Update in Hospital Medicine 2015

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UCSF Division of Hospital Medicine

Update in Hospital Medicine 2015

- Updated literature
- March 2014 – March 2015

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

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
  - Mantel-Haenszel statistical method, meta-regression, weighted regression...
- 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 COPD and diabetes who presented with 3 days of fever, cough, and shortness of breath.

On presentation, his vitals were temperature 38.9°C, blood pressure 110/65, heart rate 100s, respiratory rate 28, and oxygen saturation 87% on room air, 96% on 2 liters.
Case Presentation

His exam was notable for diffuse expiratory wheezes and crackles at the right base. His white blood cell count is 18,000 and his CXR shows a clear RLL infiltrate.

The team has diagnosed him with community-acquired pneumonia (CAP) and a COPD exacerbation and is admitting him to the stepdown unit.

How do you respond to the resident about the recent NEJM study on treatment of CAP?

A. Regardless of that study, this sounds like a pretty typical pneumonia – it’s probably strep pneumo. Let’s just go with the ceftriaxone.
B. I think it’s a good study. We probably don’t need the atypical coverage in this case.
C. I think it’s a good study. But I don’t think it is enough to change practice; let’s stick with the ceftriaxone and azithromycin.
D. What do you think about that study?

Treatment of CAP

Question: Do patients with CAP admitted to a non-ICU setting need atypical coverage?

Design: Cluster-randomized, crossover trial, 7 hospitals in the Netherlands 2283 pts. w/ CAP; mild-mod illness

1) β-lactam (amoxicillin, amox + clavulanate, 3rd-gen ceph.)
2) β-lactam + macrolide (azithro, clarithro, erythro)
3) Fluoroquinolone (levo or moxi)

Antibiotics could be adjusted
Results

- Nearly 35% got antibiotics before admission
- Only 2% had atypicals (Legionella, Mycoplasma)
- Deviation in ~ 25% of patients

<table>
<thead>
<tr>
<th>Intention-to-treat</th>
<th>90-day Mortality</th>
<th>Length of Stay (d)</th>
</tr>
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<td>β-lactam</td>
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</tr>
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<td>6</td>
</tr>
<tr>
<td>Fluoroquinolone</td>
<td>8.8%</td>
<td>6</td>
</tr>
</tbody>
</table>

Treatment of CAP

Question: Do pts. admitted with CAP need atypical coverage?

Design: Cluster-randomized; 2283 pts.; β-lactam v. β-lactam + macrolide v. fluoroquinolone

Conclusion: β-lactam monotherapy non-inferior to regimens w/ atypical coverage; no difference in side effects

Comment: Well-done study, intention-to-treat

Generalizable? European study, pre-abx, antibiotic choices, long LOS, etc. Not quite enough to change practice; β-lactam + macro/doxy or fluoroquinolone

How do you respond to the resident about the recent NEJM study on treatment of CAP?

A. I think regardless of the study, this sounds like a pretty typical pneumonia – it’s probably strep pneumo so let’s just go with the ceftriaxone.

B. I think it’s a good study and I think we probably don’t need the atypical coverage in this case.

C. I think it’s a good study but I don’t think it is enough to change practice; let’s stick with the ceftriaxone and azithromycin.

D. What do you think about that study?

Case Presentation

The resident nods but you get a sense she is skeptical of your analysis.

So you decide to pull out this article to bolster your argument:

Short Take: Treatment of CAP

In an RCT in Switzerland, 580 patients with mild-moderate CAP admitted to the hospital received β-lactam monotherapy or β-lactam + macrolide.

β-lactam monotherapy was not non-inferior (i.e. was inferior) in failure to reach clinical stability at day 7 (41.3% vs. 33.4%, p=0.07).

β-lactam monotherapy also led to higher rates of 30-day readmission (7.9% vs. 3.1%, p=0.01).

Case Presentation

The resident is, well, still not impressed.

But, the patient receives ceftriaxone and azithromycin and does well. He is discharged two days later.

Unfortunately, the patient is readmitted to you on the hospitalist service 3 weeks later. He presented with shortness of breath and cough and was found to have an acute COPD exacerbation (no pneumonia).

He has acute respiratory failure requiring non-invasive ventilation and is admitted to the ICU.

What is the appropriate dose for the corticosteroids?

