

became available, CSF culture positivity for *C. acnes* returned to baseline (late November or early December) (Fig. 1). **Conclusions:** We identified a likely pseudo-outbreak related to temporary use of a more sensitive culture media. No direct patient harm was identified, although many had increased risk of harm by surgical intervention or prolonged length of stay. Technological advances may enhance organism identification but challenge existing paradigms of care. More studies are needed to better delineate the intersection of diagnostic advancements with patient care standards.

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### Presentation Type:

Poster Presentation - Poster Presentation

**Subject Category:** Outbreaks

### Investigating a cluster of pediatric oncology invasive fungal infections—Lessons learned

Angelette Terk; Jennifer Ormsby; Paula Conrad; Catherine Svensson; David Barry; David Davis; Ana Vaughan Malloy and Tom Sandora

**Background:** In spring 2021, the infection prevention and control department at a pediatric academic medical center identified 3 oncology patients with concern for invasive *Rhizopus* spp infections. An in-depth investigation was conducted, but a common source of the fungus was not identified. In August 2021, an additional oncology patient with concern for invasive *Rhizopus* spp was identified, resulting in an extended investigation for possible sources of fungus. **Methods:** A multidisciplinary work group was assembled. The CDC Targeted Environmental Investigation Checklist for Outbreaks of Invasive Infections Caused by Environmental Fungi was used as a framework for conducting the investigation. Stakeholders were engaged throughout the process, including the hematology–oncology service, hospital leadership, environmental services, patient safety and quality, and facilities and engineering. The investigation included hospital incident command system (HICS) activation; visual inspection of patient rooms and common spaces; heating, ventilation, and air conditioning (HVAC) review; environmental sampling (surfaces, linen, and air); chart review; and process mapping. **Results:** By early October 2021, 2 environmental samples grew isolates (each at 1 CFU/m<sup>3</sup>) of the same species of *Rhizopus* as one of the affected patients. One sample was from a patient room, and the other from an outdoor garden space. No source of indoor amplification of *Rhizopus* was identified. The investigation revealed several opportunities for improvement: annual room maintenance schedules, use of gardens and outdoor spaces by at-risk patients, linen storage, construction and/or infection control risk assessment (ICRA) processes, and appliances used by families (eg, washing machines and refrigerators). Work streams were established to address each of these areas. **Conclusions:** No definite source was identified for the 4 invasive *Rhizopus* spp infections. This extensive investigation highlighted multiple opportunities for improvement; the changes implemented may prevent future invasive fungal infections in high-risk pediatric patients.

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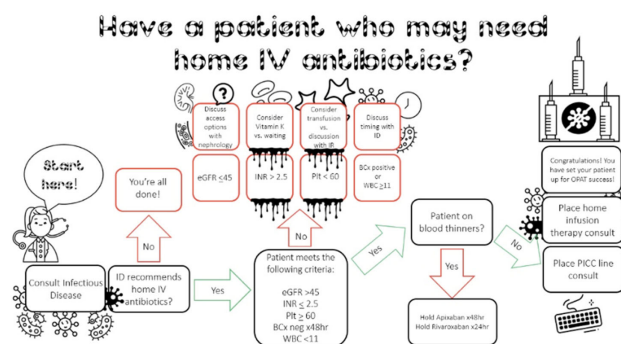
### My patient needs home IV antibiotics—Now what? Assessing OPAT involvement at a Veterans' Affairs hospital

Maddy Breeden; Elizabeth Scruggs; Payal Patel; Sarah Krein; Ronald Kendall; Andrea Starnes and Tracy Lopus

**Background:** Outpatient parenteral antimicrobial therapy (OPAT) involves the administration of intravenous antimicrobial therapy outside

