The effect of home versus rehabilitation environment on activity levels of stroke survivors: Go home, sit less

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Background: Prolonged sitting and low physical activity after stroke reduce function and increase cardiovascular risk. The rehabilitation environment may influence activity behaviours, though this remains unclear.

Objective: To examine 1) whether change in rehabilitation environment (hospital or home) and 2) what other factors, influence time sitting, upright and walking after stroke.

Methods

- Participants (n=34) with stroke from 2x inpatient rehabilitation units
- Observational study, 2 phases: final week inpatient rehabilitation; first week post discharge at home
- Inclusion: admitted with stroke; mobile pre stroke; able to consent to participate; discharge to community
- Exclusion: discharge to residential care

Measures

Activity measures:

- Sitting time – total daily (primary outcome)
- Upright time, walking time, steps/day
- activPAL3 monitor, worn 7 days (24 hours/day)
- 2 time points: hospital and home

Characteristics

- Age, sex, stroke type, severity, carer present

Physical measures

- 10mw; 6MW; 5x STS test; Motor FIM scores
- Pain (VAS)

Psychological measures

- Hospital Anxiety & depression scale
- Fatigue assessment scale

Cognition

- MoCA

Data analysis

- Descriptive statistics for participant characteristics
- Linear mixed model: activity as outcome, environment (hospital or home) as exposure
- Models adjusted for waking hours, age, sex
- Interaction terms created to determine factors that may modify activity with change in environment: fatigue, anxiety, depression, cognition, gait speed, gait capacity, FIM score, age, sex, stroke severity, pain, carer

Results

Participants

- Mean age 68 [SD 13] years, 53% male
- NIHSS admission score 7.2 [SD 5.4]
- Mean gait speed 0.98 [SD 0.58] m/s
- Mean 6 minute walk 280 [SD 165] m
- Mean MoCA score 22.1 [SD 5.6] points

Activity data

Mean waking hours:

- 13.1 [SD 1.5] h in hospital, 13.5 [SD 1.9] h at home

Mean days activity data:

- Hospital (n=34) mean 5.6 [SD 1.9] days
- Home (n=32) mean 6.7 [SD 0.6] days

Sitting and activity time with change in environment

- Significant differences in all activity measures between hospital and home environments (Table 1)

Total Activity time	β^*	95% CI	P-value	Clinical meaning
Sitting	-0.76	(-1.41, -0.10)	0.024	45 mins <i>less</i> sitting at home
Upright	0.76	(0.10, 1.41)	0.024	45 mins <i>more</i> upright at home
Walking	0.20	(0.08, 0.32)	0.001	12 mins <i>more</i> walking at home
Steps / day	724	(199, 1250)	0.007	724 <i>more</i> steps/d at home

Table 1: Change in activity between hospital and home rehabilitation environments.

β^* Adjusted mean difference from hospital to home (hours)

Activity modifiers

- Depression modified sitting and upright activity with change in environment (p=0.03)
- People with depression (figure 1) spent *more* time sitting and *less* time upright at home than in hospital
- No other covariates significantly modified activity

Figure 1: The effect of depression on sitting and upright time in the hospital and home environments

- To further assess if functional recovery may influence change in activity with environment change, a secondary analysis (figure 2) was conducted to review sitting activity by day, across the observation period

Figure 2: Mean percentage of waking day spent sitting across the 2 phases of observation, for participants with and without depression

Conclusion

- Change in environment from rehabilitation to home was associated with reduced sitting time, and greater time spent upright and walking.
- Presence of depression on discharge from hospital may negate the activity benefit of changing environment.

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