

# Certificate Training Program Session 1

## Welcome!: Before We Start

Sign-in at the back

Pick up agenda

Sit with your CTP team at your assigned table



# Today's Objectives

1. Set collective ground rules and learning objectives for the course
2. Explore an overview of the program's purpose, structure, and expectations
3. Deepen community by learning more about your team members and cohort
4. See an example of the QI work and leadership journey undertaken by a prior team of participants
5. Understand the core skills imbued by great leaders

# 97,999 and Florence: The Case for Transformation

Jeff Glasheen, MD



Institute for Healthcare Quality,  
Safety and Efficiency

SCHOOL OF MEDICINE

UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

# Meet Tina

- 47 yo woman
- Cough for 1 mo; improves spontaneously
- 10 days later develops fatigue & SOB with lower extremity swelling
- Post-viral cardiomyopathy
- Deteriorates, requires heart transplant
- A month after transplant d/c home

# After Discharge

- Day 1      Doing well
- Day 2      Continues to do well
- Day 3      Mild dyspnea on exertion
- Day 4      More short of breath
- Day 5      Worsened symptoms, 8 # wt gain
- Day 6      Biopsy, grade 2 rejection

# Medications on day of discharge

- Ranitidine 150 mg p.o. bid
- Furosemide 20 mg IV bid
- Ganciclovir 1000 mg p.o bid
- Ferrous sulfate 300 mg p.o bid
- Amlodipine 5 mg p.o. qam
- Mycophenolate 1000 mg po bid
- Pravastatin 20 mg po phs
- TMP-SMX 800 1 MWF
- Magnesium 500 mg po daily
- Docusate 100 mg po qam
- Calcium carbonate 500 mg po bid
- Aspirin 325 mg po qam
- Metoprolol 50 mg po bid
- Nystatin 500000 Units qid
- Prednisone 20 mg p.o qday
- Insulin lantus 10 Units sq qhs
- Insulin lispro 5 Units sq tid
- Insulin lispro SSI
- Milk of magnesium 2 tsp po bid
- Albuterol 2 puffs q4hrs prn
- Combivent 2 puffs q4hrs



# Medications on discharge paperwork

- Ranitidine 150 mg p.o. bid
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# Outcome

- Tina was started on appropriate medication
- Continued to deteriorate, admitted back to ICU
- Stabilized & went home 3 weeks later
- Lost her job
- No health insurance
- Hospital bill ~\$1,000,000
- Husband & child declared bankruptcy

# Introductions, Objectives & Ground Rules

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# Your Objectives for the Course



- By the end of the program, I hope to . . .
- Report out

# Objectives for the Course

- Success in project
- Get people to behave the way you want them to behave
- Learn strategies to engage others
- Learn new tools and leadership skills (say “no” and prioritize)
- Create something that improves efficiency and access for patients
- How do we sustain success?
- How do we disseminate our success?
- Build strong team
- Learn more about finance, including behind the scenes and billing processes, how does the money flow?
- Learn a framework for dealing with project work
- Learn a framework for dealing with people
- How does this campus work together?

# Objectives for the Course

- Create a repeatable process to approach problems consistently
- How do we message what we need
- How can we be more efficient to expand our footprint
- How do we get resources to do the things we want
- Leading change
- Overcoming resistance
- Working through complexity
- Sustainability
- How can two groups of people change together
- Spread
- How do we work together in a concerted effort that is sustainable
- Address burnout

# Objectives for the Course

- Be more strategic, especially when things get really technical
- How do you prove the value of the work you are doing

# Ground Rules

To make this the most productive environment for collaboration and growth, we should . . .

- Active listening
- Attend 80% of classes
- Do the assignments and show up prepared
- Psychological safety – be willing to share, even if uncomfortable
- We can share themes but not anything identifiable outside this room
- Open to respectful disagreement
- Share
- Interact, speak up
- Stay off electronics when in the room, step out if you need to
- Have fun
- Begin and end on time
- Have snacks
- Be open and tell us what you need



A top-down photograph of two white ceramic coffee cups on a light-colored wooden tray. The cup on the left contains a latte with a thick layer of white foam. The cup on the right contains a dark espresso. A hand is visible on the left holding the handle of the latte cup, and another hand is on the right holding the handle of the espresso cup. A black and white checkered cloth is partially visible in the upper left corner. A semi-transparent white rectangular box is centered over the cups, containing the text 'BREAK-TIME' in bold black letters and 'Come back at 2:30!' in a regular black font.

**BREAK-TIME**  
Come back at 2:30!



# Meet Jim

- 61 yo man admitted with R LE cellulitis
- Admission orders antibiotics, VTE proph
- Day 2 develops frank hematochezia
- Transferred to ICU, given pRBC
- Colonoscopy reveals diverticulosis
- Debilitated from ICU stay→rehab
- Day 12 discharged to home

# Admission Orders

Attending Physician:		
	Ordering Healthcare Provider:	GME/UPI #:
	Service:	Pager:
	Allergies:	
	<u>M201</u>	
	Vencorin 1g IV bid	
	Acetaminophen 1000mg PO q 6 <sup>hr</sup> PRN fever	
	MSO4 7mg IV q 6 <sup>hr</sup> PRN pain	
	Heparin 5000u SQ bid	
	<u>Amoxicillin</u> CTR, Chl F	

# Patient Safety Timeline

- 4<sup>th</sup> Century BC
  - “First Do No Harm” Hippocrates
- 1850s
  - Florence Nightingale railed against unsafe pt care in the Crimean War front
  - Ignaz Semmelweis challenges providers to wash hands to stem tide of puerperal sepsis
- 1910
  - Ernest Amory Codman implored physicians to study outcomes, remedy errors, make results public

# ...Healthcare Remains Unsafe

- 1980s
  - Harvard Medical Practice Study found 4% hospitalized patients injured, 2/3rds preventable
- 1999
  - IOM data, similar data from Canada, Europe
- 2000's
  - IHI estimates 15 million episodes of medical harm in US per year—40,000 per day!
- 2006
  - WHO declares that serious preventable adverse events occur in 10% of hospital stays
- 2010
  - 18% case-rate of harm for hospitalized patients; 63% preventable
  - No change in rate of harm between 2002-2007
- 2023
  - 24% rate of adverse events; 8% rate serious adverse event

Landrigan. *NEJM* 2010;363:2124-2134  
Bates. *NEJM* 2023; 388:142-153  
Higgins. *Am J Med* 2024; 137: 799-800





# IHQSE Mission

To transform through discovery, improvement, and spread, the people and processes that serve our patients.

# Transform

- People
  - *Develop the capacity of frontline clinicians to drive change.*
- Processes
  - *Drive improvements in clinical care processes, leading to better outcomes.*
- Organizations
  - *Develop capacity and sustained process changes to improve an organizations overall quality, safety and financial performance.*

# Transforming People

	Pre-CTP	Post-CTP
<b>Competency</b>	N = 480 (96.0%)	N = 355 (71.0%)
<b>Strategies to deal with complex change</b>	23%	82%
<b>Ability to use common QI/PI tools</b>	22%	82%
<b>Ability to use common patient safety tools</b>	43%	91%
<b>Ability to reduce operational waste</b>	24%	81%
<b>Ability to lead organizational change</b>	25%	87%
<b>Ability to create &amp; enhance high-functioning teams</b>	68%	96%
<b>Ability to identify and use data for improvement</b>	38%	87%

CTP = Certificate Training Program





# Transforming Processes

**598**

SUCCESSFUL  
Q/PS  
PROJECTS  
COMPLETED

**\$403M**

SAVED IN  
REDUCED  
INEFFICIENCIES

**1.3M**

PATIENTS  
POSITIVELY  
IMPACTED

# Transforming Organizations

Original Article

Medical Quality

## The Institute for Healthcare Quality, Safety, and Efficiency: A Comprehensive Approach to Improving Organization-Level Quality Performance

Jeffrey J. Glasheen, MD<sup>1</sup>, Ethan Cumbler, MD<sup>1</sup>, Dan Hyman, MD, MMM<sup>2</sup>, Patrick Kneeland, MD<sup>1,3</sup>, Gail Armstrong, DNP, PhD<sup>4</sup>, Sarah Caffrey, MBA<sup>5</sup>, Jennifer Wiler, MD, MBA<sup>1</sup>, Anne Fuhlbrigge, MD<sup>1</sup>, Douglas Jones, MD<sup>1</sup>, and Read G. Pierce, MD<sup>1,6</sup>

### Abstract

Despite decades of effort to drive quality improvement, many healthcare organizations still struggle to optimize their performance on quality metrics. The advent of publicly reported quality rankings and ratings allows for greater visibility of overall organizational performance, but has not provided a roadmap for sustained improvement in these assessments. Most quality training programs have focused on developing knowledge and skills in pursuit of individual and project-level improvements. To date, no training program has been associated with improvements in overall organization-level, publicly reported measures. In 2012, the Institute for Healthcare Quality, Safety, and Efficiency was launched, which is an integrated set of quality and safety training programs, with a focus on leadership development and support of performance improvement through data analytics and intensive coaching. This effort has trained nearly 2000 individuals and has been associated with significant improvement in organization-level quality rankings and ratings, offering a framework for organizations seeking systematic, long-term improvement.

















