Update in Hospital Medicine 2016-2017

• Updated literature
• August 2016 – August 2017

Process:
• CME collaborative review of journals
  ▪ Including ACP J. Club, J. Watch, etc.
• Independent analysis of article quality
• Thank you to Brad Monash, Ed Vasilevskis, Rachel Thompson, Chad Miller

Update in Hospital Medicine 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
Update in Hospital Medicine 2016-2017

- State one change in diagnostic testing you will make in clinical practice.
- Describe a new approach to treatment you can use in your clinical practice.
- List one new technique to approach patient care in patients who are at or near the end of life.
- Appreciate the challenges of keeping updated on the literature.

Update in Hospital Medicine 2016-2017

- Major reviews/short takes
- Case-based format
- Multiple choice questions
- Promote retention

Syllabus/Bookkeeping

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

Diagram: Ebbinghaus’ Forgetting Curve

- Very quick loss
- 20 min (58% left)
- 1 hour (40% left)...already halfway gone!
- 1 day (33% left)
- 6 days (23% left)
Case Presentation

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 asthma, HTN, and chronic kidney disease (CKD) 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 syncope.

In the Emergency Department, her vital signs were normal (including orthostatics) 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%)

<table>
<thead>
<tr>
<th></th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE in Syncope (overall)</td>
<td>17.3 % (95% CI 14.2%-20.5%)</td>
</tr>
<tr>
<td>PE in Syncope (no cause)</td>
<td>25.4 % (95% CI 19.4%-31.3%)</td>
</tr>
<tr>
<td>PE in Syncope (other cause)</td>
<td>12.7 % (95% CI 9.2%-16.1%)</td>
</tr>
</tbody>
</table>

*Main or lobar PE in ~ 67%*
*Tachypnea, tachycardia, hypotension, signs of DVT more common in those with PE*
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
Tachypnea, tachycardia, shock, DVT more common in patients 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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**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?

---

**Case Presentation**

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

She remains on telemetry and has no further events. After a full evaluation, the cause of the syncope is unclear.

On the day of discharge, she asks, “You know, my doctor says I have ‘asthma’ but I’ve never had it before – do you think I have asthma?”
**Short Take: Diagnosis of Asthma**

In a prospective cohort study, 701 adults diagnosed with asthma in the previous 5 years underwent spirometry, bronchial challenge, and/or tapering of asthma medications. Asthma was ruled out in 33.1%. Most had not had spirometry.

Most were felt to have something benign as the cause (e.g. allergic rhinitis).


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**Case Presentation**

You discuss the need to get a full evaluation as an outpatient and she is discharged after one night in the hospital.

Unfortunately, she is readmitted to your team 2 weeks later at the end of your attending stretch. She presented with fever, cough, and shortness of breath and was diagnosed with community-acquired pneumonia (CAP).

She is treated with levofloxacin (cephalosporin allergy) and slowly improves over 48 hours.

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**Case Presentation**

On the night of hospital day 2, she developed a fever to 38.5°C (101.3°F). Her other vitals were in the normal range and she felt fine.

In the morning, the intern says “The cross-cover intern asked and the patient did not have shaking chills and ate all of her dinner. Based on that, she didn’t get repeat cultures.”

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

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**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%.

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%.


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.


Case Presentation

You agree with the plan to not repeat cultures. The patient continues to improve and the following day (morning of hospital day 3), she feels well, has normal vital signs (on room air), and is eating and taking pills.

The team decides she is stable for discharge. The intern turns to you and asks, "How long do you think we should treat her for her community-acquired pneumonia (CAP)?"

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

<table>
<thead>
<tr>
<th>Stop</th>
<th>Continue</th>
</tr>
</thead>
<tbody>
<tr>
<td>No fever for 48h</td>
<td>Duration determined by MD</td>
</tr>
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</table>

**Results**

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

<table>
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<th>Outcome</th>
<th>5 Days</th>
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**Outcome**

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Results

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

Case Presentation

You and the team decide to treat with 5 days total and she is discharged.

As you’re walking down the hall to round on the next patient, the medical student asks, “Seems like we never culture anything in pneumonia. Has anyone ever done PCR on sputum to see what’s in there in CAP?”

Case Summary

**Definitely**

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

**Consider**

1. Up to 1/3 of adults diagnosed with asthma may not have asthma.
2. Hospitalized patients who are eating well and do not have chills are unlikely to be bacteremic.
3. Shorter courses of antibiotics (5 days) in patients with CAP who are afebrile with stable vital signs.

