Decreasing Readmissions in Outpatient Parenteral Antimicrobial Therapy (DROP IT)

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*There are no conflicts of interest for the investigators involved and the outcome of this research
Objectives

• Explain literature supporting outpatient parenteral antimicrobial therapy (OPAT) and recommendations for best practices

• Review outcomes of patients in an OPAT discharge program at an academic medical center

• Identify process improvement strategies to reduce OPAT-related readmissions

• Understand adverse effects that may be associated with OPAT readmission (see PTCE Blueprint 1.5)
Comparing IPAT and OPAT Outcomes

Outpatient Antimicrobial Therapy (OPAT)

- Treatment Initiated (n=72)
- Treatment Completed
  - Required Readmission: 8 (11.1%)
  - Cured (59, 81.9%)
  - Readmitted (13, 18.1%)
  - Death (1, 1.4%)

Inpatient Antimicrobial Therapy (IPAT)

- Treatment Initiated (n=93)
- Treatment Completed
  - Cured (75, 80.6%)
  - Readmitted (18, 19.4%)
  - Death (1, 1.1%)

Cured (17, 18.3%)
OPAT Readmission

• OPAT can be an effective treatment strategy
• Reported 90-day readmission rate of 13 to 22%
• Factors related to increased readmission rates
  • Readmissions in the last 12 months
  • History of resistant organisms
### Table 3. Reasons for 30-Day Readmission (n = 207)

<table>
<thead>
<tr>
<th>Reason for 30-Day Readmission</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not related to infection</td>
<td>63 (30)</td>
</tr>
<tr>
<td>Infection worsening</td>
<td>62 (30)</td>
</tr>
<tr>
<td>New infection</td>
<td>48 (22)</td>
</tr>
<tr>
<td>Adverse reaction to drug</td>
<td>30 (14)</td>
</tr>
<tr>
<td>Intravenous line complication</td>
<td>20 (10)</td>
</tr>
<tr>
<td>Missing</td>
<td>4 (2)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>2 (1)</td>
</tr>
</tbody>
</table>
UC Health
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12-13 Medicine Teams
Inpatient ID Consult Team

3 Pharmacists, 1 Resident
Outpatient ID Clinic
Methods

• Single-center, retrospective chart review

• Patient identification:
  • Enroll up to 200 patients, up to 100 discharged home and up to 100 discharged to a skilled nursing facility (SNF)
  • Utilize ICD-9 codes to target patients with conditions requiring long-term antibiotics
  • Time Period: August 2013 – September 2015
UCMC 90-Day Readmission Rate

- All: 33.7%
- SNF: 32%
- Home: 35.7%

Reasons for Readmission at 90 Days

- Worse Infection: 12.90%
- OPAT ADR: 6.45%
- AKI: 6.45%
- Drug Access: 8.06%
- Drug Level: 8.06%
- Culture Result: 1.61%
- Other: 56.45%
Identified Risk Factors

• Previous Admission the Last 12 Months (p<0.001)
  • Patients with a history of frequent admissions may be more likely to continue this trend
  • May have complicated medical conditions that make OPAT more difficult to manage

• Blood-Related Infection (p<0.001)
  • May have more high risk behaviors (e.g., intravenous drug use) than other populations
  • Possibility of septic emboli/microbial seeding/reinfection

Decreasing Readmissions in Outpatient Parenteral Antimicrobial Therapy (DROP IT)
- Improve
- Standardize

- Define
- Assess
- Analyze

Act

Plan

Study

Do

- Reassess
- Analyze

- Implement
Active Learning

Which part of the Plan/Do/Study/Act model for process improvement involves continual reassessment of the outcomes of a process?

A. Plan
B. Do
C. Study
D. Act
Finding Best Practices

- IDSA recommends that OPAT centers “have an active performance improvement program”

- Many health systems are moving toward the “bundle approach” to solve patient care issues

- An OPAT bundle has been recommended and described in literature

Utility of Bundles

• “…50% of patients receive the recommended care”

• A bundle should contain 3-6 services that are not being consistently delivered

• Bundles should evolve over time, aiming for consistent improvement
OPAT Discharge Process

Patient Identification

- Determination of Diagnosis, Tx, and Follow-Up
- Selection of Antibiotic Regimen
- Set Up HHC/SNF Services

Failure Modes

- No standardized way to identify OPAT patients
- Care management unable to prioritize

