

Nurse-Imposed Immobility in a Multi-Site Comprehensive Stroke Center Sample: Are US Stroke Centers Staffing Stroke Units Responsibly?

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Introduction

- ❖ Progressive mobility is an important aspect of Stroke Unit care for hemodynamically stable patients.
- ❖ Prior to the conduct of their definitive trial, AVERT investigators showed that hospitalized stroke patients spend most of their waking hours in bed; to date the amount of time mobilized in this same population has not been previously studied in an American sample.
- ❖ Therefore, we aimed to understand the amount of time hemodynamically stable stroke patients with mobility orders spent out of bed (OOB) in a USA Comprehensive Stroke Center (CSC) sample.



Methods

- ❖ Ethics approval was obtained for an observational study of time OOB in stable acute stroke patients with a physician OOB order.
- ❖ Data were collected by stroke team members who observed patient activity over a 24-hour period without alerting the nursing staff to study aims to minimize Hawthorne effect on actual patient mobility.
- ❖ Observation times were from 0800 to 2100 daily.
- ❖ Type of OOB activity was not recorded, but could consist of walking exercises with physiotherapists, occupational therapists, nursing staff or family, being OOB to sit in a chair, or being OOB to toilet. Any OOB time associated with testing (i.e. echocardiogram, MRI, etc.) was not considered allowable in the study.
- ❖ Patients could not be observed a second time on a different day for additional observations.
- ❖ Patients and family members were also queried about OOB time and activities, and medical records were reviewed for documented OOB activities to ensure the accuracy of observers' assessments.
- ❖ Stroke type, gender, age pre-morbid modified Rankin Score (mRS), NIHSS, nurse staffing ratios (i.e.: 1 registered nurse to X# of patients), minutes OOB, nursing assistant personnel availability, total length of stay (LOS), discharge or day 7 mRS were documented.
- ❖ Data were descriptively analyzed and linear regression models were built with significant correlates to determine independent predictors of time OOB and total LOS.

Results

- ❖ The sample was obtained from 4 American CSCs representing a diverse geographic area and producing a sample of 336 patient observations over a period of 1 month.
- ❖ Patient sample characteristics:
 - ❖ 66% ischemic stroke, 34% intracerebral haemorrhage
 - ❖ Mean age 63±14 (median 59) years
 - ❖ 51% female
 - ❖ Median pre-morbid mRS was 0 (IQR 0-1)
 - ❖ Median NIHSS at time of observation was 7 (IQR 3-14; range 0-20)
- ❖ Stroke Unit staffing was as follows:
 - ❖ On average 1 RN to 4.5±1.5 (median 4; range 2 to 6) patients
 - ❖ One nursing assistant was available on the Stroke Unit 85% of the time to help with mobility
- ❖ On average, OOB mobility time was 45±104 (median 10; range 0 to 390) minutes per 24-hour period.
- ❖ Both the number of patients assigned per nurse (p=0.016) and NIHSS score (p=0.026) were significant independent predictors of time OOB.
 - ❖ As the number of patients assigned per nurse increased ($\beta = -8.78$), the amount of time spent OOB decreased.
 - ❖ As the NIHSS score increased ($\beta = -1.93$), the amount of time spent OOB decreased.
 - ❖ Assuming an optimal minimal OOB time of 180 minutes (3 hours) per day, the cut point for Stroke Unit registered nurse staffing that best optimized mobility was a median of 1 RN to ≤ 4 patients.
- ❖ Hospital outcomes included:
 - ❖ Total hospital LOS 18 ± 23 (median 7) days
 - ❖ Total LOS was independently predicted by:
 - ❖ NIHSS ($\beta = +1.345$; p<0.001),
 - ❖ RN to patient staffing ratio ($\beta = +4.39$; p<0.001),
 - ❖ Age ($\beta = +0.35$; p<0.001)
 - ❖ Median discharge mRS 4 (IQR 2-4)

Conclusions

- ❖ In our American CSC sample, stroke patients with mobility orders spent a significant amount of time in bed.
- ❖ While disability severity (NIHSS score) is an important contributor to immobility and increased LOS, inadequate RN staffing was the most significant contributor to unnecessary nurse-imposed immobility.
- ❖ Given that American RN staffing is determined by hospital administrators, often without input by bedside nurses, our study suggests the need for adoption of standardized RN staffing ratios within acute stroke guidelines to support improved patient mobility and overall recovery prior to hospital discharge after an acute stroke.

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