

Task-specific and impairment-based training improves walking ability in stroke

Summary of: Nadeau SE, Wu SS, Dobkin BH, Azen SP, Rose DK, Tilson JK, Cen SY, Duncan PW (2013) Effects of task-specific and impairment-based training compared with usual care on functional walking ability after inpatient stroke rehabilitation: LEAPS Trial. *Neurorehabil Neural Repair* 27:370-380 [prepared by Marco Y. C. Pang, CAP Editor].

Synopsis:

Question: Does task-specific locomotor training program (LTP) or impairment-based strength and balance home exercise program (HEP) better in improving walking function in people with stroke compared with usual care (UC)? **Design:** multicenter, randomised controlled trial and blinded outcome assessment. **Setting:** Six rehabilitation units in US. **Participants:** Adults within 45 days of stroke, self-selected gait speed $<0.8\text{m/s}$ and living in the community by the time of randomization were key inclusion criteria. A key exclusion criterion was exercise contraindications. Randomisation of 408 participants allocated 139, 126 and 143 individuals to the LTP, HEP, and UC respectively. **Interventions:** Both the LTP and HEP groups received supervised training three days per week for 12-16 weeks. LTP included locomotor training on treadmill with partial body weight support and overground walking practice in an outpatient facility. HEP consisted of strength and balance exercises done in the home. **Outcome measures:** The primary outcomes were the proportion of people who were able to achieve functional walking level, which was defined as a walking speed of $>0.4\text{m/s}$ for those whose initial speed was $<0.4\text{m/s}$ or $>0.8\text{m/s}$ for those whose initial speed was between 0.4 and 0.8m/s . Secondary outcomes included 10-m walking speed, distance walked in 6 minutes, step activity, Fugl-Meyer lower extremity score, Berg Balance Scale (BBS), Activities-specific Balance Confidence Scale (ABC), and Stroke Impact Scale (SIS). The outcomes were measured at baseline (2 months after stroke) and 6 months after stroke. **Results:** 384 participants completed the study. Significantly higher proportion of people achieved functional walking level after LTP (by 18%, 95% confidence interval (CI) 0.07, 0.29) and HEP (by 17%, 95% CI 0.05, 0.29) than UC. Both LTP and HEP induced more gain than UC in comfortable walking speed (LTP: by 0.13m/s , 95% CI, 0.09, 0.18; HEP: by 0.10m/s , 95% CI 0.05, 0.14), fast walking speed (LTP: by 0.16m/s , 95% CI 0.10, 0.21; HEP: by 0.11m/s , 95% CI 0.05, 0.16), 6-minute walking distance (LTP: by 40.8m, 95% CI 26.2, 55.3; HEP: by 34.9m, 95% CI 20.1, 49.7) and other secondary outcomes, except step activity and SIS. No significant difference in any of these outcomes was found between the LTP and HEP groups. **Conclusion:** Both LTP and HEP are effective in enhancing walking function measured at 6 months after stroke.

Commentary

Nadeau and colleagues report on a planned secondary analysis from the LEAPS trial that compares the effects of two conceptually different but time matched interventions to usual care. The study provides Level 1 evidence that improvements in gait outcomes with usual care were inferior to both locomotor training (LT) using body weight supported treadmill training and a time matched home exercise program (HEP) at 6 months post stroke. Eighteen percent more participants in the intervention groups, as compared to usual care, transitioned to a higher level of walking ability. Walking speed increases were nearly two times higher in the intervention groups as compared to usual care. The study contributes detailed information about the large variability in the amount of usual care participants received. Twenty-one percent of participants received no physical therapy following discharge from rehabilitation, while at least one patient had usual care therapy 5 times per week. The median number of usual care visits ranged from 2 per month for the LT group to 3 times per month in the usual care and HEP groups. The dose of therapy delivered to the LEAPS intervention groups was considerably higher at 12 times per month (90 minutes, 3 times weekly). Though the amount of therapy delivered to the LEAPS intervention groups trial is likely not attainable outside a research study, the results clearly provide support for more organized and less variable delivery of community based services to stroke survivors. Future research may test the effect of scheduled consistent practice in group exercise settings (Eng et al. 2003; van de Port et al. 2012) which is likely to be less expensive and easier to sustain as compared to the one on one interventions in the LEAPS trial. Frequent and regularly scheduled interventions may deliver an important priming stimulus for motor learning (Mang et al. 2013) that is not provided by irregularly delivered usual care. Both intervention groups walked similar and greater amounts at 6 months than the usual care group, and this may also explain better walking outcomes in the intervention groups. The Nadeau study contributes foundational information to guide future research related to community based delivery of care to stroke survivors.

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References

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