Communicating Critical Results:

How Our Lab Leveraged Electronic Notification with Clinical Teams to Shorten Communication Times and Improve Patient Care

Session Overview

- About Us
- Critical Results & Communication Standards
- Closed Loop Workflows & Benefits
- Atrium Health Journey
- Lessons Learned & Opportunities for Improvement
- Optimization & Next Steps

Ryan Matos

Honeydew Consulting

Atrium Health

Beaker and Reporting Contractor

- Ex-Epic reporting specialist and lab project manager with 10+ years experience in healthcare IT

- Focused interests:

    - Leveraging reports and dashboards to improve healthcare delivery

    - Lab workflow problem solving and optimizations with operational champions

Honeydew Consulting

- Boutique consulting firm of Beaker and Data Innovations experts, with 30 staff based around US

- Had 11 staff working with Atrium from 2020-2022 for multi-wave implementation across NC, GA, and AL

- Learn more at honeydewconsulting.com

Deanna Franke, PhD, DABCC

Advocate Health, SE Region

Atrium Health

Technical Director, Core Laboratory

- Possibilitarian & Passion in Partnership

- Board certified Clinical Chemist with 20+ years of experience in laboratory medicine

- Focused interests:

  - Leveraging clinical decision support for effective lab test utilization

  - Optimizing electronic delivery of laboratory results

life-changing
IMPACT

Our Culture Commitments:

- We create a space where all **BELONG**

- We **WORK AS ONE TEAM** to make great things happen

- We earn **TRUST** in all we do

- We **INNOVATE** to better the now and create the future

- We drive for **EXCELLENCE**—always

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Atrium Health
Size & Scope

70,000+ Teammates | **40** Hospitals

58 Urgent Care Locations | **42** EDs | **61** Cancer Care Locations

3,900+ Employed Physicians | **2,300+** APPs | **19,000+** Nurses

24

In One Day at AH

43,400 Patient Encounters (**1** every **2** seconds)

24,200+ Physician Visits | **3,300** ED Visits | **740+** Home Health Visits

7,800+ Unique Patient Visits | **2,700+** Virtual Patient Visits

76 Babies Delivered | **530+** Surgeries

Updated June 6, 2022

Critical Results

Standards of Communication

Critical Results & Communication

- Result that represents a life-threatening state and requires clinical intervention

- Regulatory Standards
  - Joint Commission
  - Clinical Laboratory Improvement Amendments
  - International Organization for Standardization

- Compliance driven by institutional policy
  - Immediate - Time?
  - Licensed Caregiver/Provider

Lab

RN   MD

Clinical Provider

Communication Barriers

- Use of antiquated methods:
  - Phone call
  - Pagers
- Multiple call attempts
- Distractions and Coverage
  - Benches in Lab
  - Patients on Floor
- Call numbers
  - Right floor?
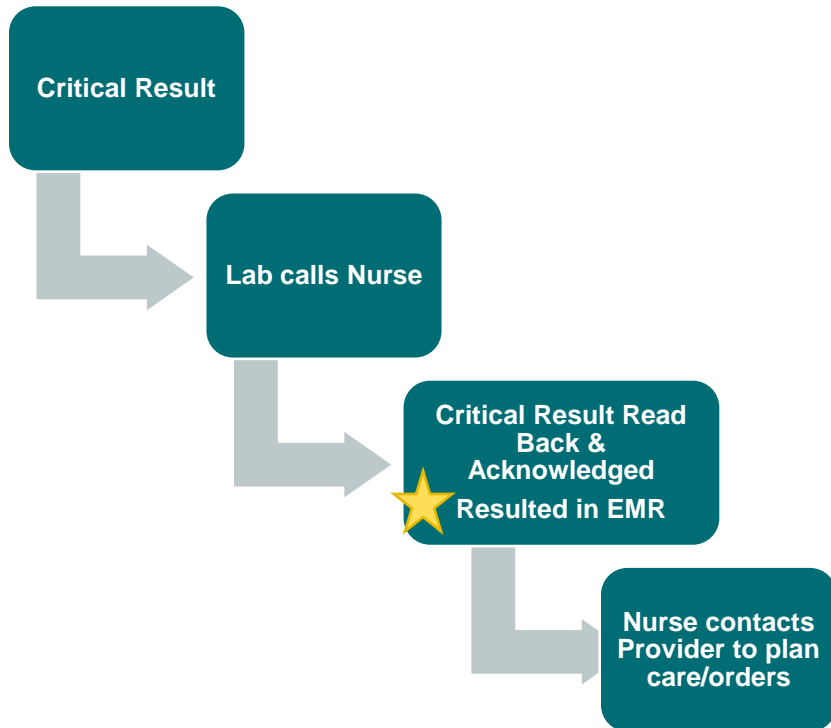 - Right nursing station?
  - Right Licensed Provider?

Historic vs Epic Closed Loop Process

Charlotte & Floyd Markets

Critical Result

Lab calls Nurse

Critical Result Read Back & Acknowledged
Resulted in EMR

Nurse contacts Provider to plan care/orders

Critical Result Resulted in EMR
- **Immediately posts to EMR**
- **Immediate push notification to Nurse and Provider**

Nurse and/or Provider can electronically acknowledge
- **Each can see if other has acknowledged**
- **If no acknowledgement by either clinical staff within 15 mins, lab calls**

