Evidence Based Clinical Practice Guidelines

Clinical Practice Guidelines for Occupational Injuries/Diseases

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Objectives

- Clinical Guidelines—why Bother?
- How Guidelines consensus and evidence methodology works?
- Why occupational guidelines may differ from other current guidelines?
- How you can use the ACOEM guidelines to validate treatment and improve the evidence level in your reports?
- Applying the ACOEM Guidelines to low back pain and other cases

Evidence Based Medicine
Is NOT popular
With all physicians

BMJ 2003; 327: 1459-1461
CRAP CONFIRMED the existence of an EBM bible and catechism – it's a religion!
- Priesthoods
- Catechisms
- Liturgy
- Religious symbols
- Sacrements
- **10 commandments**

1. Thou shalt treat all patients according to the EBM cookbook, without concern for local circumstances, patient’s preferences, or clinical judgment.
2. Thou shalt honour thy computerized evidence based support software, humbly entering the information that it requires and faithfully adhering to its commands.
3. Thou shalt put heathen basic scientists to the rack until they repent and promise henceforth to randomize all mice, materials, and molecules in experiments.
4. Thou shalt neither publish nor read any case reports, and punish those who blaspheme by uttering personal experience.
5. Thou shalt banish the unbelievers who partake in qualitative research, and force them to live among basic scientists an other heathens.
10 Commandments of EBM
BMJ 2002; 325: 1496-1498

6. Thou shalt defrock any clinician found treating a patient without reference to all research published more than 45 minutes before a consultation.

7. Thou shalt reward with a bounty any medical student who denounces specialists who use expressions such as “in my experience”.

8. Thou shalt ensure that all patients are seen by research librarians, and that physicians are assigned to handsearching ancient medical journals.

9. Thou shalt force to take mandatory retirement all clinical experts within a maximum of 10 days of their being declared experts.

10. Thou shalt outlaw contraception to ensure that there are adequate numbers of patients to randomize.

WHY?

Why do the Compensation systems and the Legislatures require the Adoption of Evidence based Treatment Guidelines?
Manufacturing Jobs are disappearing. They are going South (Latin America), East (Asia), and West (Eastern Europe).

**WHY?**

Reasons Physicians Can control
But Don't

Increasing indemnity cost (Wage replacement)
Potential Reason for HUGE Differences in Workers’ Comp Cost

- Injured Workers receive more money in temporary wage replacement or permanent disability cash awards.
  - Explains a part of the puzzle

Potential Reason for HUGE Differences in Workers’ Comp Cost

- Vocational Rehabilitation is required by law in some jurisdictions
- Physicians, hospitals, etc. are paid more for each office visit, surgery, etc.
  - Most have fee schedules with < 30% variation in rates
- Lawyers and law suits raise the administrative costs of the system.
- Insurers make bigger profits in some states.

WHY?

Reasons Physicians Can Control

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Potential Reason for HUGE Differences in Workers’ Comp Cost that are Due to Physician Behavior

**CAUSATION:**
- In some states Physicians Declare cases “Work Related” and thus “Workers’ Comp” while in other states it is somewhat limited by law.
- **OVERTREATMENT:**
  - In some states health care providers over-treat
    - Honest desire to do something for patients with persisting complaints (PAIN)
    - MONEY

**CAUSATION:** Mutation Occurred in 1985

Repetitive Motion Disorders

Causation

- Workers’ Comp requires at least one doctor to say a condition is “work related”, or else it is not treated in Workers’ Compensation.
- **NO studies**, but old doctors (like myself) have a sense that we recently started blaming work for many of the aches and pains of aging. i.e. life as in growing old
Example of Causation “Analysis”

- Joe stubs his left big toe at work. He starts limping.
- A plaintiff friendly doctor later testifies that the limp aggravated (accelerated) his pre-existing osteoarthritis, and workers' comp should pay for BILATERAL total knee AND total hip replacements, and a lumbar spine fusion.
- MY thought: “Metastatic pain” occurs only when there is a “deep pocket” to pay for or be sued for treatment.

Why would Physicians over-treat ??

Overtreatment

- The most probable cause of health care providers over-treat Patients is the honest desire to do something for patients with persisting complaints
- In few cases--MONEY
Real World Data on MDs Certifying Disability

- **Survey:**
  - 184 Internists and FPs (Random Sample, RS) (53 % of 347), and
  - 76 “Neighborhood Health Center” (NHC) MDs (76 % of 100).
- Physicist **willingness to exaggerate** clinical data to help a patient he/she thought was deserving of disability:
  - 39 % of Random Sample MDs
  - 56 % of NHC MDs

Ethics ?

- **JAMA 2000; 283; 1858-1865**
  - Random sample questionnaire of 1124 MDs.
  - Use of 3 “tactics” to help patient get health insurance coverage/permission:
    - Exaggerated complaint severity
    - Changed billing diagnosis
    - Reported signs or symptoms patient didn’t have
  - 39 % of MDs had used at least one “tactic” “sometimes” or more often in the last year.
  - Use unrelated to worry about prosecution for fraud.
  - 54 % reported using these tactics more frequently than 5 years ago.

AAOS

- “The orthopaedic treating physician has an ethical obligation to provide TRUTHFUL, scientifically correct, and CLINICALLY ACCURATE testimony at the patient’s request, and is entitled to reasonable compensation for the time spent to prepare and give testimony.”
Evidence Based Clinical Practice Guidelines

AAOS

- “The orthopaedist providing testimony should review and testify fairly and impartially to the medical information in the case. The orthopaedist should NOT adopt a position as an advocate or partisan in the proceedings.”
- Guide to the Ethical Practice or Orthopaedic Surgery, 3rd Edition, page 68

California and APG2: One TPA’s Experience

- Cases where the treatment request is reviewed by the insurer/TPA’s physician
- Out of the 15,000 reviews, approximately 79% are denied primarily for the following reasons:
  - Lack of medical documentation to support the request and/or diagnosis;
  - Conflicting and inconsistent medical reporting by the treating physician and consulting physician;
  - Diagnostic test results do not support the request or are inconclusive;
  - Request is not supported by the diagnosis and/or the documented findings upon examination (often no exam is done);
  - Request is not based on “evidenced based medicine”

Paradigm shift:
We need to do the “right thing”.
This may mean the sensible use of Evidence based Clinical practice Guidelines

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Variations in Spinal Surgical Procedures

- 22 orthopedists and 8 neuro surgeons from varied geographical locations
- Made recommendations for surgery on 5 simulated cases
- Lumbar - agreement only on lytic spondylolisthesis, not on stenosis from varied causes
- Cervical - agreement only on single level disc herniation
- Younger surgeons preferred instrumentation


Spinal Fusions

- From 1996 – 2001 rate of spinal fusion rose by 77%
- For the same time period knee arthroplasty increased 14%
- Most common reason for fusions is degenerative disc disease for which there is no evidence

Deyo, RA; Spine 2005 30(12): 1441-1445
What’s Wrong With Variation in Clinical Practice?

- “This degree of variance amounts to a roll of the dice in making health care decisions”
  - Donald Berwick MD, CEO, Institute for Healthcare Improvement
- “Random treatment strategies create random outcomes. … This…does no inspire confidence in medical care.”
  - John Weinberg MD, Dartmouth School of Medicine

Evidence-Based Medicine

“EBM is the integration of best research evidence with clinical expertise and patient values.”*

- “…integration of best research evidence with clinical expertise…” means filling the gaps in evidence with logical clinical judgment or structured consensus.
- Guides effective clinical decision-making by bringing critical appraisal [of the evidence] to the bedside.
- Respects patient values and preferences


Evidence-Based Medicine v 2

“The conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients”

-David Sackett
Evidence Based Clinical Practice Guidelines

**Expanded EBM Definition**

“A set of principles and methods intended to ensure that to the greatest extent possible, medical decisions, guidelines, and other types of policies are effectiveness and benefit.”


**Making Medical Decisions**

- The Patient’s Circumstances
- The Evidence
- The Patient’s Wishes

**The Art of Medicine**

- Know the science
- Establish the correct diagnosis
- Understand your patient’s needs – cultural and educational background, health care expectations, and personal goals
- Establish a treatment plan that the patient is committed to and will increase function.

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Clinical Practice Guidelines

- "Systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances"*
  - Evidence component – inter/national
  - Detailed instructional component – local
  - Collection of specific recommendations
    - National Institute of Medicine, 1990

Why Use Guidelines?

- Patient and Payer demands for quality of care
  - Increased expectations for good outcomes and medical safety
  - Want practices that reflect advances in medicine based on the best available evidence
- Reduce unexplained/unwanted variation in care
- Limit over-utilization
  - Curb unproductive or harmful procedures

The Goals of EBM in Clinical Practice Guidelines

- Reduce variance from best practices
  - Diagnosis
  - Work relatedness
  - Medical care
    - Testing
    - Treatment
    - Pain management
  - Activity modification
  - Time off work
  - Often independent of medical care
Guideline Types and History

- CPG--Oriented toward Practice and Treatment
- Utilization review type
- In General Health Utilization Review alone has not controlled costs
- Good practice obviates the need for Utilization Review

Guideline Sources

- www.guideline.gov  Single best resource
  - National Guidelines Clearinghouse (AHRQ) Hundreds of Organizations, Thousands of Guidelines
  - ACOEM Clinical Practice Guidelines
  - AAOS (7 Guidelines)
  - American College of Radiology (99 Guidelines)
  - NASS (4 Guidelines)
  - Washington State Dept. of Labor (15 Guidelines)
  - www.cebm.utoronto.ca/
    - Australian Evidence Based Management of acute Musculoskeletal Pain (259 pages)

Definition

- Practice Guidelines: Guidelines are systematically developed statements to assist practitioner and patient make decisions about appropriate health care for specific clinical circumstances.
- They are a set of statements, directions, or principles presenting current or future clinical rules or policy concerning the proper indications for performing a procedure or treatment or the proper management for specific clinical problems.
Clinical Practice GUIDELINES, are NOT commandments set in stone. They are Evidence based cookbooks, for a thinking cook.

