Don't Standpat on OPAT: Stewardship Opportunities at Transitions-of-Care

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Nebraska Medicine

1

Disclosures

Serve as co-investigator on an investigator-initiated grant from Merck, related to OPAT program outcomes for immunocompromised patients

Serve on clinical advisory board for Astellas Pharma, related to antifungal agents and fungal infections

2

What is OPAT?

- Outpatient Parenteral Antimicrobial Therapy (OPAT)
  - IV antimicrobial therapy being administered in any outpatient setting
  - Institutional risk: complex patients at 2.5-fold higher-risk for readmission
  - Provider risk: unfamiliarity or unresponsiveness to appropriate monitoring
  - Patient risk: unnecessary/inappropriate antimicrobial use or line-related complications
  - Recognized value for improved antimicrobial stewardship, adverse event mitigation, and reduction in readmissions
- 2018 Infectious Disease Society of America Guidelines for OPAT
  - "All patients should receive ID expert review prior to initiation of OPAT"

Huck et al. *J Antimicrob Chemother* 2014; 69: 228-33.
Norris et al. *Clin Infect Dis* 2018; 68: e1-35.

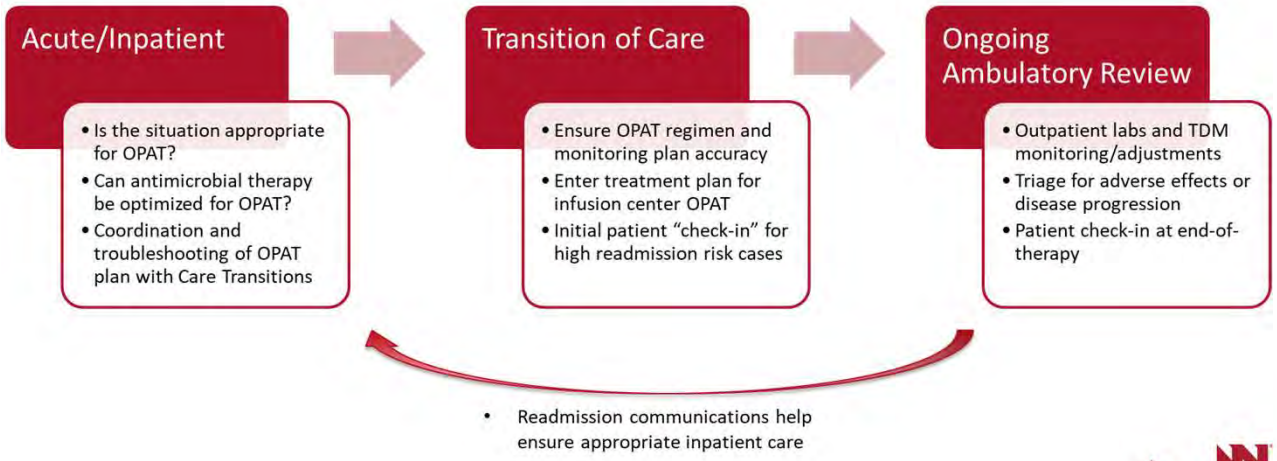
3

Birth: Supplemental OPAT PharmD Resources

- In 2017, 29% of discharges with IV antimicrobials didn't involve ID consult teams
- OPAT guidelines recommend having a pharmacist as part of the OPAT team
- OPAT program approved March 2019 within the context of the Antimicrobial Stewardship Program (ASP)
  - 1.0 FTE pharmacy coordinator and 0.3 FTE medical director
- Of note, an Orthopedic ID consult service was also initiated August 2018

4

OPAT Process and Elements



5

Indications for OPAT

Indication	Antibiotic Guidance
Intrabdominal infection (IAI) without adequate source control	OPAT is often indicated. These infections are often highly complex and such patients generally benefit from Infectious Diseases consultation.
Surgical site infection (SSI) Involving the GI tract, female GU tract, or perineum	OPAT may be indicated. Patients with SSI involving the GI tract, female GU tract, or perineum who have culture data showing organisms susceptible to oral agents (e.g. quinolones and metronidazole) can be switched to oral therapy. Patients who have infections with undefined microbiology who improve on broad-spectrum IV therapy are generally continued on their empiric regimen for 5-14 days based on clinical response.
Bone and joint infections	OPAT is often indicated. Mounting evidence supports the equivalence of oral versus intravenous antibiotics for bone and joint infections (Li HK et al, NEJM 2019). That said, intravenous antibiotics are frequently employed as initial therapy and may be continued for the duration when infected hardware is present, in patients at high risk for a poor outcome (e.g. MRSA, incomplete source control), and when the microbiologic etiology of the infection is not known. Strongly consider Infectious Disease consultation.
Endovascular infections (including bacteremia, catheter-related bloodstream infections, septic thrombophlebitis, and endocarditis)	OPAT is often indicated. Emerging data suggests that under select circumstances, gram-negative blood stream infection (Kutob LF et al, Int J Antimicrob Agents 2016), low-risk S. aureus bacteremia (Willekens R et al, CID 2018), and even infective endocarditis (Iverson K et al, NEJM 2019) may be treated with oral antibiotic therapy. That said, data are too limited to make general recommendations about oral treatment of endovascular infections. The decision to use oral agents as definitive antibiotic therapy for an endovascular infection should always be made in consultation with Infectious Diseases.

