



MetroHealth

MetroHealth's Center for Clinical Informatics Research and Education (CCIRE) – SPEED ROUNDS (10/2025 prior 03/2022)

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Assistant Professor of Family Medicine

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Learning Objectives

- To understand what types of research occurs within the Center for Clinical Informatics Research and Education (CCIRE).
- To describe at least one informatics “big data” and one informatics “interventional” study undertaken by CCIRE.
- To think of at least one way that you can partner/partner more with CCIRE faculty for research in the future.

Disclosures : NONE (except our entire operational, academic, and research careers are based on leverage informatics and Epic 😊)

Outline

- CCIRE/Epic Background (5 min)
- Informatics Data Science/“Big Data” Studies (15 min)
- Informatics Implementation Science/“Interventional” Studies (15 min)
- CCIRE Research Informatics Resources (10 min)
- Wrap-up/Questions/Discussion (10 min)

CCIRE Faculty



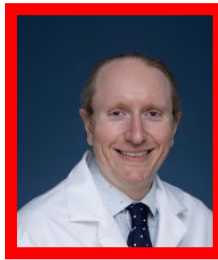
Peter Greco
Internist

*Director Clinical Informatics –
Software Infrastructure*



David Kaelber
Internist and Pediatrics

“Leader”/CHIO



Nicholas Riley
Family Physician

*Director Clinical Informatics –
Ambulatory Informatics*



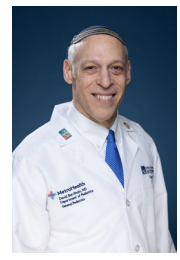
Yasir Tarabichi
Pulmonary/Critical Care
Emergency Medicine
Physician

*Director Research Informatics
CHAIO*



Jonathan Siff
Physician

CMIO



David Bar-Shain
Pediatrician

*Director Clinical Informatics –
Clinical Decision Support*

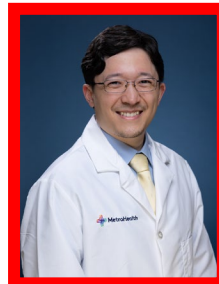


Johnbuck Creamer
Adult Hospitalist

*Director Clinical Informatics –
Inpatient Informatics*



Ashley Hughes
Research Informatics
Research Scientist



Eric Kim
Family Physician
*Director Clinical Informatics
- Virtual Care*



Janeen Leon
Nutritionist

*Associate Director
Research Informatics*



Eman Jammali
Family Physician
*Senior Clinical
Informatics Fellow*



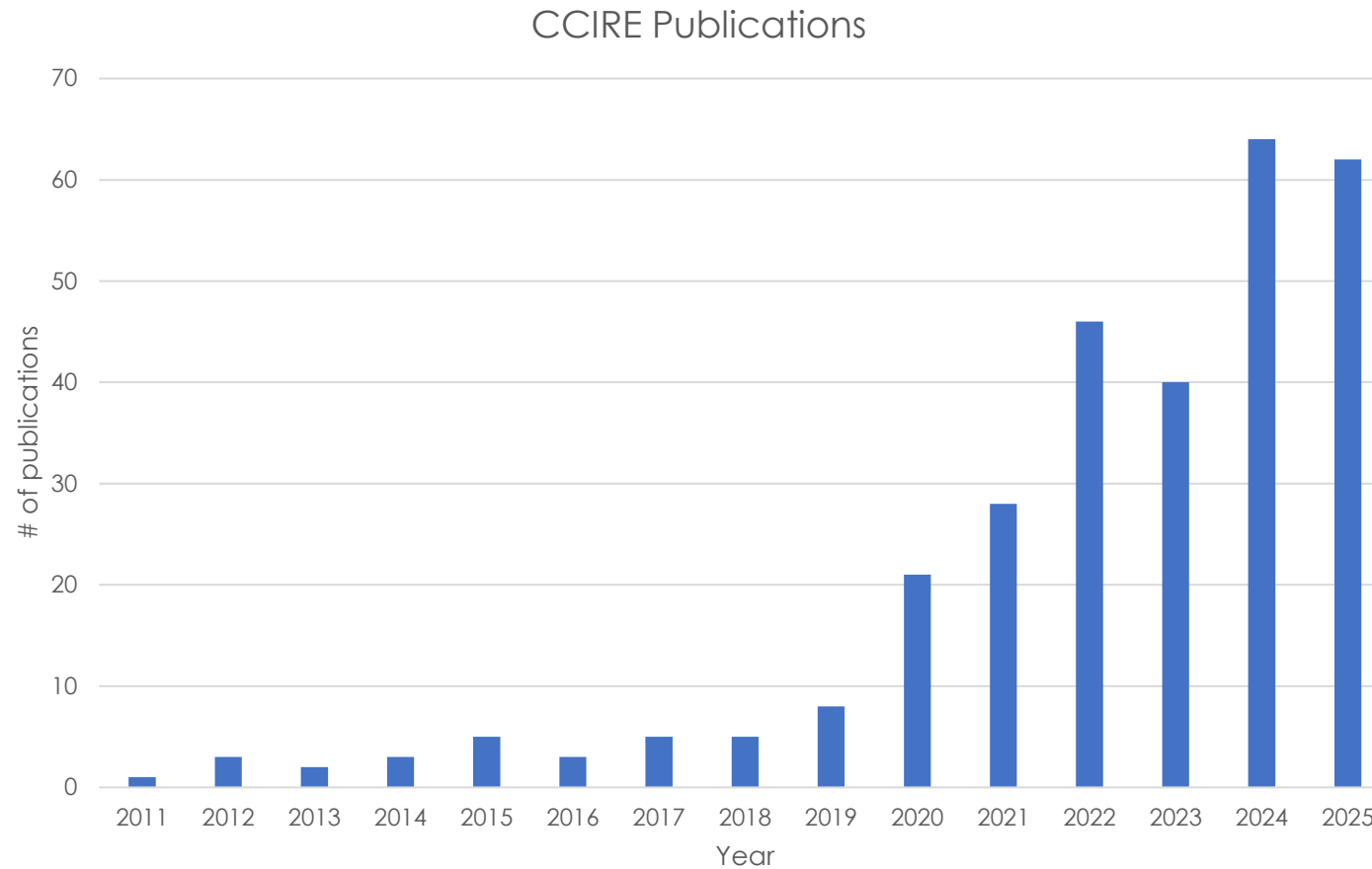
Shashank Nayak
Preventive Medicine
Clinical Informatics Fellow



Muhammad Alghanem
Geriatrics/Family Medicine
Clinical Informatics Fellow

Blue – at least partially externally funded faculty

CCIRE Publications



CCIRE has had significant growth in publications in the last ~5 years!

MetroHealth Data and Informatics Infrastructure

System Overview

- 1 tertiary care academic hospital
- 1 behavior health hospital
- 2 community hospitals
- 4 emergency departments
- 27 health centers/13 schools
- 400+ resident/fellow physicians
- 1,000+ medical staff/2,100+ nurses
- 25,000 inpatient stays/year
- 140,000 ED visits/year
- 1,500,000 outpatient visits/yr
- Recovery Resources, Corrections Care, Foster Care, Hospital @ Home, Dental Care
- Institute for H.O.P.E.², High School on Campus
- Level I Trauma Center
- Only OH Adult & Pediatric Trauma Burn Center
- Affiliated with CWRU
- Cleveland's/Cuyahoga County's public/safety-net health care system

Total EHR data

- 1.7 million patients
- 66 million visits
- 45 million labs/pathology
- 3 million imaging studies
- 26 years of data in Epic

Epic Implementations

- 1999 – Ambulatory EHR (EpicCare w/ Cadence, Prelude, & Resolute)
- 2004 – EHR in ED (ASAP)
- 2009 – Inpatient EHR (Epic w/ Inpatient Willow and Beacon)
- 2011 – CareEverywhere, e-Rx, MyChart, Nurse Triage
- 2012 – Epic Enterprise Contract, MU Stage 1
- 2013 – BCMA, EpicCare Link, Welcome
- 2014 – ADT, Beaker, Bed Tracking, Anesthesia, OpTime, Research, Resolute Hospital Billing and SBO
- 2015 – Kaleidoscope
- 2017 – Stork, LGBT module
- 2018 – Infection Control, Clinical Case Management
- 2020 – MyChart Bedside, Transfer Center, UniteUs
- 2021 – Radiant, Ambulatory Willow, PM&R
- 2022 – Behavior Health Module
- 2023 – Compass Rose, Bones, Hello World SMS, Payer Platform
- 2024 – Epic 2023 (Feb), Hyperdrive, Financial Assistance, Maternal Care Companion
- 2025 – Epic 2024 (Nov), Wisdom, Hello World platform, Cheers Campaigns

1st public health care system in US to install Epic in the outpatient setting (1999)!!!

1st public health care system in US with Epic to achieve HIMSS Stage 7 EMRAM Ambulatory & Hospital recognition (2014) and revalidation (2017, 2020, 2023)!!!

1st public health care system in the US with Epic to achieve HIMSS Enterprise Davies award (2015)!!!

1st public health care system in the US with Epic to achieve KLAS Pinnacle Award

Top 1%+ of all healthcare systems in the US/World in terms of EHR implementation and use!!!!!!!

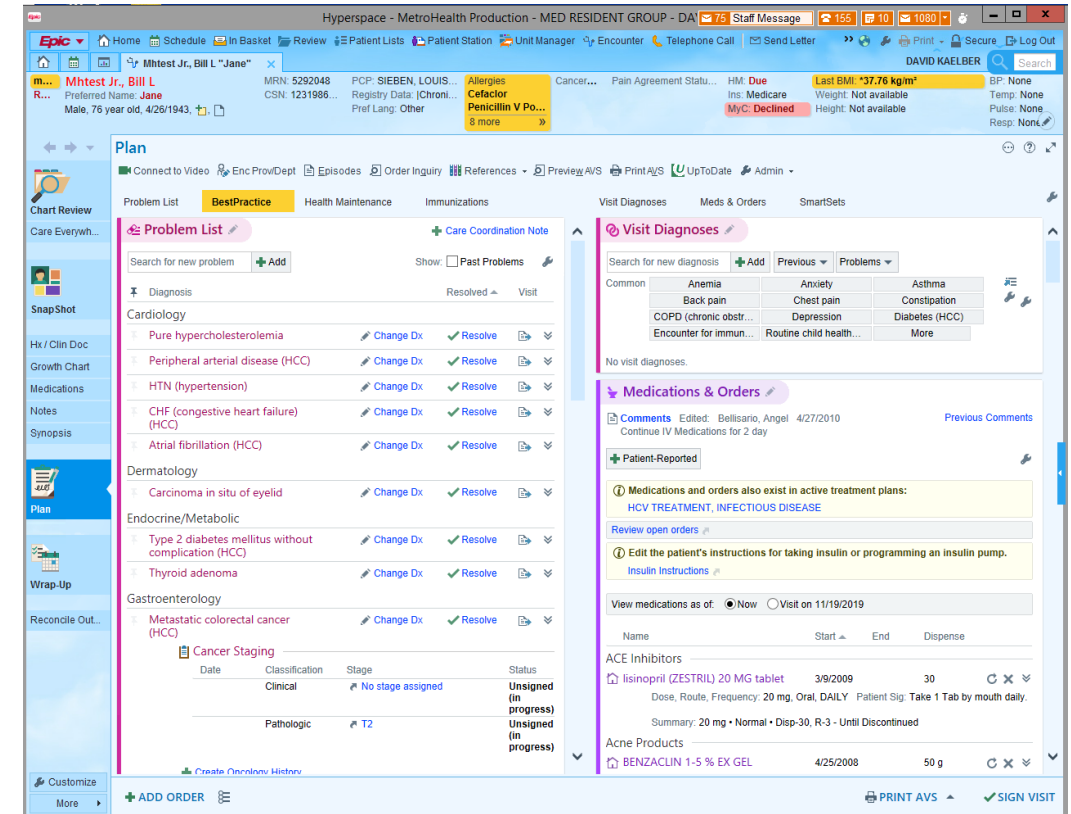
CCIRE Research Focuses



<https://marketoost.com/2014/01/big-data.html>

Using electronic health record
“big data”

Informatics Data Science



Studying how electronic health
records can improve care

Informatics Implementation Science



PHRI CCIRE Speed Rounds

Ambient AI Documentation Pilot – CCIRE Speed Rounds

Project Sponsor: Dr. Ellen Gelles

Project Executive Sponsor: Dr. David Kaelber

Project Operational Lead: Dr. Eman Jammali

Project Manager: Marie Velardo



Eman Jammali, MD

Assistant Professor, Family Medicine

Senior Clinical Informatics Fellow

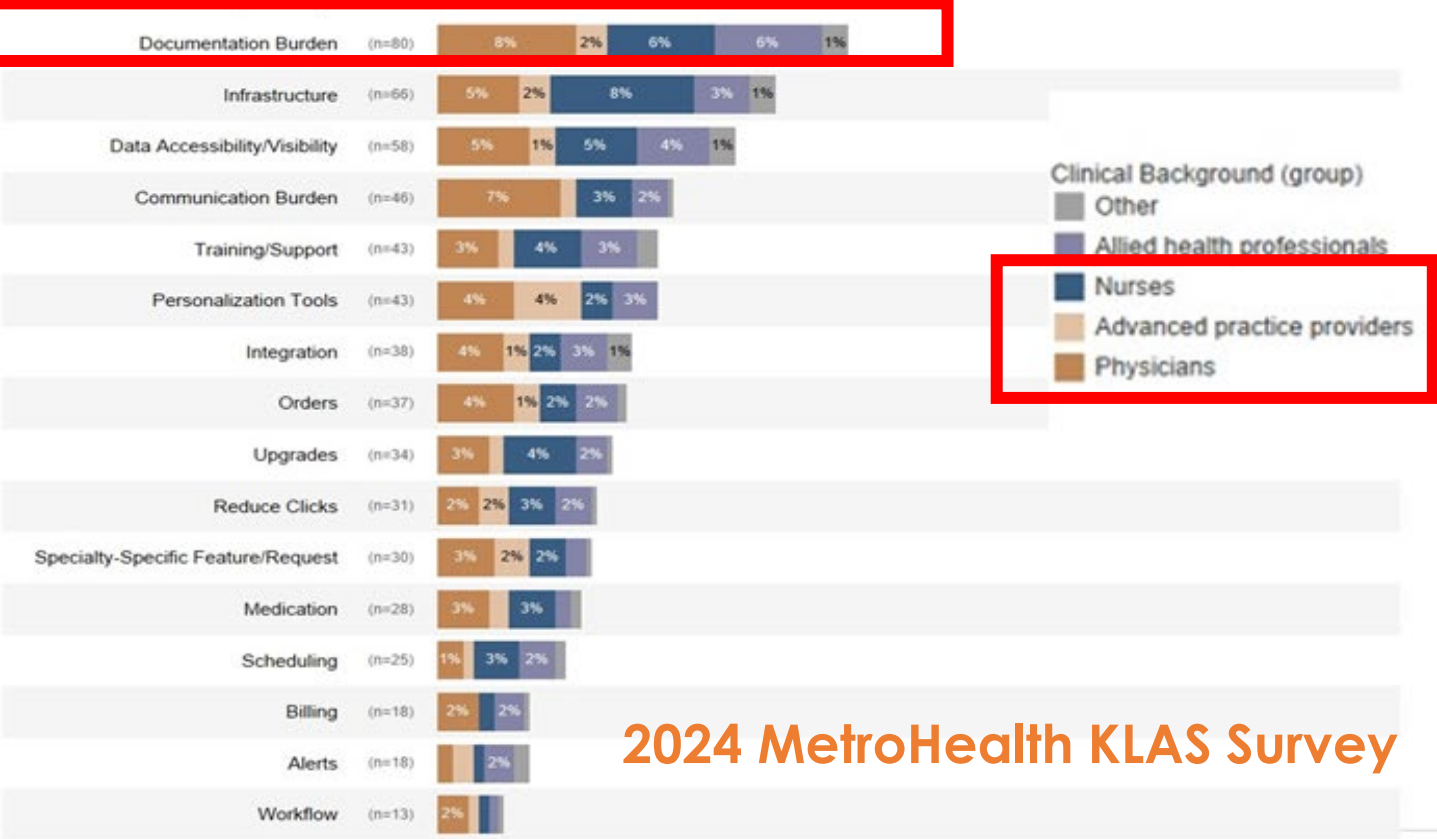
Center for Clinical Informatics Research and Education

MetroHealth clinicians feel overwhelmed by administrative tasks and want tools to help

Documentation burden is the number one item clinicians would like to see addressed.