Characteristics of Excellent Practice Guidelines

- Validity
- Reliability/reproducibility
- Clinical applicability
- Clinical flexibility
- Clarity
- Multidisciplinary process
- Scheduled review
- Documentation
- Transparency
- Approval
- Scheduled review
- Documentation
- Transparency
- Approval

Evaluating Guidelines - Are They Evidence-Based

- Is there a published, detailed, and comprehensible methodology?
- Is its use verifiable?
- Are the conclusions scientifically valid?
- Were the reviews and recommendations developed by professionals with appropriate training and credentials?
- Were findings made by individuals or by broad-based physician panels?
Evidence Based Clinical Practice Guidelines

Why is Methodology Important?
- The rigor of methodology is directly correlated with the reproducibility of the recommendations
  - Critical appraisal and synthesis are critical steps
  - Panel processes have been shown to improve consistency and benefit: risk
- Guidelines should follow a reproducible, accepted methodology to maximize the probability of accuracy

The Bottom Line
- How likely is the test to reproducibly and consistently detect the condition?
  - Specificity
  - Is the condition clinically meaningful?
- How likely is the treatment to reproducibly and consistently help the patient return to function
  - Faster than the natural history of the problem?
  - Benefits v. harms

QI Tool Convergence
- High Quality Systematic Reviews and Meta-Analyses
  - Cochrane reviews
  - Clinical Practice Guidelines
  - Quality Indicators
  - Safety Process Improvement
  - Health Technology Assessment
  - Impairment evaluation
The Core Problem: Quality of information varies

- Low quality, credibility and usefulness
  - internet searches
  - popular press
- Variable quality, credibility and usefulness
  - Reference books / Texts / Review articles
  - individual journal articles
- High quality, credibility and usefulness
  - evidence-based systematic reviews
  - evidence-based clinical practice guidelines

Definition

- **Meta-Analysis**: An overview that incorporates a quantitative strategy for combining the results of several studies into a single pooled or summary estimate.
- Mathematically combining the data from multiple similar studies into one larger data base.
- May not include data from all possible studies
  - Can’t combine apples and oranges
  - Does NOT require that a search for all possible studies was conducted

Definition

- **Systematic Review**: A critical assessment and evaluation of research (not simply a summary) that attempts to address a focused clinical question using methods designed to reduce the likelihood of bias.
- Find and analyze all available evidence.
- Studies may not use the same inclusion/exclusion criteria, outcomes, methodology, etc. so they may not permit a meta-analysis, but studies and results can be compared and generalizations supported by the data can be derived.
Steps in a Systematic Review: (Each has multiple “substeps”)

- Define the question.
- Conduct a literature search.
  - NOT just the articles that agree with my bias
  - NOT just the articles I know
- Apply PRE-DEFINED inclusion and exclusion criteria.
- Create data abstraction.
- Conduct analysis.

Guidelines

- Guidelines may be developed by government agencies, institutions, organizations such as professional societies or governing boards, or by the convening of expert panels.

What are Guidelines?

Translation of medical evidence into a useable form for caregivers

Evidence Sources → Guideline → Patients, Clinicians, Providers, Care Givers
Evidence Based Clinical Practice Guidelines

Hierarchy of Evidence

- Unsystematic Clinical Observations
  - “In my experience” anecdotes
- Physiologic Studies
- Single Observational Study
- Systematic Review of Observational Studies
- Single Randomized Controlled Trial
- Systematic Review of Controlled Trials

Guidelines will be based on this level of data

A Guide to the Development, Implementation, and evaluation of Clinical Practice Guidelines

There are even published guidelines on how to develop guidelines.

Guidelines

Reliability

Is the result reproducible?
Clinical Guidelines for the Management of Low Back Pain in Primary Care: An International Comparison

Bart W. Koes, Maurits W. van Tulder, Raymond Ostelo, A. Kim Burton, & Gordon Waddell

*Spine* 2001 26 (22): 2504-2514

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Back Pain Guidelines

- Since 1994, 11 countries have issued “Guidelines” for physicians in treating low back pain.
- All are based on systematic reviews and meta-analyses of available evidence (mainly randomized controlled trials), by multi-disciplinary panels of physicians.

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Back Pain Guidelines

- **United States: AHCPR** (1994)
- **Dutch College of General Practice** (1996)
- **Israeli Low Back Pain Guideline Group** (1997)
Evidence Based Clinical Practice Guidelines

Back Pain Guidelines

- National Advisory Committee on Health and Disability, New Zealand (1997).
- Finnish Medical Association (1999)
- National Health and Medical Research Council, Australia (1999)
  Bogduk N. Draft evidence based clinical guidelines for the management of acute low back pain.

- Royal College of General Practitioners, (RCGP, United Kingdom) (1999)
- Danish Institute for Health Technology Assessment, Denmark (2000)
- The Swedish Council on Technology Assessment in Health Care (2000)

All Independently reviewed the World’s Literature- came to similar conclusions.
Evidence Based Clinical Practice Guidelines

Diagnostic Classification

- **3 classes:**
  - Non-specific,
  - Radicular syndrome,
  - Specific Pathology.
  - US, Netherlands, Finland, Australia, UK, Germany.
- **2 classes:**
  - Non-specific,
  - Specific.
  - New Zealand, Switzerland, Denmark, Sweden, Israel

<table>
<thead>
<tr>
<th>Country</th>
<th>Radiograph Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Only if “Red Flags”</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Not useful in Non-specific back pain</td>
</tr>
<tr>
<td>Israel</td>
<td>Optional after 5-6 weeks</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Only if “Red Flags”</td>
</tr>
<tr>
<td>Finland</td>
<td>Not useful in acute Non-specific pain</td>
</tr>
<tr>
<td>Australia</td>
<td>Only if “Red Flags”</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Not useful in Non-specific pain</td>
</tr>
<tr>
<td>Switzerland</td>
<td>In case with “Red Flags” after 4 weeks</td>
</tr>
<tr>
<td>Germany</td>
<td>Not indicated in Non-specific pain</td>
</tr>
<tr>
<td>Denmark</td>
<td>Suspect “serious” path., or after 4 weeks</td>
</tr>
<tr>
<td>Sweden</td>
<td>Not useful for Dx or Rx if No “Red Flags”</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Psychosocial Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>After 4 weeks, Discuss if applicable</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Determine if applicable if return visit</td>
</tr>
<tr>
<td>Israel</td>
<td>Mentioned only in History taking</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Screen with “Yellow Flag” questionnaire</td>
</tr>
<tr>
<td>Finland</td>
<td>Screening at early stage is useful</td>
</tr>
<tr>
<td>Australia</td>
<td>Consider “Yellow Flags” at 1-2 months</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Take into account</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Consider as risk for chronicity after 4 wk</td>
</tr>
<tr>
<td>Germany</td>
<td>Consider in chronic pain</td>
</tr>
<tr>
<td>Denmark</td>
<td>Comprehensive review is important</td>
</tr>
<tr>
<td>Sweden</td>
<td>Part of normal comprehensive assessment</td>
</tr>
<tr>
<td>Country</td>
<td>Education</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>United States</td>
<td>Reassure, good Prognosis, Gradual ↑ activity</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Reassure, good Prognosis, Gradual ↑ activity</td>
</tr>
<tr>
<td>Israel</td>
<td>Explain recovery time, treatment, why no referral</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Reassure, stay active</td>
</tr>
<tr>
<td>Finland</td>
<td>Benign, prognosis good, activity helpful</td>
</tr>
<tr>
<td>Australia</td>
<td>Reassure, explain healing, stay active</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Stay active, Gradual ↑ activity, quick RTW</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Prognosis good, stay active, ergonomics</td>
</tr>
<tr>
<td>Germany</td>
<td>Prognosis good, stay active, activity not harmful</td>
</tr>
<tr>
<td>Denmark</td>
<td>Not dangerous, continue work, LTD not helpful</td>
</tr>
<tr>
<td>Sweden</td>
<td>Stay active, LBP common, not harmful</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>APAP, NSAID, options opioids, MRs</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Time contingent Paracetamol, NSAID</td>
</tr>
<tr>
<td>Israel</td>
<td>NSAID, [MR &amp; Opioid = acute only]</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Paracetamol, NSAID</td>
</tr>
<tr>
<td>Finland</td>
<td>Acute NSAID, APAP, chronic = not effective</td>
</tr>
<tr>
<td>Australia</td>
<td>Paracetamol, NSAID, opioids = expert assistance</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Time contingent Paracetamol, NSAID, opioid, MR</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Paracetamol, NSAID, MR, local anesthetic</td>
</tr>
<tr>
<td>Germany</td>
<td>Paracetamol, NSAID, MR, local anesthetic</td>
</tr>
<tr>
<td>Denmark</td>
<td>Paracetamol, NSAID, Tramadol or Codeine</td>
</tr>
<tr>
<td>Sweden</td>
<td>Time contingent Paracetamol, NSAID, weak opioid, No MR and Opioids due to side effects/dependency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Acute option, low stress aerobics</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Not &lt; 6 wk, after 6 weeks = useful</td>
</tr>
<tr>
<td>Israel</td>
<td>Strengthening effective</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Specific back exercises not useful</td>
</tr>
<tr>
<td>Finland</td>
<td>After 2 weeks, Chronic = Intense exercise</td>
</tr>
<tr>
<td>Australia</td>
<td>Not acute, &gt; 6 wk stretch, strengthen, aerobic</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Useful after 6 weeks</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Optional &lt; 4 wk, &gt; 4 wk recommended</td>
</tr>
<tr>
<td>Germany</td>
<td>Not Acute, Chronic multimodal exercise useful</td>
</tr>
<tr>
<td>Denmark</td>
<td>After 6 weeks, McKenzie for certain conditions</td>
</tr>
<tr>
<td>Sweden</td>
<td>&gt; 6 weeks, gradual increase, any type of exercise</td>
</tr>
</tbody>
</table>
### Manipulation

