Update in Hospital Medicine

A. Scott Keller
February 10, 2017
Objectives

- Discuss the latest studies on duration of therapy for community-acquired pneumonia.
- Understand the new Sepsis-3 definitions (and controversy) for sepsis and septic shock.
- Review the benefits of Rapid Response Teams.
- Learn the association between COPD and pulmonary emboli.
- Review the new ACCP guidelines for VTE.
The Hospital Saga of Mr. Lucky
Mr. Lucky

- 75 year old with COPD on tiotropium, DM on metformin, CKD, provoked DVT in 1990, and UGI bleed one year ago. Not on A/C.
- He comes to the ED: “I can’t stop coughing.”
- T 37.4°C, BP 110/70, HR 100, RR 20, SaO₂ 94% on room air.
- Hgb 13.5 g/dL, WBC 14 x 10³/µL, Na 135 mmol/L, glc 150 mg/dL, ABG 7.38/70/38 on room air, BUN 16 mg/dL, creat 1.6 mg/dL (CrCl 40), lactate 1.6 mmol/L (normal ≤2.3).
- Chest x-ray shows…
Right Lower Lobe Pneumonia
How sick is he?

- Pneumonia Severity Index (PORT Score) = 85 (Class III, mortality 0.9%).

- Started on oral levofloxacin 750 mg q24 hours for community-acquired pneumonia (CAP) and prophylactic enoxaparin.

- Does he even need to be admitted?

“Among hospitalized patients who received fluoroquinolones for CAP, there was no association between initial route of administration and outcomes.”

Question #1

What is the appropriate duration of therapy to treat CAP?
Question #1

What is the appropriate duration of therapy to treat CAP?
A. Minimum of five days.
B. Seven days.
C. Eight days.
D. 10-14 days.
Duration of Antibiotic Treatment in Community-Acquired Pneumonia: A Multicenter Randomized Clinical Trial

• A Uranga, PP Espana, A Bilbao, JM Quintana, I Arriaga, et al.
Background

• CAP is a leading cause of morbidity and mortality worldwide\(^2\) and appears to be the leading cause of sepsis.\(^3\)

• IDSA/ATS guidelines recommend a 5-day course of antibiotics, but providers routinely give longer treatment.

• Multicenter RCT to assess if duration of antibiotic based on IDSA/ATS criteria is as effective as conventional treatment.


Study Design

- Hospitalized patients diagnosed as having CAP were recruited from January 1, 2012, through August 31, 2013.

- Intervention group treated with antibiotics for minimum of 5 days (determined by provider).

- Antibiotic stopped at this point if temp \( \leq 37.8^\circ\text{C} \) or less for 48 hours and no more than 1 CAP-associated sign of clinical instability:
  - SBP < 90 mmHg
  - HR > 100/min
  - RR > 24/min
  - Arterial O$_2$ < 90% or PaO2 < 60 mm Hg (room air).
Primary outcomes were clinical success rate at day 10 and late follow-up (day 30) since admission.

“Clinical success” defined as resolution or improvement in signs and symptoms related to pneumonia without further antibiotics, and CAP-related symptoms at day 10 measured with the 18-item CAP symptom questionnaire.
Patients with CAP should be treated for a minimum of 5 days (level I evidence), should be afebrile for 48–72 h, and should have no more than 1 CAP-associated sign of clinical instability before discontinuation of therapy (level II evidence). (Moderate recommendation.)

Longer duration of therapy may be needed if initial therapy not active against the identified pathogen or if complicated by extrapulmonary infection, such as meningitis or endocarditis. (Weak recommendation; level III evidence.)

Findings

• After randomization and exclusions, 137 patients in control group (mean PSI = 83.7) and 146 in intervention group (mean PSI = 81.8).

• Control patients had mean duration of antibiotic for 10 days vs 5 days for intervention patients ($P<0.001$).

• 9 control patients vs 2 intervention patients readmitted by day 30 ($P=0.02$).