Nurse reviews care plan OR contacts **provider to plan care/orders**

8-12 minutes   5-10 minutes

Historic: Delayed Action

15 minutes
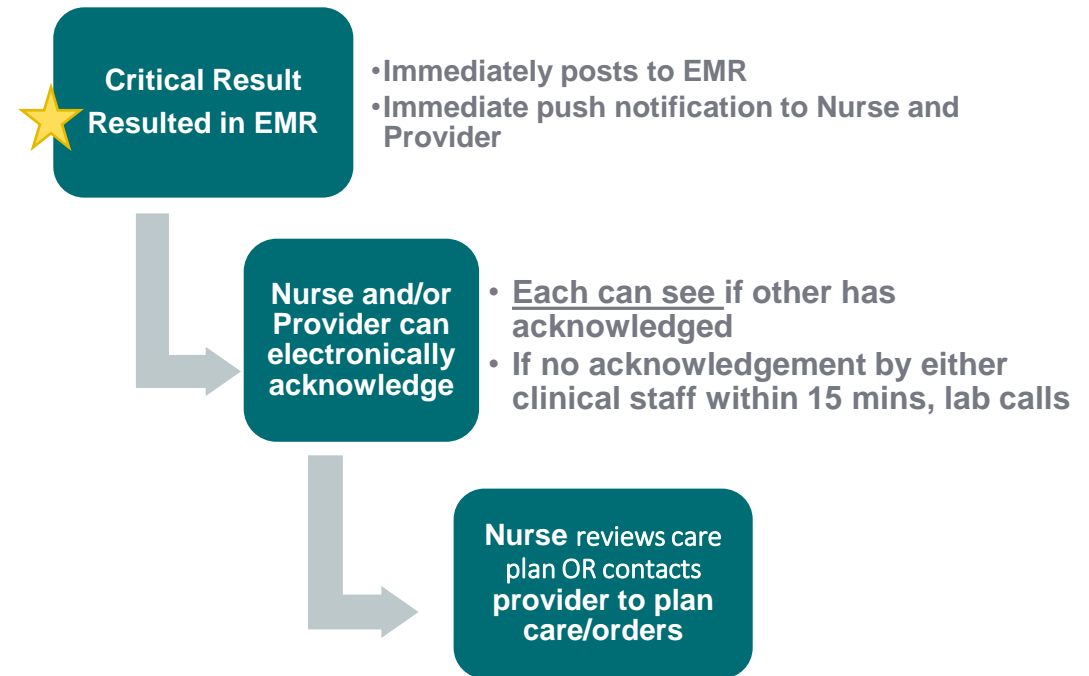
Closed Loop: Immediately Actionable

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RN

MD

MD

Everyone

Terms

- **Beaker:** Epic's LIS

- **Closed-loop critical result communication** (**CLC** for short): workflow by which clinicians are notified electronically and automatically of critical result values without lab intervention

- **Electronic acknowledgement:** a clinician's act of responding to or marking an electronic notification as "seen", closing the result communication loop between lab and clinicians

- **Comm Log:** Epic activity though which lab staff documents communication to clinicians

- **Follow-Up Work List** (abbreviated **FUWL**): Epic activity for tracking and acting upon follow-up tasks

Workflow Overview

1

Critical results
- *From instrument:* cross to Beaker and auto-verify
- *Manual entry:* enter in Beaker and verify manually

2

Critical results get follow-up task, which displays on Follow-Up Work List

3

Appropriate clinical caregivers (MD, RN) get electronic push notification and In Basket results message

4

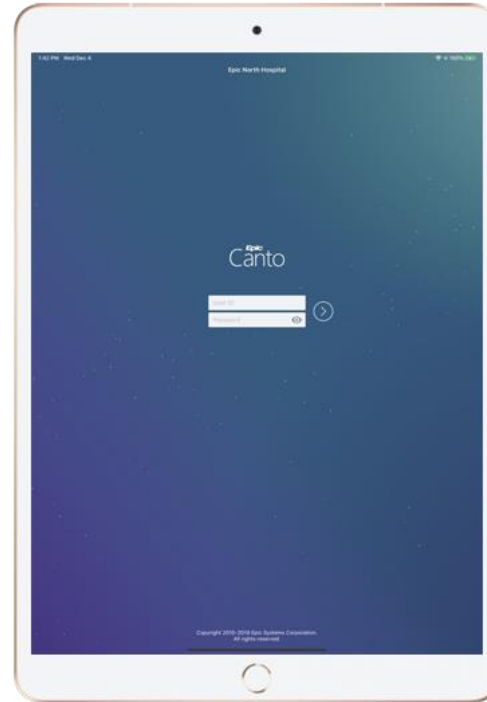Electronic acknowledgement by appropriate clinician closes follow-up task and the lab-provider communication "loop"

5

Any results not electronically acknowledged within 15 minutes – lab will call clinical caregivers and document call notes via Comm Log

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Push Notifications to Devices

| Rover & Haiku | Canto | PC - Hyperdrive |
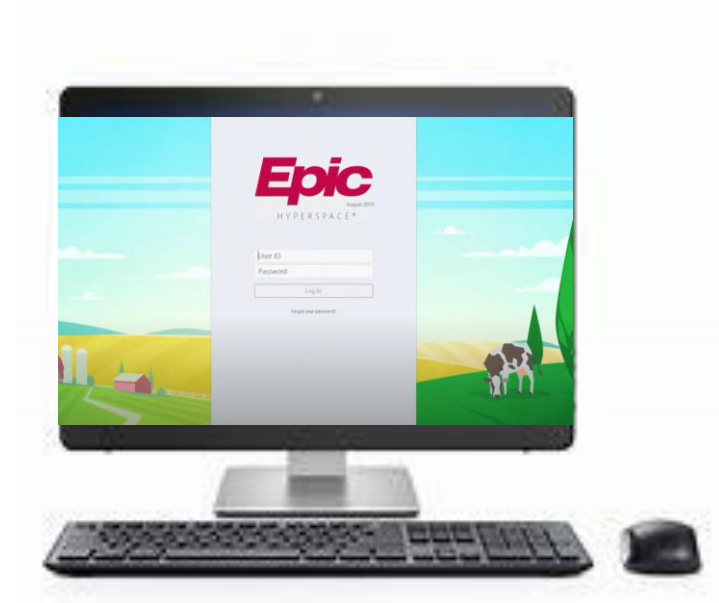
Benefits of CLC Workflow

1. Results available and actionable immediately

2. Clinical caregivers notified instantaneously and automatically

3. Reduced workload for lab and clinical staff

4. Low Implementation Risk – Safeguard = FUWL

Regulatory Concerns?
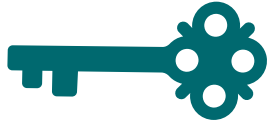
Policies in place and ensure practice follows policy

COLLEGE of AMERICAN PATHOLOGISTS

REVISED 10/24/2022
COM.30000   Critical Result Notification

The laboratory <u>immediately</u> notifies physicians or other clinical personnel responsible for patient care when results of designated tests exceed established "critical" values. Records of notification are retained.

An appropriate notification includes a <u>direct dialogue</u> with the responsible individual or an <u>electronic communication</u> (eg, secure email or fax) with confirmation of receipt by the responsible individual.

The Joint Commission

2023 Hospital National Patient Safety Goals

Improve staff communication

NPSG.02.03.01

Get important test results to the right staff person <u>on time</u>.

