

Physiotherapy interventions evidence table – Joint protection education, orthoses and splinting

The following table provides a summary of level I or II evidence (according to the NHMRC evidence hierarchy) for physiotherapy-relevant interventions in RA published between January 2012 and June 2015. Interpreting the evidence can be complex. RAP-eL users should consider the following:

- There are no current studies investigating the effects of joint protection education, splinting or orthoses on early versus late rheumatoid arthritis.
- There is inconclusive evidence regarding wrist splint types and the frequency/duration of splint use during a day.
- Although orthoses may improve hallux valgus angle, there is no evidence to provide links between this objective measurement and improvements in function and pain.
- There is inconclusive/no evidence for orthoses in improving foot function, walking speed, and gait.
- It is important to note that the interventions studied are done so in isolation, so the evidence refers to the effect of the single intervention, and not the effect of a multimodal intervention.

Physiotherapy-related intervention(s)	Sources of Evidence (see key below)	Results	Making Sense of the Evidence								
Individual joint protection education	<table border="1"> <tr> <td>RCT</td> <td>SR</td> <td>MA</td> <td>CSR</td> </tr> <tr> <td>✓</td> <td></td> <td></td> <td></td> </tr> </table> <p>Niedermann K et al. Scand J OT 2012 (19): 360-369 [PubMed link]</p>	RCT	SR	MA	CSR	✓				<ul style="list-style-type: none"> • 5 x 45 minute sessions of 1:1 joint protection (JP) education (4 in 3/52 and one booster session 2 months later) • Individualised JP education gave larger improvements in adherence, self-efficacy and grip strength than the conventional JP education group (generic joint protection and RA written and oral information, demonstration and supervision of kitchen tasks) 	<ul style="list-style-type: none"> - Individualised prescription of joint protection techniques tailored to patient-specific goals (compared to joint protection education targeted at generic tasks) improves adherence to joint protection strategies, self-efficacy and grip strength. - These effects increase at 6 and 12 months post treatment indicating improved self-management. - Strong evidence for joint protection education improving function in activities of daily living (ADL's) was
	RCT	SR	MA	CSR							
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			✓								