A. Methylprednisolone 1 gram every 6 hours.
B. Methylprednisolone 125 mg every 6 hours
C. Prednisone 60mg twice a day.
D. Prednisone 60mg once a day.
E. Hey you, Giants fan, why don’t we give him the same dose of steroids Barry Bonds was taking?

Steroids in COPD Exacerbation

Question: In COPD exacerbations requiring ICU care, what is the optimal dose of corticosteroids?

Design: Observational cohort study; 17,239 pts with a COPD exacerbation, admit to ICU; Compared low-dose vs. high-dose steroids during first 48 hours;

- Low-dose = ≤ 240 mg methylprednisolone/day
- High-dose = > 240mg methylprednisolone/day

### Results

**Low-dose vs High-dose Outcome**

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Low-dose vs High-dose</th>
<th>Outcome**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Mortality</td>
<td>OR 0.85 (0.71-1.01); p=0.06</td>
<td></td>
</tr>
<tr>
<td>Length of Stay</td>
<td>-0.44 days (-0.67-0.21); p&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Costs</td>
<td>-$2,559; p&lt;0.01</td>
<td></td>
</tr>
</tbody>
</table>

- 64% (11,083) given high-dose steroids
- Average doses: 100mg vs. 315mg per day
- Prednisone: 125mg vs. 400mg per day

**With matching & propensity scoring**

### Steroids in COPD Exacerbation

**Question:** In COPD exacerbations admitted to the ICU, what is the optimal dose for corticosteroids?

**Design:** Observational cohort study; 17,239 pts with a COPD exacerbation, admit to ICU; low-dose oral vs. high-dose steroids during first 48 hours;

**Conclusion:** Trend toward lower mortality with low-dose steroids; shorter LOS, lower costs, less insulin, less fungal infection;

**Comments:** Retrospective, database, confounders, etc. Confirms studies in non-ICU patients

Most pts should get low-dose steroids

Dose not clear – 60mg once daily? Twice daily?

**Kiser TH, et al. AMJCCM2014;189:1052.**

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### What is the appropriate dose for the corticosteroids?

- A. Methylprednisolone 1 gram every 6 hours.
- B. Methylprednisolone 125mg every 6 hours.
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- D. **Prednisone 60mg once a day.**
- E. Hey you, Giants fan, why don’t we give him the same dose of steroids Barry Bonds was taking?

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### Short Take: COPD & NIPPV

In a retrospective cohort of 25,628 patients with an acute COPD exacerbation who got NIPPV or mechanical ventilation, after propensity scoring and matching, NIPPV (70% of patients) was associated with:

- Lower mortality (OR 0.54*)
- Less hospital-acquired pneumonia (OR 0.53*)
- Shorter length of stay (1.6 days*)
- Lower costs (- $5673*)

Case Presentation

He slowly improves with treatment of his severe COPD exacerbation and is discharged 6 days later.

Unfortunately, the patient is readmitted to you when you are back on the teaching service, this time with a few hours of hematemesis.

His is given an intravenous proton pump inhibitor in the ED and transported to the ICU.

How does the intern respond to your question about the PPI?

A. Can we stop it since they treated the ulcer during the EGD?
B. This is a high risk ulcer so we have to continue a drip for 72 hours, right?
C. I think we can switch to twice daily PPI.
D. Uhh, I don’t know, what do you want to do about the PPI?
E. Umm, whatever the GI fellow tells me to do?

PPI Treatment High-Risk Ulcers

Question: Is intermittent PPI dosing non-inferior to bolus + infusion in patients with high-risk bleeding ulcers?

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

**PPI Treatment High-Risk Ulcers**

**Question:** Is intermittent PPI dosing non-inferior to bolus + infusion in patients with high-risk bleeding ulcers?

**Design:** Systematic review & meta-analysis, RCT comparing intermittent vs. continuous PPI; high-risk ulcers 13 studies, 1733 patients

**Intermittent**
- Variable dose, frequency, route
- Most common: 40mg daily or BID

**Bolus**
- 80mg IV bolus + 8mg/hour infusion
- For 72 hours

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**Results**

- No suggestion of publication bias

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intermittent</th>
<th>Bolus</th>
<th>NI</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-day Bleeding</td>
<td>6.9%</td>
<td>9.4%</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
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<td>Length of Stay</td>
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<td>NI</td>
</tr>
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</table>

- No differences in 30-day bleeding, surgery, urgent intervention, or transfusions
- Oral and IV intermittent PPI similar

PPIs in Bleeding Ulcers

Question: For patients with high-risk bleeding ulcers, what is the optimal route for the PPI?

