Update in Hospital Medicine 2016

Brad Sharpe, MD
UCSF Division of Hospital Medicine

Update in Hospital Medicine 2016

- Updated literature
- April 2015 – April 2016

Process:
- CME collaborative review of journals
  - Including ACP J. Club, J. Watch, etc.
- Four hospitalists ranked articles
  - Definitely include, can include, don’t include

Thank you to Michelle Mourad, Will Southern, Amit Pahwa, Mel Anderson

Update in Hospital Medicine 2015

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
Case Presentation

You are long-call and your hard-working intern presents the next case.

She describes a 63 year-old man with a history of diabetes who presented with 1 day of shortness of breath and subjective fevers. He says his symptoms started suddenly the day before.

On presentation, his vitals were temperature 38.1°C, blood pressure 110/65, heart rate 110, respiratory rate 28, and oxygen saturation 87% on room air, 96% on 2 liters.
Case Presentation

His exam was notable for faint crackles at the right base. His white blood cell count was 12,000 and his CXR showed some haziness at the right base. A d-dimer is elevated at 3250 mcg/L (low pretest probability for PE).

The Emergency Department ordered a CT scan for pulmonary embolism which showed a small infiltrate and a subsegmental pulmonary embolism at the right base.

The intern asks you, “How do you think we should handle the pulmonary embolism?”

Diagnosis of Pulmonary Embolism

Question: How often is pulmonary embolism misdiagnosed by CT angiography?

Design: Retrospective cohort study; single university hospital

937 CT scans were reviewed

- All scans reviewed by 3 blinded chest radiologists
- Came to consensus on their interpretation

Results

- Total of 174/937 (18.6%) scans were positive
- Of those, 45/174 (25.9%) were read as negative

<table>
<thead>
<tr>
<th></th>
<th>False positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solitary</td>
<td></td>
</tr>
<tr>
<td>Subsegmental</td>
<td></td>
</tr>
<tr>
<td>Solitary + Subsegmental</td>
<td></td>
</tr>
</tbody>
</table>

### Results

- Total of 174/937 (18.6%) scans were positive
- Of those, 45/174 (25.9%) were read as negative

<table>
<thead>
<tr>
<th>False positive</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Solitary</td>
<td>46.2%</td>
</tr>
<tr>
<td>Subsegmental</td>
<td>59.4%</td>
</tr>
<tr>
<td>Solitary + Subsegmental</td>
<td>66.7%</td>
</tr>
</tbody>
</table>

Most common reason was breathing artifact


### Diagnosis of Pulmonary Embolism

**Question:** How often is pulmonary embolism misdiagnosed by CT angiography?

**Design:** Retrospective cohort; single hospital 937 CT scans for PE were reviewed

**Conclusion:** Positive rate 18.6%; of these, 25.6% were false positives; solitary and subsegmental commonly overread

**Comment:** Retrospective, single hospital, specialists? May be overtreating a lot of patients. If single/subsegmental, consider pre-test probability; talk with the radiologist. Consider getting LE ultrasound

How do you respond to the intern about the management of the pulmonary embolism?

A. It’s a pulmonary embolism, we have to treat it.
B. **Why don’t we order LE dopplers to decide about anticoagulation?**
C. Let’s go down and go over it with the radiologist to see if this is “real.”
D. It’s a single subsegmental pulmonary embolism – we don’t have to treat that.
E. What do you think we should do about the pulmonary embolism?

Case Presentation

You and team go and talk with the radiologist and upon further read, the PE looks like artifact. You order LE dopplers to be sure and they are negative.

The team ultimately diagnosed him with community-acquired pneumonia (CAP) and started treatment with ceftriaxone and azithromycin.

You ask the resident, “What do you think of that recent paper looking at steroids in pneumonia? Do you think we should give him steroids?”
Case Presentation

How does the resident respond to your question about the use of steroids in the management of CAP?

A. There is no role for steroids in CAP unless they are also having a COPD exacerbation.
B. I don’t know. Steroids may improve clinical outcomes in CAP but there is no mortality benefit.
C. We should give steroids – they reduce mortality in CAP.
D. What do you think about that paper about steroids in pneumonia?

How does the resident respond to your question about the use of steroids in the management of CAP?