Short take: Molecular Testing in CAP

A total of 323 patients with CAP (U.K.) had sputum collected on admission. All samples were tested with real-time PCR for 26 respiratory viruses and bacteria.

A pathogen was confirmed in 87% of patients. *H Flu* (40.2%) and *Strep Pneumo* (35.6%) were the most common bacteria.

Viruses were present in 30% but 82% of these were co-detections with bacteria.

Pair Share Exercise

Update in Hospital Medicine

Year in Review

Case Presentation

A few weeks later after a vacation to Hawaii you’re back on and get called to admit a 72 year-old man with a history of hypertension who presented with a few hours of hematemesis.

He is given an intravenous proton pump inhibitor (PPI) and transported to the ICU.
Case Presentation

An EGD is performed within a few hours and reveals a visible vessel in the gastric antrum which is treated with cautery. This is deemed to be a “high-risk bleeding ulcer.”

You are seeing the patient later that day and the pharmacist is there and asks, “Now that the EGD is done, what do you want to do with the PPI?”

How do you respond to the question about the PPI?

A. We can stop it since the ulcer was treated during the EGD.
B. This is a high-risk ulcer so we have to continue a PPI drip for 72 hours.
C. I think we can switch to twice daily IV PPI.
D. I think we can switch to twice daily PO PPI.

PPIs in Bleeding Ulcers

Question: For patients with peptic ulcer bleeding, what is the optimal route for the PPI?

Design: Systematic review & meta-analysis; RCTs high-risk ulcer bleeding; Oral vs. IV PPI (BID or other)

High-risk peptic ulcers
1) Active bleeding
2) Visible vessel
3) Adherent clot


PPIs in Bleeding Ulcers

Question: For patients with peptic ulcer bleeding, what is the optimal route for the PPI?

Design: Systematic review & meta-analysis; RCTs high-risk ulcer bleeding; Oral vs. IV PPI (BID or other)

• Randomized after EGD
• Total of 7 studies, 859 patients

**Results**

- Low risk for publication bias

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<th>IV</th>
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<td>7.9%</td>
<td>8.8%</td>
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<tr>
<td>Mortality</td>
<td></td>
<td></td>
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Results

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<td>NS</td>
</tr>
<tr>
<td>Mortality</td>
<td>2.1%</td>
<td>2.4%</td>
<td>NS</td>
</tr>
<tr>
<td>Length of Stay (d)</td>
<td>4.58</td>
<td>5.23</td>
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PPIs in Bleeding Ulcers

Question: For patients with peptic ulcer bleeding, what is the optimal route for the PPI?
Design: Syst review & meta-analysis; 7 RCTs ulcer bleeding; oral vs. IV PPI
Conclusion: May be no difference in recurrent bleeding at 7 or 30 days; may be no difference in mortality or length of stay
Comment: Variable quality, only 7 studies; all RCTs; Acid suppression equivalent with PO
Adds to prior data where intermittent = bolus/infusion PPI dosing
Can start with IV BID but change to PO when able

How do you respond to the question about the PPI?

A. We can stop it since they the ulcer was treated during the EGD.
B. This is a high risk ulcer so we have to continue a PPI drip for 72 hours.
C. I think we can switch to twice daily IV PPI.
D. I think we can switch to twice daily PO PPI.
E. Tums®, Just Tums®, Tropical Fruit Tums®.
Case Presentation

You switch to an oral PPI and he goes home the next day.

A few months later you see in the EHR that he has been admitted to the surgery service for gastrectomy. He has been diagnosed with gastric cancer.

You notice this was caught by an “artificial nose” after biopsies were inconclusive. You do a quick search to see what this artificial nose is all about....

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).


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

Case Presentation

He undergoes uncomplicated gastrectomy, does well, and is discharged.

Unfortunately six months later you are called to admit him from the Emergency Department with fevers and hypoxia. You discover he has had progressive gastric cancer despite chemotherapy.

When you see him in the ED, he is febrile, tachycardic, hypoxic, and encephalopathic.

Case Presentation

You make sure he has been given timely broad-spectrum antibiotics and a fluid bolus for his severe sepsis.

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

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

Short take: Hydrocortisone, Vit C, Thiamine

In a retrospective before-after clinical study, a total of 94 patients with sepsis were included. Forty-seven (47) received usual care and 47 received hydrocortisone, vitamin C, and thiamine in addition to usual care.

The hospital mortality in the vitamin C group was 8.5% (4/47) compared to 40.4% (19/47) in the usual care group.

SOFA scores decreased faster in the vitamin C group and they weaned off pressors earlier.


Case Presentation

You decide there is not quite enough evidence but will be watching the literature closely.