ISO 15189 - Medical laboratories — Requirements for quality and competence - requirement that critical values are notified <u>urgently</u>

Atrium Health Laboratory- Charlotte Region: Critical Result Communication

1.0 Purpose

This standard procedure outlines steps for critical result communication to appropriate caregivers for safe care of patients within AH Charlotte Region. All critical results at AH Charlotte Region Laboratory locations will post the patient chart immediately. Procedure outlined includes explanation of closed loop critical and Comm Log workflow processes and includes steps required for appropriate documentation of critical result(s).

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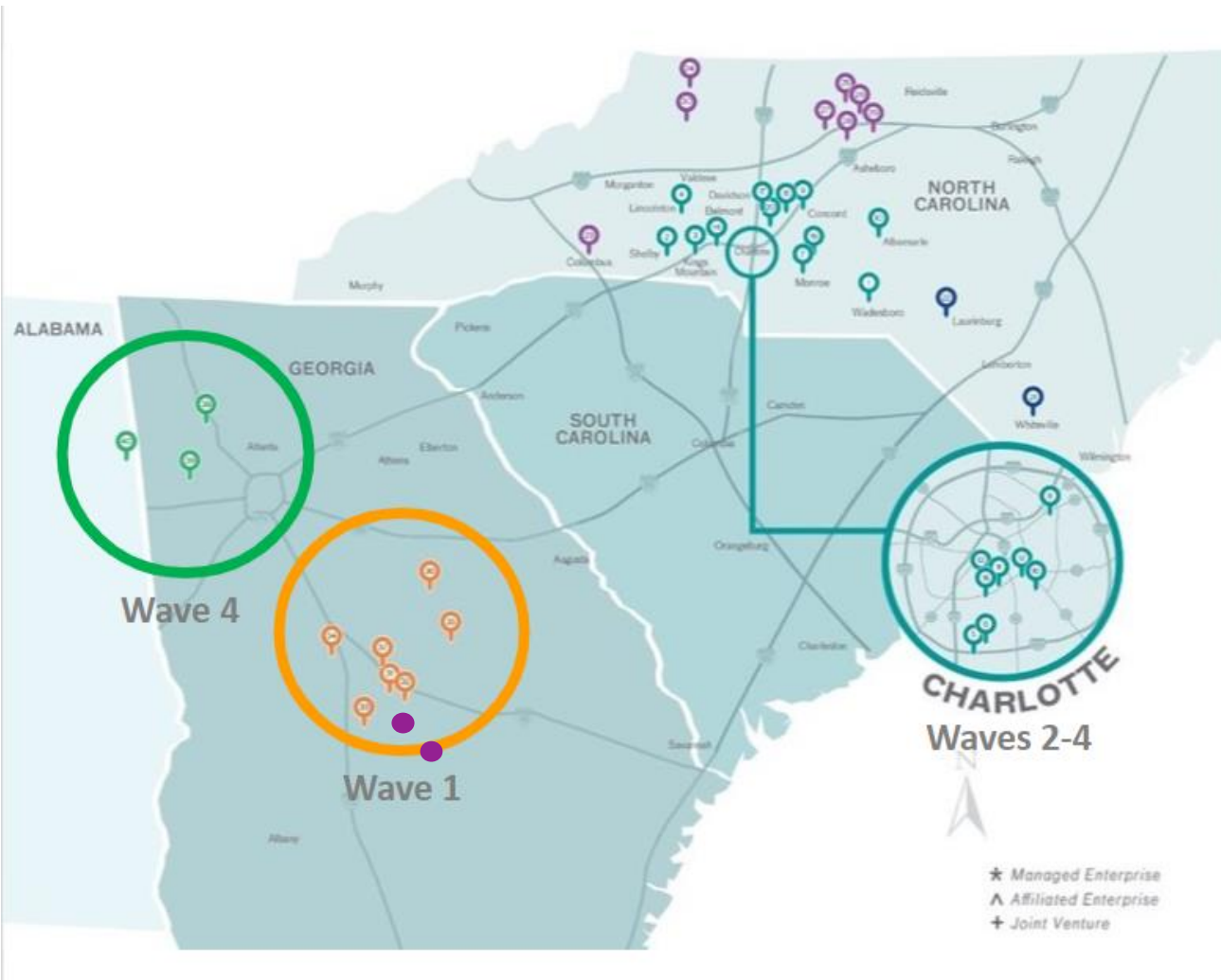
Critical Values Policy

Approval Date: 03/24/2022

Policy & Clinical Practice Guidelines

CRITICAL VALUES

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Atrium Health – Facilities and Locations

Wave 1:
- **Navicent Market – Central/South Georgia (3)** ❌

Waves 2-4:
- **Greater Charlotte Market (20)** ✔

Wave 4:
- **Floyd Market – NW Georgia/NE Alabama (3)** ✔

Future Waves:
- **Wake Forest Baptist Market – North Central/Western NC (7)**
- **Houston (2)**

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The Decision to Move

- Lab champion to drive change

- Decision Document

- Stakeholders
  - IAS Clinical Medical Executive Leaders
  - CLIA Medical Directors

- Consensus Governance Meetings

Atrium CLC Timeline

Starting in 2019…

Implementation & Pivots

Making the Decision

- Which labs are signing up?
- Who gets notified electronically?
- Who can close the communication loop?
- IP, OP, or both?
- When should lab call if no acknowledgement?

Wave 2 – Dec 2021

- Workflow diagram
- Build and thorough testing
- Notifications to providers only – attending+ auth/ord
- Tipsheet/Education Audit reports

Lab Scope
- 3 ACFs, 1 FSED

Wave 3 – April 2022

- Retooled who gets notifications: added First Contact and Nursing
- Logic to exclude Core Lab

Added Lab Scope
- +2 ACFs, 1 FSED, including level 1 trauma center + pediatric hospital

Wave 4 – Aug 2022

- Made list of ED providers more targeted
- Audit reports front and center for lab and nursing

