From Building to Bedside:

How smart hospital design supports exemplary patient experiences, always.

Denise Hardenne, President & CEO, Halton Healthcare
Bill Bailey, Vice President of Redevelopment, Halton Healthcare
Sandy Saggar, Chief Information Officer, Halton Healthcare

Agenda

About Halton Healthcare

Building & Design

Enabling Technologies

Questions

About Halton Healthcare

Denise Hardenne

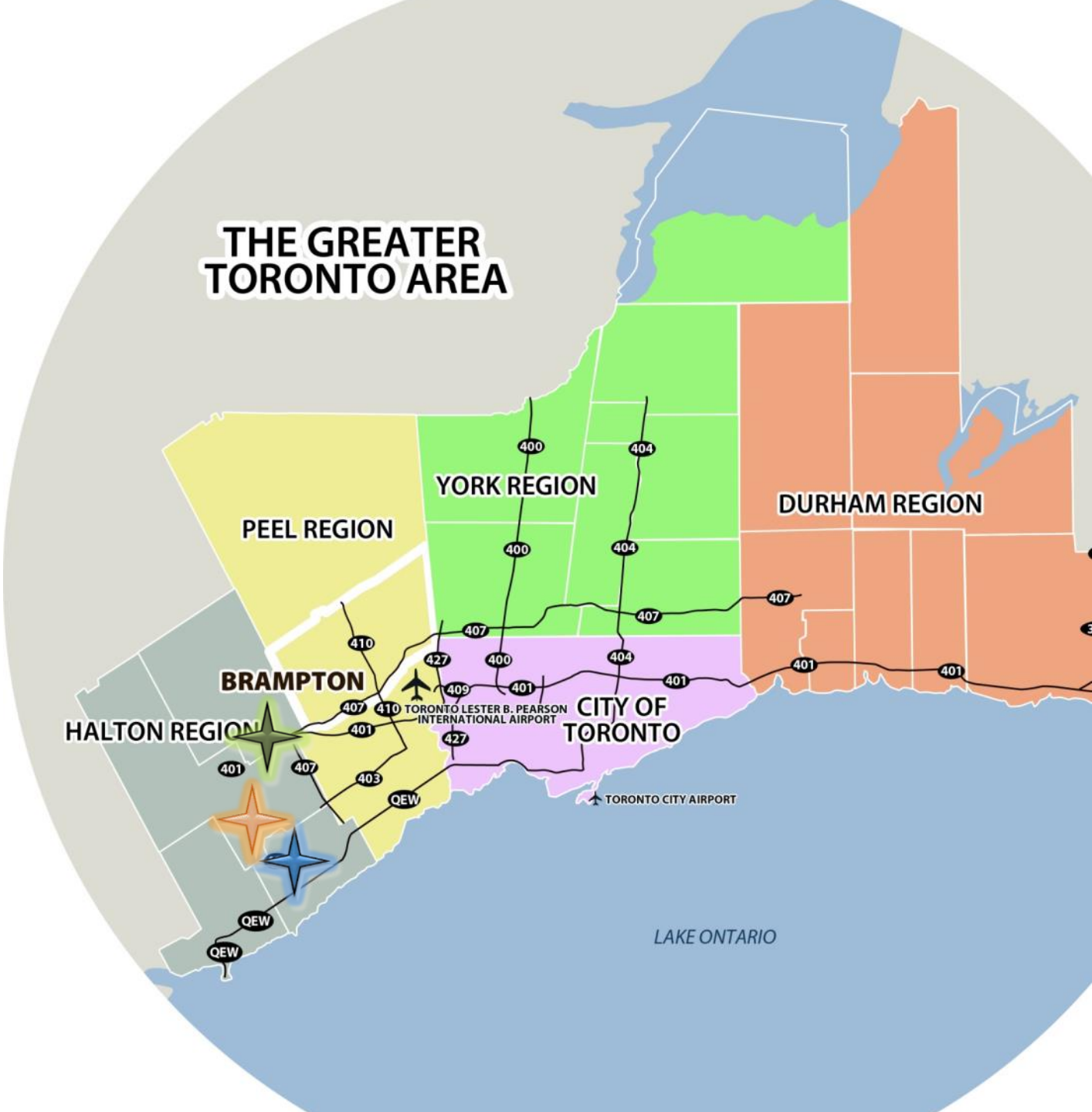
President & CEO

Location

Oakville Trafalgar Memorial Hospital

Milton District Hospital

Georgetown Hospital



Trifecta of Hospital Infrastructure Projects

OTMH
$2.7B

$3.36
Billion

GH
$.015B

MDH
$.5B

Our Capital Projects

Georgetown	Oakville	Milton
		
2013	**2015**	**2017**
• Level 1 community hospital • Brownfield • ED/CT expansion • DI renovation • 17,300 sq. ft.	• Level 2 community hospital • Greenfield • Expanded & new services • 1.6M sq. ft.	• Level 1 community hospital • Brownfield • Expanded services • 330,000 sq. ft.

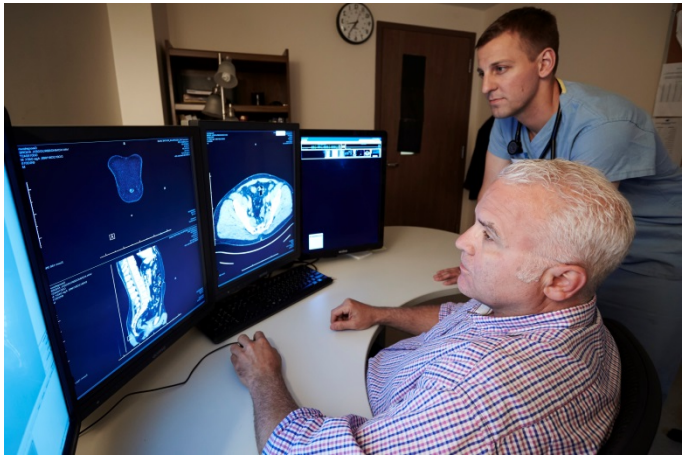
Halton Healthcare

Amazing people:

- 3,659 staff
- 305 physicians
- 1,582 volunteers

Providing exemplary patient experiences, including:

- 142,051 emergency department visits
- 25,212 admissions
- 38,309 surgeries
- 3,273 babies delivered
- 146,940 outpatient clinic visits
- 2+ million laboratory tests



Lessons Learned

- Establish an effective governance structure
- Develop and foster relationships with the community and municipality

Jason's Journey

Building & Design

Bill Bailey

Vice President of Redevelopment

Vision

"To create with and for the Community, a distinctive centre of healthcare excellence that provides, through the efficient use of resources, the highest quality of clinical patient-centered care to the Community within an innovative environment that supports the physical, mental, emotional and spiritual needs of the Community."

New Oakville Trafalgar Memorial Hospital

- Opened on December 13, 2015
- One of the largest infrastructure projects in Ontario
- 1.6 million sq. ft. on a 50-acre greenfield site
- Total contract cost after 30-years is approx. $2 billion
- Equivalent to approx. $2.7 billion (2011 dollars)
- 80% single-patient rooms
- Capacity for 457 beds with built space for 602 beds
- Three MRIs and two CTs
- Flexibility to grow through thoughtful planning and strategic use of "soft space“