A. There is no role for steroids in CAP unless they are also having a COPD exacerbation.
B. I don’t know. Steroids may improve clinical outcomes in CAP but there is no mortality benefit.
C. We should give steroids – they reduce mortality in CAP.
D. What do you think about that paper about steroids in pneumonia?
**Steroids in CAP**

**Question:** In community-acquired pneumonia (CAP), what is the effect of corticosteroids?

**Design:** Systematic review & meta-analysis; Total of 13 studies, 2005 patients; All RCT with steroids vs. placebo

- Variable drugs, doses, routes, durations
- Both moderate & severe pneumonia

---

**Results**

<table>
<thead>
<tr>
<th>Steroids vs Placebo</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Mortality</td>
<td>RR 0.67 (0.45-1.01); p=0.06</td>
</tr>
<tr>
<td>Ventilation</td>
<td>RR 0.45 (0.26-0.79); p&lt;0.05</td>
</tr>
<tr>
<td>Time to Stability</td>
<td></td>
</tr>
<tr>
<td>Length of Stay</td>
<td></td>
</tr>
</tbody>
</table>

Results

<table>
<thead>
<tr>
<th>Steroids vs Placebo</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Mortality</td>
<td>RR 0.67 (0.45-1.01); p=0.06</td>
</tr>
<tr>
<td>Ventilation</td>
<td>RR 0.45 (0.26-0.79); p&lt;0.05</td>
</tr>
<tr>
<td>Time to Stability</td>
<td>-1.22 days (-2.0 to -0.35); p&lt;0.05</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>-1.0 days (-1.79 to -0.21); p&lt;0.05</td>
</tr>
</tbody>
</table>


Steroids in CAP

Question: In community-acquired pneumonia (CAP), what is the effect of corticosteroids?
Design: Systematic review & meta-analysis; Total of 13 studies, 2005 patients; All RCT with steroids vs. placebo, variable dose/route/duration
Conclusion: Systemic steroids in CAP may save lives; May lead to less need for ventilation, earlier stability, shorter LOS; incr. hyperglycemia
Comments: Many small studies, varied dose/route/duration; Probably a real benefit in a subset of patients; Need to figure out which patients, what drug, what dose, and for how long – stay tuned.


How does the resident respond to your question about the use of steroids in the management of CAP?

A. There is no role for steroids in CAP unless they are also having a COPD exacerbation.
B. I don’t know. Steroids may improve clinical outcomes in CAP but there is no mortality benefit.
C. We should give steroids – they reduce mortality in CAP.
D. What do you think about that paper about steroids in pneumonia?
How does the resident respond to your question about the use of steroids in the management of CAP?

A. There is no role for steroids in CAP unless they are also having a COPD exacerbation.

B. I don’t know. Steroids may improve clinical outcomes in CAP but there is no mortality benefit.

C. We should give steroids – they reduce mortality in CAP.

D. What do you think about that paper about steroids in pneumonia?

Case Presentation

You decide not to treat with steroids but will be following the literature and guidelines over the next 6 - 12 months.

On rounds the next day, the medical student is presenting the SOAP presentation and reports that the patient was afebrile but that it was “axillary.”

The intern asks, “Hey, how good is an axillary temperature anyway? I have heard it isn’t any good.”

Short Take: Peripheral Thermometers

The accuracy of peripheral thermometers (ear, axillary, oral) compared to central (pulm. artery, urinary, rectal) was examined in a meta-analysis of 75 studies including 8682 patients.

Peripheral thermometers do not have clinically acceptable accuracy. For detection of fever, peripheral thermometers had a sensitivity of 64% (95% CI, 55-72%) and a specificity of 96% (95% CI, 93-97%).

**Case Presentation**

You have a brief and high-yield teaching moment about the accuracy of peripheral thermometers. Unfortunately, despite antibiotics and supportive care, the patient worsens over the first 48 hours. He has evidence of worsening sepsis and progressive hypoxic respiratory failure. He is transferred to the ICU.

**Case Presentation**

You are discussing his care and the intern states that he is 98% on 40 L/min of high-flow nasal cannula.

The intern asks, “You know, we use high-flow all the time. What is the evidence for using high-flow nasal cannula instead of non-rebreather or BiPAP?”

