Update in Hospital Medicine 2019

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Core Faculty
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Financial disclosures
None
Objectives

1. Critique recent literature relevant to the care of a hospitalized internal medicine patient.

2. Present new research in hospital medicine that may impact your practice.

3. Focus on studies with broad application.

Literature selection

• Sept 2018 to Sept 2019
• Studies relevant to hospital medicine
• Case based scenarios
Outline
- Antibiotic treatment trends
- Expanding indications for DOACs
- VTE prophylaxis
- Delirium
- Disposition options
- **Quick hits** + flavor of High Value Care

Which of the following occurred on the first Thursday in March 2019

A) Justin Bieber’s birthday
B) National Corn Dog Day
C) National Landline day
D) Nationality Grammar Day
E) National Hospitalist Day

#HowWeHospitalist
March 7, 2019 is National Hospitalist Day.
Case #1

A 67yo M with a prosthetic AV is admitted for MSSA endocarditis. He undergoes valve surgery.

What is the best strategy for treating his endocarditis?

A) 6 week course of inpatient IV antibiotics  
B) 6 week course of outpatient IV antibiotics  
C) Inpatient and then outpatient IV antibiotics  
D) Inpatient IV followed by oral antibiotics  
E) Oral antibiotics only
Background

- Infective endocarditis has a high rate of morbidity and mortality if untreated
- Current guidelines recommend 6 weeks IV antibiotics
- PICC line + outpatient infusion not without complications or logistical issues
- Efficacy of IV to oral antibiotic step-down approach not known
**Design**

- Randomized, multi-center, noninferiority
- IV vs. IV → oral strategy
- Left sided endocarditis
- *Streptococcus, Enterococcus, Staph aureus, Coag-neg Staph*

<table>
<thead>
<tr>
<th>Patients Assigned to Treatments</th>
<th>Intravenous Treatment (N = 199)</th>
<th>Oral Treatment (N = 201)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forgotten</td>
<td>199 Were assigned to intravenous antibiotic treatment</td>
<td>201 Were assigned to a shift to oral antibiotic treatment</td>
</tr>
</tbody>
</table>

**Outcome**

- Primary composite: death, unplanned surgery, embolic event or relapse of bacteremia
Results

<table>
<thead>
<tr>
<th></th>
<th>IV group</th>
<th>Oral group</th>
<th>OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composite outcome</td>
<td>24 (12.1%)</td>
<td>18 (9.0%)</td>
<td>.72 [0.37-1.36]</td>
</tr>
</tbody>
</table>

Overall: Oral strategy non-inferior to IV strategy

<table>
<thead>
<tr>
<th>Component</th>
<th>Intravenous Treatment (N=199)</th>
<th>Oral Treatment (N=201)</th>
<th>Difference</th>
<th>Hazard Ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All-cause mortality</td>
<td>13 (6.5)</td>
<td>7 (3.5)</td>
<td>3.0 (-1.4 to 7.7)</td>
<td>0.53 (0.21 to 1.32)</td>
</tr>
<tr>
<td>Unplanned cardiac surgery</td>
<td>6 (3.0)</td>
<td>6 (3.0)</td>
<td>0 (-3.3 to 3.4)</td>
<td>0.99 (0.32 to 3.07)</td>
</tr>
<tr>
<td>Embolic event</td>
<td>3 (1.5)</td>
<td>3 (1.5)</td>
<td>0 (-2.4 to 2.4)</td>
<td>0.97 (0.20 to 4.82)</td>
</tr>
<tr>
<td>Relapse of the positive blood culture†</td>
<td>5 (2.5)</td>
<td>5 (2.5)</td>
<td>0 (-3.1 to 3.1)</td>
<td>0.97 (0.28 to 3.33)</td>
</tr>
</tbody>
</table>

Commentary

When I first heard about this study...
Commentary

- Intriguing and worthwhile
- Appropriate strategy for selected stable patients
- Low rate of MRSA and IVDA limit generalizability to Oregon and USA
- Need more data before making practice change

What’s this?...
...a giant grain of salt

A 67yo M with a prosthetic AV is admitted for MSSA endocarditis. He undergoes valve surgery.