# Creating the Science of Quality and Safety: >150 publications

## Publications

	<b>IHQSE Faculty Member Creates Real-time Mortality Prediction Tool</b> May 10, 2021 Working with a team of clinicians and informaticists, IHQSE Director Dr. Jeff Glasheen helped create and implement an EHR-driven tool that accurately predicts inpatient mortality. The tool, using real-time data from Epic, provides a highly predictive mortality score that is updated every 15 minutes across a 12-hospital health system. Tested on over 80,000 patients, the tool was developed to aid decision making in scarce resource situations, such as COVID-19 ventilator shortages. <a href="#">Full story</a>
	<b>COVID-19's Impact on Physicians &amp; Staff</b> Apr 28, 2021 IHQSE Faculty member, Emily Gottenborg, MD, and her colleague, Amy Yu, MD, are first authors on an article about the pandemic's impact on personal and professional activities of healthcare providers. They suggest solutions to help mitigate the impact, such as continuing alternate and flexible work schedules, developing flexible promotion timelines, investing in family support mechanisms, creating social support networks, and addressing gender pay disparities. <a href="#">Full story</a>
	<b>IHQSE Graduates' Publication Outlines Improvements in Inpatient Penicillin Allergy Delabeling</b> Apr 13, 2021 Ninety percent of patients labeled as penicillin allergic are tolerant to the medication, yet those labeled as allergic have longer hospital stays, increased exposure to suboptimal antibiotics, and an increased risk of methicillin-resistant infections. Through several quality improvement interventions, including development of a multidisciplinary clinical care pathway, workflow optimization, and education sessions, a team from Children's Hospital Colorado successfully increased the rate of penicillin allergy delabeling among low-risk hospitalized pediatric patients. Led by Certificate Training Program graduates Drs. Maureen Egan Bauer and Kirstin Carrel, Christine MacBrayne, PharmD, and Amy Stein, CPNP, this work allowed for increased use of optimal antibiotics. <a href="#">Full story</a>
	<b>IHQSE Leader Publishes Formative Look at Challenges to Women in Healthcare Leadership</b> Feb 2, 2021 Dr. Emily Gottenborg, IHQSE faculty member and Director of the Introductory Training Program, was the lead author on a seminal paper understanding the experiences of women in leadership roles in hospital medicine. Her team highlighted four limiting challenges including lack of leadership training, bullying, a need to sacrifice to achieve balance and the need for personal and professional validation. Key interventions to address these issues were also shared. <a href="#">Full story</a>
	<b>Kidney Transplant Team Adapts Pediatric-to-Adult Transition Program to Virtual Format</b> Jan 9, 2021 Recognizing the challenges of in-person sessions due to COVID-19, Certificate Training Program graduates Drs. Mary Chandran and Margaret Bock and Clinical Program Manager Megan Bisek published their experience adapting their pediatric kidney transplant transition-to-adult-care program to a virtual platform. The team attributed much of their progress to the knowledge and skills gained in the CTP course. <a href="#">Full story</a>
	<b>IHQSE Faculty Publish Successes of Early-career Quality and Leadership Training Program</b> Oct 8, 2020 IHQSE faculty published the six-year follow up of the success of University of Colorado School of Medicine's Health Innovations Scholars Program. The program has shown a lasting impact on students' ongoing participation and leadership of quality and innovation work. <a href="#">Full story</a>
	<b>Sustaining Change: 5 Years Later Antibiotic Stewardship Project Reveals 26% Reduction in Use</b> Oct 4, 2019 Drs. Christine MacBrayne, Jason Child and Sarah Parker shared the 5-year follow up of the 'handshake stewardship' program developed in the Certificate Training Program. The program has resulted in a sustained 26% reduction in antimicrobial use and saved millions of dollars all without changes in balancing measures such as length of stay, mortality or readmissions. <a href="#">Full story</a>
	<b>Improving Care for Patients with Obstructive Sleep Apnea (OSA); Leveraging Electronic Medical Records (EMR)</b> May 20, 2019 IHQSE graduates, Ricky Mohan, MD, program coordinator Su Linstrom, Susan Hines, CPNP, and Susan Crane, PsyD, presented the outcomes of their Certificate Training Program project to improve care of pediatric patients with obstructive sleep apnea. Through the implementation of an innovative EMR process, the team significantly increased the percentage of patients who scheduled follow up appointments from 72% to 92% as well as those who completed their visits from 60% to 85%. The increased follow up enhanced patient adherence to necessary positive airway pressure treatment. <a href="#">Full story</a>
	<b>IHQSE Leaders Reduce Hospitalist Burnout by 30%</b>

## Publications

	<b>Reducing Cognitive Load is Key to Enhancing Quality and Patient Safety</b> Mar 14, 2018 Drs. Read Pierce and Patrick Kneeland, founding faculty members of IHQSE, show how addressing the limits of brainpower can lead to better patient outcomes. <a href="#">Full story</a>
	<b>Antimicrobial Stewardship Program Leads to Millions of Dollars of Savings</b> Oct 30, 2017 Dr. Sarah Parker, a pediatric infectious disease expert and graduate of the Certificate Training Program, shares the more than \$2 million cost savings obtained by building the hospital's antimicrobial stewardship program through the CTP. <a href="#">Full story</a>
	<b>Improving Length of Stay and Transitions of Care in Geriatric Hip Fracture Patients</b> Oct 30, 2017 Drs. Mary Anderson, Jason Stoneback and Kelly McDevitt, RN, Certificate Training Program graduates, and Dr. Ethan Cumbler, a founding faculty member of IHQSE, share the outcomes of a comprehensive geriatric hip fracture program. The program, completed as part of the Certificate Training Program resulted in nearly a day reduction in length of stay, increases in patient follow up, and significant improvements in osteoporosis treatment. <a href="#">Full story</a>
	<b>Improving 1-year Survival in Geriatric Patients Suffering Hip Fractures</b> Sep 8, 2017 Dr. Ethan Cumbler, an IHQSE faculty member, and Drs. Mary Anderson, (Hospitalist), Jason Stoneback, (Orthopedic Surgeon) and Kelly McDevitt (Registered Nurse), Certificate Training Program graduates, publish the outcomes of a comprehensive geriatric hip fracture program. Completed as part of the Certificate Training Program, the program resulted in a statistically significant improvement in 1-year survival in geriatric patients suffering a hip fracture. <a href="#">Full story</a>
	<b>Overcoming Change Fatigue in Continuous Quality Improvement</b> Sep 1, 2017 Drs. Ethan Cumbler and Read Pierce, both IHQSE faculty members, help to understand how QI success can lead to future failure. Using the analogy of airplane lift, the two show how flight (QI success) leads to increased wingtip vortices spiraling behind the plane resulting in drag (difficulty sustaining success with current and future QI projects) and offer suggestions to address the change fatigue common in QI. <a href="#">Full story</a>
	<b>Antimicrobial Stewardship Program Enhances Infectious Disease Team Relationships</b> May 15, 2017 The IHQSE Certificate Training Program helped Dr. Sarah Parker, an infectious disease specialist at Children's Hospital Colorado, build stronger interactions between the infectious disease and clinical teams. <a href="#">Full story</a>
	<b>IHQSE Graduates Publish Outcomes of Antibiotic Stewardship Project</b> Mar 1, 2017 Dr. Sarah Parker, an IHQSE graduate from Children's Colorado Hospital, reports on the benefits of a streamlined antibiotic regimen in children with appendicitis. The work, a by-product of their enrollment in the Certificate Training Program shows how a simplified antimicrobial regimen can lower costs and improve outcomes in patients with or without perforated appendices. <a href="#">Full story</a>
	<b>The Impact of Medicaid Expansion on Hospital Length of Stay and Mortality Rates</b> Dec 11, 2016 Certificate Training Program graduate Dr. Mary Anderson and IHQSE faculty members Drs. Jeff Glasheen and Read Pierce report no difference in hospital LOS or mortality in states who did and did not expand Medicaid under the Affordable Care Act. <a href="#">Full story</a>
	<b>QI Project Improves Time-to-Therapeutic Levels in Vancomycin Dosing</b> Oct 7, 2016 IHQSE Director Dr. Jeff Glasheen published the outcomes of a QI project resulting in approximately 60% less underdosing and 40% less overdosing of vancomycin in critically ill ICU patients. <a href="#">Full story</a>
	<b>Handshake Stewardship Model Results in 10% Reduction in Antimicrobial Usage</b> Oct 1, 2016 Drs. Jason Child and Sarah Parker, Certificate Training Program graduates, published the outcomes of their QI project showing a 10.9% reduction in antimicrobial use over a 4-year period. Their 'handshake stewardship' program resulted in a greater than 20% reduction in broad spectrum antibiotic usage such as vancomycin and meropenem.



# A decade+ of lessons learned

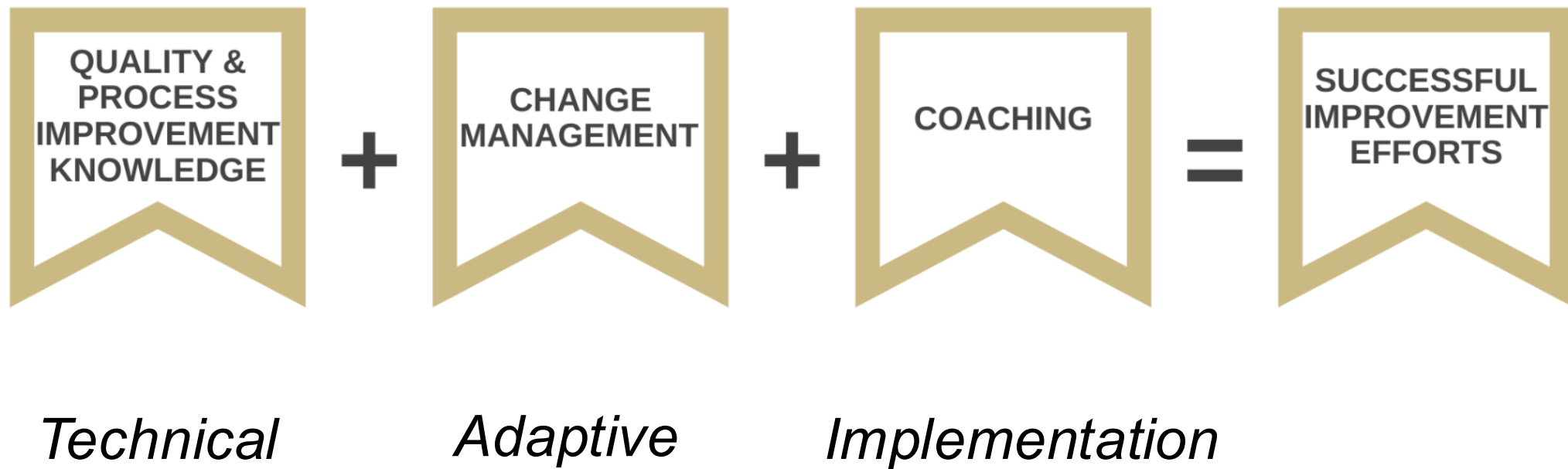
- Success defined
  - Develop QI skills
  - Grow as leader
  - Project success
- Successful teams
  - Meet consistently with coach
  - Do work outside of class and coaching sessions
  - Follow the playbook; complete assignments
  - Create a sense of urgency and guiding coalition
  - Have executive stakeholder support
  - Develop strong business cases
  - Access to data and epic integration, when necessary
  - Start with the problem, develop a solution

# Comments on the Coaching

- Routinely rated as the most important aspect of the course
- Expected to meet for 1 hour the 1<sup>st</sup> and 3<sup>rd</sup> week of month
- We will include coaching/breakouts in the classroom sessions
- Each team meets two times with the entire coaching team prior to CTP sessions
- Coaches' role is to facilitate and help the team; not do the project work

# Overview of the CTP Curriculum

## Course Overview





# Curriculum Overview

KEY	Team Check-in	Inspiration	Background	Process Improvement	Leadership	Quality/Safety	Coaching	EMR	
8/19	#1	Welcome	Beginning with the End in Mind	Objectives & Introductions	Overview	Leadership Defined	Team Norms	Understand Process	
8/26	#2	CHCO Inpatient Pediatric Rehab	Thriving as a Leadership Imperative	Value Defined	Introduction to Quality Improvement	IHQSE Model of Change	Coaching	Understand Process	
		Coaching							
9/9	#3	UCH Blood Bank	Investigate the Problem	Problem Statement	Voice of the Customer	Process Mapping	Stakeholder Analysis	Coaching	Baseline data
		Coaching							
9/23	#4	UCH Rheumatology Clinic	Investigate the Problem	Understanding Root Causes		Baseline Data	EMR Process & Data	Business Case	Baseline data
		Coaching							
10/7	#5	CHCO Digestive Health	QI vs. Research		Leading Change				Baseline data
		Coaching							
10/28	#6	UCH Pre-Procedure Services	Leading Change: Vision		QI and Health Equity		Wellness		Process Optimization
11/4	#7	DHH OB/GYN Clinics	Data Collection Plan		Myers Briggs				Process Optimization
		Coaching							
11/18	#8	UCH ED & Radiology	Hone the Intervention	This Place Called Academia		Understanding Business Drivers	Negotiating for what You Need		Finalize Need
		Coaching							
12/9	#9	CHCO Health Clinic & Dev. Peds.	Design Thinking	Positive Deviance			Leading Change: Sense of Urgency	Coaching	Finalize Need
12/16	#10	UCH Antimicrobial Stewardship	Leading Change: Guiding Coalition	Aim Statement	Optimizing EMR Requests	Overcoming Resistance	Team Logo		Submit Ticket
		Coaching							
1/13	#11	CHCO Inpatient Pediatric Rehab	Storytelling	Alumni Presentation		Leading Change: Awareness Campaign	Mid-year Report Overview		EMR Decision
		Coaching							
1/27	#12	UCH Blood Bank	Pre-mortem Analysis	Feedback to Improve Performance			Mid-year Report Practice Session		EMR Build

