A framework for planning, implementing and evaluating a dedicated inpatient trauma consult service at a Level 1 trauma centre

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Introduction

- Accreditation Canada Trauma Distinction Standards require Level I trauma centres to establish a dedicated inpatient unit to manage the care of complex trauma patients.
- The QEII Health Science Centre in Halifax is the only tertiary care facility for adult major trauma patients in Nova Scotia and serves as a quaternary care facility for the Maritime Provinces.
- The QEII does not have an inpatient trauma unit. Historically, major trauma patients were resuscitated in the emergency department (ED) at the QEII under the direction of a Trauma Team Leader (TTL) and then care was transferred to ICU or surgical services with inpatient privileges (general surgery, orthopedic surgery, neurosurgery). Following transfer of care, the TTL had no further contact with the trauma patient during their hospital stay.
- As a unique approach to dedicated trauma care, the NS Health Trauma Program implemented an inpatient Trauma Consult (TC) Service at the QEII in October 2022. Here, we describe a framework for planning, implementing and evaluating the QEII TC Service.

Methods

- Planning for the inpatient TC Service commenced in 2021. Executive leadership at NS Health were engaged early in the planning stage to guide and support formalization of the TC service. Other stakeholders were also engaged during the early stages of planning.
- The planning stage was informed by a rapid review to find evidence regarding the effect of adding dedicated trauma care professionals to inpatient trauma care settings. We searched 2 electronic databases (PubMed, Embase) and the grey literature (Google, Google Scholar) using specific keywords to identify relevant articles.
- The Trauma Leadership team consulted with leaders and educators on inpatient units that currently house trauma inpatients and used their questions to generate FAQ posters that were shared widely. We also collaborated with Registration and IM/IT services to identify trauma inpatient locations throughout the QEII.
- An evaluation framework was developed to compare trauma outcomes, key performance indicators (KPIs), and healthcare costs before and after implementation of the TC Service.

Results

1. Planning

- ▶Stakeholder engagement
- ▶Rapid review of literature
- ▶Consultation and collaboration with key hospital services and staff
- ▶Education and training sessions
- ▶Information on TC Service shared with relevant staff via email and posted on the walls of hospital wards

2. Implementation

- ▶Soft launch of the TC Service (total of 8 soft launch days over 3 weeks)
- ▶Regular debriefs with members of the TC Service to identify and address potential problem areas and inefficiencies
- ▶Consultation with hospital staff to resolve issues and facilitate the transition to the new care model
- ▶Formal launch of the TC Service

3. Evaluation

Quality	Outcomes	KPIs	Costs
▶Quality survey of providers and patients	▶Comparison of trauma patient outcomes (mortality, length of stay, etc.) before and after implementation of the TC Service	▶Assessment of various KPIs before and after implementation of the TC Service, including Accreditation Canada Trauma Distinction Indicators	▶Analysis of direct and overhead costs for inpatient care and emergency care in the pre- and post-periods
▶Satisfaction survey of trauma patients	▶A quasi-experimental interrupted time-series design will be used	▶A descriptive analysis will be conducted	▶Costing data will be used to calculate incremental cost-effectiveness ratios
▶Satisfaction survey of patient's family/proxy			
▶Satisfaction survey of trauma care providers			

Changes to Trauma Care at the QEII with a Dedicated Inpatient Trauma Consult Service

The TC Service was implemented at the QEII on October 17th 2022. The TC Service includes a TC Physician and TC Nurse who assess and coordinate with inpatient services on care issues of all admitted trauma patients following TTA. Coverage for the TC Service is during daytime hours. Nighttime coverage remains unchanged.

Severe injury

Prehospital care of major trauma patients remains unchanged

Trauma team at the QEII is activated for injuries that meet specific anatomical and mechanistic criteria

Urgent transport via EHS to the ED at the QEII

Emergency Department

Patient is resuscitated in the ED by the Trauma Team, led by the TTL and rTTL. This phase of trauma care remains unchanged.