Percent of clinicians citing a needed fix

2024 Metro Health: All respondents



2024 MetroHealth KLAS Survey

Confidential: prepared solely for client use

25%

50%

KLAS
RESEARCH

Arch Collaborative

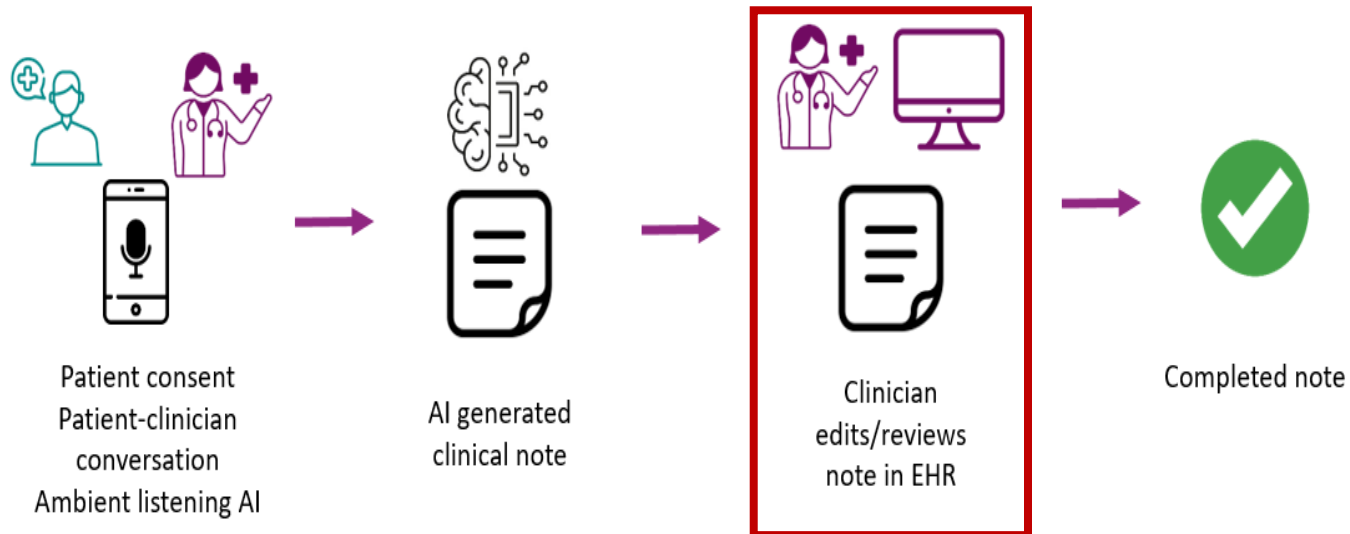


MetroHealth

Ambient Documentation

A clinician is always in the loop!

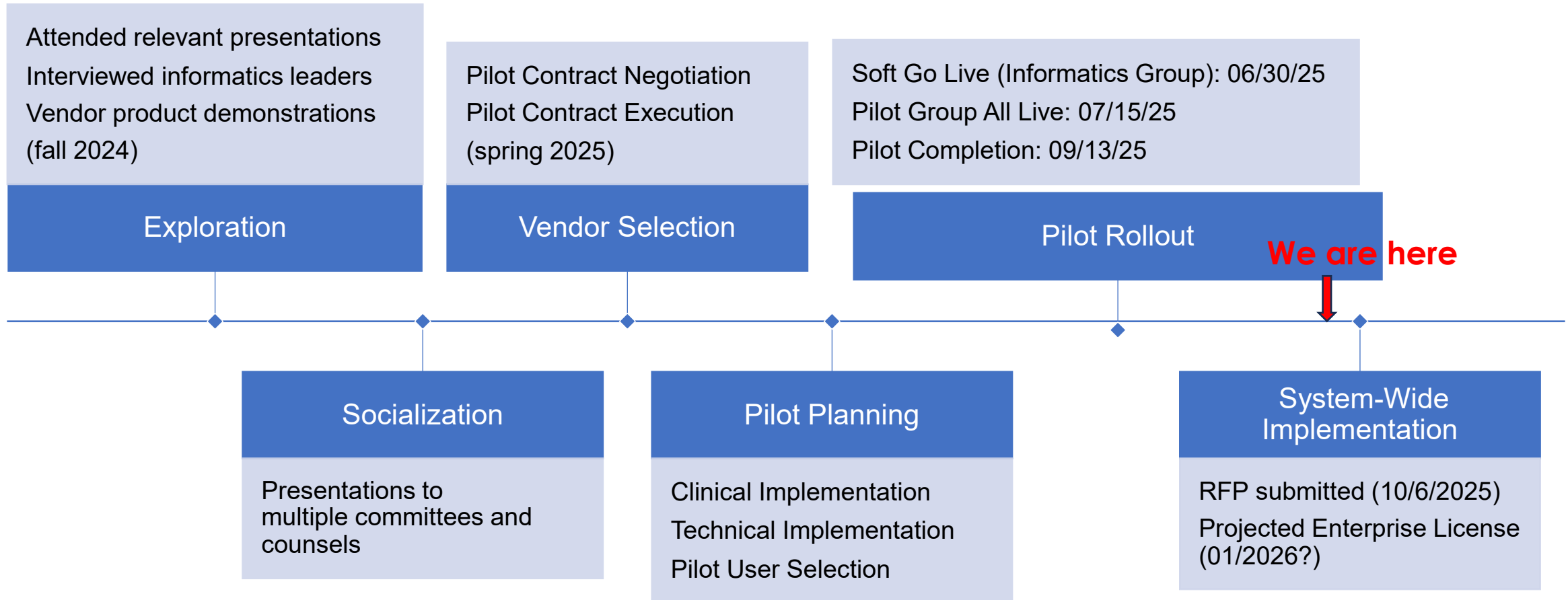
- Ambient documentation (“ambient listening”, “AI scribes”) uses natural language processing, machine learning, and contextual understanding to produce summarized real time scripts of clinician-patient encounters.



The screenshot displays a clinical note interface. On the left, there are tabs for 'CLINICAL NOTE' and 'PATIENT SUMMARY (PVS)'. The 'CLINICAL NOTE' tab is active, showing sections for 'History of Present Illness', 'Social History', 'Physical Exam', 'Assessment & Plan', and 'Obesity'. On the right, there is a 'TRANSCRIPT' tab, which is highlighted with a red border. The transcript shows a conversation between a patient and a clinician, with the patient's input in a light blue box and the clinician's response in a light orange box. The transcript includes the following text: 'Uh, you can keep them on for now.', 'Okay.', 'So you're on one milligram of the Ozempic.', 'Yes, there is an opportunity to go up.', 'Okay.', 'So, um, yeah.', 'So I am going to just put on, cause you are also diabetic.', 'So there's, you have double reasons for being on it, both, uh, for the obesity as well as, yeah, your weight has gone up.', and 'I'll be in'. At the bottom of the transcript, there is a 'COPY ALL' button and a 'MARK DONE' button.

Making the EHR Work for Us, Not Vice Versa, Mishuris, R, IM 2024, Boston, Massachusetts.

Ambient Listening (Abridge) Timeline



Abridge Pilot Group Characteristics

Pilot Cohort

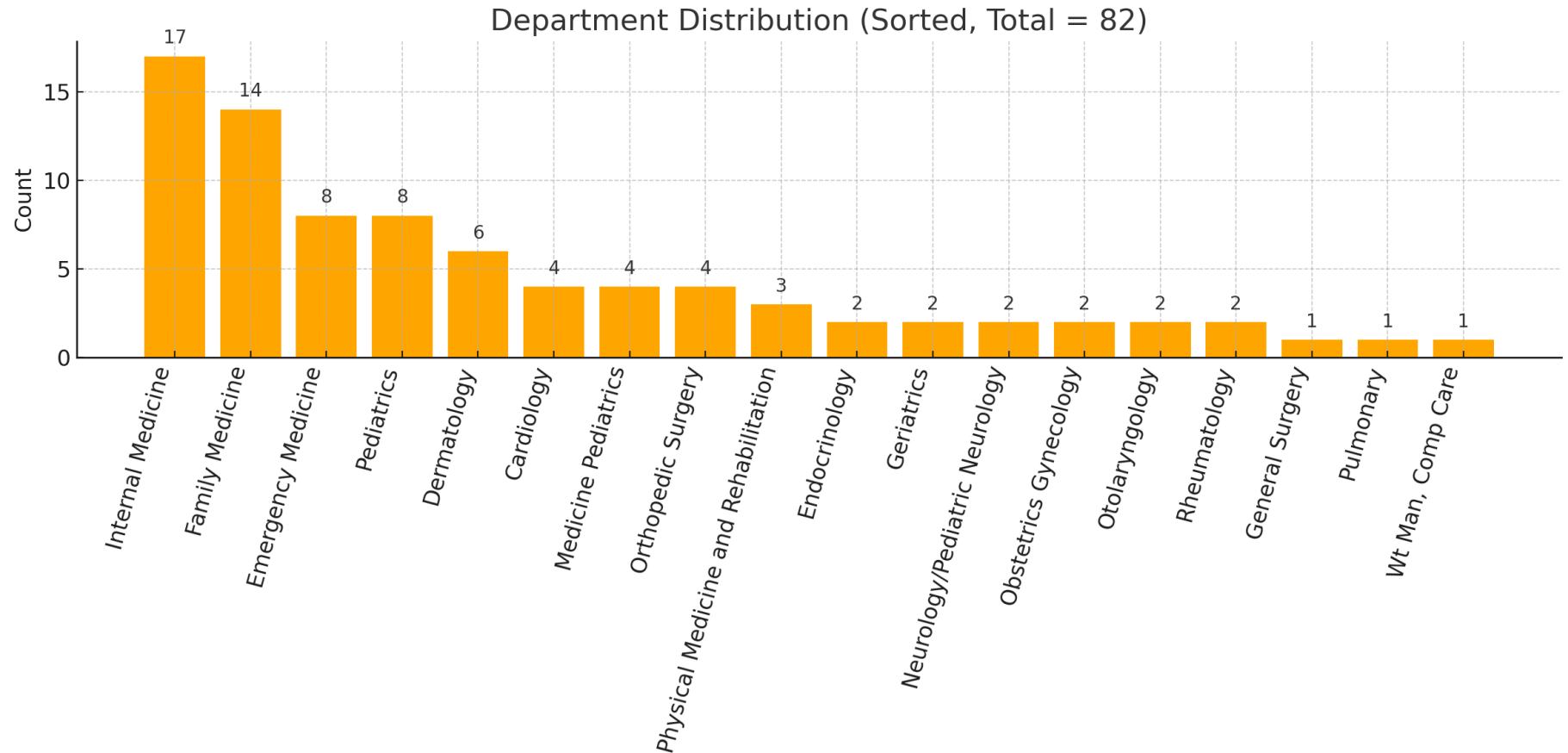
N=84

51% Primary care

20% APPs

20% Scribe Users

50% Fluency Direct
Users



Abridge Pilot Metrics

Domain	Metric	Measurement Source
Adoption	# of notes generated using Abridge	Abridge
	# of active and engaged users	Abridge
Clinician Experience	Likelihood to recommend (NPS)	Patient Survey
	Burn-out assessment	Patient Survey
	Cognitive load assessment	Patient Survey
	Work Outside of Work (WoW)	Epic Signal
Note Quality	Avg. note star rating (1–5)	Abridge
	Avg. note turnaround time	Abridge
	% effort reduction	Abridge
Operational Efficiency	Same-day close rate	Epic Signal
	Time in notes per encounter	Epic Signal
	Same-day patient availability	Patient Survey
Patient Experience	Undivided attention of clinician	Clinician Survey
	Visit improved compared to encounters without Abridge	Patient Survey
	Comfort with technology	Patient Survey
Financial	Visits per session/shift	MetroHealth Billing and Revenue
	Provider wRVU distribution pre-/post- use of Abridge	MetroHealth Billing and Revenue
	HCC Gap Closure Rate	MetroHealth Billing and Revenue
Scribes/Dictation Behavior	% of providers willing to eliminate or reduce scribe use	Client Survey (adapted for MH)
	M Modal use in pilot users, pre- and post- pilot	Client Survey (adapted for MH)

A decorative graphic in the top right corner of the slide, consisting of numerous circles of various sizes and colors (orange, red, pink, purple, blue, teal, and green) arranged in a pattern that suggests movement or a cluster.

