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Cochrane Corner

What are the effects of rehabilitation interventions following surgical or non-surgical management of ankle fractures in adults? - A Cochrane review summary with commentary

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The aim of this commentary is to discuss in a rehabilitation perspective the recently published Cochrane review "Rehabilitation for ankle fractures in adults"[1] by Lewis SR, Pritchard MW, Parker R, Searle HKC, Beckenkamp PR, Keene DJ, Bretherton C, Lin C-WC[a], published on the Cochrane Library. This Cochrane Corner is produced in agreement with The Turkish Journal of Physical Medicine and Rehabilitation by Cochrane Rehabilitation with views* of the review summary author in the "implications for practice" section.

Ankle fractures are common orthopedic injuries that can significantly impact an individual's mobility and quality of life (QoL). Treatment options vary depending on the severity of the injury. Individuals with a stable ankle fracture are generally advised to maintain immobility for a specified duration, during which they are provided with a removable ankle brace or cast for support. Those with more severe ankle fractures undergo surgery followed by pain management and controlled movement or weight-bearing as prescribed.

Whilst the initial treatment, whether immobilization or surgery, is primarily concerned with bone healing, rehabilitation plays a crucial role in the recovery process after an ankle fracture. It aims to reduce pain, prevent long-term complications, improve ankle function, and QoL. The choice of treatment and rehabilitation plan is tailored to the individual patient's needs and fracture characteristics. A rehabilitation program typically includes early mobilization and structured exercise programs including range of motion exercises, followed by flexibility, progressive strengthening, balance, and proprioception exercises. These exercises gradually progress in intensity as the ankle heals to facilitate a smooth return to pre-injury activity levels.

Rehabilitation for ankle fractures in adults (Lewis SR et al., 2024)[1]

What is the aim of this Cochrane review?

The aim of this Cochrane review was to assess the effects of rehabilitation interventions following surgical or non-surgical treatment of ankle fractures in adults.

What was studied in the Cochrane review?

The population addressed in this review was adults of either sex who attended a hospital or community setting for rehabilitation following an ankle fracture. Allocation to the treatment group must have been within three months of the ankle fracture, and participants could have had either surgical or

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[1]This summary is based on a Cochrane Review previously published in the Cochrane Database of Systematic Reviews 2020, Issue 3, Art. No.: CD009233. doi: 10.1002/14651858.CD009233.pub3. (see www.cochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and Cochrane Database of Systematic Reviews should be consulted for the most recent version of the review.

** The views expressed in the summary with commentary are those of the Cochrane Corner author, who is different from the original Cochrane Review authors, and do not represent the Cochrane Library or Wiley.*

non-surgical orthopaedic management. Interventions studied were any rehabilitation intervention (e.g. early weightbearing, orthoses, ankle exercises, manual therapy, stretching, electrotherapy) employed by a health professional (e.g. doctor, physiotherapist) started at or after surgical or non-surgical fracture treatment. In this review, the authors focused on the following intervention comparisons.

- Early weight-bearing versus delayed weight-bearing
- Removable ankle support versus non-removable ankle support (e.g. cast, back-slab)
- Rehabilitation interventions versus usual care or other rehabilitation interventions

The primary outcome studied was activity limitation as a measure of ankle function, using questionnaires or performance tests. The secondary outcomes were health-related QoL (HRQoL), participant satisfaction, pain, and adverse events. The authors collected outcome data at the following three time points for both primary and secondary outcomes, where relevant:

- At the end of treatment
- In the short term
- In the long term

Search methodology and up-to-dateness of the Cochrane review?

The review authors searched CENTRAL, MEDLINE, Embase, three other databases, and two clinical trials registers in May 2022, and conducted additional searches of CENTRAL, MEDLINE, and Embase in March 2023. They also searched reference lists of included studies and relevant systematic reviews.

What are the main results of the Cochrane review?