• No difference in any other parameter including mortality, recurrence, complications, adverse effects, or LOS.
Findings

<table>
<thead>
<tr>
<th></th>
<th>Clinical Success (%)</th>
<th>P-Value</th>
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<tbody>
<tr>
<td><strong>Per-Protocol Analysis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td>50.4</td>
<td>0.12</td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>56.3</td>
<td>0.54</td>
</tr>
<tr>
<td><strong>10 Days</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
<td>92.7</td>
<td></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>94.4</td>
<td></td>
</tr>
<tr>
<td><strong>30 Days</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Intention-To-Treat Analysis** |                      |         |
| **Controls**          | 48.6                 | 0.18    |
| **Intervention**      | 56.3                 |         |
| **10 Days**           |                      |         |
| **Controls**          | 88.9                 | 0.33    |
| **Intervention**      | 91.9                 |         |
| **30 Days**           |                      |         |
Cautions

- Almost 80% of patients received quinolones.
- Few patients were included who had severe disease (PSI class V). There were 61 and 60 patients grouped as PSI IV-V in control and intervention groups, respectively.
- Patients requiring ICU care were excluded.
The Bottom Line

• Stopping antibiotic treatment based on clinical stability criteria after a minimum of 5 days of appropriate treatment is not inferior to traditional treatment schedules in terms of clinical success.

• The authors concluded that IDSA/ATS guidelines concerning duration of antibiotic treatment can be safely implemented among hospitalized patients with CAP.
Total Duration of Antimicrobial Therapy in Veterans Hospitalized with Uncomplicated Pneumonia: Results of a National Medication Utilization Evaluation

Study Design

• Retrospective multicenter evaluation in 30 VHA facilities.

• Manual review of electronic medical records of inpatients discharged with uncomplicated CAP or HCAP.

• Appropriate CAP therapy duration was at least 5 days, and up to 3 additional days beginning the first day of clinical stability criteria.

• Appropriate HCAP therapy duration defined as 8 days.
Findings

- Study included 1195 patients with CAP and 544 with HCAP.
- Only **13.9%** of patients (CAP 6.9%, HCAP 29.0%) received therapy duration consistent with guidelines!
- Median therapy was 4 days inpatient IV + 1 day inpatient PO + 6 days outpatient PO.
- Therapy duration not associated with readmission or mortality rate.
- CDI was rare (15 cases), but more common in guideline therapy (40.0% vs 13.6%, $P<0.01$).
Cautions

• Retrospective study performed at VHA facilities, predominantly male patients.
The Bottom Line

• Patients with uncomplicated pneumonia were commonly prescribed antimicrobials for the duration of therapy in excess of guideline recommendations.

• Approximately half of all therapy was prescribed upon hospital discharge—possible opportunity for improvement using antimicrobial stewardship programs.
Recap of Question #1

What is the appropriate duration of therapy to treat CAP?

A. Minimum of five days.
B. Seven days.
C. Eight days.
D. 10-14 days.
Back to Mr. Lucky...
Oops!
• Four hours after admission, he develops fever (T 39.0°C) with shaking chills/rigors.
• BP 90/40, HR 120, RR 36, SpO₂ 84% room air.
• The Rapid Response Team is called.
He’s transferred to the ICU.
Question #2

Which of these patients has/have sepsis?
Question #2

Which of these patients has/have sepsis?

A. Mr. Lucky (T 39.0, HR 120, and CXR).
B. Mr. Lucky (RR 36, WBC 14,000, and CXR).
C. Mr. Lucky’s roommate who has acute delirium, BP 96/50, and RR 24.
D. Mr. Lucky’s doctor, who has a cold and just ran up 3 flights of stairs to assess him.
E. All of the above.
F. It depends on your definition of sepsis.
“Sepsis is not a specific illness but rather a syndrome encompassing a still-uncertain pathobiology.”

Sepsis is a big deal! US prevalence 1 million cases/year for patients ≥ 65 years, approx 350,000 deaths per year.\(^5\)


- “The systemic response to infection.”
- “The clinical syndrome defined by the presence of both infection and a systemic inflammatory response.”
- “The presence (probable or documented) of infection together with systemic manifestations of infection.”

- Sepsis → Severe Sepsis → Septic Shock

Original Sepsis Definitions

• Two or more SIRS criteria (1991)
  • WBC >12,000 or <4,000 or >10% bands.
  • T <36 or >38.3°C.
  • HR >90.
  • Hyperventilation (RR >20 or PaCO₂ <32 mmHg).