<table>
<thead>
<tr>
<th>Country</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Useful &lt; 1 month</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Not &lt; 6 wk, &gt; 6 weeks useful with active approach</td>
</tr>
<tr>
<td>Israel</td>
<td>Unclear evidence</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Useful in 4-6 weeks</td>
</tr>
<tr>
<td>Finland</td>
<td>Option &lt; 6 weeks</td>
</tr>
<tr>
<td>Australia</td>
<td>No evidence, better than other conservative therapy</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Consider for pain or help returning to activity</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Option in first 4 weeks</td>
</tr>
<tr>
<td>Germany</td>
<td>Option first 4-6 weeks, same as Physical Therapy</td>
</tr>
<tr>
<td>Denmark</td>
<td>Recommended in acute, chronic, and recurrent</td>
</tr>
<tr>
<td>Sweden</td>
<td>First 6 weeks for pain or help returning to activity</td>
</tr>
</tbody>
</table>

### Bed Rest

<table>
<thead>
<tr>
<th>Country</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Severe cases, 2-4 days maximum</td>
</tr>
<tr>
<td>Netherlands</td>
<td>If really necessary, 2 day maximum</td>
</tr>
<tr>
<td>Israel</td>
<td>Not more than 2 days</td>
</tr>
<tr>
<td>New Zealand</td>
<td>&gt; 2 days discouraged</td>
</tr>
<tr>
<td>Finland</td>
<td>Avoid</td>
</tr>
<tr>
<td>Australia</td>
<td>Should not be prescribed</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Discouraged</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Not recommended, Severe case = limited days</td>
</tr>
<tr>
<td>Germany</td>
<td>Up to 2 days, if no radicular symptoms</td>
</tr>
<tr>
<td>Denmark</td>
<td>Discouraged, severe cases 1-2 days</td>
</tr>
<tr>
<td>Sweden</td>
<td>Do not recommend or use as treatment</td>
</tr>
</tbody>
</table>

### Referral to Specialist Physician

<table>
<thead>
<tr>
<th>Country</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>Suspicion of specific pathology (Red Flags), unimproved</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Red Flags, persisting disability</td>
</tr>
<tr>
<td>Israel</td>
<td>Red Flags, or &gt; 6 Wks &amp; Rx ? symptoms</td>
</tr>
<tr>
<td>New Zealand</td>
<td>Red Flags</td>
</tr>
<tr>
<td>Finland</td>
<td>Possible serious disease</td>
</tr>
<tr>
<td>Australia</td>
<td>Red Flags</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Red Flags, Cauda Equina = emergency</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Red Flags</td>
</tr>
<tr>
<td>Germany</td>
<td>&gt; 6 Wk, neural symptoms, root signs, imaging “HNP”</td>
</tr>
<tr>
<td>Denmark</td>
<td>Red Flags, option for persisting pain</td>
</tr>
<tr>
<td>Sweden</td>
<td>Red Flags</td>
</tr>
</tbody>
</table>
Red Flags

- Age at onset < 20 or > 55 years
- Significant Trauma
- Thoracic Pain
- Weight Loss
- Widespread Neurologic Change
- Fever, Night Sweats
- Immunosuppression (disease or by meds)
- Recent Infection
- History of Cancer

Summary of Recommendations
Accute or Subacute Pain

- Reassure of favorable prognosis.
- Advise to stay active.
- Meds if necessary:
  - Paracetamol, NSAID, consider muscle relaxants or opioids
  - Discourage bed rest.
  - Consider manipulation for pain relief.
  - Do not advise back-specific exercises.

Summary of Recommendations
Chronic Pain

- Refer for exercise therapy
Guidelines
Validity

Do Guidelines produce better patient care?

Why Follow These Guidelines ??
McGuirk, Spine 2001; 26 (23): 2615-2622

- **Australia**: 437 patients with acute LBP treated by
  - 15 physicians trained in Australian Guidelines,
  - 83 patients receiving “usual” care from GP.
  (Comparative, Not randomized, study)
- Workers’ Comp patients excluded.
- 12 month study.
- VAS, SF-36, other measures to assess outcome.

Outcome 3 months 6 months 12 months
Full recovery, “Guidelines” 67 % 70 % 71 %
Full recovery, “Usual care” 49 % 64 % 56 %
Recurrence, “Guidelines” 16 % 16 %
Recurrence, “Usual Care” 7 % 27 %
Why Follow These Guidelines ??

- @ 12 months, need for continuing care:
  - Guidelines 23 %
  - Usual care 37 %
- Cost per case:
  - Guidelines $ 276
  - Usual care $ 472
  (more imaging, meds, therapy)
- Patient perception that treatment was helpful:
  - Guidelines 82 %
  - Usual care 43 %

JAMA 2001; 286 (12): 1461-1467

Reviewed 17 Guidelines published by AHRQ

"As a general rule, guidelines should be reasessed for validity every 3 years."

"If you don't like a guideline, and if it's more than 3 years old, cite this reference in your criticism."
Why did ACOEM primarily choose Practice Guidelines?

- Most cases “go wrong” early
- “Medicalization” of many cases
- Many problems with vague or inaccurate diagnoses continue to be treated
- Emphasizing disability management, accurate diagnosis, and conservative care for most musculoskeletal injuries, has been shown to have better functional outcome and controlled cost
- ACOEM Guidelines emphasize accurate diagnosis, return to function, and active patient involvement in recovery

Overall Practice Patterns Matter

- ACOEM guidelines follow internationally accepted recommendations for care
- They differ by adding more information on achieving functional recovery and covering more topics
- Guidelines must teach disability management – return to function
- ACOEM is the only guideline that teaches a paradigm of care rather than prescriptive care

Why do recommendations differ between guidelines?

- Evidence based
  - System used to rate articles
    - Read the actual definitions of each category. Do they follow generally accepted definitions?
  - Critical Review of statistics
    - Is there an epidemiologist, statistician, or MPH involved with evaluation?
  - Consistency with which articles are graded
    - Check accompanying tables. How often are categories listed as not applicable or do they appear to be incorrectly rated?
Why do recommendations differ between guidelines?

- Consensus-based
- Group not controlled by issuing organization
- Multi-disciplinary group without industry alliances and balanced for practice type
- Face-to-face meetings may be preferable
- Values
  - Long term outcome versus short
  - Function versus pain
  - Risk of side effects/morbidity versus mortality
- Cost

Enhanced Methodology Adopted

1. Exhaustive Literature Searches for Randomized Controlled Trials (RCTs):
   - Articles Critiqued
   - Summary Tables Compiled
   - Articles Graded
   - Strength of Article Assigned
   - Summary Evidence and information forwarded to Evidence-Based Practice Panel
   - Guidance (Semi)-Finalized
      - External Peer Review
      - Guidance Finalized

**Exhaustive Literature Searches for Randomized Controlled Trials (RCTs):**

- The National Library of Medicine’s MEDLARS database (Medline)
- EMB Online
- The Cochrane Central Register of Controlled Trials
- TRIP Database
- CINAHL (Nursing, allied health, physical therapy, occupational therapy, social services)
- EMBASE
- PEDro: Physiotherapy Evidence Database
Systematic Review Process

- Articles Identified
- Articles Critiqued: MD, PhD
- Summary Tables Compiled
- Articles Graded
- Articles, analyses, and summary tables forwarded to the Evidence Based Panels

RCT Article Grading (0-11 pts)

1. Randomization (0, 0.5, 1.0 pts.)
2. Allocation concealed (0, 0.5, 1.0)
3. Baseline comparability of groups
4. Blinding of patients
5. Blinding of provider
6. Blinding of assessor
7. Avoid co-interventions
8. Compliance Rate
9. Dropout Rate
10. Timing of Assessments
11. Intention to Treat Analysis

Note: Bias rating (0, 0.5, 1.0) is also included, but not in the 0-11 point grade.
Strength of an Article

Low Quality: 0-3.5 points
Moderate Quality: 4.0-7.5 points
High Quality: 8.0+ points

Moderate and High Quality RCTs USED as evidence.
Low Quality RCTs, Other Systematic Reviews, Meta-analyses, Case Series “considered” and listed in an Appendix.

Strength of Evidence

A: Strong evidence-base: One or more well-conducted systematic reviews or meta-analyses, or two or more high-quality studies.
B: Moderate evidence-base: At least one high-quality study, a well-conducted systematic review or meta-analysis of lower-quality studies, or multiple lower-quality studies relevant to the topic and the working population.
C: Limited evidence-base: At least one study of intermediate quality.
I: Insufficient Evidence: Evidence insufficient or irreconcilable.

