Characterization of Patient-Directed Discharge in Patients with Substance Use Disorder(s) Pre- and Post-Implementation of an Inpatient Addiction Consult Service: A Retrospective Cohort Study

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Introduction

- Emergency department (ED) visits and hospitalizations for patients with substance use disorder (SUD) have increased related comorbidities and SUD-related medical complications.[1]
- Patient-directed discharge (PDD) is associated with increased 30-day hospital readmissions and in-hospital mortality.[2]
- Inpatient addiction consult services (ACS) reduce addiction severity and increase abstinence.[3]
- In July 2020, the Johns Hopkins Hospital introduced a multidisciplinary ACS.
- The impact of this ACS has not been described.

Objectives

- Compare PDD for patients with a SUD before and after implementation of the ACS.
- Characterize patients with a SUD and PDD before and after implementation of the ACS.
- Describe utilization of the ACS among patients with PDD.
- Delineate treatment strategies initiated prior to PDD for OUD before and after implementation of the ACS.

Methods

Study Design, Study Period, Data Collection, and Study Eligibility

- Single-center, retrospective, pre- and post-implementation study
- Pre-implementation: July 1, 2018, to June 30, 2019
- Post-implementation: July 1, 2020, to June 30, 2022
- Patient encounters identified via report generated from the electronic medical record

Inclusion Criteria	Exclusion Criteria
• Patients ≥18 years of age • At least 1 SUD by ICD-10 diagnosis codes • Encounter resulted in PDD	• Not having an admission order at time of PDD

Primary Outcome

- Comparison of PDD rates pre- and post-implementation of the ACS

Secondary Outcomes

- Comparison of hospital length of stay (LOS), 30-day readmission rate, baseline demographics, and substance use history
- Description of ACS consult or peer recovery coach (PRC) request processes and completion
- Severity of pain and withdrawal symptoms in an opioid use disorder (OUD) subgroup as well as medication for the treatment of OUD (MOUD) in the first 24 hours

Statistical Analysis

- Differences in categorical variables between cohorts were analyzed using Chi-square or Fisher's exact test. Continuous variables were compared using Student T-test or Wilcoxon Rank Sum

