



Collaborative Research to Improve Hospital Care for Patients with Opioid Use Disorder: Pragmatic Trial of the 'Consult for Addiction Treatment and Care in Hospitals (CATCH)' Program in 6 NYC H+H Hospitals

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Disclosures

Dr. McNeely is a Scientific Advisor with Eli Lilly & Co

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Today's talk

1. Background and overview of the study
2. Effectiveness outcomes
3. Implementation outcomes
4. Qualitative findings – staff and patients

Hospitalization presents an opportunity to engage patients in opioid use disorder (OUD) treatment

- 20% of people with SUD are hospitalized in a given year
- Hospitalized patients with OUD have **high rates of acute care readmissions and mortality** (Hser et al., 2017; Larney et al., 2019; Lewer et al., 2019)
- Medications for OUD (MOUD) are an essential component of medical management in the hospital
- MOUD treatment after discharge is lifesaving, but treatment uptake post-hospitalization is typically <10%
- Addiction consult service models show promise for increasing engagement in treatment after discharge

Gryczynski et al., Health Affairs 2017

Liebschutz et al., JAMA Int Med 2014

Weinstein et al., Med Clin N America 2018

Englander et al., JGIM 2019

Englander et al., JGIM 2022

NYC Mayor's initiative to address the overdose crisis, 2017



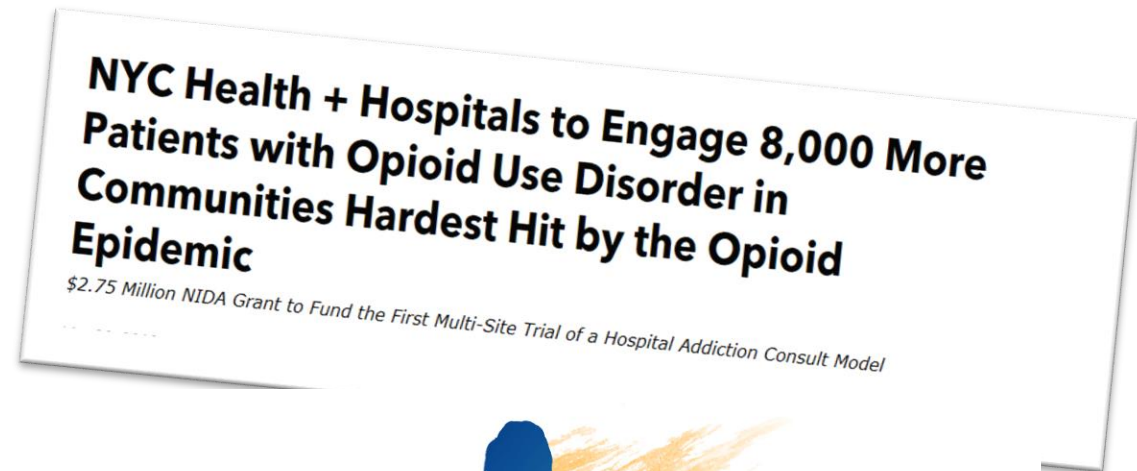
NYC Health + Hospitals

- Largest municipal system in the US
- 11 acute care hospitals
- 1.4 million patients/year
- Over 60% of the opioid-related ED visits in NYC