Added Lab Scope
- +10 ACFs, 6 FSEDs

Dec 2022

- Nursing can close loop on Rover

Future

- Core Lab
- Wake Forest
- Navicent
- Houston
- *Undoubtedly others*

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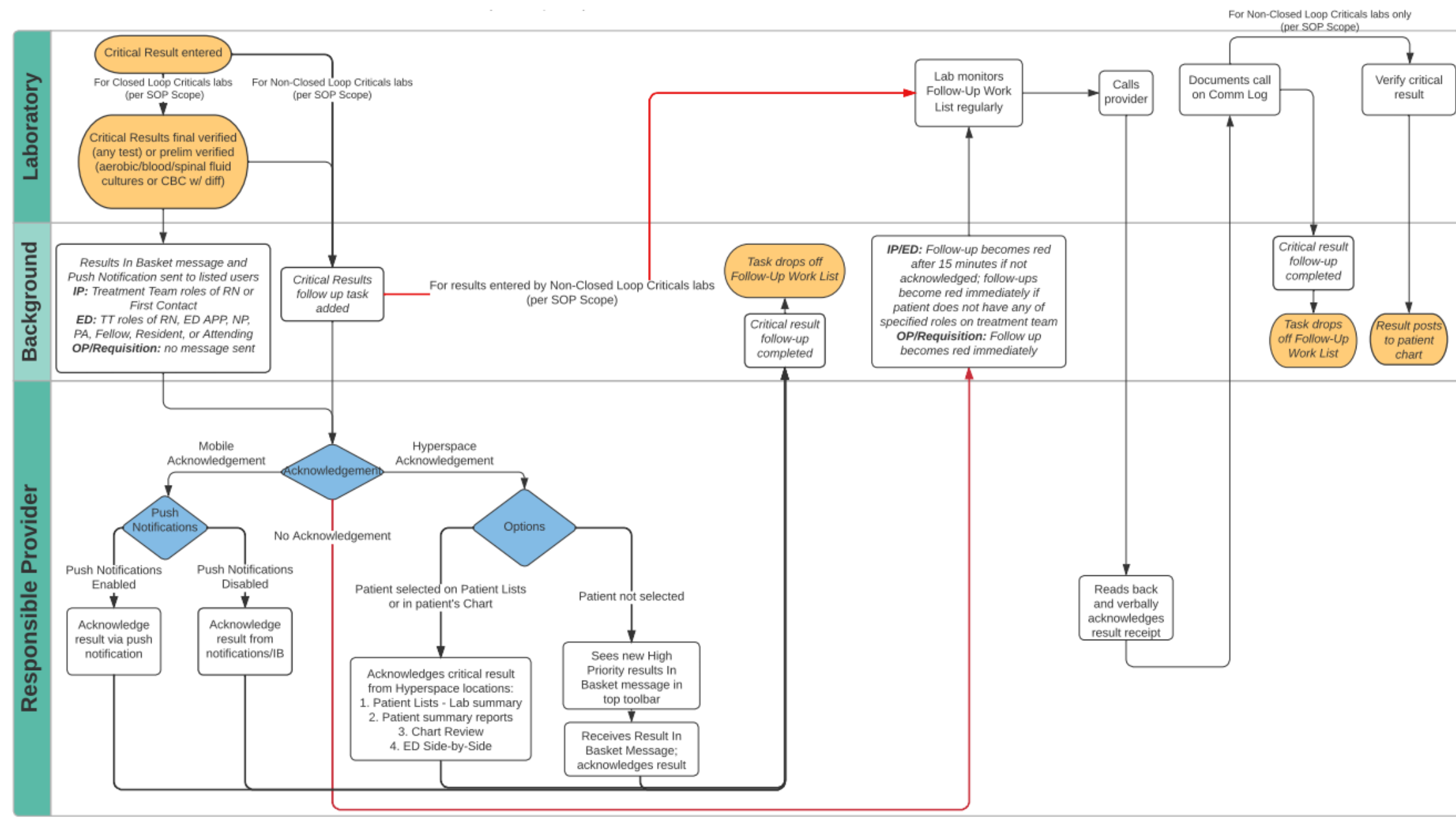
Who Gets Notifications and Can Close Loop?

	Term	Definition	Receives Notification	Can Close Loop
ED	Treatment Team providers (actively assigned to patient)	ED APP, NP, PA, Fellow, Resident	Yes	Yes
	Authorizing provider (if not assigned to patient TT)	ED APP, NP, PA, Fellow, Resident	No	Yes
	Attending provider	Active Assigned	Yes	Yes
	RN, LPN (actively assigned to patient's TT)	Active Assigned	Yes	Yes
IP	**First Contact** (actively assigned to patient's TT)	Active Primary	Yes	Yes
	Authorizing provider	NP, APP, Fellows	No	Yes
	Attending provider	Active Assigned	No	Yes
	Ordering provider	Residents	No	Yes
	RN, LPN (actively assigned to patient's TT)	Active Assigned	Yes	Yes

Setting Sites Up for Success

- Audit reports for follow-up completion and TAT front and center on lab KPI dashboards

- Nursing audit reports by collection unit and hospital

- Education – in person training, tip sheets

Critical Result Calls/Acknowledgement (Past Week)

Last Refresh: 05:02:09 PM

Critical Result Calls/Acknowledgement (Today)

Last Refresh: 05:01:57 PM

Report completed: Sun 4/23 05:01 PM

This component shows the number of critical calls and compliance for tests verified today at the logged-in lab.

AH Lab Critical Results FUWL Completion Type	Critical Tests	% of Group
∨ Comm Log	7	58 %
<=15 min	4	57 %
15-60 min	3	43 %
>60 min	0	-
∨ Provider Acknowledgement	5	42 %
<=15 min	4	80 %
15-60 min	1	20 %
>60 min	0	-
Count unique values	12	-