the hospital. The literature suggests that inpatient providers are often unaware of OPAT programs and may not engage this multidisciplinary group in a timely fashion, leading to potentially inappropriate OPAT use. However, few studies have directly addressed this issue. We characterized current practices for coordinating OPAT and assessed provider understanding of OPAT services. We also conducted an exploratory analysis of placement of a peripherally inserted central catheter (PICC) consultation prior to an infectious disease (ID) consultation as a proxy for potentially avoidable OPAT use. **Methods:** This study was conducted between September and December 2021 at the Ann Arbor VA Healthcare System. All charts (n = 212) in which a consultation for a PICC was placed between January and September 2021 were reviewed, including free-text data entered by patient teams and inpatient progress notes in the days leading up to and following PICC consultation. Additionally, inpatient providers were surveyed using an online format regarding knowledge, utilization, and perceptions of OPAT. **Results:** Of the 212 charts reviewed, 108 patient encounters resulted in PICC placement; 80 (74.1%) were placed for the indication of home IV antibiotics. Of these, 3 (4.0%) had the PICC consult placed prior to the ID consultation. Of the 104 PICC consultations that were cancelled, 9 (8.7%) were cancelled because the ID staff did not recommend home IV antibiotics. Other reasons for cancellation included alternative device placement, duplicate order, referral to interventional radiology, failure to meet criteria, or unsuccessful placement. Of the 285 inpatient providers sent the electronic survey, 121 (46.9%) completed at least some portion. Overall, 17 respondents (14.0%) were familiar with the acronym OPAT; however, only 10 were able to expand the acronym correctly. Of the 118 respondents asked about their familiarity with the OPAT program at the local institution, 98 (83.1%) were not familiar at all or were only slightly familiar with the program. In contrast, 7 respondents (6.0%) were very or extremely familiar with the OPAT program. **Conclusions:** Further education and structural interventions are necessary to improve inpatient providers' awareness and early engagement of local OPAT programs to ensure appropriate OPAT use. An educational intervention with an informative flowchart diagramming the steps for engaging the OPAT team could raise

Figure A: Workflow of Outpatient Parenteral Antimicrobial Therapy at the Ann Arbor VA Healthcare System



## What is OPAT?

Outpatient Parenteral Antimicrobial Therapy (OPAT) involves the administration of parenteral (intravenous) antimicrobial therapy without an overnight hospital stay. Patients are frequently transitioned to OPAT following an inpatient hospitalization.

## Is there an OPAT program at the Ann Arbor VA?

The Ann Arbor Veterans Affairs Hospital has a multidisciplinary OPAT program, consisting of Infectious Disease (ID) physicians, ID pharmacists, ID nursing, vascular access nursing, social workers, and community care workers, that works to provide appropriate monitoring and follow up for Veterans discharged from inpatient hospitalizations with IV antibiotic therapy. This team is crucial to ensure safety and appropriate follow up in the outpatient setting!

awareness and improve engagement when potential OPAT needs are identified (Fig. 1).

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**Subject Category:** Patient Safety

**Patient safety and quality care: Time to focus on nonventilator hospital-acquired pneumonia**

Karen Giuliano and Dian Baker

**Background:** A growing body of evidence has reported on the harm and cost of nonventilator hospital-acquired pneumonia (NVHAP), currently the most common hospital-acquired infection (HAI). Although the US Congress and the Center for Medicare and Medicaid Services (CMS) have acted to reduce rates of some HAIs through the Hospital-Acquired Condition Reduction Program (HACRP), NVHAP is not currently included. Thus, most hospitals do not engage in active prevention. Here, we report the findings from our analysis of Medicare claims data on hospital length of stay (LOS), cost for patients with hospital-acquired pneumonia (HAP), including both ventilator-associated pneumonia and NVHAP, and mortality. **Methods:** We used Medicare claims data for Federal Fiscal Year 2019 for inpatient and postdischarge services. Beneficiaries who died, were without continuous Medicare Part A and B enrollment, and patients eligible for Medicare for end-stage renal disease were excluded. Inpatient payments and 30-, 60-, and 90-day postdischarge episodes for 2,457 beneficiaries with HAP were examined and compared to a non-HAP control group of 2,457 beneficiaries. Groups were matched on age, sex, race, and the diagnosis-related group (DRG) for their index hospitalization. **Results:** Most HAP was NVHAP (N = 2,222; 89%) versus VAP (N = 275; 11%). LOS stay was significantly (p HAP patients were 2.8 times more likely to die vs non-HAP. **Conclusions:** These findings provide additional support to previous research on the harm and cost associated with NVHAP. Previous HACRP HAI initiatives, such as catheter-associated urinary tract infection (CAUTI) and surgical-site infection (SSI), have resulted in measurable HAI reductions. Although recent evidence-based NVHAP and initiatives indicate that NVAHP is largely preventable, to date, no acute-care inpatient hospital quality improvement program implemented by Medicare includes measures for NVHAP prevention. The time is right to include NVHAP as an HACRP HAI initiative.

