GE HealthCare

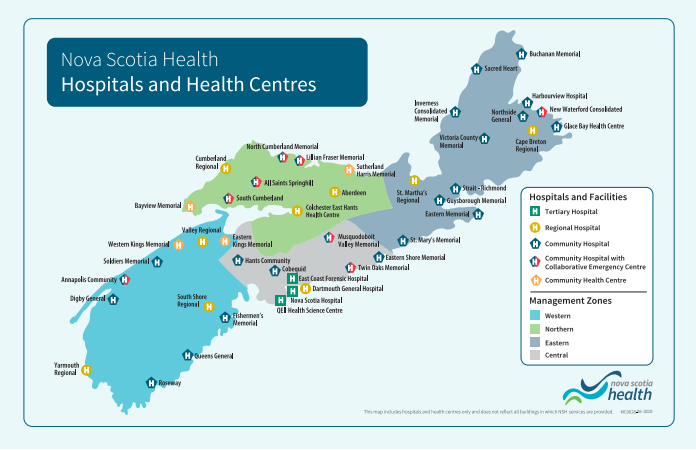
From paper processes to real-time patient care: Nova Scotia Health Authority implements Canada's first provincial Care Coordination Centre (C3)

Case study: Nova Scotia Health Authority

Background

Nova Scotia Health Authority (NSHA) partnered with GE HealthCare Command Center (GEHC) to implement Canada's first province-wide command center for real-time optimization of patient care delivery. The Care Coordination Centre (C3) is one of NSHA's largest digital transformations to date, focused on improving patient throughput across the Health Authority's forty-one facilities and supporting teams to provide better patient care and experiences. C3 is a priority initiative of the government's strategic plan, Action for Health.

Nova Scotia Health Authority: Hospitals and Health Centers by Zone



In 2021, NSHA sought a solution that would provide a real-time view of where patients are in their care journey, where system pressures are building, and what in-the-moment actions must happen to get patients to the right place at the right time.

Several patient flow challenges were identified on which to anchor the solution, including bottlenecks in the Emergency Department (ED), difficult patient transitions, lengthy wait times for diagnostics and consults, bed availability, staffing pressures, inefficient administrative processes, and lack of timely information. The lack of consistent documentation and workflow exacerbated these challenges, resulting in communication difficulties and limited visibility to patient needs and critical resource availability.

Documentation tools, workflows, and practices vary across NSHA's four zones. While the Central Zone is the only zone lacking an electronic medical record (EMR), managing flow was largely paper-based across all four regions. Data quickly became stale, and it was difficult to discern which care progression activities to prioritize. This led to hurdles with discharge planning, difficulty expediting consults, and ultimately delays in delivering care.

Approach

NSHA identified GE HealthCare's Command Center Software Platform (CCSP) as the most suitable solution for mitigating challenges with patient flow, capacity management and discharge planning, and for increasing transparency across the system. CCSP pulls in relevant data from STAR, Meditech and NSHA's other workflow systems, applies logic and advanced algorithms to that data, and generates actionable, real-time information. This information provides situational awareness of hospital-wide patient census, bed availability and hospital surge status to support NSHA's goals of reducing ED wait times, decreasing delays and excess days, reducing procedure cancellations and increasing throughput. In addition, CCSP aims to help care team members reduce time spent rounding, reporting, and documenting or re-documenting patient information.

When GEHC and NSHA began their partnership in March 2022, NSHA resolved to sort through clinical process and workflow information system gaps in parallel with the CCSP implementation. Specifically, opportunities to automate existing paper processes were implemented by IT, for example bed requests, transfer requests, and discharge orders and relevant clinical and clerical workflows were streamlined. Six CCSP web-based applications called "Tiles[1]" (see Appendix A) were selected for implementation at the QEII Health Sciences Centre (QEII), one of which (Capacity Expediter Tile) was deployed province-wide, and another (Patient Manager Tile) selected for launch at 11 regional sites.

