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Outpatient parenteral antimicrobial therapy (OPAT) practice variation and safety: results of an Emerging Infections Network survey

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Abstract

Background: Outpatient parenteral antimicrobial therapy (OPAT) use has been increasing, however little is known about OPAT practice patterns.

Methods: In November 2012, we administered an electronic or facsimile survey on OPAT practices to adult infectious disease (ID) physicians participating in the Emerging Infections Network (EIN), a voluntary sentinel event network in North America. Email reminders were sent at 2 and 4 week intervals. The survey consisted of 11 questions on OPAT practices. We obtained demographic characteristics including years in practice, geographic region, employer and primary hospital affiliation type from EIN enrollment data. We analyzed differences in frequencies for statistical significance using χ^2tests, Student's t-test and Mann-Whitney U-test as appropriate.

Results: Overall, 555 (44.6%) of EIN members responded to the survey. Physicians with ≥25 years of experience were the largest group of respondents. Among responders, 105 (19%) do not manage OPAT. Of the remaining 450 respondents, most (351; 78%) report that ID consultation is not required for patients to be discharged on OPAT. Inpatient (282/449; 63%) and outpatient (232/449; 52%) ID physicians were frequently identified as being responsible for monitoring lab results. Only 26% (118/448) had dedicated OPAT teams at their clinical site. The patient's home was the most common location for patients to receive OPAT. Most ID physicians do not have systems to track errors, adverse events or "near-misses" associated with OPAT (352/449; 78%). OPAT complications were perceived to be rare. Among respondents, 80% reported line occlusion/clotting as the most common complication (occurring in ≥6% of patients), followed by nephrotoxicity and rash (each reported by 61%). Weekly lab monitoring of patients on vancomycin was reported by 77% (343/445) of respondents; whereas19% (84/445) of respondents reported twice weekly lab monitoring for these patients.

Conclusion: Despite widespread use and availability of national guidelines, significant variations exist in OPAT practice. Most institutions do not require ID consultation to initiate OPAT. OPAT complications are perceived to be rare, but few ID physicians have systems to actively track adverse events and harm.

Background

- Outpatient parenteral antimicrobial therapy (OPAT) has become a common practice for treating a wide range of infections
- There is significant cost savings by treating patients in the outpatient setting
- Infectious Disease Society of America (IDSA) guidelines, published in 2004, provides recommendations on appropriate patient selection for OPAT services, antibiotic selection, OPAT team structure, and laboratory monitoring.
- Prior surveys of infectious disease physicians revealed diverse OPAT practice patterns.
- Little is known about OPAT practice patterns, complication rates, and safety systems since the publication of the IDSA guidelines.

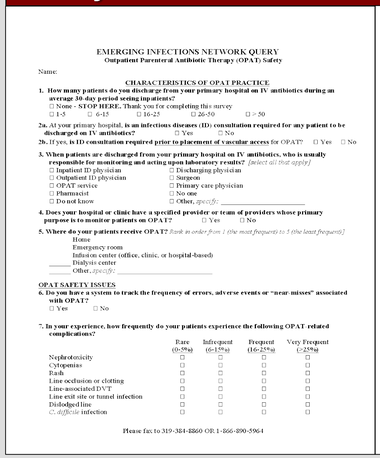
Methods

- The Emerging Infections Network (EIN) is a network of ID physicians in America who provide care to adult and pediatric patients.
- A survey was sent electronically or via facsimile to all members who provide care to adult patients
- The survey was conducted in November and December 2012. Email reminders were sent to non-respondents 2 and 4 weeks after the initial invitation
- The survey consisted of brief introductory text and 11 questions.
- Demographic information on respondents including geographic region, years since completing training, employment and hospital type was collected from EIN enrollment data
- Differences in frequencies were analyzed for statistical significance using χ^2 tests, Student's t-test and Mann-Whitney U-test, as appropriate. A p-value of <0.05 was considered significant.

Results

- 555/1244 (44.6%) physicians participating in EIN responded to the survey
- Response rates across all US Census regions were similar
- 450/555 (81%) of respondents discharge patients on OPAT in an average month
- Most patients receive OPAT in their home (median rank = 1)
- Only 22% (99/450) of respondents indicated ID consultation was required to initiate OPAT
- Laboratory monitoring is most commonly performed by the inpatient (63%) and outpatient (52%) ID physician.
- 94/450 (21%) indicated the patient's primary care physician is responsible for monitoring OPAT labs
- Dedicated OPAT teams are uncommon (118/450, 26%)
- Only 22% (97/450) of respondents have a system to track errors, adverse events, or "near-misses" associated with OPAT
- Line occlusion, rash and nephrotoxicity are the most commonly reported complications (Figure 1)