https://www.unmc.edu/intmed/_documents/id/asp/opat-unmc-asp-indications-for-opat.pdf

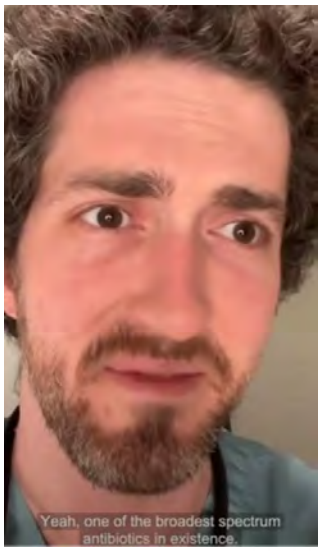
6

Opportunities for Stewardship in OPAT

Mahoney, et al. Curr Infect Dis Rep. 2021; Nov 9.

7

In OPAT, sometimes "stewardship" means Ertapenem



Everyone Else

Infectious Disease

Dr. Glaucomflecken: https://www.youtube.com/watch?v=nJVG_B32qSI

8

What Metrics are Utilized for OPAT?

- OPAT programs do not employ a consistent set of operational metrics
- Readmission rate is the most consistently evaluated/reported (particularly 30-day, all-cause)
  - In general, this metric falls around a 20% rate
  - Consider adjudicating an "infection-related" subset for this metric, also
- Program-specific process interventions or "leading indicators"

Mahoney, et al. Curr Treat Options Infect Dis. 2020; 12: 158-77.

9

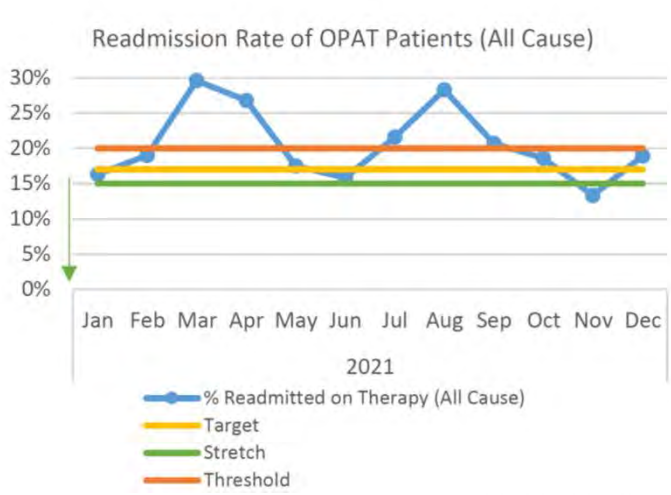
Optimization of Antibiotics at Discharge

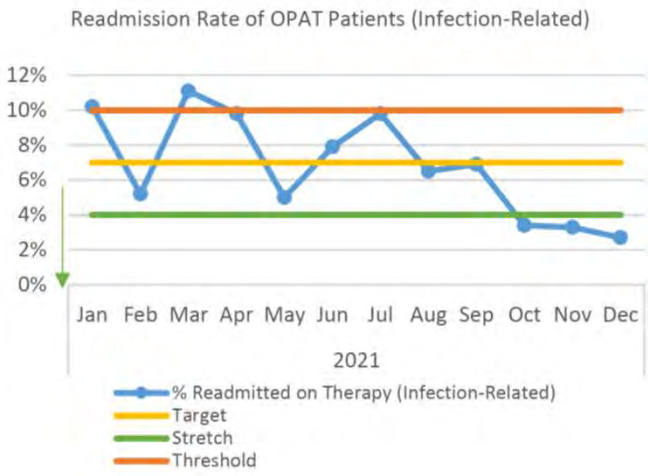
- Lots of interest and publications on this over just the past few years
- Many done in community hospitals and utilizing generalist clinical pharmacists
  - Mercuro, et al. JAMA Netw Open 2022; 5(5), May 2.
  - Vaughn, et al. CID 2022; Feb 10.
  - Giesler, et al. Am J Infect Control 2022; 50(7): 777-86.
  - Saleh, et al. JAC Antimicrob Resist 2022; 4(4), Jul 11.
  - Brower, et al. Hosp Pharm 2021; 56(5): 532-36.
  - Conner, et al. OFID 2021; 8(8), Jul 24.
  - Choi, et al. Am J Health Syst Pharm 2021; 78(S2), S62-9.
  - Vaughn, et al. CID 2021; 73(11), Dec 6.

