Case
A 73-year-old patient had a stroke resulting in right hemiplegia and high spasticity in his right hand. It was recommended by the OT supervisor to apply a hand splint to improve hand function. However, after six weeks of the patient wearing the splint per recommendation, no significant improvement in function or spasticity was noted. The OT is curious about what support the research has for splinting on spastic hemiplegia.

What is the effect of splinting on spastic hemiplegia?

A review and critical appraisal of the literature indicates that there is currently no evidence to support the use of splinting for hemiplegic upper extremities in post-stroke patients.

1 Ask: Research Question
In patients with spastic hemiplegia, what is the effect of splinting on hand function compared with no splint?

2a Acquire: Search Terms
Patient/Client group: hemiplegia, muscle spasticity, muscle hypertonia, stroke.
Intervention: splints, cast, surgical.
Comparison: no splint.
Outcome(s): hand, upper extremity, recovery of function.

2b Acquire: Selected Articles
Lannin et al. (2007): A randomized control trial that examined the effect of resting hand splints on the extensibility of the wrist and long-finger flexors in patients post-stroke.
Lannin and Herbert (2003): A systematic review that examined 5 randomized control trials on the effect of splinting on patients with upper-extremity hemiplegia post-stroke. The studies varied in design, type of splint used, and outcome measures.
Sheehan et al. (2006): A randomized control trial that examined the effect of a thermoplastic resting splint on wrist and finger spasticity in 14 post-stroke patients.

3a Appraise: Study Quality
Lannin et al. (2007): Conclusive: A randomized control trial that was of high quality, using reliable and valid methods, as well as an independent blind assessor to measure outcomes.
Lannin and Herbert (2003): Suggestive: The strength of the systematic review was evident by a thorough literature search strategy, relevant selection criteria, and independent assessors of methodological quality.
Sheehan et al. (2006): Inconclusive: The RCT demonstrated good internal validity, but lacked external validity due to small sample size and inherent flaws in study design. Due to overall poor design, the clinical usefulness of the findings are questionable.

3b Appraise: Study Results
There is currently insufficient evidence to support the use of splints to improve hand function in patients post-stroke. Lannin et al. (2007) found that results suggest that hand splinting to prevent contracture during the acute phase of rehabilitation is ineffective and does not produce clinically useful effects. Furthermore, Lannin and Herbert (2003) found that after a content analysis, it was determined that there is not enough evidence to support the use of hand splinting for this population. Sheehan et al. (2006) revealed effect sizes that were too small to be considered clinically worthwhile. The long- and short-term effects are unclear at this time, and the literature varies with respect to type of splint used, splinting regimens, and outcome measures. Furthermore, because some studies have demonstrated mixed results on the use of splints, more research is needed to determine the effects of splinting.

4 Apply: Conclusions for Practice
The studies suggest that splinting on spastic hemiplegia will not help patients achieve their goals because it did not prevent contracture or result in improvement in functional use of the extremity. In the above clinical scenario, despite the OT supervisor’s request, the literature does not support the use of splinting for this patient. At this point there is no evidence to support the use of splints to improve hand function and decrease spasticity in patients post-stroke.

References

Reviewers:
Sultan Alfawaz, Eleanor Fountain, Rebecca Ho, Shireen Lalezari, Sara Levy, Susan Luong, Robin Munsey

Date completed: April 25, 2011

X No: Splinting is not effective for improved hand function in patients with spastic hemiplegia post-stroke.