

There is insufficient evidence to establish the effectiveness of physiotherapy intervention in the rehabilitation of adults with fractures of the distal radius.

Prepared by: Maureen Duggan
Maureen.Duggan@vch.ca
Date: November 2006
Review date: November 2008

CLINICAL SCENARIO: Physiotherapy intervention following distal radius fractures is frequently initiated as a stage in the recovery of adults with this common injury. Many studies have questioned its effectiveness and necessity for this population. At Vancouver General Hospital physiotherapists attend the fracture clinics and initiate a program of home exercises and education immediately post cast removal as an interim to initiating formal physiotherapy. Is this a cost effective and necessary intervention?

FOCUSSED CLINICAL QUESTION: Does early intervention within the first 7 days post cast removal improve the functional outcome of adults with distal radius fractures?

SUMMARY of Search, 'Best' Evidence' appraised, and Key Findings:

- Five studies were identified by the database search that met the inclusion criteria. Three randomised controlled trials, a cohort study and a recently updated systematic review. The systematic review from the Cochrane Library has a 1a level of evidence rating and includes all four of the studies.
- All four studies concluded that there was statistically significant improvement over time in both the control and the treatment groups but there was no difference between the control and treatment groups for pain, grip strength, functional tasks or ROM.
- One study showed statistically significant improvement in flexion
- One study showed statistically significant improvement in flexion/extension
- Neither study indicated that the difference was clinically important or that it resulted in improved function
- The systematic review concluded that there was insufficient evidence to establish the effectiveness of rehabilitation intervention in adults with distal radius fractures.

CLINICAL BOTTOM LINE:

There is insufficient evidence to support rehabilitation intervention other than a home program of exercise and advice following distal radius fractures in adults.

Limitation of this CAT: This critically appraised paper has not been peer-reviewed by one other independent person.

SEARCH STRATEGY:

- Patient/Client Group: Adults with distal radius fractures
- Intervention (or Assessment): physiotherapy, rehabilitation, exercise, ROM, passive mobilisation, modalities
- Comparison: nil
- Outcome(s): pain, ROM, strength, functional outcomes

Databases and sites searched	Search Terms	Limits used
OVID EBM MEDLINE CINHAL EMBASE PEDro J. of Hand Therapy (1996-2006)	Radius fractures, rehabilitation, physiotherapy, exercise, ROM, passive mobilisation, modalities	Human adults, English language

INCLUSION and EXCLUSION CRITERIA**Inclusion:**

- Studies published in the English language
- Studies that are systematic reviews, randomised controlled trials (with good methodological rigor (one cohort study with less rigor was accepted because of relevance)
- Studies with adults with distal radius fractures
- Studies where participants received some type of physiotherapy/rehabilitation intervention

Exclusion:

- Descriptive articles of management interventions
- Articles that reviewed therapy practice patterns only
- Clinical trials of one specific modality of unproven benefit
- Studies with participants with complications ie. Infections, CRPS
- Studies with children

RESULTS OF SEARCH

A total of five relevant studies were located and categorised as shown in Table 1 (based on Levels of Evidence, Centre for Evidence Based Medicine, 1998)

Table 1: Summary of Study Designs of Articles retrieved

Study Design/ Methodology of Articles Retrieved	Level	Author (year)	Source of evidence
Systematic review	1a	Handoll, H.H.G., Madhok, R., & Howe, T.E. (2006)	OVID EBM, Medline, CINHAL, PEDro, EMBASE
Randomised Controlled Trials	2b	Wakefield, A.E., & McQueen, M.M. (2000)	OVID EBM, Medline, EMBASE
Randomised Controlled Trial	1b	Kay, S. Haensel, N. & Stiller, K., (2000)	Reference list of SR
Cohort Study	4	Oskarsson, G.V., Hjall, A., & Aaser, P., (1997)	Medline

BEST EVIDENCE

The following study/paper was identified as the 'best' evidence and selected for critical appraisal. Reasons for selecting this study were:

- It is the highest level of evidence (1a)
- Current updating May 2006
- It includes all of the other identified studies as part of its review

SUMMARY OF BEST EVIDENCE

Table 2: Description and appraisal of systematic review by Handoll, H.H.G., Madhok, R. & Howe, T.E., (2006)

Aim/Objective of the Study/Systematic Review: To determine the effectiveness of rehabilitation interventions for adults with conservatively or surgically treated distal radius fractures.