Abridge Pilot Results

- Utilization
- Financial
- Patient Experience
- Physician/APP Experience

Total Notes Generated
20,000+

Utilization Rates

~70 recording users weekly

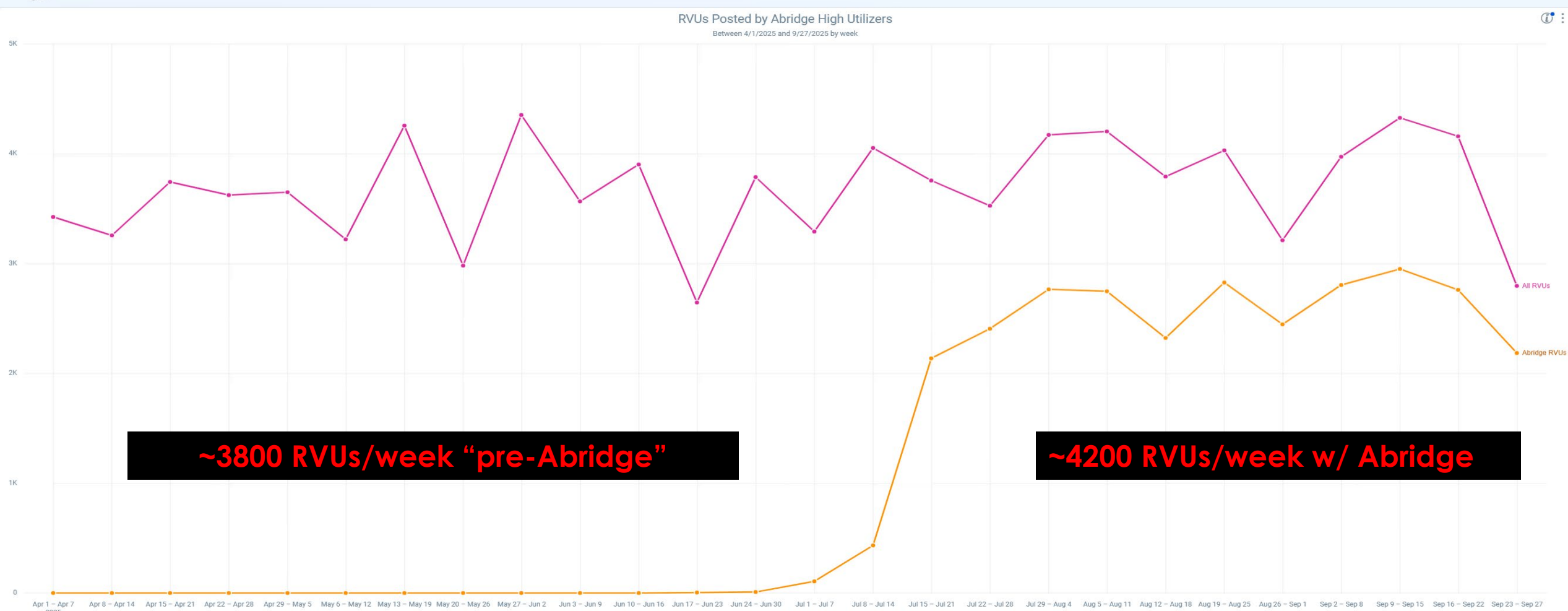
Abridge Usage Rate - High Utilizers

Between 6/30/2025 and 9/12/2025 by week

DepartmentSpecialty	2025										Sep 8 – Sep 12
	Jun 30 – Jul 6	Jul 7 – Jul 13	Jul 14 – Jul 20	Jul 21 – Jul 27	Jul 28 – Aug 3	Aug 4 – Aug 10	Aug 11 – Aug 17	Aug 18 – Aug 24	Aug 25 – Aug 31	Sep 1 – Sep 7	
Dermatology	3.75%	63.64%	73.68%	90.65%	92.93%	93.26%	100%	98.72%	96.67%	92.31%	98.46%
OB/Gyn	0%	0%	-	60.78%	91.3%	86.36%	91.84%	91.84%	95%	93.62%	96%
Endocrinology	0%	0%	100%	0%	100%	100%	100%	77.42%	96.55%	-	57.14%
Internal Medicine	0.24%	9.92%	55.48%	72.79%	80.09%	83.14%	89.67%	86.9%	88.43%	88.57%	82.11%
Neurology	0%	0%	47.37%	70.37%	71.43%	96.88%	70%	86.67%	87.5%	92.59%	93.33%
Family Practice	12.5%	17.38%	50.59%	66.67%	77.97%	90.44%	79.2%	84.93%	83.26%	80.65%	87.76%
Neurosurgery	-	0%	0%	-	-	-	35.14%	-	100%	-	89.47%
Pediatrics	0%	0%	64.35%	76.56%	75.38%	75.75%	77.84%	72.92%	69.7%	76.47%	69.92%
Orthopedics	0%	0%	28.3%	-	71.43%	63.64%	79.59%	64.29%	90.2%	-	85.71%
Physical Medicine & Rehab/PM&R	0%	0%	51.85%	82.52%	76.32%	73.21%	65.79%	78.72%	66.36%	68.85%	72.88%
Medicine/Pediatrics	4.76%	22.95%	46.94%	39.5%	62.42%	63.95%	70.13%	69.92%	64.29%	67.24%	78.88%
Pediatric Urgent Care	0%	0%	-	100%	-	-	-	-	-	100%	100%
Express Care	0%	-	-	-	0%	90.91%	-	0%	100%	-	-
Urgent Care	0%	0%	-	-	-	-	50%	-	100%	-	-
Gastroenterology	-	-	-	-	-	0%	-	0%	0%	-	0%
Oncology Medical	0%	-	0%	0%	-	0%	0%	-	0%	-	-
Radiology	0%	0%	0%	0%	0%	0%	0%	0%	0%	-	0%
Total*	3.77%	10.24%	54.52%	69.8%	77.61%	81.18%	80.11%	80.73%	83.35%	81.77%	81.94%

RVU Impact

(presumably from “RVU drift/per encounter” as well as willingness to “squeeze in encounters”)



~3800 RVUs/week “pre-Abridge”

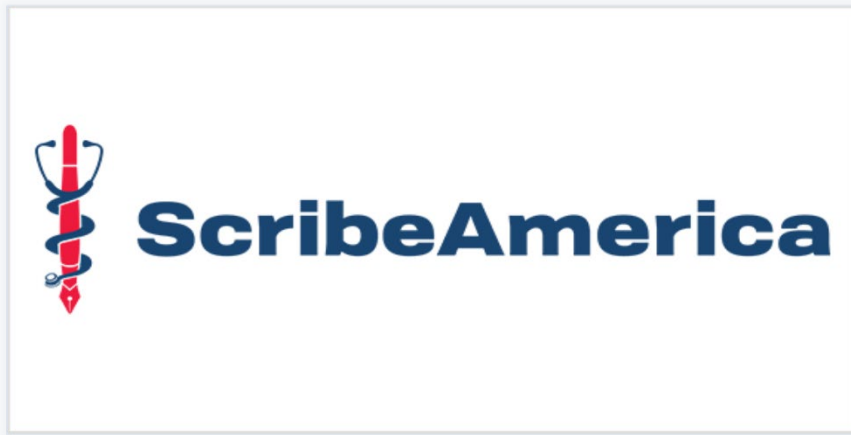
~4200 RVUs/week w/ Abridge

~400 increase in RVUs shown in high utilizers (preliminary result)*; for a typical provider with 8 half-day clinical sessions per week with typical RVUs, a 2% increase in RVUs will pay for ambient listening license

Note – not sure of aggregate RVU to \$ conversion factor for MetroHealth, but for Medicare ~\$32 per RVU proposed for 2026

*-UPMC showed a 7% increase in RVUs

Scribe (virtual and physical) and mModal User Impact



All virtual and most physical scribe users (13/15 overall scribe users) in the pilot indicated that ambient listening was an effective scribe substitute

MetroHealth current has ~50 virtual and physical scribe users and spent \$862K on scribes in 2024.

Scribes cost ~\$200 per provider per day; Ambient listening costs ~\$200 per provider per MONTH.



25/34 mModal users in the pilot indicate that they would “not need” mModal if they continue to use ambient listening

MetroHealth current has ~400 mModal users and spent ~\$200K on mModal per year.

mModal costs ~\$35 per provider per month.

Epic HCC Gap Closure Rates with Abridge

Abridge Pilot - Score Gap Analysis

All Time

# of encounters	# of encounters with Abridge	0	1	2	3
	Measures				
^1	Avg CMS HCC Score Gap	0.279808	0.2147403	-	-
	Patient Volume	5,481	4,395	-	-
^2	Avg CMS HCC Score Gap	0.2833307	0.2343808	0.1953627	-
	Patient Volume	511	449	317	-

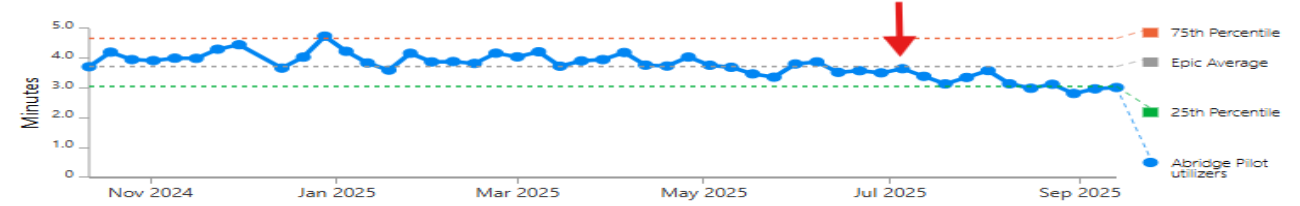
For each patient with an HCC gap, the HCC gap per encounter is LESS after the encounter if the encounter occurred with Abridge then without Abridge, presumably because the provider has “more time” and “less cognitive load” and so is more likely to address any HCC gaps as part of the encounter.

"Time in Notes" and "Pajama Time" for Abridge Users (Epic)

Time in Notes
per Note
3.0 min



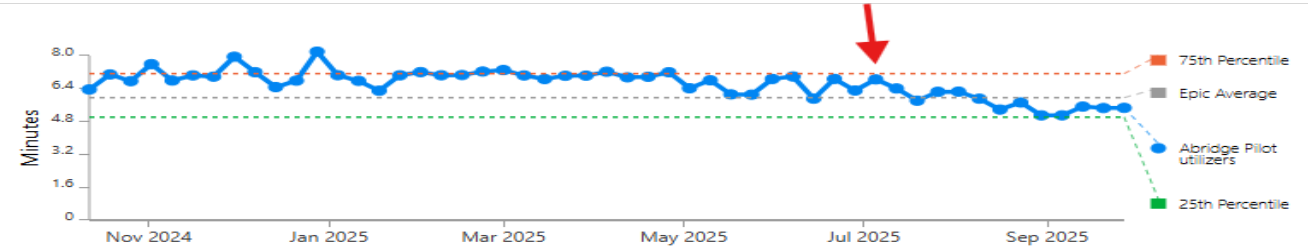
- Metric Description
- Download Most Recent Data
- Download Historical Data



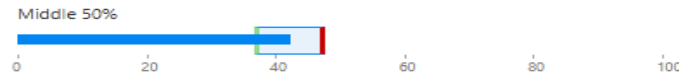
Time in Notes
per Appointment
5.5 min



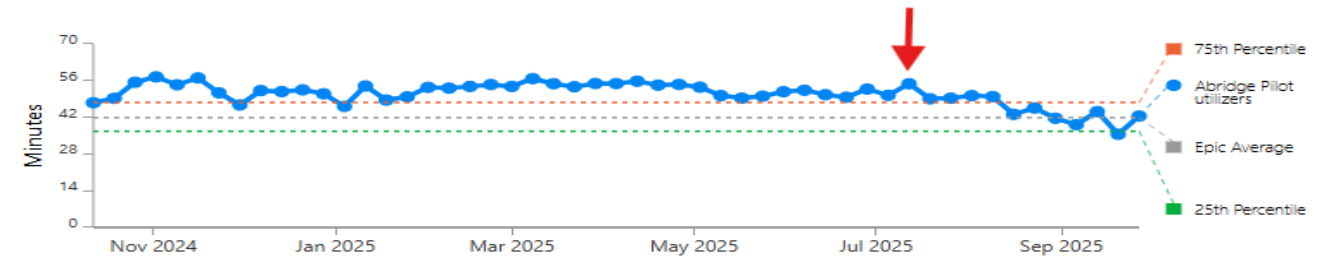
- Metric Description
- Download Most Recent Data
- Download Historical Data



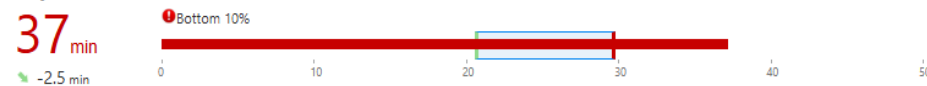
Time in Notes
per Day
42 min



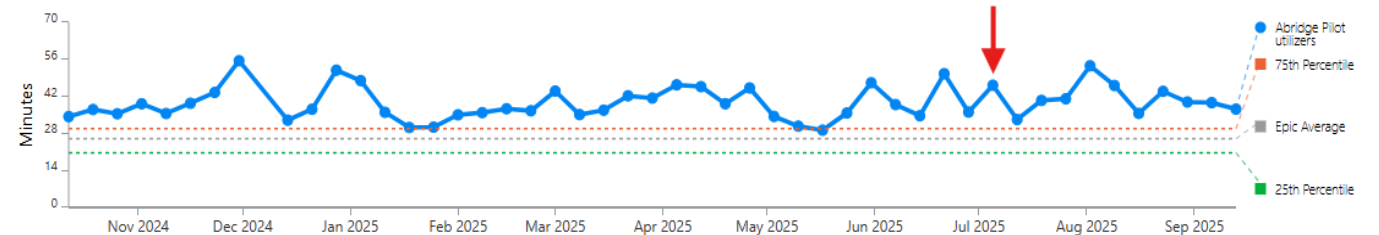
- Metric Description
- Download Most Recent Data
- Download Historical Data



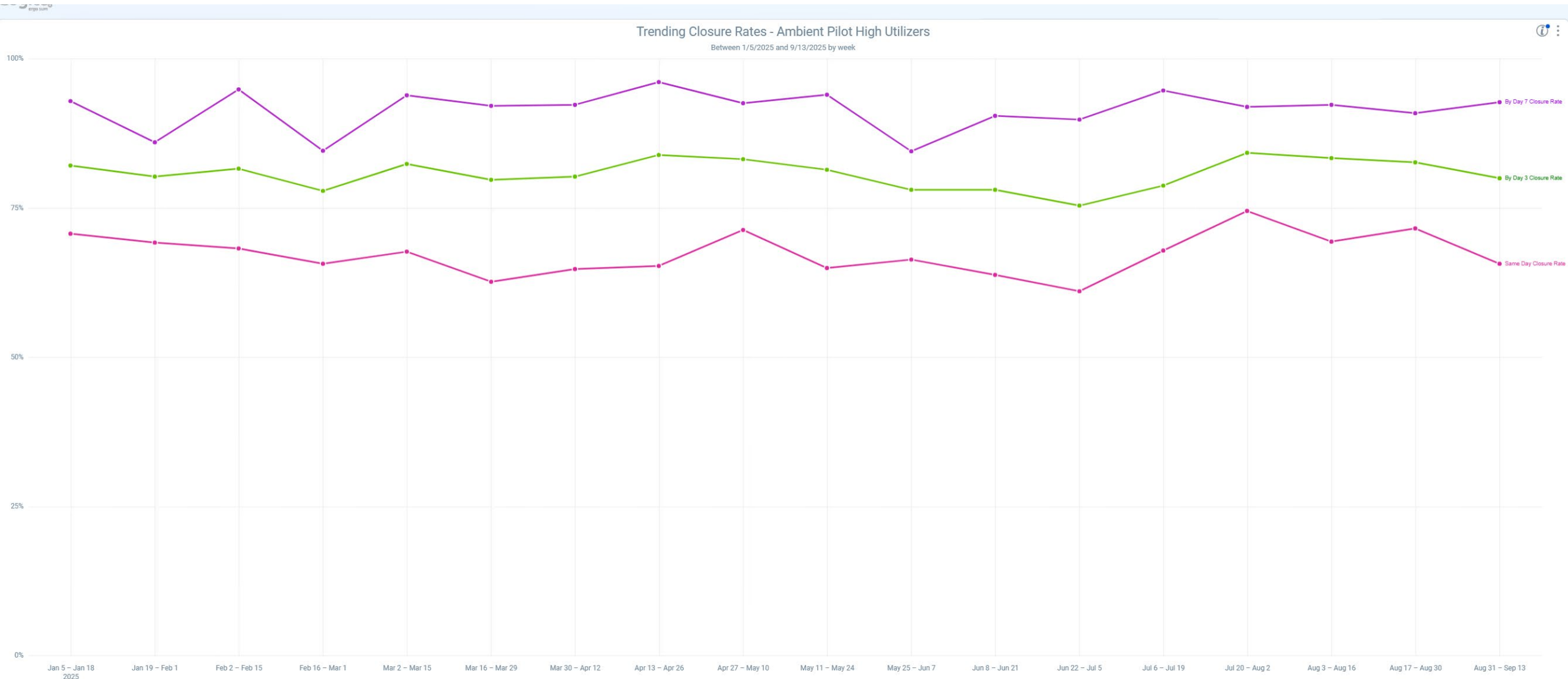
Pajama Time
per Scheduled Day



- Metric Description
- Download Most Recent Data
- Download Historical Data



Epic Encounter Chart Closure Rates



Patient Experience

MH Patient Experience - Ambient Pilot

This component displays surveys collected after 1/1/2025



Abridge users appear to have a SLIGHT increase in “Explains”, “Shows Respect” and “Provider Listens” patient experience scores

Patient Experience Survey

The ambient listening tool improved my visit today compared to other visits when it was not used.