• Additional SIRS criteria (incorporated 2001, revised 2012--“some of the following,” including the original four)
  • General variables such as altered mental status plus inflammatory, hemodynamic, organ dysfunction, and tissue perfusion variables.
Problem

• SIRS is nonspecific and may occur from infection OR noninfectious conditions like pancreatitis, autoimmune disorders, vasculitis, thromboembolism, burns, or surgery.

• Running up stairs can give you 2 SIRS criteria!
Problem

- Recent study of 109,663 patients with severe sepsis (infection and organ failure) found 13,278 (12.1%) had SIRS-negative (<2 SIRS criteria) severe sepsis.\(^9\)

- “The SIRS criteria do not necessarily indicate a dysregulated, life-threatening response.”\(^4\)

- SIRS may simply reflect an appropriate host response that is frequently adaptive.”\(^4\)

Enter the Latest Definitions: Sepsis-3

*JAMA* February 23, 2016
Sepsis-3 Task Force Issues

• Differentiate sepsis from uncomplicated infection.

• Update definitions of sepsis and septic shock.

• Develop clinical criteria that could better identify patients with suspected infection likely to progress to a life-threatening state.
New **Sepsis** Definition

- “Life-threatening organ dysfunction caused by a dysregulated host response to infection.”
- Organ dysfunction can be identified as acute change in SOFA score $\geq 2$ due to the infection.
- SOFA score gives 0-4 points for each of 6 variables: $\text{PaO}_2/\text{FiO}_2$ ratio, MAP/vasopressor use, GCS, serum creatinine or urine output, total bilirubin, platelet count—higher score correlates with higher mortality.
qSOFA for Non-ICU Patients

• For non-ICU patients with infection, screen for possible sepsis with 2 or more qSOFA criteria:
  • Altered mentation (any GCS score < 15).
  • RR ≥ 22/min.
  • SBP ≤ 100 mmHg.

• Score of ≥ 2 associated with poor outcomes due to sepsis—consider possibility of sepsis.

Can be rapidly scored at bedside--
No need for blood tests!
New Septic Shock Definition

• “A subset of sepsis in which underlying circulatory, cellular/metabolic abnormalities are profound enough to substantially increase mortality.”
Clinical Criteria to Identify Septic Shock

• Hypotension requiring vasopressor therapy to maintain MAP $\geq 65$ mmHg

   And

• Having a serum lactate level $> 2$ mmol/L after adequate fluid resuscitation.

This combination is associated with hospital mortality rates greater than 40%!
Patient with Suspected Infection

- qSOFA ≥2?
  - No → Sepsis Still Suspected?
  - Yes → Assess for Evidence of Organ Dysfunction

Assess for Evidence of Organ Dysfunction

- SOFA ≥2?
  - No → Monitor Clinical Condition, Reassess for Possible Sepsis if Indicated
  - Yes → Sepsis

Despite Adequate Fluid Resuscitation,
1. Vasopressors to maintain MAP ≥ 65 AND
2. Lactate ≥2?

- No → Septic Shock
- Yes → Monitor Clinical Condition, Reassess for Possible Sepsis if Indicated
No More “Severe Sepsis”

Sepsis → Severe Sepsis → Septic Shock
Recap of Question #2

Which of these patients has/have sepsis?

A. Mr. Lucky (T 39.0, HR 120, and CXR).
B. Mr. Lucky (RR 36, WBC 14,000, and CXR).
C. Mr. Lucky’s roommate who has acute delirium, BP 96/50, and RR 24.
D. Mr. Lucky’s doctor, who has a cold and just ran up 3 flights of stairs to assess him.
E. All of the above.
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So what’s the catch?
Severe Sepsis/Septic Shock Early Management Bundle (SEP-1)

• New CMS Core Metric (NQF #0500) for discharges on or after October 1, 2015.