# Curriculum Overview

KEY	Team Check-in	Inspiration	Background	Process Improvement	Leadership	Quality/Safety	Coaching	EMR
		Coaching						
2/10	#13	Report Outs				Leading Change: Removing Barriers		EMR Build
		Coaching						
2/24	#14	Report Outs				Leading Change: Short-term Wins		EMR Build
		Coaching						
3/10	#15	UCH Pre-Procedure Services	Piloting your Intervention	Leadership Journey: Jena Hausmann	Intro to AI	Positive Organizational Design		EMR Build
		Coaching						
3/24	#16	DHH OB/GYN Clinics	Data to Understand Impact	Time Management & Delegation		AI Prompting		Production
		Coaching						
4/14	#17	UCH ED & Radiology	Impact of Quality and Safety on Healthcare Finance	Leadership Journey: Tom Gronow		Running Effective Meetings		Refinement
		Coaching						
4/28	#18	CHCO Health Clinic & Dev. Peds.	Strategic Planning			QI Spread	Power & Influence	Refinement
		Coaching						
5/12	#19	UCH Antimicrobial Stewardship	Second Victim	Innovation in Healthcare		Embed the Change		Data Extraction
		Coaching						
5/26	#20	Leadership Journey: Vineet Chopra	Report Outs					Data Extraction
		Coaching						
6/9	#21	Report Outs						Data Extraction
		Coaching						
6/23	#22	Reflecting on Why			Certificates	Closing Time		Data Extraction

Date Assigned	Assignment	Due Date
#1 – Aug. 19, 2025	<ul style="list-style-type: none"> <li>Develop group ground rules</li> <li>Complete Leadership Defined Self-assessment</li> </ul>	#3 – Sept. 9, 2025
#2 – Aug. 26, 2025	<ul style="list-style-type: none"> <li>No new assignments</li> </ul>	
#3 – Sept. 9, 2025	<ul style="list-style-type: none"> <li>Complete voice of customer</li> <li>Build stakeholder analysis</li> <li>Develop a problem statement</li> </ul>	#6 – Oct. 28, 2025
	<ul style="list-style-type: none"> <li>Complete a process map</li> </ul>	#7 – Nov. 4, 2025
#4 – Sept. 23, 2025	<ul style="list-style-type: none"> <li>Reading: Kotter, John. <i>Leading Change: Why Transformation Efforts Fail</i></li> </ul>	#5 – Oct. 7, 2025
	<ul style="list-style-type: none"> <li>Meet with Dr. Moksha Patel</li> </ul>	# 7 – Nov. 4, 2025
	<ul style="list-style-type: none"> <li>Draft business case</li> </ul>	#8 – Nov. 18, 2025
	<ul style="list-style-type: none"> <li>Complete affinity diagram</li> </ul>	#9 – Dec. 9, 2025
#5 – Oct. 7, 2025	<ul style="list-style-type: none"> <li>Complete Myers-Briggs Assessment</li> </ul>	Friday, Oct. 24, 2025
	<ul style="list-style-type: none"> <li>Complete literature review</li> <li>Complete Program Evaluation/QI/Research Tool</li> </ul>	#8 – Nov. 18, 2025
#6 – Oct. 28, 2025	<ul style="list-style-type: none"> <li>Well-being Analysis</li> <li>Health Equity Analysis</li> <li>Develop/utilize current vision tying to project</li> </ul>	#9 – Dec. 9, 2025
#7 – Nov. 4, 2025	<ul style="list-style-type: none"> <li>Complete data collection plan</li> </ul>	#10 – Dec. 16, 2025
#8 – Nov. 18, 2025	No new assignments	
#9 – Dec. 9, 2025	<ul style="list-style-type: none"> <li>Finalize sense of urgency</li> </ul>	#11 – Jan. 13, 2026
	<ul style="list-style-type: none"> <li>Complete Design Thinking Exercise</li> <li>Complete Positive Deviance Exercise</li> <li>Develop list of potential interventions</li> </ul>	#12 – Jan. 28, 2026
#10 – Dec. 16, 2025	<ul style="list-style-type: none"> <li>Complete aim statement</li> <li>Finalize guiding coalition</li> </ul>	#11 – Jan. 13, 2026
	<ul style="list-style-type: none"> <li>Finalize logo</li> </ul>	#13 – Feb. 10, 2026
#11 – Jan. 13, 2026	<ul style="list-style-type: none"> <li>Draft mid-year report out</li> </ul>	#12 – Jan. 27, 2026
	<ul style="list-style-type: none"> <li>Create and implement a communication plan</li> </ul>	#14 – Feb. 24, 2026

Date Assigned	Assignment	Due Date
#12 – Jan. 27, 2026	<ul style="list-style-type: none"> <li>Finalize mid-year report out</li> <li>Complete pre-mortem assessment</li> </ul>	#13 / #14 – Feb. 10 or 24, 2026
#13 – Feb. 10, 2026	<ul style="list-style-type: none"> <li>Create plan for removing barriers to success</li> </ul>	#15 – Mar. 10, 2026
#14 – Feb. 24, 2026	<ul style="list-style-type: none"> <li>Create series of short-term wins to support project</li> </ul>	#15 – Mar. 10, 2026
#15 – Mar. 10, 2026	<ul style="list-style-type: none"> <li>Outline pilot</li> </ul>	#16 – Mar. 24, 2026
#16 – Mar. 24, 2026	<ul style="list-style-type: none"> <li>Update data plan to include current state data</li> </ul>	#18 – Apr. 28, 2026
#17 – Apr. 14, 2026	No new assignments	
#18 – Apr. 28, 2026	<ul style="list-style-type: none"> <li>Develop plan for sharing/spreading your work</li> </ul>	#21 – June 19, 2026
#19 – May 12, 2026	<ul style="list-style-type: none"> <li>Plan for putting project into embed phase</li> <li>Develop final report out</li> </ul>	#20 / #21 – May 26 / June 9, 2026
#20 – May 26, 2026	No new assignments	
#21 – June 9, 2026	No new assignments	
#22 – June 23, 2026	No new assignments	

# Comments on the Curriculum

- We will strive to stick to this plan
- However, we may move some topics around
  - Hard to pin down faculty full 12 months in advance
  - Tailor to needs of the class
  - Likely will have a weather event, etc.
- Definitive update on what we are covering, and how long each topic will last, ***will occur through the agenda we send out 5 days in advance for each session***

# Program Expectations

1. Build community & share
2. Start Tuesday sessions on time—**by 1:05**
  - *Music cues start of session*
3. Attend > 80% of Tuesday sessions
  - *Let Cortney know if you can't make a session*
4. Come prepared to practice, discuss, & lead
  - *Complete all assignments and reading prep work*
  - *~1-4 hrs of work between each session*
5. Coaching sessions twice/month to drive both team enhancement & projects forward
6. Drive toward scholarly activity and spread; include coach, acknowledge IHQSE

# Questions?

# Meet Sarah

- 51 yo woman
- Admitted to ICU with severe CAP
- Intubated, started on broad spectrum antibiotics
- Day 2 improving
- Day 3 off vent
- Day 5 severe sepsis from femoral line infection
- Day 6 line removed
- Day 10 on oral antibiotics
- Day 14 discharged to home



# Keystone Project

- CLABSI common, deadly, costly
  - 80,000 CLABSI annually
  - Kills between 30,000-62,000 annually
  - CLABSI costs \$2.3 billion annually
- 103 Michigan ICUs
  - Wash your hands
  - Clean skin with chlorhexidine soap
  - Cover yourself and patient when placing catheter
  - Avoid groin catheters
  - Take out unneeded catheters
- Median CLABSI per 1000 catheter-days
  - Before 2.7
  - 3 months 0
  - 18 months 0

# But Most Often Don't

- Social and cultural reasons
- Physicians and nurses are famously autonomous
- Technical solution (checklist) can't solve a social/cultural problem
- Work when led by clinicians with expertise in PI AND leadership

# Denver Health Hospital Antimicrobial Stewardship



Institute for Healthcare Quality,  
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# Development of an Infectious Diseases Diagnostic Excellence Program at Denver Health

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IHQSE CTP Report  
August 19, 2025



# Project Team



**Maggie Cooper, PharmD, BCIDP  
ID Pharmacist**



**Kati Shihadeh, PharmD, BCIDP  
ID Pharmacist**



**Tim Jenkins, MD  
ID Physician**



**Laura Triplett, MSc, M(ASCP)<sup>CM</sup>  
Infectious Diseases Laboratory  
Technical Supervisor**



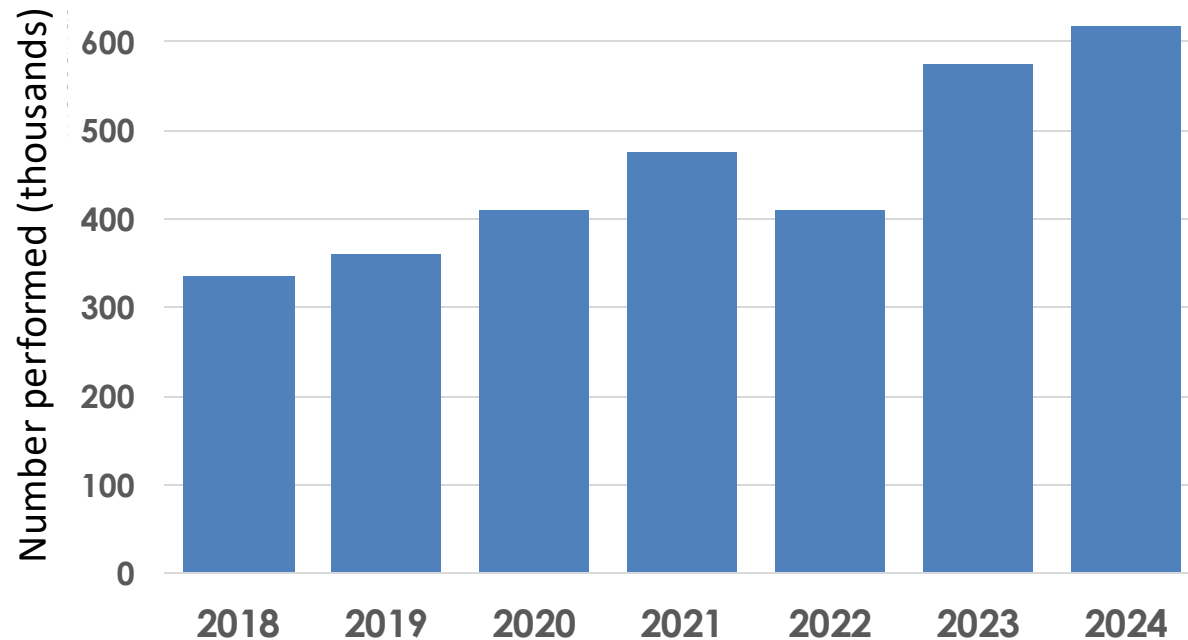
**Brian Listy, MSN, RN, CIC  
Infection Prevention Manager**