TTL · Resuscitation · Trauma Team · rTTL

Tiered Response:
RED Tier = Activation of entire trauma team
YELLOW Tier = Activation of core group of trauma team members

Patient admitted to appropriate impatient service at the QEII

In-Hospital Admission

Following initial resuscitation in the ED, trauma care is transferred to ICU or to an appropriate surgical service based on the type and severity of injuries

ICU · GS · Ortho · Plastics · Neuro

Admission

NEW TC Physician and TC Nurse assess all admitted TTA patients in a consultant role and coordinate/facilitate multidisciplinary care and ED flow of trauma patients

Patient may be transferred between multiple inpatient services

Hospital Discharge

Patient is discharged from the QEII

Home · Nursing Home · Home w/ Support Services · Acute Care Facility · Rehab · Chronic Care Facility · Other

Discharge

NEW TC Physician and TC Nurse participate in discharge planning and facilitate discharge from hospital (ED or inpatient ward) to most appropriate location

Patient is discharged home or to an appropriate facility

Follow-Up Care

Patient follow-up with the appropriate inpatient service remains unchanged

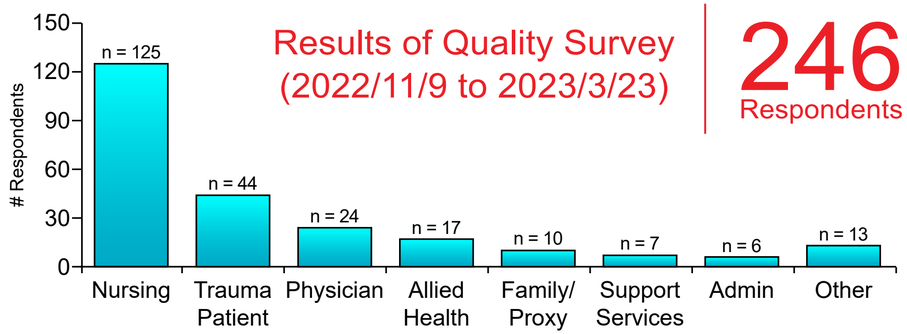
Follow-up

NEW TC Physician and TC Nurse ensure coordinated trauma service follow-up after discharge by meeting virtually with all TTA patients 5-10 days after discharge.

TC = Trauma Consult; TTA = Trauma Team Activation; EHS = Emergency Health Services; ED = Emergency Department; TTL = Trauma Team Leader; rTTL = Resident Trauma Team Leader; ICU = Intensive Care Unit; GS = General Surgery; Ortho = Orthopedic Surgery; Neuro = Neurosurgery; Rehab = Rehabilitation.

Results of Quality Survey (2022/11/9 to 2023/3/23)

246 Respondents



Quality of Care	Timeliness	Communication	Helpfulness	Positive Interactions
4.72 out of 5	4.63 out of 5	4.68 out of 5	4.72 out of 5	4.80 out of 5
5 star 84%	5 star 80%	5 star 82%	5 star 84%	5 star 88%
4 star 10%	4 star 9%	4 star 10%	4 star 10%	4 star 8%
3 star 3%	3 star 6%	3 star 4%	3 star 3%	3 star 1%
2 star 0%	2 star 2%	2 star 1%	2 star 0%	2 star 1%
1 star 3%	1 star 3%	1 star 3%	1 star 3%	1 star 2%

Discussion

- The TC service at the QEII represents a novel approach to facilitating and coordinating the care of all major trauma patients at a Level 1 trauma centre.
- The rapid review identified 5 studies on the effect of introducing specialized trauma care professionals to inpatient care, all of which reported improved patient outcomes. 3 studies examined the effect of a dedicated inpatient geriatric trauma consultation service, all of which observed improvements in care for geriatric trauma patients.
- A key component of the planning stage was developing partnerships with consult services including geriatrics, mental health, and rehabilitation to ensure that the new care model enabled provision of holistic care early on in the patient stay rather than near the end.
- The Quality Survey is ongoing and being administered by members of the TC Service with 246 responses to date, predominantly from nurses (50.8%) and trauma patients (17.9%). Thus far, the response has been overwhelmingly positive. All survey data is post-implementation.
- In addition to the Quality Survey, the evaluation framework includes 3 longer satisfaction surveys that will be administered to trauma care providers, trauma patients, and patient families/proxies, respectively.
- Furthermore, the evaluation framework involves a pre-post analysis of trauma outcomes, KPIs, and healthcare costs during a 2-year period before and after implementation of the TC Service (allowing for a 6-month transition period) using data collected from the Nova Scotia Trauma Registry, QEII ICU database, QEII ED Information System, Vizient Decision Support (case costing) and from the patient chart.
- The findings of this evaluation will determine the impact of this unique approach to the management and care of major trauma patients, and will determine whether we move to the next stage of developing and implementing a dedicated inpatient trauma unit at the QEII.

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