To Main Entrance
Emergency Department
Dundas Street
Third Line

500kW Solar Array


Cafeteria Courtyard


Outpatient Rehabilitation Courtyard


Third Floor Courtyard

Main Lobby

Information Desk

Outpatient Waiting Space


Hallway from Emergency Department

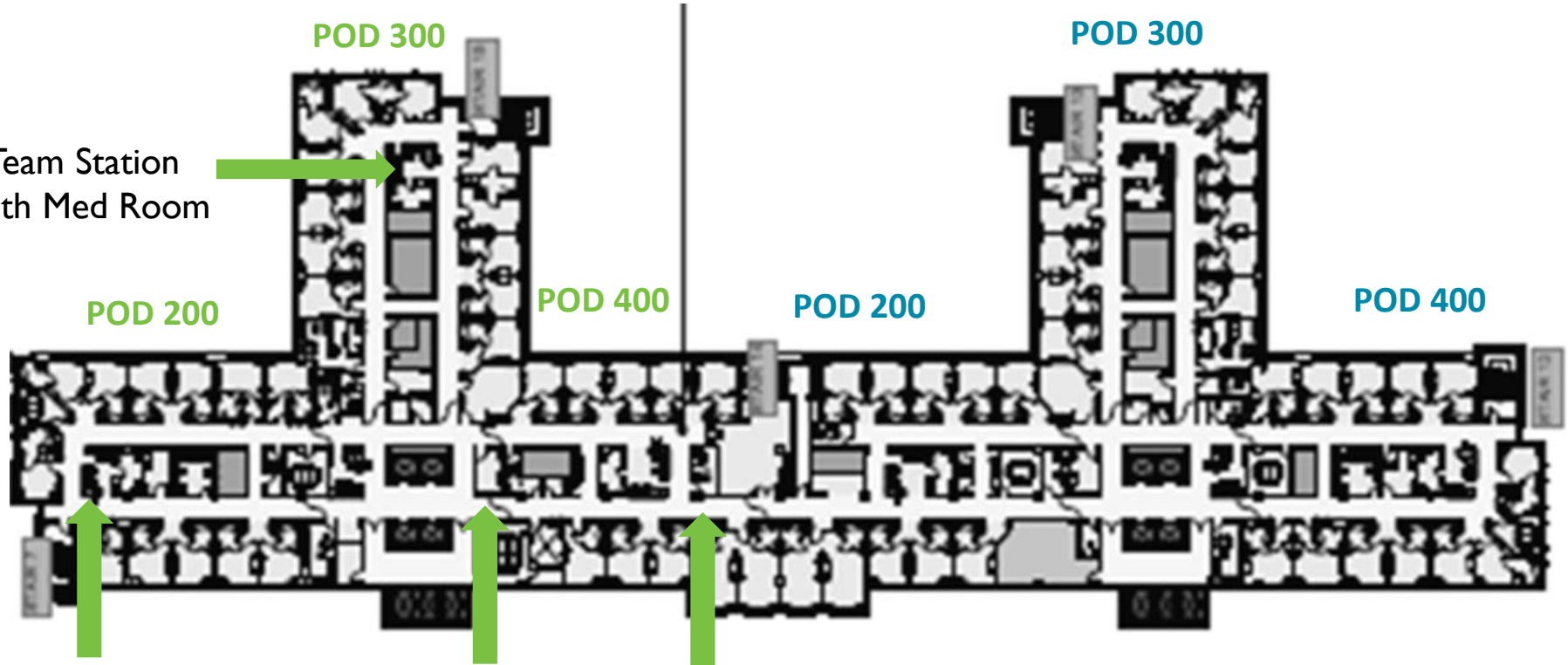
Emergency Department Trauma Room

Special Care Nursery Bassinet

Single Patient Room

Inpatient Unit Design

- Each POD has 12 beds and each unit has 36 beds



Integrated Pneumatic Tube System

- More frequent sending of specimens
- Nursing-based vs. lab team model of specimen collection
- Quicker receipt of blood products & pharmaceuticals
- Robust software backbone monitors performance of the system,
- Security features, delivery verification
- Preservation of specimen integrity

Integrated Pneumatic Tube System

- 79 integrated tube stations
- Approved lab specimens, blood products, approved pharmaceuticals, paper
- Travel rate up to 25 ft/sec
- Express technology stations located in Lab & Pharmacy
- Simulation studies performed based on 400 transactions/hr over 24 hrs

Bedpan Sanitizer

Lessons Learned

- Create an organizational understanding, capacity, and capability for the delivery of AFP projects
- Champion good design and user engagement
- Deliver a truly "substantially complete" facility with minimal deficiencies
- Establish the procurement process and roles between all parties for equipment procurement
- Resource internally to plan, manage, implement, and accept large volumes of equipment