Evidence-based Recommendations

<table>
<thead>
<tr>
<th>Strongly Recommended</th>
<th>“A” Level Evid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately Recommended</td>
<td>“B” Level</td>
</tr>
<tr>
<td>Recommended</td>
<td>“C” Level</td>
</tr>
<tr>
<td>Insufficient For (Consensus-based)</td>
<td>“I” Level Evidence</td>
</tr>
<tr>
<td>Insufficient - No Recommendation (Consensus-based)</td>
<td>“I” Level Evidence</td>
</tr>
<tr>
<td>Insufficient Against (Consensus-based)</td>
<td>“I” Level Evidence</td>
</tr>
<tr>
<td>Recommended Against</td>
<td>“C” Level</td>
</tr>
<tr>
<td>Moderately Recommended Against</td>
<td>“B” Level</td>
</tr>
<tr>
<td>Strongly Recommended Against</td>
<td>“A” Level</td>
</tr>
</tbody>
</table>
Medical Societies Invited to Review the ACOEM CPG

- American Academy of Neurological Surgery
- American Academy of Orthopaedic Surgery
- American Academy of Physical Medicine and Rehab
- American Board of Independent Medical Examiners
- American Occupational Therapy Association
- American Occupational Health Nurses Association
- American Physical Therapy Association
- American Psychological Association
- Approximately 24 other external reviewers

ACOEM Consensus 1st principles

- Tests to affect course of treatment
- Imaging or testing generally done to confirm a diagnosis
- Treatments to improve natural history, consider if recovery likely without treatment
- Invasive treatment preceded by failed adequate conservative treatment

ACOEM Consensus 1st principles

- More invasive tests and treatments require stronger evidence and more caution
- More costly tests and treatments require stronger evidence and more caution
- Collaboration between clinician and patient with full disclosure of benefits and risks necessary for testing and treatment decisions
- Treatment should not create dependency or functional disability
Evidence Based Clinical Practice Guidelines

Outline

- Red Flags
- Mechanism of Injury/Illness
- Diagnostic Criteria
- Diagnostic Testing
- Medications
- Exercise
- Cryotherapies
- Heat Therapies
- Manipulation and Mobilization

Outline

- Injections
- Surgical Considerations
- Spinal Cord Stimulation
- Acupuncture
- Mattresses, Water Beds, Sleeping Surfaces
LBP Update: Vital Statistics

- Pages: 361 (without reference list)
- Short version: 6 page table
- Intermediate version: ~100 pages
- Electronic version
- References: >1,200

ACOEM Summary Table

<table>
<thead>
<tr>
<th>Clinical Measure</th>
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<tbody>
<tr>
<td>Recommended</td>
<td>No Recommendation</td>
</tr>
<tr>
<td>Diagnostics</td>
<td></td>
</tr>
<tr>
<td>Screening</td>
<td></td>
</tr>
<tr>
<td>Tests</td>
<td></td>
</tr>
</tbody>
</table>

Mohammed Ranavaya MD, JD, FFOM, FRCP
### ACOEM Summary Table

**Table 1. Summary of Recommendations for Evaluating and Managing Low Back Disorders**

<table>
<thead>
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<tbody>
<tr>
<td><strong>Tests</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydroxyurea for acute, subacute, chronic LBP, spinal traction, radiofrequency to symmetrical or post-surgical back pain problems (1)</td>
</tr>
<tr>
<td></td>
<td>Surface electromyography (1)</td>
</tr>
<tr>
<td></td>
<td>Thermography for acute, subacute, chronic LBP or radicular pain (1)</td>
</tr>
<tr>
<td></td>
<td>Functional capacity evaluations for acute LBP, acute or subacute radicular pain (symptoms, or post-surgical back pain within first 12 weeks of presentation) (1)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Medications</strong></td>
<td></td>
</tr>
<tr>
<td>NSAIIDS for acute LBP (A)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>NSAIIDS for subacute, chronic, or postoperative LBP or sciatica (B)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>NSAIIDS for radicular pain syndromes (C)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Corticosteroid injections for patients with contraindications for NSAIDS (D)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Ammonium for LBP with or without radiculopathy for patients with contraindications for NSAIDS (E)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Discosids, botulinum toxin for patients with known or multiple risk factors for lumbar vascular disease (F)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Gabapentin for chronic back pain syndromes (G)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Tramadol for acute or subacute LBP (1)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Tramadol for acute or subacute LBP (1)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Motor or sensory muscle relaxants for acute or subacute LBP (1)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Physical therapy for spinal pain (H)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Stabilization exercises for surgical wound healing (I)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
</tbody>
</table>

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<tbody>
<tr>
<td><strong>Medications</strong></td>
<td></td>
</tr>
<tr>
<td>with known or multiple risk factors for cardiovascular disease (A)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Neurontin for radicular pain (A)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Neurontin for radicular pain (A)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Topiramate for limited use in</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Glibenclamide for acute, subacute, or chronic LBP (1)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
<tr>
<td>Glibenclamide for acute, subacute, or chronic LBP (1)</td>
<td>anti-inflammatory medications for acute, subacute, or chronic LBP (1)</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Meds</th>
<th>Treatment with Evidence Rating Recommendation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>GABA antagonists for pruritus to pain management (A)</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>Gabapentin for severe sympathetic dyslexic with limited walking distance (C)</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>Limited to 2 to 3 weeks of quinine with long periods for more invasive procedure (C)</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>Skilled muscle relaxants for second-line treatment to medicate to severe acute LBP that has not been adequately controlled by NSAIDS (B)</td>
<td>Not Recommended</td>
</tr>
<tr>
<td>Skilled muscle relaxants for second-line injection treatment for acute inelastic pain syndromes or acute post-surgical situations (A)</td>
<td>Not Recommended</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Orthotic and Immobilization</th>
<th>Treatment with Evidence Rating Recommendation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braced for unstable spinal fractures (D)</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Abetion of sleep posture (I)</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Bed rest for acute LBP (A)</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Bed rest for subacute and chronic LBP (B)</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Bed rest for subacute pain syndrome</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Bed rest for other lower back problems (D)</td>
<td>Not recommended</td>
</tr>
<tr>
<td>Commercial sleeping products (e.g., pillows) for primary prevention or treatment of acute, subacute, or chronic LBP (D)</td>
<td>Not recommended</td>
</tr>
</tbody>
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<tr>
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<tbody>
<tr>
<td>Physical Treatment Methods</td>
<td>Recommended</td>
</tr>
<tr>
<td>Slow lift for chronic or recurrent LBP or patients with significant leg length discrepancy (≥3 cm)</td>
<td></td>
</tr>
<tr>
<td>Lower back muscle stretching exercises for acute LBP (C)</td>
<td></td>
</tr>
<tr>
<td>Self-application of heat therapy (including a heat wrap) (C)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matress firmness (C)</td>
</tr>
<tr>
<td></td>
<td>(e.g., building, water, heat, lasers) (C)</td>
</tr>
<tr>
<td></td>
<td>Inflamed therapy for chronic LBP</td>
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</tr>
</thead>
<tbody>
<tr>
<td>Physical Treatment</td>
<td>Recommended</td>
</tr>
<tr>
<td>Physical Therapy (including a heat wrap) (C)</td>
<td></td>
</tr>
<tr>
<td>Massage: time-limited use in acute and chronic LBP or patients with significant leg length discrepancy (≥3 cm)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matress firmness (C)</td>
</tr>
<tr>
<td></td>
<td>(e.g., building, water, heat, lasers) (C)</td>
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<tbody>
<tr>
<td>Physical Treatment</td>
<td>Recommended</td>
</tr>
<tr>
<td>Manipulations for select acute LBP based on Clinical Prediction Rules (C)</td>
<td></td>
</tr>
<tr>
<td>Manipulations for new or persistent LBP without Clinical Prediction Rules (C)</td>
<td></td>
</tr>
<tr>
<td>Acupuncture for select use in chronic LBP as a limited service during which data from non-clinical sources (C)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Matress firmness (C)</td>
</tr>
<tr>
<td></td>
<td>(e.g., building, water, heat, lasers) (C)</td>
</tr>
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<th>Treatment with Evidence Rating Recommendation Level</th>
<th>Recommended</th>
<th>No Recommendation</th>
<th>Not Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Treatment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High-voltage pulsed for acute, subacute, chronic LBP, radicular pain syndrome or other condition (I)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manipulations for chronic LBP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical therapy with good functional outcomes that include return to work, manipulations, accessory muscle co-contractions, and thus maintain an overall state of 1 to 2 manipulations every 3 to 5 months may have a positive effect on conditioning program (psychic and strengthening exercises (I)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<tbody>
<tr>
<td></td>
<td>Recommended</td>
</tr>
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</table>

#### Activity & Exercise

<table>
<thead>
<tr>
<th>Activity &amp; Exercise</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobic exercise for acute, subacute, or chronic LBP (A)</td>
<td></td>
</tr>
<tr>
<td>Aerobic exercise for pre-operative patients (I)</td>
<td></td>
</tr>
<tr>
<td>Strength-straining exercises directed toward specific muscle groups (I)</td>
<td></td>
</tr>
<tr>
<td>Strengthening exercises that can be used to strengthen muscle groups (I)</td>
<td></td>
</tr>
<tr>
<td>Pre-operative LBP patients (III)</td>
<td></td>
</tr>
</tbody>
</table>