Lessons Learned & Opportunities for Improvement

What Closed Loop – by Wave

WAVE 2 (12/4/21 - 4/3/22)
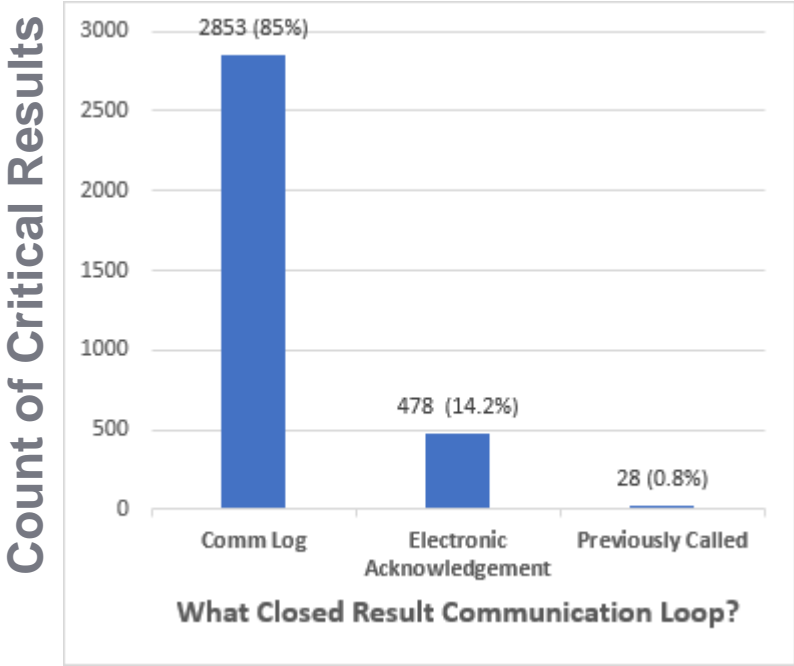
WAVE 3 (4/4/22 – 8/5/22)
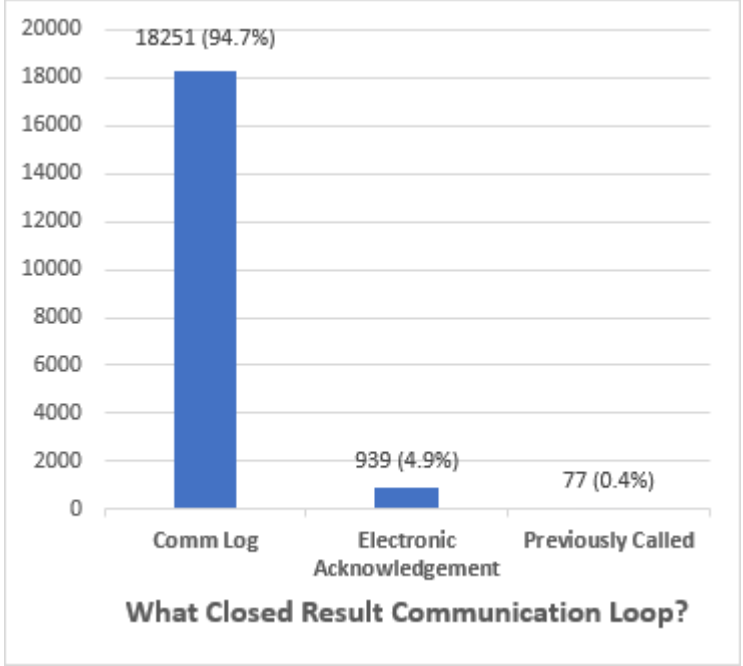
WAVE 4 (8/6/22 – 4/15/23)
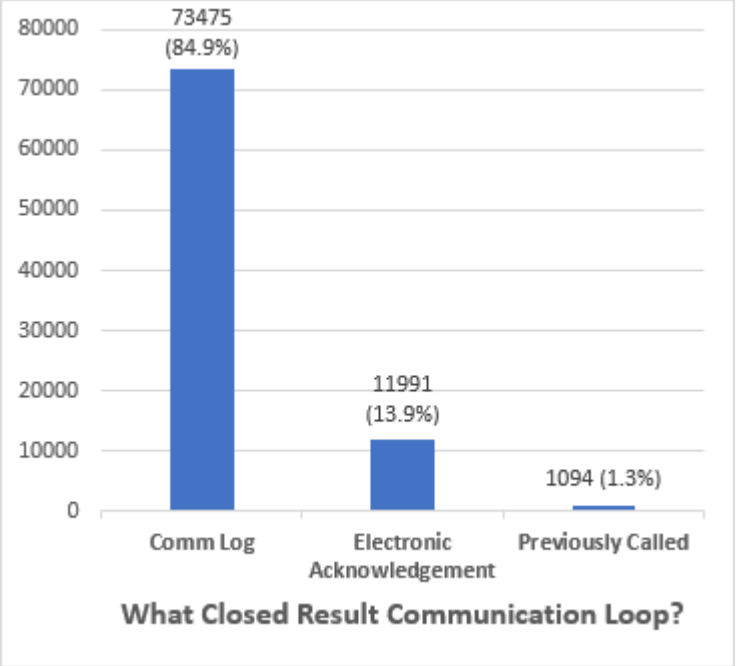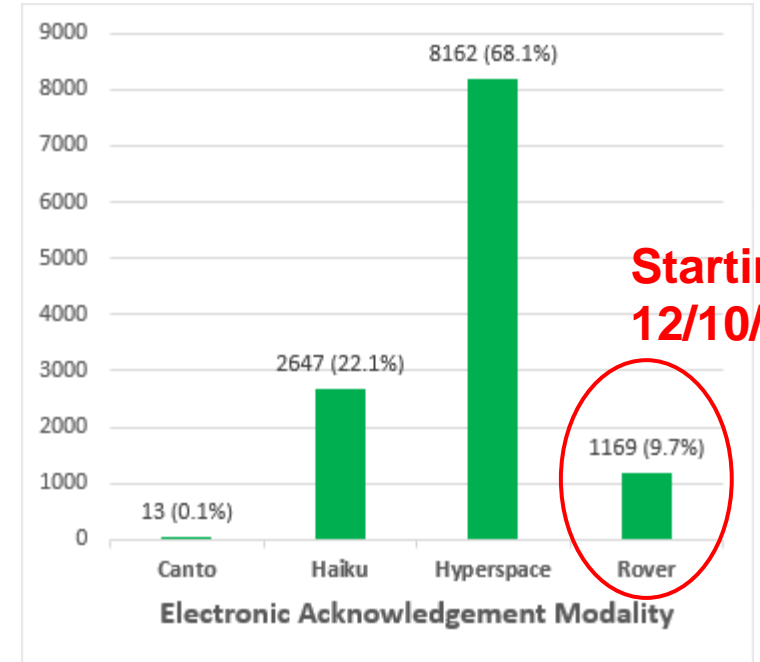
Electronic Ackn Modalities – by Wave
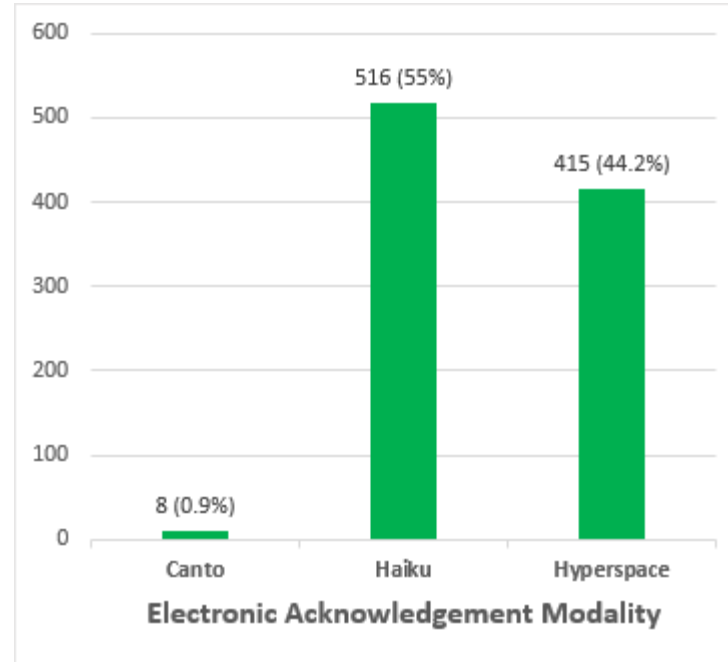
Follow-Up TAT (Open-Close) – by Wave