Enabling Technologies

Sandy Saggar
Chief Information Officer

Major Achievements

- Over 90 IT projects implemented by opening day
- Over 10K devices deployed and activated on the network
- All staff and physicians trained on systems
- Seamless migration of over 400 servers from legacy to new data centre (no downtime!)
- Tracked patient move between sites through corporate patient flow system
- No major system issues on opening day and beyond
- Opened up new hospital safely for our patients

ICAT Strategy & Standards

- Smart Hospital Design and Technologies
- Single, converged, highly availability network
  - All hospital systems – EMR, Imaging, Building Automation, Security, Life Safety, Biomed equipment all reside on shared network
- Standardization on IP-based systems
  - All systems must use Internet Protocol to facilitate interoperability with other systems
- Middleware/ESB (Enterprise Service Bus)
  - Vendor/device agnostic hub for routing and applying business intelligence to messages from disparate systems

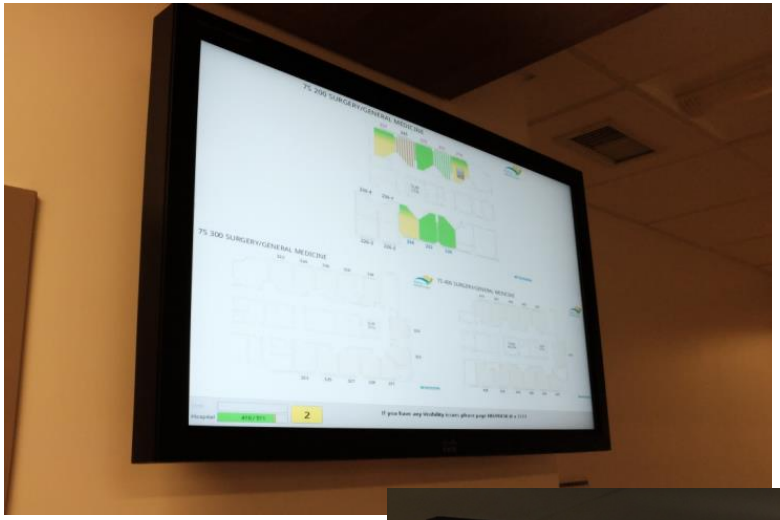
ICAT Strategy & Standards

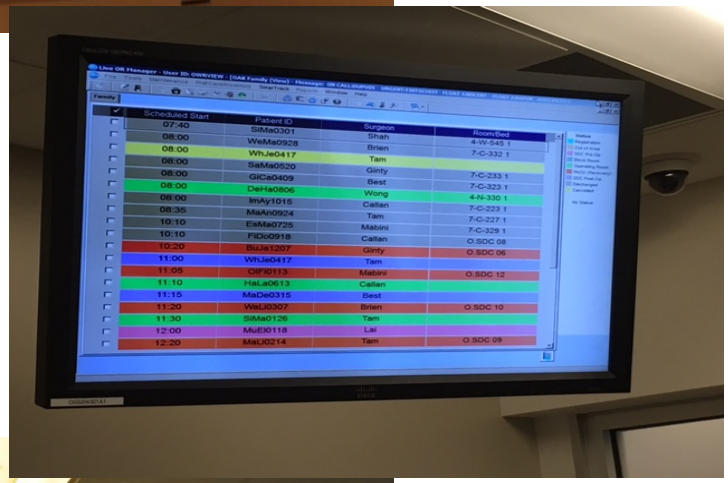
- Desired future
  - Infrastructure capable of accepting future systems
  - Integrated and automated
  - Support future state workflows
  - Phased deployment/expansion
- Homogeneity of ICAT systems
- Interoperability
- Disaster Recovery

