

Sustained Efforts Improve Adherence to Monitoring for Solid Tumor Patients Discharged on Outpatient Parenteral Antimicrobial Therapy (OPAT) at a Comprehensive Cancer Center

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Background/Aims

- OPAT shortens hospital stays and improves patient quality of life; however, adverse events, Emergency Center (EC) visits, and hospital readmissions can occur
- Approximately 1 in 4 patients experience readmissions after discharge on OPAT
- Laboratory monitoring and hospital follow up within 4 weeks of discharge reduces hospital readmissions^{2,3,4,5}
- Few OPAT studies have specifically focused on patients with malignancies and the benefits of OPAT are not well understood in this population

Aim: To improve laboratory monitoring and follow up in Infectious Disease (ID) clinic, with the goal of reducing readmissions, through a pilot program in patients with solid tumors discharged on OPAT from a comprehensive cancer center

Methods

- We performed multiple interventions from June 2018- January 2020, outlined in Figure 1
- Pre-intervention data was collected retrospectively with prospective data collection during interventions
- We used the Plan-Do-Study-Act methodology to initiate and analyze our interventions
- We collected data on baseline characteristics (see QR code for supplemental material), quality of notes, frequencies of laboratory monitoring, follow up in ID clinic, and 30-day outcomes of EC visits, hospital readmissions, and deaths
- We used Research Electronic Database Capture (REDCap) to collect and store data gathered from the electronic medical record (EMR) on patients discharged on OPAT
- Statistical analysis was performed with 5-group comparison
- Chi-square or Fisher's exact test were used, as appropriate, for comparison of categorical variables
- Continuous variables were compared using the Kruskal-Wallis test and the Wilcoxon rank-sum test with pairwise comparisons performed if significance was detected

Primary Outcomes: Frequency of follow up in ID clinic and laboratory monitoring as recommended by ID

Secondary Outcomes: Confirmed completion of antibiotics, 30-day OPAT-related readmissions, all cause deaths, and OPAT-related EC visits

Demographics

- Median age of 61 years, 51.9% males
- Most common malignancies: genitourinary (25.7%), breast and gynecologic (11.7% each), head and neck (11.2%), and sarcoma (10.7%)
- Most common indications for OPAT: abscess (32.7%), bacteremia (28.9%), and skin/soft tissue (25.9%)



Results:

Table 1: Primary outcomes of multiple OPAT intervention phases

Table 1. Primary Outcomes		Pre-intervention n=48 (%)*	Phase 1 Intervention n=17 (%)*	Post Phase 1- intervention n=149 (%)*	Phase 2 Intervention n=71 (%)	Phase 3 Intervention n=116 (%)	P-value
Quality of notes							
Complete antibiotic recommendations^A	Yes	37 (77.1)	17 (100)	140 (94.0)	71 (100)	116 (100)	< 0.0001
	Partial / No	11 (22.9)	0 (0)	9 (6.0)	0 (0)	0 (0)	
Recommended follow up^B	Yes / Not Recommended	36 (75.0)	17 (100)	124 (83.2)	70 (98.6)	113 (97.4)	< 0.0001
	Not Discussed	12 (25.0)	0 (0)	25 (16.8)	1 (1.4)	3 (2.6)	
Recommended labs^C	Yes / Not recommended	9 (18.8)	15 (88.2)	109 (73.2)	69 (97.2)	114 (98.3)	< 0.0001
	Partial / No	39 (81.3)	2 (11.8)	40 (26.9)	2 (2.8)	2 (1.7)	
Primary Outcomes		Pre-intervention n=31 (%)*	Phase 1 Intervention n=15 (%)*	Post Phase 1 Intervention n=103 (%)*	Phase 2 Intervention n= 55 (%)	Phase 3 Intervention n=85 (%)	
Follow up in ID Clinic (if recommended)^D	Yes	17 (54.8)	11 (73.3)	67 (65.0)	42 (76.4)	61 (71.8)	0.25
	Partial / No	14 (45.2)	4 (26.7)	36 (35.0)	13 (23.6)	24 (28.2)	
		Pre-intervention n=21 (%)*	Phase 1 Intervention n=15 (%)*	Post Phase 1 Intervention n=111 (%)*	Phase 2 Intervention n=68 (%)	Phase 3 Intervention n=113 (%)	
Completion of lab monitoring (if recommended)^E	Yes	5 (23.8)	5 (33.3)	63 (56.8)	32 (47.1)	63 (55.8)	0.027
	Partial / No	16 (76.2)	10 (66.7)	48 (43.2)	36 (52.9)	50 (44.3)	

^A Yes means drug, dose, frequency, and duration are all present; Partial means 3 out of 4 components present; No means 2 or more components missing

^B Includes provider and time frame of follow up

^C Yes means lab type, frequency, and contact information for results are all present; Partial means 2 of 3 components present; No means 2 or more component are missing

^D Yes means the patient follow up was completed within the recommended time period; Partial means patient followed up but later than recommended (8-30 days); No means the patient did not follow up within 30 days of the recommended date

^E Yes means completion of the recommended labs tests at the recommended frequency; Partial means some of the recommended labs were completed; No means there was not lab monitoring