**800,000**

**Deaths or permanent disabilities each year due to  
diagnostic errors**

# Trends in Testing

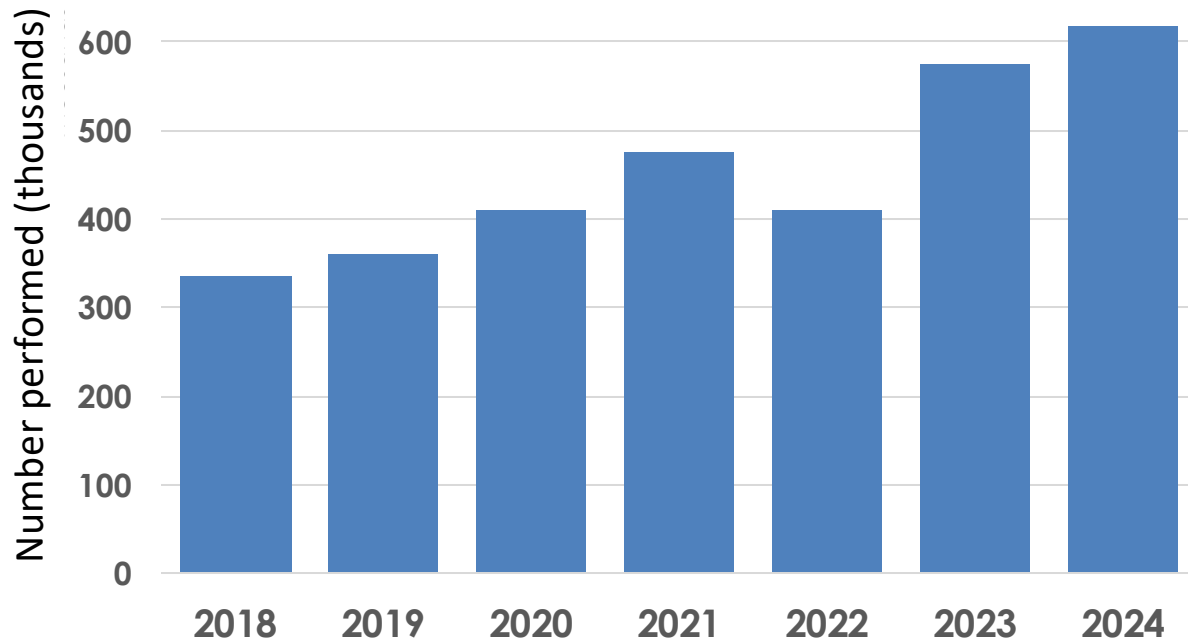
Infectious Diseases Diagnostic Tests Performed



**90% increase in test volume**

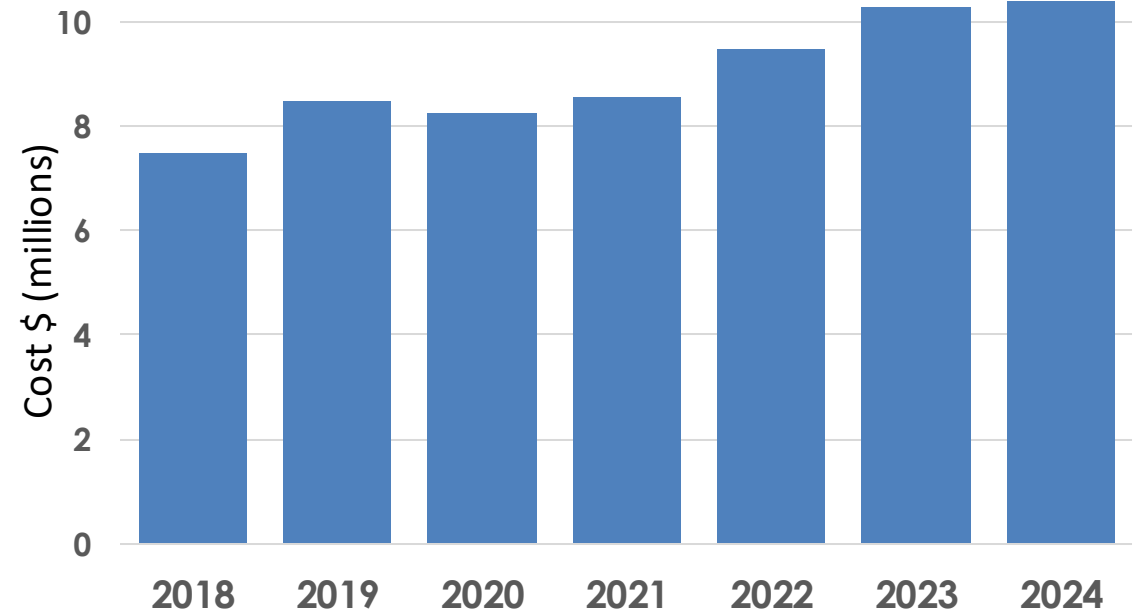
# Trends in Testing

## Infectious Diseases Diagnostic Tests Performed



**90% increase in test volume**

## Lab Supply Costs



**35% increase in lab expenses**



# Diagnostic Excellence

**Accurate and timely diagnoses using the fewest resources while maximizing patient satisfaction and managing uncertainty**

## Vision

**To Be the National Model for Diagnostic Excellence**



# Initial Target Tests

## CSF PCR

- 400 tests/year
- \$90K/year
- 53% normal CSF

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## GI PCR panel

- 3,500 tests/year
- \$600K/year
- 40% unnecessary

# Initial Target Tests

## CSF PCR

- 400 tests/year
- \$90K/year
- 53% normal CSF

## GI PCR panel

- 3,500 tests/year
- \$600K/year
- 40% unnecessary

## Flu/COVID/RSV PCR

- 30,000 tests/year
- \$2.2 million/year
- 25% unnecessary

# The Aim

**To reduce microbiology tests that are unnecessary, low clinical value, or may lead to misdiagnosis or unnecessary antibiotic use**



# The Aim

To reduce microbiology tests that are unnecessary, low clinical value, or may lead to misdiagnosis or unnecessary antibiotic use



CSF PCR

- Reduce monthly volume by 40% by April 2025

GI PCR

- Reduce monthly volume by 20% by June 2025

FLUVID

- Reduce volume from Oct 2024 – May 2025 by 10%
- Reduce volume from June – Sept 2025 by 80%

# Important Perspectives



General agreement that over testing is prevalent



Guidance for diagnostic testing would be helpful



Cost of testing should be more transparent



Importance of workflow and patient throughput



Importance of patient experience / ratings

# Business Case

## Quality Improvements

### Providers:

- ↓ diagnostic uncertainty
- ↓ time for test follow up/EHR messages

### Patients:

- ↓ antibiotic exposure
- ↓ cost and inconvenience

### Lab:

- ↓ strain on lab instruments/personnel



# Business Case

## Quality Improvements

### Providers:

- ↓ diagnostic uncertainty
- ↓ time for test follow up/EHR messages

### Patients:

- ↓ antibiotic exposure
- ↓ cost and inconvenience

### Lab:

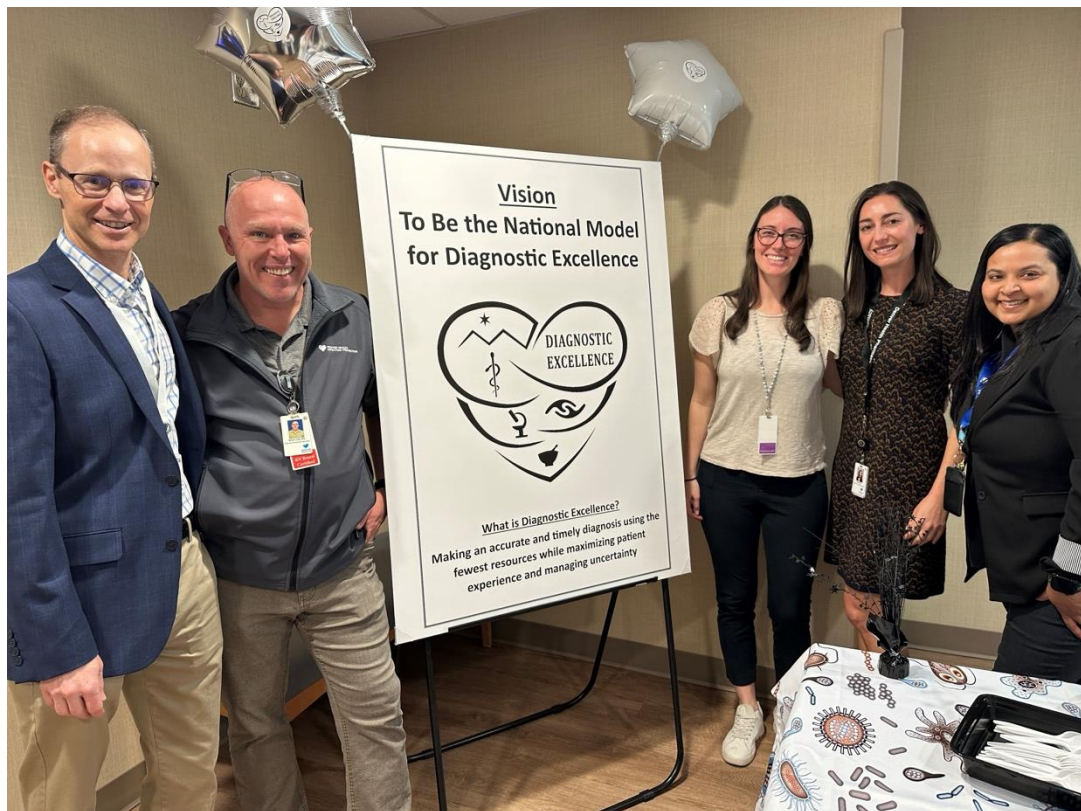
- ↓ strain on lab instruments/personnel

## Financial Benefits

- Cost savings = \$596,000
- Loss in reimbursement = \$43,625
  - Net cost savings = **\$552,375**

**Request for Medical Director of Microbiology Lab position approved!**





# Interventions - CSF PCR Panel

Lab protocol to perform only if abnormal CSF WBC ( $\geq 5$ /hpf)

