

# An evaluation of the removable ankle serial casting orthotics clinic for adults with multiple sclerosis

Maria McMahon (Orthotic Physiotherapist) - West Midlands Rehab centre, Birmingham

## What is serial casting

Serial casting is the process of applying and removing corrective casts to increase extensibility in the soft tissues surrounding the joint (Singer et al., 2001).

The clinicians position and cast the ankle in the most optimal position in terms of dorsiflexion and medio-lateral alignment



Serial cast with weight bearing platform

## Introduction

Removable ankle serial casting has been used to treat reduced ankle ROM due to increased spasticity in the adult neurological population (including those with MS) in our orthotics department in the West Midlands Rehabilitation Centre for 10 years.

Reduced ROM has been shown to reduce mobility (Yasar et al., 2010), quality of life, heighten economic burden (Frag et al 2020) and increase falls in neurological populations. (Abasiyanik et al 2021), and is commonly seen in patients with MS (Hugis and Cameron 2019).

Non-removable Serial casts have been proven to effectively improve ROM (Yasar et al., 2010). although they also pose increased risks for the adult population including pressure sores and foot and calf pain (Leung et al., 2019). Therefore, Removable serial casts may be a viable alternative. However, There is a lack of research in this area (particularly in patients with MS), and we have never examined the outcome measures of our serial casting clinic.

## Aim

To determine if our novel serial casting treatment is producing favourable results in our patients with MS.