Implementation

The approach to project implementation was three-fold: establish a C3 hub as a center of gravity for a new way to work; build and deploy the CCSP software; and optimize routine care team operations such as rounds, huddles, and shift handoffs using CCSP as an enabler. Work began at the QEII with the installation of workstations on wheels and large monitors in rounding rooms to display Tiles during huddles, the rollout of new workflows to replace paper processes, and the start of an organizational culture shift towards more collaboration and transparency.

NSHA adopted a phased approach to implementation, beginning with Tile activation at QEII, and then expanding select Tiles elsewhere in the province. See Appendix B for the Tile deployment schedule.

New Care Coordination Centre hub

In March 2022, the C3 team comprised of previously siloed roles and functions moved into a dedicated 3,300 square foot space at QEII. The area was equipped with 22 workstations, three offices, and six 55" mobile monitors that were eventually replaced with two large video walls comprised of 16 monitors. Roles included a C3 Senior Operations Director, C3 Medical Director, Central Zone (CZ) Access and Flow Director, CZ Director of Clinical Activation, Patient Flow Managers, Provincial and CZ C3 Access and Flow Managers, Transfer Liaison, Alternate Level of Care (ALC) Consultant, Staffing Clerk, Continuing Care Leads, Communications, EHS Liaison, Administrative Support, Project and IT Support. New full-time roles were created to accelerate the transformation: Training and Activation Leads to drive adoption and Bed Allocators that ensure units have 24/7 clerical support. Recruitment is underway for additional Trainers, a Complex Care Coordinator, and a CZ Project Manager. The C3 hub serves Central Zone facilities and will collaborate with other (soon to be established) Zone hubs on regional flow needs.

Tile deployment at QEII

By June 2022, the first CCSP Tile (Capacity Expediter) was live at QEII and hosted in the Microsoft Azure cloud. Tile implementation at QEII was piloted with select teams prior to full rollout. Along with C3 staff, only a few units were initially given Patient Manager Tile access. The Tiles were gradually integrated into unit daily operations as waves of teams were trained and onboarded.

Workflow and process optimization

Changes to how staff and physicians work does not come without initial pushback. It was challenging for some care team members to see how the lift of integrating new software into clinical operations would benefit them in the long run. Training had to emphasize how Tiles would save time, reduce cognitive burden, and give time back at the bedside. This was done by identifying use cases relevant to each care team member's role. Susan Huntington, Charge Nurse at QEII, remarked,

"It really does make flow easier for everyone. There have been significantly less phone calls from Patient Flow. Previously, it was not unusual to get upwards of 25 phone calls in 12 hours. Now those phone calls aren't needed because Flow knows the Tile is accurate, and so do we."

More frontline user feedback can be found in Appendix C.

Change management

Managing culture change was key during implementation to ensure staff were on board with the C3 initiative. Using a phased-in approach while showcasing wins along the way and engaging staff to gain buy-in were two ways this was accomplished.

The phased-in approach showcased small wins and allowed C3 to grow into a collaborative initiative. The first step was incorporating the Tiles to support patient care at the facility level among care teams and departments. The next steps were expanding to Zones and eventually to the rest of the province. The cultural shift that resulted was no small feat, but most staff recognize the positive change. Jonathan Veale, a recent C3 Project Lead, coined the phrase, "get good at working together, then get faster." Staff are already seeing synergies that would not normally happen, such as connections with EHS, rehab, and others. They are experiencing the culture shift that is underway.

Staff buy-in was achieved by documenting use cases and metrics to show Tile impact. A major improvement was incorporating Tiles into facility-wide morning and afternoon bed meetings. Prior to C3, Patient Flow facilitated these meetings by referencing an Excel sheet that took hours to generate the night before by calling each unit to get bed numbers and closures. Slowly, the Capacity Expediter Tile was integrated into these meetings. This drove inpatient unit teams to improve the timely input of discharge orders and expected discharge dates (EDDs). The Tile allows for transparency across the organization and will replace the Excel report.

