Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

# Telehealth Consultations for Traumatic Brain Injury

Neurosurgery: Dr. Martina Stippler (Neurosurgeon and the Director of Neurotrauma at BIDMC, Senior Author) Dr. Ron Alterman (Chair Neurosurgery)
Emergency Medicine: Dr. Carlo Rosen (Executive Vice Chair BIDMC), Dr. Jonathan Anderson (Chief BID-Milton), Dr. Bryan Stenson (Associate Director BID-Needham), Dr. Kyle Trecartin (Associate Director BID-Plymouth)

## Introduction/Problem

- Traumatic brain injury (TBI) leads to an estimated 2.5 million emergency department visits annually[1].
- The majority of cases are mild (Glasgow Coma Scale, GCS, of 13-15)
- The increasing use of CT scan has identified increasing numbers of patients with mild TBI with associated intracranial hemorrhage, known as complicated, mild TBI (cmTBI)
- An ED observation pathway was implemented at BIDMC to reduce admissions of cmTBI[2]
  - 138 patients enrolled and analyzed
  - 113/138 (81.9%) discharged home
  - 91/111 (81.9%) transferred from outside hospitals  subsequently discharged home
  - Seven (5.1%) return visits to the ED within 7 days; three (2%) related to the cmTBI
  - No patients required neurosurgical intervention

1) American College of Surgeons. ACS TQIP Best Practices in the Management of Traumatic Brain Injury.; 2015.
2) Singleton JM, Bilello LA, Greige T, et al. Outcomes of a novel ED observation pathway for mild traumatic brain injury and associated intracranial hemorrhage. Am J Emerg Med. 2020. doi:10.1016/j.ajem.2020.08.093

## Aim/Goal

1) Implement Tele Brain Interprofessional Consult (TBIC) to triage patients with cmTBI at the Beth Israel Deaconess Community Hospitals in order to triage patients for local care or transfer to BIDMC
2) Decrease the transfer rate for cmTBI from the Beth Israel Community Hospitals within 3 months of implementation

## The Team

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## The Interventions

- A. Inclusion Criteria
  - GCS 15 (14 if intoxicated)
  - Minor CT findings of traumatic head injury:
    - Traumatic SAH
    - SDH < 1 cm
    - Contusion without midline shift or mass effect
    - Skull fracture without associated ICH
- B. Indications for Transfer
  - ED attending or neurosurgeon discretion
  - Any focal or lateralizing neurologic deficit
  - Epidural hematoma
  - Skull fracture with ICH
  - Post-traumatic seizure
  - Any anticoagulation or anti-platelet agent (excluding aspirin)
  - Signs of basilar skull fracture with CSF leak
- C. Responsibilities of the telehealth neurosurgeon
  - Telephone consultation initiated by ED attending with neurosurgery attending
  - Discussion of history and neurologic exam findings
  - Neurosurgical attending reviews images
  - Neurosurgical attending writes a note in Meditech
- D. Medical treatment then provided, as necessary, at the Beth Israel Community Hospital

*For more information, contact:*
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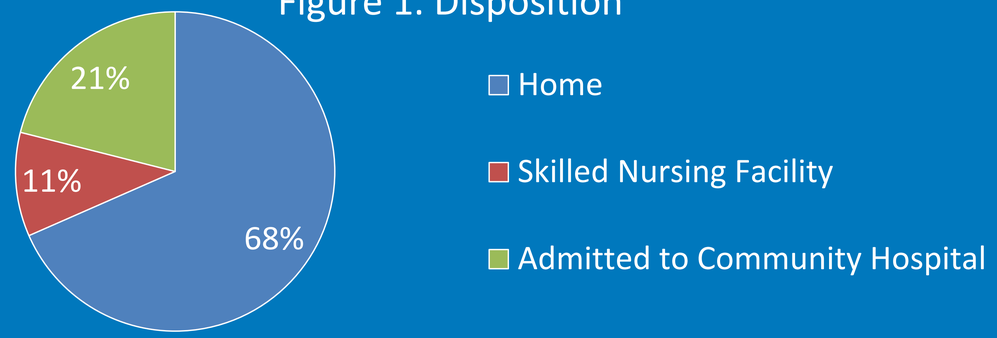
## Results/Progress to Date

| Table 1. Descriptive Statistics | | |
|---|---|---|
| Total Cases | 19 | |
| Age | 71 (Mean) | 23-98 (Range) |
| Female | 12 | 63.2% |
| **Chief Complaint** | | |
| Fall | 14 | 73.7% |
| Motor Vehicle Collision | 2 | 10.5% |
| Syncope | 2 | 10.5% |
| Assault | 1 | 5.3% |
| **CT Findings** | | |
| Subdural Hematoma | 9 | 47.4% |
| Subarachnoid Hemorrhage | 8 | 42.1% |
| Intraparenchymal | 2 | 10.5% |

Figure 1. Disposition




- No patients required transfer to BIDMC
- Only 1 patient on aspirin
- All patients that were admitted were admitted for a non-TBI related reason
- No patients were readmitted within 30 days
- No patients died within 30 days
- No patients needed neurosurgical intervention within 30 days

## Lessons Learned

- Telehealth consultations for cmTBI are safe and effectively avoid transfer to a tertiary care center
- Consults were successfully carried out by inpatient teams as well (ex. fall while in the hospital)
- Different EMR platforms within the network creates challenges for documentation and scan review
- Credentialing of the neurosurgical consultant at each site was the most significant hurdle

## Next Steps

- Advocate for universal credentialing system across BILH
- Ensure billing supports a sustainable system
- Expand to all hospitals in the BID Network
- Expand to include other neurosurgical issues (ex. non-traumatic hemorrhage, spine pathology etc.)
- Expand to other specialties

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