Foot position pre Serial cast



Standing position on delivery of the serial cast



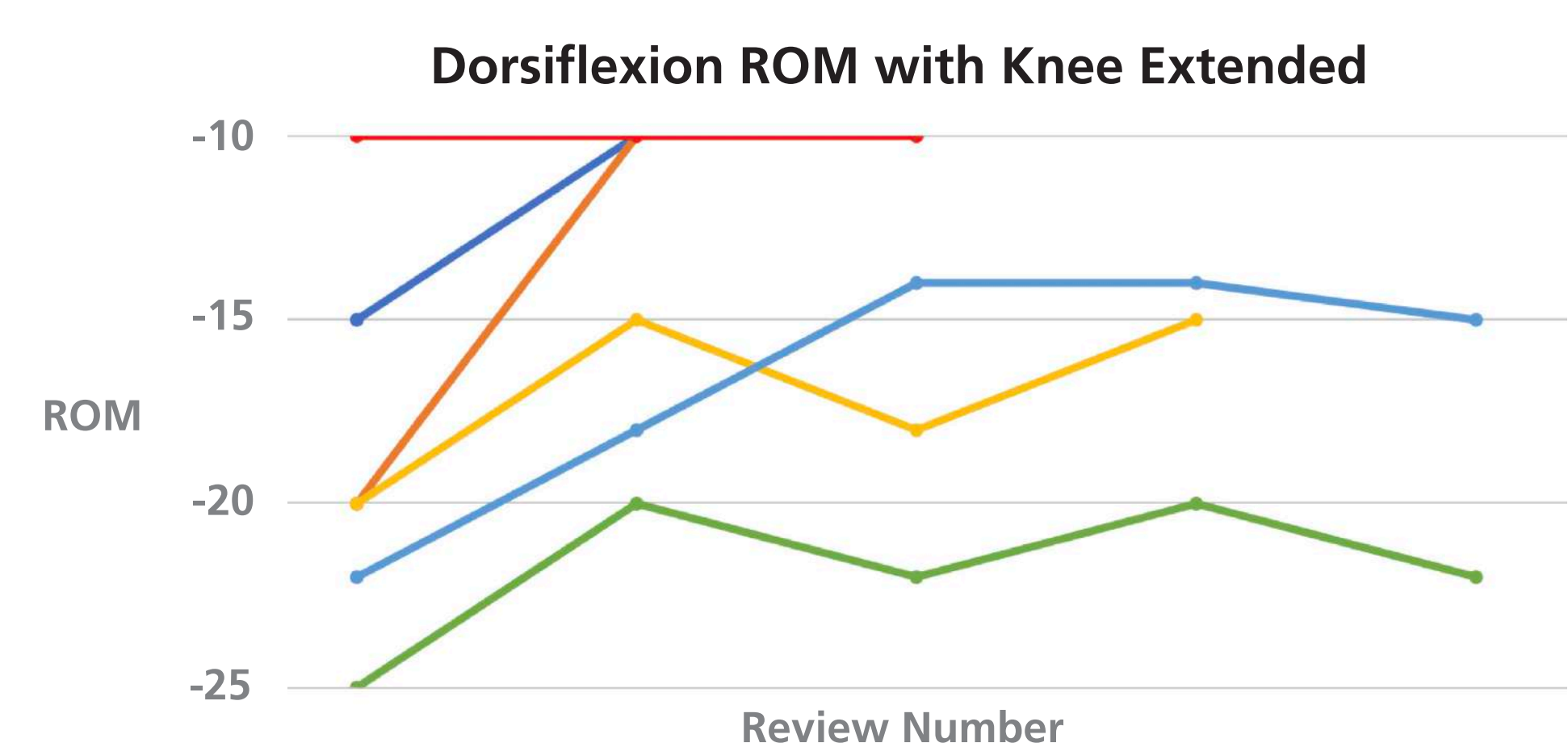
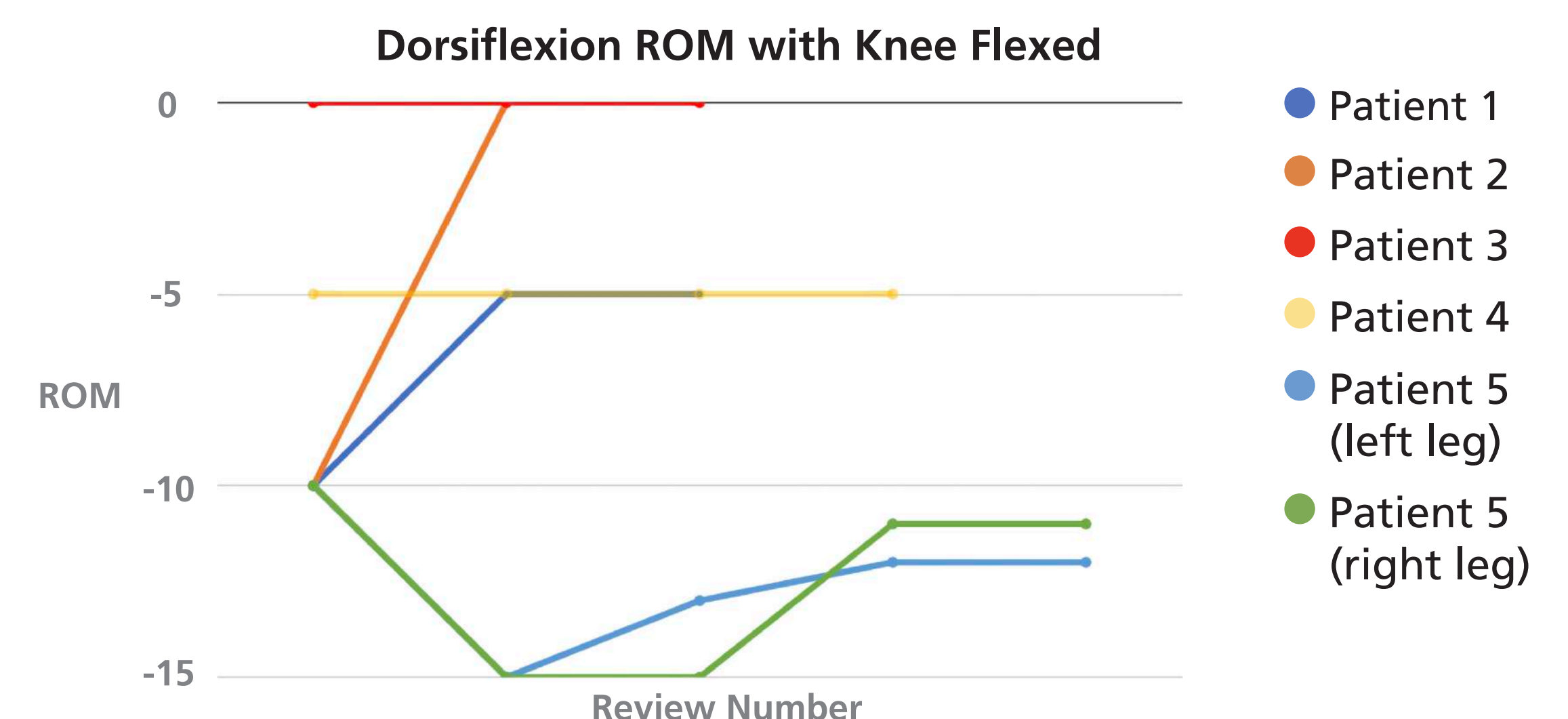
Standing position after 6 months