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

A. HFNC reduces mortality.
B. HFNC decreases intubation but has no mortality benefit.
C. HFNC has similar clinical outcomes but is more comfortable for patients.
D. I don’t know. But, it has to be better, right? It’s higher flow. That just sounds better.
E. Good question. Why don’t you go and look that up.

**High-Flow Nasal Cannula**

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

**Benefits**

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

**High-Flow Nasal Cannula**

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

**Design:** Multicenter, open label RCT; 310 patients with hypoxic resp. failure (P:F < 300mmHg); Excluded pts. w/ hypercarbia, CHF, on pressors

- Randomized to high-flow NC vs. NRB vs. NIPPV
- Goal was O2 saturation > 92%


**Results**

- Most patients with CAP (64%); P:F ~ 150mmHg
- High-flow set at 48 liters/minute

<table>
<thead>
<tr>
<th></th>
<th>HFNC</th>
<th>NRB</th>
<th>NIPPV</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td>38%</td>
<td>47%</td>
<td>50%</td>
<td>0.17</td>
</tr>
<tr>
<td>ICU mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90d mortality</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results

- Most patients with CAP (64%); P:F ~ 150 mmHg
- High-flow set at 48 liters/minute

<table>
<thead>
<tr>
<th></th>
<th>HFNC</th>
<th>NRB</th>
<th>NIPPV</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation</td>
<td>38%</td>
<td>47%</td>
<td>50%</td>
<td>0.17</td>
</tr>
<tr>
<td>ICU mortality</td>
<td>11%</td>
<td>19%</td>
<td>25%</td>
<td>0.05</td>
</tr>
<tr>
<td>90d mortality</td>
<td>13%</td>
<td>22%</td>
<td>31%</td>
<td>0.02</td>
</tr>
</tbody>
</table>

- Bigger benefit in more hypoxic patients
- Patient’s more comfortable on HFNC


* Appropriate logistic regression

High-Flow Nasal Cannula

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

Design: Multicenter, open label RCT; 310 patients with hypoxic resp. failure (P:F < 300mmHg)

Conclusion: HFNC may decrease mortality in hypoxic respiratory failure vs. other modes of O2
Bigger benefit in sicker patients; safe & more comfortable for patients

Comments: Single, small study; methodologically sound
Real benefits to HFNC vs. facemask or NIPPV
Should be standard for patients with hypoxic respiratory failure


A. HFNC reduces mortality.
B. HFNC decreases intubation but has no mortality benefit.
C. HFNC has similar clinical outcomes but is more comfortable for patients.
D. I don’t know. But, it has to be better, right? It’s higher flow. That just sounds better.
E. Good question. Why don’t you go and look that up.
How do you respond to the intern’s question about the evidence for using high-flow nasal cannula (HFNC) vs. other oxygen delivery?

A. **HFNC reduces mortality.**
B. HFNC decreases intubation but has no mortality benefit.
C. HFNC has similar clinical outcomes but is more comfortable for patients.
D. I don’t know. But, it has to be better, right? It’s higher flow. That just sounds better.
E. Good question. Why don’t you go and look that up.

---

**Case Summary**

**Consider**

1. Solitary subsegmental pulmonary emboli may be false positives.
2. Using systemic steroids in the management of CAP once we have a bit more evidence.
3. Peripheral thermometers **cannot** be reliably used to rule out the presence of fever.

---

**Pair Share Exercise**

![Ebbinghaus' Forgetting Curve](image_url)
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 acute diverticulitis and a 6cm diverticular abscess.

After discussion with the general surgeon and interventional radiologist, the decision is made to pursue IR drainage. He is treated with intravenous ertapenem.

He undergoes uncomplicated IR drainage of the abscess.

Case Presentation

After the procedure he feels well but continues to have a low-grade fever (38.1°C), mild abdominal pain, and a WBC of 14,000. Blood cultures are negative.

What is the appropriate duration of antibiotics for this complicated intra-abdominal infection which has been treated by IR drainage?

A. Four days more. B. A total of 7 days. C. A total of 10 days. D. A total of 14 days. E. For 2 days after evidence of SIRS has resolved. F. Who cares. He probably won’t take it anyway. I hate my job.
Antibiotics Intra-abdominal Infection

Question: What is the appropriate duration of antibiotics in patients who have a complicated intra-abdominal infection?