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#### Activity & Exercise

<table>
<thead>
<tr>
<th>Activity &amp; Exercise</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instruction in pain-reducing exercises during episodes of exacerbation (I)</td>
<td></td>
</tr>
<tr>
<td>Yoga for other non-surgical chronic LBP patients (II)</td>
<td></td>
</tr>
<tr>
<td>A trial of aquatic therapy for subacute or chronic LBP (II)</td>
<td></td>
</tr>
<tr>
<td>Patient-centered medical care (II)</td>
<td></td>
</tr>
<tr>
<td>Aquatic therapy for all acute LBP and for all other subacute and chronic LBP</td>
<td></td>
</tr>
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<tr>
<td></td>
<td>Recommended</td>
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</table>

#### Reactions

<table>
<thead>
<tr>
<th>Reactions</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epitrochlear or synovial injections in acute or subacute synovial pain (I)</td>
<td></td>
</tr>
<tr>
<td>Epitrochlear or synovial injections in chronic synovial pain (II)</td>
<td></td>
</tr>
<tr>
<td>Trigger points treated with joint injections or paravertebral options for subacute or chronic LBP that is not resolving (I)</td>
<td></td>
</tr>
<tr>
<td>Sacroiliac joint motor-innervated injections in patients with specific known cause of symptoms (II)</td>
<td></td>
</tr>
<tr>
<td>Diabetic foot joint injections for chronic LBP (II)</td>
<td></td>
</tr>
<tr>
<td>Hip joint injections for acute, subacute, or chronic LBP in the absence of inflammatory signs and symptoms (II)</td>
<td></td>
</tr>
<tr>
<td>Sacroiliac joint injections for acute, subacute, chronic LBP (II)</td>
<td></td>
</tr>
<tr>
<td>Sacroiliac joint injections for acute LBP, including LBP thought to be SI joint-related (III)</td>
<td></td>
</tr>
<tr>
<td>Sacroiliac joint injections for acute LBP, including LBP thought to be SI joint-related (III)</td>
<td></td>
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Injections</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prednisolone</td>
<td></td>
<td>Recommended</td>
</tr>
<tr>
<td>Botox</td>
<td></td>
<td>Recommended</td>
</tr>
<tr>
<td><strong>Surgery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinal fusion</td>
<td></td>
<td>Recommended</td>
</tr>
<tr>
<td>Artificial disc replacement</td>
<td></td>
<td>Recommended</td>
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<tr>
<td><strong>Recommended</strong></td>
<td><strong>No Recommendation</strong></td>
</tr>
<tr>
<td><strong>Rehabilitation</strong>&lt;br&gt;<strong>Behavioral Education</strong>&lt;br&gt;Chronic pain management or functional restoration program for chronic pain management (C)&lt;br&gt;Chronic pain management or functional restoration program for subacute LBP (C)&lt;br&gt;Work conditioning and work hardening programs for chronic LBP (C)&lt;br&gt;Work conditioning and work hardening programs for subacute LBP (C)&lt;br&gt;Participation in ergonomic programs for healthy weight subacute and chronic LBP (C)&lt;br&gt;Work hardening for subacute chronic LBP as component of an interdisciplinary approach (C)</td>
<td>Back school for acute LBP (D)</td>
</tr>
</tbody>
</table>

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<tr>
<td><strong>Recommended</strong></td>
<td><strong>No Recommendation</strong></td>
</tr>
<tr>
<td><strong>Rehab</strong>&lt;br&gt;Multi-disciplinary rehabilitation programs with focus on cognitive behavioral therapy and activity-based approaches</td>
<td>Combined with aerobic exercise and often conditioning exercise for chronic LBP (C)</td>
</tr>
</tbody>
</table>

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#### ACOEM Summary Table

#### Table 1. Summary of Recommendations for Evaluating and Managing Low Back Disorders

<table>
<thead>
<tr>
<th>Clinical Measure</th>
<th>Treatment with Evidence Rating Recommendation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recommended</strong></td>
<td><strong>No Recommendation</strong></td>
</tr>
<tr>
<td><strong>Rehab</strong>&lt;br&gt;Standing exercises and weight loss programs to prevent LBP (D)&lt;br&gt;Fast track rehabilitation for acute, subacute, or chronic LBP (B)&lt;br&gt;Back school and education for subacute or chronic LBP and chronic refractory pain syndrome (B)&lt;br&gt;Cognitive behavioral therapy as component of a formal multidisciplinary programs for treatment of chronic LBP, and for subacute LBP when combined with other indicated therapies with permission described in Rehabilitation for D-ticket Injury, notice (C)</td>
<td></td>
</tr>
</tbody>
</table>
Diagnostic Studies: X-ray

ACOEM:
- **Recommended**
  - X-rays – acute LBP with red flags, or subacute or chronic LBP (I)
  - Flexion and extension views for evaluation of symptomatic spondylolisthesis (I)
- **NOT Recommended**
  - Routine x-rays – acute nonspecific LBP (C)

Diagnostic Studies: Advanced Imaging

ACOEM:
- **Recommended**
  - MRI during first 6 weeks if patient has “red flag” conditions – acute LBP (I)
  - MRI – subacute or chronic radicular pain syndrome lasting at least 4-6 weeks (B)
  - MRI – select chronic LBP (I)
  - CT – subacute radicular pain syndrome (C)
  - Myelography, including CT myelography – only in uncommon specific situations (I)
- **NOT Recommended**
  - MRI – acute radicular pain syndrome (C)
  - Standing or weight bearing MRI – any back or radicular pain syndrome or condition (I)
  - CT – acute, subacute, chronic non-specific LBP (I)
  - Ultrasound (diagnostic) (I)
### Diagnostic Studies: Advanced Imaging

**NOT Recommended**
- Bone scans – any LBP (I)
- SPECT – acute, subacute, chronic LBP, radicular pain syndromes or other LBP-related conditions (I)
- Fluoroscopy – acute, subacute or chronic LBP (I)
- Videofluoroscopy – acute, subacute/chronic LBP (I)
- Thermography – acute, subacute, chronic LBP or radicular pain (I)

### Diagnostic Studies: Advanced Imaging

**NOT Recommended**
- Discography – acute, subacute, chronic LBP or radicular pain syndromes (B)
- MRI discography (C)
- Myeloscopy – acute, subacute, chronic LBP, spinal stenosis, radicular pain syndromes or post-surgical back pain problems (I)

### Diagnostic Studies: Electrodiagnostic Studies

**ACOEM:**
- **Recommended**
  - Electrodiagnostic Studies which must include needle EMG where CT or MRI is equivocal and there are ongoing pain complaints (C).
- **NOT Recommended**
  - Surface electromyography (I)
Medications: ACOEM

RECOMMENDED:
- NSAIDs – acute LBP (A)
- NSAIDs – subacute, chronic, or post-operative LBP (B)
- NSAIDs – radicular pain syndromes, including sciatica (C)
- Acetaminophen – LBP with or without radicular symptoms, particularly for those with contraindications for NSAIDs (C)

Medications: ACOEM

RECOMMENDED:
- Cytoprotective medications – particularly for those with contraindications for NSAIDs (C)
- Discuss risks/benefits of NSAID therapy with patients with known cardiovascular disease or multiple risk factors for cardiovascular disease. In these patients, it appears to be safest to use acetaminophen or aspirin as first line therapy. (A)

Medications: ACOEM

RECOMMENDED:
- Norepinephrine reuptake inhibitor antidepressants – chronic LBP (A)
- Norepinephrine reuptake inhibitor antidepressants – radicular pain (C)
Medications: ACOEM

RECOMMENDED:
- Gabapentin for perioperative pain management (A)
- Gabapentin – severe neurogenic claudication from spinal stenosis or chronic radicular pain syndromes (C)
- Topiramate for limited use in select chronic LBP patients as a 4th or 5th line agent.
- Carbamazepine for chronic radicular or neuropathic pain as a 4th or 5th line agent.

Medications: ACOEM

RECOMMENDED:
- Skeletal muscle relaxants – second line treatment in select cases of moderate to severe acute LBP (B)
- Skeletal muscle relaxants – second or third line agents in acute radicular pain syndromes or acute post-surgical pain (I)

Medications: ACOEM

RECOMMENDED:
- Systemic glucocorticosteroids for acute severe radicular pain syndromes (C)
- Harpagoside – acute, subacute or chronic LBP when NSAIDs are contraindicated (C)
- Capsicum – acute, subacute or temporary flare-ups of chronic LBP (B)
Medications: ACOEM

RECOMMENDED:
- Trial of opioid therapy – chronic severe back or leg pain (I)
- Limited use (2 weeks) of opioids – acute LBP with severe pain (C)
- Limited use (2-3 weeks) of opioids – post-operative management (C)

ACOEM: NSAIDs

- 1 systematic review, 1 guideline, 27 RCTs
- For acute [Evidence (A)], subacute, chronic, post-operative LBP, or sciatica patients NSAIDs are recommended [Evidence (B)]. Acetaminophen is a reasonable alternative, although evidence suggests it is modestly less efficacious.
- Generally, generic ibuprofen, naproxen or other older generation NSAIDs are recommended as first line medications. COX-2 selective agents may still be used for those with contraindications to other medications, especially those with a history of gastrointestinal bleeding or past history of peptic ulcer disease.