• Applies to patients with severe sepsis and septic shock.
Severe Sepsis/Septic Shock Early Management Bundle (SEP-1)

To establish severe sepsis, all 3 of the following must be met within 6 hours of each other:

- Documentation of a suspected source of infection.
- Two or more SIRS criteria.
- Evidence of organ dysfunction.
CMS Response July 26, 2016

• “A change to the existing definition could disrupt the 15-year trend toward further reduction in sepsis mortality.

• Prior to changing the widespread and understood definitions used in SEP-1, rigorous clinical investigation will be required of the task force’s proposed definitions.

• In the coming years, CMS will track the research and field testing that the proposed definitions will inspire.”

A dose of common sense?

The CMS Sepsis Mandate: Right Disease, Wrong Measure

Worth the few minutes to read!
So What Do We Do Now?
What to Do

• These new definitions have not yet been incorporated into practice guidelines, so still use the “original” definitions of sepsis, severe sepsis, and septic shock.

• A non-ICU patient with suspicion of infection and ≥ 2 qSOFA criteria should be evaluated and treated with heightened concern for sepsis.¹²

¹². Personal communication, Dr. Ognjen Gajic, Professor of Medicine (Critical Care), Mayo Clinic.
But Wait—Two New Studies!

• SIRS, qSOFA and Organ Dysfunction: Insights from a Prospective Database of Emergency Department Patients with Infection
  • JM Williams, JH Greenslade, JV McKenzie, et al.
  • *CHEST*, accepted October 27, 2016.

• Survival Benefit and Cost Savings From Compliance With a Simplified 3-Hour Sepsis Bundle in a Series of Prospective, Multisite, Observational Cohorts
  • DE Leisman, ME Doerfler, MF Ward, et al.
  • *Crit Care Med* 2016; published online December 9, 2016.
• 4176 ED patients with SIRS admitted with presumed infection, prospectively enrolled over 3 years.

• SIRS associated with increased risk of organ dysfunction (RR 3.5) and mortality in patients without organ dysfunction (OR 3.2).

• SIRS and qSOFA showed similar discrimination for organ dysfunction (AUROC 0.72 vs 0.73).

• Similar mortality for patients with organ dysfunction with Sepsis-2 (12.5%) and Sepsis-3 (11.4%).
### Diagnostic Accuracy

<table>
<thead>
<tr>
<th></th>
<th>Organ Dysfunction</th>
<th>Mortality</th>
</tr>
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<tbody>
<tr>
<td>SIRS ≥ 2</td>
<td>Sensitivity</td>
<td>72.1%</td>
</tr>
<tr>
<td>SIRS ≥ 2</td>
<td>Specificity</td>
<td>61.1%</td>
</tr>
<tr>
<td>qSOFA ≥ 2</td>
<td>Sensitivity</td>
<td>29.7%</td>
</tr>
<tr>
<td>qSOFA ≥ 2</td>
<td>Specificity</td>
<td>96.1%</td>
</tr>
</tbody>
</table>

Sensitivity = (true positive) / (true positive + false negative)  
= Probability of being test positive when disease present.

Specificity = (true negative) / (true negative + false positive)  
= Probability of being test negative when disease absent.
The Bottom Line

• SIRS is a useful screening tool for organ dysfunction and death in ED patients with suspected infection.

• SIRS contributed less to prognosis in the context of organ dysfunction or shock.

• Poor sensitivity of qSOFA may limit utility as a bedside screen.

• Wide variation in mortality with SOFA.
• Prospective, observational study of 3 cohorts (total of of 14,755 consecutive patients) with severe sepsis or septic shock.

• All patients treated with “3-hour bundle:”
  • Blood cultures before antibiotics
  • IV antibiotics within 180 min from $\geq$ two SIRS criteria and lactate ordered, or within 60 minutes from time zero, whichever occurs earlier.
  • Lactate result available within 90 minutes.
  • 30 mL/kg IV crystalloid bolus initiated within 30 minutes from time zero.
Mortality Comparison

