

In-hospital Code Stroke Protocol Ensures Faster Access to Hyperacute Stroke Care

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Background

Approximately 6.5% -15% of all strokes occur in hospitalized patients, who can be susceptible to poorer outcomes as they often have multiple comorbidities¹. All stroke patients, regardless of where the stroke occurred, should have access to best practice stroke care. The Clinical Neurosciences (CNS) Unit at London Health Sciences Centre(LHSC) developed a protocol for In-hospital Code Stroke (IHCS) to ensure rapid access to stroke care at its' 2 campuses: University Hospital (UH)and Victoria Hospital (VH). UH: 415 beds; VH: 525 beds. The Hyperacute/Acute Stroke Unit for LHSC is located at UH and is equipped with a 24/7 tPA nurse.

Method

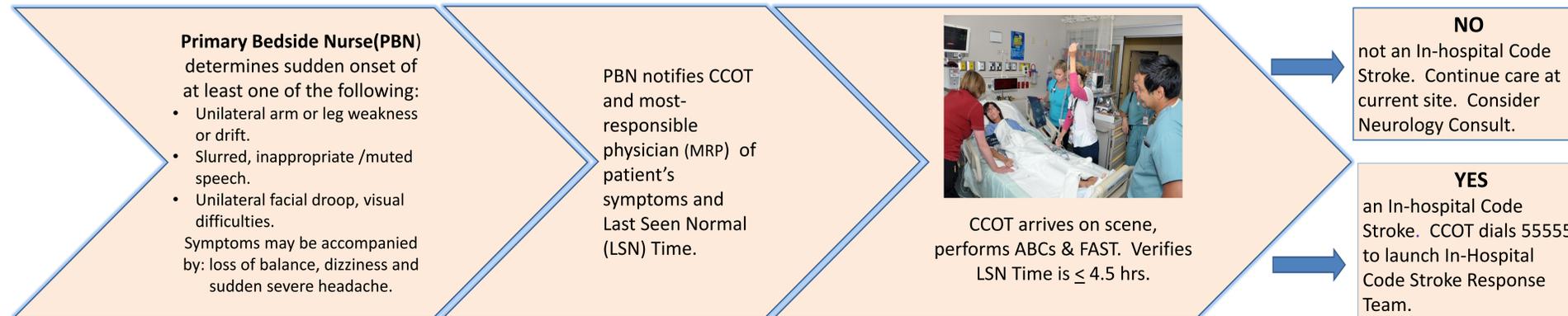
A committee was established to develop and implement an IHCS protocol. Steps included:

1. Design of IHCS protocol;
2. Training Plan for (a) key responders Critical Care Outreach Team (CCOT) who upon arrival validate patient's signs and symptoms are consistent with stroke; and (b) broader staff education regarding signs and symptoms of stroke and who to call;
3. Development of tools to support knowledge translation and sustainability plans.
4. Evaluation

Results

IHCS was implemented at UH on July 31st and at VH October 15, 2014. Key steps are outlined in **Figure 1**.

Figure 1: In-Hospital Code Stroke Protocol

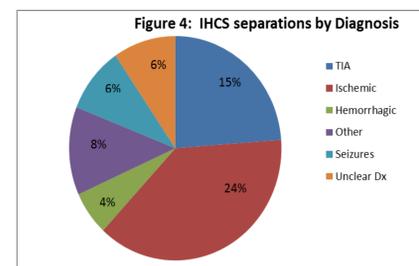


Training

CCOT training for both UH and VH sites took place at their Annual Skills /Professional Development day. 20 -minute staff education sessions were provided hospital-wide. See **Figure 2** for Training Outlines; **Figure 3** for Resource Tools. A Mock at both sites prior to GO-LIVE date provided the opportunity for protocol testing and further clarification of roles and processes. Lack of tPA nurse at VH site necessitated a greater role for CCOT. CCU Nurse was identified as back up for CCOT nurse. Physicians were informed of the new protocol via email and education sessions.

Performance

From July 31st 2014 to July 31st 2015 there have been 70 IHCS (see **Figure 4** for separations by diagnosis). tPA was given in 6/70 (8.5%) cases; 1 patient received endovascular treatment(no tPA).



| Site | Number of Cases | First Page to CT Time | |
|------|-----------------|-----------------------|-----------|
| | | Median | Mean |
| UH | 33* | 23 min | 24.72 min |
| VH | 18** | 25 min | 35.00 min |

*missing data for 11 cases
**missing data for 8 cases

| First Page to Needle Time, n=6 cases (min) | Site | Number of IHCS | Average Time Neurologist Arrival from First Page |
|--|------|----------------|--|
| 50 | UH | 44 | 4.47 min (per 38 cases*) |
| 59 | VH | 26 | 8.10 min (per 10 cases**) |

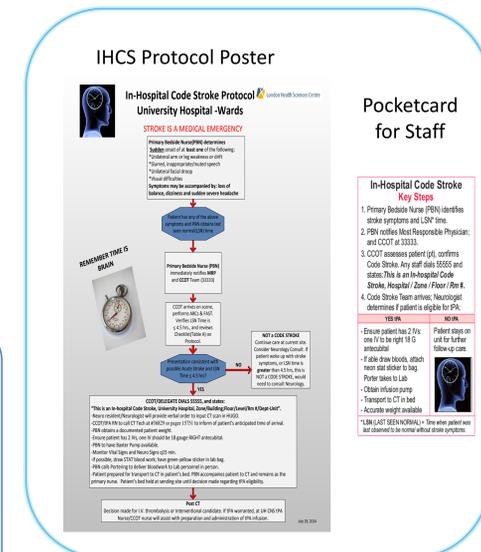
*data not recorded for 6 cases
**data not recorded for 15 cases

| Reasons cited for IV tPA Exclusion | Frequency |
|--|-----------|
| Recent major surgery | 15 |
| Not a Stroke | 13 |
| Other Reasons(Severe Dementia; TNK for STEMI; recent CABG; unreliable last seen normal time) | 9 |
| Rapidly resolving/TIA | 8 |
| Outside the window | 4 |

Figure 2: Training Outlines



Figure 3: IHCS Resource Tools



Post Implementation

Booster sessions were provided to staff in June 2015 as part of "Stroke Month" plans. Exploring opportunity to develop an online IHCS educational program as part of staff annual recertification will help to support sustainability. Issues are addressed at the monthly Stroke Care Sustainability Committee with CCOT representation from both sites.

Summary and Conclusions

- A formalized IHCS protocol can ensure this patient group receives rapid access to urgent stroke evaluation similar to patients arriving in the ED.
- Use of CCOT as initial responders was an excellent fit.
- Continued monthly reporting regarding performance, and education sessions for nurses and physicians are a necessary part of sustainability.
- Limitations: No data regarding patient outcomes and no baseline data prior to implementation was available.