What is the best strategy for treating his endocarditis?

A) 6 week course of inpatient IV antibiotics
B) 6 week course of outpatient IV antibiotics
C) Inpatient and then outpatient IV antibiotics
D) Inpatient IV followed by oral antibiotics
E) Oral antibiotics only
You are paged by the inpatient pharmacist because you ordered Metformin for your patient to continue in the hospital.

How do you respond?:

A) Apologize and stop Metformin
B) Consider the renal function
C) Continue Metformin, lactic acidosis be damned!
D) "$H*#$@!!

---

Association of Metformin Use With Risk of Lactic Acidosis Across the Range of Kidney Function: A Community-Based Cohort Study

Benjamin Lazarus, MBBS, MPH; Aozhou Wu, MHS; Jung-Im Shin, MD, PhD; Yingying Sang, MS; G. Caleb Alexander, MD, MS; Alex Secora, MPH; Lesley A. Inker, MD, MS; Josef Coren, MD, PhD; Alex R. Chang, MD, MS; Morgan E. Grams, MD, PhD

• N=75,400 over 5.7 years
• Single center, Geisinger Health System
• Any hospitalization for “acidosis” not DKA

<table>
<thead>
<tr>
<th>GFR level</th>
<th>HR acidosis</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-59 ml/min</td>
<td>1.16</td>
<td>0.95-1.41</td>
</tr>
<tr>
<td>30-44 ml/min</td>
<td>1.09</td>
<td>0.95-1.08</td>
</tr>
<tr>
<td>&lt;30 ml/min</td>
<td>2.07</td>
<td>1.33-3.22</td>
</tr>
</tbody>
</table>
The 67yo man from first case returns to hospital with infected prosthetic hip joint and osteomyelitis of the femur. He undergoes appropriate surgical drainage and washout.

What is the best strategy to treat his osteomyelitis?

A) 6 week course of inpatient IV antibiotics
B) 6 week course of outpatient IV antibiotics
C) Inpatient and then outpatient IV antibiotics
D) Inpatient IV followed by oral antibiotics
E) Oral antibiotics only
Background

- Surgery + 6 week IV abx current standard for complex bone and joint infections
- Based on 1970s article
- Risks to IV therapy
- Meta-analysis* 180 patients x 1 year → no advantage IV over PO treatment


Original Article

Oral versus Intravenous Antibiotics for Bone and Joint Infection


Design

• Multi-center non-blinded randomized controlled non-inferiority

• IV antibiotics (N=527) vs. PO antibiotics (N=527) for >4 weeks

• Antibiotic choice at discretion of physician

• Primary outcome: Treatment failure at one year defined by one or more:
  - Draining sinus tract or pus
  - Deep-tissue microbiologic isolation same as index infection
  - Histology of ongoing infection
Results

• 75% of participants had abx at least 6 weeks
• Tried different mathematical models to “break” non-inferiority.
• PO was still non-inferior to IV
• Oral therapy had shorter hospital length of stay

Commentary

• Largest RCT to date for this issue
• Challenges long held dogma about treating complex orthopedic infections
• Study design mimics “real world”
• Oral therapy could be considered in selected cases
The 67yo man from first case returns to hospital with infected prosthetic hip joint and osteomyelitis of the femur. He undergoes appropriate surgical drainage and washout.

What is the best strategy to treat his osteomyelitis?

A) 6 week course of inpatient IV antibiotics
B) 6 week course of outpatient IV antibiotics
C) Inpatient and then outpatient IV antibiotics
D) Inpatient IV followed by oral antibiotics
E) Oral antibiotics only

Didn’t I hear something about oral therapy for appendicitis?

