Year in Review 2016-2017

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Year in Review 2016-2017

- Updated literature
- September 2016 – September 2017

Process:
- CME collaborative review of journals
  - Including ACP J. Club, J. Watch, etc.
- Independent analysis of article quality
- Tried to avoid repeating articles from the conference

Year in Review 2016-2017

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
You are on the teaching service 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) and chronic kidney disease (CKD) stage III who presented after a syncopal episode at dinner with her family.

She described the sudden onset of loss of consciousness just after ordering dessert. She had no prodromal symptoms and no prior episodes of syncpe.
**Case Presentation**

In the Emergency Department, her vital signs were normal and her exam was unremarkable. Her electrocardiogram (ECG) was sinus with new lateral T-wave inversions; troponin I negative.

The etiology of her syncope was unclear. She was admitted for observation.

During the assessment and plan, the nightfloat asks, “I’m wondering, how often in patients with syncope from an unclear cause is it from a pulmonary embolism (PE)?”

**How do you respond to the nightfloat about the rate of PE in syncope of unclear cause?**

A. It’s low, about 2%.
B. If I remember right, it’s about 10%.
C. It’s a lot higher than you would think – like 25% or so.
D. Who cares, the ED is going to get the CT scan anyway.
E. What do you think the rate of PE is?

---

**PE in Syncope**

**Question:** How common is PE in patients admitted to the hospital with syncope?

**Design:** Prospective study, 11 hospitals in Italy Hospitalized for syncope, age > 18 years Standard evaluation for syncope

- Applied simplified Wells & d-dimer to all patients
- If “high-risk” → CT angiogram or V/Q scanning
- Of 2584 screened, 560 admitted* to the hospital
- Average age 76 years old

**Results**

- Cause of syncope identified in 355 patients (63.4%)
- PE low-prob. by Wells/d-dimer in 330 pts. (58.9%)

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Update in Hospital Medicine


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[Note: The image contains additional text and tables that are not fully visible in the provided image.]
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• Main or lobar PE in ~ 67%
• Tachynea, tachycardia, hypotension, signs of DVT more common in those with PE

Prandoni P, et al. NEJM 2016;375:1524

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Question: How common is PE in patients admitted to the hospital with syncope?

Design: Prospective, admitted for syncope; Wells & d-dimer for PE, then CTA or V/Q

Conclusion: PE in syncope was 17.3% overall; 25.4% in pts. with no other cause; 67% main/lobar; tachynea, tachycardia, shock, DVT more common in pts. with PE

Comments: Only admitted patients; admit criteria Many would have had PE workup separately; Within 48 hours of admission; real PEs? Likely an overestimate; consider applying Wells/d-dimer in syncope

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Case Presentation

In the moment, you apply the simplified Wells and she is “low probability.” A d-dimer is added on which is low.

You realize that the resident did not report orthostatic vital signs. You ask if orthostatics were done.

She reports they were negative but 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: Orthostatic Vital Signs

In a prospective cohort study of 11,429 middle-aged adults (age 44-66 years), orthostatic vital signs were checked every 30 seconds.

Orthostatic hypotension identified within one minute of standing (vs. later) was most strongly associated with:

- Dizziness
- Fracture
- Car crashes

- Falls
- Syncope
- Death

You repeat orthostatic vital signs while rounding on the patient, checking at one minute, and they are negative.
She remains on telemetry and has no further events. After a full evaluation, the cause of the syncope is unclear.
She is discharged with close follow-up with her primary care doctor.

Unfortunately, she is readmitted to your team two weeks later at the end of your attending stretch.
She presented with fever, cough, and shortness of breath. On presentation, she was febrile, tachycardic, and hypoxic (86% on room air, 96% on 4 liters). She had diffuse wheezing and crackles at the right base. She was alert and oriented.

She had an elevated white blood cell count and the CXR confirmed a right lower lobe infiltrate.
The intern admitting the patient states he thinks she has community-acquired pneumonia (CAP) and a COPD exacerbation. He outlines the initial plan for fluids, antibiotics, corticosteroids, and bronchodilators.

He then states that an arterial blood gas (ABG) is 7.33/52/82 on room air. She is breathing comfortably with a respiratory rate of 24.
You ask, “In the setting of her COPD exacerbation, do you think we should use BiPAP (non-invasive ventilation) given that blood gas?”
How does the intern respond to your question about starting BiPAP?

A. I wouldn’t – we usually use it when the pH is lower.
B. We could try it but there isn’t great evidence it will help because she is not in distress.
C. Hadn’t thought of that – that’s a good idea.
D. I was going to ask if I could just intubate her.
E. Do you think we should start BiPAP?