<table>
<thead>
<tr>
<th></th>
<th>Bundle Compliant</th>
<th>Bundle Non-Compliant</th>
<th>Adjusted Odds Ratio</th>
</tr>
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<tbody>
<tr>
<td>Cohort 1 (5,819)</td>
<td>22.6%</td>
<td>26.5%</td>
<td>0.72</td>
</tr>
<tr>
<td>(18.0% Compliant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohort 2 (1,697)</td>
<td>13.4%</td>
<td>17.8%</td>
<td>0.60</td>
</tr>
<tr>
<td>(43.5% Compliant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohort 3 (7,239)</td>
<td>18.1%</td>
<td>21.0%</td>
<td>0.84</td>
</tr>
<tr>
<td>(29.2% Compliant)</td>
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</tbody>
</table>
The Bottom Line

• Compliance with a 3-hour sepsis bundle rather than reliance on physiologic endpoints was associated with lower in-hospital mortality.

• “Our results suggest acknowledging sepsis as a time dependent, high-consequence emergency warranting highly aggressive management is a clinical imperative.”
Question #3

Do Rapid Response Teams Improve Outcomes?
Do Rapid Response Teams improve outcomes?
A. No.
B. No, but they can expedite transfer to ICU.
C. Yes, for mortality but not in-hospital cardiac arrest.
D. Yes, for in-hospital cardiac arrest but not mortality.
E. Yes, for both mortality and in-hospital cardiac arrest.
Effectiveness of Rapid Response Teams on Rates of In-Hospital Cardiopulmonary Arrest and Mortality: A Systematic Review and Meta-analysis

• RS Solomon, GS Corwin, DC Barclay, SF Quddusi, MD Dannenberg
Background

• In 2004, the Institute for Healthcare Improvement’s 100,000 Lives Campaign recommended that hospitals implement RRTs to identify non–ICU patients at risk for rapid deterioration.

• By 2010, 50% of hospitals had some form of RRT!

• However, many studies had conflicting results, with some showing no mortality benefit but improvement in cardiac arrest but others noting improved mortality.
Study Design

• Systematic review and meta-analysis of 30 studies.

• 20 studies were included for the hospital mortality analysis and 20 studies were included for the IHCA analysis.

• The 22 studies included in either or both analyses spanned the years 2000 to 2014.
Findings

• Implementation of RRT was associated with a significant decrease in hospital mortality, RR = 0.88 (95% CI, 0.83-0.93); 3,478,952 admissions.

• RRTs were also associated with a significant decrease in number of non-ICU cardiac arrests, RR = 0.62 (95% CI, 0.55-0.69); 3,045,273 admissions.
Cautions

• Most studies were before-after observational trials, lacking a concurrent control group making it difficult to draw causal relationships (mortality has been falling since 2000, but cardiac arrests have been increasing since 2000).

• Significant heterogeneity among studies regarding mortality ($I^2 = 86\%$, where a value $< 50\%$ means “passed”).

• Moderate heterogeneity among studies regarding cardiac arrest ($I^2 = 71\%$).
The Bottom Line

• RRTs are effective in decreasing both hospital mortality and IHCA.

• These findings support the 2004 IHI recommendations for the implementation of RRTs in hospitals.

• Additional studies are still required to explore team composition, activation criteria, activation mechanism, and implementation strategies.
Question #3

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B. No, but they can expedite transfer to ICU.
C. Yes, for mortality but not in-hospital cardiac arrest.
D. Yes, for in-hospital cardiac arrest but not mortality.
E. Yes, for both mortality and in-hospital cardiac arrest.
Back to Mr. Lucky...
In the ICU…

- Mr. Lucky is treated with IV fluids (30 mL/kg).
- Blood and sputum cultures are obtained and he is given vancomycin + cefepime + levofloxacin.
- He fortunately has a rapid recovery and does not require intubation.
- Cultures remain negative and antibiotics are de-escalated back to levofloxacin alone.
- He remains stable and is transferred back to the medicine service the next day.
In the ICU…

May be best to avoid vanco + piperacillin/tazobactam due to association with AKI (aOR 3.11).¹⁴

In the ICU…

Don’t overdo it! Higher cumulative fluid balance at day 3, but not in first 24 hours, after ICU admission independently assoc with increased hazard of death (1.36 to 1.63).\textsuperscript{13}

\textsuperscript{13} Y Sakr et al. \textit{Crit Care Med} 2016, published online December 5, 2016.
Oops!
Acute Change in Clinical Status

• Mr. Lucky develops worsening dyspnea, but no cough, sputum, or wheezing. He tells his nurse “my chest hurts when I take a deep breath.” No orthopnea or leg edema, normal JVP.