ACOEM: NSAIDs

- For acute, subacute, chronic or post-operative LBP, NSAIDs are recommended for treatment. OTC agents may suffice and may be tried first.
- In most acute LBP patients, scheduled dosage, rather than as needed, is generally preferable. PRN prescriptions may be reasonable for mild or moderate, chronic LBP.
- Indications for Discontinuation: Resolution of LBP, lack of efficacy, or development of side effects that necessitate discontinuation.

Strongly Recommended (acute LBP), Evidence (A)
Moderately Recommended (subacute and chronic LBP), Evidence (B)
ACOEM: NSAIDs

- For radicular pain syndromes, including sciatica, NSAIDs are recommended

- In acute radicular pain syndromes, scheduled dosage, rather than as needed, is generally preferable. PRN prescriptions may be reasonable for mild or moderate, chronic radicular pain.
  **Recommended, Evidence (C)**

ACOEM: NSAIDs

- Patients at substantially increased risk for gastrointestinal bleeding
  - E.g., history of prior gastrointestinal bleed, elderly, diabetics, and cigarette smokers.
- Consider concomitant prescriptions of cytoprotective medications. No substantial differences between:
  - Misoprostol
  - Sucralfate
  - Histamine type 2 receptor blockers
  - Proton pump inhibitors
  **Recommended, Evidence (C)**

ACOEM: NSAIDs

- Known cardiovascular disease or with multiple risk factors for cardiovascular disease should have risks and benefits discussed.
- Acetaminophen or aspirin safest as first line therapy.
- Non-selective NSAIDs preferred over COX-2s.
  **Strongly Recommended, Evidence (A)**

  - Acetaminophen is recommended for treatment of LBP with or without radicular symptoms, particularly for those with contraindications for NSAIDs.
  **Recommended, Evidence (C)**

Mohammed Ranavaya MD, JD, FFOM, FRCP
ACOEM: Anti-depressants

- 7 systematic reviews, 1 guideline, 10 RCTs
- Norepinephrine reuptake inhibitor antidepressants (TCAs) are recommended for chronic LBP.
  Moderately Recommended, Evidence (B)
- Radicular pain: Limited evidence to recommend
  Recommended, Evidence (C)
- Chronic LBP: Selective serotonin reuptake inhibitors, bupropion and trazodone NOT recommended
  Strongly NOT Recommended, Evidence (A)

“A lot of relief” or “complete relief”
Cyclobenzaprine 10 mg vs 5 mg vs placebo


“A lot of relief” or “complete relief”
Cyclobenzaprine 5 mg vs 2.5 mg vs placebo

ACOEM: Muscle Relaxants

- 7 systematic reviews, 1 guideline, 38 RCTs
- NOT recommended for mild to moderate acute LBP
- NOT recommended for chronic use in subacute or chronic LBP (other than acute exacerbations).

**NOT Recommended, Insufficient Evidence (I)**
- Recommended as second line treatment in moderate to severe LBP NOT controlled by NSAIDs.
- For most, not recommended as NSAIDs, progressive walking, other exercises will be sufficient.
- Generally, prescribe nocturnally initially (and not during work or operating vehicles).

**ACOEM: Muscle Relaxants**

- Caution: history of depression, personality disorder, substance addiction or abuse, including alcohol. For those, consider cyclobenzaprine should be the drug tried since its chemical structure resembles a tricyclic antidepressant and less addiction.

**Moderately Recommended, Evidence (B)**
- Acute Radicular Pain: Second or third line agents.
- Other agents may be more efficacious, e.g., NSAIDs.

**Recommended, Insufficient Evidence (I)**

**ACOEM: Exercise**

- 15 systematic reviews, 1 guideline, 66 RCTs, and 6 other studies
- Most articles mixed various forms of exercise
- Most study’s quality is moderate (or low)
Evidence Based Clinical Practice Guidelines

Exercise: Oswestry Scores for Fitness Group versus Controls

ACOEM: Exercise; AEROBIC

- Recommended for all patients, although most quality evidence is on chronic LBP.
- Recommend a structured, progressive walking program.
- Some controversy about bicycling (biomechanics: lordosis). Also, back muscles less active.
- No evidence on other specific exercises, but there is a direct correlation between benefit and the amount of aerobic activity that results in higher MET expenditure.
- Prescribe what they will adhere to.
- Cardiac disease, or significant potential should consider pre-exercise evaluation. [ACSM’s Guidelines for Exercise Testing and Prescription (7th edition)]

ACOEM: Exercise; AEROBIC

- Chronic LBP: Walking at least four times per week at 60% of predicted maximum heart rate (220-age-maximum heart rate). One successful study benchmarked twenty minutes during week 1, 30 minutes during week 2, and 45 minutes after that point.
- Acute or Subacute LBP: Graded walking program, often with distance or time as minimum benchmarks. E.g., start with 10-15 minutes twice a day for one week, and increase in 10-15 minute increments per week until at least 30 minutes per day is achieved.
  Strongly Recommended, Evidence (A)
- Aerobic exercise believed highly important for post-operative but no quality data.
  Recommended, Insufficient Evidence (I)
ACOEM: Strengthening and Stabilization Exercises

- Evidence of efficacy of aerobic exercises appears greater and should be initiated first.
- Develop home exercise program.
- Some may need supervised program (e.g., lacking motivation, or with fear avoidant beliefs).
- Recommended, Evidence (C)
- Strengthening of abdominal muscles is a frequent goal.
- NO quality evidence that these exercises are effective for treatment or prevention.
- Other treatment strategies have efficacy.
- NOT Recommended, Insufficient Evidence (I)
- Fear Avoidance Belief Training and principles appear important and should be incorporated.
- Recommended, Insufficient Evidence (I)

ACOEM: Cryotherapies

- 4 systematic reviews and 2 RCTs incorporated in this analysis. No quality evidence of efficacy.
- Acute LBP: Self applications of low tech recommended.
- Moderate to severe acute LBP: reasonable to attempt, but threshold to discontinue lower. Active modalities are far preferable to passive modalities for rehabilitation of non-acute LBP.
- Recommended, Insufficient Evidence (I)
- Routine use in healthcare provider offices or home use of high tech devices not recommended. Single use of low tech cryotherapy for severe exacerbations are reasonable to try.
- NOT Recommended, Insufficient Evidence (I)

ACOEM: Heat Therapies

- 2 systematic reviews, 1 guideline, and 8 RCTs.
- Recommended for acute, subacute and chronic LBP.
- Recommended, Evidence (C)
- Application by healthcare provider in conjunction with exercise program may have some value in acute LBP.
- Education for home applications part of treatment.
- Self-applications are recommended.
- Application by healthcare provider not recommended as the patient can perform this independently.
- Provider based treatment of acute LBP not over 4 visits.
- Self-applications may be periodic, and include different regimens. For example, 15-20 minutes, 3-5 times/day.
- Recommended, Insufficient Evidence (I)
Criteria Definition of Positive

<table>
<thead>
<tr>
<th>Duration of current LBP</th>
<th>Less than 16 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of distal symptoms</td>
<td>Not having symptoms below the knee</td>
</tr>
<tr>
<td>FABQ work subscale score</td>
<td>Less than 19 points</td>
</tr>
<tr>
<td>Segmental mobility testing</td>
<td>At least one hypomobile segment in the LS Spine</td>
</tr>
<tr>
<td>Hip internal rotation range of motion</td>
<td>At least 1 hip with &gt;35 degrees of internal rotation range of motion</td>
</tr>
</tbody>
</table>

‡Those patients with a positive Clinical Prediction Rule are considered more likely to respond to manipulation. Adapted from Childs MJD, et al. Ann Intern Med. 2004;141(12):920-8, W-165-166.

ACOEM: Manipulation and Mobilization

- 12 systematic reviews, 1 guideline, and 32 RCTs incorporated in this analysis.

ACOEM: Manipulation and Mobilization

- Acute and subacute LBP: Manipulation for selective acute LBP patients based on the Clinical Prediction Rule
  Moderately Recommended, Evidence (B)
- Manipulation for Acute or Subacute LBP, BUT negative for the Clinical Prediction Rule
  Recommended, Evidence (C)
- Chronic treatment: no evidence of efficacy
- No evidence for prophylactic treatment
- Aerobic and strengthening exercises are believed to be more important for promotion and maintenance of functional status.

NOT Recommended, Evidence (I)
ACOEM: Manipulation and Mobilization

- Radicular: Nearly all studies excluded clear cases
- Yet, many patients with “leg pain”
- Manipulation is not recommended for the treatment of radicular pain syndromes with neurological deficits.

**NOT Recommended, Insufficient Evidence (I)**

- No quality studies showing that adjustments/ manipulations of the neck are effective in treatment of LBP
- High velocity rotary cervical spine manipulations previously done had rare, severe complications.

**NOT Recommended, Insufficient Evidence (I)**

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**Injection Therapies**

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**Surgical Considerations**

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Discectomy, Microdiscectomy, Sequestrectomy and Endoscopic Decompression

ACOEM: Discectomy, Microdiscectomy, Sequestrectomy and Endoscopic Decompression

- 8 systematic reviews, 18 RCTs or quasi-RCTs.
- Lumbar discectomy recommended with radiculopathy and functional limitation after 4-6 weeks and appropriate conservative therapy.
- Should inform patients “there is evidence that there is no need to rush surgical decisions as there is no difference in long term functional recovery whether the surgery is performed early or delayed.”
- Open disectomy, microdiscectomy, and endoscopic discectomy are all potentially appropriate. Decision up to surgeon and patient until quality evidence available.