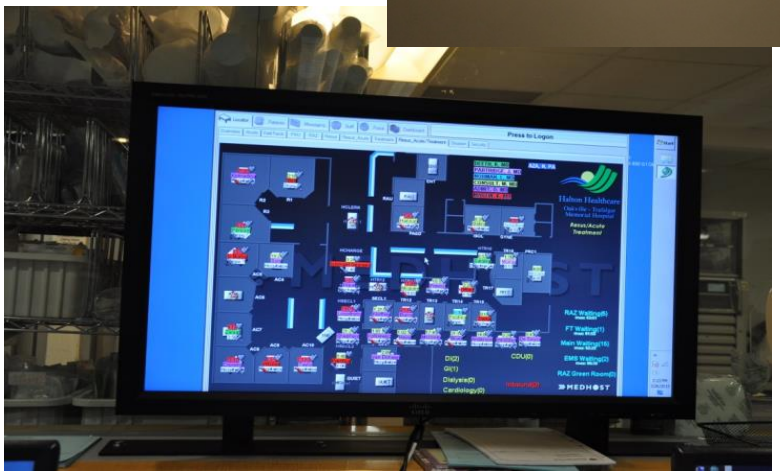
Building Systems

Patient Flow Systems

- Information is displayed on strategically placed large LCD monitors
- Shows patient location, status and clinician assignments
- Shows room status for Housekeeping and Admitting
- Improved visibility of operations and conserves time for all staff and physicians
- Separate specialized systems for Inpatient Units, Operating Room and Emergency







Patient Facing Technology

Interactive Bedside Terminals

- Light and Temperature Controls
- Patient Entertainment
- Food Ordering
- Disease-specific education delivery

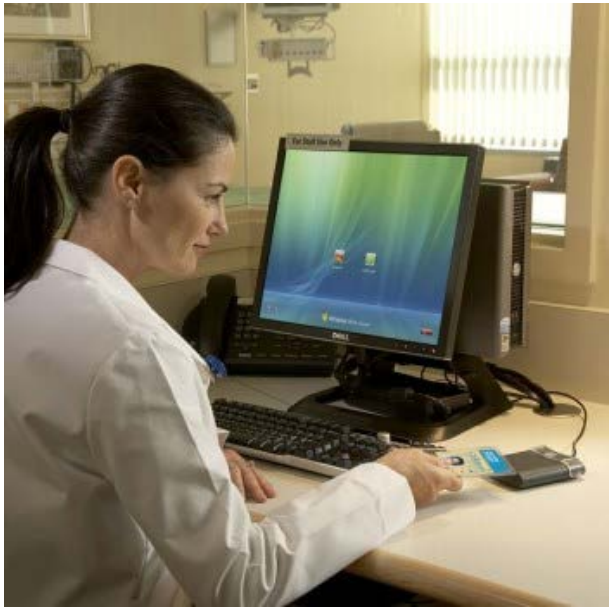
Wayfinding Kiosks

Biomedical Integration

- Physiological Monitors, ECG carts, Telemetry packs, Vital signs machines
- Clinical values can be transmitted over the network to the EMR
- Eliminates data entry time and reduces transcription errors
- Alerts/alarms are sent to mobile phones

Single Sign-On/Persistent Computing

- Use Tap in/out functionality
- Same ID badge for parking, security access, system login, printing
- Uses Thin Client Architecture where sessions are hosted on central servers in Data Centre
- Persistent/Roaming session internal and external to hospital
- Reduce issues with password/login management
- Over 2200 enrolled physicians and staff
- 150-200K logins per week
- 110-150K application events per week
- Efficiencies include login time, roaming, application access, ~5-10 minutes per staff per shift



Single Sign-On/Persistent Computing

"**On a typical day, a physician will access 15-20 different computers logging into 4-5 applications multiple times**. Single sign-on streamlines this process by having the user tap their access card to sign into the computer and it looks after logging into various applications. When a physician taps into a computer, they are presented with their virtual session. All their favourite clinical tools and files they are working on are where they have left them. No more playing "Where's Waldo" with misplaced icons. These are significant timesavers for us. **More importantly, these technologies let us keep our clinical train of thought instead of being interrupted with icon hunting, usernames and passwords**. This is technology as it should be. It adds value with minimal effort from the user."

