

# Evidence Based Research

# Research Sites

| Resource                                | Website   |
|---|---|
| Georgia State University                | <a href="http://research.library.gsu.edu/content.php?pid=35730&amp;sid=263000">http://research.library.gsu.edu/content.php?pid=35730&amp;sid=263000</a> |
| APTA                                    | <a href="http://www.apta.org/">http://www.apta.org/</a>   |
| PubMed                                  | <a href="http://www.ncbi.nlm.nih.gov/pubmed">http://www.ncbi.nlm.nih.gov/pubmed</a>   |
| Best Evidence                           | <a href="http://group.bmj.com/products/evidence-centre">http://group.bmj.com/products/evidence-centre</a>   |
| BioMedCentral                           | <a href="http://Biomedcentral.com">Biomedcentral.com</a>  |
| Clinical Evidence                       | <a href="http://www.ovid.com/products/clinical/clinicalevidence.cfm">http://www.ovid.com/products/clinical/clinicalevidence.cfm</a>                     |
| ClinicalTrials.gov                      | <a href="http://clinicaltrials.gov/">http://clinicaltrials.gov/</a>   |
| Cochrane Database of Systematic Reviews | <a href="http://www.cochrane.org/">http://www.cochrane.org/</a>   |
| Cochrane Library                        | <a href="http://www.thecochranelibrary.com/view/0/index.html">http://www.thecochranelibrary.com/view/0/index.html</a>                                   |



# Research Sites

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| <b>DARE – Database of Abstracts of Reviews of Effectiveness</b> | <a href="http://agatha.york.ac.uk/darehp.htm">http://agatha.york.ac.uk/darehp.htm</a>  |
| <b>Evidence Based Healthcare</b>                                | <a href="http://www.ebmny.org/pubs.html">http://www.ebmny.org/pubs.html</a>  |
| <b>EMBASE</b>   | Embase.com   |
| <b>Evidence Based Medicine Reviews</b>                          | <a href="http://www.ovid.com/products/clinical/ebmr.cfm">http://www.ovid.com/products/clinical/ebmr.cfm</a>                        |
| <b>Google Scholar</b>   | Scholar.google.com   |
| <b>Medical Smart Search</b>                                     | <a href="http://SmartSearch.UTHSCSA.edu">http://SmartSearch.UTHSCSA.edu</a> ;  |
| <b>PEDro</b>  | <a href="http://www.pedro.fhs.usyd.edu.au/">http://www.pedro.fhs.usyd.edu.au/</a> ; <a href="http://Pedro.org.au">Pedro.org.au</a> |
| <b>Physiopedia</b>  | Physic-pedia.com   |
| <b>PubMed</b>   | Ncbi.nlm.nih.gov   |



# Research Sites

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| <b>Rehabtrials.org</b>                                | <a href="http://www.rehabtrials.org/">http://www.rehabtrials.org/</a>   |
| <b>SUMSearch</b>                                      | <a href="http://sumsearch.uthscsa.edu/searchform4.htm">http://sumsearch.uthscsa.edu/searchform4.htm</a>                           |
| <b>TRIP</b>   | <a href="http://www.tripdatabase.com">http://www.tripdatabase.com</a>   |
| <b>World Confederation for Physical Therapy</b>       | <a href="http://www.wcpt.org/node/29660#pt-journals">http://www.wcpt.org/node/29660#pt-journals</a>                               |
| <b>CEBM- The Centre for Evidence-Based Medicine</b>   | <a href="http://ktclearinghouse.ca/cebm/syllabi/occupational/intro">http://ktclearinghouse.ca/cebm/syllabi/occupational/intro</a> |
| <b>National Guideline Clearing house</b>              | <a href="http://www.guideline.gov/">http://www.guideline.gov/</a>   |
| <b>OT Seeker</b>                                      | <a href="http://www.otseeker.com/">http://www.otseeker.com/</a>   |
| <b>Evidence Based Review of Stroke Rehabilitation</b> | <a href="http://www.ebrsr.com/reviews_list.php">http://www.ebrsr.com/reviews_list.php</a>   |
| <b>AAOS</b>   | <a href="http://www.aaos.org/research/guidelines/guide.asp">http://www.aaos.org/research/guidelines/guide.asp</a>                 |
| <b>CIRRIE</b>   | <a href="http://cirrie.buffalo.edu/">http://cirrie.buffalo.edu/</a>   |



# Research Overview

- Therapy visits should be for skilled interventions, reassessments, and the development of a strong and progressive home management program.
- Skilled interventions include anything that cannot be transitioned to a home program and require the sophisticated skills of the therapist.
- In addition to skilled interventions, evidence shows that the best outcomes result from an independent, well-developed home management program.
- The focus of the therapy should be on patient independence and compliance with the home program.