"Start where you are. Use what you have. Do what you can"
- Arthur Ashe

10

Monthly OPAT Metrics Dashboard





11

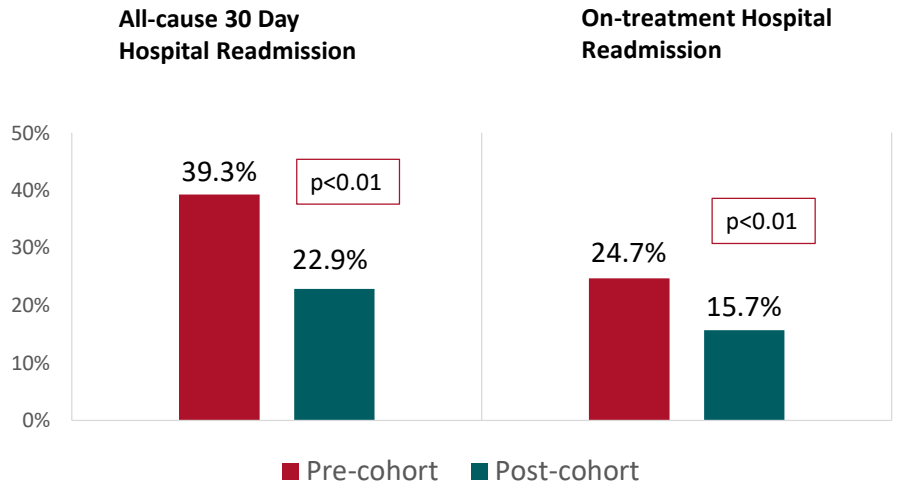
Initial OPAT Program Outcomes

- Retrospective, quasi-experimental cohort
- Time Periods:
  - Pre-OPAT Cohort: Apr. 1st – Oct. 31st, 2018
  - Post-OPAT Cohort: Apr. 1st – Oct. 31st, 2019
- Outcomes:
  - 30-day, all-cause readmission rate
  - On-treatment readmission rate
  - Optimal treatment rate for MSSA (cefazolin, oxacillin, or nafcillin)
  - Orthopedic ID subgroup: time from final OR visit to discharge

Young, et al. IDWeek. October 2020. Oral abstract #O-126

12

Primary Study Outcomes



Young, et al. IDWeek. October 2020. Oral abstract #O-126

13

Initial OPAT Program Outcomes - Conclusions

Implementation of an OPAT program combined with an OID Consult Service showed a clinical benefit in:

- Significant reduction in 30-day, all cause and on-treatment hospital readmission rates
- Significant reduction in time from final OR visit to discharge for Orthopedic Infectious Disease indications
- Increase in optimal treatment of MSSA with gold standard therapies

Young, et al. IDWeek. October 2020. Oral abstract #O-126

14

Discharge Facilitation: An OPAT Core Competency

Open Forum Infectious Diseases

BRIEF REPORT

Use of a Standardized Dalbavancin Approach to Facilitate Earlier Hospital Discharge for Vulnerable Patients Receiving Prolonged Inpatient Antibiotic Therapy

Axel A. Vazquez Deida,[1] Katherine C. Shihadeh,[1] Candice R. Preslaski,[1] Heather L. Young,[2,3] David L. Wyles,[2,3] and Timothy C. Jenkins[2,3]

[1]Pharmacy Department, Denver Health Medical Center, Denver, Colorado, USA, [2]Division of Infectious Diseases, Department of Medicine, Denver Health Medical Center, Denver, Colorado, USA, and [3]Division of Infectious Diseases, Department of Medicine, University of Colorado School of Medicine, Aurora, Colorado, USA

- Facilitating inpatient discharge from difficult to discharge patients was identified as a focus group at NMC
- Others reported on discharging vulnerable patients for the last week of treatment with a structured dalbavancin regimen (n=27)
- 90d readmission = 15% (4% related)
- 182 inpatient days avoided

Vazquez Deida AA, et al. Open Forum Inf Dis. 2020; Jul 13.