*Data previously presented at ID Week 2019

Table 2: Secondary outcomes of multiple OPAT intervention phases

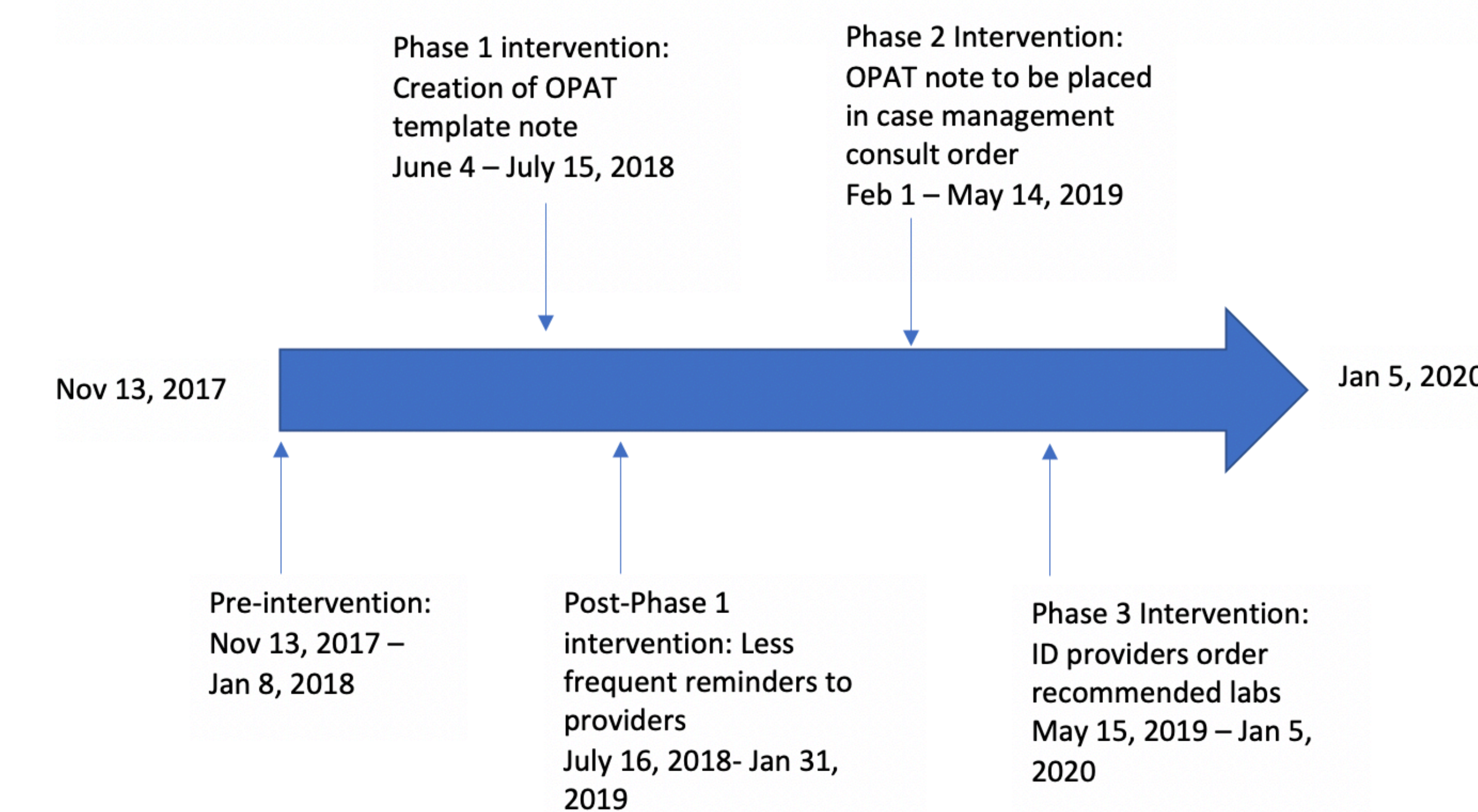
Table 2. Secondary Outcomes		Pre-intervention n=48 (%)*	Phase 1 Intervention n=17 (%)*	Post Phase 1- intervention n=149 (%)*	Phase 2 Intervention n=71 (%)	Phase 3 Intervention n=116 (%)	P-value
Confirmed completion of antibiotics^F	Yes	31 (64.6)	13 (76.5)	119 (79.9)	62 (87.3)	99 (85.3)	0.018
	Partial / No/Unknown	17 (35.4)	4 (23.5)	30 (20.1)	9 (12.7)	17 (14.7)	
30 Day Outcomes	Unplanned OPAT Related 30-day readmission/unknown	10 (20.8)	0 (0)	26 (17.5)	14 (19.7)	12 (10.3)	0.094
	Death #	2/47 (4.3)	0 (0)	5/147 (3.4)	0/68 (0)	2/114 (1.8)	
	OPAT related EC visits/unknown	8 (16.7)	0 (0)	26 (17.5)	15 (21.1)	16 (13.8)	

^F Yes means the patient received appropriate antimicrobial/dose/frequency/duration as recommended; Partial means correct antimicrobial(s) but wrong dose, frequency, or duration; No means wrong antimicrobial(s) and/or 2 out of the following: wrong dose/frequency/duration
Infection related EC visit includes both OPAT-related readmissions and new infections

*Patients enrolled in hospice were excluded from analysis

*Data previously presented at ID Week 2019

Figure 1: Timeline of Interventions



Conclusions:

- Sustained efforts with the involvement of multidisciplinary stakeholders and standardized recommendations can help improve completion of laboratory monitoring in patients with solid tumor malignancies discharged on OPAT
- We observed a trend towards decreased readmissions, suggesting our unique patient population may benefit from the same OPAT guidelines as the general population

Next Steps:

- Future OPAT interventions aim to use the EMR to more easily follow patients over time
 - Use of this OPAT feature in the EMR will facilitate ordering, lab monitoring, and patient tracking
- Expansion of OPAT to additional services within our cancer center

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