A Safe Early Mobility Protocol for Stroke Patients

Lisa Yanase, MD, Providence Stroke Center, Elizabeth Baraban, MPH, PhD, Tamela Stuchiner, MA, Providence Brain and Spine Institute, Ashley McBride, PT, Deborah Walker, OT, Providence Rehabilitation Services

PROVIDENCE Brain and Spine Institute

Background

Early mobilization of general and critical medical patients benefits outcome, length of stay, and patient satisfaction.[1] Protocols for early mobility have been demonstrated safe even in the ICU setting. However, there is limited and inconsistent data regarding safety of early mobilization of stroke patients.[2, 3, 4] Concern for falls or neurologic deterioration due to physiologic changes has led to promoting bed rest during the acute phase of care. In addition, a patient who arrives in the ED with stroke symptoms in the morning, may not have Physical Occupational or Therapy (PT/OT) evaluation until the next day, and thus be on bed rest for more than 24 hours from the onset of their symptoms.

We hypothesized that nurses could safely evaluate and mobilize stroke patients at an appropriate level within 8 hours of admission while not increasing the fall rate.

Methods

A Stroke Mobility Protocol was developed by a multidisciplinary team including a stroke neurologist, physical and occupational therapists and stroke nurses that includes an admission nursing tool to assess the clinical readiness of patients to be mobilized, then allows monitored, progressive levels of activity determined by patient tolerance.

The protocol was implemented in January 2011 for all stroke patients in the neurosciences unit of a Primary Stroke Center. Protocol safety was evaluated by the number of persistent clinical deteriorations, falls occurring due to the protocol and the overall fall rate on the unit. Nurses were to monitor for clinical decline and report any changes not resolving after repositioning. Falls in patients with a stroke diagnosis were tracked using unusual occurrence reports. Ischemic and hemorrhagic stroke and TIA patients discharged from the neurosciences unit were included in the analyses. Patients admitted for less than one day or who were placed on comfort care were excluded.

Retrospectively abstracted fall rates were calculated as number of falls per 1,000 patient days. The post-implementation fall rate from 2011 and 2012 was compared to the pre-implementation fall rate from 2010. The study hospital's 2011 and 2012 post-implementation fall rate was also compared to the 2011 and 2012 fall rate of an affiliated hospital's neuroscience unit, with a similar population and shared stroke care processes, but which was not using the study protocol. Fall rates were compared using the Wilcoxon Rank Sum Test for non-parametric distributions.

Figure 1. Nursing Mobility Assessment Tool

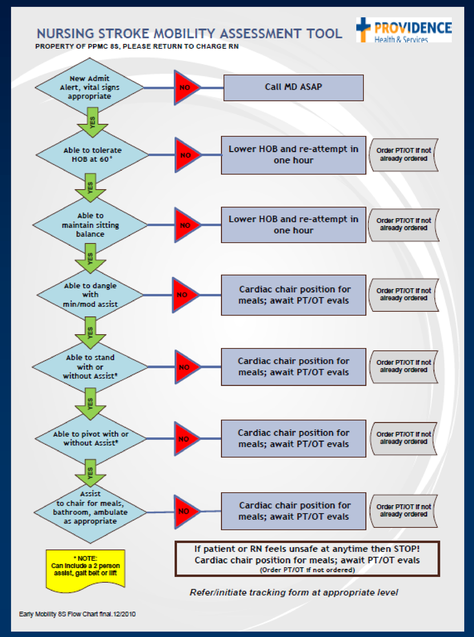

Table 1. Demographics of Patients in Neurosciences Units of Study and Comparison Hospitals by Years