Design: RCT of patients with a complicated intra-abdominal infection; Total of 518 patients at 23 sites;

Complicated intra-abdominal infection:
- Fever, WBC, or peritonitis
- Needed surgery or catheter drainage


Results

- 35% colon/rectal, 15% appy, 13% small bowel
- 33% treated with IR drainage

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Four days</th>
<th>After SIRS</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Site Infxn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recurrent intraabdominal infection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antibiotics (median)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Results

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Four days</th>
<th>After SIRS</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgical Site Infxn</td>
<td>6.6%</td>
<td>8.8%</td>
<td>0.43</td>
</tr>
<tr>
<td>Recurrent intraabdominal infection</td>
<td>15.6%</td>
<td>13.8%</td>
<td>0.67</td>
</tr>
<tr>
<td>Death</td>
<td>1.2%</td>
<td>0.8%</td>
<td>0.99</td>
</tr>
<tr>
<td>Antibiotics (median)</td>
<td>4 days</td>
<td>8 days</td>
<td>0.01</td>
</tr>
</tbody>
</table>


Antibiotics Intra-abdominal Infection

Question: What is the appropriate duration of antibiotics intra-abdominal infection?
Design: RCT; compared 4 days after source control to 2 days after SIRS resolved;
Conclusion: No difference in surgical infection or death
Four days led to fewer antibiotic days
Longer antibiotics may delay diagnoses

Comment: RCT but ~ 25% did not follow protocol
No clear harm to short-course (4 days)
Likely most complicated abdominal infections should get 4 days after source control*

What is the appropriate duration of antibiotics?

A. Four days more.
B. A total of 7 days.
C. A total of 10 days.
D. A total of 14 days.
E. For 2 days after evidence of SIRS has resolved.
F. Who cares. He probably won't take it anyway. I hate my job.

Case Presentation

He receives four more days of antibiotics total and is discharged home.

A few months later you see in the EHR that he has been admitted to the general surgery service for colectomy. A colonoscopy revealed colon cancer and he underwent surgical resection.

You see in the chart orders for “Mozart,” “Lady Gaga,” and “Juicy Fruit,” and wonder what these are for.

Short take: Music & Surgery

In a meta-analysis of 73 RCTs involving 6902 patients, music before, during, and/or after surgery was associated with:

- Reduced post-operative pain
- Less anxiety
- Improved patient satisfaction
- No difference in LOS

The choice of music & timing made no difference.

**Short take: Gum Chewing & Surgery**

In a meta-analysis of 81 studies (low quality) with 9072 participants, post-operative gum chewing was associated with:
- Shorter time to first flatus (TFF)
- Time to bowel movement (TBM)
- Possible shorter length of stay (LOS)

The best data was for colorectal surgery. There were no significant cost differences and no significant side effects.


**Case Presentation**

He does well and is discharged.

Unfortunately six months later he is admitted to you with a malignant pleural effusion and has had progressive cancer despite chemotherapy.

On hospital day one you decide to consult palliative care. You wonder if there are evidence-based benefits to palliative care consultation in patients with end-stage cancer.


**Short take: Costs and Palliative Care**

In a prospective observational study at 5 hospitals with palliative care programs, in patients with advanced cancer, palliative care consultation in the first two days was associated with:
- Lower costs (-$2,280, p<0.001)
- Shorter LOS (-1.0 days, p<0.01)

**Case Presentation**

Palliative care is consulted and he receives an indwelling catheter for his malignant pleural effusion.

Unfortunately, he worsens despite treatment and becomes confused with progressive hypoxia and renal failure. His overall prognosis is very poor.

You meet with his wife and two children to discuss his goals of care.
Case Presentation

You explain his current condition including the poor prognosis given the multi-organ failure and metastatic cancer.

While discussing his wishes, his wife says, “You know, it is in God’s hands now. We both really have a lot of faith in God.”

How do you respond to her comment?

How do you respond to the wife’s comment about their faith in God?

A. Hang in there. I know it’s hard. I know.
B. We’ll do our best with what we have.
C. Can we talk more about his faith?
D. Would you like me to call the chaplain?
E. I do think we need to consider if your husband would really want to end up hooked up to machines.
F. Hmm. Hmm.

Religion/Spirituality & Goals of Care

Question: In goals of care meetings with surrogates, how frequently are religious or spiritual considerations discussed?