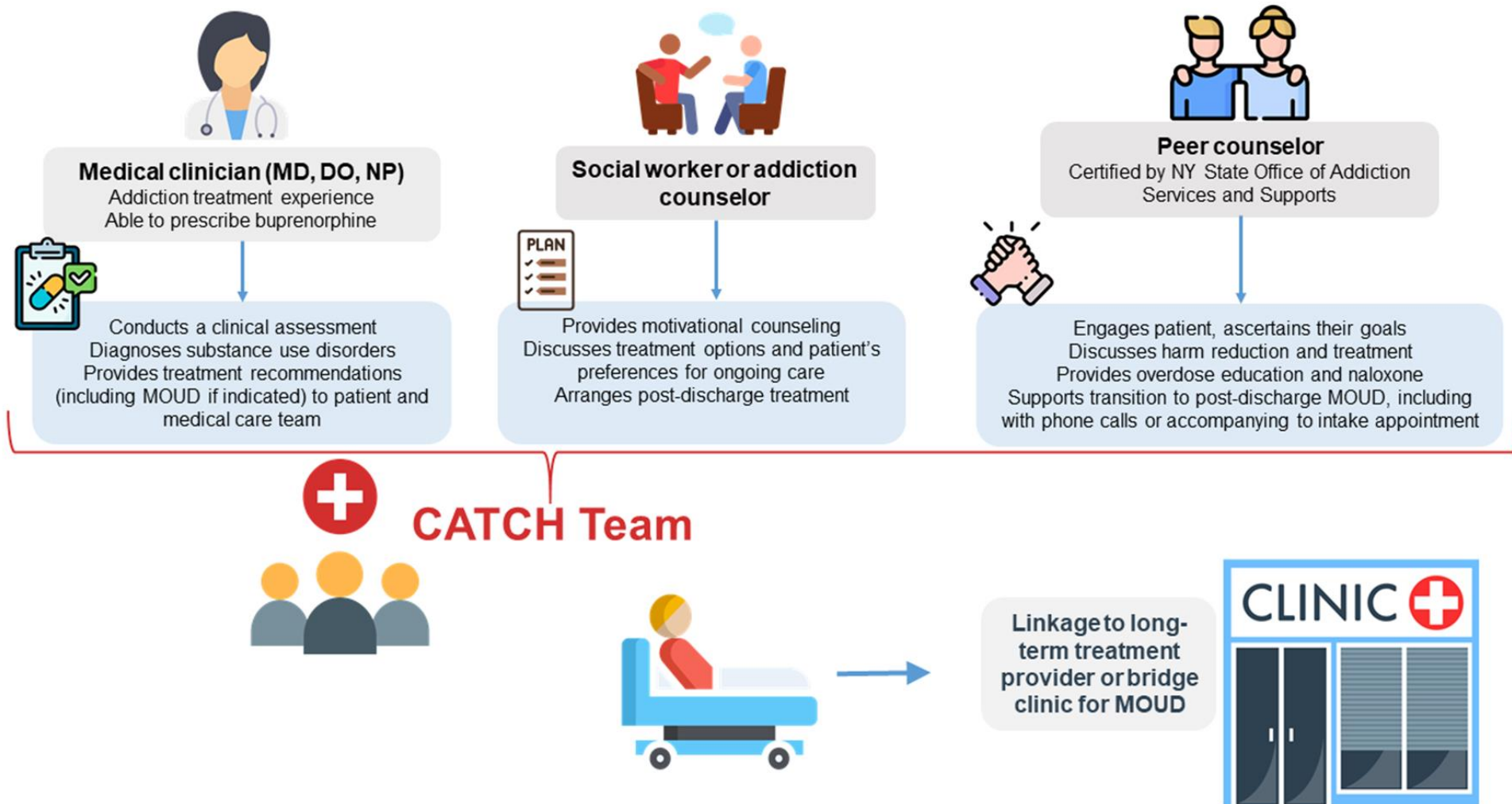


Effectiveness of the CATCH model for engaging patients in opioid use disorder treatment: Pragmatic trial in a large municipal hospital system

- NIH/NIDA R01
- Research collaboration:
 - NYU School of Medicine – Dept. of Population Health
 - H+H – Office of Behavioral Health
 - NYC DOHMH – Bureau of Alcohol and Drug Use Prevention, Care, and Treatment
- Facilitated by NYU/H+H CTSI
- First multi-site controlled trial of a hospital addiction consult model



Consult for Addiction Treatment and Care in Hospitals (CATCH)



CATCH Hospital Sites in Four Boroughs



Lincoln Hospital



Metropolitan Hospital Center



Coney Island/South Brooklyn Hospital



Bellevue Hospital Center

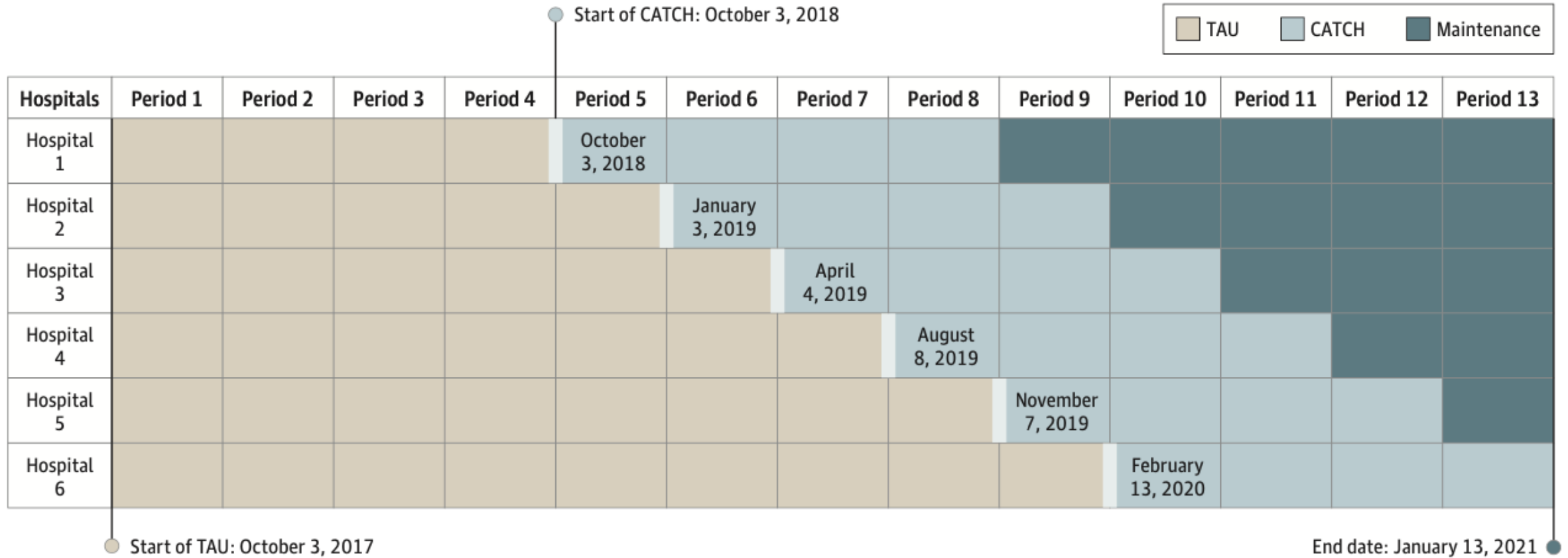


Elmhurst Hospital Center



Woodhull Medical Center

Stepped-wedge study design



The study condition is demonstrated by hospital during each study period. Dates represent the start of the Consult for Addiction Treatment and Care in Hospitals (CATCH) program at each hospital. Each colored box represents

3 months. White boxes represent the 1-month transition period during which the CATCH program was introduced at each hospital. TAU indicates treatment as usual.