Study Design: systematic review

Search strategy: Electronic searches of Cochrane Bone, Joint and Muscle Trauma group (Dec. 2005), Central Register of Controlled trials (Cochrane Library Issue 4, 2005), MEDLINE (1966 - Nov. 2005), EMBASE (1988 – Dec.2005), CINHAL (1982 – Dec 2005), AMED (1985- Dec. 2005), LILACS (accessed Dec. 2, 2005), PEDro (accessed Dec.2, 2005), OT SEEKER (accessed Dec.2, 2005), Cochrane Rehabilitation and Related Therapies Field database (Sept. 2001) and reference lists of articles.

Hand search of conference and meeting proceedings and contacted trialists.

Selection Criteria: “Randomised or quasi-randomised controlled trials evaluating rehabilitation as part of the management of fractures of the distal radius in adults. Rehabilitation interventions such as active and passive mobilisation exercises, and training for activities of daily living administered in various ways by various practitioners.”¹(p. 2) Trials comparing techniques, timing and intensity of single modalities and drug trials were excluded.

Data Collection and Analysis: The authors independently selected and reviewed trials. Study authors were contacted for additional information. No data pooling was done. All three authors independently assessed the methodological quality of the included studies.

Main Results: Fifteen trials involving 746 predominantly females were included. For intervention started during immobilisation there was weak evidence of improved hand function in the short term but not long term (3 months). There was no difference between supervised and unsupervised exercises.

For intervention started post-immobilisation there was weak evidence of a lack of clinically significant difference in outcome of patients receiving formal therapy as compared to no intervention. There was weak evidence of better short term hand function in participants given physiotherapy than those given home exercise instruction by a surgeon.

Conclusions: “The available evidence from randomised controlled trials is insufficient to establish the relative effectiveness of the various interventions used in the rehabilitation of adults with fractures of the distal radius.”¹ (p.2)

Critical Appraisal:

Validity: High level of methodological rigor—systematic review with homogeneity of RCT’s.

Randomised controlled trials: Wakefield, et al (2000) PEDro scale—8

Maciel, et al(2005) PEDro scale—6

Kay, et al (2000) PEDro scale—9

Cohort study: Oskarsson, et al (1997) PEDro scale—4

Cohort study is of poor rigor but was relevant to the topic.

Subgroup and sensitivity analysis was done.

Possible publication and selection bias as chosen by only one reviewer.

Interpretation of Results: The variation in intervention, providers and method of intervention made this a complex and extensive subject to review. Results were looked at in 3 comparisons: rehabilitation intervention vs. no intervention, one intervention vs. another intervention and methods of delivering rehabilitation intervention (home program, frequency etc.). Evidence was restricted to randomised controlled trials to reduce selection bias but this limited the number of trials.” The lack of compatible outcome data from the few trials generally prevented pooling. “¹ Statistical analysis was done extensively between studies and between specific outcomes however “overall comparison showed insufficient evidence to determine how best to manage the rehabilitation of adults with fractures of the distal radius.”¹

Conclusion: This review was unable to determine what intervention is necessary, what type of specialist (PT, OT, surgeon, U/E specialist) should provide this care and when, how long or what method (home program/at clinic) it should take. However, the authors state that these findings do not indicate that there should be no intervention and that general advice and instruction on mobilisation should be given to patients with distal radius fractures. In addition, patients with complications may still require more formal physiotherapy intervention.

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

- Clinical recommendations are to continue to provide home exercise programs with comprehensive advice and instruction to patients with distal radius fractures.
- Routine provision of formal physiotherapy intervention is not supported by evidence.
- Patients that develop complications with significant stiffness and loss of function may require and benefit from formal physiotherapy.
- Further research is required to establish indicators to identify which patients will develop such complications so that therapy can be initiated.
- Further research is required to evaluate specific treatment interventions, their frequency and duration.

REFERENCES

1. Handoll, H.H.G., Madhok, R. & Howe, T.E., (2006) Rehabilitation for distal radius fractures in adults. In the Cochrane Database of Systematic Reviews, 3, Retrieved September 27, 2006, from www.gateway.ut.ovid.com.
2. Kay, S., Haensel, N. & Stiller, K., (2000). The effect of passive mobilisation following fractures involving the distal radius: a randomised study. Australian Journal of Physiotherapy, 46, 93-101
3. Maciel, J.S., Taylor, N.F. & McIlveen, C., (2005). A randomised clinical trial of activity-focussed physiotherapy on patients with distal radius fractures. Archives of Orthopaedic Trauma Surgery, 125, 515-520
4. Oskarsson, G.V., Hjal, A. & Aaser, P., (1997). Physiotherapy: an overestimated factor in after-treatment of fractures in the distal radius? Archives of Orthopaedic Trauma Surgery, 116, 373-375
5. Wakefield, A.E. & McQueen, M.M., (2000). The role of physiotherapy and clinical predictors of outcome after fracture of the distal radius. The Journal of Bone and Joint Surgery, 82-B, &, 972-976.