I felt comfortable knowing that the ambient listening tool was being used to document my conversation with my provider today.

Strongly agree	40%	12
Agree	40%	12
Neutral	17%	5
I have not had healthcare visits when this technology was not used	3%	1

Post-Pilot Survey Results

SURVEY RESULTS ANALYSIS

74 RESPONSES, 15 WITH SCRIBES

Cognitive Load (Nasa TLX)

Mental Demand

74.3% Lower

- Avg 4/20 post-launch, compared to 14/20 pre-launch

Temporal Demand

66.7% Lower

- Avg 5/20 post-launch, compared to 15/20 pre-launch

Effort

65% Lower

- Avg 6/20 post-launch, compared to 16/20 pre-launch

Burnout (Mini Z)

Burnout

Decrease of 32.1%

- 11/74 clinicians feel burnout, compared to 54/74 pre-launch

Other

Undivided Attention

Decrease by 27.6%

Perceived WoW

Avg: 2.25 hrs/wk

- Avg 2.25 hrs/wk post-launch, compared to 5.74 hrs/wk pre-launch

Perceived Patient Access

Increase by 20.3%

Most Recent Clinician Feedback

"When I started using Abridge, **writing the notes became a breeze**. The AI-generated **notes are very detailed, organized, and accurate**. I only have to proofread them and make any necessary minor changes. It would take me 30 minutes at the end of the day to do this, instead of the 3-4 hours it took before. **I can give my undivided attention to the patients**. As for my family life, I stopped taking 30-40 notes home for the weekend. I finish the majority of them by Friday at 6 PM. I noticed that **my mind is free when I am home** with my spouse and my children. I am a better husband and a happier father. I wish we had this a long time ago. I hope that MetroHealth will soon contract for AI transcription for all its providers. **It is definitely a game-changer.**

"Abridge has been very beneficial and effective in note taking. Truly **makes stress of documentation way less**. Thorough and easy to follow. Does not necessarily decrease work burden but **decreases note burden and burn out. Would not want to lose this!**"

"I do feel that it is better (or at least much less frustrating) than the human scribes we get currently in the majority of cases."

"Notes are **more accurate**, since it catches details that patient is providing during the interview even if you have to finish a note several days later"

"Abridge has **literally removed a significant amount of stress from my day-to-day work**. Additionally, the stress is also removed from family time, allowing for **optimal work/life balance**"

"The improvement in cognitive burden is SUBSTANTIAL. Even when I wasn't initially saving time, I was DEFINITELY more cognitively available. Now I am leaving the office two hours earlier than usual."

"This has been life changing. **My notes are more thorough and address everything** I talk about but forget by the time I get to writing my notes. I am actually **able to have a conversation with my patients** without having to type and look at my computer the entire time"

Conclusions



1. Happy Providers - Ambient listening is easy to use, popular among most pilot users and has high utilization, particularly in primary care, dermatology and orthopedics. In some departments including the ED this technology received mixed review due to challenges with specialty workflow.



2. RVUs - In high Abridge utilizers (top 20%), increased RVUs, but could be confounders of other interventions @ MetroHealth during the pilot period



3. Scribe/Dictation Users - Many scribe and dictation users feel that ambient documentation could replace these other documentation aids.



4. HCCs - In Abridge utilizers with high patient volumes, trend towards reduced HCC gap



Efficiency

5. Efficiency - Decreased provider pajama time and time in notes per appointment (objective and subjective). There was not a significant increase in chart closure rates.



6. Burnout/Cognitive Burden - Decreased provider burnout and cognitive burden



7. Happy Patients - Improvement in "Explains", "Shows Respect" and "Provider Listens Carefully" patient experience metric. Limited data shows patients respond well to use of the technology and felt that patient facing material was helpful.

PHRI CCIRE Speed Rounds



Eric Kim, MD, PhD

Assistant Professor, Family Medicine

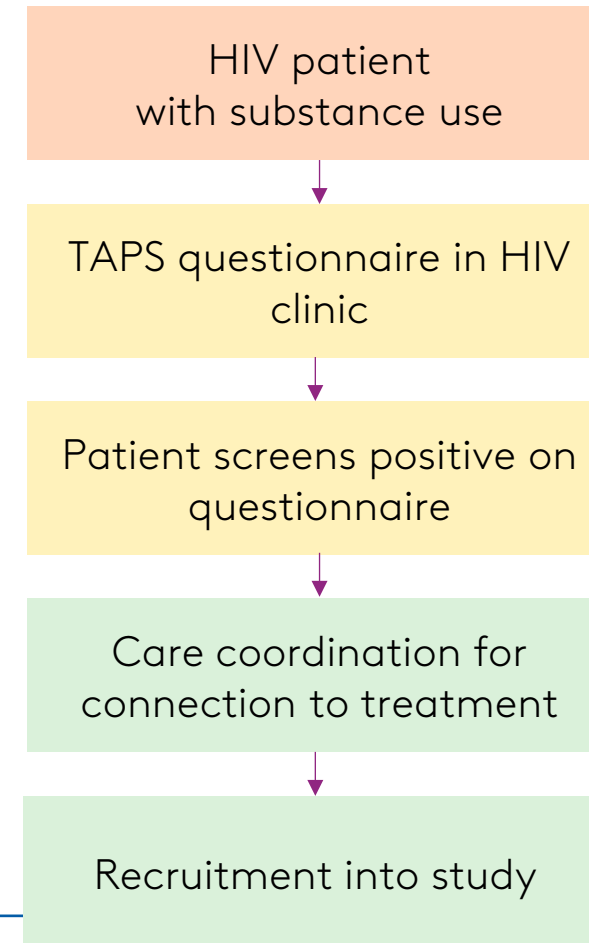
Center for Clinical Informatics Research and Education

National Institute on Drug Abuse Center of Excellence

NIDA COE at MetroHealth

Synergy between clinical management and research data

- PI: Ann Avery MH/CWRU
- One project of many
- HIV patients with substance use
- Clinical substance use screening in HIV clinic
- Connection with resources
- Recruitment into study for positive responses
- ~500 questionnaire responses per month
- ~25 eligible patients per month



TAPS Substance Use Screening Questionnaire

Tobacco, Alcohol, Prescription Medication, and Other Substance Use Tool

TAPS 1		TAPS 2	TAPS SCORE
In the PAST 12 MONTHS, how often have you used any tobacco product?	screen +	In the PAST 3 MONTHS, did you smoke a cigarette containing tobacco? (no=0, yes=1) • In the PAST 3 MONTHS, did you usually smoke more than 10 cigarettes each day? (no=0, yes=1) • In the PAST 3 MONTHS, did you usually smoke within 30 minutes after waking? (no=0, yes=1)	Tobacco Score (0-3)
In the PAST 12 MONTHS, how often have you had 5 or more drinks (men)/4 or more drinks (women) containing alcohol in one day?	screen +	In the PAST 3 MONTHS, did you have a drink containing alcohol? (no=0, yes=1) • In the PAST 3 MONTHS, did you have 5 or more drinks containing alcohol in a day? (no=0, yes=1) • In the PAST 3 MONTHS, have you tried and failed to control, cut down or stop drinking? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your drinking? (no=0, yes=1)	Alcohol Score (0-4)
In the PAST 12 MONTHS, how often have you used any drugs including marijuana, cocaine or crack, heroin, methamphetamine (crystal meth), hallucinogens, ecstasy/MDMA?	screen +	In the PAST 3 MONTHS, did you use marijuana (hash, weed)? (no=0, yes=1) • In the PAST 3 MONTHS, have you had a strong desire or urge to use marijuana at least once a week or more often? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your use of marijuana? (no=0, yes=1)	Cannabis Score (0-3)
	screen +	In the PAST 3 MONTHS, did you use cocaine, crack, or methamphetamine (crystal meth)? (no=0, yes=1) • In the PAST 3 MONTHS, did you use cocaine, crack, or methamphetamine (crystal meth) at least once a week or more often? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your use of cocaine, crack, or methamphetamine (crystal meth)? (no=0, yes=1)	Stimulant Score (0-3)
	screen +	In the PAST 3 MONTHS, did you use heroin? (no=0, yes=1) • In the PAST 3 MONTHS, have you tried and failed to control, cut down or stop using heroin? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your use of heroin? (no=0, yes=1)	Heroin Score (0-3)
	screen +	In the PAST 3 MONTHS, did you use a prescription opiate pain reliever (for example, Percocet, Vicodin) not as prescribed or that was not prescribed for you? (no=0, yes=1) • In the PAST 3 MONTHS, have you tried and failed to control, cut down or stop using an opiate pain reliever? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your use of an opiate pain reliever? (no=0, yes=1)	Opioid Score (0-3)
In the PAST 12 MONTHS, how often have you used any prescription medications just for the feeling, more than prescribed or that were not prescribed for you?	screen +	In the PAST 3 MONTHS, did you use a medication for anxiety or sleep (for example, Xanax, Ativan, or Klonopin) not as prescribed or that was not prescribed for you? (no=0, yes=1) • In the PAST 3 MONTHS, have you had a strong desire or urge to use medications for anxiety or sleep at least once a week or more often? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your use of medication for anxiety or sleep? (no=0, yes=1)	Sedative Score (0-3)
	screen +	In the PAST 3 MONTHS, did you use a medication for ADHD (for example, Adderall, Ritalin) not as prescribed or that was not prescribed for you? • In the PAST 3 MONTHS, did you use a medication for ADHD (for example, Adderall, Ritalin) at least once a week or more often? (no=0, yes=1) • In the PAST 3 MONTHS, has anyone expressed concern about your use of medication for ADHD (for example, Adderall or Ritalin)? (no=0, yes=1)	Stimulant Score (0-3)
Any drugs or prescription medications	screen +	In the PAST 3 MONTHS, did you use any other illegal or recreational drug (for example, ecstasy molly, GHB, poppers, LSD, mushrooms, special K, bath salts, synthetic marijuana ('spice'), whip its, etc.)? (no=0, yes=1) • In the PAST 3 MONTHS, what were the other drug(s) you used? (fill in response)	Not Scored

Presenting the Questionnaire to Patients

Creating an optimized version of a standard screening for iPad and Kiosk

The image displays two screenshots of a mobile application interface for a 'Tobacco, Alcohol and Drug Screening' questionnaire. The interface is designed for use on an iPad or Kiosk.

Left Screenshot: The screen shows the title 'Tobacco, Alcohol and Drug Screening'. Below the title, it states 'Indicates a required field.*' and asks 'In the PAST 12 MONTHS, how often have you used any drugs?*. For example, marijuana, cocaine or crack, heroin, methamphetamine (crystal meth), hallucinogens, ecstasy/MDMA.' The response options are: 'Never', 'Less Than Monthly', 'Monthly' (highlighted with a red box), 'Weekly', and 'Daily Or Almost Daily'. A red arrow points from the 'Monthly' option to the right screenshot.

Right Screenshot: The screen shows the title 'Tobacco, Alcohol and Drug Screening'. Below the title, it states 'Indicates a required field.*' and asks 'In the PAST 3 MONTHS, have you tried and failed to control, cut down, or stop using heroin, fentanyl, or other street opiate?*. The response options are: 'No' and 'Yes'.

Both screenshots show a top navigation bar with 'Questions' and a 'Finish' button. The bottom status bar shows the time as 8:24 PM and the Epic logo.

Storing and Recalling Results

Filling questionnaire responses to flowsheets for easy access and retrieval

The screenshot displays the Epic Hyperspace interface for a patient named Ann Test Annie. The interface is divided into several sections:

- Header:** Includes the Epic logo, navigation tabs (Record Viewer, My Reports, Home, Chart Review, Encounter, Refill Medication, Patient Lists, Patient Station, Send Letter, MModal, On-Call Finder, Remind Me, On-Call Scheduler, Rx Admin, More), and a search bar.
- Left Sidebar:** Contains patient information (Ann Test Annie, Female, 37 year old, 5/3/1988, MRN: 6013037), care gap orders, research participant status, primary care provider (Medical Mutual - Tr...), allergies (Unable to Assess), active treatment/therapy plans, pregnancy verification, and a list of care gaps (HIV Depression Screening, HPV Vaccine, Influenza Vaccine, Hemoglobin A1C, Hepatitis A Antibody, Hepatitis B Surface Antigen, Hepatitis B Surface Antibody, Toxoplasma IgG, CD4 Count).
- Main Content Area:** Displays the 'Flowsheets' section for 'The Tobacco, Alcohol...'. It includes a search bar, a table of questionnaire responses, and a summary of scores.
- Right Sidebar:** Shows a dropdown menu for 'In the PAST 12 MO...' with options: Less than Monthly, Daily or Almost Daily, Weekly, Monthly, Less than Monthly (selected), and Never. It also includes a comments field.

The questionnaire table contains the following data:

Question	Answer
In the PAST 3 MONTHS, have you tried and failed to control, cut down or stop drinking?	Yes
In the PAST 3 MONTHS, has anyone expressed concern about your drinking?	Yes
In the PAST 3 MONTHS, did you use a prescription opiate pain reliever (for example: Percocet, Vicodin) not as prescribed or that ...	Yes
In the PAST 3 MONTHS, have you tried and failed to control, cut down or stop using an opiate pain reliever?	No
In the PAST 3 MONTHS, has anyone expressed concern about your use of an opiate pain reliever?	Yes
In the PAST 3 MONTHS, did you use a medication for anxiety or sleep (for example: Xanax, Ativan, or Klonopin) not as prescribe...	Yes
In the PAST 3 MONTHS, have you had a strong desire or urge to use medications for anxiety or sleep at least once a week or more ...	No
In the PAST 3 MONTHS, has anyone expressed concern about your use of medication for anxiety or sleep?	Yes
In the PAST 3 MONTHS, did you use a medication for ADHD (for example: Adderall, Ritalin) not as prescribed or that was not pre...	Yes
In the PAST 3 MONTHS, did you use a medication for ADHD (for example: Adderall, Ritalin) at least once a week or more often?	No
In the PAST 3 MONTHS, has anyone expressed concern about your use of medication for ADHD (for example: Adderall, Ritalin)?	Yes
In the PAST 3 MONTHS, did you use marijuana?	Yes
In the PAST 3 MONTHS have you had a strong desire or urge to use marijuana at least once a week or more often?	No
In the PAST 3 MONTHS, has anyone expressed concern about your use of marijuana?	Yes
In the PAST 3 MONTHS, did you use cocaine, crack, or methamphetamine (crystal meth)?	Yes
In the PAST 3 MONTHS, did you use cocaine, crack, or methamphetamine (crystal meth) at least once a week or more often?	No
In the PAST 3 MONTHS, has anyone expressed concern about your use of cocaine, crack or methamphetamine?	Yes
In the PAST 3 MONTHS, did you use heroin?	Yes
In the PAST 3 MONTHS, have you tried to and failed to control, cut down or stop using heroin?	No
In the PAST 3 MONTHS, has anyone expressed concern about your use of heroin?	Yes
In the PAST 3 MONTHS, did you use any other illegal or recreational drug (for example: ecstasy/molly, GHB, poppers, LSD, mus...	Yes
In the PAST 3 MONTHS, what were the other drug(s) you used?	Test answer
Tobacco Score	2
Alcohol Score	3
Cannabis Score	2
Stimulant Score	2
Heroin Score	2
Opioid Score	2
Sedative Score	2
Prescription Stimulant Score	2

Questionnaire Initiated Recruitment

Questionnaires notify study staff of eligible patients and communicate information

The screenshot displays a medical software interface with a message list on the left and a detailed patient view on the right.