Specific Aims

Hybrid Type 1 Implementation-effectiveness study

Aim 1 (Primary aim)	Evaluate the effectiveness of CATCH in increasing <u>MOUD initiation and engagement</u>
Aim 2	Assess the effectiveness of CATCH for increasing <u>MOUD retention</u>
Aim 3	Compare the frequency of <u>acute care utilization and overdose deaths</u> , and their associated costs, among patients with OUD hospitalized during the CATCH period versus usual care
Aim 4	Evaluate <u>implementation outcomes</u> to assess: <i>Reach</i> – proportion of eligible patients reached by CATCH <i>Adoption</i> – utilization of CATCH by medical staff <i>Implementation process</i> – barriers to delivering high-quality MOUD to the target population, during and after hospitalization

Addiction Consultation Services for Opioid Use Disorder Treatment Initiation and Engagement A Randomized Clinical Trial

Jennifer McNeely, MD, MS; Scarlett S. Wang, MPH, MSW; Yasna Rostam Abadi, MD, MPH; Charles Barron, MD; John Billings, JD; Thaddeus Tarpey, PhD; Jasmine Fernando, MPharm; Noa Appleton, MPH; Adetayo Fawole, MD, MPH; Medha Mazumdar, MS; Zoe M. Weinstein, MD, MS; Roopa Kalyanaraman Marcello, DrPH; Johanna Dolle, MPA; Caroline Cooke, MPH; Samira Siddiqui, MPH; Carla King, MPH

Data source: Medicaid claims

Disclaimer: The views and opinions expressed in this presentation are those of the authors and do not necessarily reflect the official policy or position of the New York State Department of Health. Examples of analysis performed within this article are only examples. They should not be utilized in real-world analytic products.

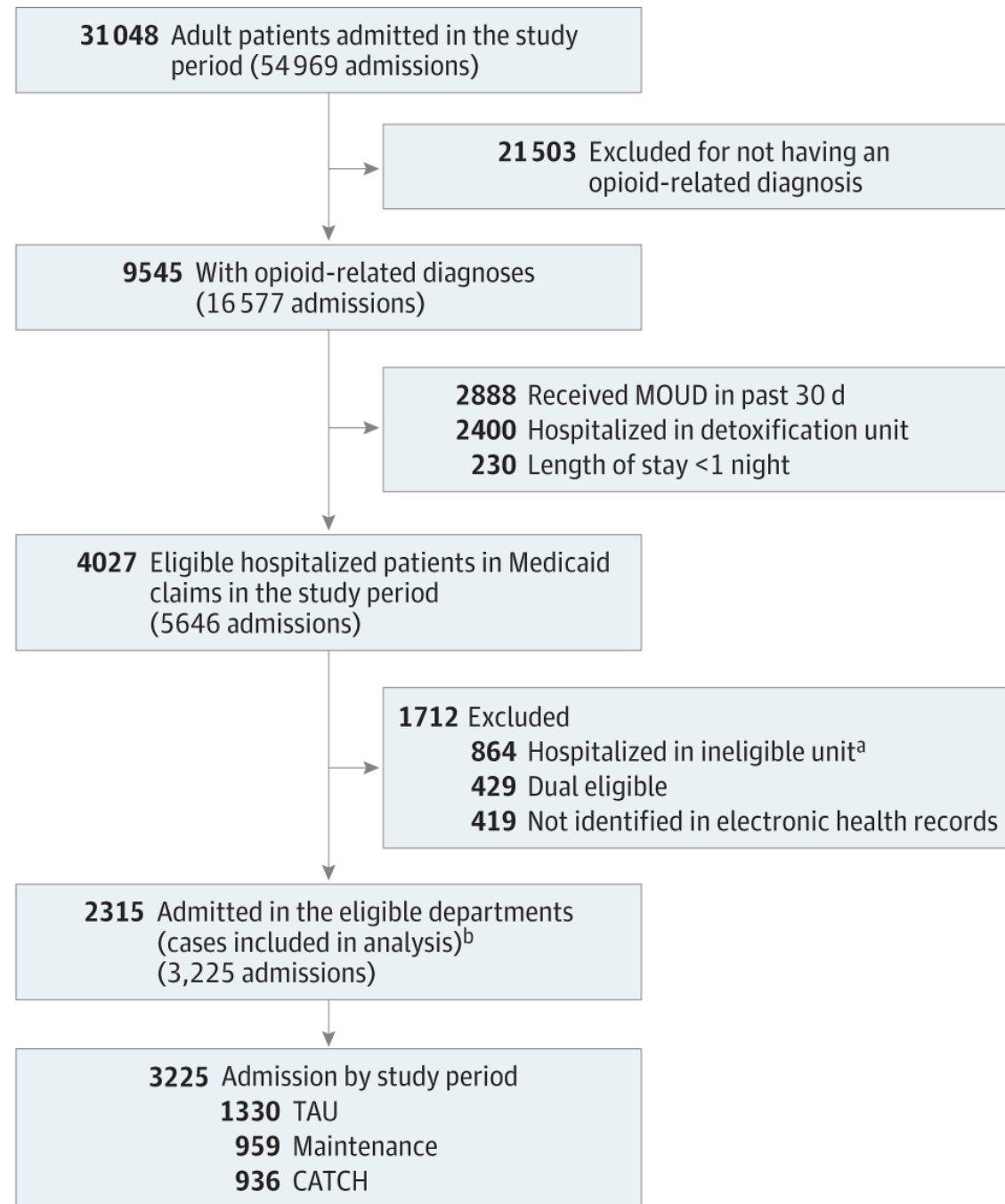
Study Flow Diagram

Eligibility criteria

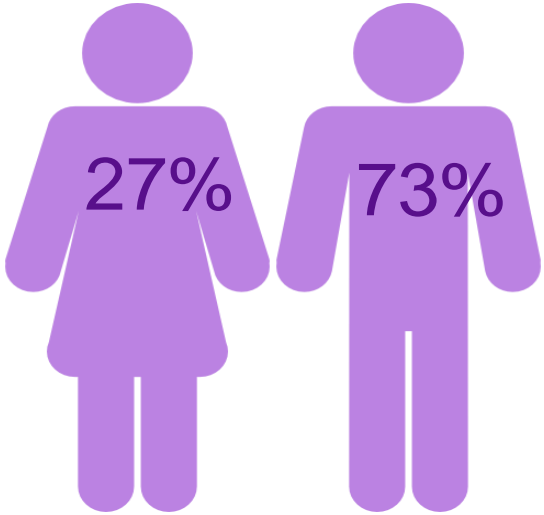
- Adult patients (18+)
- Opioid diagnosis
- Hospitalized ≥ 1 night
- Medical/surgical unit

^A Hospitalizations in dedicated psychiatric/detoxification units or jail/prison units were not eligible.