15

Discharge Facilitation ROI

- OPAT team focused on identifying and assisting with patients requiring OPAT that had barriers preventing hospital discharge

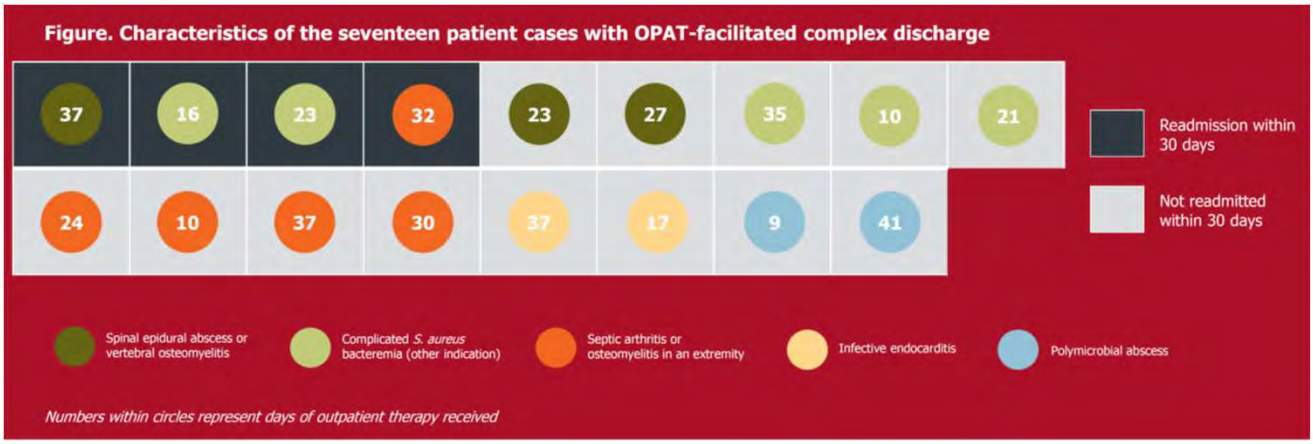
- **Intervention led to 17 significant episodes** of discharge facilitation
- **429 days of inpatient stay were avoided** (25.2 days per episode)
- **$943,000 in total inpatient stay costs were avoided** ($2200 per day)

- In 15 episodes inpatient care was shifted to NMC outpatient infusion centers
  - In these cases, medication costs were reimbursed fully through OPAT team enrolling patients in a manufacturer-sponsored assistance program (drug value $28,000) or reimbursed through insurance coverage at a net $11,100 profit to the hospital

Alexander, et al. IDWeek. October 2020. Abstract #624.

16

Discharge Facilitation ROI



Alexander, et al. IDWeek. October 2020. Abstract #624.

17

OPAT Team Structure & Responsibilities

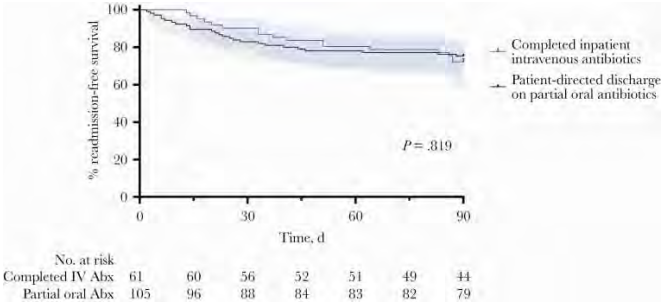
Team member responsibilities have been outlined to allow each team member to perform activities commensurate with their training and licensing:

Nurse	Pharmacist	Physician
• Review charts daily to ensure appropriate follow-up • Triage incoming phone calls from HHCs/SNFs • Initial review and entering outpatient labs into EPIC • Contact facilities to obtain missing lab results • Contact facilities post-discharge to verify details of therapeutic plan • Contacting patients at end-of-therapy to verify completion details • Prepare and follow-through on applications for pharmaceutical patient assistance	• Review and intake all new OPAT consults • Daily review of all inpatients with a current OPAT consult • Review of all flagged lab results collected by nurse • Review, document, and adjust (as needed) all patients on antimicrobials requiring TDM • Verify cases at end-of-therapy and adjudicate final entries in OPAT database • Maintain OPAT database • Compilation of metrics for reporting, processes/procedures/protocols, research projects, etc.	• Discuss with PharmD all new non-ID OPAT consults • Review all abnormal lab results flagged by PharmD • Discuss clinical questions with PharmD – consult with responsible ID staff on plan • Compilation of metrics for reporting, processes/procedures/protocols, research projects, etc.