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**Subject Category:** Patient Safety

**Retrospective cohort analysis of the safety of outpatient parenteral antimicrobial therapy (OPAT) in an academic hospital**

Kaylyn Billmeyer; Alison Galdys; Susan Kline; Elizabeth Hirsch; Jennifer Ross and Michael Evans

**Background:** Although many infectious conditions can be safely treated with oral antimicrobials, select circumstances require parenteral antimicrobial therapy. Benefits of OPAT include prevention of hospital-associated conditions and significant cost savings. However, risks of OPAT include adverse drug events (ADEs) and vascular access device (VAD) complications. We analyzed the safety of OPAT regimens as part of implementing a collaborative OPAT program. **Methods:** We reviewed adult patients discharged home from an academic hospital between January 2019 and June 2021. Patients with cystic fibrosis were excluded. Data on OPAT agents, ADEs, and VAD complications were collected from electronic medical records by 2 reviewers using a standardized REDCap

Table 1. Frequencies of adverse drug events (ADEs) and vascular access device complications (VADs) among all single and multi-drug regimens, stratified by agent class.

Agent class	Single-drug therapy (n=212)		Multi-drug therapy (n=108)		Any ADE (n=110)		VAD Complications (n=72)	
	n	(%)	n	%	n	(%)	n	(%)
Aminoglycosides	0	0.0%	3	2.8%	0	0.0%	1	1.4%
Azoles	0	0.0%	2	1.9%	1	0.9%	0	0.0%
Beta-lactam/Beta-lactamase inhibitors	13	6.1%	4	3.7%	4	3.6%	6	8.3%
Carbapenems	47	22.2%	10	9.3%	16	14.5%	6	8.3%
Cephalosporins	124	58.5%	40	37.0%	46	41.8%	37	51.4%
Echinocandins	1	0.5%	5	4.6%	4	3.6%	2	2.8%
Lincosamides	1	0.5%	1	0.9%	1	0.9%	0	0.0%
Lipopeptides	8	3.8%	35	32.4%	24	21.8%	14	19.4%
Nitroimidazoles	1	0.5%	0	0.0%	0	0.0%	0	0.0%
Nucleoside analogs	1	0.5%	1	0.9%	1	0.9%	0	0.0%
Penicillins	11	5.2%	6	5.6%	7	6.4%	5	6.9%
Polyenes	0	0.0%	1	0.9%	1	0.9%	0	0.0%
Pyrophosphate analogs	5	2.4%	0	0.0%	5	4.5%	1	1.4%

instrument. The institutional review board approved this study. **Results:** The cohort comprised 265 unique patients; 212 (80%) received single-drug therapy and 53 (20%) received multidrug therapy. In total, 81 patients (31%), who received a total of 110 antimicrobials, experienced an ADE. In total, 55 patients (21%), who received a total of 72 antimicrobials, experienced a VAD complication. Patients who received >1 antimicrobial were more likely to experience an ADE (53% vs 25%;  $P = .0002$ ) or a VAD complication (32% vs 18%;  $P = .04$ ). Cephalosporins were the most frequently prescribed antimicrobial class (Table 1). **Conclusions:** ADEs and VAD complications were frequent in patients on OPAT. Local data should inform (1) the selection of OPAT therapy and (2) the standardized monitoring of patients who receive OPAT going forward in the implementation of this collaborative OPAT program.

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**Zoster on the brain: Clinical characteristics of patients PCR positive for varicella-zoster virus in cerebrospinal fluid and implications for transmission base**

Mahmoud Al-Saadi; Michael Haden; Nora Colburn; Shandra Day and Christina Liscynsky

**Background:** Transmission-based precautions against varicella-zoster virus (VZV) in healthcare settings are determined by the extent of rash (localized vs disseminated) and the immune status of the host. At our facility, immunocompetent patients with localized disease are placed in standard precautions whereas patients with disseminated disease and/or immunocompromised status are placed in airborne and contact isolation. The use of molecular diagnostics has increased recently, and patients can have a PCR positive for VZV in cerebral spinal fluid (CSF) without evidence of pneumonia or disseminated rash. These patients are classified as disseminated disease, but it is unlikely that they are spreading VZV via respiratory aerosols in the absence of other symptoms. Infection prevention guidance is limited in this situation, and these patients may be in unneeded isolation, with the potential for adverse patient effects and overutilizing PPE resources. We have described the clinical characteristics of patients with a PCR positive for VZV in CSF, and we evaluated the risk for transmitting VZV via airborne aerosols. **Methods:** A retrospective, single-center chart review was performed on all patients admitted with a PCR positive for VZV in CSF between July 2017 and November 2021. Chart