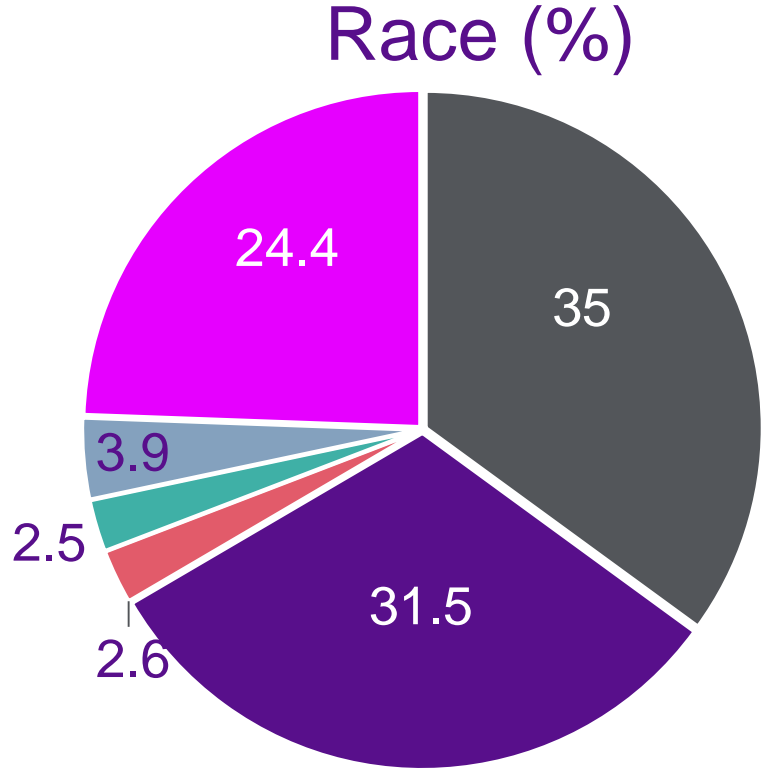
^B A total of 81 individuals (84 admissions) had a gap in Medicaid enrollment during the first 30 days post discharge.



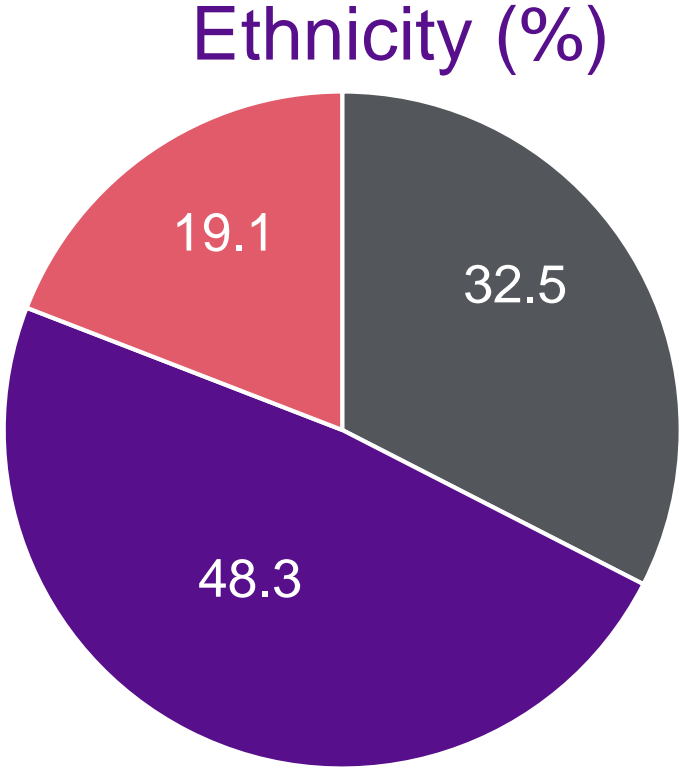
Demographics of patients included in the analysis (N= 2,315)



Mean age **47**



- White
- Black
- Native American
- Asian
- Multiracial
- Unknown



- Hispanic
- Non-Hispanic
- Unknown

Characteristics of eligible admissions included in the analysis (N= 3,225)

Primary diagnosis – N (%)	
Opioid use disorder	49 (1.5)
Opioid-related poisoning	280 (8.7)
Opioid adverse events	0 (0)
Alcohol use disorder or related poisoning	90 (2.8)
Other drug use disorders or related poisonings	118 (3.7)
Secondary diagnosis – N (%)	
Opioid-related diagnosis	3,131 (97.1)
Alcohol-related diagnosis	806 (25.0)
Other drug use-related diagnosis	1,596 (49.5)



Median Length of Stay: **5.0 days**

Same for TAU and CATCH

Comorbidities in the past 3 years (N= 2,315)



≥3 chronic conditions: 67.7%



Any serious mental illness*: 64.2%

*bipolar disorder, major depressive disorder, manic episodes, schizophrenia, and other psychotic disorders.

Acute care utilization in the prior three years (N= 2,315)

Acute care utilization – N (%)	
Hospitalizations*	
Median [min, max]	3.0 [0.0, 127.0]
Mean (SD)	7.2 (12.7)
0 admission	562 (24.3)
1 admission	329 (14.2)
2 admissions	252 (10.9)
3 and more admissions	1,172 (50.6)
Emergency department visits*	
Median [min, max]	4.0 [0.0, 1274.0]
Mean (SD)	12.8 (46.8)
0 admission	469 (20.3)
1 admission	270 (11.7)
2 admissions	224 (9.7)
3 and more admissions	1,352 (58.4)
Any MOUD	
No	1,276 (55.1)
Yes	1,039 (44.9)

Outcome definition

Aim 1: Treatment initiation and engagement

Initiation	Outpatient MOUD encounter* within 14 days of hospital discharge
Engagement	Receipt of 2+ additional MOUD services within 30 days of initiation