## Design and methods

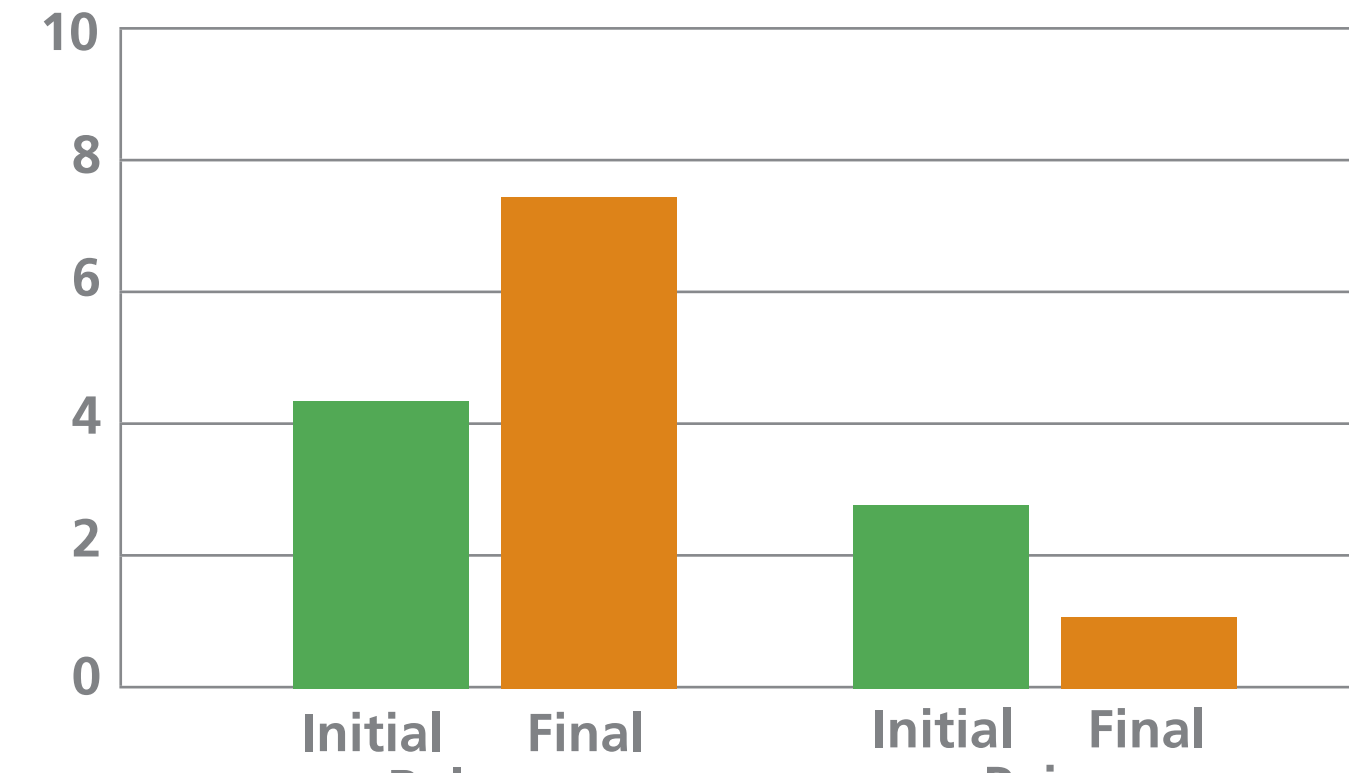
- Evaluation design: quasi-experimental, pretest-posttest.
- Patient selection: purposeful sampling by joint MDT clinical decision making.
- Inclusion criteria: Adults with MS who may benefit from Serial Casting.
- Patients were reviewed by an orthotist and a physiotherapist and a joint decision was made to either make no changes, add a calf wedge, recast, or fabricate a permanent orthosis.
- Data collection: 5 patients with MS, over 16 months. Outcomes repeated at each review appointment which were every 6 weeks to 3 months until a permanent orthosis was issued and/or serial casting was stopped.
- Measurement techniques:
  - ROM: goniometer
  - Balance + pain: NRS 0-10
  - Mobility: JH-HLM Scale
  - Complications / Benefits: Open questions