Message List:

Status	Subject	Msg Date/Time	Patient
Read	TAPS Positive Screen	04/09/2025 08:56 PM	Mh-test, Abigail
New	NM-ASSIST Positive Scr...	03/19/2025 02:32 PM	Test, December
New	NM-ASSIST Positive Scr...	03/19/2025 02:40 PM	Test, December
New	NM-ASSIST Positive Scr...	03/19/2025 05:55 PM	Test, David
New	Smoking Screener Surve...	12/05/2022 12:51 PM	DBS, Seth
New	Smoking Screener Surve...	09/29/2022 06:30 PM	Test, Purplepeds
New	Smoking Screener Surve...	09/28/2022 10:43 AM	Test, Purplepeds
New	Smoking Screener Surve...	07/17/2022 12:21 AM	Test, Purplepeds
New	Smoking Screener Surve...	07/15/2022 01:45 PM	Test, Purplepeds
Read	Smoking Screener Survey ...	07/15/2022 06:23 PM	ThreeM, Christopher

Patient View (Abigail Mh-test):

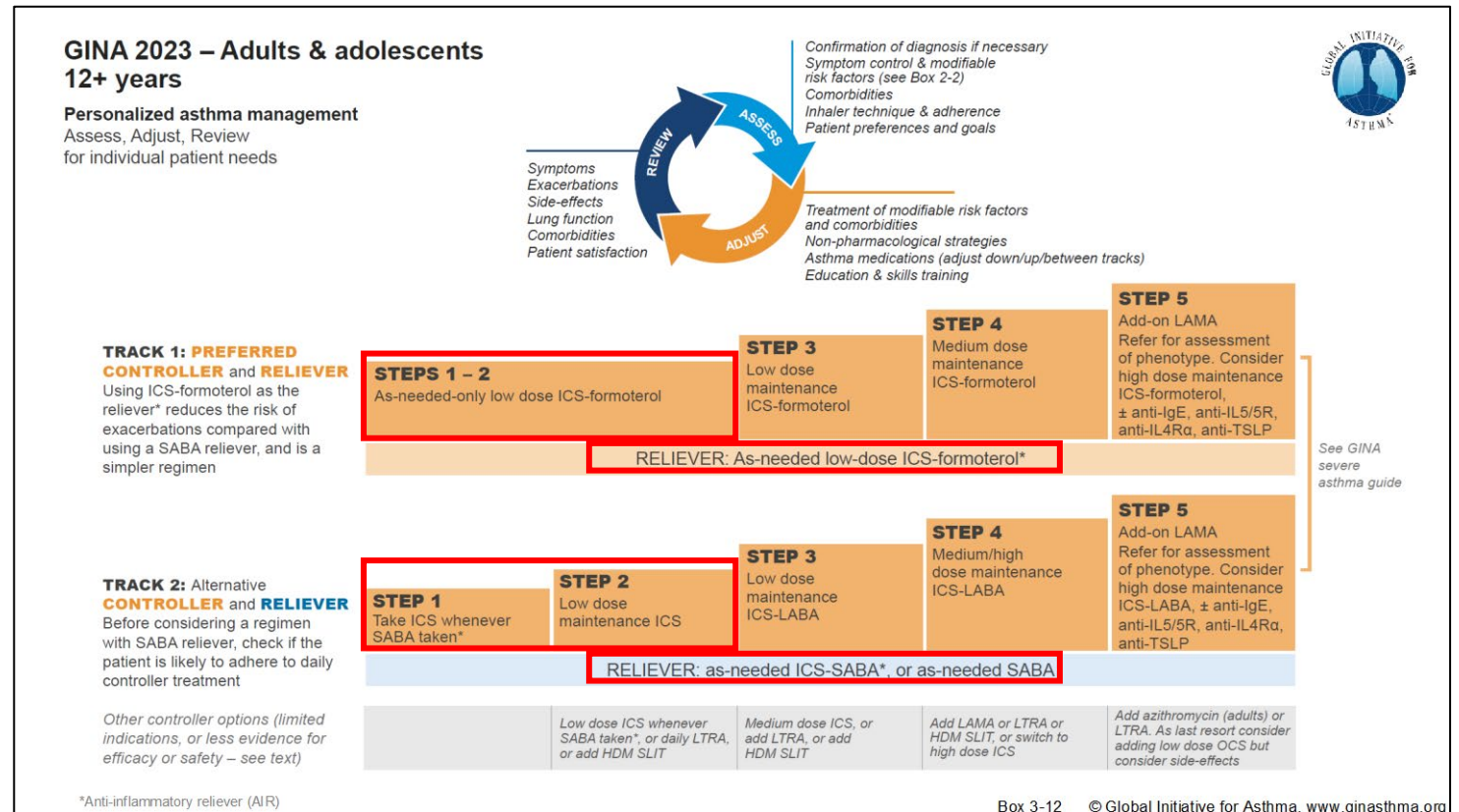
- Message:** TAPS Positive Screen (Received: Today)
- Legend:** Triggered an OurPractice Advisory (Scoring question)
- Patient Responses:**
 - MHS TAPS TOBACCO ALCOHOL PRESCRIPTION MEDICATION AND OTHER SUBSTANCE USE QUESTIONNAIRE:**
 - Question: In the PAST 12 MONTHS, how often have you used any tobacco product? Answer: Never
 - Question: In the PAST 12 MONTHS, how often have you had 4 or more drinks containing alcohol in one day? Answer: Never
 - Question: In the PAST 12 MONTHS, how often have you used any drugs? Answer: Monthly
 - Question: In the PAST 12 MONTHS, how often have you used any prescription medications just for the feeling, more than prescribed or that were not prescribed for you? Answer: Never
 - Question: Calculates if any alcohol use in the past 12 months question (male, female, unk) has an answer besides never. (range: 0 - 4) Answer: 0
 - MHS TAPS MARIJUANA:**
 - Question: In the PAST 3 MONTHS, did you use marijuana (hash, weed)? Answer: Yes
 - MHS TAPS MARIJUANA YES:**

PARTICS Implementation Project

Encouraging Adoption of New Practice

Patient Activated Reliever Triggered Inhaled Corticosteroids

- Pls: Elliot Israel MGH, David Kaelber MH/CWRU
- Supported by the PREPARE trial, our patients were a part of this trial!
- Less than 1% of Family Medicine asthma patients on indicated therapy
- ~25 provider interventions per month
- ~15 patient self referrals per month



Provider Just-In-Time Support

Clinical decision support based on asthma registry standardized metrics

This patient appears to have uncontrolled asthma. Start a corticosteroid reliever inhaler.

X

Asthma in past 15 months

Item	Value
Last ED/Inpatient Visit for Exacerbation:	11/30/2023
Last Prescription Oral Steroids for Asthma:	none
Last Asthma Control Score:	none

i

According to the 2023 GINA recommendations, all asthma patients should have a **corticosteroid containing reliever inhaler** either **with or without maintenance inhalers**.

[Global Initiative for Asthma's 2023 recommendations \(click and wait for PDF to open\)](#)

Start a corticosteroid reliever inhaler using the SmartSet
click **Open SmartSet**

or

Place a pharmacy consult for asthma
click **Order**

Apply one of the following

+ Open SmartSet

Asthma Corticosteroid Reliever Inhalers [Preview](#)

+ Order

Pharmacy Consult for Asthma

Acknowledge Reason

Unable to address today

Does not have uncontrolled asthma

Already on corticosteroid reliever

Corticosteroid reliever inappropriate

I don't manage this patient's asthma

Patient Declined

 Patient **DOES** use nebulized albuterol

Patient Activated Reliever Triggered ICS (PARTICS):
 1 puff of ICS for every puff of albuterol, or 5 puffs of ICS for every albuterol nebulizer treatment

- + Continue to use current maintenance inhalers
- + Better insurance coverage than budesonide-formoterol
- + Can be used with nebulizer
- Multiple inhalers, more co-pays

 **When using PARTICS, your patient may be on:**
 any dose of an *additional* steroid containing maintenance inhaler in addition to the albuterol-ICS reliever
 ([ICS dosing](#), [ICS-LABA dosing](#))

☐ pharmacy consult for treatment optimization

☐ albuterol HFA - select if not already on albuterol
 Normal, Disp-1 Each, R-1

☐ albuterol (PROVENTIL) (2.5mg/3ml) 0.083% nebulizer solution q4h PRN - 12ml w/ 1R
 2.5 mg, Disp-12 mL, R-1

  **Reliever steroid inhaler - choose one**

☐ (reliever only) beclomethasone (QVAR) redihaler 80 mcg/act PRN
 Normal, Disp-1 Each, R-1

☐ (reliever only) budesonide (PULMICORT) flexhaler 180 mcg/act PRN
 Normal, Disp-1 Each, R-1

☐ (reliever only) mometasone (ASMANEX) twisthaler 110 mcg/act PRN
 Normal, Disp-1 Each, R-1, PARTICS inhaler. Attach to your rescue inhaler with a rubber band. Inhale 1 puff for each puff of rescue inhaler every 4 hours as needed. Inhale 5 puffs with each rescue nebulizer use. Put a canister next to your nebulizer. Continue to use your regular daily maintenance inhalers. Max 12 puffs in 1 day.

 note attestation - include for prior authorization

 AVS patient instructions - how to use PARTICS

 AVS patient instructions - frequently asked questions

Patient Education Materials

After visit summary materials to help patients understand the intervention

PARTICS Asthma Inhalers Frequently Asked Questions

What is PARTICS? -- Adding an extra inhaler that you were just prescribed to use every time you use your quick relief medication like Albuterol.

Why use PARTICS? -- Using this combination can

- Reduce severe asthma attacks, emergency room visits, and being hospitalized for asthma.
- Improve your ability to do regular activities, like work, school and taking care of family.

How do I do PARTICS? -- Each time you use your reliever medication, you also use the additional PARTICS inhaler.

- If you use a reliever inhaler, like Albuterol, take a puff of your reliever inhaler then take a puff of the additional PARTICS inhaled corticosteroid, puff for puff.
- If you also use a nebulizer: Take 5 puffs of the PARTICS inhaler after you finish your nebulizer treatment.

How do I make PARTICS easy to do? -- To remember to use 2 inhalers, you can put a rubber band around the additional PARTICS inhaler and your rescue inhaler to keep them together and carry with you. See the picture below.

Attach your additional PARTICS inhaler you were prescribed today to your rescue inhaler with a rubber band to carry with you.



When you need to use your rescue inhaler to relieve asthma symptoms:

#1

Turn the inhalers around to make them easy to puff.



#2

Put the rescue inhaler to your mouth, take as many puffs as you feel you need.



#3

Then place the additional PARTICS inhaler in your mouth and take the same number of puffs as you took of the rescue inhaler.



If you have a nebulizer:

Place an additional PARTICS inhaler next to or on top of your nebulizer.



Provider Intervention Outside of Visits

A refill protocol for asthma medication that prompts the provider to act

Requested Renewals

Rx albuterol (PROVENTIL HFA) INHALATION HFA inhaler
(VENTOLIN,PROAIR,PROVENTIL) 90mcg

Sig: Inhale 2 Puffs by mouth every 4 hours as needed for Wheezing.

Disp: 8.5 g Refills: 0

Start: 3/31/2024

Class: Normal

[Relevant Medication Info](#)

Non-formulary

To pharmacy: Dispense whatever albuterol is covered by insurance

Rx Appt Reminder Protocol Failed

03/31/2024 07:58 AM 

✗ Visit/Appointment Check (see details)

[Protocol Details](#)

✗ Active on medication list

Asthma Control Refill Protocol Failed

✗ Has had no asthma exacerbation since last outpatient visit for asthma

[Protocol Details](#)

To be filled at: MetroHealth Cleveland Heights Retail Pharmacy

Asthma Control Refill Protocol Failed

✗ Has had no asthma exacerbation since last outpatient visit for asthma

This refill protocol checks for:

- a qualifying **office visit** or **telemedicine visit** with a diagnosis of asthma, after
- a qualifying **asthma exacerbation** in the past 15 months

It fails if the patient has had an **asthma exacerbation** since their last visit for asthma.

Asthma exacerbations are:

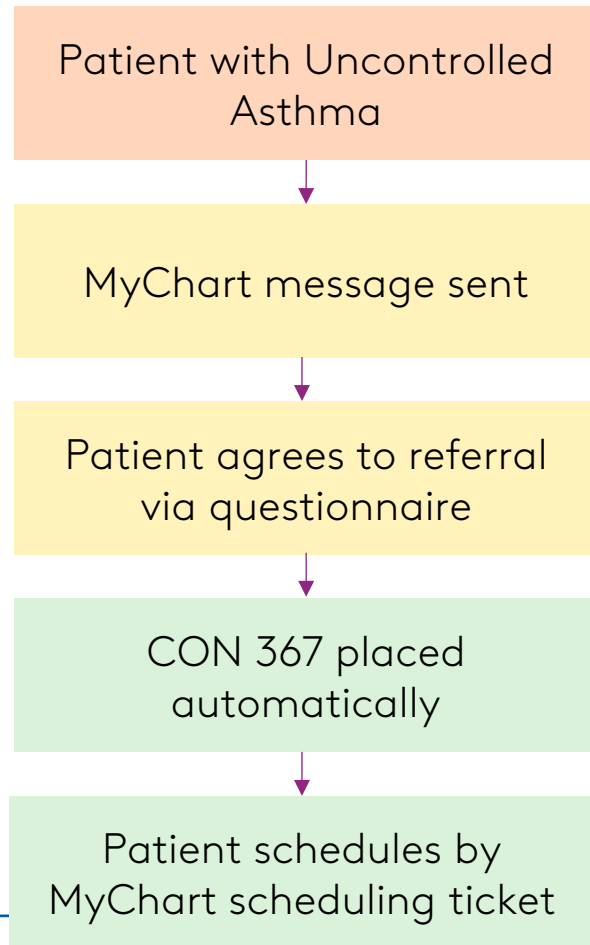
- an ED/Hospital admission for asthma exacerbation, or
- a prescription for oral steroids with an associated diagnosis of asthma

Asthma Events in past 15 months

Event	Last Date
Outpatient Visit with Asthma Diagnosis:	none
ED/Inpatient Visit for Exacerbation:	2/28/2024
Prescription Oral Steroids for Asthma:	none

Clinical Pharmacy Partnership

Patient self-referral based on objective evidence of uncontrolled asthma



MyChart Message

1 New message

Eric Kim
5:57 AM

Hello [redacted]

Patients with asthma like you can experience many symptoms like difficulty breathing, wheezing, and shortness of breath. It appears that you have had worse asthma symptoms recently. We would like to help!

The Pharmacy Medication Management Clinic is partnering with your doctor to help asthma patients like you get on the best medications to feel better and do more. Based on your current medicines, we think they could help you.

To see the clinic, please click on the attached questionnaire and complete it. It will give you instructions on how to schedule a visit!

Your MetroHealth Care Team

1 task to complete

☒ Would you like to see the pharmacy clinic for asthma?

Patient Self-Triage

A patient-entered questionnaire in MyChart that triggers a referral.

Would you like to see the pharmacy clinic for asthma?

Attached to a message from **Eric Kim** received **10/16/2025**

According to our records, it appears that you have had worse asthma symptoms recently.

Your MetroHealth care team is working with your doctor to help patients who have asthma feel better and do more!

Asthma symptoms like shortness of breath or wheezing can change over time. An asthma attack is when your symptoms suddenly get worse. To prevent asthma attacks, you have to be on the right inhalers.

During the past year, were there any times that your asthma symptoms bothered you a lot?

Yes

No

Continue

Patient Self-Triage

A patient-entered questionnaire in MyChart that triggers a referral.