Aim 2: Treatment retention

Retention	Continuous retention in treatment for 6 months (OTP encounters and/or MOUD prescribed \geq 80% of days)
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*MOUD encounter at OTP or office-based buprenorphine

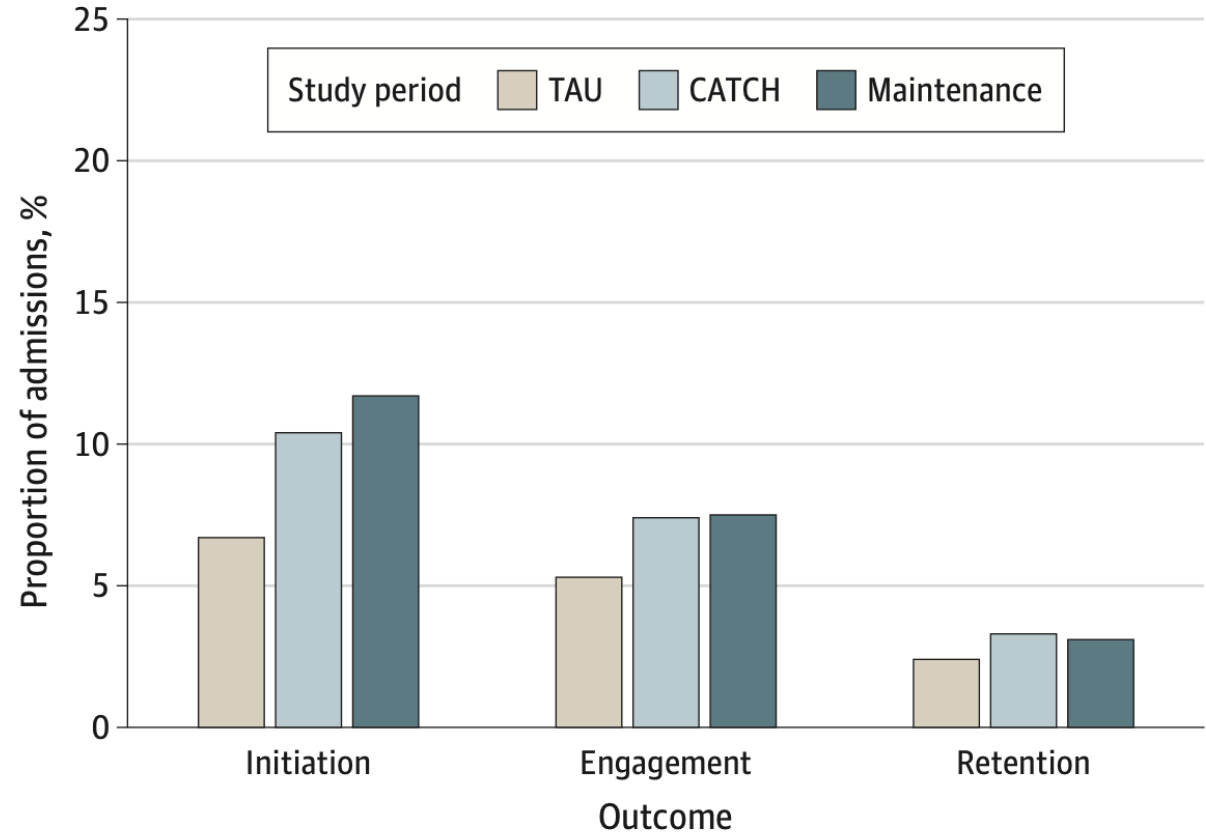
Statistical Analysis

- Bayesian model chosen due to complexities of the analysis:
 - Clustering of patients within hospitals
 - Open cohort, multiple admissions
 - Admissions may occur in different study conditions
- Hierarchical logistic regression model adjusted for age, sex, and a period factor (thirteen periods, each 3 months duration)
- Used posterior distributions of the model parameters to generate estimates of the treatment coefficient parameter comparing CATCH to TAU, along with their associated 95% credible intervals and posterior probabilities

CATCH performed better than treatment as usual in measures of and engagement

- **Initiation nearly 8x higher**
[odds ratio 7.96]
- **30-day engagement nearly 7x higher**
[odds ratio 6.90]
- Retention for 6 months was not significantly different

Figure 4. Proportion of Admissions With Treatment Initiation, Engagement, and Retention by Study Period Among the 3225 Eligible Admissions Included in the Analysis



CATCH indicates Consult for Addiction Treatment and Care in Hospitals; TAU, treatment as usual.

Specific Aims

Hybrid Type 1 Implementation-effectiveness study

Aim 1 (Primary aim)	Evaluate the effectiveness of CATCH in increasing post-discharge <u>MOUD initiation and engagement</u>
Aim 2	Assess the effectiveness of CATCH for increasing <u>MOUD retention</u>
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Original Investigation | Substance Use and Addiction

Addiction Consult Services, Mortality, and Acute Care Utilization in Inpatients With Opioid Use Disorder

A Secondary Analysis of a Cluster Randomized Clinical Trial

Yasna Rostam-Abadi, MD, MPH; Scarlett Wang, MPH, MSW; Carla King, MPH; Roopa Kalyanaraman Marcello, DrPH, MPH; Gretchen Van Wye, PhD, MA; Ellenie Tuazon, MPH; Joseph Kennedy, MPH; Caroline Cooke, MPH; Medha Mazumdar, MS; Thaddeus Tarpey, PhD; John Billings, JD; Noa Appleton, MPH; Jasmine Fernando, MPharm; Adetayo Fawole, MD, MPH; Samira Siddiqui, MPH; Charles Barron, MD; Daniel Schatz, MD, MS; Jennifer McNeely, MD, MS

Outcome Measures

Acute care utilization (Medicaid data)

Emergency visits	Emergency department visits within one year of eligible admission
Hospitalizations	Hospitalizations within one year of eligible admission

Mortality (NYC Department of Health and Mental Hygiene)