JAMA | Original Investigation

Five-Year Follow-up of Antibiotic Therapy for Uncomplicated Acute Appendicitis in the APPAC Randomized Clinical Trial

Paulina Salminen, MD, PhD; Risto Tuominen, MPH, PhD; Hannu Pajunen, MD, PhD; Tero Rautio, MD, PhD; Pia Nordström, MD, PhD; Markku Aarnio, MD, PhD; Tuomo Rantanen, MD, PhD; Saaja Hurme, MSC; Jarkko-Pekka Mecklin, MD, PhD; Juhani Sand, MD, PhD; Johanna Vittinen, MD, PhD; Ari Jartti, MD, PhD; Juhani M. Grönhovd, MD, PhD

<table>
<thead>
<tr>
<th>Group</th>
<th>Syr Complication</th>
<th>Recurrent appendicitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendectomy</td>
<td>24.4%</td>
<td>NA</td>
</tr>
<tr>
<td>(n=273)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antibiotic only (n=257)</td>
<td>6.5%</td>
<td>34% at 2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>35.2% at 3 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39% at 5 years</td>
</tr>
</tbody>
</table>

Conclusion: Oral antibiotics safe for uncomplicated appendicitis

Case #3

75yo F with newly diagnosed cancer is about to start chemotherapy. She has no history of venous thromboembolism.

What is the best strategy to prevent VTE in this patient?

A) Warfarin  
B) Low molecular weight heparin  
C) Factor Xa inhibitor  
D) ASA + Plavix  
E) Compression hosiery
Background

• Low molecular weight heparin is current standard of care for VTE treatment and prevention in patients with cancer

• VTE is common in cancer patients, possibly interrupting treatment

• Factor Xa inhibitors ("DOAC", “NOAC”) have been FDA approved for anticoagulant use in Afib, Stroke, PE/DVT treatment and prevention

• Initial studies of Factor Xa inhibitors had patients with cancer but small volume and methodological issues with studies

Clinical question

• What is the role of Factor Xa inhibitors in VTE prevention in patients with cancer?

• Is primary prevention of VTE warranted in “high risk” cancer patients?

“Khorana score”

<table>
<thead>
<tr>
<th>Patient characteristics</th>
<th>Risk score points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site of cancer</td>
<td></td>
</tr>
<tr>
<td>Very high risk (stomach, pancreas)</td>
<td>2</td>
</tr>
<tr>
<td>High risk (lung, lymphoma, gynecologic, genitourinary excluding prostate)</td>
<td>1</td>
</tr>
<tr>
<td>Pre-chemotherapy platelet count ≥350,000/mm³</td>
<td>1</td>
</tr>
<tr>
<td>Hemoglobin level less than &lt;10 g/dl or use of red cell growth factors</td>
<td>1</td>
</tr>
<tr>
<td>Pre-chemotherapy leukocyte count &gt;11,000/mm³</td>
<td>1</td>
</tr>
<tr>
<td>BMI 35 ≥ 35 kg/m²</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk score (points)</th>
<th>Risk category</th>
<th>Rates of sVTE according to scores (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Low</td>
<td>0.3-0.8</td>
</tr>
<tr>
<td>1-2</td>
<td>Intermediate</td>
<td>1.8-2.0</td>
</tr>
<tr>
<td>≥3</td>
<td>High</td>
<td>6.7-7.1</td>
</tr>
</tbody>
</table>

BMI, body mass index; sVTE, symptomatic VTE
### Primary prevention vs. placebo...