- **Dr. Allan Lee, Chief Medical Information Officer and Hospitalist**

Follow Me Print Service

- Print on demand service wherever and whenever needed
- Convenient and efficient for staff
- Automatically purge print jobs not needed
- Ability to strategically deploy printer resources
- Reduction in printers from 678 to 350
- Over 800K sheets of paper saved (over 2700kg of paper)
- Over 13000 litres of water saved
- Over 30000 KW/h of energy saved
- Over 7800 Kg carbon dioxide not emitted

Mobility, Alarm Propagation, Messaging

- Converged Network and IP Standardization allow any system to communicate with any device
- New workflows can be developed based on intercommunications between systems
- Staff no longer travel to get information – information travels to them
- Nurse call, smartbed alarms, patient elopement, duress, clinical alerts, workflow messages are all sent to appropriate staff with embedded escalation routines

Integrated Building and Clinical Alerting

20 Disparate Systems

Austco

AeroScout

Honeywell Building Controls

Connexall®
A BETTER WAY TO WORK

18,692 Washroom Alarms

1,465 Code Blue Alarms

7,539 Staff Assist Alarms

110,780 Patient Call Alarms

907 Temperature Alarms

228 Patient Wander Alarms

61,492 Bed Exit Alarms

Staff no longer travel to get information – information travels to them

Exemplary Patient Experiences, Always

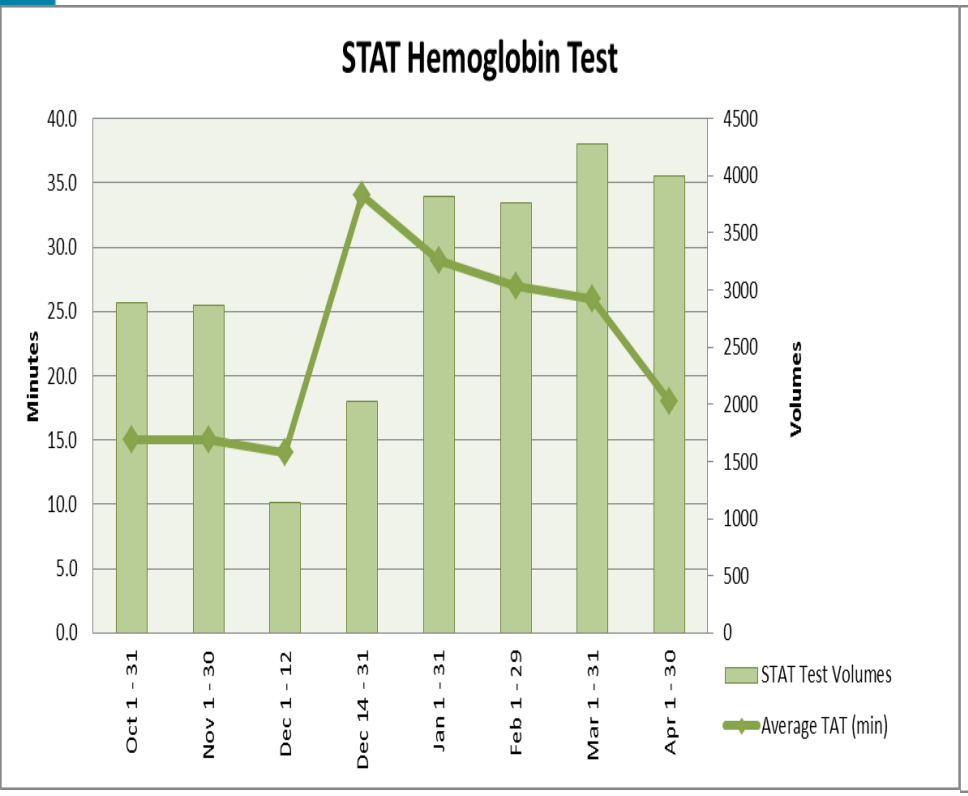
- Conduct Patient Surveys

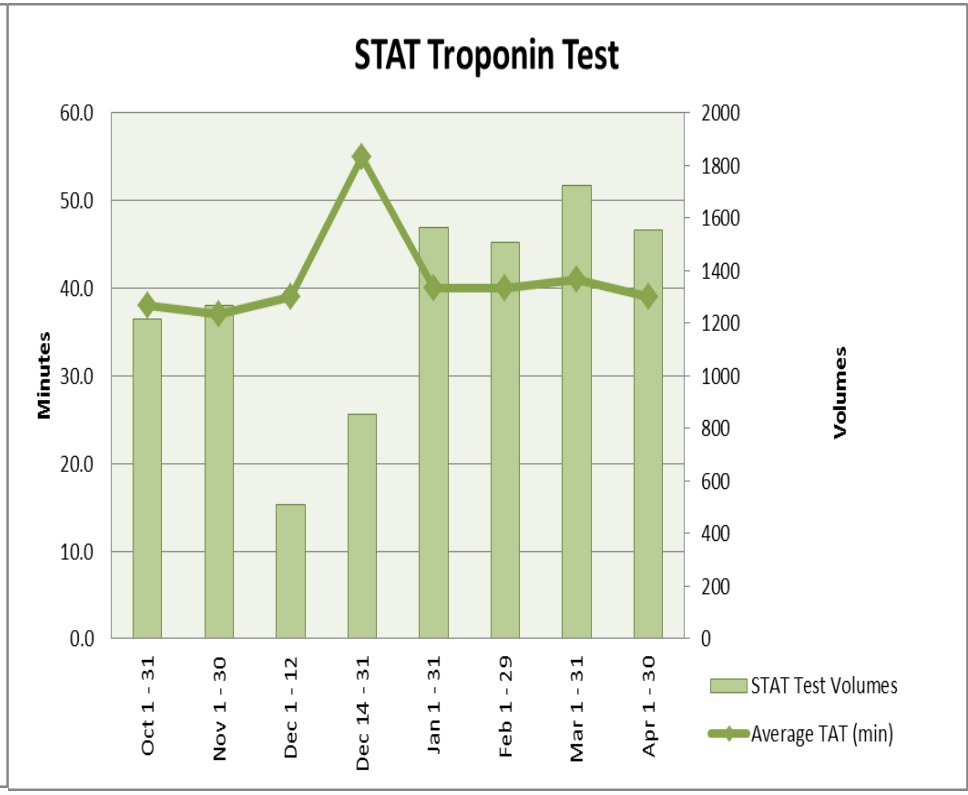
In general, after you used the call button, was the time you waited for help reasonable?

In the 3 months post move into the new hospital:

50% increase in satisfaction rates

Lab Automation

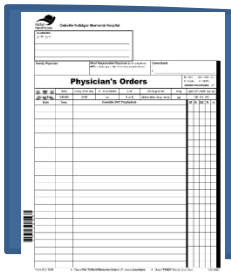




- ~42% and 27% respective increases in volumes post move to the new hospital
- Significant improvements in turnaround time despite these volume increases
- Staff continue to work on improvements and changes to processes to gain even further efficiencies

