HMS
MICHIGAN HOSPITAL MEDICINE
SAFETY CONSORTIUM

D.I.S.Ch.A.R.G.E. Antibiotics: FACTS AND SOLUTIONS

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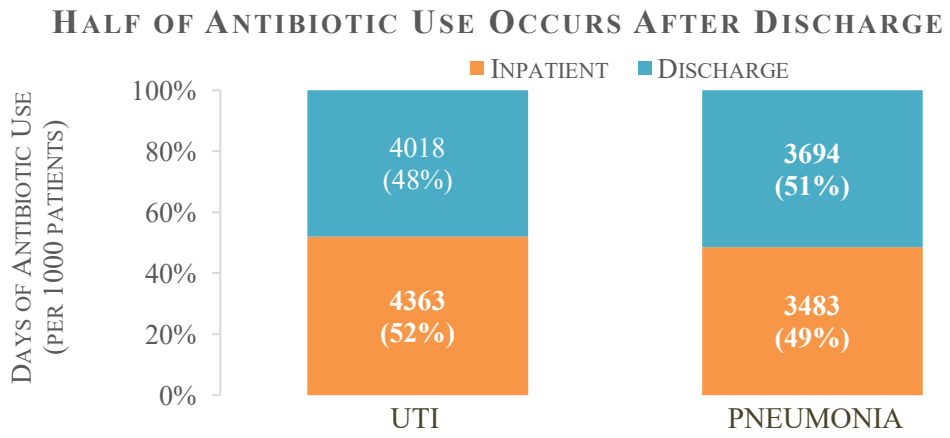
1 Most Antibiotic Stewardship Programs do not Monitor Antibiotic Use at Hospital Discharge

- **8** out of 48 HMS hospitals (HMS Spring Survey 2016)

2 Half of Antibiotic Exposure Related to Hospitalization Occurs After Discharge (HMS Data)



- For some antibiotics, this number is even higher:
  - For example, **65.8%** of fluoroquinolone-days occur after discharge

3 Without Monitoring, Antibiotic Use at Discharge is Often Excessive (HMS Data)

- For pneumonia, **94.3%** of all excess antibiotic duration occurs after discharge
- Up to half of antibiotics prescribed at discharge have a broad spectrum

  - Pneumonia: **56.5%**
    - Fluoroquinolone: **39.5%** of patients
    - Third-generation cephalosporin: **15.8%** of patients
  - UTI: **31.2%**
    - Fluoroquinolone: **25.4%** (17.3% of asymptomatic bacteriuria)
    - Third-generation cephalosporin: **6.8%** (5.7% of asymptomatic bacteriuria)

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4 Inpatient Antibiotic Stewardship May Shift Antibiotic Use to Discharge (HMS data)

- In hospitals actively targeting inpatient fluoroquinolone use:
  - **79.6%** of fluoroquinolone-days occur after discharge
  - Twice as many new fluoroquinolone starts occur at discharge
  - There is less inpatient fluoroquinolone use, but similar discharge and overall days of fluoroquinolone therapy per **1000** patients

5 Why do Discharge Prescriptions Matter?

- Discharge antibiotics can cause patient harm:
  - Including side effects, Clostridium difficile (CDI), and antibiotic resistance, diarrhea, rash, kidney toxicity, etc.
  - As few as 1-3 days of fluoroquinolone therapy doubles risk of CDI[3]
    - So, changing to fluoroquinolone therapy at discharge puts patients at risk for community-onset CDI
- If we could optimize duration at discharge, we would:
  - **Eliminate 94.3%** of all excess antibiotic duration for pneumonia
  - **Reduce** days of antibiotic therapy by **25%** (2398 days/1000 patients)
    - Half of the reduction would be in broad-spectrum antibiotic therapy

D.I.S.Ch.A.R.G.E!

How to improve antibiotic prescribing at hospital discharge.

Default orders and order sets

- Consider use of default transitions from IV to oral and recommendations within computerized order-entry to improve early transition to appropriate oral therapy (which can then be continued on discharge)
- Make sure default orders and order sets recommend guideline-appropriate antibiotic choice and duration

Incentivize

- Consider incorporating discharge antibiotic metrics into quality or compensation targets

Discharge **S**ummary

- Require documentation of total antibiotic duration in discharge summary
    - Consider enforcing this rule by using smart phrases with hard stops for antibiotic duration in the discharge summary
    - E.g.: To treat (disease), Mr(s) X will continue (abx name) for X additional days, for X days total.

Checklist

- Use an antibiotic checklist at discharge to evaluate and ensure antibiotic appropriateness

Audit and Feedback

- Audit and provide feedback of discharge prescriptions (e.g., pharmacists or stewardship team, performance review, quality compensation targets)

Review: Incorporate antibiotic appropriateness into discharge review process using different members of the care team

- For example
    - With pharmacists (when reviewing or filling discharge medications)
    - With bedside nurse (when reviewing discharge medications)
    - During multidisciplinary/discharge rounds

Guidelines

- Make sure your institutional guidelines include oral antibiotic recommendations for discharge for common infections (e.g., pneumonia, urinary tract infection)
    - Prioritize non-fluoroquinolone antibiotics in guidelines
    - Recommend alternatives to fluoroquinolone antibiotics when possible
    - Provide a recommendation for appropriate duration for different disease states (e.g., 5 days for community-acquired pneumonia), making sure that total duration includes effective inpatient therapy

Educate providers on guidelines and discharge recommendations

- Formal lectures to residents, physicians (e.g., hospitalist, ID, ED), APPs
- Consider using pocket card
- Consider the use of multiple ways to post guidelines (e.g., websites, apps, printed books)

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