Meningitis/Encephalitis Multiplex PCR: Cerebrospinal Fluid; CSF, Lumbar Puncture		<input checked="" type="checkbox"/> Accept	<input checked="" type="checkbox"/> Cancel
Frequency:	<div>Once <input type="text"/> <input type="button" value="Once"/> <input type="button" value="STAT"/></div>		
	<div>At <div>5/6/2025 <input type="button" value="Calendar"/> <input type="button" value="Today"/> <input type="button" value="Tomorrow"/> 1502 <input type="button" value="Clock"/></div></div>		
Type:	<input type="button" value="Cerebrospinal Fluid"/>		
Source:	<input type="button" value="CSF, Lumbar Puncture"/> <input type="text"/>		
<div><input checked="" type="checkbox"/> Is the patient highly immunosuppressed (e.g. advanced HIV, ANC&lt;500, recent transplant)? <input type="button" value="Yes"/> <input type="button" value="No"/></div>			
Release to patient	<input type="button" value="Immediate"/> <input type="button" value="Manual release only"/>		
Comments:	<input type="button" value="+ Add Comments"/>		
Add-on:	No add-on specimen found		
<input checked="" type="checkbox"/> Next Required	<input type="button" value="Link Order"/>	<input checked="" type="checkbox"/> Accept	<input checked="" type="checkbox"/> Cancel



## First ME PCR on normal CSF averted!



Jenkins, Timothy MD

To **DL\_Lab Microbiology**; Penick, Amanda; Rocker, Jenna; Wilson, Michael MD; Wolfe, Marissa; Zwakenberg, Melody;  
Fish, Lindsey MD; Feijoo, Benjamin MD; Pippins, Michael; Pierce, Read  
Cc Triplett, Laura; Cooper, Maggie; Shihadeh, Katherine; Listy, Brian RN; Glasheen, Jeffrey

Thu 3/13/2025 4:04 PM

Reply

Reply All

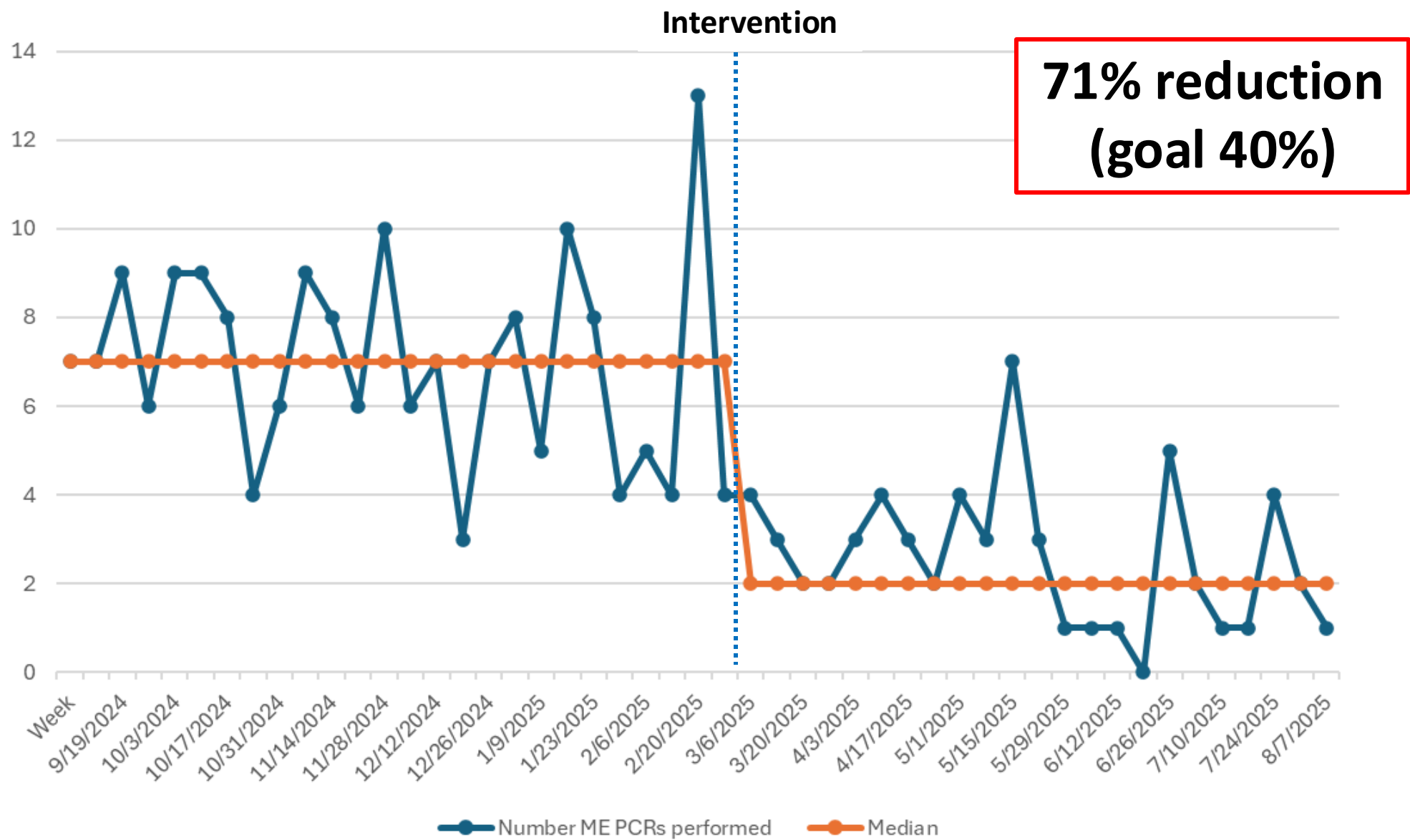
Forward

...

Hi all,  
Exciting news! The new micro lab protocol and Epic order for the ME PCR panel went live yesterday. **The protocol has already been applied on two CSF specimens where the ME PCR was ordered (thank you Sierra Westmoreland and Danka Iverson!), and we have already averted our first unnecessary ME PCR on normal CSF!** Thanks so much for everyone's input and assistance to operationalize this testing change that will contribute to higher value care for our patients – the first of many steps on Denver Health's journey toward diagnostic excellence.



# CSF PCR panels performed 9/2024 – 8/2025

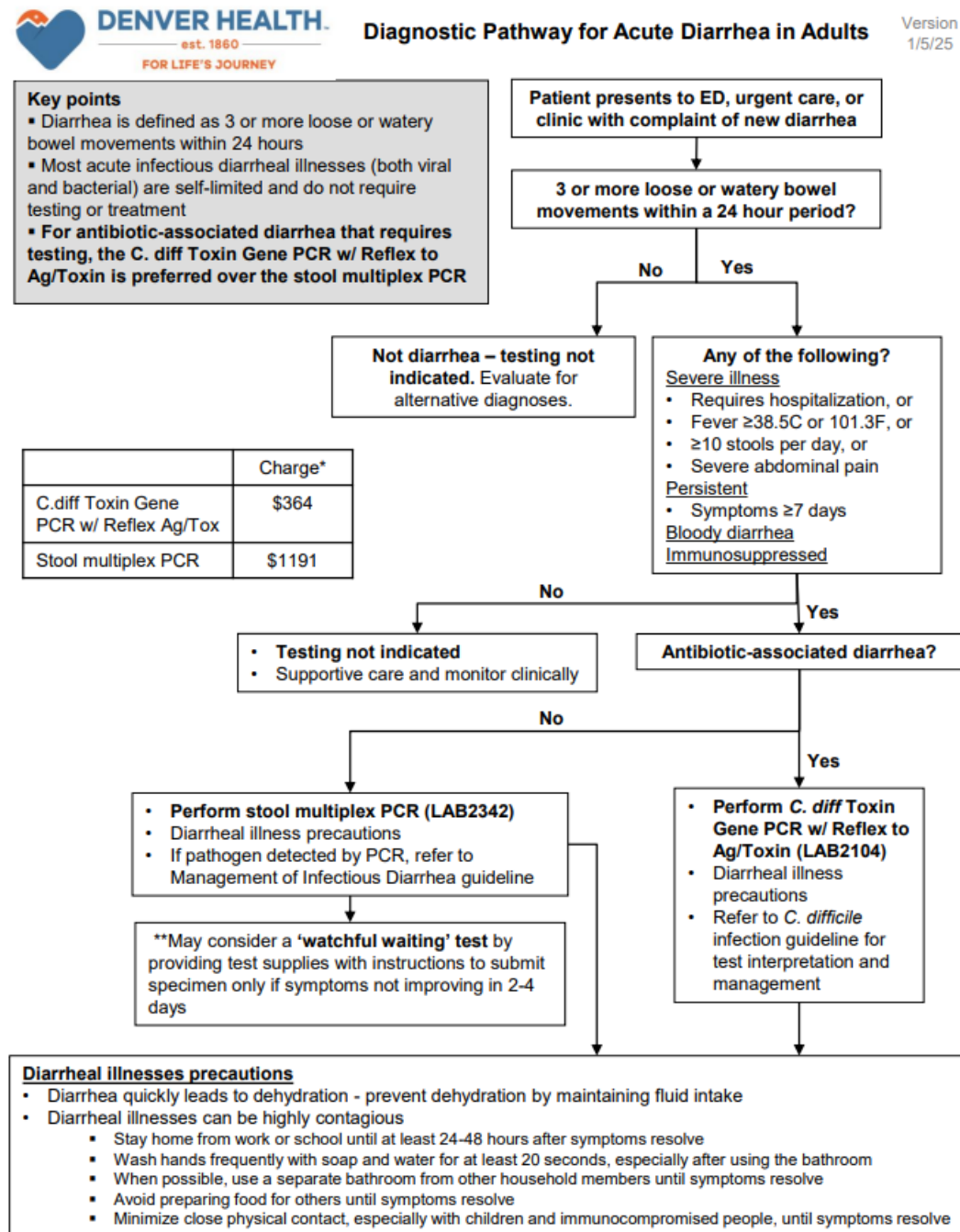




# Interventions - GI PCR panel

## 1. Diagnostic pathway for acute diarrhea

- Indications for GI PCR
- *C.diff* test if antibiotic-associated
- Transparency around cost





### Thank you!

20% reduction in stool PCR orders since dissemination  
of the diagnostic pathway for acute diarrhea

#### Indications for stool multiplex PCR test:

- Severe symptoms (fever,  $\geq 10$  stools/day, severe abd pain)
- Acute diarrhea lasting  $\geq 7$  days
- Bloody diarrhea
- Immunosuppression

Not indicated for evaluation of chronic diarrhea



## 2. Clinical decision support with indications for GI PCR

Stool Multiplex PCR: Stool; Stool

✓ Accept

✗ Cancel

Priority:

Routine

STAT

Status:

Normal

Standing

Future

Expected Date:

Today

Tomorrow

1 Week

2 Weeks

1 Month

6 Weeks

3 Months

6 Months

☐ Approx.

Expires:

5/26/2025

1 Month

2 Months

3 Months

4 Months

6 Months

1 Year

18 Months

Class:

Lab Collect

Lab Collect

Clinic Collect

External

Type:

Stool

Source:

Stool

Colostomy Bag

! Bloody diarrhea or severe illness (fever, >10 stools/day, severe abdominal pain)?

Yes

No

! Acute diarrhea lasting >=7 days?

Yes

No

! Immunosuppression (e.g., advanced HIV infection, ANC<500, cancer on chemotherapy)

Yes

No

Release to patient

Immediate

Manual release only

Important (1)

❗ Why are you seeing this alert?


Most acute diarrheal illnesses - including those caused by bacteria - are self-limited. Testing is often not necessary unless an indication for antibiotic treatment is present such as severe illness, prolonged symptoms, or immunosuppression.

