

PROPOSAL TITLE: OPAT-ACC: An Initiative to Facilitate Outpatient IV Antibiotics at Home via Wraparound Addiction and Infection Care for People Who Inject Drugs

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EXECUTIVE SPONSOR(S): TBD

ABSTRACT:

- As the epidemic of injection drug use rages on, people who inject drugs (PWID) continue to suffer rising rates of deep-seated bacterial infections, such as endocarditis and vertebral osteomyelitis, that require prolonged intravenous antimicrobial therapy.
- Prior research has shown that PWID can successfully complete intravenous antibiotic treatment at home when appropriately supported by addiction and other specialists, yet PWID are currently excluded by candidacy for Outpatient Parenteral Antibiotic Therapy (OPAT) at UCSF Health.
- This results in extended lengths of stay for the receipt of IV antibiotics, which is costly to the healthcare system and is less desirable from a patient care perspective as well.
- The major aim of this proposal is to develop an addiction medicine-infectious diseases co-management program that serves inpatient and outpatient people with substance use disorder at UCSF Health.
- This program will enable PWID to enroll in OPAT and receive IV antibiotics at home and, more broadly, will facilitate the optimal care of patients with substance use disorder during hospitalization and after discharge, a major clinical gap at UCSF and providing cost savings to the health system.

TEAM:

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Matt Tierney, NP – Medical Director of Inpatient Substance Use Management, UCSF Health; Clinical Director of Substance Use Treatment and Education, UCSF Office of Population Health

PROBLEM:

- As the epidemics of injection drug use and opioid use disorder rage on, people who inject drugs (PWID) continue to suffer rising rates of deep-seated bacterial infections that require prolonged intravenous antimicrobial therapy, such as endocarditis and vertebral osteomyelitis.
- Co-treatment of infections and opioid use disorders has been shown to improve addiction- and infection-related outcomes, and to prevent future infections. This has never been more relevant, as rising rates of opioid use disorder have ushered in increasing hospitalizations and deaths from bacteremia, endocarditis, skin and soft tissue infections, osteomyelitis, septic arthritis, and central nervous system infections.
- Discriminatory preclusion of PWID from OPAT at home significantly extends length of stay and is therefore costly to the medical system. PWID are often excluded on the basis of their substance use disorder and are relegated to completing their therapy as an inpatient or in the inpatient or skilled nursing setting, despite having no other skilled nursing needs, despite the fact that most studies that have included PWID in OPAT programs have found that the rate of antibiotic course completion and complication rates were similar in PWID as compared to non-PWID enrolled in OPAT.
- There is also a high rate of self-directed discharge among these patients, which leads to substandard care.
- Successful completion of an outpatient intravenous antibiotic course by PWID requires additional infrastructure and investment to facilitate follow-up with numerous specialties, including Infectious Diseases and Addiction Medicine.
- In addition, for many patients admitted to the hospital who have both serious infections and addiction, such a hospitalization can serve as a pivotal event that can serve as an opportunity to engage the patient in care and provide long-term benefits with regards to addiction and infection treatments, improving healthcare utilization, boosting rates of initiation of medications for opioid use disorder, and increasing IV antibiotic completion rates among PWID with infections.

- Other anticipated key benefits of this initiative include improved patient and provider satisfaction, community perceptions, decreased mortality, and reduction of harm related to drug use among PWID.

TARGET:

- Our goal is to create a structured multidisciplinary program aimed at engaging patients with substance use disorder while providing infection and addiction treatment in order to facilitate the treatment PWID who have infections requiring intravenous antibiotics at home via OPAT.
- We will evaluate outcomes related to length of stay, mortality, and rehospitalization among PWID enrolled in OPAT at home as compared to PWID who are not enrolled in the program and matched controls without injection drug use.

GAPS:

- Among the gaps in current treatment of infections among PWID and people with opioid use disorder, discriminatory preclusion from enrollment OPAT enrollment is perhaps one of the most readily apparent.
- Although OPAT at home is a cost-effective and safe practice, and although discriminatory medical care based on a history of substance use disorder is a violation of the Americans with Disabilities Act (ADA), PWID are often excluded on the basis of their substance use disorder and are relegated to completing their therapy in the inpatient or skilled nursing setting, despite having no other skilled nursing needs.
- Although most studies that have included PWID in OPAT programs have found that rate of antibiotic course completion and complication rates were similar among PWID as compared to non-PWID enrolled in OPAT, educational gaps about this topic persist among providers.
- Successful completion of an outpatient intravenous antibiotic course requires investment in, collaboration between, and follow-up with numerous specialties, most notably Infectious Diseases and Addiction Medicine, the absence of which constitutes a systemic gap in the UCSF Health system.