## Results

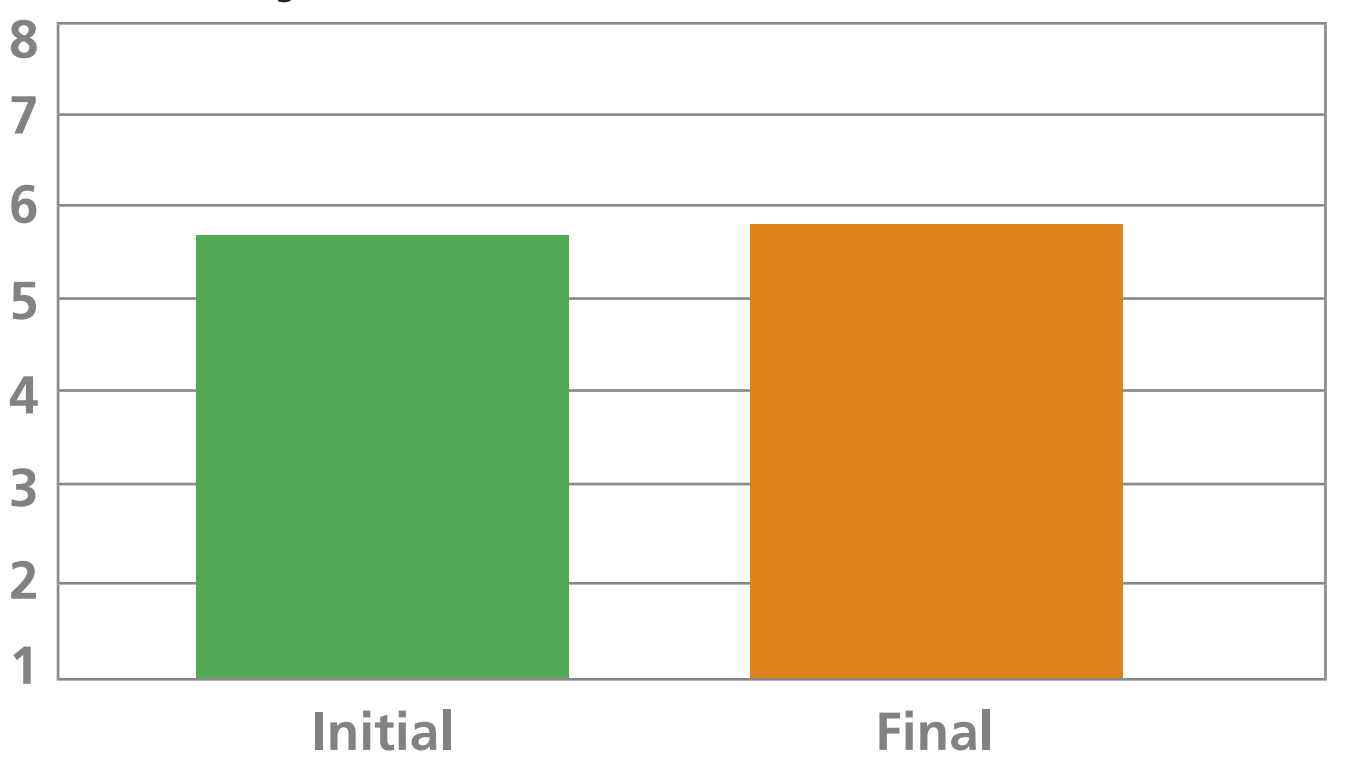
- Below are graphs that highlight the improvements seen in ROM, self reported balance and pain levels, and the unchanged mobility scores.
- The average dorsiflexion improvement with knee flexed was 2° and with knee extended was 5°.



NRS Scores



Mobility Score (JH-HLM Scale)



"Helps me to walk, I would be lost without it"

"They are comfortable and stop my foot turning in"

"They allow me to stand to my standing frame"

## Conclusion

- Our serial casting produced Improvements in ROM, balance and pain, but mobility remained unchanged.
- No adverse effects were reported.
- Our team will act upon the lack of improvement in mobility scores, and discuss an action plan to improve this.
- More high quality research is required to determine if these results are generalisable to patients with MS in different clinic settings.
- More research is also required to determine the factors that specifically contributed to these results to aid with patient selection and advice for optimisation of serial cast use in future (i.e. duration of wear, stretches to complete, etc.).

## References

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