COPD Exacerbation & NIPPV

Question: What is the benefit of NIPPV over usual care in COPD exacerbations?
Design: Meta-analysis, RCT of NIPPV vs. usual care in adults w/ COPD exacerbation
Standard treatments for COPD

- Enrolled if pH < 7.35 + PCO₂ > 45mmHg
- Examined pH < 7.35 and pH < 7.30

Results


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**Results**

- Total of 17 studies, 1264 patients; age 67 yo
- Moderate quality evidence

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- NIPPV with shorter LOS (~ 3.39 days)*
- Complications more common but mild
- Results true for pH < 7.35 & pH < 7.30

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**COPD Exacerbation & NIPPV**

**Question:** What is the benefit of NIPPV over usual care in COPD exacerbations?

**Design:** Meta-analysis, RCT of NIPPV vs. usual care in adults w/ COPD exacerbation

**Conclusion:** NIPPV decreases mortality & intubation vs. usual care; may cut LOS (3 days); True for pH < 7.35

**Comments:** Meta-analysis, moderate quality overall

- Duration of use unclear
- NIPPV may be underused
- Consider in patients with pH < 7.35


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**How does the intern respond to your question about starting BiPAP?**

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**How does the intern respond to your question about starting BiPAP?**

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C. **HADN’T thought of that – that’s a good idea.**
D. I was going to ask if I could just intubate her.
E. Do you think we should start BiPAP?
Case Presentation

She is placed on BiPAP and avoids intubation.
Over the next few days, the patient continues to improve and on the morning of hospital day 3, she feels well.
When you and the team walk in the room, she is furiously typing on her iPhone. She apologizes, “Sorry about that, just posting a message on Instagram.”
You lean over to the intern and whisper, “Alas, the smartphone sign.”

Case Presentation

You and the team are feeling that she may be ready for discharge.
In getting more clinical information, she feels well, has normal vital signs (on room air), and is eating and taking pills.
The team decides to discharge her. The intern turns to you and asks, “How long do you think we should treat her for her community-acquired pneumonia (CAP)?”

Case Presentation

How do you respond to the intern’s question – how long should her total antibiotic course be?

A. 3 days  
B. 5 days  
C. 7 days  
D. 10 days  
E. 14 days  
F. Who cares. She probably won’t take it anyway. I hate my job.
**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

Hospitalized for CAP, age > 18 years-old

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

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

**Continue**
- Duration determined by MD

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**Results**

- A total of 312 patients, 40% class IV or V (not ICU)
- Most received a fluoroquinolone (~80%)

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<td>2.1%</td>
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Outcome 5 Days Longer p

- Clinical Success (10d) 56.3% 48.6% 0.18
- Clinical Success (30d) 91.9% 88.6% 0.33
- Mortality (30d) 2.1% 2.2% 0.99
- Median Duration of Abx 5 days 10 days 0.001

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

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/generated
- For most patients, 5 days is enough
- Use your judgement, can treat longer but 7 days usually enough

How do you respond to the intern’s question – how long should her total antibiotic course be?

A. 3 days
B. 5 days
C. 7 days
D. 10 days
E. 14 days
F. Who cares. She probably won’t take it anyway. I hate my job.
How do you respond to the intern’s question – how long should her total antibiotic course be?

A. 3 days
B. **5 days**
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E. 14 days
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Case Summary

**Definitely**

1. Recognize PE may be common in patients admitted with syncope.

**Consider**

1. Checking orthostatic vital signs at one minute.
2. Using NIPPV (BiPAP) in patients with a COPD exacerbation and hypercarbia with a pH < 7.35.

---

Case Summary

**Consider**

1. Patients using their smartphone may be ready for discharge.
2. Shorter courses of antibiotics (5 days) in patients with CAP who are afebrile with stable vital signs.

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Pair Share Exercise
Case Presentation

A 56-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 at 100% FiO₂.

The RT asks, “Hey! Do you know of any evidence supporting use of HFNC in 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.
High-Flow Nasal Cannula

Heated and humidified oxygen delivered at rates of up to 60L/min

Benefits
- Patient comfort
- Mobilize secretions
- Decreased entrainment 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; mix RCTs (12), prospective, retrospective

Compared HFNC vs. usual oxygen therapy or NIPPV
Goal was O2 saturation > 92%

Results

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

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Intubation 0.47* (0.27-0.84)
ICU mortality 0.65 (0.37-1.13)

* P < 0.05
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- Only subgroup analyzed was post-extubation
- No data on patient comfort


**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 decreases need for intubation in hypoxic respiratory failure vs. usual oxygen delivery. No difference when compared to NIPPV. No change in ICU mortality.

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

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Case Presentation

She continues on HFNC with SpO₂ > 92%. Despite IV fluids and broad-spectrum antibiotics she remains febrile and hypotensive.

You inform the ED nurse that she will need to be admitted to the ICU for management of ARDS and septic shock...

The ED nurse asks, “Hey, are you going to save her life with that Vitamin C cocktail?”

Case Presentation

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

Short take: Hydrocortisone, Vit C, Thiamine

• Retrospective before-after study (94 patients).
• Half (47 pts) received hydrocortisone, vitamin C, and thiamine; 47 pts received “usual care.”