All-cause deaths	Derived from death certificate; within one year of eligible admission
Overdose deaths	Based on cause of death codes on death certificate; within one year of eligible admission
Opioid-involved overdose deaths	

Outcomes by Intervention Period

	Total (N= 1,355)	TAU (N= 623)	CATCH (N= 732)
Emergency department visits			
Median [range]	1.0 [0.0, 284.0]	1.0 [0.0, 221.0]	1.0 [0.0, 284.0]
No visits	520 (38.4)	251 (40.3)	269 (36.7)
One or two visits	396 (29.2)	176 (28.3)	220 (30.1)
Three or more visits	439 (32.4)	196 (31.5)	243 (33.2)
Hospitalizations			
Median [range]	1.0 [0.0, 46.0]	1.0 [0.0, 32.0]	1.0 [0.0, 46.0]
No visits	502 (37.0)	220 (35.3)	282 (38.5)
One or two visits	359 (26.5)	176 (28.3)	183 (25.0)
Three or more visits	494 (36.5)	227 (36.4)	267 (36.5)
Mortality – N (%)			
All-cause deaths	113 (8.3)	52 (8.3)	61 (8.3)
Overdose deaths	34 (2.5)	16 (2.6)	18 (2.5)
Opioid overdose deaths	28 (2.1)	13 (2.1)	15 (2)
Days to death following hospital discharge			
Median [range]	118.0 [1.0, 360.0]	117.0 [1.0, 360.0]	121.0 [1.0, 360.0]

Statistical Analysis

Acute care utilization

- Poisson mixed-effects regression model comparing patients admitted during TAU and CATCH periods
- Adjusted for age, sex, time, and a random effect at the hospital level

Mortality

- Cox proportional hazard models to compare deaths among patients admitted during TAU and CATCH periods
- Adjusted for age, sex, time, and a random effect at the hospital level

Acute Care Utilization

	Incidence rate ratios (95% CI)	p-value
Emergency department visits	0.79 (0.72-0.88)	<i><0.001</i>
Hospitalization	0.99 (0.87-1.13)	0.901

Mortality

	Hazard ratios (95% CI)	p-value
All-cause deaths	1.14 (0.98, 1.92)	0.652
Overdose deaths	1.06 (0.41, 2.74)	0.791
Opioid-involved overdose deaths	1.03 (0.36, 2.91)	0.917

Strengths and limitations

- First randomized trial of addiction consult services
- Robust study conducted in real-world setting
- Findings are limited to a subset of patients served by CATCH
- Treatment initiation rates after any given admission remained low (11%) even with CATCH
- Many patients lost to treatment, and 6-month retention was not improved by CATCH

Implementation Findings



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Journal of Substance Use and Addiction Treatment

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Attributes of higher- and lower-performing hospitals in the Consult for Addiction Treatment and Care in Hospitals (CATCH) program implementation: A multiple-case study



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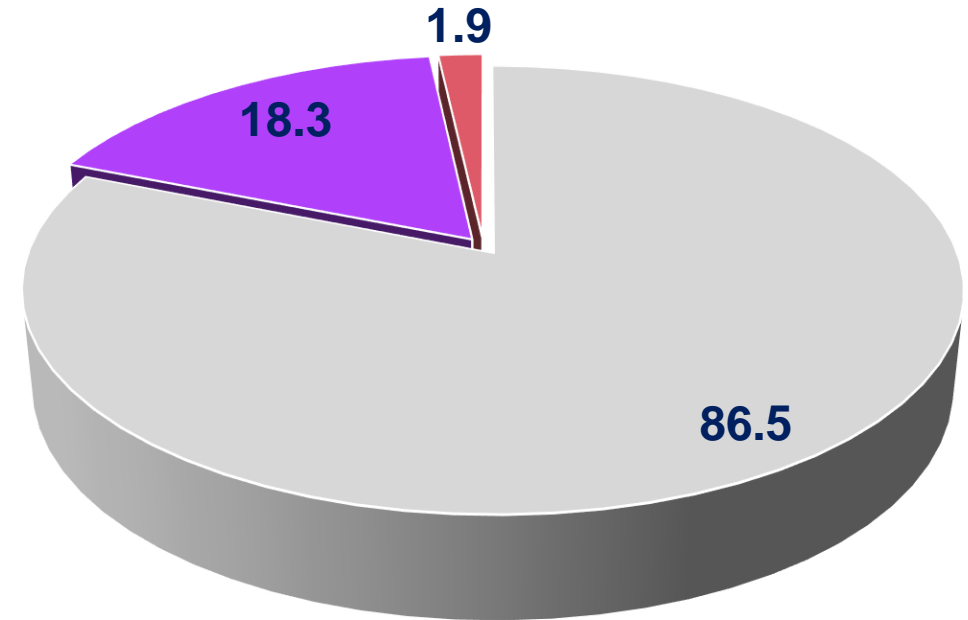
Multiple-Case Study Approach

Question answered: *What are the characteristics of study sites associated with high and low performance?*

Performance measure: Reach, % of eligible admissions receiving a MOUD order

Receipt of at least one MOUD order during first admission in study period among eligible patients* (N= 2,117)

Any MOUD **60.9%**



■ Methadone ■ Buprenorphine ■ Naltrexone

*The first hospitalization among patients aged ≥ 18 years with a length of stay ≥ 1 night and an opioid-related discharge diagnosis during the first year of CATCH

MOUD orders during hospitalization (Reach)

Hospital	H1	H2	H3	H4	H5	H6
MOUD ordered (%)**	71.8%	61.9%	49.1%	49.7%	61.5%	70.3%
Performance category High \geq 50% MOUD ordered	High	High	Low	Low	High	High

*Eligible admissions are patients aged \geq 18 years with a length of stay \geq 1 night and an opioid-related discharge diagnosis during the first year of CATCH