Additional approaches for gaining buy-in included peer testimonials, one-to-one Tile trainings, and regular meetings where unit staff discuss best practices and give feedback. To improve utilization of the Tiles, Tile action deliverables were assigned to units and a C3 scorecard was developed with targets for QEII. Deliverable metrics are shared with all units to foster "friendly competition."

Impact

While C3 implementation will continue through Spring 2024, in just under a year there have been large advances toward a more unified and sustainable approach to delivering patient care. As of July 2023, four of six Tiles are live at QEII (Capacity Expediter, Boarders Expediter, Patient Manager and Transfers Expediter), and Patient Manager and Capacity Expediter are live at Dartmouth General Hospital. Activation to integrate current Tiles beyond QEII is underway.

Progress required a continuous improvement mindset and a focused team. As transparency improved, Tile data highlighted areas with the largest opportunities for improvement. Andrea Muenster, Senior Director of C3 reflects that,

"Inevitably, we realized quickly that all parts of the orchestra weren't playing right. We [had to] fine tune to perform the best we can for the patient to get the right care, at the right place, at the right time."

Determining where data could be leveraged, identifying where Tiles brought the most value, and discovering how to maximize the data for the highest impact was key. It was a group effort with units and departments using the Tiles to support collaborative decision making, and C3 monitoring the Tiles to resolve patient escalations that required higher-level intervention. Sample use cases for how different roles within NSHA use Tiles today to support their daily work can be found in Appendix D.

As data entry compliance has increased in source systems, Tile accuracy has increased, making the Tiles near-time and information-rich. From September 2022 to July 2023, there was an increase in EDD entry compliance (up to nearly 91%) and an increase in EDD accuracy on day of discharge across 37 units at the QEII. Acute units in particular experienced a 36% jump in accuracy on day of discharge to 62.5% (see Appendix E and F). Work on accuracy is continuing to be refined. The increase in Tile accuracy is driving trust and Tile engagement and leading to greater synchronized awareness at many levels within the NSH system. The increase in Tile accuracy is also bringing tangible changes to Nova Scotia's daily operations. Kim McMahan, C3 Director of Access and Flow across the Central Zone, said:

"As [Tile use] has evolved, we are able to resolve things more organically now. The operations meeting has morphed into something more fluid where we are resolving escalations earlier and all day using the Patient Manager Tile. We have also been able to branch out from focusing on QEII sites to supporting the entire Central Zone."

The reductions in meetings and reporting time have contributed to an average of nearly five hours saved per day for clinical staff (see Appendix G) and created efficiencies that have allowed C3 to take on new initiatives as well. With continued use, Patient Manager will replace the manual updating of whiteboards and other tracking tools, which has already occurred for some units. One Charge Nurse at the QEII commented,

"We no longer ask ourselves, 'What's holding the patient up?' The barriers are clearly displayed on the Tile."

Lessons learned

Data quality

The value of the Tiles is only as good as the data entered in the source systems feeding the analytics. Accurate, timely, and consistent data input is essential to reflecting a true "state of the house." Gap analysis prior to, and during, Tile design is an essential step during which decisions are made about the cost-benefit of implementing new workflows and processes.

Adoption

It takes time to build confidence in new software and change ways of working that have been in place for years. Humility is key. Jonathan Veale remarked, "The best part about the Tiles is what you do with them. If we picked this [software] up and kept doing things exactly how we were before, we would not be successful." The technical go-live was the first step. The heavy lift comes after, with the gradual adoption of new standard operating procedures (SOPs) to support workflow evolution and the integration of CCSP into operational routines.

Champions

Buy-in at every level is critical. Providers must realize their role and impact on the bigger picture. A Tile Champion was identified for each Tile as key "knowledge keepers" that staff could approach for continuous sharing and learning as the Tiles were rolled out after initial training.

