Splinting in Neurology

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Splinting in Neurology

- When should splinting be considered?
- How to choose the most appropriate splint or position for splinting.
- Practicalities of providing a splinting regime.
- Outcome measures for determining effect.
- What is the evidence.
Definition

“Splints and casts are external devices designed to apply, distribute or remove forces to or from the body in a controlled manner to perform one or both basic functions of control of body motion and alteration or prevention in the shape of body tissue.”

Rose 1986
1. When should splinting be considered?

Splints can be considered for any of the following reasons:

- To maintain range of movement.
- To regain range of movement.
- For function.
Examples

Edwards (2002)
Examples
Examples

Edwards (2002)
Examples

So what does the splint actually do to maintain or regain ROM?

- Muscles and soft tissues constantly held in a lengthened or shortened position will adapt to that position and become longer or shorter.
- The splint either prevents this occurring in ‘at risk’ muscle groups or re alters the length by providing a prolonged low load stretch to the shortened muscles.

Moseley (1997) - Similar study. 9 HI subjects. Methodology tighter. Same result.
Moseley et al 2008

Serial casting versus positioning for the treatment of elbow contractures in adults with traumatic brain injury: a randomised controlled trial
Moseley et al 2008

- 26 Subjects
- Sustained TBI
- Elbow contracture of at least 15°
- Treatment group casts applied for 2 weeks, cast changed after 7 days
- Positioning group had passive stretch applied to the elbow flexors for 1 hour a day
Moseley et al 2008

- Results greater reductions in elbow flexion contracture with serial casting by an average of 22°.
- Results not maintained. Diminished by half one day post intervention and completely disappeared at 4 weeks follow up.
Examples

Edwards (2002)
Examples

Edwards (2002)
2. Options – How to choose the most appropriate splint / position for splinting

- It depends upon what you are wanting to achieve.

- On deciding the most appropriate splint also depends upon:
  - Knowledge and skills of the treating therapist
  - Resources available
How to choose the most appropriate splint

- You should only make a splint using the material you are trained to use.
- A custom made splint may be equally as effective and might be more cost effective.

NB politics / budgets

Potential problems

- Resources available for provision of splinting materials
How to choose the most appropriate splint

- Whether we like it or not, choosing the most appropriate splint means:
  - Looking at materials or products you have available and the skills you have within your team.
  - Asking, ‘Will it do the job?’
How to choose the most appropriate splint

- Removable versus non removable
- NB Problems of pressure

Advantages of removable splints:
- Cut them off from the start
- Daily checking / washing of skin
- Can monitor effect
- Can still get “24 hr” effect if bandage back on.
Timing of splints
105 brain injured patients.
Compared 5-7 day casting interval with 1-4 days.
Results Improvement seen in all patients still present after 1 month. 1-4 days considered superior as reduced complications & discontinuation rates.
The most appropriate position for splinting

- Need to consider this according to the type of splint being made:
  - Backslab
  - Increasing ROM
  - Maintaining ROM
3. Practicalities of a splinting regime

- Splints need to be put on properly and taken off.
- Problems need to be identified and action taken if found eg pressure areas.
- Decisions need to be made as to the effectiveness of the splint and ongoing need.
- If you made or supplied it its your responsibility to put in place and document an appropriate regime
- SO, BE REALISTIC!
3. Outcome measures

- Changing ROM is not enough.
- Ask, what is that changed ROM required for?
- Clinical examples
  - eg ROM at knees for standing or to be seated?
  - Hands that can function or for hygiene?
4. The evidence – what does the literature say?

- Review paper:

**Mortenson et al (2003)** The use of casts in the management of joint mobility and hypertonia following brain injury in adults: A systematic review
Splinting - Literature

Aim

To report on best practice for the use of casting in brain injury rehabilitation.

Only 13 articles fulfilled the criteria.
Splinting - Literature

3 categories emerged re: effect of casting:

1. Reduction of spasticity – only 5/12 measured properties of spasticity

Awarded grade C
Splinting - Literature

2. Passive ROM

10 studies measured this and in all improvements were seen except 1 (but it was not the first aim)

Awarded grade B
Splinting - Literature

3. Function

“Trends regarding the effect of casting on ‘function’ could not be identified from the inconsistent results identified”

No grade level of recommendation given
Splinting - Literature

Therefore only improvement / prevention of loss of ROM suggested as having sufficient evidence to support use of casts as best practice.
Splinting - Literature

The National Clinical Guidelines for Stroke 2008 state:

If stretching alone does not control contractures, serial casting around a joint should be considered as a treatment for reducing contractures.
Splinting - Literature

- The National Clinical Guidelines for Stroke 2008 state:

Inflatable arm splints enveloping the hand, forearm and elbow, and resting wrist and hand splints should not be used routinely.
Lannin et al 2003

- 28 subjects
- Inclusion criteria – single stroke / BI leading to hemiparesis no more than 6 months before
- Unable to actively extend wrist
- Rx group wore a functional resting hand splint for up to 12 hours a night
- Both Rx and control group had x2 / day 30 min stretches applied to hands
Splinting - Literature

Lannin et al 2003

Result

No difference between groups

BUT

Unable to conclude the effect of hand splints alone as all subjects additionally received stretches
Splinting - Literature

Lannin 2003

Is hand splinting effective for adults following stroke? A systematic review and methodological critique of published research.

Conclusion
There is insufficient evidence to support or refute effectiveness of hand splinting following stroke.
Splinting - Literature

- Lannin et al 2007
  - 63 subjects
  - All within 8 weeks of having stroke
  - No active wrist extension
  - 3 groups:
    - Routine therapy (no stretches) plus splint in neutral
    - Routine therapy (no stretches) plus splint in extension
    - Routine therapy (no stretches) ie control group
Splinting - Literature

- **Lannin 2007**
  
  **Result**
  There was no significant difference between the groups

  **Conclusion**
  These findings suggest that the practice of routine wrist splinting soon after stroke should be discontinued
Splinting the wrist and hand

- How should these results accurately inform clinical practice?

- How can these results be misinterpreted and impact upon clinical practice?
Splinting in Neurology

➢ And finally...

ACPIN splinting guidelines.