• Vital signs show temp 37 °C, BP 110/60, HR 102, RR 22, SaO₂ 91% on room air.

• Labs show normal WBC, negative troponin.

• Your visiting medical student wonders about a COPD exacerbation and starting steroids.

• You mention a new study…
Question #4

What is the next best intervention for Mr. Lucky’s dyspnea?
Question #4

What is the next best intervention for Mr. Lucky’s dyspnea?
A. Start IV methylprednisolone 125 mg q6h x 5 days.
B. Check a BNP.
C. Check a D-dimer.
D. Obtain a chest CT angiogram with PE protocol.
Prevalence and Localization of Pulmonary Embolism in Unexplained Acute Exacerbations of COPD: A Systematic Review and Meta-Analysis

- FE Aleva, LWLM Voets, SO Simons, Q de Mast, AJAM van der Ven, et al.
- *Chest* published online August 2016.
Background

- The majority of AECOPD develop in response to infections, but in about 30% of cases no clear etiology is found.

- Prior population studies have shown either a modest excess risk for PE with OR ranging from 2.51 (CI, 1.62-3.87) to 5.46 (CI, 4.25-7.02) or no association at all.\textsuperscript{14-17}

Study Design and Findings

• Systematic search of MEDLINE and EMBASE from 1974 to October 12, 2015. Of 1650 identified studies, seven (880 patients) were included for the analysis.

• 16.1% of patients had PE (32.5% of these were isolated subsegmental PE) and 10.5% had DVT.

• In patients with AECOPD who had a PE, pleuritic pain was reported more frequently as were signs of cardiac failure like hypotension, syncope, and acute right heart failure.

• Signs of infection were less common in PE.
Cautions

• Heterogeneity of findings among studies (prevalence rates of PE ranging from 3.3% to 29.1%).

• Risk of publication bias.

• Predominately male patients.
The Bottom Line

• PE is frequently seen in unexplained AECOPD. Two-thirds of emboli are found in larger arteries that have a clear indication for anticoagulant treatment.

• “PE should receive increased awareness in patients with unexplained AECOPD, especially when pleuritic chest pain and signs of cardiac failure are present and no clear infectious origin can be identified.”
What next?

• Based on low suspicion for AECOPD, you do not start steroids (which would be given as oral prednisone 40 mg daily for 5 days). Since no HF symptoms, you forego a BNP.

• You choose not to obtain a D-dimer since Mr. Lucky has a high pre-test probability for PE.

• You start N-acetylcysteine and IV normal saline, hold metformin, and get a CT (his CrCl is 40).


Chest CT

- Resolving right lower lobe pneumonia.
- No new areas of pneumonitis or interstitial edema.
- Bibasilar atelectasis.
- But...there are 2 tiny subsegmental PEs.
- You get a bilateral lower extremity US that is negative for DVT.
Now what do we do?

- Presumed provoked PE while in hospital despite prophylactic enoxaparin.
- Prior provoked DVT in 1990 while traveling, treated with 3 months of warfarin, no recurrence.
- History of upper GI bleed (NSAID use) one year ago.
- Should we start anticoagulation?
New VTE Guideline!
Antithrombotic Therapy for VTE Disease: CHEST Guideline and Expert Panel Report

• C Kearon, EA Akl, J Ornelas, A Blaivas, et al.
New Recommendations

• In patients with subsegmental PE (no involvement of more proximal pulmonary arteries) and no proximal DVT in the legs who have a
  • (i) low risk for recurrent VTE, we suggest clinical surveillance over anticoagulation (Grade 2C)
  • (ii) high risk for recurrent VTE (see text), we suggest anticoagulation over clinical surveillance (Grade 2C).

Or

• (ii) high risk for recurrent VTE (see text), we suggest anticoagulation over clinical surveillance (Grade 2C).
The Plan

• Careful discussion of benefits and risks (shared decision making) with Mr. Lucky and his family.

• He remains stable and does not require oxygen.