**“CASSINI”**

Rivaroxaban for Thromboprophylaxis in High-Risk Ambulatory Patients with Cancer  

**“AVERT”**

Apixaban to Prevent Venous Thromboembolism in Patients with Cancer  
Marc Caire, M.D., Karim Abou-Nassar, M.D., Ranjeeta Mallick, Ph.D., Vicki Tagalakis, M.D., Sudeep Shivakumar, M.D., Aria Schattner, M.D., Philip Kuruvilla, M.D., Danny Hill, M.D., Silvana Spadafora, M.D., Katende Marquis, M.D., Matelye Lirnka, M.D., Anna Tomiak, M.D., Agnes Y.Y. Lee, M.D., Peter L. Gross, M.D., Alejandro Lazo-Langner, M.D., Robert El-Marzouki, M.D., Glenwood Goss, M.D., Gregory Le Gal, M.D., David Stewart, M.D., Timothy Ramsay, Ph.D., Marc Rodger, M.D., Debra Wolhum, B.Sc. N., and Philip S. Wells, M.D., for the AVERT Investigators

### Secondary prevention vs. LMWH...

Comparison of an Oral Factor Xa Inhibitor With Low Molecular Weight Heparin in Patients With Cancer With Venous Thromboembolism: Results of a Randomized Trial (SELECT-D)  
Amie M. Young, Andrea Marshall, Jenny Thirlwall, Oliver Chapman, Anand Lokare, Catherine Hill, Danielle Hale, Janet A. Dunn, Gary H. Lyman, Charles Hutchinson, Peter McCullagh, Ajay Kakkar, E.D. Richard Hobbs, Stamos Petrou, Jeremy Dale, Christopher J. Peile, Anthony Maranuyas, and Mark Levine

### Design

<table>
<thead>
<tr>
<th>Type</th>
<th>CASSINI</th>
<th>AVERT</th>
<th>SELECT-D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>DBRCT</td>
<td>DBRCT</td>
<td>DBRCT</td>
</tr>
<tr>
<td>Size</td>
<td>~400 patients each arm</td>
<td>~275 patients each arm</td>
<td></td>
</tr>
<tr>
<td>Comparison</td>
<td>6 mo Rivaroxaban vs. Placebo</td>
<td>6 mo Apixaban vs. Placebo</td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td>DVT/PE or Death</td>
<td>VTE</td>
<td></td>
</tr>
</tbody>
</table>

Khorana et al "Rivaroxaban for Thromboprophylaxis in High-Risk Ambulatory Patients with Cancer". NEJM. Feb 2019: 380 (8)  
Cantor et al "Apixaban to Prevent Venous Thromboembolism in Patients with Cancer". NEJM. Feb 2019: 380(8)  
Young et al "Comparison of an Oral Factor Xa inhibitor with low molecular weight heparin in patients with cancer with venous thromboembolism". J Clin Oncology 36:2017-2023
### Results: CASSINI and AVERT

