had blood cultures drawn (for any reason) were followed.

Among patients with
1) Poor food consumption and
2) Shaking chills,

The incidence of true bacteremia was 47.7%.


Case Presentation

Her fever resolves without explanation.

She is discharged later that day to finish a course of oral antibiotics.

Case Summary

Consider

1. Hydrocortisone, vitamin C and thiamine in the management of sepsis (pending further studies)
2. Not routinely obtaining follow-up blood cultures for GNR bacteremia.
3. Oral antibiotics may be used to treat gram-negative rod bacteremia
4. Deferring blood cultures if the patient is eating well and without rigors.

Case Presentation

A 66-year-old woman presented to the ED with fevers, chills, and shortness of breath.

She was severely hypoxic and the respiratory therapist (RT) placed her on 40 L/min of high-flow nasal cannula (HFNC) at 100% FiO₂.

The RT asks, “Hey! Do you know of any evidence supporting use of HFNC compared with other methods of oxygen delivery?”

How do you respond to the RT’s question about the evidence for using high-flow nasal cannula (HFNC) vs. other oxygen delivery?

A. What is high-flow nasal cannula?
B. HFNC reduces mortality.
C. HFNC decreases intubation but has no mortality benefit.
D. HFNC has similar clinical outcomes but is more comfortable for patients.
E. I don’t know. It’s got to be better, right? I mean, higher flow. That just sounds better.
High-Flow Nasal Cannula

Benefits
- Patient comfort
- Mobilize secretions
- Decreased entrapment of room air
- Washout of dead space
- PEEP
- Deliver ~ 100% FiO2

Question: What are the benefits of high-flow nasal cannula (HFNC) in hypoxic respiratory failure?

Design: Syst-rev & meta-analysis; 18 studies, 3,881 patients with hypoxic resp. failure; RCTs (12), prospective, retrospective


Results
- Medical & surgical causes of respiratory failure
- No evidence of publication bias

<table>
<thead>
<tr>
<th>Outcome</th>
<th>HFNC vs. O₂</th>
<th>HFNC vs. NIPPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU mortality</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Outcome</th>
<th>HFNC vs. O₂</th>
<th>HFNC vs. NIPPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td>0.47*</td>
<td>(0.27-0.84)</td>
</tr>
<tr>
<td>ICU mortality</td>
<td>0.65</td>
<td>(0.37-1.13)</td>
</tr>
</tbody>
</table>

* P < 0.05
Results

- Medical & surgical causes of respiratory failure
- No evidence of publication bias

<table>
<thead>
<tr>
<th>Outcome</th>
<th>HFNC vs. O₂</th>
<th>HFNC vs. NIPPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td>0.47*</td>
<td>0.73</td>
</tr>
<tr>
<td></td>
<td>(0.27-0.84)</td>
<td>(0.47-1.13)</td>
</tr>
<tr>
<td>ICU mortality</td>
<td>0.65</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>(0.37-1.13)</td>
<td>(0.34-1.18)</td>
</tr>
</tbody>
</table>

- Reintubation: O₂ > HFNC = NIPPV
- No data on patient comfort

* P < 0.05

High-Flow Nasal Cannula

Question: What are the benefits of high-flow nasal cannula in hypoxic respiratory failure?

Design: Syst-rev & meta-analysis; 18 studies, 3,881 patients with hypoxic resp. failure;

Conclusion: HFNC may decrease intubation in hypoxic respiratory failure vs. usual oxygen delivery
No difference when compared to NIPPV;
No change in ICU mortality

Comments: Statistical heterogeneity; many causes
Better than usual oxygen delivery; no worse than NIPPV, more comfortable
Can be standard for patients with hypoxic respiratory failure

Your response to the RT’s question about the evidence for using high-flow nasal cannula (HFNC) vs. other oxygen delivery?

A. What is high-flow nasal cannula?
B. HFNC reduces mortality.
C. HFNC decreases intubation but has no mortality benefit.
D. HFNC has similar clinical outcomes but is more comfortable for patients.
E. I don’t know. It’s got to be better, right? I mean, higher flow. That just sounds better.

A. What is high-flow nasal cannula?
B. HFNC reduces mortality.
C. HFNC decreases intubation but has no mortality benefit.
D. HFNC has similar clinical outcomes but is more comfortable for patients.
E. I don’t know. It’s got to be better, right? I mean, higher flow. That just sounds better.
Case Presentation

She is placed on high-flow nasal cannula (HFNC) and responds well.

The respiratory therapist asks you, “Hey, this is your first year as a hospitalist, right?”

“Yes, you reply,” wondering why he is asking.