Would you like to see the pharmacy clinic for asthma?

Attached to a message from **Eric Kim** received 10/16/2025

According to our records, it appears that you have had worse asthma symptoms recently.

Your MetroHealth care team is concerned about your asthma symptoms. Asthma symptoms like wheezing, coughing, and chest tightness can lead to asthma attacks, you have to be careful.

During the past year, how often have you had an asthma attack?

Would you like to see the pharmacy clinic for asthma?

Attached to a message from **Eric Kim** received 10/16/2025

The **Pharmacy Medication Clinic** at MetroHealth can help:

- find the best inhalers for you
- find you the best prices for them
- teach you how to use them best.

Would you like to see one of your doctor's pharmacy team members to adjust your asthma medications and prevent another asthma attack?

Patient Self-Triage

A patient-entered questionnaire in MyChart that triggers a referral.

Would you like to see the pharmacy clinic for asthma?

Attached to a message from **Eric Kim** received 10/16/2025

According to our records, it appears that you have had worse asthma symptoms recently.

Your MetroHealth care team is concerned about your asthma symptoms. Asthma symptoms like wheezing, coughing, and chest tightness can make it difficult to breathe. If you have had asthma attacks, you have to be careful about what you eat and drink.

During the past year, have you had any of the following symptoms?

Would you like to see the pharmacy clinic for asthma?

Attached to a message from **Eric Kim** received 10/16/2025

The **Pharmacy Medication Clinic** at MetroHealth can help:

- find the best inhalers for you
- find you the best prices for them
- teach you how to use them best

Would you like to see the pharmacy clinic for asthma?

Attached to a message from **Eric Kim** received 10/16/2025

A referral has been placed for you to see the Pharmacy Medication Clinic. You can call 440-592-3890 or schedule in MyChart. Please click "continue" and then "submit" to submit your questionnaire. Then navigate to your MyChart home page. In your feed, you should see a card for the Pharmacy Medication Clinic. Click "schedule now". This will bring you to scheduling options.

Patient Self-Scheduling

Patients who have completed the questionnaire can self-schedule in MyChart

 Schedule an appointment for your PHARMACY MEDICATION CLINIC.

[Schedule now](#)

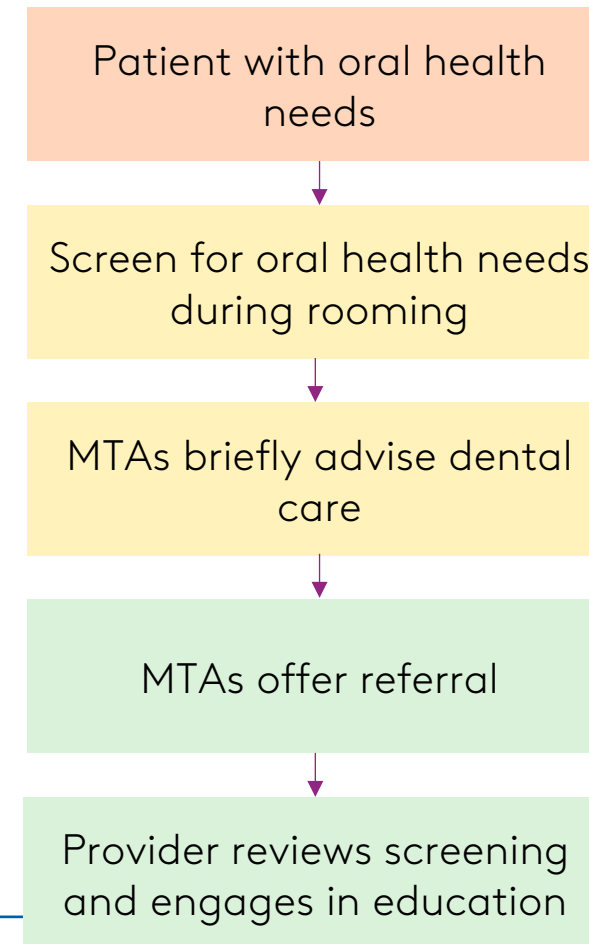
[Decline](#)

Oral Health Intervention in Primary Care

Dental Health Is Primary Care

A team-based approach to encouraging dental care in older adults

- PIs: Suchitra Nelson CWRU, David Kaelber MH/CWRU
- Previous successful study among pediatric patients
- Encourage dental care among the elderly by integrating with primary care
- Ask, Advise, Assess, Assist, Arrange
- 9 MH practices engaged
- 40 MH providers trained
- ~30 provider patient interventions per month



Primary Care Screening for Oral Health

Involving medical staff in the system of care

The screenshot displays a medical software interface. On the left, a patient profile for "Ann Test 'Annie'" is visible, including her age (35), gender (Female), and MRN (6013037). A red box highlights a notification: "Staff: Dental Scr (research)". The main area shows a "Primary Care Dental Screening" form. A red rectangle outlines the entire form area. The form has a yellow header with the instruction: "Please click to complete dental care screening questions." Below this, there are tabs for "Document" and "Do Not Document". The form contains several questions with "yes/no" buttons and a "Next Steps" section at the bottom. A red arrow points from the "Staff: Dental Scr (research)" notification to the "Document" tab.

Ann Test "Annie"
Female, 35 year old, 5/3/1988
MRN: 6013037
Bed: 18
Code: Not on file (no Adv Dir)

COVID-19 Vaccine: Unknown
Isolation: None

Staff: Dental Scr (research)

Primary Care Dental Screening

Please click to complete dental care screening questions.

Document Do Not Document Primary Care Dental Screening Collapse

Responsible Show Row Info Show Last Filed Value Show All Choices

Ask the following questions

Was your last dental visit longer than 12 months ago?
1=yes 0=no

Do you commonly experience dry mouth (i.e. requiring swallowing water to eat crackers)?
1=yes 0=no

Do you experience tooth pain when you eat or brush your teeth?
1=yes 0=no

Do you experience bleeding gums when you eat or brush your teeth?
1=yes 0=no

Do you have loose teeth and/or discolored teeth?
1=yes 0=no

abnormal answers?
3

Next Steps

Tell the patient "Please see the dentist soon" and click yes when done
yes no

Ask the patient, "Do you want a call to schedule an appointment with a MetroHealth dentist?"
yes no

Accept Cancel

Supporting Provider Intervention

CME/MOC certified provider education with a clinical script



Goals for Provider Training

- Understand Oral Health Problems in Older Adults
- Understand Barriers to Care for Older Adults
- Learn Strategies to Improve Oral Health in Older Adults Including:
 - ✓ Oral Hygiene
 - ✓ Importance of Fluoride
 - ✓ Nutrition for Oral Health

AT

Ann Test "Annie"
Female, 35 year old, 5/3/1988
MRN: 6013037
Bed: 18
Code: Not on file (no Adv Dir)

COVID-19 Vaccine: Unknown
Isolation: None

Care Gap: Dental (click here)

PCP: Test, Provider2, MD
Research Participant

Coverage: Medical Mutual -...

Allergies: Not on File

Active Treatment/Therapy Plans

Pregnant: (48wtd, 12/27/23)

Agmnts: None

2/22 HOME VISIT

102 kg
(224 lb 13.9 oz)

SINCE LAST SYSTEM SUPPORT VISIT

Sys Support (8)

Lab (25)

CARE GAPS

- Hepatitis A Antibody
- Hepatitis B Surface Antig...
- Hepatitis B Surface Antib...
- Toxoplasma IgG
- Syphilis Test
- HIV Counseling
- Dental Visit/Referral
- Lipid Profile

BestPractice Advisory - Test, Annie

Suggestion (1)

Positive dental screening! Please counsel your patient by giving the dental facts and to see the dentist soon.

Oral Health Screening: Positive!

1. Review screening questions

Question	Answer
Was your last dental visit longer than 12 months ago?	(!) yes
Do you commonly experience dry mouth (i.e. requiring swallowing water to eat crackers)?	(!) yes
Do you experience tooth pain when you eat or brush your teeth?	no
Do you experience bleeding gums when you eat or brush your teeth?	no
Do you have loose teeth and/or discolored teeth?	(!) yes

2. Discuss the following oral health facts

- Dental problems are chronic and can be present even without pain or symptoms.
- Bacteria are the main cause made worse by poor oral hygiene, poor diet, and tobacco use.
- Annual dental visits can help oral health problems from getting worse, prevent pain, stress, and costly expenses.
- A healthy mouth is important for your overall health. Dental and medical conditions are related to each other.
- Prioritize taking care of your oral health like any other medical condition.

3. Counsel your patient to see the dentist soon

4. Inform your patient that referral instructions and dental resources are in the AVS

Document Do Not Document Oral Health Counseling Collapse

5. Click "Yes" and "Accept"

Document completion of steps 1-4

yes=1 no=0

Accept Cancel

Cancer Staging

Referral Management

Systems of support to organize referral, outreach, and follow up

REFS PC Dental Scr Referral Follow Ups With Tracking (Research) [48863001] as of Thu 10/16/2025 5:27 AM

Research Studies | Chart | Encounter | Place Orders | Send Recruitment Request | Release to Study Monitor | Communication | Track Pt Outreach | Add to List | Questionnaire Series | Active Referrals

Detail List | Explore | Referrals

Filter | Clear All Filters

Re-run Report | Refresh Selected | Select All

Active?	MH Referral?	Last Dental Apt	Next Dental Apt	Patient	MRN	DOB	Address	Phone	Last Date	Last Time	Last Outcome	# Attempts	Next Date	Next Time	Comments	Visit Date	Visit Time
yes	2025								/2025	10:57 AM	No answer, no VM	4			No answer, no voicemail. Would like MBH but has a lot of other appointments - his response on another date.		
yes	2025								/2025	10:57 AM	Other (see comments)	1	/2026	11:00 AM	Patient wants only Broadway, would not consider Ohio City or MBH even for first visit. She did take my number and to reach out in the future looking for openings at Broadway. I too will keep her in mind when/if Broadway opens up.		
yes	/2...								/2025	10:38 AM	No answer, left VM	3	/2025	1:00 PM	No answer, left voicemail.		
yes	/2...																

Referral Management

Systems of support to organize referral, outreach, and follow up

REFS PC Dental Scr Referral Follow Ups With Tracking (Research) [48863001] as of Thu 10/16/2025 5:27 AM

Research StudiesChartEncounterPlace OrdersSend Recruitment RequestRelease to Study MonitorCommunicationTrack Pt OutreachAdd to ListQuestionnaire SeriesActive Referrals

Detail ListExploreReferrals

Filter

Active?

yes

yes

yes

yes

Outreach Tracking

Instance Name: Visit Name

Dental Referral Outreach Outcomes

Contact Attempt Date

Contact Attempt Time

Contact Attempt #

Contact Outcome

Next Outreach Date

Next Outreach Time

No Further Outreach as of This Date

Comments

Insert SmartText

100%

Re-run ReportRefresh SelectedSelect All

Date	Last Time	Last Outcome	# Attempts	Next Date	Next Time	Comments	Visit Date	Visit Time
10/16/2025	10:57 AM	No answer, no VM	4			No answer, no voicemail. Would like MBH but has a lot of other appointments - his response on another date.		
10/16/2025	10:57 AM	Other (see comments)	1	10/26/2026	11:00 AM	Patient wants only Broadway, would not consider Ohio City or MBH even for first visit. She did take my number and to reach out in the future looking for openings at Broadway. I too will keep her in mind when/if Broadway opens up.		
10/16/2025	10:38 AM	No answer, left VM	3	10/25/2025	1:00 PM	No answer, left voicemail.		

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MetroHealth

PHRI CCIRE Speed Rounds

Nicholas Riley, MD, PhD, FAMIA



Assistant Professor, Family Medicine

Center for Clinical Informatics Research and Education

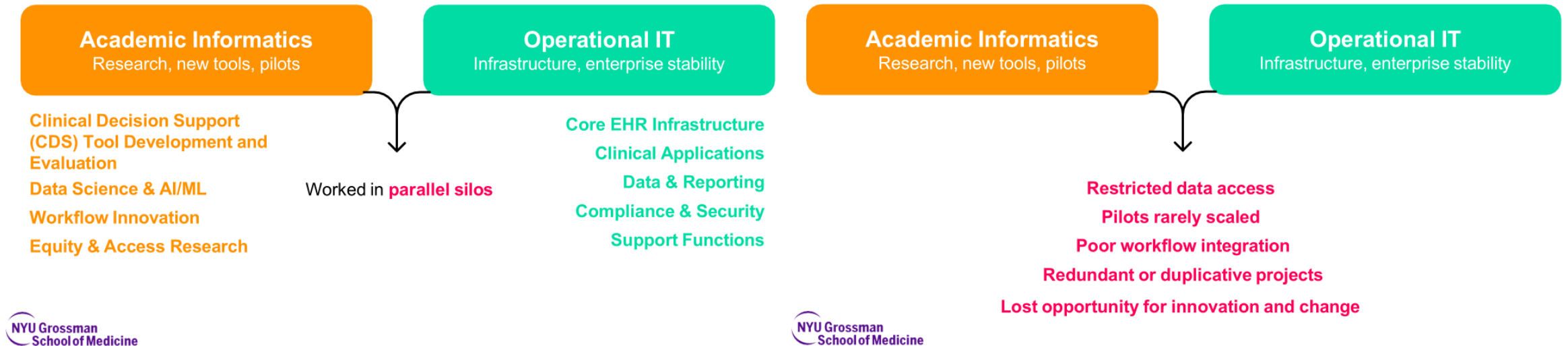
Director of Informatics, Ambulatory Care,

The MetroHealth System

From last week's PHRI seminar...