#### Table 1. Cumulative Analysis of the AVERT and CASSINI Trials

<table>
<thead>
<tr>
<th>Outcome</th>
<th>CASSINI Trial</th>
<th>AVERT Trial</th>
<th>Cumulative Values</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rivaroxaban</td>
<td>Placebo</td>
<td>rivaroxaban</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Number/effect</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(total number)</td>
</tr>
<tr>
<td>Primary efficacy outcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITT analysis</td>
<td>25/420 (6.0)</td>
<td>57/425 (8.8)</td>
<td>12/288 (4.2)</td>
</tr>
<tr>
<td></td>
<td>37/708 (5.2)</td>
<td>45/696 (6.6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.56 (95% CI: 0.39 - 0.80)</td>
<td>4.1</td>
<td>24</td>
</tr>
<tr>
<td>Analysis during treatment period</td>
<td>11/420 (2.6)</td>
<td>27/425 (6.4)</td>
<td>3/288 (1.0)</td>
</tr>
<tr>
<td></td>
<td>34/708 (5.0)</td>
<td>47/696 (6.8)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.29 (95% CI: 0.16 - 0.53)</td>
<td>4.8</td>
<td>23</td>
</tr>
<tr>
<td>Symptomatic VTE; ITT analysis</td>
<td>15/420 (3.6)</td>
<td>19/425 (4.5)</td>
<td>9/288 (3.1)</td>
</tr>
<tr>
<td></td>
<td>24/708 (3.4)</td>
<td>41/696 (5.9)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.51 (95% CI: 0.35 - 0.74)</td>
<td>2.3</td>
<td>40</td>
</tr>
<tr>
<td>Major bleeding</td>
<td>8/405 (2.0)</td>
<td>4/404 (1.0)</td>
<td>10/288 (3.5)</td>
</tr>
<tr>
<td></td>
<td>18/689 (2.6)</td>
<td>9/689 (1.3)</td>
<td>1.96 (95% CI: 1.30 - 2.58)</td>
</tr>
<tr>
<td></td>
<td>0.92 (95% CI: 0.73 - 1.16)</td>
<td>1.4</td>
<td>72</td>
</tr>
<tr>
<td>Death from any cause</td>
<td>84/420 (20.0)</td>
<td>100/425 (23.8)</td>
<td>15/288 (12.2)</td>
</tr>
<tr>
<td></td>
<td>119/708 (16.8)</td>
<td>127/696 (18.2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.92 (95% CI: 0.73 - 1.16)</td>
<td>0.23</td>
<td></td>
</tr>
</tbody>
</table>

* In the AVERT trial, the modified intention-to-treat analysis was the primary analysis (574 patients underwent randomization). DOACs denotes direct oral anticoagulants, ITT intention to treat, and VTE venous thromboembolism.
* The number needed to treat is shown for all outcomes except major bleeding (number needed to harm).

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### Results: SELECT-D

<table>
<thead>
<tr>
<th></th>
<th>Rivaroxaban</th>
<th>Dalteparin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk of VTE</td>
<td>3.94%</td>
<td>8.86%</td>
</tr>
<tr>
<td>RR</td>
<td>.44</td>
<td></td>
</tr>
<tr>
<td>ARR</td>
<td>4.92%</td>
<td></td>
</tr>
<tr>
<td>NNT</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Risk of Major Bleeding</td>
<td>5.4%</td>
<td>2.9%</td>
</tr>
<tr>
<td>RR</td>
<td>1.86</td>
<td></td>
</tr>
<tr>
<td>NNH</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
Commentary

- DOACs are emerging as alternative to LMWH in cancer patients for primary or secondary prevention

- Costs, risk:benefit, patient preference may play role in choice

- Might require guideline update before broad practice change occurs

75yo F with newly diagnosed cancer is about to start chemotherapy. She has no history of venous thromboembolism.

What is the best strategy to prevent VTE in this patient?

A) Warfarin
B) Low molecular weight heparin
C) Factor Xa inhibitor
D) ASA + Plavix
E) Compression hosiery
You are admitting a patient to the ICU who is deemed “high risk” for VTE development. The patient is not on any VTE prophylaxis.

As you open the chart...
You are admitting a patient to the ICU who is deemed “high risk” for VTE development. The patient is not on any VTE prophylaxis.

How do you respond?:

A) Order enoxaparin alone
B) Order SCDs alone
C) Order both SCDs and enoxaparin
D) Order TED hose instead
E) No VTE prophylaxis, that stuff is overrated
Background

• VTE is common in critically ill patients

• 50% reduction in VTE with pharmacologic prophylaxis vs. placebo
  ➢ 5-20% still get VTE even with pharmacologic prophylaxis

• 30% reduction in VTE with pharm + SCD vs. pharm alone—retrospective stroke population

• No RCTs comparing pharm +/- SCDs in critically ill

• Guidelines make mixed recs; therefore...