Final Discharge Coordination

Communication with HHC/SNF and Patient

Patient Identification

Set Up HHC/SNF Services
OPAT Discharge Process

- Determination of Diagnosis, Tx, and Follow-Up
- Selection of Antibiotic Regimen
- Set Up HHC/SNF Services
- Documentation
- Final Discharge Coordination
- Communication with HHC/SNF and Patient

Failure Modes:
- Patients not consistently getting ID consult and follow-up
- Antibiotics not always properly dosed for discharge due to lack of formal recommendations with pharmacist review
OPAT Discharge Process

- Patient Identification
- Determination of Diagnosis, Tx, and Follow-Up
- Selection of Antibiotic Regimen
- Set Up HHC/SNF Services

Documentation

Final Discharge Coordination

Communication with HHC/SNF and Patient

Failure Modes

- Recommendations are not consistently being pulled into the discharge summary and continuation of care/home health summaries
- No reliable communication with SNF or HHC companies
- No emergency plan
The UCMC OPAT Bundle

Consult to Care Management

Consult to Pharmacy

Consult to Infectious Disease
Consult to ID

Consult to Pharmacy

Evaluate Antibiotics

Discuss Care Options with Patient

Consult to Care Mgmt

Submit Referrals For SNF/HHC/Infusion Services

Decide on Final Dispo Service(s) with Patient

Communicate to Service Provider(s)

Coordinate with Scheduling Services to set up ID Appt

Patient Education from HHC/Infusion Service Where

Follow-Up Within 14 Days

Evaluate Patient

Formalize Recs

Progress Notes

Finalize Antibiotic Plan

Progress Notes

Stacy E, et al. *University of Cincinnati Medical Center Internal Data*. 2016
Active Learning

What should a healthcare bundle look like?

A. Rigid, unchanging model with 10-20 components
B. Rigid, unchanging model with 3-6 components
C. Flexible, evolving model with 10-20 components
D. Flexible, evolving model with 3-6 components
Decreasing OPAT Readmissions
Key Driver Diagram (KDD)

Project Leader(s): Beth Stacy, Maria Guido, Siyun Liao, Kristen Carter
Revision Date: 04/04/2017 (v1)

SMART Aim
Reduce 30-day and 90-day OPAT-related readmissions by 20%
Population: OPAT patients being discharged with at least 7 days of therapy

Key Drivers
- Appropriate antibiotic selection and dosing
- Reliable therapeutic monitoring
- Reliable ID Follow-Up
- Patient Education
- Addressing Social Barriers

Interventions (LOR #)
- Early identification of patients
- Pharmacy-initiated documentation of appropriate antibiotics
- ID Consult on patients as appropriate
- Social Work/Care Management consult on all patients

Key
- Gray shaded box = pending intervention
- Red shaded box = what we’re working on right now
- LOR # = Level of Reliability Number, e.g., LOR 1

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Identification of Patients Through Chart Review

Recommend ID Consult

Evaluate ID recommendations and antibiotic considerations

Leave formal recommendations using OPAT note template
Add to OPAT List

CURRENT PHARMACY PROCESS

DISCHARGE

Update formal note as needed based on monitoring or other therapeutic changes

Open Pharmacist Communication for ongoing review
Process Outcomes

• **Timely Antibiotic Recommendations:** Within 24 hours of consult placement AND at least 24 hours prior to patient discharge

• **Accurate Antibiotic Recommendations:** Antibiotics match those recommended by infectious disease AND dose, frequency, and infusion rate are appropriate based on clinical pharmacist judgement

• **Utilization of Antibiotic Recommendations:** Antibiotic dose, frequency, and infusion rate match those recommended in the pharmacist note and ID or pharmacy recommended monitoring is included in the discharge summary, continuation of care summary, or home healthcare note
Continuous Evaluation of Pharmacy Process

![Graph showing outcomes completed over time for patients chronologically.](Image)
Next Steps – Pharmacy Process

• Address discrepancies in discharge summary and continuation of care/home health care notes

• Streamline pharmacy process to include quicker recognition time
  • Request consults when patients with long antibiotic courses identified regardless of discharge status
  • Note when patients are close to discharge and communicate with team, especially if there has been team turnover
Next Steps – Global Bundle

- “Go live” of the full OPAT Bundle
- Continued PDSA cycles
- Study comparing post-bundle implementation to pre-bundle patients
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