Design: Syst review & meta-analysis; 13 RCTs high-risk ulcers; intermittent vs. bolus PPIs

Conclusion: Trend toward less bleeding at 7 days in intermittent group; no difference in 30 d bleeding, mortality, surgery, transfusions; Oral and IV PPI similar

Comment: Variable quality studies but all RCTs

Enough acid suppression w/ intermittent? Dose & route unclear but probably don’t need the infusion; clear cost savings

Probably PO BID once taking POs

Short Take: Transfusion & Infection

In a systematic review and meta-analysis of 21 RCTs including 8735 patients, a restrictive transfusion strategy (goal hemoglobin 7mg/dL) was associated with:

A reduced risk for healthcare-associated infection (RR 0.88, p<0.05).

Case Summary

Definitely

1. Continue providing atypical coverage to patients admitted with CAP.
2. Prescribe lower doses of corticosteroids for COPD exacerbations requiring ICU care.

Consider

1. Using non-invasive ventilation to improve outcomes in COPD exacerbations.
2. Using intermittent PPI dosing in patients with high-risk ulcers.
3. A restrictive transfusion strategy is associated with a lower rate of infection.
A few weeks later you’re back on the hospitalist service and you’re going to see and evaluate one of the overnight admissions.

You got signout on a 44 year-old man with alcoholic cirrhosis who presented with fever, abdominal pain, and confusion.

Based on a paracentesis, he was diagnosed with SBP (spontaneous bacterial peritonitis) and was started on intravenous cefotaxime.
Case Presentation

You’re reviewing his history and notice he has a history of varices and is on propranolol.

In the setting of SBP, his blood pressure is a little low and you are not sure if he actually has ever had a variceal bleeding episode.

You wonder what to do about the non-selective beta-blocker (propranolol).

Non-selective Beta-blockers after SBP

Question: Are NSBBs beneficial in patients with cirrhosis who have had SBP?

Design: Retrospective cohort study, single institution;
Total of 607 patients with cirrhosis who got a paracentesis;

• Examined those patients with SBP
• Compared patients on NSBB vs. not

Results

• 30% (182/607) patients of developed SBP

<table>
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<td>1-year Mortality</td>
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Which is true regarding non-selective beta-blockers in patients with cirrhosis?

A. Non-selective beta-blockers (NSBBs) should not be used in patients who have had SBP
B. NSBBs should be used for secondary prophylaxis in patients with history of variceal bleed
C. NSBBs should be used as primary prophylaxis for all patients with varices even without history of bleed
D. NSBBs, known as “the aspirin of hepatologists”, have so many hemodynamic benefits, they should be used in virtually all patients with cirrhosis

Results

- 30% (182/607) patients of developed SBP

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Window Theory of β-blockers in Cirrhosis

- Increased mortality persisted after controlling for other factors
- No difference in variceal bleeding

Non-selective Beta-blockers after SBP

Question: Are NSBBs beneficial in patients with cirrhosis who have had SBP?

Design: Retrospective cohort; compared NSBB in pts w/ and without SBP

Conclusion: Overall mortality high in cirrhosis + SBP
NSBB after episode of SBP led to higher mortality, more hepatorenal, more AKI
No difference in bleeding rates

Comment: Observational study but well done
Fits with “window hypothesis”
NSBB may increase morbidity & mortality; consider stopping after SBP


Which is true regarding non-selective beta-blockers in patients with cirrhosis?

A. Non-selective beta-blockers (NSBBs) should not be used in patients who have had SBP
B. NSBBs should be used for secondary prophylaxis in patients with history of variceal bleed
C. NSBBs should be used as primary prophylaxis for all patients with varices even without history of bleed
D. NSBBs, known as “the aspirin of hepatologists”, have so many hemodynamic benefits, they should be used in virtually all patients with cirrhosis

Case Presentation

You decide you probably should stop the non-selective beta-blocker.

As you’re evaluating the patient, his parents walk in, both of whom are medical malpractice plaintiff’s attorneys (you think you recognize one of them from a billboard on the highway).

You wonder if your chosen career as a hospitalist increases your risk of getting sued.
**Short take: Liability & Hospitalists**

Claims data from over 52,000 malpractice claims were examined to compare hospitalists to other physicians.

The most common allegations against hospitalists were for errors in treatment (42%) and diagnosis (36%).