Branding

Several C3 leaders noted the importance of how C3 was presented early in implementation. Kim McMahan emphasized the need to communicate that, "C3 is not, 'We make decisions for you,' but rather, 'We are here to support you and collaborate with you.'" Once staff understood the extra support they would have and visibility they would gain, there was excitement to get on board.

Culture change

Transparency of information was an important adjustment for the province. Role clarity, documented responsibilities, team accountability and clear procedures are needed to ensure success. With the Tiles going live in all Zones, there will be improved provincial visibility to census, bed availability and other indicators of pressure which will enhance collaboration across the forty-one facilities.

Conclusion

C3 is already bearing fruit one year into implementation: increasing visibility to capacity pressures, replacing stale data reporting and paper processes with automated real-time information, and streamlining patient care delivery for better patient and staff experiences. Most importantly, time saved on documentation, phone calls, notes, and reporting has given frontline staff more time back to care for patients at the bedside. Julia Stuckless, Patient Flow Manger, remarked,

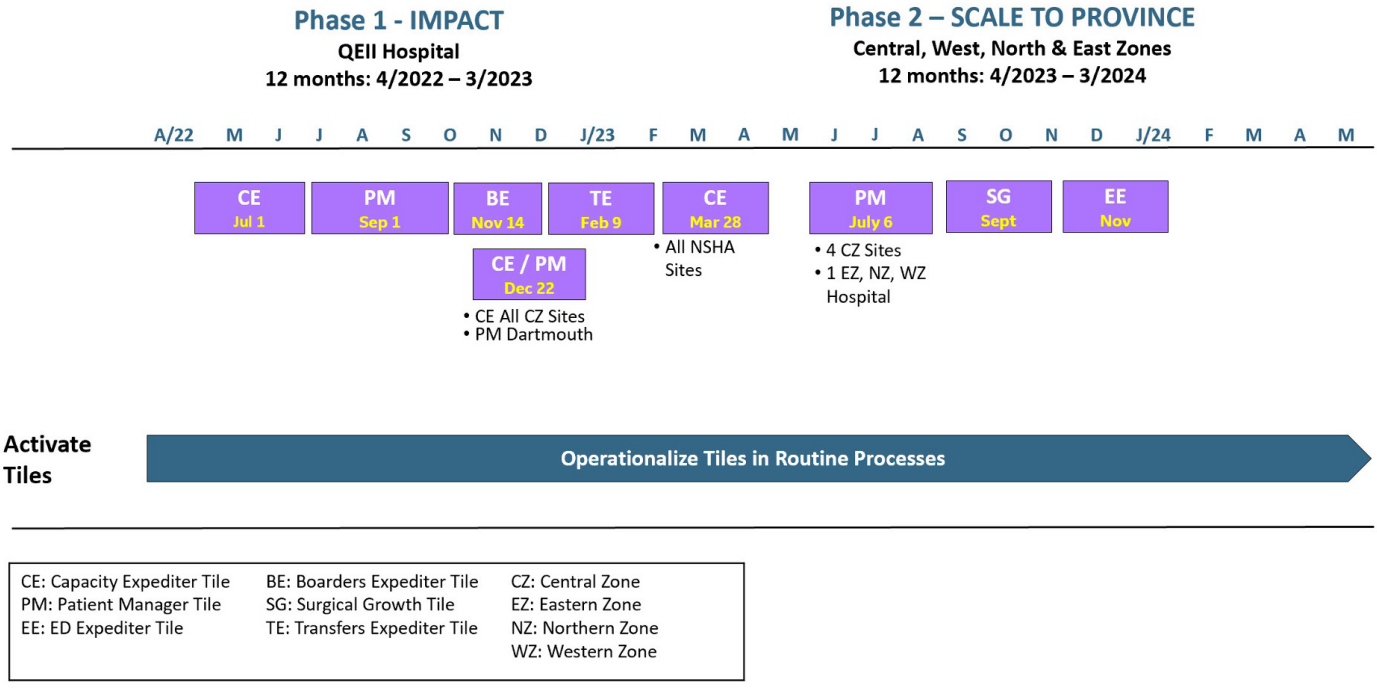
"It's about more than just flow. It's bringing it back to patient care. We have to remind people why they got into healthcare. Those aren't numbers on the Tiles. Those are patients."