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Adjunctive Intermittent Pneumatic Compression for Venous Thromboprophylaxis

Design

- Multi-site international non-blinded RCT
- Pharmacologic VTE +/- pneumatic compression
- Primary outcome: Incidence of lower limb DVT

Results

No difference in VTE incidence between two groups
Commentary

• Largest controlled trial to date on topic
• Eliminating SCDs when patients are on LMWH has potential huge cost implications and patient mobility
• Need to address hospital policies to match this new data

You are admitting a patient to the ICU who is deemed “high risk” for VTE development. The patient is not on any VTE prophylaxis.

How do you respond?:

A) Order enoxaparin alone
B) Order SCDs alone
C) Order both SCDs and enoxaparin
D) Order TED hose instead
E) No VTE prophylaxis, that stuff is overrated
Case #5

85yo female with influenza is admitted to the wards. On HD#3, she is confused, seems to be hallucinating and is picking at her IV and removing her oxygen. She has a fever of 101.4 and SaO2 90% on 2L. Overnight she has more shortness of breath and is transferred to the ICU with ARDS and respiratory failure. She remains confused.

Which of the following are true?

A) Early treatment with anti-psychotic medications on the wards will shorten her duration of delirium?
B) Early treatment with anti-psychotic medications could have prevented her ICU transfer?
C) Initiation of anti-psychotic medications in the ICU will shorten her days of delirium?
D) None of the above are true
Background

• Delirium is very common in hospitalized patients and associated with poorer outcomes

• Hypoactive (80%) >> Hyperactive (20%) cases

• Conflicting prior data on effectiveness of anti-psychotics in treatment of delirium

• Anti-psychotics continue to be used widely (50-60% cases)

Design

Haloperidol and Ziprasidone for Treatment of Delirium in Critical Illness

Design

- Multi-center DBRCT
- ICU patients with delirium
- Haldol IV (N=192) vs. Ziprasidone IV (N=190) vs. Placebo (N=184)
- Trained assessments 2x/day with CAM-ICU tool
- Outcome: Number of days with and without delirium

Results

No difference in delirium days between the groups
Commentary

- Largest DBRCT to date on topic

- Similar findings as prior smaller ICU delirium studies (“MIND” and “Hope-ICU”)

- Reemphasizes need to address underlying factors leading to delirium and be patient for resolution

- TWDFNR=Anti-psychotics for delirium
85yo female with influenza is admitted to the wards. She is confused, seems to be hallucinating and is picking at her IV and removing her oxygen. She has a fever of 101.4 and SaO2 90% on 2L. Overnight she has more shortness of breath and is transferred to ICU with ARDS and respiratory failure. She remains confused.

Which of the following are true?

A) Early treatment with anti-psychotic medications on the wards will shorten her duration of delirium?
B) Early treatment with anti-psychotic medications could have prevented her ICU transfer?
C) Initiation of anti-psychotic medications in the ICU will shorten her days of delirium?
D) None of the above are true

75yo M with sepsis and acute cholecystitis.

Which of the following has a lower complication rate?

A) Lap chole—get that sucker out of there!
B) Percutaneous drainage
Laparoscopic cholecystectomy versus percutaneous catheter drainage for acute cholecystitis in high risk patients (CHOOCOLATE): multicentre randomised clinical trial

Charlotte S Loozen, Hjalmar C van Santvoort, Peter van Duijvenbeld, Marc GH Besselink, Dirk J Gouma, Grard AP Nieuwenhuijzen, Johannes C Keijer, Sandra C Donkervoort, Anna AW van Geloven, Philip M Kuyp, Daphne Roos, Kirsten Koekram, Verena NN Kornmann, Apollo Pronk, Donald L van der Peet, Rogier MPH Crolla, Bert van Ramshorst, Thomas L Bollen, Djamila Boerma

- First RCT
- APACHE score 7-14

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Complication rate</th>
<th>Death</th>
<th>Healthcare cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lap chole (N=66)</td>
<td>12%</td>
<td>3%</td>
<td>-30%</td>
</tr>
<tr>
<td>Perc drainage (N=68)</td>
<td>65%</td>
<td>9%</td>
<td>NA</td>
</tr>
</tbody>
</table>

Loozen et al “Laparoscopic cholecystectomy versus percutaneous catheter drainage for acute cholecystitis in high risk patients (CHOOCOLATE): multicentre randomised clinical trial” BMJ 2018; 363:k3965 Aug 2018

When I regretted using Google...
75yo M, who lives independently, is admitted after a fall due to CHF exacerbation. PMH includes COPD, HTN and mild cognitive impairment. He works with PT/OT and is not quite at his functional baseline.