# Low Back Pain

- van Tulder et al., 2000:
  - Strong evidence that exercise therapy is not more effective than education and active rest in reducing pain in patients with acute low back pain (<12 weeks).
- DeLitto et al., 2012:
  - Movement-based exercise on a limited basis is a recommended intervention for acute low back pain.
  - Patient education is a recommended intervention for patients with low back pain.

# Spinal Dysfunction

Hayden et al., 2005:

A meta-analysis of exercise therapy found that home exercise with supervision was as effective or more effective than high-dosage exercise therapy for spinal dysfunction.

# McKenzie Method

Published literature regarding frequency and duration show:

- Petersen et al. reported a 70 percent success rate with the McKenzie method combined with advice as measured by reduction in pain and reduced disability scores at a 12-month post-treatment follow up.
  - Average number of treatments was 8 ( $\pm 3.5$ ) over a two-month period, with a maximum of 15 visits.
- Cherkin et al. reported a 75 percent reduction in the Roland Disability score using a McKenzie treatment protocol (assessment, treatment, home program).
  - Reported mean scores were 12.1 (baseline), 3.7 (4 weeks) and 3.1 at 12-week follow up.
  - Average number of visits was  $<5$ , with a maximum of 9 over a four-week treatment period.



# McKenzie Method

- Schenk et al. reported a reduction in visual analog score (VAS) by 50 percent in patients with subacute LBP treated with the McKenzie method:
  - Patients received 3 physical therapy treatments.
  - Baseline VAS was 3.9; third-visit score was 1.5.
- Stankovic and Johnell reported a 100 percent return to work after 6 weeks for patients with acute LBP treated with the McKenzie method:
  - Patients received an average of 5.5 treatments (range of 2-20).
  - Seven out of 49 patients accounted for ≈50 percent of treatments due to recurrence.
    - 45 percent of patients experience a recurrence of symptoms within 1 year.
    - 70 percent resolved symptoms with self-help or by doing nothing.

# McKenzie Method References

- Petersen T, Kryger P, Ekdahl C, et al. The effect of McKenzie therapy as compared to intensive strengthening training for the treatment of patients with sub-acute or chronic low back pain: a randomized clinical trial. *Spine* 2002 27:1702-1709.
- Petersen T, Larsen K, Nordsteen J, et al. The McKenzie method compared with manipulation when used adjunctive to information and advice in low back pain patients presenting with centralization of peripheralization. *Spine* 2011 36:1999-2010.
- Cherkin, DC, Deyo RA, Battie M, et al. A comparison of physical therapy, chiropractic manipulation, and provision of an educational booklet for the treatment of patients with low back pain. *NEJM* 1998 339:1021-1029.
- Schenk RJ, Jozefczyk C, Kopf A. A randomized trial comparing interventions in patients with lumbar posterior derangement. *J Man Manip Ther* 2003 11:95-102.
- Stankovic R, Johnell O. Conservative treatment of acute low back pain. A randomized trial: McKenzie method of treatment versus patient education in “mini back school.” *Spine* 1990 15:120-123.



# Shoulder Pain

Chen et al., 2009:

- 2 groups of patients with shoulder pain and stiffness:
  - 1 group received advice, exercise, and passive mobilization (low-velocity oscillation).
  - 1 group received advice and exercise alone.
  - Up to 10 visits were completed over 8 weeks.
- Mobilization group had 3 percent less pain and disability at 3 months and 1 percent less pain at 6 months, both non-significant differences.

# Acromioclavicular Joint Separation

Standard of care reported by Brigham and Women's Hospital for A-C separations recommends PT 1-2 times per week for 2-4 weeks — up to 12 weeks if the injury is severe enough.

## Reference:

Casby J, Penikas L, Stephenson R. Standard of care: Acromioclavicular joint separation. 2007. Accessed 3/12/13.

[http://www.brighamandwomens.org/Patients\\_Visitors/pcs/rehabilitationservices/Physical%20Therapy%20Standards%20of%20Care%20and%20Protocols/Shoulder-Acromioclavicular%20Separation.pdf](http://www.brighamandwomens.org/Patients_Visitors/pcs/rehabilitationservices/Physical%20Therapy%20Standards%20of%20Care%20and%20Protocols/Shoulder-Acromioclavicular%20Separation.pdf)

# Rotator Cuff

Rehabilitation for rotator cuff repair is guided by expert opinion and clinical experience. There is little high-level scientific evidence for or against current post-op rehabilitation protocols. The AAOS (American Academy of Orthopedic Surgeons) working group on rotator cuff repair rehabilitation stated that the evidence is inconclusive regarding the benefit of clinic-based (constant supervision) versus home-based (reduced or no supervision) rehabilitation.