Lessons Learned

Expect a steep learning curve
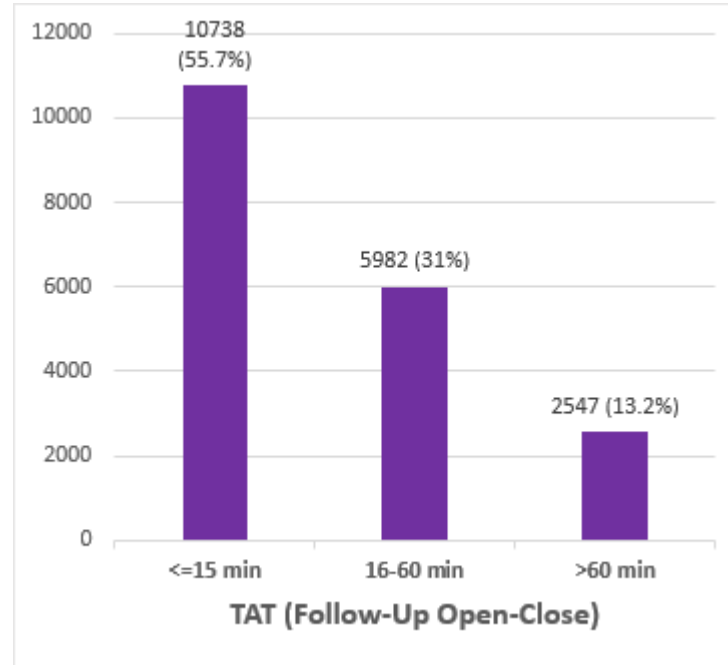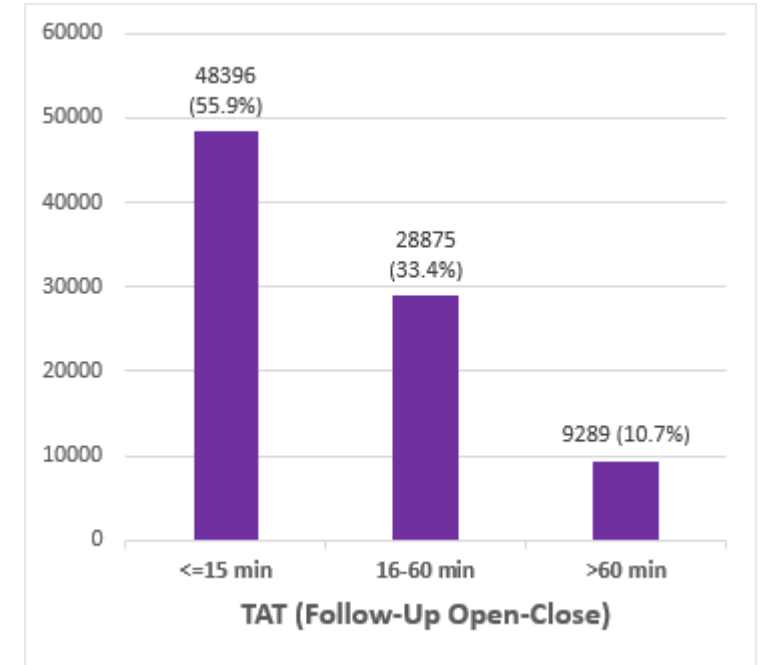
- Notification:
  - No retraction
  - Key targeting – notifying the correct clinician(s)
- Recognition failure of what action actually closed the loop
- Addition of Trackboards in lab
- Education and learning curve
- Audit Data – low adoption rate
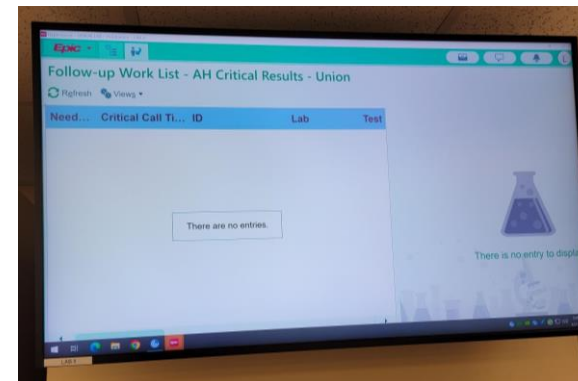
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Home > Tools > Business Tools > Encompass > Rover Challenge

Encompass

- Encompass Education
- Epic Implementation
- Encompass Status and Downtime
- Support
- Rover Challenge

Rover Challenge

⚠️ Red Rover Challenge ⚠️

Red Rover, Red Rover send those critical results right over!

Did you know that laboratory critical results can be delivered to patient care teams using automated, electronic notification and acknowledgement capabilities in Encompass – and they can be sent right to your Atrium Health mobile device? Recent monitoring shows it's only being used 20% of the time. That means 80% of the time Lab Services is picking up the phone to track down the care team.