**Denominator represents total number of eligible patients

Hospital attributes influence on reach

Measure		Reach		
		High (N=4) %	Low (N=2) %	Influence Strength
Adoption				
High rate of ordered consults of all potential consults		50	50	=
Implementation Fidelity				
High rate of completed consults of all ordered consults		50	50	=
High proportion of staff received formal training		50	50	=
Complete Staff coverage	CATCH lead	100	50	++
	MD/NP	100	0	+++
	Peer counsellors	75	50	+
	Social workers	75	100	-
Ratio of encounters by staff type in balance		75	50	+
Regular use of CATCH report		50	50	=
Established bridge clinic		100	100	=
CATCH Context				
Designated office space		100	0	+++
Collaborative space available		100	50	++
CATCH lead specialty in addiction		50	50	=
Experienced CATCH lead		25	50	-
Bridge clinic attributes	Designated space	50	100	--
	Location in existing OUD program	50	50	=
	Fixed hours of operation	0	50	--

Hospital attributes influence on reach

Measure		Reach		
		High (N=4) %	Low (N=2) %	Influence Strength
Hospital attributes				
	Epic EHR throughout the CATCH period	50	50	=
	Large Size (beds)	25	50	-
	Active in COVID-19	25	100	---
	Primary Care Buprenorphine clinic	75	0	+++
OUD treatment resources available	Medically Supervised Outpatient Program (MSOP)	100	100	=
	On campus MSOP location	50	50	=
	Opioid treatment program (OTP)	25	100	---
Attributes of OUD patients				
Higher proportion than system overall by:				
	Sex (Female)	0	0	=
Age	18-44 years	25	50	-
	45-64 years	100	100	=
	65-80 years	100	100	=
Race/ Ethnicity	Black	50	50	=
	Hispanic	25	0	+
	White	75	100	-
	Other	100	100	=
	Language	English	100	100
	Spanish	25	0	+
	Uninsured	0	0	=

Qualitative Interviews - Staff

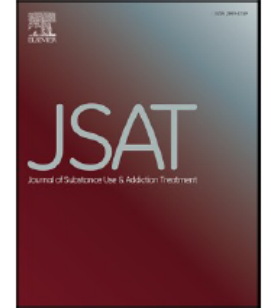


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Staff perspectives of barriers and facilitators to implementation of the Consult for Addiction Treatment and Care in Hospitals (CATCH) program in New York City safety net hospitals



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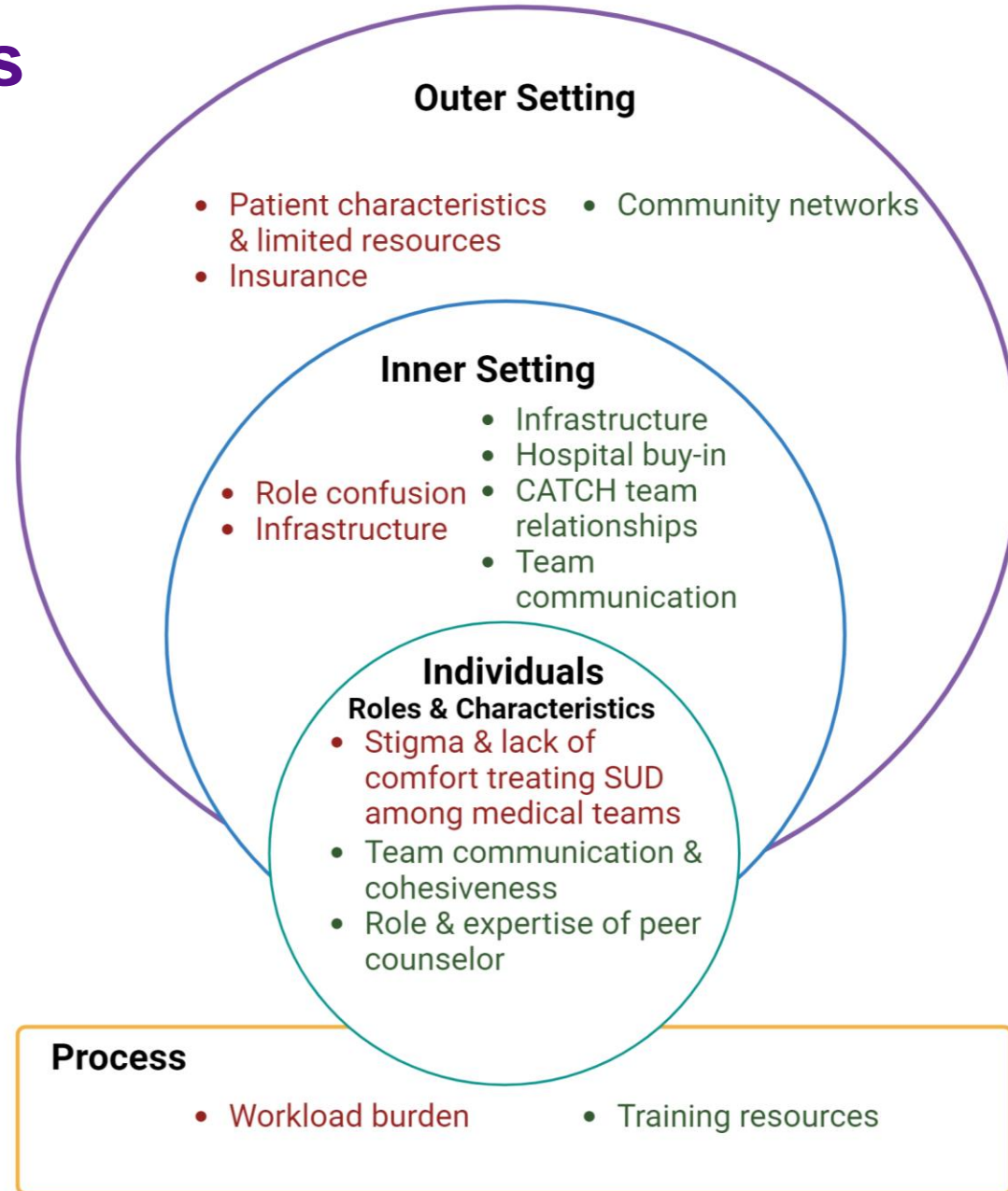
Staff Perspectives