• He is easily and frequently ambulatory in the hospital and expects to dismiss tomorrow.

• He prefers to avoid starting anticoagulation, and you agree this is reasonable.

• You continue prophylactic enoxaparin while he is in the hospital and arrange for repeat US in 5-7 days and outpatient PCP follow up.
Additional New ACCP Recommendations

• 2. In patients with DVT of the leg or PE and no cancer, as long-term (first 3 months) anticoagulant therapy, we suggest dabigatran, rivaroxaban, apixaban, or edoxaban over vitamin K antagonist (VKA) therapy (all Grade 2B).
Additional New ACCP Recommendations

• 3. In patients with DVT of the leg or PE and cancer (“cancer-associated thrombosis”), as long-term (first 3 months) anticoagulant therapy, we suggest LMWH over VKA therapy (Grade 2C), dabigatran (Grade 2C), rivaroxaban (Grade 2C), apixaban (Grade 2C), or edoxaban (Grade 2C).

• 18. In patients with acute DVT of the leg, we suggest not using compression stockings routinely to prevent PTS (Grade 2B).
Additional New ACCP Recommendations

• 20. In patients with low-risk PE and whose home circumstances are adequate, we suggest treatment at home or early discharge over standard discharge (eg, after the first 5 days of treatment) (Grade 2B).

• 22. In most patients with acute PE not associated with hypotension, we recommend against systemically administered thrombolytic therapy (Grade 1B).
Additional New ACCP Recommendations

• 23. In selected patients with acute PE who deteriorate after starting anticoagulant therapy but have yet to develop hypotension and who have a low bleeding risk, we suggest systemically administered thrombolytic therapy over no such therapy (Grade 2C).

• 29. In patients who have recurrent VTE on VKA therapy (in the therapeutic range) or on dabigatran, rivaroxaban, apixaban, or edoxaban (and are believed to be compliant), we suggest switching to treatment with LMWH at least temporarily (Grade 2C).
Additional New ACCP Recommendations

• 30. In patients who have recurrent VTE on long term LMWH (and are believed to be compliant), we suggest increasing the dose of LMWH by about one-quarter to one-third (Grade 2C).
Wait a minute—what about syncope and PE?
Prevalence of Pulmonary Embolism Among Patients Hospitalized for Syncope

- P Prandoni, AWA Lensing, MH Prins, M Ciammaichella, M Perlati, et al.
Study and Findings

- 560 patients hospitalized with first episode of syncope.
- 330 patients (58.9%) ruled out for PE based on low pretest clinical probability and negative d-dimer.
- PE found in 97 of remaining 230 patients!
- 61 of these had a large PE (main pulmonary or lobar artery or >25% perfusion defect).
- Overall prevalence of PE in all patients was 17.3% (95% CI, 14.2 to 20.5).
Recap of Question #4

What is the next best intervention for Mr. Lucky’s dyspnea?

A. Start IV methylprednisolone 125 mg q6h x 5 days.
B. Check a BNP.
C. Check a D-dimer.
D. Obtain a chest CT angiogram with PE protocol.
New Guideline!

• From *JAMA*, published online October 12, 2016 for RBC transfusion thresholds:
  • 7 g/dL for hospitalized adult patients who are hemodynamically stable, including critically ill patients.
  • 8 g/dL for patients undergoing orthopedic surgery, cardiac surgery, and those with preexisting cardiovascular disease (7 g/dL “likely comparable” but not enough RCTs for all groups).
FDA Updates
Metformin April 8, 2016

- FDA is requiring manufacturers to revise labeling of metformin-containing drugs to indicate that these products may be safely used in patients with mild to moderate renal impairment.

- Before starting metformin, obtain the patient’s eGFR.

- Metformin is contraindicated in patients with an eGFR below 30 mL/minute/1.73 m².
Metformin

• Starting metformin in patients with an eGFR between 30-45 mL/minute/1.73 m² is not recommended.

• In patients taking metformin whose eGFR later falls below 45 mL/minute/1.73 m², assess benefits and risks of continuing treatment.