The review included fifty-three studies (45 RCTs, 8 quasi-RCTs) with 4,489 adults with ankle fracture. In most studies, orthopaedic treatment included surgical fixation but was non-surgical in five studies, and either surgical or non-surgical in six studies. The authors summarized the results for three common rehabilitation methods as they included the most data and were the most clinically relevant. This review indicates that early weightbearing within three weeks of ankle fracture surgery appears to improve function in the first six months following injury. However, the improvement is small and unlikely to be clinically important. Early weight-bearing may offer little or no difference to HRQoL compared to delayed weight-bearing with a low-certainty evidence; when translated to the EQ-5D scale, any small difference was not clinically important. There may be no difference between early and delayed weight-bearing in the risk of reoperation. The authors assume that these findings are applicable to people with a closed ankle fracture who had surgery that achieved satisfactory fracture stabilization. The applicability of the results to non-surgically treated ankle fractures in uncertain because, the evidence only included participants who had undergone surgery. Data shows that a removable ankle support may improve ankle function better after surgery than a non-removable support ankle like a back slab or a cast. The results indicate both a clinically important and unimportant difference in ankle function, but include uncertainty. The authors were unable to suggest a particular rehabilitation intervention due to the high level of variability in types of interventions that precluded meta-analysis, and the small sample sizes in reported trials.

How did the authors conclude on the evidence?

The authors concluded that early weight-bearing may improve outcomes in the initial six months following ankle fracture surgery; however the difference is likely to be small and may not always be clinically important. A removable ankle support may also provide a better outcome, but again, the difference may not always be clinically important. The reoperation risk is probably not increased by either approach. The authors found no evidence suggesting that removable ankle support is more effective than non-removable support, or vice versa, for individuals receiving non-surgical treatment.

The authors were unable to pool data for rehabilitation interventions due to heterogeneity in types of interventions, and concluded that the effectiveness of these interventions, whether compared to usual care or other interventions, remained uncertain.

What are the implications of the Cochrane evidence for practice in rehabilitation?

This Cochrane review investigates the importance of evidence for rehabilitation interventions for ankle fractures in adults. The authors have made the long-awaited update on the Cochrane review first published in 2008 and updated in 2012.[2,3] It is important to note that the authors downgraded the certainty of all evidence in this review since all

studies in the main comparison groups were at high risk of performance and detection bias. "Certainty of evidence" is the term increasingly used to refer to "quality of evidence" in Cochrane language. Moderate-certainty/quality evidence indicates that the true effect is likely to be close to the effect estimate.[4]

Initiating weight-bearing early after ankle fracture surgery might lead to better results within the first six months, although the improvement is likely to be minor and may not always be clinically significant. Clinicians might consider early weight-bearing as a possibility but should manage patient expectations regarding the extent of functional gains. Similarly, using a removable ankle support could offer better outcomes, but the benefits may also be modest and not consistently clinically meaningful. Early weight-bearing's impact on HRQoL varies, so clinicians shouldn't rely on it alone to improve HRQoL. Instead, they should monitor HRQoL and include other strategies like pain management and psychological support in rehabilitation plans for a patient-centered approach.

Rehabilitation interventions included in the current review were active controlled motion, a spring-loaded ankle trainer, an antigravity treadmill, and variations of enhanced physiotherapy administered during or after initial fracture management. Data could not be pooled due to heterogeneity of interventions and comparators, and most studies had very small sample sizes. The certainty of evidence was very low, leaving the effectiveness of these therapies uncertain. It remains unclear whether any physical therapy interventions are superior to usual care or alternative physical therapy approaches.

There are a small number of studies measuring pain and satisfaction in the current review. This limitation was also addressed in a recent editorial by Madden[5] The author emphasizes the need for research using patient-important outcomes to provide high-quality treatment recommendations, and proposes the use of a core outcome set in future ankle fracture studies. Utilizing a standardized set of outcomes, determined through expert consensus, would enhance the consistency and comparability of research in this area.[6]

In summary, this review suggests a cautious approach to early weight-bearing and removable ankle supports due to the uncertain clinical significance of the observed benefits following surgically treated closed ankle fractures in adults. It also underscores the necessity for subsequent research to employ a core outcome set and to utilise larger sample sizes in studies investigating rehabilitation interventions for ankle fractures.

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