INTERVENTION:

General Overview of Intervention

1. Meet bimonthly and as-needed as a multidisciplinary committee to discuss patients referred to the program to identify optimal and harm reduction treatment of enrolled patients' SUD and infections via engagement of addiction and infectious disease specialists, taking into account patient goals, strengths, and preferences, as well as to identify and counteract non-addiction barriers to optimal treatment of infection, such as housing instability, copays, and transportation barriers with the assistance of a program/addiction medicine social worker.
2. When warranted, engage additional subspecialists who are interested in participation in this program when appropriate, e.g. cardiothoracic surgeons for a patient with endocarditis, orthopaedists or neurosurgeons in a patient with bone or central nervous system infections.
3. Meet with patient while admitted to the hospital at least once to use shared decision-making to develop optimal ID and addiction treatment plans for patients.
4. Follow-up in the outpatient setting at least once monthly with infectious diseases and addiction specialists, as well with other subspecialists as deemed necessary by the committee.
5. Identification of outcomes via chart review.

Participant Recruitment

1. Identify patients admitted to UCSF-Parnassus, UCSF-Mt. Zion, and UCSF-Mission Bay who have both a serious infection and substance use disorder (SUD) (e.g. opioid use disorder, stimulant use disorder) via clinician referral and screening for criteria for both of these conditions among newly hospitalized patients, who consent to enrollment in the program.
2. Recruit candidates via clinician identification and identification via electronic health record information of patients with substance/opioid use disorder and a deep-seated infection.

Inclusion criteria

1. Patients receiving treatment for the following infections in the hospital:

- a. Bacteremia
 - b. Osteomyelitis
 - c. Skin/skin structure infection
 - d. Hardware infection
 - e. Central nervous system infection
2. Patients with a diagnosis of a substance use disorder as per DSM-V criteria, with last use within the last 12 months (sustained remission as defined by DSM-V criteria is last substance use at least 12 months ago).
 3. Eligible patients will include both those whose substance use disorder is in remission and those who do not have a documented period of remission.

Outcome Measures

1. Length of stay
2. 30- and 90-day hospital readmission
3. 30- and 90-day mortality, including whether related to overdose
4. Self-discharge from hospital and/or post-acute setting, if applicable
5. Completion of antimicrobial therapy

PROPOSED EHR MODIFICATIONS:

- There is currently no order set for enrollment in OPAT, which presents logistical challenges with regards to tracking patients throughout their treatment course and makes ensuring they are getting all needed follow-up studies, labs and appointments labor intensive. This also makes data collection challenging.
- In conjunction with the other facets of this project, we will develop an order set intended to:
 - Facilitate enrollment in OPAT for patients being referred, including PWID;
 - Facilitate data collection and outcomes evaluation pertaining to this initiative.

RETURN ON INVESTMENT (ROI):

- We anticipate cost savings to the health system will be driven by decreased length of stay (LOS), with a contribution as well from decreased readmission rates, as premature self-discharge is a common complication of long-term inpatient IV antibiotic receipt among PWID.
- Cost savings estimation solely related to LOS:
 - Cost per day (room and board) for medical/surgical floor inpatients at UCSF Health (per UCSF Finance): \$1,586
 - Number of PWID who complete their IV antibiotic course as an inpatient at UCSF: 15
 - This is an estimate based on OPAT/inpatient ID service census in the last academic year.
 - With more time, we could work with UCSF Division of Hospital Medicine's Data Core service to collect more precise information about this.
 - Average LOS among PWID completing IV antibiotics as inpatient: Seven weeks
 - Average time point during hospitalization at which final infection treatment plan is determined: Two weeks
 - Excess LOS for each PWID who remains inpatient for IV antibiotics: 7 minus 2 weeks = 5 weeks
 - Anticipated LOS-related cost savings per PWID who remains inpatient for IV antibiotics if they could be enrolled in OPAT at home: 5 weeks x 7 days x \$1586/d = ~\$56,000
 - Anticipated LOS-related cost savings per year to UCSF Health solely from room and board costs: \$56,000/patient x 20 patients **\$1.1M per year**
- We anticipate there would be additional cost savings related to decreased readmissions.

SUSTAINABILITY:

This intervention will result in a program that will become embedded in standard of care inpatient and outpatient addiction and infection treatment at UCSF Health. The leaders of the OPAT program and Inpatient

Addiction Consult services are collaborators on this project, ensuring that the intervention will become well-integrated into these pre-existing services at UCSF Health.

BUDGET:

A more complete budget is in the works, but we would anticipate dividing the funding three ways between the three primary collaborators on this project as salary support given the time and resources required for making this project successful.