The Divide

Consequences



What I do best

Build bridges to solve complex health care problems
in ways that **work** for patients, families and clinicians



ABC Quit

ABC Quit

Leveraging technological innovation to reduce pediatric secondhand smoke exposure

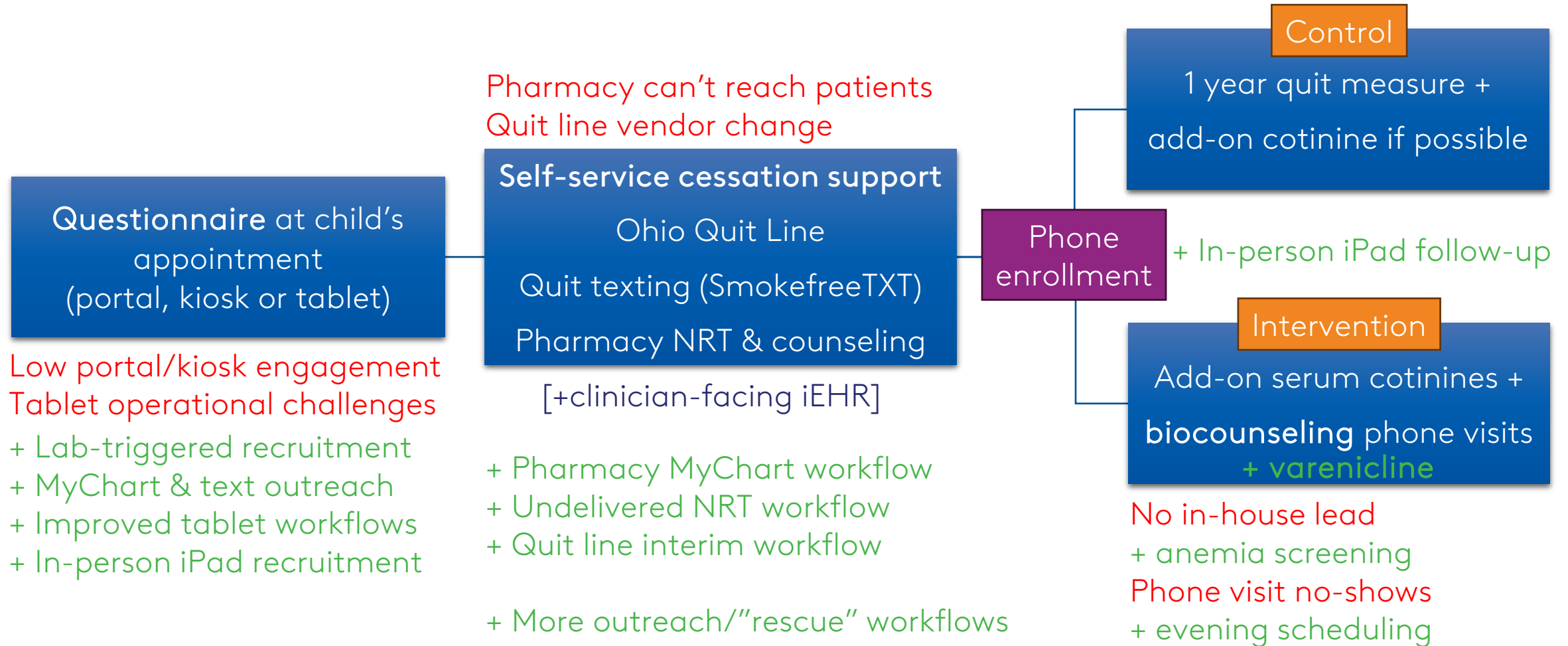
PI: Jonathan Winickoff, MD, MPH, pediatric tobacco use researcher at MGH

Investigators at Metro

- David Kaelber
- Janeen Leon
- Nicholas Riley

Population: 868 dyads of parents and children under 12 receiving care at Metro

ABC Quit



ABC Quit

Build using Epic modules (live starting 12/12/2022)

- EpicCare Ambulatory
 - Clinical workspace configuration
 - Clinical documentation
 - In Basket
 - Orders & Order Transmittal
- OurPractice Advisories (clinical decision support)
- MyChart/Welcome questionnaires (patient portal/kiosk/tablet)
- Cogito (reporting)
 - Clarity (data warehouse)
 - Radar (dashboards)
 - Reporting Workbench (patient outreach/operational reporting)
 - SlicerDicer (self-service reporting)
- Canto (tablet-based in-person recruitment workflow)
- Interconnect (web services, SMART on FHIR app development)
- Research
- Secure Chat (coordination during in-person recruitment)
- Chronicles (custom code running in Epic)



ABC Quit

Started from a working system (eCEASE) at the Children's Hospital of Philadelphia

Required both technical (e.g. SMART on FHIR) and operational adaptations to MetroHealth Informatics fellows collaborated — Drs. Kim at Case/Metro and Saleh at CHOP

Choose2Quit



Choose2Quit

Adult primary care rooming staff-initiated eReferral versus navigation for tobacco cessation

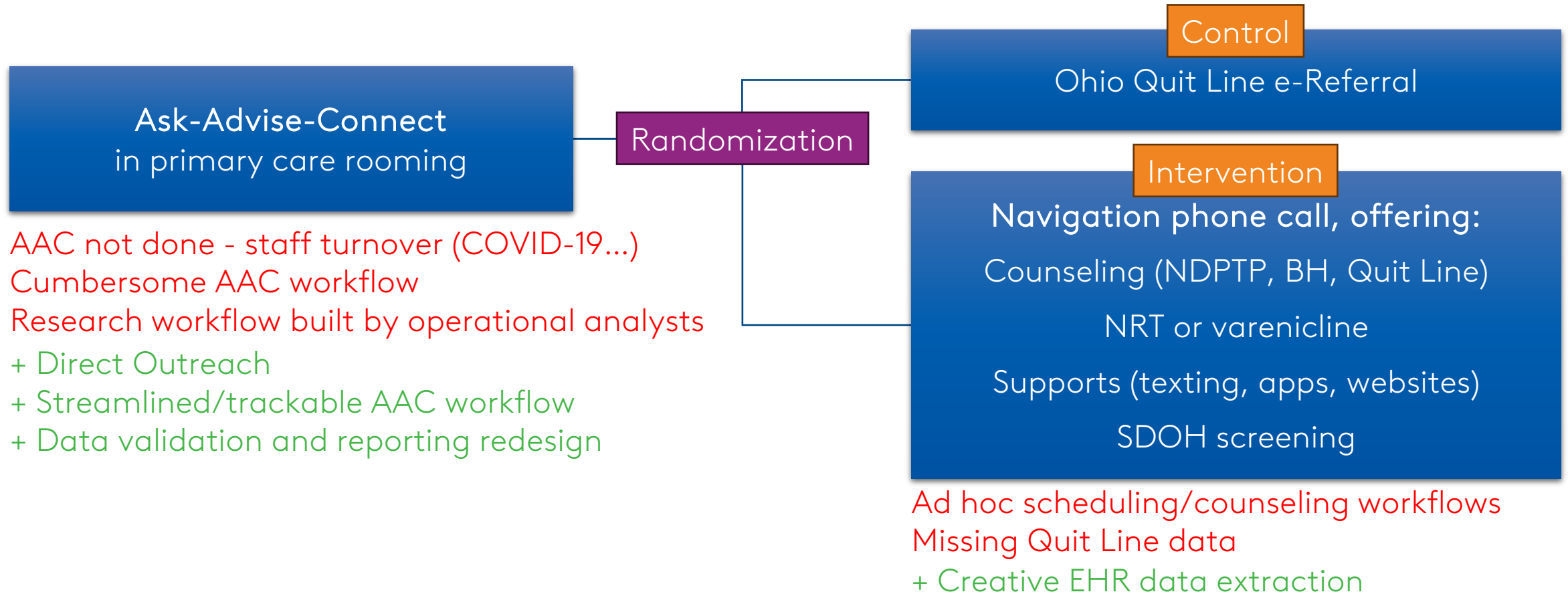
PI: Susan Flocke, PhD, preventive services researcher at Oregon Health and Science University

Investigators at Metro

- David Kaelber
- Nicholas Riley
- Eileen Seeholzer

Population: 2231 adult primary care patients during/after in-person visits at 11 Metro clinics

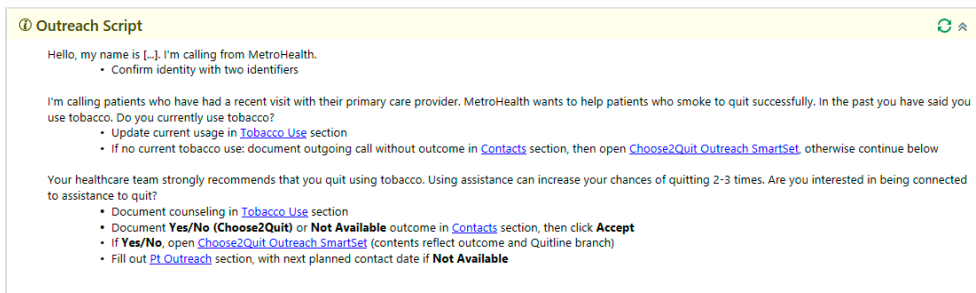
Choose2Quit



Choose2Quit

Direct Outreach (live 8–11/2023)

"Rescue" workflow for missed/unavailable AAC
91% contact rate
Informing current study (TEAM-UP)



① Outreach Script

Hello, my name is [...]. I'm calling from MetroHealth.

- Confirm identity with two identifiers

I'm calling patients who have had a recent visit with their primary care provider. MetroHealth wants to help patients who smoke to quit successfully. In the past you have said you use tobacco. Do you currently use tobacco?

- Update current usage in [Tobacco Use](#) section
- If no current tobacco use: document outgoing call without outcome in [Contacts](#) section, then open [Choose2Quit Outreach SmartSet](#), otherwise continue below

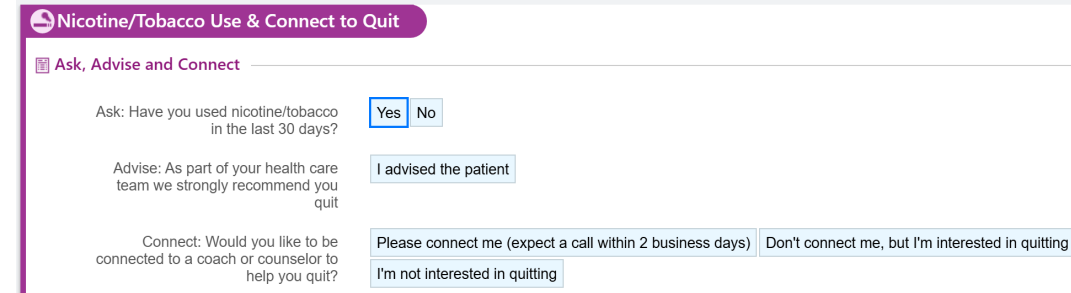
Your healthcare team strongly recommends that you quit using tobacco. Using assistance can increase your chances of quitting 2-3 times. Are you interested in being connected to assistance to quit?

- Document counseling in [Tobacco Use](#) section
- Document **Yes/No (Choose2Quit)** or **Not Available** outcome in [Contacts](#) section, then click **Accept**
- If **Yes/No**, open [Choose2Quit Outreach SmartSet](#) (contents reflect outcome and Quitline branch)
- Fill out [Pt Outreach](#) section, with next planned contact date if **Not Available**

- SmartSets
- MyChart patient messaging
- Cogito (reporting)
 - Clarity (data warehouse)
 - Datalink (batch processing)
 - Reporting Workbench (patient outreach)
- Chronicles (custom code running in Epic)

Streamlined AAC/vaping history (live 5/18/2024)

Reduced friction and double documentation
Operational reporting facilitated increase in AAC completion
Vaping history characterization informed ENDS R21



Nicotine/Tobacco Use & Connect to Quit

Ask, Advise and Connect

Ask: Have you used nicotine/tobacco in the last 30 days?

Advise: As part of your health care team we strongly recommend you quit

Connect: Would you like to be connected to a coach or counselor to help you quit?

- OurPractice Advisories
 - Custom actions placing quit line and navigation orders
 - Custom actions manipulating history data
- Cogito (reporting)
 - Reporting Workbench (including custom action for vaping history migration)
- Chronicles (custom code running in Epic)

PHRI CCIRE Speed Rounds

Proposals in Progress

Opportunities for feedback and partnership



Ashley Hughes, PhD

Associate Professor, Internal Medicine

Center for Clinical Informatics Research and Education

Lung cancer screening

- Target: Bristol Myers Squibb Foundation
- Co-lead with CWRU
- Stakeholders: FQHCs, MetroHealth*, CCF, University Hospitals
- **Overall objective**: Improve lung cancer screenings for patients served at FQHCs



Lung cancer screening

- **Obj. 1: Develop a community-informed referral process for lung cancer screening and smoking cessation**
 - Establish an EMR-integrated shared decision-making tool.
 - CoDevelop referral pathway(s) for lung cancer screening and smoking cessation.
- **Obj. 2: Implement strategies for lung cancer screening and smoking cessation referral pathways through training and education.**
- **Obj. 3: Evaluate the agile implementation of the multi-touch referral system for smoking cessation/lung cancer screening bundle.**

Breast cancer screening

■ Background

- Breast cancer is among the leading causes of cancer-related deaths.
- Breast cancer screening can detect up to 85% of breast cancers and reduce mortality from breast cancer by up to 40%.
- Disparities are present in both mortality rates due to breast cancer and screening rates.
- Epic Cheers campaigns provide a viable approach to improving outstanding health services, like cancer screenings.

- **Overall objective:** Improve guideline concordant breast cancer screenings in MHS population.

Breast cancer screening

- **Aim 1:** Identify patient factors for APO success in breast cancer screening campaigns.
- **Aim 2:** Understand unmet needs of non-responders to breast cancer screening APO messaging.
- **Aim 3:** Tailor breast cancer screening outreach to improve guideline concordant breast cancer screening for underserved patient populations.
- Target: American Cancer Society
- Stakeholders: MetroHealth- Cancer Center, primary care, population health, radiology

PHRI CCIRE Speed Rounds

David Kaelber, MD, PhD, MPH, FAAP, FACP, FACMI, FAMIA

Professor of Internal Medicine, Pediatrics, and Population and Quantitative Health Sciences

Center for Clinical Informatics Research and Education

Chief Health Informatics Office and Vice-President of Health Informatics and Patient Engagement Technologies

The MetroHealth System



Machine Learning Interpretability Methods – Low value in isolated \$\$\$ biomarkers



Computers in Biology and Medicine

Volume 183, December 2024, 109251

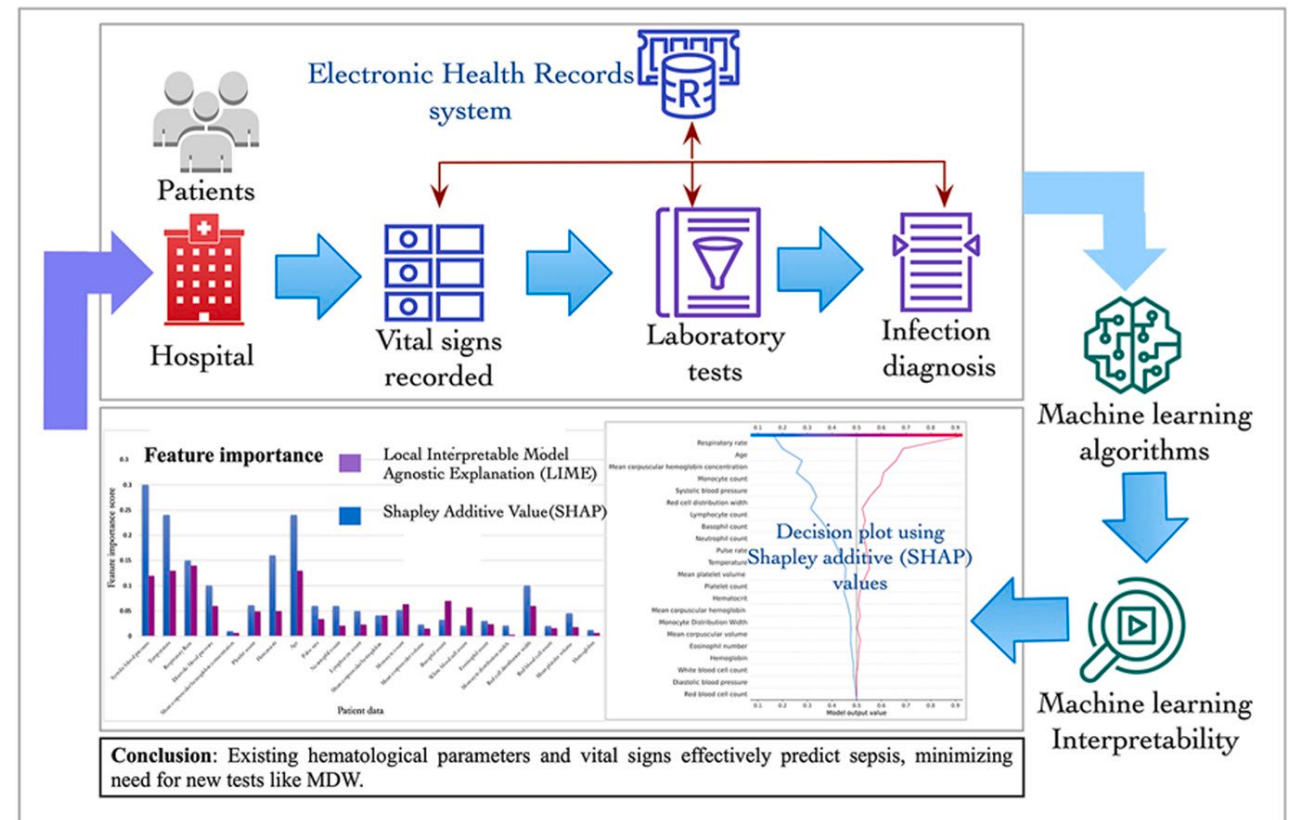


Machine learning interpretability methods to characterize the importance of hematologic biomarkers in prognosticating patients with suspected infection