Design: Multi-center, prospective, cohort study, 13 ICUs; total of 249 family meetings Audio-recorded, qualitatively coded

- All patients with respiratory failure
- All had high estimated mortality


Results

- Religion/spirituality fairly or very important to most surrogates (77.6%)

<table>
<thead>
<tr>
<th>Religion or spirituality discussed</th>
<th>Incidence</th>
</tr>
</thead>
</table>

Results

- Religion/spirituality fairly or very important to most surrogates (77.6%)

<table>
<thead>
<tr>
<th>Incidence</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Religion or spirituality discussed</td>
<td>40/249  (16.1%)</td>
</tr>
</tbody>
</table>

- Surrogates raised issues 65% of the time


Results

<table>
<thead>
<tr>
<th>Physician Responses</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redirect the conversation</td>
<td>37.5%</td>
</tr>
<tr>
<td>Provide empathy</td>
<td>32.5%</td>
</tr>
<tr>
<td>Acknowledge with close-ended response</td>
<td>27.5%</td>
</tr>
<tr>
<td>Provide reassurance</td>
<td>10.0%</td>
</tr>
</tbody>
</table>

- Rarely explored beliefs further
- Rarely discussed personal beliefs


Religion/Spirituality & Goals of Care

Question: In goals of care meetings, how frequently are religious/spiritual issues discussed?

Design: Multi-center, prospective, cohort study, 13 ICUs; total of 249 family meetings

Conclusion: Religious/spiritual issues rarely discussed (16%); usually raised by surrogate
Physicians often responded by redirecting; Rarely explored beliefs further

Comment: May not be generalizable; selection bias
Unclear if similar in outpatient setting
Patients want to discuss, not happening
Proactively ask, respond if raised

How do you respond to the wife’s comment about their faith in God?

A. Hang in there. I know it’s hard. I know.
B. We’ll do our best with what we have.
C. Can we talk more about his faith?
D. Would you like me to call the chaplain?
E. I do think we need to consider if your husband would really want to end up hooked up to machines.
F. Hmm. Hmm.

Case Summary

Consider
1. Treating complicated intra-abdominal infections with 4 days of antibiotics after source control.
2. Using music and gum chewing perioperatively to improve outcomes.
3. Palliative care may lower costs and shorten length of stay.
4. In goals of care discussions with surrogates, exploring religion and spirituality.
**Short take: Losing the Game**

In a case control study involving the 2008 (New England Patriots loss) and 2009 (Pittsburgh win) Super Bowls, rates of cardiovascular death in the week after the Super Bowl were compared with the week after the Super Bowl in previous years.

After the Patriots loss, coronary artery disease deaths increased by 24%. After Pittsburgh’s victory, coronary artery deaths decreased by 31%.


---

**Short take: Knuckle Cracking**

Based on real-time MRI imaging, knuckle cracking (all 10 MCP joints in one male participant) was caused by the formation of gas cavities in the joint, not by collapse of cavitation bubbles.


---

**Short take: Can you do the Dishes?**

**Short take: Can you do the Dishes?**

A total of 51 college students were randomized to “control” dishwashing or “mindful” dishwashing. Those in the “control” group, read a passage about the mechanics of dishwashing while those in the “mindful” group read a passage about being mindful while washing.

Both groups washed the same number and type of dishes.


---

**Short take: Can you do the Dishes?**

Those in the “mindful” dishwashing group reported spending *more* time washing the dishes.

They also reported *less* nervousness and *more* inspiration.


---

**Questions**

While washing the dishes one should only be washing the dishes. This means that while washing the dishes one should be completely aware of the fact that one is washing the dishes. At first glance, that might seem a little silly. Why put so much stress on a task that would rather do, hurrying to finish the dishes as if they were a nuisance, then we are not “washing the dishes to wash the dishes.” What’s more, we are not alive during the time we are washing the dishes. In fact we are completely incapable of realizing the miracle of life while standing at the sink. If we can’t wash the dishes, the chances are we won’t be able to drink our tea either. While drinking the cup of tea, we will only be thinking of other things, barely aware of the cup in our hands. Thus we are sucked away into the future—and we are incapable of actually living one minute of life.

Update in Hospital Medicine 2016

Brad Sharpe, MD
UCSF Division of Hospital Medicine