18

OPAT in Patients with Substance Use Disorders

- With appropriate case selection, >70% of people who inject drugs (PWID) complete OPAT with success rates comparable to non-PWID
- Integration of OPAT with medication-assisted therapy (MAT) for opioid use disorder leads to better outcomes than extended inpatient/LTC care
- Oral antibiotics as a "backstop" to OPAT or alone in a patient-directed discharge are becoming standard-of-care



Suzuki, et al. OFID 2018; 5: 194.
Fanucchi, et al. CID 2020; 70: 1226-9.
Lewis, et al. OFID 2022 Jan 6.

19

Guidance for OPAT & MAT Discharge in PWID

Start: A hospitalized patient with opiate use disorder and an infection potentially requiring home IV antibiotics is identified by the Infectious Diseases, Addiction Psychiatry, or primary teams

↓ Contact OPAT team (or ID if consulted) **OPAT or ID team to assess**:

Q1: IDU notwithstanding, would OPAT be the treatment of choice for the patient's infection?
- Endovascular infection (e.g.; bacteremia, septic thrombophlebitis, endocarditis)
- Bone & joint infection
- Infection due to resistant pathogens (e.g. FQ-resistant *P. aeruginosa*) with a planned course of therapy ≥2 weeks

NO →

OPAT is not appropriate at this time. Consider alternative approaches to therapy, including:
- Discharge with long-acting depot antimicrobials (e.g. oritavancin, dalbavancin) and outpatient f/u with Addiction Psychiatry and ID
- Discharge with oral antimicrobials and outpatient f/u with Addiction Psychiatry and ID
- Continued admission and IV therapy, with Addiction Psychiatry consultation

Note: clinicians should offer patients with serious infections who choose to leave the hospital against medical advice the best available oral antimicrobial therapy, even if IV therapy would otherwise be the standard of care (i.e.; do not withhold treatment from patients leaving AMA)

↓ **YES** Consult Addiction Psychiatry **Addiction Psychiatry team to assess**:

YES →

Q2: Is the patient at elevated risk for OPAT treatment failure?
- Active IDU, not willing to enroll in or not a candidate for medication-assisted treatment (MAT) for opiate use disorder
- Current nonadherence to other aspects of medical & psychiatric care
- Unstable home environment
- Poorly controlled psychiatric disease (other than opiate use disorder)

OR two or more of the following:
- Polysubstance use
- History of drug overdose
- History of multiple relapses
- History of nonadherence to other aspects of medical & psychiatric care

NO →

The patient can be treated with combination OPAT-MAT:
- Addiction Psychiatry to start MAT prior to discharge, schedule followup in clinic within 1-2 weeks of discharge
- ID to schedule followup in clinic within 2 weeks of discharge (Dr. Cortes-Penfield to see, OK to overbook; notify RN Ross to schedule)
- OPAT ID to follow weekly labs
- If the patient is nonadherent to MAT or OPAT, the OPAT ID team will contact the primary treating ID MD and patient, reassess the treatment plan, and discontinue OPAT if it no longer the optimal treatment approach

https://www.unmc.edu/intmed/_documents/id/asp/opat-unmc-opat-mat-guidance.pdf

20

Financial ROI Summary FY20 & FY21

Initiative	FY20 Savings	FY21 Savings	Total Documented Savings - Initial 2 Program Years:
Complex Ortho ID patients decreased time from OR to discharge	$435,600	$699,600	
Decreased LOS secondary to utilization of dalbavancin in appropriate patients	$943,000	$1,034,000	
Readmissions avoided due to preemptive outpatient OPAT interventions	$100,000	$460,000	
Estimated Total Annual Contribution	**$1,478,600**	**$2,193,600**	**$3,672,200**

21

Optimization of OPAT is for Everyone!

Larger Hospitals… start an OPAT program!!

Smaller Hospitals

- Engage pharmacists/prescribers in antimicrobial discharge review (PO and IV)
- Review OPAT-related readmissions for transitions-of-care breakdowns and identify OFIs

SNFs/LTACs

- Establish lines of communication with providers that manage your OPAT patients

Individual Providers

- Understand when OPAT is indicated (and when it's not!)

22

Teamwork and Gratitude

NMC Pharmacy Department

Scott Bergman, PharmD

Colleen Malashock, PharmD

Melissa LeMaster, RN

Molly Miller, PharmD

Brett Young, PharmD

UNMC Infectious Diseases

Nicolás Cortés-Penfield, MD

Trevor Van Schooneveld, MD

Mark Rupp, MD

Erica Stohs, MD

Colleagues and Friends, Past and Present… Thank you!

23

24