What is the best discharge disposition for him?

A) He should be discharged to home with home health  
B) He should be discharged to Skilled nursing  
C) He should remain in hospital until fully back to functional baseline  
D) Need more information
Background

- 40% Medicare inpatients get “post-acute” care—90% as Skilled nursing (SNF) or Home health (HH)
- $60 billion per year and rising!
- Prior studies have been small or observational with conflicting results
- HH costs<<SNF costs
- What about other metrics or clinical outcomes?

Background

Research

JAMA Internal Medicine | Original Investigation

Patient Outcomes After Hospital Discharge to Home With Home Health Care vs to a Skilled Nursing Facility

Rachel M. Werner, MD, PhD; Norma B. Coe, PhD; Mingyu Qi, MS; R. Tamara Konetzka, PhD
Design

- Retrospective cohort Medicare beneficiaries
- 17.2 million hospitalizations
- Jan 1, 2010 to Dec 31, 2016

Outcome measures

- All cause 30 day readmission
- Death within 30 days of discharge
- Functional status change
- Medicare payment for postacute care and total payment at 60 days
Results

- Cohort well-matched
- Usual stuff

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Patients, No. (%)</th>
<th>SNF (n = 10 548 515)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean (SD), y</td>
<td>78.7 (7.7)</td>
<td>81.5 (7.9)</td>
</tr>
<tr>
<td>Female sex</td>
<td>3 918 245 (58.6)</td>
<td>6 809 443 (64.6)</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>5 706 387 (85.3)</td>
<td>9 163 361 (86.9)</td>
</tr>
<tr>
<td>Black</td>
<td>657 929 (9.8)</td>
<td>959 701 (9.1)</td>
</tr>
<tr>
<td>Hispanic</td>
<td>128 577 (1.9)</td>
<td>159 732 (1.5)</td>
</tr>
<tr>
<td>Dually enrolled in Medicare and Medicaid</td>
<td>863 159 (12.9)</td>
<td>2 179 823 (20.7)</td>
</tr>
<tr>
<td>Enrolled in Medicare Advantage</td>
<td>1 633 387 (24.4)</td>
<td>2 602 358 (24.7)</td>
</tr>
<tr>
<td>No. of comorbidities, mean (SD)</td>
<td>3.2 (2.7)</td>
<td>3.3 (2.8)</td>
</tr>
<tr>
<td>5 Most common DRGs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total knee or hip replacement</td>
<td>856 617 (12.8)</td>
<td>1 178 668 (11.2)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>313 046 (4.7)</td>
<td>667 208 (6.3)</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>456 418 (6.8)</td>
<td>460 914 (4.4)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>293 392 (4.4)</td>
<td>406 087 (3.8)</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>170 681 (2.6)</td>
<td>434 723 (4.1)</td>
</tr>
</tbody>
</table>