Appendix

A – Tiles and definitions

CCC Tiles	Description
Capacity Expediter Tile	Provides flow managers, unit leaders and bed allocators automated, real-time situational awareness about the current and near-term status of beds, patients inbounding to beds, outbound transfers and discharges, and blocked beds.
Patient Manager Tile	Helps inpatient unit teams, department staff and C3 staff stay in sync regarding which patient care activities need attention now to avoid care progression and discharge planning delays.
Boarders Expediter Tile	Makes visible in real time the queue of patients waiting for beds in the ED, PACU, direct admits and level of care transitions, the workflow state of each queuing patient, and candidate beds for patients without assigned beds.
Transfers Expediter Tile	Helps bed management, transfer teams and provider teams monitor inbound patient transfers from other facilities and the workflow status of each transfer from request through to patient arrival.
Surgical Growth Tile	Provides OR schedulers, flow coordinators, and surgical care teams a 14-day forward-looking view of OR capacity utilization, and surfaces barriers to patient readiness for scheduled cases as well as scheduling optimization opportunities.
ED Expediter Tile	Supports ED flow managers, team leads and care providers in the ED with real-time awareness of ED arrivals, where patients are queuing, where pressure is building and the workflow state of labs, imaging, inpatient bed assignment and consults where applicable.

B – Revised Tile deployment schedule



C – Frontline user feedback

> **It saves an average of 10-15 minutes in rounds.**

> This is something that I think will be **groundbreaking for patient care** in Nova Scotia.

> I'm seeing **a lot of synergies that wouldn't normally happen**…people [stepping] up to solve a problem rather than having to be sought out. That's slow cultural change. **It's 'how do we help each other'?** And that's been a visible change for me.

> **I feel the confidence in my staff. We have visibility, we can have a plan…** I can be at peace knowing I don't have to worry- if something is wrong, it will be escalated to me.

> As a Charge Nurse, when I first saw PM, I thought to myself 'it's time to retire.' Now **it's my go-to system** first thing in the morning!

> I don't have to wait for the afternoon report in bed rounds. **I can look right now.**

> **Escalations can now be quickly resolved**, which prior would have taken at least 2+ phone calls each.