Figure 1. Study Eligibility
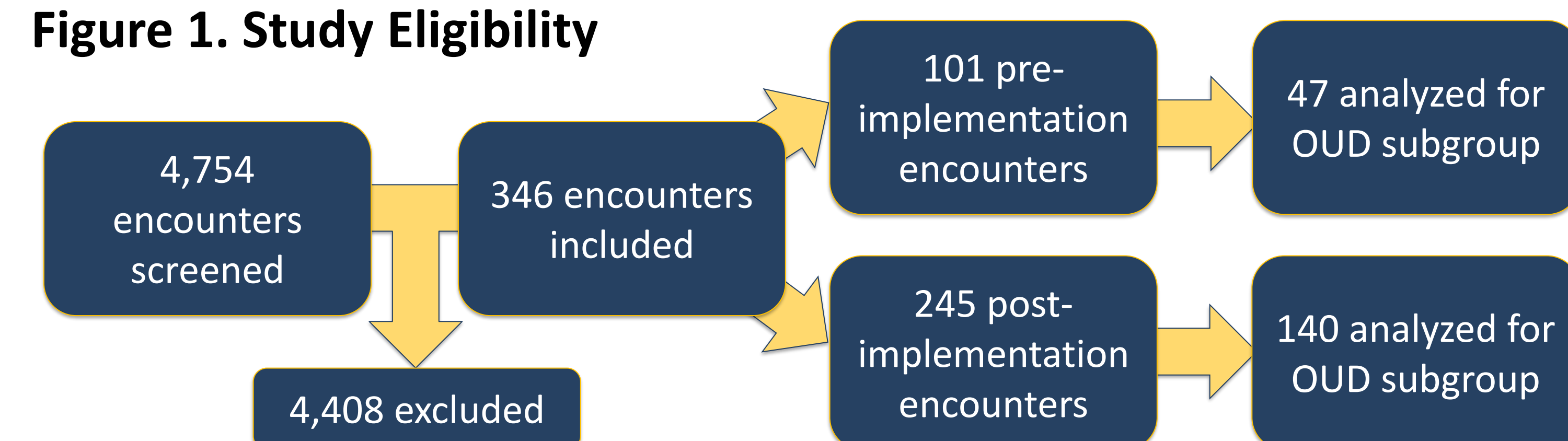
Results

Table 1. Baseline Demographics

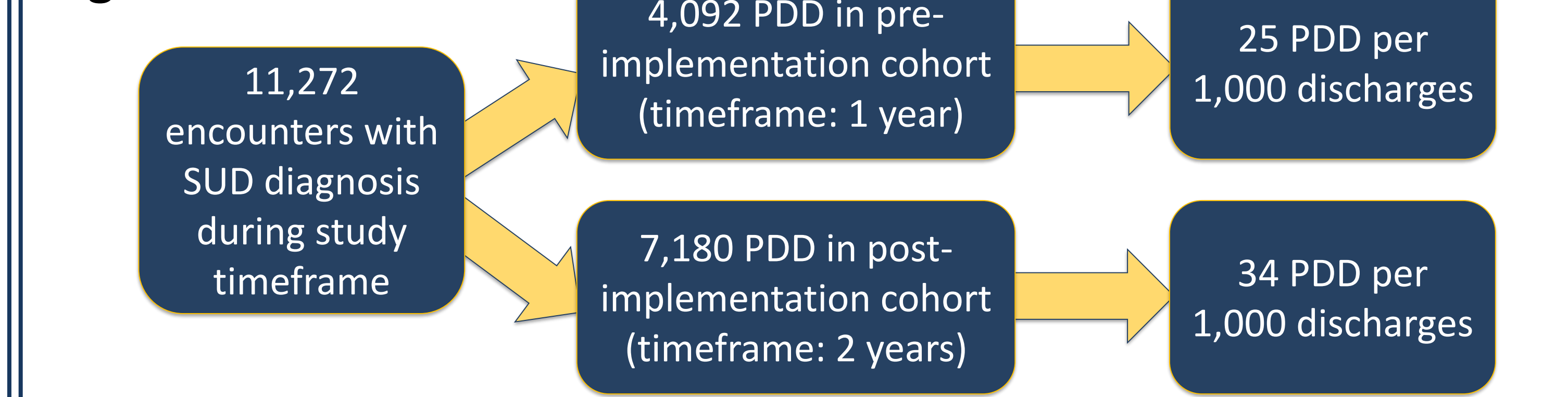| Characteristic	All (n=346)	Pre-Cohort (n=101)	Post-Cohort (n=245)	P value
Age, years (IQR)	41 (33-54)	47 (35-54)	40 (32-54)	0.14
Male, n (%)	228 (65.9)	73 (72.3)	155 (63.3)	0.11
Race, n (%)				**0.03**
White	**170 (49.1)**	**43 (42.6)**	**127 (51.8)**	
Black/African American	**157 (45.4)**	**54 (53.5)**	**103 (42.0)**	
Other	**19 (5.5)**	**4 (4.0)**	**15 (6.1)**	
PDD in prior 12 months, no. (IQR)	1 (0-2)	1 (0-2)	1 (0-3)	0.54
ED visits in prior 12 months, no. (IQR)	2 (0-7)	3 (1-8)	2 (0-6)	0.21
Co-Occurring SUD, n (%)				0.78
1 SUD	205 (59.2)	61 (60.4)	144 (58.8)	
>1 SUD	141 (40.8)	40 (39.6)	101 (41.2)	
Active tobacco use, n (%)	255 (78.0)	81 (80.2)	174 (77.0)	0.15
Alcohol-related disorder, n (%)	135 (39.0)	36 (35.6)	99 (40.4)	0.41
Opioid-related disorder, n (%)	**199 (57.5)**	**50 (49.5)**	**149 (60.8)**	**0.05**
Sedative, hypnotic, or anxiolytic-related disorder, n (%)	31 (9.0)	5 (5.0)	26 (10.6)	0.09
Cocaine-related disorder, n (%)	**68 (19.7)**	**12 (11.9)**	**56 (22.9)**	**0.02**
Other stimulant-related disorder, n (%)	4 (1.2)	1 (1)	3 (1.2)	0.85
Other psychoactive substance-related disorder, n (%)	164 (47.4)	50 (49.5)	114 (46.5)	0.61
Admitting service, n (%)				0.41
Medicine	259 (74.9)	79 (78.2)	180 (73.5)	
Surgery	22 (6.4)	9 (8.9)	13 (5.3)	
Other	65 (18.8)	13 (12.9)	52 (21.2)	
First pain score, score (IQR)	8 (5-10)	8 (5-10)	8 (4-10)	0.66
First COWS score, score (IQR)	5 (2-8)	5 (4-6)	5 (2-8)	0.95
ACS consult ordered, n (%)	---	---	114 (46.5)	---
ACS consult orders completed, n (%)	---	---	68/114 (59.6)	---
PRC referral ordered, n (%)	---	---	54 (22.0)	---
PRC referral orders completed, n (%)	---	---	42/54 (77.8)	---

Data reported as either mean (SD) or median (IQR) for continuous variables; PDD=patient-directed discharge, ED=emergency department, SUD=substance use disorder, COWS=Clinical Opiate Withdrawal Scale, ACS=addiction consult service, PRC=peer recovery coach