Hospital mortality
Vitamin C cocktail - 8.5% (4/47)
Usual care - 40.4% (19/47)

• SOFA scores decreased faster, less RRT for AKI, and they had shorter duration of vasopressors
Case Presentation

The vitamin C cocktail is withheld, her sepsis improves, and her encephalopathy clears.

On further questioning, she notes intermittent right upper quadrant (RUQ) pain after meals the last few weeks.

You log into your friendly neighborhood EMR...

Case Presentation

The RUQ ultrasound reveals a dilated common bile duct, consistent with a passed gallstone.

On hospital day two, 1 out of 2 blood cultures from admission returns positive for *E. coli*.

You then wonder, “Should I be doing this?”

Follow-up blood cultures in gram-negative bacteremia: are they needed?

A. Yes, definitely!
B. Yes, but only after confirming that the initial culture is not a contaminant.
C. Probably not under most circumstances.
D. No, never!
E. GNRs make me weary, so to find the answer I’m asking SIRI.
Question: What is the value of follow-up blood cultures (FUBC) in GNR bacteremia?

Design: Retrospective analysis, 383 FUBCs, assessed source, abx exposure, susceptibilities, fever, comorbidities, ICU need, mortality.

Additional findings:
1. No difference in ICU need or mortality for (+) vs. (-) FUBCs.
2. Risks: contamination, increased costs, longer hospital stays, unnecessary consultations, inappropriate use of antibiotics, more pokes.

For 1 positive culture result:
- 5 FUBCs: GPC
- 17 FUBCs: GNR

Conclusion: Follow-up blood cultures add little value in the management of GNR bacteremia.

Comment: Retrospective, single center, eliminated contaminants / skewing true positives; indications for initial and FUBC unknown. In general, do not repeat blood cultures in GNR bacteremia; still consider for dx/rx CVC infxn, endocarditis.
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Case Presentation

You do not order repeat blood cultures. Over the next few days, her fevers resolve, vital signs stabilize, and you are getting things ready for discharge.

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.

Case Presentation

During morning sign-out 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%**.


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Short Take: Blood Culture Yield

In patients with:
1) Normal food consumption and
2) No shaking chills,

The incidence of true bacteremia was **2.4%**.


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Short Take: Blood Culture Yield

Normal food consumption had a negative likelihood ratio of 0.18 (95% CI, 0.17-0.19) for excluding true bacteremia.

The presence of shaking chills had a positive likelihood ratio of 4.78 (95% CI, 4.56-5.00) for true bacteremia.


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Case Presentation

Equipped with your new knowledge, you do not order blood cultures, and continue the current course with antibiotics and supportive care.*

On the day of discharge, she complains of back pain. She’s convinced it is the hospital bed.

Given the recent fevers, you ask yourself, “What are the chances I’m missing an epidural abscess?”

*Supportive care = IV fluids and friendly banter
Short take: Epidural abscesses

- Retrospective chart review, 119 patients dx’d with new epidural abscess
- 66 (55%) involved diagnostic error
- Median time to dx:
  - W/o dx error: 4 days
  - With dx error: 12 days
- 60% errors -> serious harm or death
- Missed red flags (>90%)
Red Flags Most Often Missed

- Unexplained fever
- Focal neurologic deficit
- Active infection
- Immunosuppression
- IV drug use

Case Presentation

With a little massage, her back pain completely resolves.

She no longer has any red flag symptoms, and so you spare her the MRI.

She leaves well before noon, does not get readmitted, and submits all top box scores on her Press Ganey survey.

Case Summary

Definitely
1. Keep high-flow nasal cannula in your armamentarium for hypoxic respiratory failure.
2. Be on the lookout for red flags suggesting epidural abscess.

Consider
1. Not routinely obtaining follow-up blood cultures for GNR bacteremia.
2. Deferring blood cultures if the patient is eating well and without rigors.
3. Hydrocortisone, vitamin C and thiamine in the management of sepsis (pending further studies)

Case Summary

Definitely
1. Recognize PE may be common in patients admitted with syncope.

Consider
1. Checking orthostatic vital signs at one minute.
2. Using NIPPV (BiPAP) in patients with a COPD exacerbation and hypercarbia with a pH < 7.35.
Case Summary

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1. Patients using their smartphone may be ready for discharge.
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Short take: Nano-Nose

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).

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

Short take: The Power of Perception

- What is the relationship between individual perception about level of physical activity and mortality outcomes?
- Study of 3 nationally representative samples
  - National Health Interview Survey (NHIS)
  - National Health and Nutrition Examination Survey (NHANES)
- 61,141 adults, 21 years follow-up

Short take: The power of perception

- People who perceived themselves as more physically active lived longer.
- People who perceived themselves as less active were up to 71% more likely to die during follow-up.
- Findings held true even after adjusting for actual levels of physical activity, health status and behavior, and sociodemographic variables.