**\*\*The charge associated with this test is approximately \$1200\*\***

If C. difficile is the primary pathogen of concern, the preferred test is the C. diff Toxin Gene PCR w/ Reflex to Ag/Toxin

**Remove** the following orders? \_\_\_\_\_

Remove	Keep
--------	------

 **Stool Multiplex PCR: Stool; Stool**  
Expires: 5/25/2025, Lab Collect, Resulting Agency - DENVER HEALTH CENTRAL LABORATORY

**Apply** the following? \_\_\_\_\_

Order	Do Not Order
-------	--------------

 **C. diff Toxin Gene PCR w/reflex to Ag/Toxin**

### 3. Hard stop when GI PCR ordered on or after hospital day 4

#### Order Validation



**⚠ You cannot sign these orders because information is missing or requires your attention:**

This test is not indicated on hospital day 4 or later because the pathogens on this panel rarely cause hospital-onset diarrhea (except *C. difficile*). If testing for *C. difficile* is indicated, please order the *C. diff* Toxin Gene PCR w/ reflex to Ag/Toxin (LAB2104).

OK

## 4. Nudge against treating non-pathogenic targets

### ⚠ Stool Multiplex PCR (Evaluation of Community-Onset Diarrhea): Stool; Stool

Collected 5/6/2025 14:00 Status: Final result Dx: Diarrhea of infectious origin

Test Result Released: Yes (seen) Messages: Seen

0 Result Notes | 1 Patient Communication | [View Follow-Up Encounter](#)

#### Component

Ref Range & Units

Campylobacter	Target Not Detected
---------------	---------------------

Target Not Detected

Clostridium difficile Toxin A/B	Target Not Detected
---------------------------------	---------------------

Target Not Detected

Plesiomonas shigelloides	Target Not Detected
--------------------------	---------------------

Target Not Detected

Salmonella	Target Not Detected
------------	---------------------

Target Not Detected

Vibrio	Target Not Detected
--------	---------------------

Target Not Detected

Vibrio cholerae	Target Not Detected
-----------------	---------------------

Target Not Detected

Yersinia enterocolitica	Target Not Detected
-------------------------	---------------------

Target Not Detected

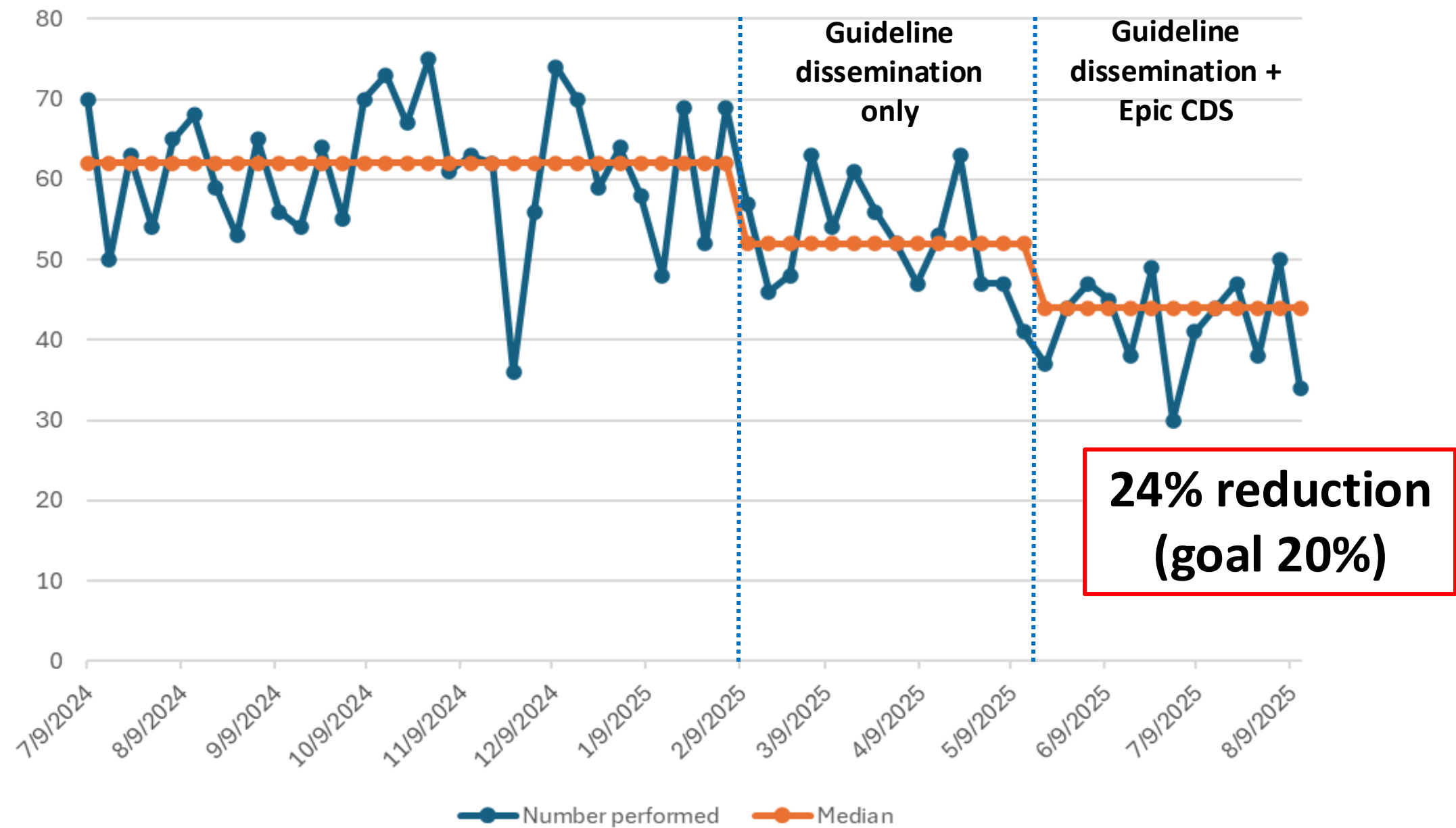
Enteraggregative E.coli (EAEC)	Target Detected !
--------------------------------	-------------------

Target Not Detected

Comment: Usually self-limiting infection. Treatment rarely indicated.



# GI PCR panels performed 7/2024 - 8/2025



# Interventions – Flu/RSV/COVID PCR (FLUVID)

- Communication campaign – ‘Test Only If You Would Treat’
- Respiratory season guidance



**DENVER HEALTH™**

est. 1860

FOR LIFE'S JOURNEY

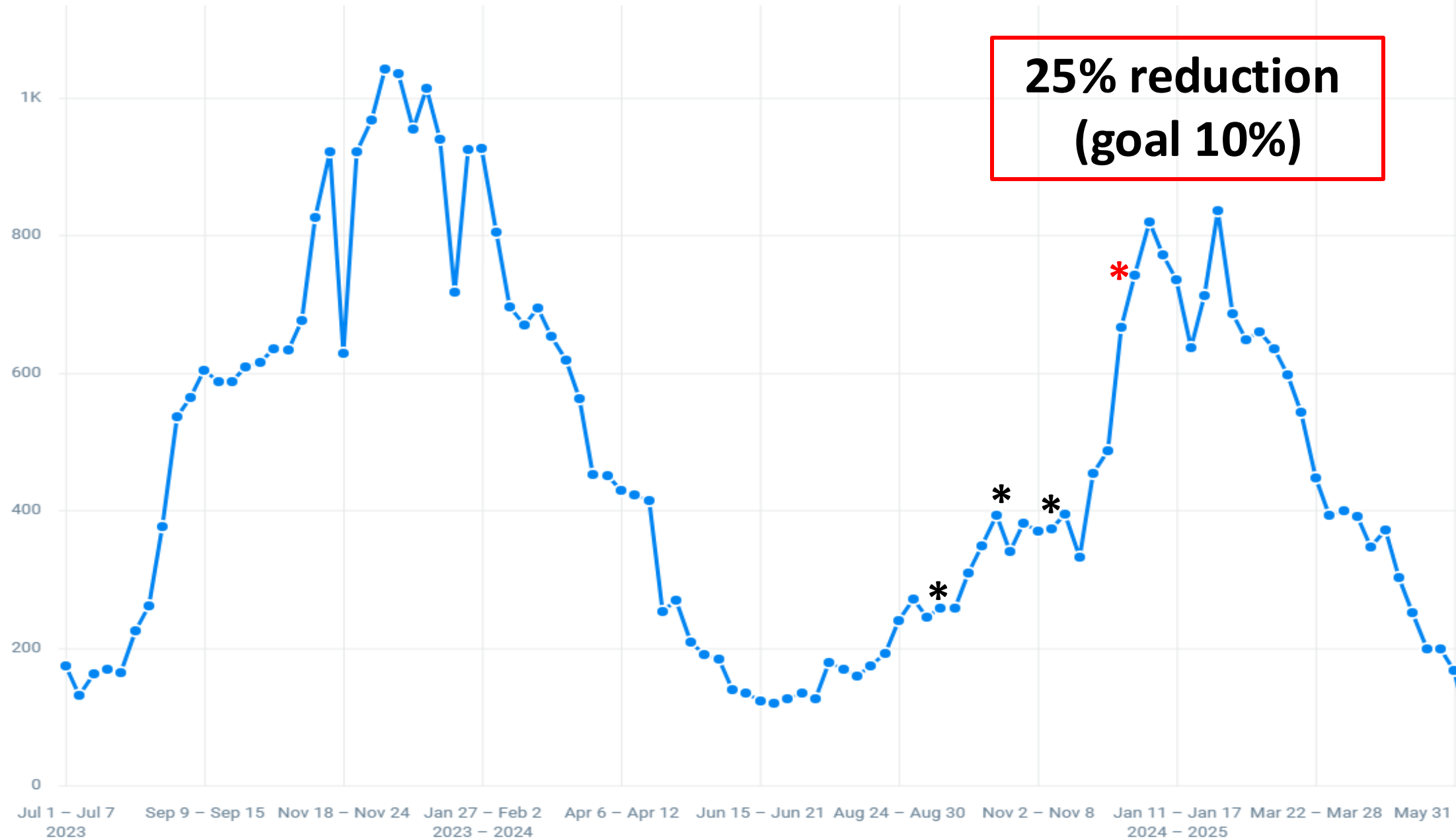
## Diagnostic and Treatment Recommendations for the 2024-2025 Respiratory Season

### What are the common symptoms of influenza, COVID-19, and RSV?

- Influenza, COVID-19, and RSV have overlapping symptoms that can range from mild symptoms to severe illness
- Infants, young children, and older adults are more likely to develop severe illness