Figure 2. Timeline of PDD with ACS/PRC Involvement
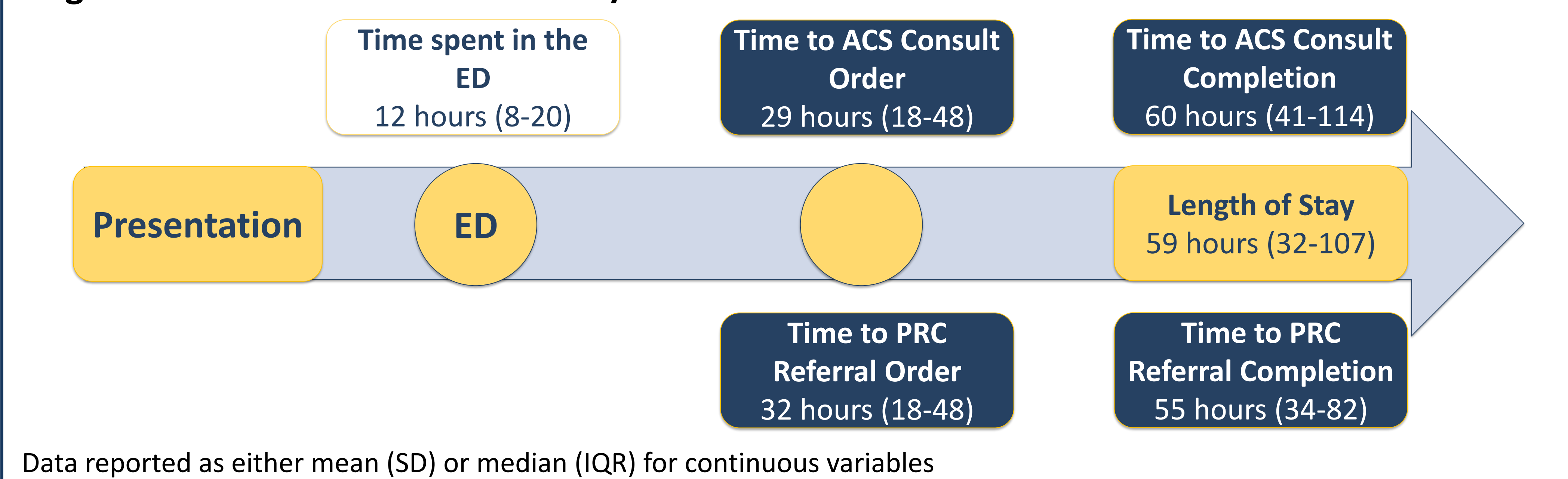
Data reported as either mean (SD) or median (IQR) for continuous variables

Figure 3. PDD Rates

Table 2. LOS and ED Visits and Readmissions within 30 days

Outcome	All (n=346)	Pre-Cohort (n=101)	Post-Cohort (n=245)	P value
LOS (hours)	56 (27-102)	53 (22-91)	59 (32-107)	0.12
ED Visits within 30 days	0 (0-2)	0 (0-2)	0 (0-2)	0.95
Readmissions within 30 days	1 (0-2)	1 (0-2)	1 (0-2)	0.63

Data reported as either mean (SD) or median (IQR) for continuous variables

Table 3. OUD Subgroup

Outcome	All (n=187)	Pre-Cohort (n=40)	Post-Cohort (n=147)	P value
Active opioid use, n (%)	166 (88.8)	39 (83.0)	127 (90.7)	0.23
Fentanyl use within 24 hours of presentation, n (%)*	**121 (70.4)**	**20 (48.8)**	**101 (77.1)**	**0.01**
Any MOUD in first 24 hours, n (%)	**110 (58.8)**	**20 (42.6)**	**90 (64.3)**	**0.01**
Total methadone dose in first 24 hours, mg (IQR)	20 (0-60)	20 (0-50)	20 (0-60)	0.82
Total buprenorphine dose in first 24 hours, mg (IQR)	2 (0-8)	2.5 (0-8)	2 (0-8)	0.75
Any full mu-opioid agonist in first 24 hours, n (%)	95 (50.8)	21 (44.7)	74 (52.9)	0.33
Total MME in first 24 hours, MME (IQR)	7.5 (0-75)	0 (0-45)	7.5 (0-90)	0.21

Data reported as either mean (SD) or median (IQR) for continuous variables; MOUD=medication for opioid use disorder, MME=morphine milligram equivalents; *some data unavailable

Conclusion

- Results show low ACS involvement post-implementation encounters
- Potential reasons:
  - Delayed ACS consultation
  - Median time to consult > 24 hours
  - Limited weekend availability of the ACS
- PDD generally happened at the same time as ACS consultation completion
- Need for rapid identification of patients with SUD and earlier ACS consultation, starting in the ED

References
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2. Tan SY, Feng JY, Joyce C, Fisher J, Mostahimi A. Association of Hospital Discharge Against Medical Advice With Readmission and In-Hospital Mortality. *JAMA Netw Open.* 2020;3(6):e206009. Doi:10.1001/jamanetworkopen.2020.6009
3. Wakeman SE, Metlay JP, Chang Y, Herman GE, Rigotti NA. Inpatient Addiction Consultation for Hospitalized Patients Increases Post-Discharge Abstinence and Reduces Addiction Severity. *J Gen Intern Med.* 2017 Aug;32(8):909-16. Doi: 10.1007/s11606-017-4077-z