## References:

- van der Meijden O, Westgard P, Chandler Z, et al. Rehabilitation after arthroscopic rotator cuff repair: Current concepts review and evidence based guideline. *Int J Sports Phys Ther* 2012 7:197-219.
- Millett P, Wilcox R, O'Holleran J, Warner J. Rehabilitation of the rotator cuff: an evaluation based approach. *J Am Acad Orth Surg* 2006 14:599-509.
- Pedowitz R, Yamaguchi K, Miller B, et al. Optimizing the management of rotator cuff problems. Guideline and evidence report. AAOS, 2010.
- Baumgarten K, Vidal A, Wright R. Rotator cuff rehabilitation: a level I and level II systematic review. *Sports Health* 2009 1:125-130.



# Rotator Cuff

Hayes et al., 2004:

- 58 patients, two groups
  - Individualized PT with home program managed by physical therapist. Therapist determined number of visits necessary to manage patient progress.
  - Home exercise patients received a detailed 3-phase exercise program and instructions when to implement the exercises.
- Group with individual therapy averaged 16 ( $\pm 11$ ) over 17 ( $\pm 9$ ) weeks.
- Home group received no additional PT beyond the initial instruction in the program.
- No difference was noted ROM, strength or pain. Favorable outcomes for the majority of patients were noted.

# Rotator Cuff

Risk factors for shoulder stiffness after rotator cuff surgery:

Shoulder stiffness is the major complication following rotator cuff surgery. There is no evidence to support the need for constant PT supervision in patients without risk factors or evidence of healing delay.

- ≈3 percent of patients have shoulder stiffness, defined as failure to achieve ROM goals at 4-6 weeks.
- ≈10 percent of patients with risk factors experience shoulder stiffness and require additional supervision to achieve ROM goals.

References:

- Koo S, Parsley B, Burkhart S, Schoolfield J. Reduction of postoperative stiffness after arthroscopic rotator cuff repair: Results of a customized physical therapy regimen based on risk factors for stiffness. *J Arthroscopic Rel Surg* 2011 27:155-160.
- Huberty D, Schoolfield J, Brady P, et al. Incidence and treatment of postoperative stiffness following arthroscopic rotator cuff repair. *J Arthroscopic Rel Surg* 2009 25:880-809.

# Hip Fracture

Ziden et al., 2008, on hip fractures:

Home-based rehabilitation is as effective as clinical rehabilitation for postoperative hip fracture patients.





# Total Hip Arthroplasty

Clinic-based rehabilitation has not been shown to be more effective than home-based rehabilitation following hip arthroplasty when a specific, targeted progressive exercise program is utilized. Exercises performed at home with occasional clinic visits for review, education and progression of the home program are as effective as center-based therapy.

## References:

- Galea M, Levinger P, Lythgo N, et al. A targeted home- and center-based exercise program for people after total hip replacement: A randomized clinical trial. *Arch Phys Med Rehabil* 2008 89:1442-1447.
- Lowe C, Barker K, Dewey M, Sackley C. Effectiveness of physiotherapy exercise following hip arthroplasty for osteoarthritis: a systematic review of clinical trials. *BMC Musculoskel Disorders* 2009 10:98-111.



# Hamstring Tear

Sherry and Best, 2004:

- Athletes with acute hamstring tear (grade 1 or 2) who participated in a movement-based agility program returned to function earlier and with fewer recurrences of injury compared to those who participated in a stretching and hamstring strengthening program.
- Return to function occurred within 30 days.
- PT program was provided on a 1x/week basis supplemented by detailed home exercise program.

# Total Knee Arthroplasty

Kim et al., 2009:

- Two groups patients undergoing bilateral TKA scheduled 2 weeks apart:
  - One knee for each patient received physical therapy consisting of quadriceps strengthening, gait training, AROM, and PROM stretching exercises.
  - One knee received the same protocol without the PROM stretching.
- No difference was found in pain, functional level, or ROM between knees that received PROM stretching and knees that did not.

# Anterior Cruciate Ligament Reconstruction

Satisfactory results following ACL reconstruction can be achieved with as few as 7 clinic visits over 6 months, although 20 visits is considered more reasonable. Patients following a home program with an average of one clinic visit per month achieved the same ROM and strength as patients seen for 20 visits over the first 3 months.

## References:

- Adams D, Logerstedt D, Hunter-Giordano A, et al. Current concepts for ACL reconstruction: a criterion based rehabilitation progression. *JOSPT* 2012 42:601-614.
- Kruse L, Gray B, Wright R. Rehabilitation after anterior cruciate ligament reconstruction. A systematic review. *JBJS* 2012 94:1737-1748.