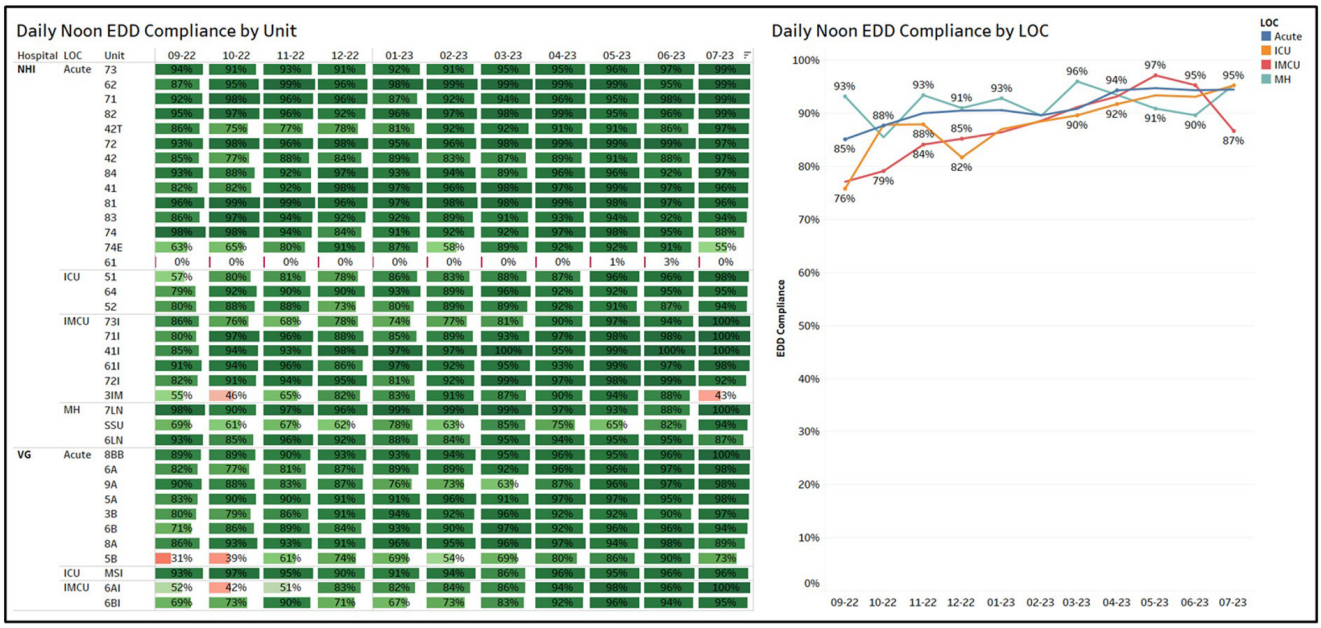
> **The transparency is great.** Everyone knows the traffic that's coming, what has changed overnight, the discharges for today. **We are all finally engaged in the same game and trying to work together.**

> Patient Flow Managers can **focus more attention on expediting flow rather than making phone calls.**

D – Sample Tile use cases by role

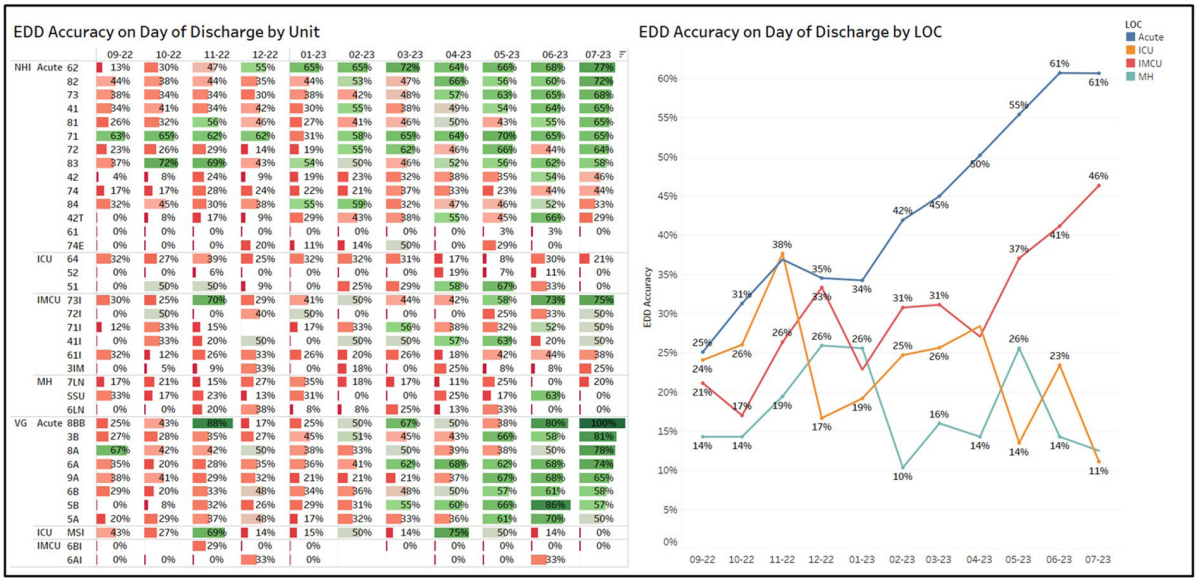
Role	Tile	Use case
Leadership	Capacity Expediter	Quick view of the "state of the house" including available beds, expected discharges and where pressure points are for the day.
Unit Staff	Patient Manager	One source for patient information, facilitating faster patient rounds. Ability to escalate to C3 any barriers to discharge or care progression that they cannot solve locally.
Departments	Patient Manager	Prioritize the day's work by sorting patient orders and pending tasks on patients being discharged today/tomorrow, new admission, deteriorating, etc.
Physicians	Patient Manager	View patients they follow across multiple units and services.