Unfortunately, he has progressive hypoxia (likely from pneumonia). The respiratory therapist says that she has placed him on 30 liters of high-flow nasal cannula at 100% FiO₂.

The respiratory therapist asks, “Hey is there any evidence of using HFNC compared to other oxygen delivery in the hospital?”
How do you respond to the therapists’ 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. But, it has to be better, right? It’s higher flow. That just sounds better.

High-Flow Nasal Cannula

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%


Benefits

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

High-Flow Nasal Cannula

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

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>
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<tbody>
<tr>
<td>Intubation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICU mortality</td>
<td></td>
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Results

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

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<td>Intubation</td>
<td>0.47* (0.27-0.84)</td>
<td>0.73 (0.47-1.13)</td>
</tr>
<tr>
<td>ICU mortality</td>
<td>0.65 (0.37-1.13)</td>
<td>0.63 (0.34-1.18)</td>
</tr>
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</table>

* 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
Likely better than usual oxygen treatment; no worse than NIPPV, more comfortable
Can be standard for patients with hypoxic respiratory failure

Update in Hospital Medicine
Case Presentation

He is placed on high-flow nasal cannula (HFNC). Unfortunately, he continues to worsen and develops multi-organ failure and worsening confusion (in the setting of metastatic gastric cancer).

You meet with his wife and children and they want to focus on making him comfortable. He is transitioned to the palliative care suite in the hospital.

How do you manage his delirium in the setting of palliative care?

- A. Increase the dose of the morphine as it may be pain related
- B. Treat with intravenous haloperidol 1.0mg every hour as needed
- C. Treat with oral risperidone 1.0mg every four hours as needed
- D. Treat with non-pharmacologic means (orientation, lighting, pain control, etc.)
- E. Bring in your pit bull for some pet therapy

Delirium in Palliative Care

Question: Should haloperidol or risperidone be used to treat delirium in palliative care?

Design: Single center, randomized, controlled trial, 11 hospice services; 249 patients with delirium; double blind

- All patients treated with supportive care,
- Reversible causes of delirium treated
- Randomized to titrated doses
  - Oral risperidone
  - Oral haloperidol
  - Placebo

### Results

- Followed NuDESC symptom score for delirium (higher score is worse, 0-6 scale)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Risperidone vs. Placebo</th>
<th>Haloperidol vs. Placebo</th>
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<tbody>
<tr>
<td>NuDESC Score</td>
<td>+ 0.48* (0.09-0.86)</td>
<td>+ 0.24* (0.06-0.42)</td>
</tr>
<tr>
<td>Mortality</td>
<td>1.29 (0.91-1.94)</td>
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- Increased extrapyramidal side effects
- Less midazolam use in the placebo group

Mortality: 1.29 (0.91-1.94)
Delirium in Palliative Care

Question: Should haloperidol or risperidone be used to treat delirium in palliative care?
Design: Single center, randomized trial, 11 hospice services; all patients with delirium
Conclusion: Haloperidol & risperidone may increase delirium; more extrapyramidal side effects
Haloperidol may increase mortality
Comment: Some methods issues; dosing & route
May cause harm & increase mortality
Other studies in delirium mixed regarding benefit of antipsychotics
 Likely should avoid if possible

How do you manage his delirium in the setting of palliative care?

A. Increase the dose of the morphine as it may be pain related
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E. Bring in your pit bull for some pet therapy

Case Summary

Definitely
1. Change to PO PPI when able in patients with high-risk peptic ulcer bleeding.

Consider
1. A future state where breath samples will be analyzed using nanotechnology.
2. High-flow nasal cannula may be better than usual oxygen delivery.
3. Avoiding antipsychotics when treating delirium in palliative care.

Case Summary

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

Consider
1. Up to 1/3 of adults diagnosed with asthma may not have asthma.
2. Hospitalized patients who are eating well and do not have chills are unlikely to be bacteremic.
3. Shorter courses of antibiotics (5 days) in patients with CAP who are afebrile with stable vital signs.
Genetically identical mice were infected with a bacteria (Listeria) or a virus (influenza) and then either force-fed or starved.

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Short take: Feed a Cold?

Genetically identical mice were infected with a bacteria (*Listeria*) or a virus (influenza) and then either force-fed or starved.

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<tr>
<td>Bacterial Infection</td>
<td>0%</td>
<td>60%</td>
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<tr>
<td>Viral Infection</td>
<td>78%</td>
<td>11%</td>
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Glucose appeared to be the key driver of mortality in bacterial infections. It is unclear if there are implications for humans.