Hospitalists had a malpractice claim rate that was **significantly lower** than other internal medicine providers, ER physicians, general surgeons, and Ob/gyn physicians.


**Case Presentation**

You feel reassured and are able to explain the plan in way everyone understands.

The patient’s mother does ask, “If you rotate every week, I bet that makes it tough. It can’t be good for patients to have a new doctor every 7 days.”

You wonder if all of the discontinuity negatively impacts patient care.

**Short Take: Hospitalist Discontinuity**

In a retrospective study of 18,375 patients admitted to a non-teaching service at an academic medical center, less continuity of care was associated with:

1) Increased cost
2) Lower readmission rates

In a retrospective study of 474 patients admitted to a nonteaching service at an academic medical center, less continuity was **not** associated with increased adverse events.


**Case Summary**

**Consider**

1. Stopping non-selective beta-blockers in patients with cirrhosis who have SBP.
2. Hospitalists are less likely to get sued compared to other physicians.
3. Hospitalist discontinuity may not negatively impact clinical outcomes.

Case Presentation

The intern on your team presents a new admission – a 72 year-old woman with metastatic lung cancer who presented with acute shortness of breath and chest pain. At baseline, she has poor functional status.

On presentation, she was afebrile, blood pressure 138/47 mmHg, heart rate 120s, respiratory rate 28, and oxygen saturation 86% on room air (94% on 6 Liters).

Case Presentation

A CT scan ordered by the ED showed a large saddle pulmonary embolism (PE). She was started on low molecular weight heparin.

A few hours later, she remains symptomatic, tachycardic, and hypoxic. A troponin is elevated at 2.45 ng/mL and a transthoracic echocardiogram shows acute right ventricular (RV) dysfunction.

You ask the intern, do you think we should use thrombolytics?

How does the intern respond to your question?

A. No. There is no mortality benefit to thrombolytics in PE whatever the risk.
B. No. Thrombolytics only have a mortality benefit in patients who are hemodynamically unstable.
C. Yes. All saddle emboli need thrombolytics.
D. Yes. There is a mortality benefit to thrombolytics in intermediate-risk PE.
E. Thrombolytics? No. I think we probably can discharge her and have her follow up in PE clinic. Oh yeah, and we'll discharge by noon. And vaccinate her. And sit down while we tell her. And smile. And make sure we listen. Listen real good.
Use of Thrombolytics in PE

Question: Do thrombolytics improve mortality in patients with acute PE (including intermediate-risk patients)?

Design: Meta-analysis of 16 RCTs, 2115 patients with acute PE; Compared thrombolytics vs. anti-coagulation; stratified by risk

- Intermediate risk: evidence of RV strain
- RV strain: echo, troponin, or BNP
- Trials excluded patients who were high risk for bleed


Results

<table>
<thead>
<tr>
<th>Intermediate-Risk PE</th>
<th>Thrombolytics</th>
<th>Anticoagulation Alone</th>
<th>OR</th>
<th>NNT/NNH</th>
</tr>
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<tbody>
<tr>
<td>Mortality</td>
<td>1.4%</td>
<td>2.9%</td>
<td>0.48*</td>
<td>67</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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* p < 0.05

## Results

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<td>2.25%</td>
<td>3.19*</td>
<td>18</td>
</tr>
<tr>
<td>Intracranial Hemorrhage</td>
<td>1.5%</td>
<td>0.2%</td>
<td>4.63*</td>
<td>78</td>
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\* p < 0.05

Intermediate-Risk PE Thrombolytics Anticoagulation Alone OR NNT/NNH

| Mortality            | 1.4%          | 2.9%                  | 0.48* | 67      |
| Recurrent PE         | 1.2%          | 3.0%                  | 0.40* | 54      |
| Major bleeding       | 7.74%         | 2.25%                 | 3.19* | 18      |
| Intracranial Hemorrhage | 1.5%       | 0.2%                  | 4.63* | 78      |

\* p < 0.05

Similar results for the other 30% of patients

<table>
<thead>
<tr>
<th>Patients ≤65 (N=784)</th>
<th>Thrombolytics</th>
<th>Anticoagulation Alone</th>
<th>OR</th>
<th>NNT/NNH</th>
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<tr>
<td>Patients &gt;65 (N=1331)</td>
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<td>13%</td>
<td>4.1%</td>
<td>3.1*</td>
<td>14</td>
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- Mortality lower in both groups

*p < 0.05


Use of Thrombolytics in PE

Question: Do thrombolytics improve mortality in patients with acute PE?