Results

- Raw data

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Discharge to Home Health Care</th>
<th>Discharge to SNFs</th>
<th>Difference Between Discharge to Home Health Care (vs SNF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient outcomes (all discharges N = 17 235 854), %</td>
<td>15.8</td>
<td>17.8</td>
<td>-2.0</td>
</tr>
<tr>
<td>Readmission within 30 d</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death within 30 d</td>
<td>2.3</td>
<td>6.9</td>
<td>-4.6</td>
</tr>
<tr>
<td>Improvement in activities of daily living</td>
<td>80.2</td>
<td>29.3</td>
<td>50.9</td>
</tr>
<tr>
<td>Medicare payment (fee-for-service Medicare discharges N = 13 000 109), mean (SD), $</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medicare payment to hospital</td>
<td>11 240 (11 231)</td>
<td>11 549 (12 195)</td>
<td>-309</td>
</tr>
<tr>
<td>Medicare payment to HHA or SNF</td>
<td>2459 (1520)</td>
<td>11 073 (9414)</td>
<td>-8614</td>
</tr>
<tr>
<td>Total Medicare payment in first 60 d after hospital admission</td>
<td>17 088 (14 525)</td>
<td>26 101 (16 426)</td>
<td>-9013</td>
</tr>
</tbody>
</table>
Results

- After statistical analysis
- 17,235,854 hospitalizations
- 62.2% women, 37.8% men

<table>
<thead>
<tr>
<th>Outcome</th>
<th>HH (38.8%) vs. SNF (61.2%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>30d readmission</td>
<td>+5.6%</td>
<td>0.02</td>
</tr>
<tr>
<td>30d mortality</td>
<td>-2%</td>
<td>0.12</td>
</tr>
<tr>
<td>Functional status</td>
<td>-1.9%</td>
<td>0.71</td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30d</td>
<td>-$5384</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>60d</td>
<td>-$4514</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Commentary

- Largest study to date looking at this topic
- 2x more patients to SNF vs. Home—Why?...
  - Clinical factors—old, frail, complicated
  - Non-clinical factors—social support, “easy DC”, CCOs, hospitalists, fear of readmission
- Tradeoffs of “risks”—readmissions vs. cost
- Need better Home Health “system” analysis and improvement

- Tip of iceberg sort of study...gets the policy and other conversations going
75yo M, who lives independently, is admitted after a fall and CHF exacerbation. PMH includes COPD, HTN and mild cognitive impairment. He works with PT/OT and is not quite at his functional baseline.

What is the best discharge disposition for him?

A) He should be discharged to home with home health
B) He should be discharged to Skilled nursing
C) He should remain in hospital until fully back to functional baseline
D) Need more information

You are co-managing an 83yo F with a right hip fracture after a ground level fall. She has osteoporosis, HTN, cataracts and hypothyroidism. Her pain is well controlled on oral morphine.

Which of the following should NOT be used for prevention of constipation?

A) Docusate oral
B) Sennoside oral
C) Polyethylene glycol (PEG or Miralax)
D) Lactulose
E) Soluble fiber (Psyllium aka “Metamucil”)
**CHOOSING WISELY®: THINGS WE DO FOR NO REASON**

**Things We Do for No Reason: Prescribing Docusate for Constipation in Hospitalized Adults**

Robert J Fakheri, MD*, Frank M Volpicelli, MD²

- On balance studies on docusate effectiveness show no difference vs. placebo or other modalities
- Cost of drug and administration--$100 million!* 
- Harm in waiting to poop

**Recommendation:**
- PEG>Lactulose>Psyllium>Sennosides**
- Remove colace from hospital formulary!

**Ramkumar D, Efficacy and safety of traditional medical therapies for chronic constipation: systematic review. Am J Gastroenterol. 2005;100(4):936-971

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**Summary**

**START**
- Oral antibiotics for selected cases of endocarditis, osteomyelitis and appendicitis
- DOACs as an option in cancer patients
- Cholecystectomy rather than perc drainage for high risk acute cholecystitis
- Redesigning home health to be a more robust discharge option
- Thank a hospitalist 1st Thursday every March
Summary

STOP
• Metformin if GFR<30 ml/min
• SCDs in high risk patients already on pharmacological VTE prophylaxis
• Anti-psychotics in patients with hypOactive delirium
• Colace for constipation

What Questions Do you have?

Thank you!

kbreger@LHS.org
CAM-ICU tool from MDCalc.com