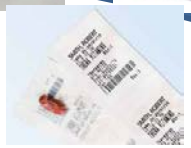
Medication Management

Physician Order sent to Pharmacy



Over 40,000 Orders

Order Filled via Automation



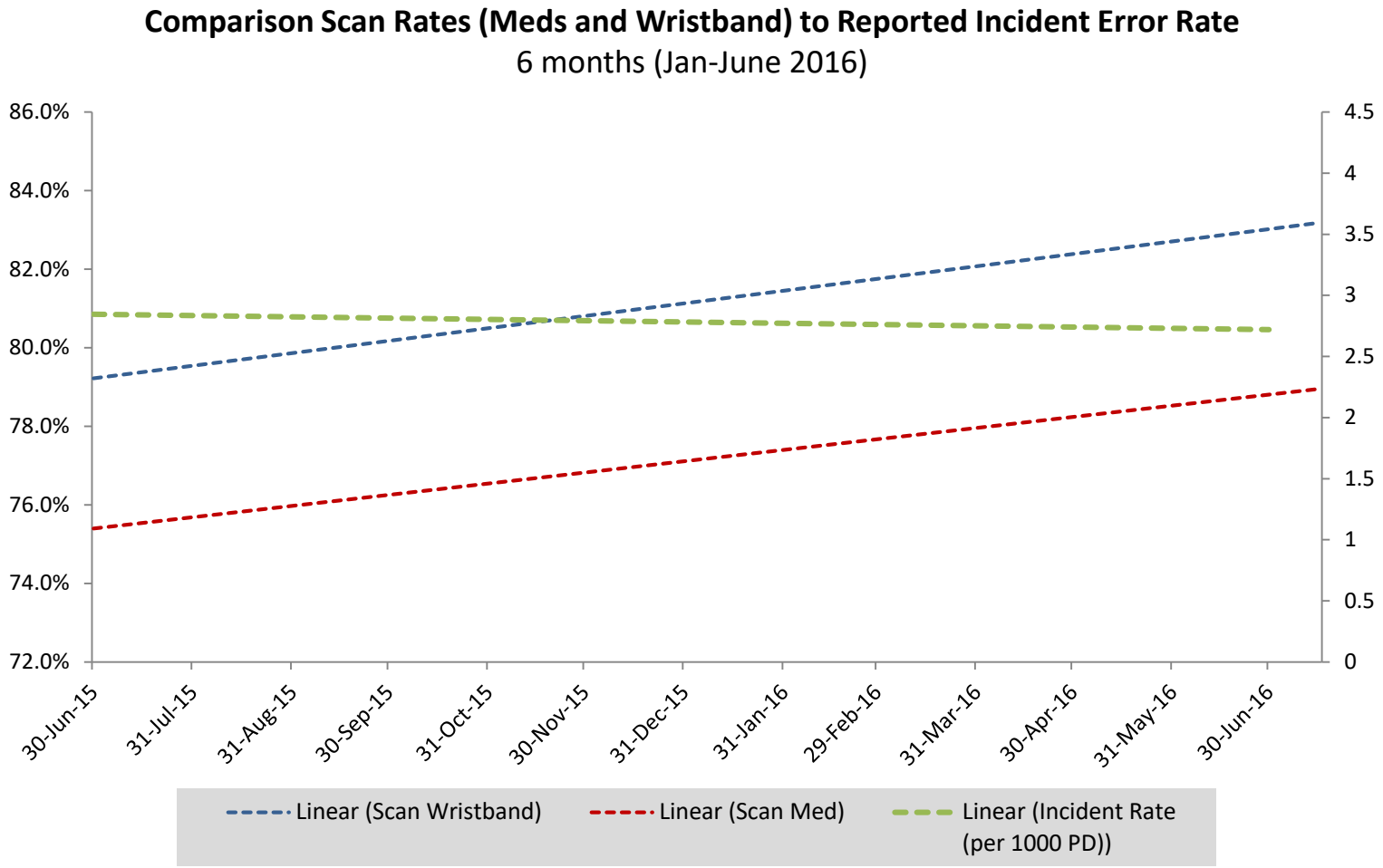
Over 205,000 patient-specific medication packages (85% via automation)

Medication available in ADU at point of care

Over 85 ADUs distributed through the Hospital

Bedside Administration and Verification

Medication Management



Overall, while scan rates have continued to increase, reported actual medication incidents have decreased

Lessons Learned

- Seasoned IT lead focused on redevelopment
- Implement systems, devices and tools early to facilitate user workflow changes and early adoption ahead of Opening Day
- Utilize Super Users to support staff during the transition window
- Convene multi-disciplinary team sessions to coordinate equipment deployment
- Testing/Commissioning and ‘Day in the Life’
- Provide visible IT support pre and post occupancy
- CIO/COO joined at the hip
- Maintain ‘no-fly zones’ pre and post move (lived experience)
- Risk Management (‘Simple and Safe’ Approach)

Questions