But there's a better way – and we want more teams to learn about it.
Nursing leaders and Clinical Informatics Coordinators have launched a focused education and adoption campaign to increase electronic acknowledgement of critical laboratory results using Rover. They're calling it the Red Rover Challenge.
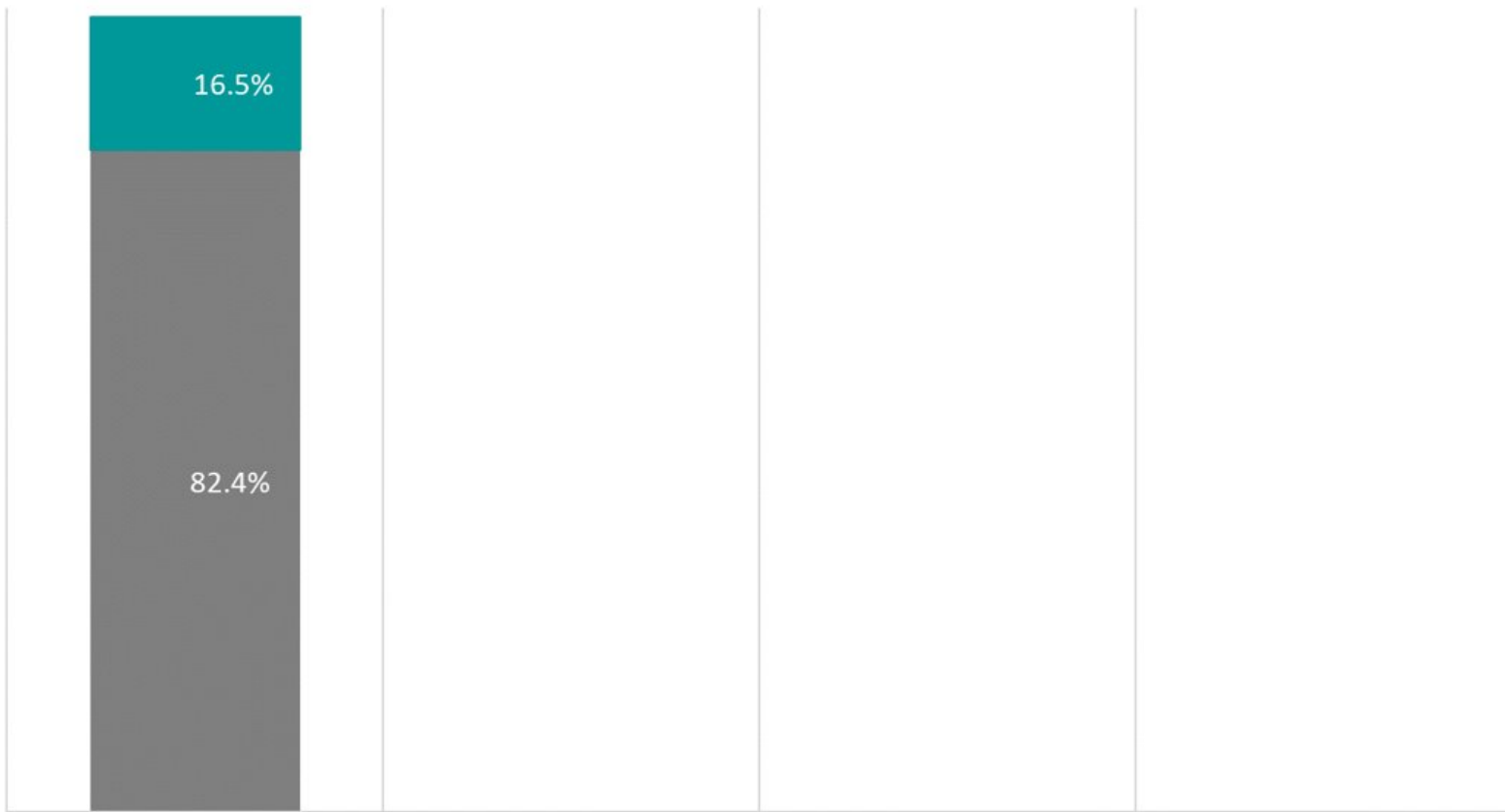
Here's how it works:

- Red Rover Challenge will focus on the following metric tracking per facility throughout 2023

-

Red Rover Challenge	Round 1	Round 2	Round 3	Final
System Goals	25% electronic acknowledgement modality- any	50% electronic acknowledgement modality any	75% electronic acknowledgement modality - any	
Facility Goals	Improve 15% from Facility Baseline and sustain - Rover	Improve 30% from Facility Baseline and sustain - Rover	Improve 60% from Facility Baseline and sustain - Rover	
Baseline	**Round 1**	**Round 2**	**Round 3**	
Monthly Stats: Dec 2022 Jan 2023 Feb 2023	Monthly Stats: Mar 2023 Apr 2023 May 2023	Monthly Stats: Jun 2023 Jul 2023 Aug 2023	Monthly Stats: Sept 2023 Oct 2023 Nov 2023	Dec 2023 Publish final metrics and close out the challenge

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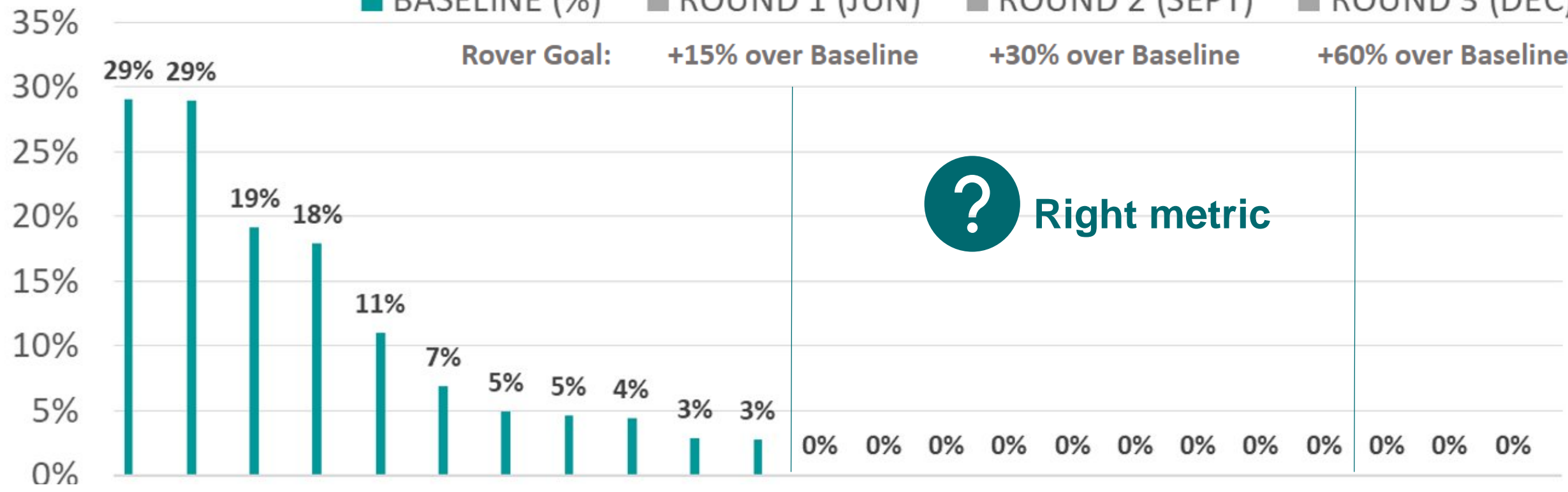
"Marketing" The Closed Loop Workflow