Design: Meta-analysis of 16 trials, 2115 patients

Conclusion: In intermediate risk, lysis assoc. with lower PE mortality, less recurrent PE; increased major bleeding, ICH; possibly only increase bleeding in pts > 65 yrs old

Comment: Well done but not perfect
- Stronger case in young patients without bleeding risk or ICH risk
- Unclear in patients > 65 years old
- Choice should be made patient by patient


How does the intern respond to your question?

A. No. There is no mortality benefit to thrombolytics in PE whatever the risk.
B. No. Thrombolytics only have a mortality benefit in patients who are hemodynamically unstable (i.e. high risk).
C. Yes. All saddle emboli need thrombolytics.
D. Yes. There is a mortality benefit to thrombolytics in intermediate-risk PE.
E. No. I think we probably can discharge her and have her follow up in intermediate-risk PE clinic. Oh yeah, and discharge by noon.

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Case Presentation

For a number of reasons, you decide not to use thrombolytics. Unfortunately, she has progressive hypoxia and a rapid response is called three times. She is now requiring a non-rebreather facemask and is confused and tachypneic.

You want to speak with her husband and children about her degree of illness and would like to estimate her in-hospital mortality. Based on the information you have, what would you estimate is her in-hospital mortality if she requires intubation?

(72 year-old woman with metastatic cancer and poor baseline functional status)

What would you estimate is his in-hospital mortality?

A. 35%  
B. 60%  
C. 85%  
D. 95%  
E. It was hard to come up with an appropriate “joke” answer for this one. But, if you’re the one person that has to answer E, go right ahead.

Cancer Patients Intubated

Cancer Patients Intubated

Question: What are the outcomes of patients with cancer who require mechanical ventilation? What predicts mortality?

Design: Prospective observational study, 28 Brazilian hospitals; 263 patients with known cancer intubated for > 24 hours;

- Used multivariable analysis & propensity scoring
- Many different cancers


Results

- A total of 86% solid cancer, 14% heme cancers
- Overall in-hospital mortality was 67%

<table>
<thead>
<tr>
<th>Predictor of Mortality</th>
<th>OR (95% CI)</th>
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<tbody>
<tr>
<td>Active/Progressive Cancer</td>
<td>3.67 (1.25-10.81)*</td>
</tr>
<tr>
<td>Poor Performance Status</td>
<td>2.39 (1.24-4.59)*</td>
</tr>
<tr>
<td>Other Organ Dysfunction</td>
<td>1.15 (1.03-1.29)*</td>
</tr>
</tbody>
</table>

- Respiratory failure > to cancer also bad

Results

- A total of 86% solid cancer, 14% heme cancers
- Overall in-hospital mortality was 67%

84% Mortality

52% Mortality

Cancer Patients Intubated

Question: What are the outcomes of patients with cancer who require mechanical ventilation?
Design: Prospective observational study, pts. with known cancer intubated for > 24 hours;
Conclusion: Overall mortality quite high; active cancer, performance status, organ failure predict death; pts. with non-active cancer, good performance status do better
Comment: Just observational study; most solid cancer; did not look at other outcomes; Very high mortality for some cancer patients who need intubation
Can use for family/patient discussions

Azevedo LC, et al. CHEST.2014;146:257

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Short Take: Apple a Day?

In an cross-sectional study of a national sample of adults in the U.S., daily apple eaters (~ 9%) were more educated, less white, and smoked less than non-daily apple eaters.

Daily apple eaters visited physicians with similar frequency to non-apple eaters.

They maybe used fewer prescriptions.


Short Take: Greeting in the Hospital?

Short Take: Handshake vs. Fist Bump?

In an experimental model a sterile-gloved hand was immersed in a culture of pathogenic *E. coli*. Then different greetings (handshake, high five, fist bump) were repeated 5 times with a sterile-gloved hand. This recipient hand was cultured.

Nearly **twice** as many bacteria were transferred during a handshake compared with a high-five. The fist bump consistently led to the **lowest** transmission of bacteria.


Case Summary

**Consider**

1. Thrombolysis in younger patients (< 65 years old) with intermediate risk PE.
3. An apple a day may not keep the doctor away.
4. Fist bump!

Questions

![Questions Image]
Syllabus/Bookkeeping

- No conflicts of interest
- Final presentation available by email:
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