A retrospective review of functional outcomes in patients receiving Neurological (tPA and Endovascular) Interventions and Comprehensive Rehabilitation Treatment in Maine

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Background:

Maine Medical Center (MMC), a primary stroke center enhanced its stroke care capabilities to include 24/7 endovascular access in August 2010, prior to which patients with endovascular needs were transferred to out-of-state hospitals. Recently an evaluation project was undertaken to review the functional outcomes for severe stroke patients receiving Endovascular Intervention (EVI) combined with Comprehensive Rehabilitation Treatment (CRT) and to identify the impact that these interventions and subsequent inpatient rehabilitation stay made for patients. Rehabilitation Treatments took place at New England Rehabilitation Hospital (NERH), a free standing rehabilitation hospital with JCAHO Disease Specific Certification in Stroke Rehabilitation.

Objectives:

1) To retrospectively analyze the number of patients who get evaluated using a standardized scale to assess level of impairment caused by a stroke.
2) To describe and catalogue the functional outcome data of patients with severe strokes who received EVI (including tPA) and CRT.
3) To determine whether severe stroke patients that receive EVI and CRT have improved outcomes at discharge compared to regional averages.

Methods:

A retrospective analysis of functional outcome of those stroke patients who had EVI and CRT was conducted (see Fig. 1). The time period for this evaluation was August 2010 to April 2011. Patients with NIHSS ≥ 8 (severe stroke patients) were selected for the study and compared with patients with NIHSS 0-8. Outcomes were evaluated using the NIHSS (NIH Stroke Scale-stroke severity)* and FIM (Functional Independence Measure – burden of care)**.

Reference:

**: The National Institute of Health (NIH) stroke scale (NIHSS) is used by physicians and other health care professionals to measure the level of impairment caused by a stroke.*
***: Functional Independence Measure is an indicator for the burden of care; particularly useful for judging the extent of recovery from serious injury. It has five grades, ranging from 0 (fully independent) to 4 (completely dependent).*

Fig. 1 Data Analysis Flowchart

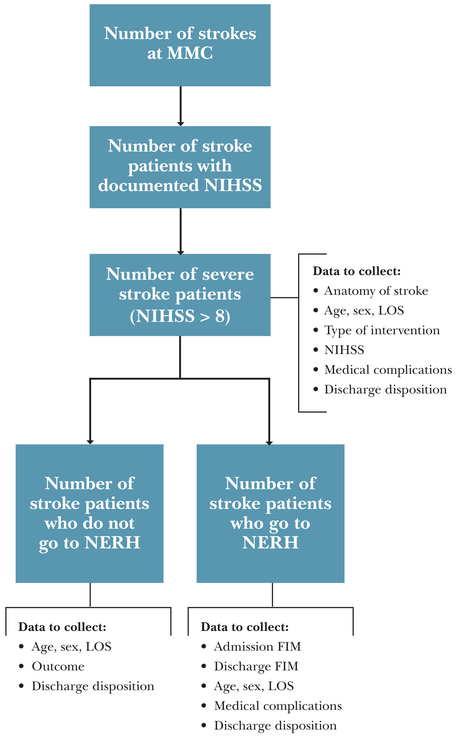

TABLE 1

Stroke Patients admitted between August 2010 to April 2011

	NIHSS >8	NIHSS 0-7	No NIHSS	Total
Total Number of Patients	43	22	315	380
tPA and/or Endo Intervention	41	3	14	58
LOS at MMC (Avg.)	9.4	4.2	7.1	
Discharge to Home	2	9	95	106
Expired	11	4	30	45
Discharge to SNF/Home Health/Hospice	10	3	84	97
Discharge to NERH	21	7	87	115
Discharge to Other Rehab	1	6	10	17

TABLE 2

Outcomes for Stroke Patients receiving both EVI and CRT

Indicators	NIHSS >8	NIHSS 0-7
Number of Patients	43	22
tPA and/or Endo Intervention	43	
LOS at MMC (Avg.)	9.4	4.2
Discharge to Home	2	9
Expired	11	4
Discharge to SNF/Home Health/Hospice	10	3
Discharge to NERH	21	7
Discharge to Other Rehab	1	6
For NERH Patients with Intervention Only		
tPA and/or Endo Intervention	19	3
Onset Days (Avg.)	11	5
Discharged to Home	15	3
Admit FIM (Avg.)	47	77
Discharge FIM (Avg.)	84	118
FIM Change (Avg.)	37	41
LOS at NERH (Avg.)	23	16

Results:

A retrospective analysis of 380 stroke patients admitted at MMC with an acute stroke diagnosis between August 2010 to April 2011 identified that approximately 30% stroke patients had a NIHSS documented. 43 patients were included in this study as severe stroke patients (see Table 1.)

The outcome indicators of these severe stroke patients were compared with those patients who had NIHSS between 0 and 7 (mild and moderate strokes). The results indicate an excellent outcome for stroke patients receiving both EVI and CRT (see Table 2.)

Conclusions:

- Severe stroke patients receiving EVI and CRT indicated a Discharge Home percentage of 88%.
- 100% of the mild and moderate strokes receiving EVI and CRT were discharged to home.
- Compared to regional averages for stroke patient discharges to home range from 60 - 70 %, depending on the time period analyzed, this indicates an excellent outcome of severe stroke patients receiving both EVI and CRT.
- Data suggest that strong consideration should be given to CRT as a key component in the continuum of care for best outcome for severe stroke patients receiving EVI.

Implications for Practice:

- In the short period since MMC has offered 24/7 endovascular treatment, there has been an enhanced outcome among stroke patients receiving the treatment.
- Neurological intervention at MMC and subsequent transfer to NERH allows patients to resume a higher level of functional independence and return to their communities.
- However with only a third of the stroke patients getting the NIHSS documented, it is difficult to accurately measure the severity of stroke patients and thereby their potential for inclusion in CRT.

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New England Rehabilitation Hospital of Portland
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Maine Medical Center
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