	Mobility Protocol Hospital		Comparison Hospital
Demographics	**2010 % (n=446)**	**2011 - 2012 % (n=949)**	**2011 - 2012 % (n=1159)**
Stroke Type			
Ischemic	68.8	68.7	70.0
TIA	18.4	18.8	13.8
SAH	1.6	1.4	5.5
ICH	11.0	11.2	10.6
Age *(mean)*	72.1	71.8	70.9
18 -49	8.3	8.7	9.5
50 - 74	42.6	42.7	45.0
75 - 84	24.2	24.8	23.6
85 or older	24.9	23.8	22.0
Female	54.3	51.5	49.2
Insurance			
Public	52.5	53.6	49.3
Private	40.6	38.5	44.3
Self-Pay/no insurance	7.0	7.9	6.5
Race/Ethnicity			
Hispanic or Latino	1.3	1.6	3.3
White	70.6	73.4	76.4
African American	7.2	5.2	1.4
Asian	6.1	5.9	6.4
Other	1.3	1.5	0.4
Unable to determine (UTD)	13.5	12.4	12.2
NIHSS at Admit			
Mean (n)	6.8	6.3	5.8

Results

Patients' demographics were similar across years and hospitals (Table 1). There were no reports of persistent neurologic deterioration related to protocol use. No falls occurred as a result of the protocol.

The pre-implementation fall rate in 2010 (Table 2) was 6.3 falls per 1,000 days (n=376). The 2011 and 2012 post-implementation fall rate was 1.2 falls per 1,000 patient days (n=819). The 2011 and 2012 fall rate at the comparison hospital was 5.6 falls per 1,000 patient days (n=1,015).

The fall rate at the comparison hospital was significantly higher (Table 3) compared to the study hospital (mean ranks: 923.2 versus 910.4, respectively, p=.02). When comparing the pre-implementation fall rate to the post-implementation rate at the study hospital, the difference was not significant (mean rank=600.6 versus 596.8, respectively, p=.35).

Table 2. Number of Falls Per 1,000 Patient Days Among Patients in Neurosciences Units of Study and Comparison Hospitals by Years

Hospital Group	N	Number of Falls	Falls/1,000 Patient Days
2010 Study Hospital Pre-Implementation	376	8	6.3
2011 & 2012 Study Hospital Post-Implementation	819	8	1.2
2011 & 2012 Comparison Hospital	1015	29	5.6

Table 3. Comparison of Fall Rates: Wilcoxon Rank Sum Test Results

Comparison	N	Mean Rank	Standardized Test-Statistic	P-Value
2010 Pre-Implementation	376	600.8	-.937	NS
2011 & 2012 Post-Implementation	819	596.8		
2011 & 2012 Mobility Protocol Hospital	819	910.4	2.27	.02
2011 & 2012 Comparison Hospital	1015	923.2		

Note: NS=Not Significant, α=.05

Conclusions / Discussion

- Our data indicate that early mobilization does not lead to prolonged neurologic deterioration and appears to reduce falls in stroke patients.
- After the protocol was implemented at the study hospital, the observed fall rate in our stroke population was significantly lower than that of the comparison hospital.
- We cannot determine if there were other factors that impacted the fall rate other than effect of time period (pre vs. post-implementation) and the comparative hospital and had one year of complete pre-implementation fall data.
- An estimated 30% of in-hospital falls cause significant injury, which is associated with the cost of diagnostic testing, treatment, and extended length of hospital stay. Thus a significant decrease in fall rate could save not only pain and suffering, but health care dollars.
- We have collaborated with the comparison hospital to implement this protocol on that campus. If we are able to replicate our findings, we will expand the protocol to our extensive hospital network.
- The Stroke Mobility protocol empowers nurses to safely evaluate patients' function, allowing earlier mobilization.

References

1 Kress JP (2009) Clinical trials of early mobilization of critically ill patients. *Crit Care Med* Oct; 37 (10 Suppl): S442-7.

2 Sundseth A, Thommessen B, Ronnig OM (2012) Outcome after mobilization within 24 hours of acute stroke: a randomized controlled trial. *Stroke* 43: 2389-2394.

3 Cumming T, Thrift A, Collier J, Churilov L, Dewey H, Donnan G, Bernhardt J (2011) Very early mobilization after stroke fast-tracks return to walking: further results from the phase II Avert randomized controlled trial. *Stroke* 42(1):153-158.

4 Bernhardt J, Thuy M, Collier J, Legg L (2009) Very early versus delayed mobilization after stroke. *Cochrane Database System Review* Jan 21 (1): CD006187.

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Providence Portland Medical Center
4805 NE Glisan Street
Portland, OR 97213
Providence Brain and Spine Institute
503-216-1055

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