E – EDD Compliance: September 2022 to July 2023 at QEII Hospital



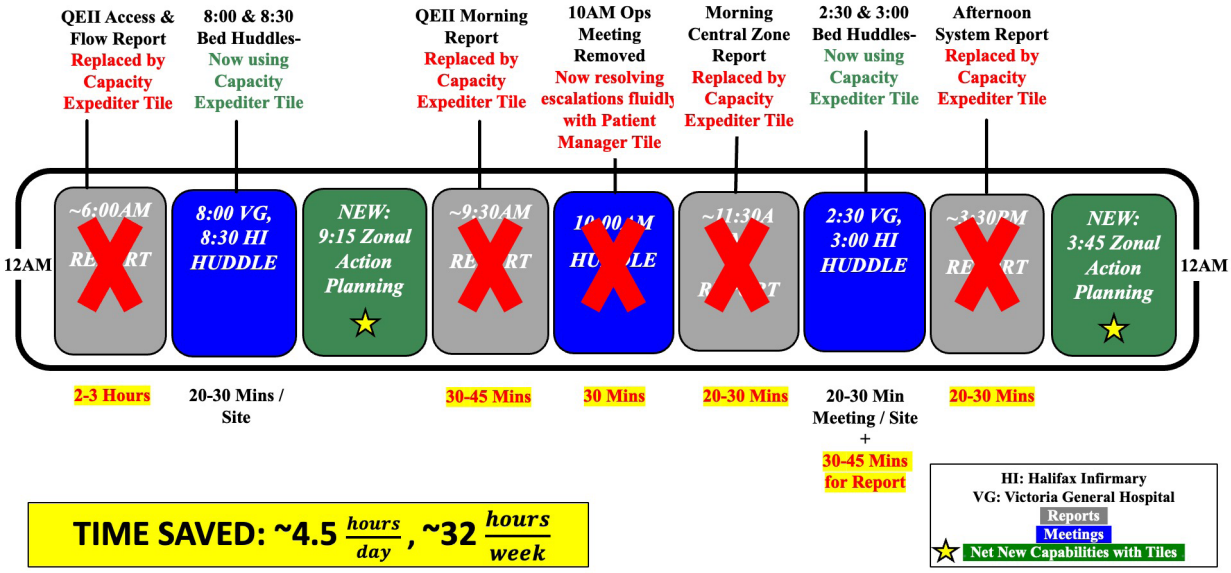
MH = Mental Health; Compliance is defined as EDD being present on a patient's chart at noon each day.

F – EDD Accuracy on Day of Discharge: September 2022 to July 2023 at QEII Hospital



MH = Mental Health; Accuracy is defined as an EDD within 48 hours of patient's actual discharge date.

G – Time saved in current state for QEII using the Tiles



- The daily 10:00am QEII Operations Meeting was replaced with a broader Central Zone huddle focused on resolving patient placement issues at Central Zone hospitals.
- Morning census reporting is now generated in minutes using Capacity Expediter, compared to hours for the legacy manual Excel report.
- Morning and afternoon facility bed huddles at both the QEII hospital were streamlined using Capacity Expediter.
- The afternoon bed meeting agenda was expanded to discuss demand and planned discharges for the following day.

Testimonials were provided by the QEII frontline care delivery team members.

[1]Tile: A decision support application within the GE HealthCare Command Center Software Platform enabling immediate action and cross-system insight by pulling from source system data in near real-time.

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