		<p>for hand JP education +/- extra written information e.g. home exercise programme from OT)</p> <ul style="list-style-type: none"> • Effect sizes increased at 6 and 12 months post intervention. • Both groups showed improvements although individualised education was more effective at 6 and 12 months. 	<p>also found by the Cochrane Systematic Review by Steultjens et al in 2004.</p>																								
<p>Foot orthoses and special shoes +/- orthoses</p>	<table border="1" data-bbox="495 667 863 751"> <thead> <tr> <th>RCT</th> <th>SR</th> <th>MA</th> <th>CSR</th> </tr> </thead> <tbody> <tr> <td></td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table> <p>Hennessy et al 2012; 64(3): 311-320. [link]</p> <table border="1" data-bbox="495 907 863 992"> <thead> <tr> <th>RCT</th> <th>SR</th> <th>MA</th> <th>CSR</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table> <p>Egan et al (2010) Splints and Orthoses for treating RA [link]</p> <table border="1" data-bbox="495 1148 863 1232"> <thead> <tr> <th>RCT</th> <th>SR</th> <th>MA</th> <th>CSR</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table> <p>Hawke et al (2008) Custom-made orthoses for the treatment of foot pain [link]</p>	RCT	SR	MA	CSR		✓			RCT	SR	MA	CSR				✓	RCT	SR	MA	CSR				✓	<ul style="list-style-type: none"> • No studies had good external and internal validity (Hennessy et al, 2012). • Moderate improvements in forefoot pressures and pain were found with using orthoses. • One study showed reduced pain with walking and stair climbing associated with wearing extra-depth shoes for 2/12. These benefits were maximised with extra-depth shoes. • Orthoses may prevent progression of hallux valgus angle but do not improve pain or function. 	<ul style="list-style-type: none"> - Conflicting benefits (moderate improvement versus no improvement in foot and ankle pain in patients with RA) were found by Hennessy et al (2012) and Egan et al (2010). - Extra deep shoes may improve pain with walking and stair climbing, particularly when combined with orthoses (see Egan et al (2010) for more information). - It may be prudent in the first instance to consider supportive footwear +/- soft over-the-counter orthotics due to the lack of conclusive evidence and high cost
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		<ul style="list-style-type: none"> Hawke et al (2008) found some reduction in rear-foot pain at 3/12 with nil maintained at 3/12. Reductions in 1st MTPJ pain at 6/52 and 3/12 with orthoses may not be superior to supportive shoes or soft over-the-counter orthotics. 	<p>associated with custom orthoses.</p>																								
<p>Wrist splints</p>	<table border="1" data-bbox="495 548 863 634"> <tr> <th>RCT</th> <th>SR</th> <th>MA</th> <th>CSR</th> </tr> <tr> <td></td> <td>✓</td> <td></td> <td></td> </tr> </table> <p>Ramsey et al 2014 ; J Rehabil Med; 46(6): 481-492. [link]</p> <table border="1" data-bbox="495 829 863 915"> <tr> <th>RCT</th> <th>SR</th> <th>MA</th> <th>CSR</th> </tr> <tr> <td></td> <td></td> <td></td> <td>✓</td> </tr> </table> <p>Steultjens et al (2004) OT for RA. [link]</p> <table border="1" data-bbox="495 1073 863 1159"> <tr> <th>RCT</th> <th>SR</th> <th>MA</th> <th>CSR</th> </tr> <tr> <td></td> <td></td> <td></td> <td>✓</td> </tr> </table> <p>Egan et al (2010) Splints and orthoses for treating RA [link]</p>	RCT	SR	MA	CSR		✓			RCT	SR	MA	CSR				✓	RCT	SR	MA	CSR				✓	<p>Working wrist splints (i.e. not resting splints or post surgical splints aimed to immobilise) may:</p> <ul style="list-style-type: none"> reduce hand pain improve grip strength (moderate evidence) at the expense of reducing dexterity (Ramsey et al, 2014; Steultjens et al, 2004). <p>Conflictingly Egan et al (2010) concluded:</p> <ul style="list-style-type: none"> no statistically significant improvements in pain or grip strength. <p>There is inconclusive evidence to support the effects on function.</p> <ul style="list-style-type: none"> Egan et al (2010) found no benefits of resting splints, however patients wearing resting splints for >2/12 preferred use to non-use of 	<p>Wrist splints can be considered for:</p> <ul style="list-style-type: none"> reducing hand pain, and improving grip strength in patients with RA. <ul style="list-style-type: none"> It should be noted that there is likely to be a reduction in dexterity so assessment for hand splints should be made on a case by case basis depending on the functional needs of the patient Splinting has a trend towards being more efficacious for tasks where strength is required e.g. lifting, vaccuming and sweeping rather than where dexterity is required. Subjectively, patients prefer padded resting splints and using splints compared with non-use despite there being
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		splints and padded splints over non-padded splints.	no evidence for resting splints improving function, pain or joint count in patients with RA.
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Key To Evidence Sources:

Randomised Controlled Trial (RCT)
Cochrane Systematic Review (CSR)
Meta-Analysis (MA)
Systematic Review (SR)

List of Table Abbreviations:

ADL's – Activities of Daily Living
DAS28 – Disease activity score calculator for Rheumatoid arthritis [[click here for link to PDF](#)]
DASH – “Disabilities of the Arm Shoulder and Hand” outcome measure
HEP – Home Exercise Programme
HRQ – Health Risk Questionnaire
JP – Joint Protection
LBP – Lower Back Pain
OA – Osteoarthritis
OT – Occupational Therapy
QOL – Quality Of Life
RA – Rheumatoid Arthritis
RCT – Randomised Controlled Trial
TENS – Transcutaneous Electrical Nerve Stimulation
US - Ultrasound
1st MTPJ – 1st Metatarsophalangeal Joint