# Anterior Cruciate Ligament Reconstruction

Grant et al., 2005:

- Clinic-based group: 12-week protocol. Therapy 2x/week through week 7, 1x/week for weeks 8-12. Total of 17 PT visits.
- Home-based group: PT visit at weeks 1, 3, 6 and 12, for a total of four visits. Home patients were given exercise tubing, wobble board and a cryo/cuff.
- No differences between groups in ROM, ligament laxity or strength at 12 weeks.
- A follow-up study by the same authors (Grant and Mohtadi, 2007) found that the home-based group had higher ACL quality of life scores than the supervised group. All other outcome measures (ROM, laxity, quad/ham strength) were equivalent.

# Anterior Cruciate Ligament Reconstruction

Hohmann et al., 2011:

- Two groups – supervised and unsupervised
  - Supervised group had PT weekly for the first 6 weeks, every 2 weeks until the 6-month mark, then monthly until 9 months.
  - Unsupervised group were given a specific protocol (from *Campbell's Operative Orthopaedics*) to follow with goals/criteria for advancement.
- No benefit as defined by activity level, functional hopping tests, or isokinetic or isometric strength was found from supervised therapy compared to unsupervised therapy.

# Ankle Sprain

Green et al., 2001:

- Two groups of patients with acute ankle sprains:
  - One group received RICE and taping during the first 2 weeks.
  - One group received RICE, taping and AP glide of the talus.
- Mobilization group:
  - Returned to “normal” walking at 7.7 days.
  - Ran at 12.6 days.
  - Returned to sports at 12.2 days.
- Non-mobilization group
  - Returned to “normal” walking at 9.2 days.
  - Ran at 13.3 days.
  - Returned to sports at 13.4 days.
- No statistical difference was noted.

# Ankle Sprain

Hing et al., 2011:

- 2 groups of patients with acute ankle sprain:
  - 1 group received RICE and self-management through day 11.
  - 1 group received RICE plus 6 treatments of physiotherapy through day 11. (PT included modalities, mobilization, strapping.)
  - After day 11, all patients could participate in physiotherapy.
- No difference in swelling or pain at day 11 between groups.
- Non-significant trend toward greater function for the PT group at day 11.
- PT group used less medication than the control group.



# Ankle Sprain

- Bleakley et al., 2008:
  - Systematic review of effective strategies added to controlled mobilization and external support following acute ankle sprain.
  - No evidence of effectiveness for electrotherapeutic modalities or ultrasound in reducing symptoms.
- Markert et al., 2005 (animal model):
  - Use of non-thermal ultrasound does not increase muscle regeneration following a contusion injury.
- Mason D, Dickens V, Vail A, 2012:
  - Evidence base for the use of ultrasound or other modalities in the regeneration of muscle tissue has not been established.

# Ankle Fractures

- There is no evidence that ultrasound is beneficial in the care of ankle fractures<sup>(1)</sup> nor is there any evidence that whirlpool is beneficial in the care of extremity fractures.<sup>(2)</sup>
- Passive stretching in addition to exercise is no more effective than exercise alone in the treatment of ankle fracture.<sup>(3)</sup>
- Manual therapy plus exercise is no more effective than exercise alone in the functional outcome of ankle fractures.<sup>(4)</sup>
- The only evidence-based intervention following ankle fracture shown to improve function is exercise.<sup>(5)</sup>

See sources, next slide...



# Ankle Fractures

## References:

1. Handolin L, Kiljunen V, Arnalia I, et al. Effect of ultrasound therapy on bone healing of lateral malleolar fractures of the ankle joint fixes with bioabsorbable screws. *J Ortho Sci* 2005 10:391-395.
2. Toomey R, Grief-Schwartz R, Piper M. Clinical evaluation of the effects of whirlpool on patients with Colles fractures. *Physiother Canada* 1986 38:280-284.
3. Moseley A, Herbert R, Nightingale E, et al. Passive stretching does not enhance outcomes in patients with plantarflexion contracture after cast immobilization for ankle fracture: a randomized controlled trial. *Arch Phys Med Rehabil* 2005 86:1118-1126.
4. Lin C-W, Moseley A, Haas M, et al. Manual therapy in addition to physiotherapy does not improve clinical or economic outcomes after ankle fracture. *J Rehabil Med* 2008 40:433-439.
5. Lin C-W, Hiller C, de Bie R. Evidence based treatment for ankle injuries: a clinical perspective. *J Man Manip Ther* 2010 18:22-28.