Symptom	Influenza	COVID-19	RSV
Fever or chills	✓	✓	✓
Cough	✓	✓	✓
Sore throat	✓	✓	

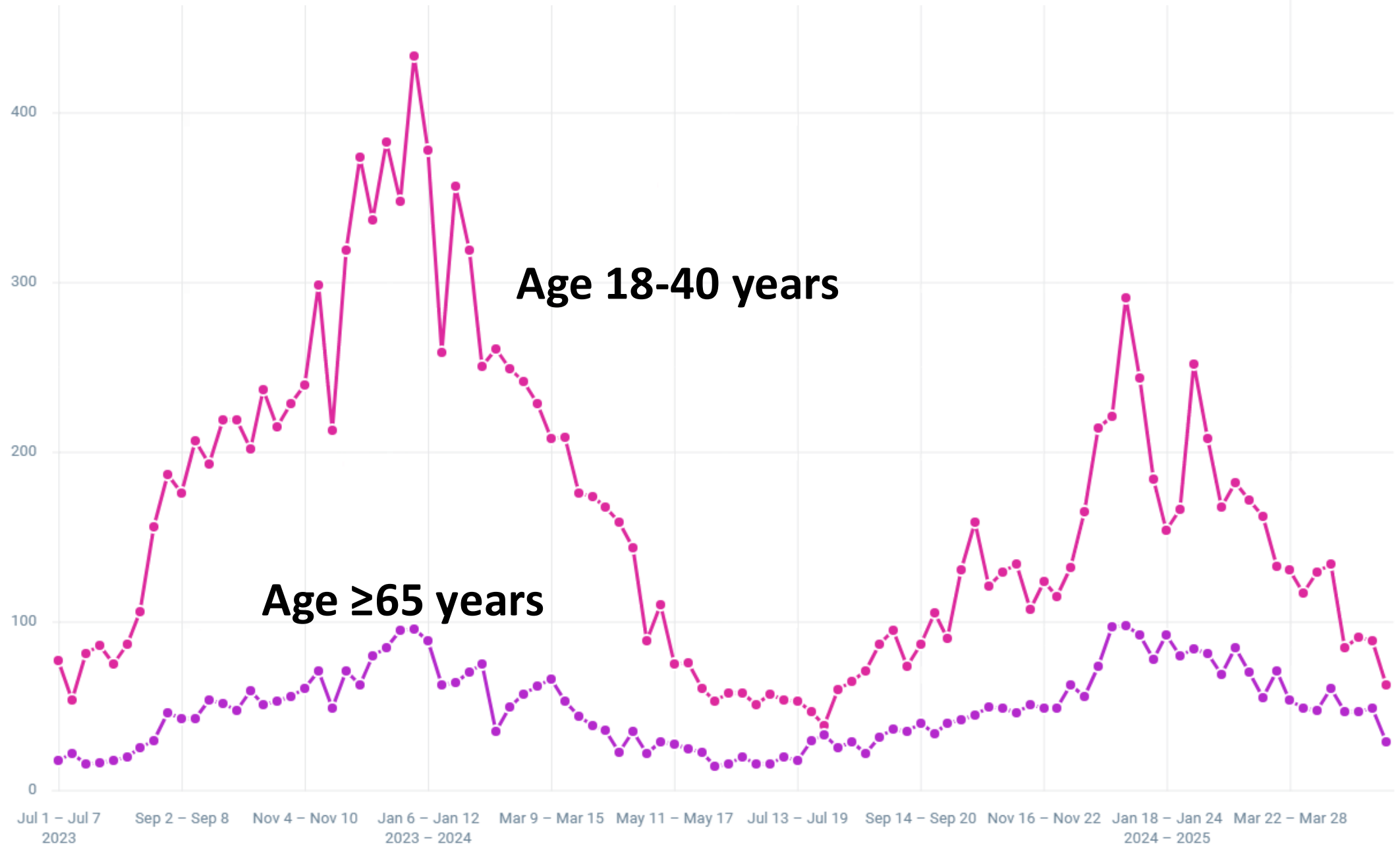
# FLUVID panels by week, 7/2023 to 5/2025



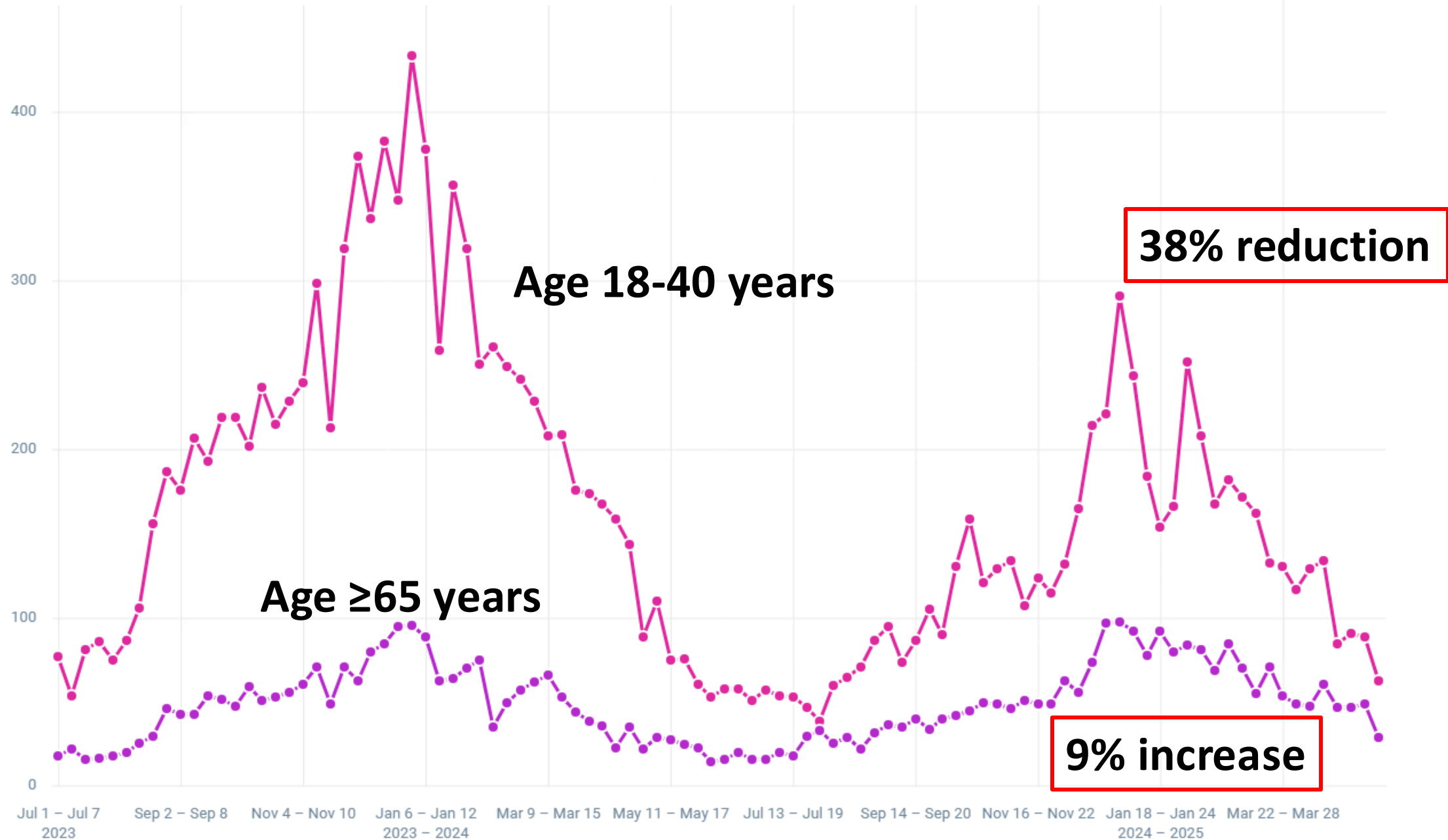
# FLUVID panels by week, 7/2023 to 5/2025