Survey



EMERGING INFECTIONS NETWORK QUERY
Outpatient Parenteral Antibiotic Therapy (OPAT) Safety

Name:

CHARACTERISTICS OF OPAT PRACTICE

1. How many patients do you discharge from your primary hospital on IV antibiotics during an average 30-day period seeing inpatients?
☐ None - STOP HERE, Thank you for completing this survey
☐ 1-5 ☐ 6-15 ☐ 16-25 ☐ 26-50 ☐ > 50

2a. At your primary hospital, is an infectious diseases (ID) consultation required for any patient to be discharged on IV antibiotics? ☐ Yes ☐ No

2b. If yes, is ID consultation required prior to placement of vascular access for OPAT? ☐ Yes ☐ No

3. When patients are discharged from your primary hospital on IV antibiotics, who is usually responsible for monitoring and acting upon laboratory results? *[select all that apply]*
☐ Inpatient ID physician ☐ Discharging physician
☐ Outpatient ID physician ☐ Surgeon
☐ OPAT service ☐ Primary care physician
☐ Pharmacist ☐ No one
☐ Do not know ☐ Other, *specify:* _____

4. Does your hospital or clinic have a specified provider or team of providers whose primary purpose is to monitor patients on OPAT? ☐ Yes ☐ No

5. Where do your patients receive OPAT? *Rank in order from 1 (the most frequent) to 5 (the least frequent)*
_____ Home
_____ Emergency room
_____ Infusion center (office, clinic, or hospital-based)
_____ Dialysis center
_____ Other, *specify:* _____

OPAT SAFETY ISSUES

6. Do you have a system to track the frequency of errors, adverse events or "near-misses" associated with OPAT?
☐ Yes ☐ No

7. In your experience, how frequently do your patients experience the following OPAT related complications?

	Rare (0-5%)	Infrequent (6-15%)	Frequent (16-25%)	Very Frequent (>25%)
Nephrotoxicity	☐	☐	☐	☐
Cytopenias	☐	☐	☐	☐
Rash	☐	☐	☐	☐
Line occlusion or clotting	☐	☐	☐	☐
Line-associated DVT	☐	☐	☐	☐
Line exit site or tunnel infection	☐	☐	☐	☐
Dislodged line	☐	☐	☐	☐
Cl. difficile infection	☐	☐	☐	☐

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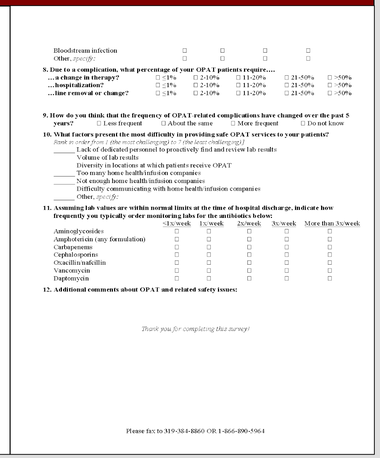

Bloodstream infection	☐	☐	☐	☐
Other, *specify:*	☐	☐	☐	☐

8. Due to a complication, what percentage of your OPAT patients require….

…a change in therapy?	☐ ≤1%	☐ 2-10%	☐ 11-20%	☐ 21-50%	☐ >50%
…hospitalization?	☐ ≤1%	☐ 2-10%	☐ 11-20%	☐ 21-50%	☐ >50%
…line removal or change?	☐ ≤1%	☐ 2-10%	☐ 11-20%	☐ 21-50%	☐ >50%

9. How do you think that the frequency of OPAT related complications have changed over the past 5 years? ☐ Less frequent ☐ About the same ☐ More frequent ☐ Do not know

10. What factors present the most difficulty in providing safe OPAT services to your patients?
Rank in order from 1 (the most challenging) to 7 (the least challenging)
_____ Lack of dedicated personnel to proactively find and review lab results
_____ Volume of lab results
_____ Diversity in locations at which patients receive OPAT
_____ Too many home health/infusion companies
_____ Not enough home health infusion companies
_____ Difficulty communicating with home health/infusion companies
_____ Other, *specify:* _____

11. Assuming lab values are within normal limits at the time of hospital discharge, indicate how frequently you typically order monitoring labs for the antibiotics below:

	<1x/week	1x/week	2x/week	3x/week	More than 3x/week
Aminoglycosides	☐	☐	☐	☐	☐
Amphotericin (any formulation)	☐	☐	☐	☐	☐
Carbapenems	☐	☐	☐	☐	☐
Cephalosporins	☐	☐	☐	☐	☐
Oxacillin/nafcillin	☐	☐	☐	☐	☐
Vancomycin	☐	☐	☐	☐	☐
Daptomycin	☐	☐	☐	☐	☐

12. Additional comments about OPAT and related safety issues:

Thank you for completing this survey!