Discectomy, Microdiscectomy, Sequestrectomy and Endoscopic Decompression

- Indications (all): 1) radicular pain with current dermatomal pain and/or numbness, or myotomal muscle weakness all consistent with herniated disc, 2) imaging findings by MRI, or CT without myelography that confirm persisting nerve root compression at same level and side predicted by history and examination, 3) continued significant pain and functional limitation after 4-6 weeks of time and conservative therapy.

Moderately Recommended, Evidence (B)
- Percutaneous discectomy (nucleoplasty), laser discectomy, and disc coblation therapy are not recommended for any back or radicular pain syndrome.

NOT recommended, Evidence (B)
Evidence: There are 12 systematic reviews, 1 guideline, 31 RCTs, and 1 other study incorporated in this analysis.


ACOEM: Fusion; Spondylolisthesis

- Lumbar fusion is recommended for isthmic spondylolisthesis.
  Recommended, Evidence (C)

- Degenerative spondylolisthesis: Lumbar fusion is recommended
  Recommended, Evidence (C)

ACOEM: Fusion; Stenosis

- Lumbar fusion not recommended
  - unless concomitant instability has been proven.
  NOT Recommended, Evidence (C)
Evidence Based Clinical Practice Guidelines

Spinal Fusion: Chronic non-specific LBP

ACOEM: Fusion; Chronic Non-Specific Low Back Pain

- Lumbar fusion not recommended

Moderately NOT Recommended, Evidence (B)

ACOEM: Disc Replacement

- 0 Systematic Reviews and 2 RCTs
- Minimal evidence, with need to replicate
  - one encouraging RCT (Zigler).
- Follow-up periods are too short and complications are being reported.
  - Long-term safety needs to be defined
- Still considered experimental treatment.

NOT Recommended, Insufficient Evidence (I)
ACOEM: A Few Other Interventions

- Electrical therapies (TENS, PENS, etc.)
- Heat therapies (U/S, IR, LLLT)
- Behavioral (includes FABT, CBT)
- Multidisciplinary Rehabilitation
- Work Conditioning/Work Hardening
- Participatory Ergonomics
- Back Schools
- Adhesiolysis
- Decompressive Surgery for Spinal Stenosis
- Vertebroplasty, Kyphoplasty
- SI Joint Surgery

ACOEM: Acupuncture

"On the plus side, you've cured my back pain."

4 systematic reviews, 1 guideline, and 20 RCTs

Traditional Acupuncture Vs. Minimal Ac. Vs. Wait Listed Controls (n=301)

### ACOEM: Acupuncture

- Acute, subacute or radicular LBP: No quality evidence. **NOT Recommended, Insufficient Evidence (I)**
- Chronic LBP: Select use recommended as an adjunct to more efficacious treatments
- Should have clear objective and functional goals to be achieved.
- E.g., adjunct to a conditioning program that has both graded aerobic exercise and strengthening exercises. Acupuncture is an adjunctive treatment. Primary attention should remain on the conditioning program.
- Not recommended for those not involved in a conditioning program, or who are non-compliant with graded increases in activity levels.

### ACOEM: Acupuncture

- Treatments have ranged from weekly for a month to 20 appointments over 6 months
- Norm is up to 8-12 sessions. Initial trial of 5-6 appointments would appear reasonable in combination with a conditioning program of aerobic and strengthening exercises. Future appointments should be tied to improvements in objective measures and would justify an additional 6 sessions, for a total of 12.
- Resolution, intolerance or non-compliance, including non-compliance with aerobic and strengthening exercises.

#### Recommended, Evidence (C)

### Anti-epileptic agents (including Carbamazepine, but excluding Gabapentin)

- 0 systematic review, 1 RCT
- Not recommended for acute, subacute, chronic LBP, or acute radicular pain. **NOT Recommended, Insufficient Evidence (I)**
- Recommended for chronic radicular pain, after attempting other treatments (e.g., different NSAIDs, aerobic exercise, other exercise, manipulation), as fourth or fifth line treatment. **No Recommendation, Insufficient Evidence (I)**
ACOEM: Gabapentin

- 0 systematic reviews, 1 guidelines 7 RCTs
- Recommended for perioperative management of pain to reduce need for opioids, particularly those with opioid side effects.
  Strongly Recommended, Evidence (A)

- Not recommended for acute, subacute, chronic LBP
  NOT Recommended (Acute, Subacute), Insufficient Evidence (I)

- NOT Recommended (Chronic), Evidence (C)

- Severe neurogenic claudication from spinal stenosis or chronic radicular pain syndromes.
  Recommended, Evidence (C)
Pharmacologic therapy

NSAID Recommendations

Research Issues

- 5 RCTs, N = 270 for cervicothoracic pain in a recent review
- No placebo controlled trials
  - Comparison to manipulation, acupuncture, etc
  - Similar results
  - Evidence less clear for radicular pain syndromes
    - Diagnostic uncertainty for above
- Few if any head to head trials of NSAIDs
- No strong evidence for dosing patterns
- No quality studies of hydrocodone in adult populations
  - Paracetamol appears to be effective

NSAID Recommendations

Neck Pain – acute, sub-acute, chronic

- Not invasive, low cost generic
- Low side effects profile in healthy working population
- Scheduled dose (acute); prn (chronic) (C)
- Known CVD or multiple risk factors
  - Aspirin or acetaminophen (A)
  - Counseling on risks and benefits (I)
- Gastro-protective agents
  - PPIs with increased bleeding risk (A)
  - Sucralfate (B)
  - H2 blockers (C)
Skeletal muscle relaxants
Cervicothoracic Pain
- Recommended for moderate to severe acute cervicothoracic pain not controlled by NSAIDs (C)
  - Second line, nocturnal use
  - Caution with machinery
    - May cause daytime somnolence
  - Caution with history of depression, personality disorder, SA
  - Abuse potential
    - Cyclobenzaprine – resembles TCA
- Diazepam not recommended as a muscle relaxant
  - Higher incidence of adverse effects, addictive
- Not recommended for mild to moderate acute pain due to adverse effects (I)

Skeletal muscle relaxants
Cervicothoracic radicular, post op pain
- Recommended for acute radicular cervicothoracic pain with a muscular component not controlled by NSAIDs (I)
  - Second or third line, nocturnal use
  - Caution with machinery
    - May cause daytime somnolence
  - Caution with history of depression, personality disorder, SA
  - Abuse potential
    - Cyclobenzaprine – resembles TCA
- Recommended for acute post operative pain (I)
  - Muscular component
  - See above
  - Problems with blinding in quality studies
  - Obvious CNS effects

Anti-depressants
Cervicothoracic pain
- TCAs and SNRIs are not recommended for acute or sub-acute cervicothoracic pain (I)
  - No quality evidence of efficacy
- TCAs and SNRIs are recommended for chronic cervicothoracic pain (C)
  - Pain not adequately treated with NSAIDs, exercise
  - Particularly helpful with sleep disruption, mild dysthymia
  - Escalate dose to effective level vs adverse effects
- SSRIs not recommended for chronic cervicothoracic pain
  - Limited evidence of effectiveness in cervicothoracic pain
  - Strong evidence not effective for low back pain
Anti-depressants
cervicothoracic radicular syndromes

- TCAs and SNRIs are recommended for chronic cervicothoracic radicular syndromes (C)
  - Pain not adequately treated with NSAIDs, exercise
  - Particularly helpful with sleep disruption and mild dysthymia
  - Escalate dose to effective level v adverse effects
- Quality evidence for TCAs (doxepin)
- Quality evidence for TCAs and SNRIs for chronic LBP
- SSRIs
  - Limited evidence of effectiveness in cervicothoracic pain
  - Strong evidence not effective for low back pain

Oral Steroids
cervicothoracic pain

- Glucocorticoids are not recommended for non-radicul, non-traumatic cervicothoracic pain (I)
  - No quality evidence of effectiveness
  - Quality evidence of ineffectiveness for LBP
- Oral glucocorticoids are recommended for acute severe radicular pain for short term pain reduction (I)

IV Steroids
cervicothoracic whiplash pain

- IV glucocorticoids are recommended for whiplash-related cervicothoracic pain (C)
  - Limited quality evidence of effectiveness
    - One high quality RCT
  - Within first 8 hours
  - Single dose followed by infusion for 23 hours
    - Grade II (pain and musculoskeletal signs)
    - Grade III (neurologic deficits)
Issues in Research on Manipulation of the Cervical and Thoracic Spine

- Numerous types of manipulation and mobilization
  - Usually aggregated in research
- Outcomes unclear
- No trials v. placebo or sham
  - Same effect as ultrasound, exercise, PT
- Don’t differentiate by duration
- Heterogeneous results
- Serious adverse effects
  - Vertebrobasilar events, cauda equina syndrome, death

Active Physical Methods

- For cervical strain with impaired function, ROM and strengthening exercises are recommended (I)
  - 1-2 visits for education and counseling
- Aerobic exercise is recommended
- Relaxation techniques
  - [At-home heat and cold]
Treatment Guidelines for the Elbow: Latest Updates from the ACOEM Practice Guidelines

Elbow Straps

- Eleven studies reviewed (5 original studies)
- Highest quality studies use a wrist-based off-loader brace, not widely used in the US.
- Those studies did tend to show reductions in pain
- Limitations are primarily lack of blinding
- Insufficient Evidence “I”, Recommended
Injections:
Glucocorticosteroids

- Ten Studies
  - Natural history is to improve or resolve
  - Strong evidence of short term benefit. But, strongly recurrent such that no evidence of altering long term prognosis
  - If non-invasive therapy fails to improve condition over 3-4 weeks
  - Evidence (B), Moderately Recommended.