# FLUVID panels by week, 7/2023 to 5/2025

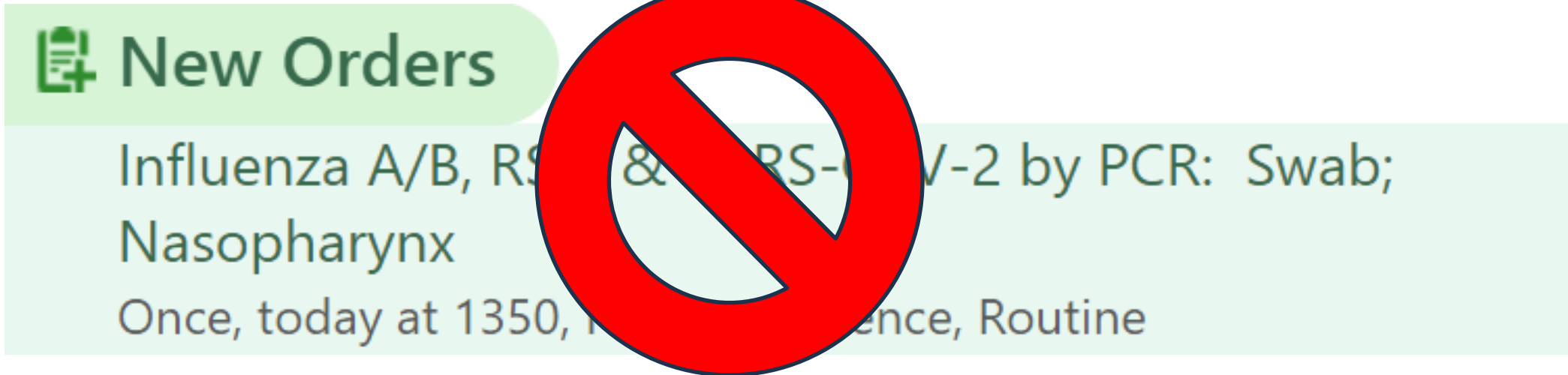


# FLUVID panels by week, 7/2023 to 5/2025



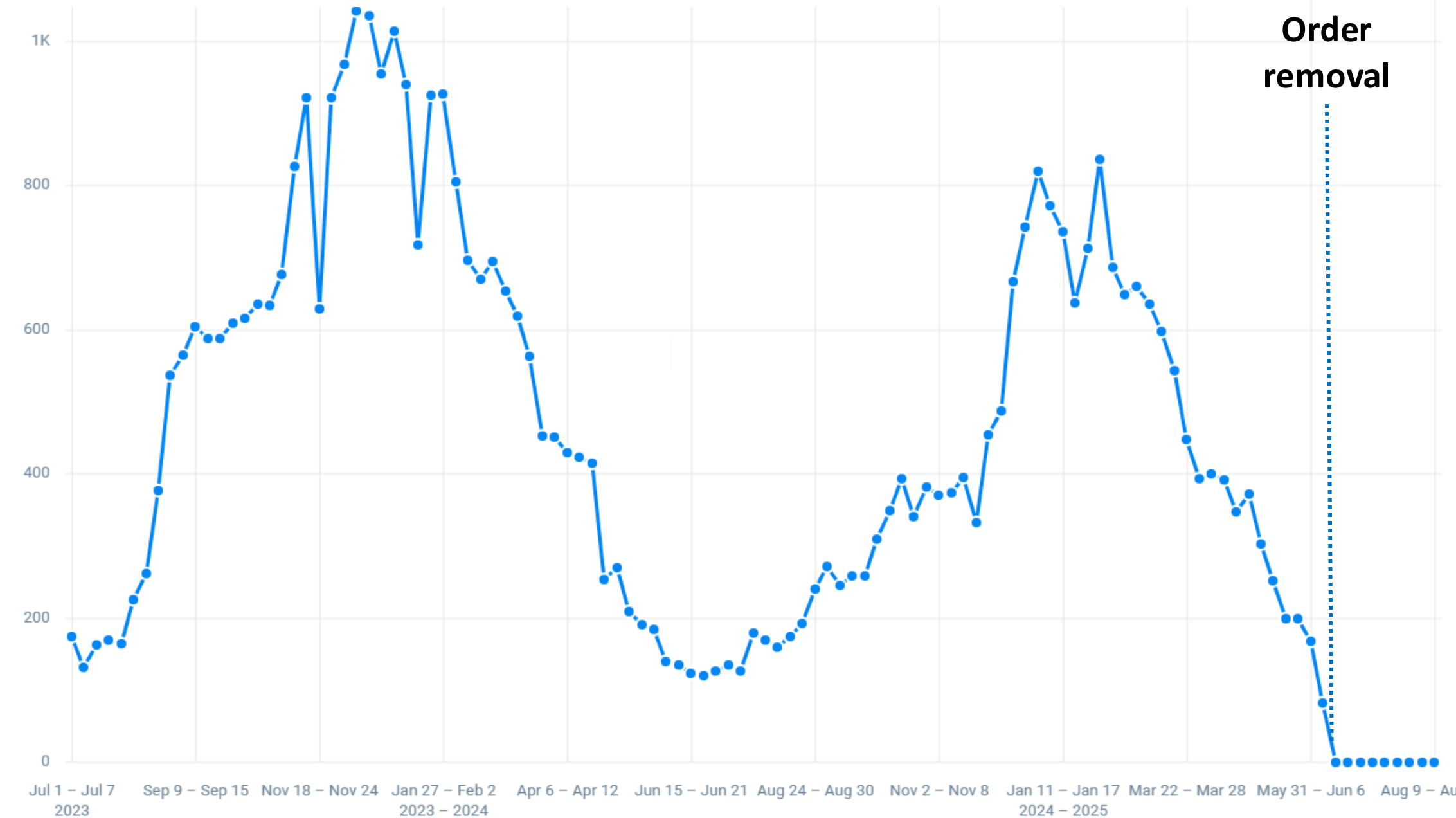
# Prevention of summer testing

- <1% FLUVID tests positive for influenza/RSV in summer
- >3,000 ordered from June – Sept 2024



- Replace order October 1st

# Impact of order removal on summer FLUVID utilization





**From errors to  
excellence...**



**Epic**

**Mike Pippins  
Jahnine Nassif  
Ellen Sarcone**

**Coach/Executive Sponsor**

**Read Pierce**

**Guiding Coalition**

**Marissa Wolfe  
Lindsey Fish  
Melody Zwakenberg  
Ben Feijoo**

*thank you*

**Lab Leadership**

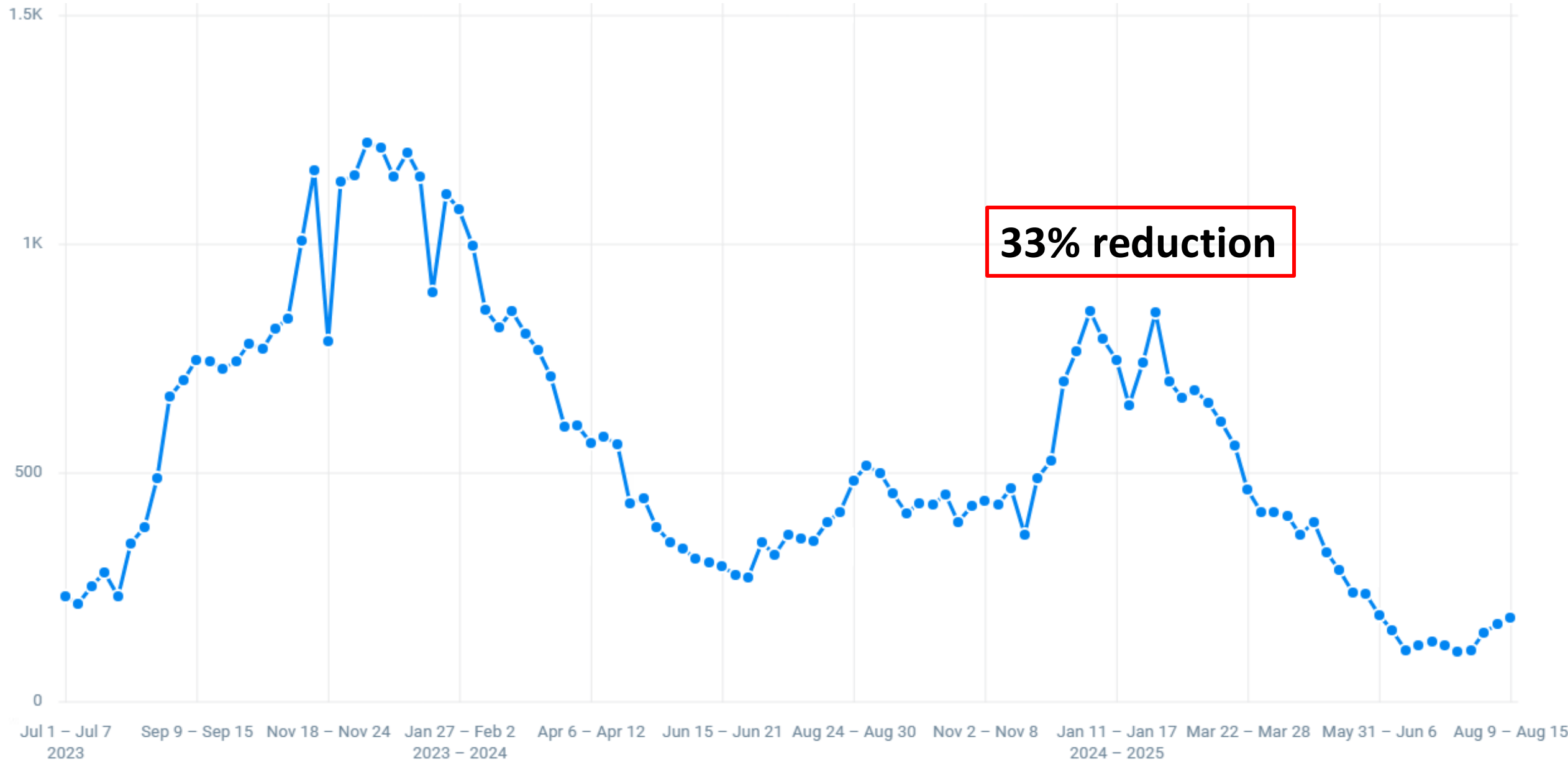
**Amanda Penick  
Mike Wilson  
Jenna Rocker**

**IHQSE Staff**

**Leadership**

**Anu Paranjape  
David Wyles  
Nathalie Seoldo Hinman  
Dawn Whiting  
Kris Gaw**

# Total molecular respiratory tests by week, 7/1/23 – 8/15/25



# Leadership Defined

Katie Raffel, MD



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# What is Leadership, Exactly?



# Leadership Attributes

Think of someone you consider a great leader.

*What words describe that person's leadership?*



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# Attributes of Great Leaders

- Integrity - R
- Approachable - R
- Authentic - VR
- Inclusive - R
- Responsive not reactive - R
- Charisma/social capital - R
- Humble - R
- Solutions are goal oriented - T
- Recognizes others' strengths - R
- Get work done – T
- Role modeling - TR
- Undaunted - V
- Mentors and develops others - R
- Sponsorship - R
- Investment in others - R
- Available - R
- Passionate - V
- Inspiring - V
- Collaborative - R
- Organized - T
- Accountable - TR
- Steadfast – steady in times of change - V
- Ownership - VT
- Not micromanager - TR
- Good communicator and listener - R
- Visionary - V
- Doesn't promote drama - R

# Leadership Framework: Kotter

## Three Primary Functions

1. Development and articulation of a **vision**—an ideal state of being we are striving to achieve
2. Attention to organization and execution of **tasks**, needed to move toward the vision
3. Cultivation of productive **relationships** with others in the pursuit of both vision and task management



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# Leadership Framework: Kotter

**Leadership = Vision + Tasks + Relationships**

$$***L = V + T + R***$$



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# Leadership Attributes

Look again at the list of leadership attributes.

*For each attribute, label it—is it **V**, **T**, or **R**?*



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# Leadership Attributes

Looking at leadership  
through our definition  
( $L = V + T + R$ ) . . .

*What patterns emerge?*



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# Leadership Attributes

Where do clinicians excel?

$$L = V + T + R$$



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# How Clinicians and Leaders Differ

Clinicians	Clinician Leaders & Executives
Doers	Planners & designers

# How Clinicians and Leaders Differ

Clinicians	Clinician Leaders & Executives
Doers	Planners & designers
Deciders	Delegators
Value autonomy	Value collaboration

# How Clinicians and Leaders Differ

Clinicians	Clinician Leaders & Executives
Doers	Planners & designers
Deciders	Delegators
Value autonomy	Value collaboration
1:1 interaction	1:N interaction
Patient advocate	Population, organization advocate









A top-down photograph of two white ceramic coffee cups on a light-colored wooden tray. The cup on the left contains a latte with a thick layer of white foam. The cup on the right contains a dark espresso. A hand is visible on the left holding the handle of the latte cup, and another hand is on the right holding the handle of the espresso cup. A black and white checkered cloth is partially visible in the upper left corner. A semi-transparent white rectangular box is centered over the cups, containing the text "BREAK-TIME" in bold black letters and "Come back at 4:20!" in a regular black font.

**BREAK-TIME**  
Come back at 4:20!

# Meet Rory

- 63 yo man HTN and DM
- Acute right sided weakness for 45 minutes
- Symptoms improved
- Admitted with TIA at 9am

# Later that day...

- 500pm
  - R-sided hemiplegia & aphasia
- 530pm
  - Nurse calls physician, no answer x 3
  - Realizes different physician after 5pm
- 550pm
  - Physician evaluates, orders HCT
  - Transport unavailable
- 620pm
  - To CT but patient in scanner
- 645pm
  - HCT completed
- 715pm
  - HCT read by rads; no bleed
- 730pm
  - Rads alerts MD of findings
- 735pm
  - Neurology consulted
- 800pm
  - Neurology sees Rory

Rory's symptoms do not improve. Eventually transferred to a nursing home.

# Breakout: Team Ground Rules

- *When will we meet for coaching?*
- *How will we get work done outside of class/coaching sessions?*
- *What will allow our team to work together effectively this year?*

# Appreciative Debrief

*Share with the group 1 thing you found most intriguing  
from this session*

# CTP Session 2

Tuesday, August 26, 2025 | 1:00-5:00 PM

**New Location:**

Research Complex 2

2<sup>nd</sup> Floor

12700 E 19th Ave, Aurora, CO 80045

[CU Anschutz Campus Map](#)



# Next Steps

- We are very excited for our shared transformation journey
- The learning experience and climate rely on you as much as on the faculty
- We will set the stage for presence, growth, fun before every session
  - One of your teams will lead the session start every time to do this
  - This will happen the session after you come for pre-session coaching
  - This team gets to choose the three songs for the session
- Coaching Session 1/Homework
  - Complete your Team Ground Rules and Leadership Defined Worksheet
  - Due Session 2 (discuss with coach)

# Meet Florence

- 68 yo woman h/o afib on warfarin
- Admitted with altered mental status
- CT revealed massive intracerebral bleed
- INR 7.2
- Review of chart shows TMP/SMX given for UTI one week prior
- No INR check in past 3 months
- Care withdrawn, Florence passed away

# Evaluation





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