Dipak P. Upadhyaya^a, Yasir Tarabichi^{a, b}, Katrina Prantzas^a, Salman Ayub^b, David C. Kaelber^a, Satya S. Sahoo^a  

[Show more](#) 

- Big data collaboration with CWRU PhD and PhD candidate.
- Demonstrating novel ML frameworks with a focus on interpretability methods



Prevail – Multicenter COPD phenotyping and prospective QI study

Primary Health Care
Research & Development

cambridge.org/phc

Development

Cite this article: Evans A, VanWyk J, Kerr M, Couper A, Pace WD, Tarabichi Y, Pullen R, Pollack M, Drummond MB, Ohar J, Meldrum C, Han Meilan K, Kaplan A, Winders T, Wisnivesky J, Make B, Federman A, Carter V, Lang K, Mapel D, Hanania NA, Stolz D, Martinez FJ, Price D. (2025) Practical strategies for achieving system change in the US: lessons

Practical strategies for achieving system change in the US: lessons and insights from the CONQUEST quality improvement programme

Alexander Evans¹, Jill VanWyk², Margee Kerr^{1,3}, Amy Couper^{1,3}, Wilson D. Pace^{4,5}, Yasir Tarabichi⁶, Rachel Pullen¹, Michael Pollack⁷, M. Bradley Drummond⁸, Jill Ohar⁹, Catherine Meldrum¹⁰, Meilan K. Han¹¹, Alan Kaplan^{12,13}, Tonya Winders¹⁴, Juan Wisnivesky¹⁵, Barry Make¹⁶, Alex Federman¹⁷, Victoria Carter³, Katie Lang^{1,3}, Douglas Mapel¹⁸, Nicola A. Hanania¹⁹, Daiana Stolz²⁰, Fernando J. Martinez²¹ and David Price^{1,3,22}

¹Observational and Pragmatic Research Institute Pte Ltd, Singapore, Singapore; ²Department of Family Medicine,

Pragmatic and Observational Research

Dovepress

Open Access Full Text Article

ORIGINAL RESEARCH

Preserved Ratio Impaired Spirometry in US Primary Care Patients Diagnosed with Chronic Obstructive Pulmonary Disease

Alexander Evans¹, Yasir Tarabichi², Wilson D Pace^{3,4}, Barry Make⁵, Nicholas Bushell⁶, Victoria Carter⁷, Ku-Lang Chang⁸, Chester Fox⁹, Meilan K Han¹⁰, Alan Kaplan^{11,12}, Janwillem WH Kocks^{13–15}, Chantal Le Lievre⁶, Alexander Roussos⁶, Neil Skolnik^{10,16}, Joan B Soriano¹⁷, Barbara P Yawn¹⁰, David Price^{1,6,7,18}

¹Observational and Pragmatic Research Institute, Singapore, Singapore; ²Center for Clinical Informatics Research and Education, MetroHealth, Cleveland, OH, USA; ³DARTNet Institute, Aurora, CO, USA; ⁴Department of Family Medicine, Anschutz Medical Campus University of Colorado,

- Early results demonstrating care opportunities primarily in diagnostic spirometry and med optimization in our own population

Chronic Obstructive Pulmonary Diseases:

Journal of the COPD Foundation®



Original Research

Pragmatic Evaluation of an Improvement Program for People Living With Modifiable High-Risk COPD Versus Usual Care: Protocol for the Cluster Randomized PREVAIL Trial

Katherine Hickman, MBBS^{1,2,3} Yasir Tarabichi, MD, MSc⁴ Andrew P. Dickens, MSc, PhD⁵ Rachel Pullen, MBChB⁵ Margee Kerr, PhD^{5,6} Amy Couper, BSc^{5,6} Alexander Evans, MSc⁶ James Gatenby, MD⁶ Luis Alves, MD^{7,8} Cono Ariti, MSc⁵ Mona Bafadhel, MBChB, MRCP, PhD⁹ Victoria Carter, BSc⁶ James Chalmers, MBChB, PhD¹⁰ Rongchang Chen, MD¹¹ Graham Devereux, MBChB, PhD, FRCP¹² M. Bradley Drummond, MD, MHS¹³ J. Martin Gibson, MD, FRCP^{14,15,16} David M. G. Halpin, MD, DPhil¹⁷ Meilan K. Han, MD, MS¹⁸ Nicola A. Hanania, MD, MS¹⁹ John R. Hurst, PhD²⁰ Alan Kaplan, MD^{5,21,22} Konstantinos Kostikas, MD, PhD, FERS^{5,23} Barry Make, MD²⁴ Douglas Mapel, MD, MPH²⁵ Jonathan Marshall, BSc, PhD²⁶ Fernando Martinez, MD, MS²⁷ Catherine Meldrum, PhD, RN²⁸ Marije van Melle, PhD^{5,29} Marc Miravilles, MD³⁰ Tamsin Morris, BSc³¹ Hana Mullerova, PhD²⁶ Ruth Murray, PhD⁶ Shigeo Muro, MD, PhD³² Clementine Nordon, MD, PhD²⁶ Jill Ohar, MD³³ Wilson Pace, MD, FAAP^{34,35} Michael Pollack, MSc³⁶ Jennifer K. Quint, FRCP³⁷ Arita Sharma, FRACGP, MBBS³⁸ Dave Singh, MD³⁹ Mukesh Singh, MBBS^{40,41,42} Frank Trudo, MD, MBA³⁶ Dennis Williams, PharmD^{43,44} Tom Wilkinson, MA Cantab, MBBS, PhD, FRCP, FERS^{45,46,47} Tonya Winders, MBA⁴⁸ David Price, MA, MBChB, FRCP^{6,49}

Continuing to lead in responsible AI-driven CDS evaluation and implementation

American Journal of Emergency Medicine 97 (2025) 147–151



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journal homepage: www.elsevier.com/locate/ajem



External validation of a widely available, localizable sepsis early detection model in the emergency department setting

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Artificial intelligence

Clinical decision support

ABSTRACT

Study objective: Several algorithms have been developed to assist clinicians in predicting the onset of sepsis. One of the most widely used is the Epic Sepsis Model. The first release of the model (V1) was a logistic regression that suffered from variable results in external validation. The second release (V2) leverages a gradient boosted tree model that can be localized to an individual hospital system. While widely available, V2 has yet to be independently externally validated.

Methods: We conducted a retrospective study comparing the performance of both models in the emergency department setting. Model discrimination was measured via AUC-ROC for both V1 and V2 at the encounter level, before sepsis-3 criteria were met and before there was evidence of clinical recognition of sepsis (identified by antibiotic, culture, or lactate orders).

Results: 35,076 encounters were included. 648 (1.8 %) met sepsis-3 criteria. AUC-ROC scores were 0.77 for V1 and 0.90 for V2. When only considering scores before evidence of clinical recognition of sepsis, there is a drop in AUC-ROC to 0.70 for V1 and to 0.85 for V2. At a scoring threshold targeting a 60 % sensitivity, V1 and V2 predictions were earlier than the first clinical recognition of sepsis in only 33.0 and 33.5 % of cases respectively.

Conclusion: While V2 achieves superior AUC-ROC's to V1 both before and after clinical recognition of sepsis, both models tended to alert for sepsis after evidence of clinical recognition.

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MetroHealth Selects Pieces Technologies as AI Platform to Improve Clinical Workflows and Enhance Patient Care

Share Post

Cleveland, OH, April 30, 2025

The MetroHealth System ("MetroHealth") and Pieces Technologies, Inc. ("Pieces") announced a strategic partnership that will provide care teams across the enterprise with AI-powered tools to assist with clinical workflows, returning valuable time to clinicians and enhancing patient care. MetroHealth will deploy Pieces' AI platform, which seamlessly integrates into the health system's existing electronic health record (EHR), across inpatient and outpatient settings.

"Pieces' AI-powered solutions will help MetroHealth enhance patient care and improve access by reducing inefficiencies and eliminating time-consuming administrative tasks, allowing our talented caregivers to work at the top of their licenses and provide more personalized care to more patients," said R. Douglas Bruce, MD, MBA Interim Executive Vice President and Chief Operating Officer for MetroHealth.



Pieces awarded \$2m SBIR contract to improve cancer care with AI

Pieces will deploy its new conversational AI at MetroHealth, a public health system based in Cleveland, Ohio, which can interact directly with cancer patients and leverage the advanced human oversight platform

Vidya Sagar Maddela October 30, 2024

CDC Cosmos Partnership

Pauline Terebuh, MD MPH

Assistant Professor

Case Western Reserve University School of Medicine

Disclosure(s): No financial relationships to disclose

Poster(s):

(P-711) Testing for SARS-CoV-2, Respiratory Syncytial Virus and Human Metapneumovirus among patients hospitalized with acute respiratory tract infection — United States, 2022–2025

📅 Monday, October 20, 2025 ⌚ 12:15 PM - 1:30 PM US ET

CDC paid MetroHealth/CWRU folks ~\$300K for a one-year IPA (Inter-organization Partnership Agreement) for us to use Cosmos to answer questions for the CDC

Organization that would like to use Epic Cosmos (for example the CDC) can only do so by partnering with a healthcare system submitting data to Cosmos (for example MetroHealth).

MetroHealth has the potential for a HUGE “first-moved” advantage in this space!



MITRE Research Partnership (www.mitre.org)

MITRE is 65+ year old not-for-profit organization that acts in the public interest by delivering objective, cost-effective solutions to many of the world's biggest challenges.

MITRE operate FFRDCs—federally funded research and development centers—and provide technical expertise, stability, and continuity to government agency sponsors.

MITRE powers advances in national defense, aviation safety, GPS, financial systems, **healthcare**, cybersecurity, and more—advances that make your life better.

MITRE was looking for a healthcare partner with healthcare data for their research, MetroHealth is stepping up!

Current MITRE projects include:

1. LLM for patient oncology trial matching
2. Dula use and value
3. Chronic kidney disease

The MetroHealth/MITRE partnership facilitated MetroHealth standing up a PHI/HIPAA compliant Microsoft Azure LLM “playground”!!!!



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Clinical and Translational
Science Collaborative



REGISTER NOW!



EPIC COSMOS DATATHON

Join the CTSC of Northern Ohio for the second multi-institutional Epic Cosmos Datathon. Over the course of the day, teams will harness their skills, tackle challenges, and transform concepts into tangible results. The event culminates in a dynamic presentation session, where each group shares their findings and insights with everyone.

OCTOBER 18, 2025 | 8:00AM - 5:00PM

MidTown Collaboration Center
1974 E. 66th St., Cleveland, OH



case.edu/medicine/ctsc

CCIRE Research Informatics Resources



David Kaelber
CHIO



Yasir Tarabichi
*Director Clinical
Research
Informatics/
CHAO*



Janeen Leon
*Associate Director
Research
Informatics*

The MetroHealth CTSC
Research Informatics team is
housed in CCIRE.

MetroHealth Research
Informatics is the lead
informatics site in the Northern
Ohio CTSC!

Use us EARLY (@ grant writing) and use of OFTEN for ANY non-standard technology requests (i.e anything other then items such as computer/printer issues; login/password issues); And we can help escalate quickly IF we are engaged!

REDCap Update

REDCap is a HIPAA compliant database.

Hundreds of users.

Hundreds of studies.

Can be used for surveys.

Has a mobile app.

Can be used for texting patients.

 <https://redcap.metrohealth.org/redcap/index.php>

 **REDCap**[®]

Log In



MetroHealth
Devoted to Hope, Health, and Humanity
New REDCap server

Please log in with your user name and password. If you are having trouble logging in, please contact [IS Service Desk 216-957-3280](#).

Username:

Password:

TriNetX Update (>130 million patients AND “line level” data access)

Global Collaborative Network | 196,257,338 Patients

● 161 of 163 Online | Last Update: an hour ago

LATAM Collaborative Network | 20,338,906 Patients

● 28 of 28 Online | Last Update: 9 hours ago

Linked | 21,233,263 Patients

● 39 of 39 Online

MetroHealth System | 1,602,345 Patients

● 1 of 1 Online | Last Update: 15 days ago

Research | 158,847,643 Patients

● 110 of 112 Online | Last Update: an hour ago

Research USA Minimal Date Shift | 111,393,071 Patients

● 58 of 59 Online | Last Update: an hour ago

Research USA No Date Shift | 96,931,945 Patients

● 52 of 53 Online | Last Update: 6 hours ago

US Collaborative Network | 131,663,968 Patients

● 70 of 72 Online | Last Update: an hour ago

- ✓ Analyze Outcomes
- ✓ Compare Outcomes
- ✓ Propensity Score Matching
- ✓ Explore Outcomes
- ✓ Compare Cohorts
- ✓ Treatment Pathways
- ✓ Time on Treatment
- ✓ Burden of Illness
- ✓ Patient Clustering
- ✓ Incidence and Prevalence
- ✓ Competing Risks
- ✓ Advanced Explore Cohort
- ✓ Cox Proportional Hazards Model

Increased data, new
analytic tools, “line
level” data requests,
amazing research
opportunities

Email me for your account
TODAY! (MetroHealth is #1 user
in the WORLD!)

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SCHOOL OF MEDICINE
CASE WESTERN RESERVE
UNIVERSITY



MetroHealth

Cosmos Update (>300 million patients and SDoH data now too!)

Cosmos Statistics

 **73** Billion Lab Results  **16** Billion Procedures  **12** Billion Medications  **3** Billion Immunizations

Population Growth



Select a Data Model			
Hospital-Acquired SSIs	Hospital-Acquired UTIs	Hospital-Acquired VAEs	Hyperlipidemia Trials
86,074	18,189	30,988	29,532,355
Hypertension Trials	NHSN Procedures	Organ Transplant Episodes	Patient-Entered Questionnaire Responses
89,348,447	2,503,991	30,324	1,258,394,366
Patients	Patients with Birthing Parent Information	Pregnancies	Research Study Patient Associations
300,232,949	11,240,484	6,590,293	5,425,972
Type 2 Diabetes Trials	Variant Results		
40,102,585	5,082,459		

**22 different data models (including 11+ million patients with birthing parent information)
Epic SDoH wheel and Social Vulnerability Index now included!**

“Line level” data “sandbox” available too!

LLM “sandbox with data available for early adopters in 2/2016!!!!!!”

(MetroHealth is the larger publisher using Cosmos except for Epic – 8 of 133 publications)

Wrap-up/Questions/Discussion



The MetroHealth System/CCIRE has:

1. Epic EHR with more breadth, depth, and longevity of data (especially among a diverse population) than almost any other healthcare system.
2. Epic EHR with implemented functionality and usability that places it in the top 1% of all healthcare systems in the world.
3. “Dream team” of clinical informaticists **(and PhD Informaticist)**.
4. Unique deidentified population health tools (Epic Cosmos, Epic’s Slicer-Dicer, and TriNetX) and imbedded geo-coding and SDoH metrics.
5. Nationally recognized informatics expertise in informatics data sciences (big data) and informatics implementation sciences.

**Let us work even closer together to
GROW RESEARCH and MAKE AMAZING RESEARCH
DISCOVERIES!**