• Discontinue metformin if the patient’s eGFR later falls below 30 mL/minute/1.73 m².
Metformin

• Discontinue metformin at the time of or before an iodinated contrast imaging procedure in patients with an eGFR between 30 and 60 mL/minute/1.73 m²; in patients with a history of liver disease, alcoholism, or heart failure; or in patients who will be administered intra-arterial iodinated contrast. Re-evaluate eGFR 48 hours after the imaging procedure; restart metformin if renal function is stable.

• Obtain an eGFR at least annually in all patients taking metformin, or more frequently if at increased risk to develop renal impairment.
Fluoroquinolone Advisory May 12, 2016

• Health care professionals should not prescribe systemic fluoroquinolones to patients who have other treatment options for
  • Acute bacterial sinusitis
  • Acute bacterial exacerbation of chronic bronchitis
  • Uncomplicated UTIs

• Risks outweigh the benefits in these patients!
Opioid Abuse Epidemic February 4, 2016

• Drug overdose deaths are now the leading cause of injury death in the US-- surpassing motor vehicle crashes!

• More than 60% of deaths involve opioids including prescription opioid pain relievers, synthetic opioids including fentanyl, and heroin.
Drug Overdose Death Rates 2014

Drug overdose deaths per 100,000 population
- 6.3 - 11.7
- 11.9 - 14.4
- 15.1 - 18.4
- 19 - 35.5

*Age-adjusted death rate per 100,000 population
Source: CDC National Vital Statistics System
Opioid Abuse Epidemic

- FDA’s Opioids Action Plan and the U.S. Department of Health and Human Services’ Opioid Initiative [http://www.hhs.gov/opioids/]
Prescription of Long-Acting Opioids and Mortality in Patients with Chronic Noncancer Pain

- WA Ray, CP Chung, KT Murray, K Hall, CM Stein.
Overview and Key Points

• Retrospective cohort study of Tennessee Medicaid enrollees from 1999 through 2012.

• Propensity score–matched new episodes of prescribed therapy for long-acting opioids or either analgesic anticonvulsants or low-dose cyclic antidepressants (control medications).

• HR for total mortality was 1.64 (95%CI, 1.26-2.12) with a risk difference of 68.5 excess deaths (95%CI, 28.2-120.7) per 10,000 person-years.
Summary

- In patients with CAP, antibiotic treatment for minimum of 5 days is not inferior to “traditional” therapy.

- Early recognition and treatment of sepsis is key!

- New sepsis definitions and clinical criteria may help identify patients likely to have sepsis and septic shock, but should NOT be used for documentation and billing.

- Continue using SIRS criteria until CMS says otherwise.
Summary

• Rapid Response Teams are associated with decreased hospital mortality and non-ICU cardiopulmonary arrest.

• PE are frequently seen in unexplained AECOPD (almost 11% in one study needed A/C).

• Keep a copy of the new ACCP guidelines for VTE on your mobile device!

• Having at-risk patients wear earplugs may decrease the incidence of delirium.
Summary

• Follow latest guidelines for prescribing opioids to help reduce to opioid abuse epidemic.

• Example: for acute pain severe enough to require opioids, “3 days or less will often be sufficient; more than 7 days will rarely be needed.”
Acknowledgement

Thanks to the ACP Hospitalist Weekly staff for their outstanding work to keep hospitalists updated on the current literature!

- Stacey Butterfield
- Jennifer Kearney-Strouse
- Ryan DuBosar
- Mollie Durkin
ACP Hospitalist® Weekly

Welcome to this week's issue of ACP Hospitalist Weekly, an update for hospitalists published every Wednesday by the American College of Physicians.

IN THE NEWS FOR THE WEEK OF MARCH 23, 2016

Oxygen therapy

Reintubation rates lower with noninvasive ventilation or high-flow oxygen than standard therapy

The results of these 2 studies add to the accumulating evidence that noninvasive approaches have a role in reducing respiratory failure and need for reintubation, according to an accompanying editorial. More...

ICU care

Diagnoses of Medicare ICU patients have shifted

Cardiovascular disease remains the top disease category of primary diagnoses, but it declined yearly from 1996 to 2010, while infection-related diagnoses, especially sepsis, rose. More...
Thank you for your attention!

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