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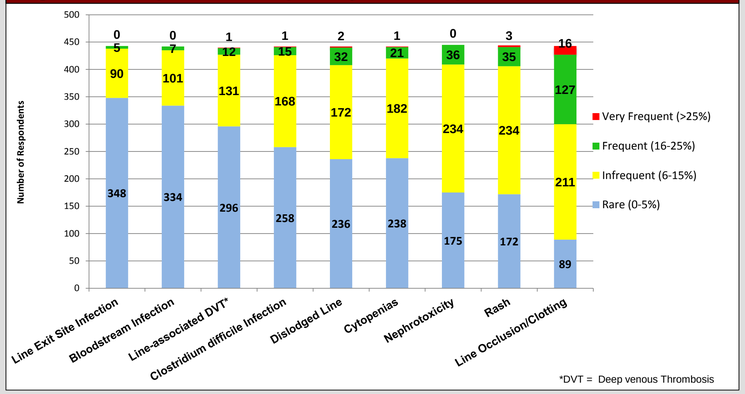
Figure 1: Reported Frequency of Complications

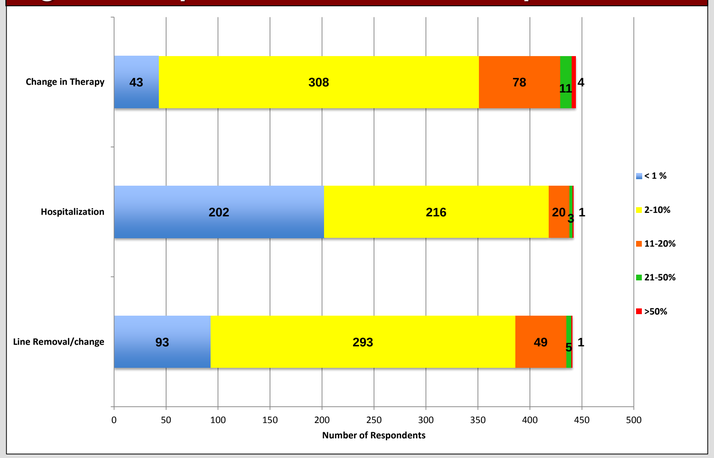


*DVT = Deep venous Thrombosis

Table 1: Laboratory Monitoring Frequency

	Total	< Weekly N (%)	Weekly N (%)	2x/Week N (%)	3x/Week N (%)	> 3x/Week N (%)
Daptomycin	439	33 (7.5)	385 (87.7)	20 (4.6)	1 (0.2)	0 (0)
Vancomycin	445	16 (3.6)	343 (77.1)	84 (18.9)	2 (0.4)	0 (0)
Oxacillin/Nafcillin	442	38 (8.6)	385 (87.1)	17 (3.8)	2 (0.5)	0 (0)
Cephalosporins	441	44 (10.0)	384 (87.1)	11 (2.5)	1 (0.2)	1 (0.2)
Carbapenems	444	44 (9.9)	388 (87.4)	12 (2.7)	0 (0)	0 (0)
Amphotericin	415	22 (5.3)	98 (23.6)	194 (46.7)	91 (21.9)	10 (2.4)
Aminoglycosides	435	23 (5.3)	130 (29.9)	247 (56.8)	31 (7.1)	4 (0.9)

Figure 2: Reported Outcomes of Complications



Conclusions

- OPAT remains a common approach for treating patients with infections.
- Despite IDSA guidelines recommending appropriate patient selection for OPAT, few organizations require infectious disease consultation prior to discharging patients on OPAT.
- There is tremendous variation in the infrastructure supporting OPAT services; only 26% of respondents report having a dedicated OPAT team to monitor patients' laboratory results.
- Only 22% of respondents report having system for tracking clinical outcomes, adverse events, and the safety of OPAT.
- OPAT complications are relatively common. Line occlusion, rash and nephrotoxicity were the most common reported complications of OPAT therapy.
- Although clinical guidelines recommend weekly laboratory monitoring in patients treated with vancomycin, these guidelines do not address the safety of high dose vancomycin strategies that target a trough concentration of 15-20 mg/L. More frequent laboratory monitoring, favored by 19% of respondents, may allow for early identification and intervention in patients who develop nephrotoxicity.
- Standardization of OPAT practices may provide opportunities to improve clinical outcomes and the safety of OPAT.

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