“Well, I read some study that showed mortality is higher for hospitalists in their first year. Are you out here just killing people?” He asks.

Case Presentation

You chuckle awkwardly and slowly walk off.

You walk right down the hall to talk to the Division Chief about the current faculty development program.

You learn about the robust audit and feedback program and feel better.

Short take: Hospitalists & Mortality

• Retrospective study large Medicare database
• Mortality in 1st-year vs. 2nd-year & beyond
• Controlled for multiple factors
• Hospitalists in their 1st-year had a **higher:**
  • In-hospital mortality (3.33% v 2.96%, p<0.05)
  • 30-day mortality (9.97% v 10.5%, p<0.05)
• There was no change in mortality after the second year

Year in Review

How do you respond to the patient’s statement about her pneumonia?

A. Sure, sure, of course.
B. I know this is very scary – it is scary to be in the hospital.
C. Did they give you those antibiotics?
D. Hmph, hmm, hmphs.
E. Hey, listen, suck it up. You want to see sick? I’ll show you freakin’ sick!

Statements of Empathy

Question: What is the impact of empathy statements on hospitalized patients?
Design: Prospective qualitative/quantitative; Audio-recorded admit encounters Assess anxiety & communication ratings

Results


- Recorded empathic responses to negative emotions

- A total of 76 patients, 27 admitting attendings
- Range negative emotions 0-14 (median 1)
- Empathic statements improved ratings for:
  - Covering points of interest
  - Feeling listened to
  - Feeling cared about
  - Overall trust
- Reduced STAI-S anxiety score
- No change in encounter length (median 19 min.)
**Statements of Empathy**

**Question:** What is the impact of empathy statements on hospitalized patients?

**Design:** Prospective qualitative/quantitative; Audio-recorded admit encounters Assess anxiety & communication ratings

**Conclusion:** Empathic statements improved ratings of provider communication; reduced anxiety No change in time spent

**Comments:** Small study, one hospital Consistent with prior studies Low (no?) cost intervention to improve patient satisfaction

---

**How do you respond to the patient’s statement about her pneumonia?**

- A. Sure, sure, of course.
- **B. I know this is very scary – it is scary to be in the hospital.**
- C. Did they give you those antibiotics?
- D. Hmph, hmm, hmphs.
- E. Hey, listen, suck it up. You want to see sick? I’ll show you freakin’ sick!

---

**Case Presentation**

You respond with a statement of empathy and provide supportive care.*

Three days later she has improved and you and the nurse go to see her together. When you enter the room, she is on her iPhone furiously typing away. “My apologies, just posting on Instagram,” she says.

The nurse turns to you and whispers, “Alas, the smartphone sign.”

*Supportive care = IV fluids and friendly banter
**Short Take: Smartphone Sign**

In a prospective cohort study of 221 patients on a surgical ward, smartphone use was recorded daily with other clinical data.

After controlling for demographics (e.g. age) and clinical data, patients using their smartphone:

- Were 5.29 (95% CI, 2.24-12.84) more likely to be discharged.

The negative predictive value was 93.5%.


---

**Case Summary**

**Definitely**

1. Use high-flow nasal cannula for hypoxic respiratory failure.
2. Use statements of empathy.

**Consider**

1. First-year hospitalists may have a higher mortality.
2. Patients using their smartphone may be ready for discharge.

---

**Case Summary**

**Definitely**

1. Recognize PE may **not** be that common in patients admitted with syncope.

**Consider**

1. Treating most patients with CAP for a total of 5 days of antibiotics.
2. Checking orthostatic vital signs at one minute.
3. Starting probiotics in patients at high-risk for *C. diff*.

---

**Case Summary**

**Consider**

1. Hydrocortisone, vitamin C and thiamine in the management of sepsis (pending further studies)
2. Not routinely obtaining follow-up blood cultures for GNR bacteremia.
3. Oral antibiotics may be used to treat gram-negative rod bacteremia
4. Deferring blood cultures if the patient is eating well and without rigors.
A complex artificial intelligence nanoarray was used to analyze 2808 breaths from 1404 patients with different illnesses (e.g. cancer, infection, etc.). The nanoarray identified unique volatile organic compounds (VOCs).

The analyzer was able to accurately identify the illness 86% of the time.

Short take: The Power of Perception

- Study of 3 nationally representative samples (National Health Interview Survey and the National Health and Nutrition Examination Survey)
- Total of 61,141 adults, 21 years follow-up

Perceived physical activity was associated with mortality risk.

People who perceived themselves as less active were up to 71% more likely to die.

Held true even after adjusting for actual levels of physical activity, health status and behavior, and sociodemographic variables.
Questions