- Epic estimates only a handful of customers are pursuing or live
  - Requires Beaker implementation

- Technical improvements needed to make workflow more attractive

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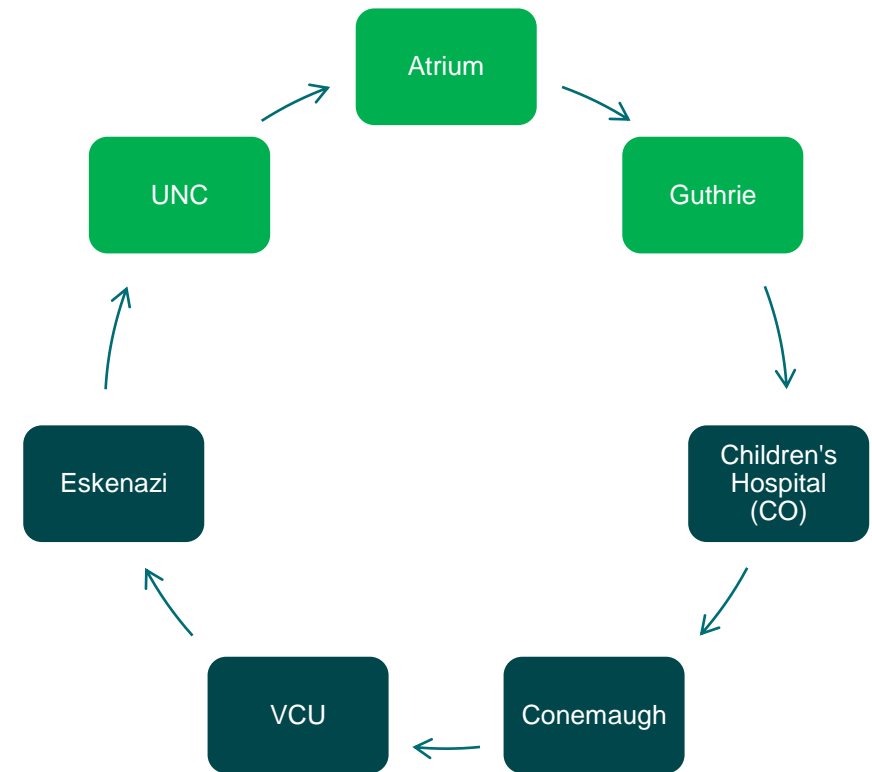
What's Next
Optimizations and Development

Optimizations vs. Development

Optimizations – change is technically possible, but requires research/implementation

Development – not technically possible; partnership with Epic

Optimizations in Progress

- Handling for repeat critical results within specific time range that may not be clinically significant (e.g. hourly critical troponins)
  - Epic has native support for phone call/Comm Log, but only a workaround for CLC

- Improvements to suppression of duplicate follow-ups for microbiology (e.g. critical gram stain, but then no critical organism cultured)

- Implementations
  - Core Laboratory (Charlotte regional reference lab)
  - Wake Forest
  - Navicent – Wave 1?

Development: Epic R&D #1

Issue: Notification Acknowledgement Synchronization

- If one user electronically acknowledges and closes the loop, that action does not retract the notification or mark as complete for others who received it
- Similarly, if lab closes the loop via phone call/Comm Log, that action does not retract the notification or mark as complete for others who received it

Mitigation in Place:

- Electronic acknowledgement and Comm Log information displays in notifications, In Basket, and other areas of Hyperspace

Development Goal:

- Seamlessly retract or automatically close notifications/IB messages if loop is closed via electronic acknowledgement or lab Comm Log

Development: Epic R&D #2

Issue: Unify Acknowledgement UI

- UI to electronically acknowledge results is not the same across acknowledgement modalities. Depending on modality, UI displays "Done", "Accept", "Mark as Reviewed", "Acknowledge" – confusing to end users

Mitigation in Place:

- Training only

Development Goal:

- Unified UI across activities with visual cue (such as green check mark)

Development: Epic R&D #3

Issue: Streamline ED User Acknowledgement

- Currently no ability to acknowledge results from the Workup sidebar on ED Trackboard in Hyperspace, an activity heavily used by ED staff
- Additional request for a column that would display whether patients have critical results not yet acknowledged

Mitigation in Place:

- Non-intuitive, multi-click workaround

Development Goal:

- Extend electronic acknowledgement to Workup tab in intuitive fashion
- Create column requested above

Development: Epic R&D #4

Issue: Improve result routing

- Current technical limitations of result routing scheme prevent more targeted notifications
- Example:
  - If patient has active attending provider, send critical result notification to attending provider
  - If no active attending provider, send to other treatment team role X
  - If no active treatment team role X, send to other treatment team role Y

Mitigation in Place:

- Notifications sent to all specific clinicians actively on patient treatment team

Development Goal:

- Technical structure facilitating tiered/targeted notifications

Conclusion

- Critical Results & Communication Standards
- Closed Loop Workflows & Benefits
- Atrium Health Journey
- Lessons Learned & Opportunities for Improvement
- Optimization & Next Steps

Continuous lookback and improvement → how can we optimize the tool to improve utilization?

Acknowledgements

- AH IAS Beaker Team
  - Stephanie King, Director
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- AH IAS Executive Team
  - Andy Crowder – CIO
  - Matt Sullivan, MD - CMIO
  - Dawn Ross, Chief Clinical Informatics Officer
  - Pamela McCreary – VP, Clinical Applications
  - Rich Albarran – VP, Enterprise Implementation & Integration

- AH Lab Operations Directors and Teammates

- AH Nursing Leadership Teams & Nurses

- Atrium's Epic IS & TS

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