Cortisone efficacy for epicondylitis treatment

![Graph showing success rates of three treatment regimens: Placebo, Glucocorticoid Injection (x=62), and Physiotherapy (n=64).]


Botulinum

- Three Studies
  - 1- no effect, 2- some reductions in pain but complications, 3- reduced pain over a few weeks
  - Side effects digital paresis and weakness of finger extension
  - Evidence (I), Insufficient Evidence. No Recommendation.

Autologous Blood Injections

- No studies
  - Evidence (I), Insufficient Evidence. Recommended Against
Physical Methods

- To justify continuing care document
  - Increased pain free grip
  - Increased lifting ability
  - Improvement on functional disability scales
- Frequency should decrease over time with patient performing independently and treatment moving to home use
- Treatment should usually provide functional benefit in 2-3 visits. If no benefit either discontinue or modify
- Moderate symptoms 5-6 visits
- Severe 8-13 over 6-8 weeks

Home Exercise Instructions

- Eight studies
  - Studies use markedly different methods, different exercises, or do not describe the exercises used.
  - Insufficient Evidence (I), Recommended.

Iontophoresis

- Three studies.
  - Some evidence for short term efficacy of iontophoresis (current of 4.0 mA, treatment for 20-40 minutes, total of 6-10 treatments) for both lateral and medial epicondylitis. Six treatments are appropriate for acute cases and 10 treatments for chronic cases, as long as the patient is showing functional improvement.
  - Evidence (C), Recommended.
Ultrasound

- Seven studies
- Evidence for short term efficacy with ultrasound (pulsed ratio of 1:4 and duration of 2 ms or continuous at a frequency of 0.7-11.0 MHz, an intensity of 1.0-2.0 W/cm², for 5-10 minutes, over a 5 cm² treatment area, 2-3 times per week based on objective results over a 5-6 week trial). Unclear if superior to other treatments such as exercise. Evidence (B), Moderately Recommended.

Manipulation

- Three Studies
- Problems with comparability
- No long term studies of adequate methodological quality on manual therapy. Insufficient Evidence (I), Recommended Against.

Extracorporeal Shock Wave Therapy

- Ten studies
- Pooled analyses with Cochrane, mostly negative results, including acute versus chronic. Studies compared with forearm stretching or placebo negative. Evidence (A), Strongly Recommended Against.
Evidence Based Clinical Practice Guidelines

Phonophoresis

- **Three studies**
- No significant differences among the various experimental groups.
- **Evidence (C), Recommended Against.**

Low Level Laser Therapy

- **Eight studies**
- No evidence for the effectiveness of low level laser therapy in medial or lateral elbow pain.
- **Evidence (A), Strongly Recommended Against.**

Acupuncture

- **Six studies**
- Varying results between studies. Heterogeneity of study designs.
- Needling at depths of 1.25-2.5 cm for 20-25 minutes, 2-3 times a week for a total of 6 treatments may be appropriate for an initial trial of therapy for the treatment of lateral epicondylitis, with an additional 6 if there is evidence of objective functional improvement.
- **Insufficient Evidence (I), Recommended**

Medial Epicondylitis

- Recommend to treat similar to lateral epicondylitis (however, studies mostly lacking)
- Iontophoresis
  - **Evidence (C), Recommended**
- Corticosteroids
  - **Evidence (B), Recommended**
Activity Modifications

- No Studies.
  - No studies on workplace “restrictions,” or similar.
  - No studies that activity modifications alter the clinical course. Still, widely believed that some activities may materially aggravate and perpetuate symptoms of lateral epicondylitis.
- Insufficient Evidence (I), Recommended.

Job Design

- No studies
- Force especially believed to be important where occupational tasks materially contribute. Understanding the worksite and the employer’s willingness and the feasibility to modify the workstation may be important to maintain the employee at work and/or minimize disability time.
- Insufficient Evidence (I), Recommended.

Surgical referral

- Limitations of activity for more than 3 months after appropriate treatment programs have begun
- Clear clinical and electrophysiologic or imaging evidence of a lesion shown to benefit from surgery
- Patient must understand, outcomes, risk, and benefit
- Patient should commit to pre and post operative exercise program
Surgery: Lateral Epicondylitis

- Four Studies
- No comparisons of surgery to non-surgical options
- For those unusual cases who fail several weeks of conservative treatment, surgery may be considered with debridement of inflammatory or scarred tissue. There is preliminary evidence that patients undergoing less invasive procedures have fewer complications.
- Insufficient Evidence (I), Recommended.

Summary Table

- Debridement of inflammatory or scarred tissue for patients with epicondylalgia if conservative treatment fails (I)

- Surgery after at least 6 months of conservative treatment with failure to show signs of improvement (at least 3 months in unusual circumstances) (I)

Ulnar neuropathy

- No studies on non-surgical options
- The following are recommended:
  - Elbow padding Insufficient Evidence (I), Recommended.
  - Avoidance of leaning on the ulnar nerve at the elbow Insufficient Evidence (I), Recommended.
  - Avoidance of prolonged hyperflexion of the elbow Insufficient Evidence (I), Recommended.
  - Nonsteroidal anti-inflammatory medications may be utilized Insufficient Evidence (I), Recommended.
Evidence Based Clinical Practice Guidelines

Ulnar Neuropathy: Surgery

- **Five Studies**. (2 subcutaneous transposition v. simple decompression and 2 submuscular transposition v. simple decompression and 1 subcutaneous transposition v. medial epicondylectomy)
- No studies with non-surgical control
- Simple decompression has fewer complications for + electrodiagnostic cases with functional deficits. Evidence (C), Recommended.
- Anterior transposition indicated under limited circumstances Evidence (I), Recommended;
- Submuscular transposition Evidence (C), Not Recommended;
- Medial epicondylectomy with transposition Evidence (C), Not Recommended.

Other surgery recommendations

- Radial nerve entrapment after 3 months of therapy, with + electrodiagnostics and functional loss Insufficient Evidence I, recommended
- Pronator syndrome after 3 months of therapy, with + electrodiagnostics and functional loss Insufficient Evidence I, recommended
- Biceps rupture usually due to supramaximal force Insufficient Evidence I, recommended
- Olecranon bursitis aseptic or septic, aseptic after 6 weeks of treatment Insufficient Evidence I, recommended

ACOEM Shoulder Guideline

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Diagnostic Testing Recommendations: If it affects therapy procedure is contemplated, agreed

- Condition
  - Rotator cuff tear
  - Labral tear
  - Shoulder instability
  - Dislocation
  - AC separation
  - Impingement
  - Adhesive capsulitis

- Test
  - MRI
  - MRI
  - Weight-bearing films
  - Plain radiographs
  - Weight-bearing films
  - Plain films, MRI often obtained, no evidence
  - MRI plain films often obtained
Shoulder Tests

- Routine films before 4-6 weeks
- Stress films for instability
- Plain radiographs (type 2) MRI for impingement/ bursitis (aging changes)
- Ultrasonography to evaluate cuff tear

TREATMENT RECOMMENDATIONS

Treatment Recommendations

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
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</thead>
<tbody>
<tr>
<td>Impingement</td>
<td>Home heat or cold</td>
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<td>NSAIDs</td>
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<td>Impingement exercise instruction, global/cuff strengthening</td>
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<td></td>
<td>Arthroscopic decompression for treatment failure eg activity limitations and moderate to severe symptoms – 3-6 months</td>
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<tr>
<td>Rotator cuff tear</td>
<td>Home heat or cold</td>
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<td>NSAIDs</td>
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<td>Cuff strengthening exercise instructions (small tears)</td>
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<td>Arthroscopic repair (large tears, treatment failure after 3-6 months)</td>
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### Treatment Recommendations

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<th>Condition</th>
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<tr>
<td>Labral tear</td>
<td>Instruction in global cuff strengthening, ROM</td>
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<tr>
<td>Should instability</td>
<td>Instruction in global cuff strengthening, ROM, HEP</td>
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<tr>
<td>Recurrent dislocation</td>
<td>Instruction in global cuff strengthening, ROM, Repair?</td>
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### Treatment Recommendations

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<tr>
<td>Adhesive capsulitis</td>
<td>Manual physical therapy</td>
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<tr>
<td>AC strain</td>
<td>Ultrasound</td>
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<tr>
<td>AC separation</td>
<td>ECSWT</td>
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<td>Non-specific pain</td>
<td>NSAIDs, Sling</td>
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### Shoulder Not Recommended

- Manipulation for impingement/bursitis, tears
- May worsen the condition
- Acupuncture
- Provider dependent
- Injections
  - Trigger point injections
  - More than 3 SA bursa injections
    - 2-3 weeks conservative therapy first
    - Evidence for injections weak
    - May weaken tendons, other tissue
Shoulder
Not Recommended

- Physical methods
  - TENS
  - Massage
  - Diathermy
  - Cutaneous laser
  - Ultrasound
  - Biofeedback
  - Chiro dependent on previous chiro experience

Shoulder
Not Recommended

- Anterior repair for initial dislocation
- Acute AC separation repair
- Acute cuff repair except massive tear
- Surgery for recurrent dislocation before rehab
- Biceps tendon repair
- Impingement surgery for mild symptoms
- TOS surgery without treatment failure (scalene and trapezius stretching), EMG/scalene block confirmation [very low success rate]

Questions?
Answers, Maybe!