- Implementation barriers and facilitators probed with a semi-structured guide
- Qualitative analysis guided by the Consolidated Framework for Implementation Research (CFIR)
- Early implementation (n=26) and post-implementation (n=33) interviews
41 unique participants



n=16 Medical providers
15 Social worker/Addiction counselor
10 Certified peer recovery advocate

Staff Perspectives



Staff Perspectives

CATCH team internal communication & cohesiveness

Well, just like the word say, "catch" ...you know, the peers...we kinda similar [to] like a quarterback [laughter], get the ball and keep running...We all gonna have our positions. They [team members] also get the ball. It's kinda like **warm, friendly hand-off all across the whole team**

Infrastructure barriers- office space & bridge clinic

And then we went this long period of time with not having any place to go, so we literally have to meet people in the lobby...we had to make it work...**it really limited our effectiveness.**







Hospital leadership buy-in & support

We were invited to do the grand rounds...that showed that, they want... everybody in the hospital to know about CATCH and... to know the system and figure out how exactly to put a consult in and provide education on the program. So I think ...**that has definitely showed some support and has made us feel valued as a team.**

Qualitative Interviews - Patients

Original Research

“They Never, Never, Never Give Up on Me”: Perspectives on an Addiction Consult Service From Hospitalized People Who Use Opioids at 6 New York City Public Hospitals

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Noa Appleton, MPH³, Amanda M. Bunting, PhD³ , Adetayo Fawole, MD, MPH³ ,
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Patient Perspectives

- 30 participants with OUD who were hospitalized at a CATCH hospital
- Asked about their experiences during hospitalization (past and current) and interactions with CATCH

Characteristics

	N=30 (%)
Age	
Mean (SD)	49 (11)
Range	23 - 64
Gender	
Men	22 (73.3)
Women	8 (26.7)
Race and Ethnicity	
Hispanic	18 (60.0)
Non-Hispanic Black	5 (16.7)
Non-Hispanic White	7 (23.3)
Actively unhoused	11 (37.9)
Initially declined some aspect of CATCH services	10 (33.3)

Connection & Conversation

- Participants described CATCH teams providing **support, conversation, and humanizing care**

*“You have somebody to speak to. You feel a little bit more human. Me, I been in the street, right? People don’t treat me like a human being. **If you just have a conversation with me, that’s what’s important. It makes me want to come back to socialize again.**”*

Advocacy

- Participants described CATCH teams as **advocates**
- CATCH helped participants **navigate** the health system's structures
- One participant explained that a CATCH medical provider went with them to the outpatient treatment program and **advocated for their admission post-discharge:**

*“Really, she saved my life, and she gave me this chance. **I tried so many times, and they turned me down. I was thinking, ‘Oh, my god, lady. You don’t know.’ [Laughter] But I said, ‘It’s okay. Let’s try again. What bad can happen?’ But I don’t know what she told them, but I guess she told them I was desperate, really desperate, so I was lucky. They accepted me.**”*

Receiving medications for opioid use disorder (MOUD)

- CATCH met a need for **withdrawal management** during hospitalization
- Participants described benefits of accessing **MOUD treatment** while hospitalized

*“I mean, it mighta not worked out as well as this if I had the time to **get released from here and then had to wait another week to go to this**, you know, other thing 'cause, **what am I gonna do in that week if I was active?** You know, it could get complicated. **So, the convenience of everything definitely increased the chances of my success.**”*

Summary

- Hospitals have an important role to play in identifying and treating patients with substance use disorders
- Addiction consult services are effective for increasing MOUD, but are just one element in the treatment landscape
- CATCH was feasible to implement in a public hospital system
- CATCH was well accepted, and has been sustained

Publications

- **Study protocol for a pragmatic trial of the Consult for Addiction Treatment and Care in Hospitals (CATCH) model for engaging patients in opioid use disorder treatment.** *Addict Sci Clin Pract.* 2019
 - **How Physician Workforce Shortages Are Hampering the Response to the Opioid Crisis.** *Psychiatr Serv.* 2022
 - **Sensitivity of Medicaid Claims Data for Identifying Opioid Use Disorder in Patients Admitted to 6 New York City Public Hospitals.** *J Addict Med.* 2022
 - **A Taxonomy of Hospital-Based Addiction Care Models: a Scoping Review and Key Informant Interviews.** *Journal of General Internal Med.* 2022
 - **A Comprehensive Clinical Guide to Support the Implementation of Addiction Consult Services & the Value of Training and Technical Assistance (TTA) Primary Outcome.** *J Addict Med.* 2024
 - **Addiction Consultation Services for Opioid Use Disorder Treatment Initiation and Engagement: A Randomized Clinical Trial.** *JAMA Int Med* 2024
 - **Attributes of Higher- and Lower-Performing Hospitals in the Consult for Addiction Treatment and Care in Hospitals (CATCH) Program Implementation: A Multiple-Case Study** *J Subst Use and Addiction Treatment* 2024
 - **Staff Perspectives of Barriers and Facilitators to Implementation of the Consult for Addiction Treatment and Care in Hospitals (CATCH) Program in New York City Safety Net Hospitals** *J Subst Use and Addiction Treatment* 2024
 - **Addiction Consult Services, Mortality, and Acute Care Utilization in Inpatients With Opioid Use Disorder.** *JAMA Netw Open.* 2025
 - **Medication for Opioid Use Disorder for Hospitalized Patients at Six New York City Public Hospitals with an Addiction Consult Service.** *J Addict Med.* 2025
 - **“They never, never, never give up on me”:** Perspectives on an addiction consult service from hospitalized people who use opioids at six New York City public hospitals. *SAJ* 2025.
- In Progress:**
- **Economic analysis (2025)**

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Q&A

