



A REPORT TO THE INDUSTRY

**Utilization Review & the Use of  
Medical Treatment Guidelines  
in California Workers' Compensation:**

A Comparison of ACOEM & AAOS on  
Medical Testing and Service Utilization  
for Low Back Injury

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## A REPORT TO THE INDUSTRY

### **Foreword**

The California workers' compensation system experienced a 300 percent growth rate in medical costs between 1993 and 2003, caused primarily by ever-increasing medical utilization. In order to control runaway medical costs and encourage high-quality scientifically proven medical treatments, the State of California has mandated a workers' compensation medical treatment utilization schedule that incorporates evidence-based, peer-reviewed, nationally recognized medical treatment guidelines, beginning with the guidelines developed by the American College of Occupational and Environment Medicine (ACOEM). A recent study suggests the need to include additional treatment guidelines such as the low back injury treatment guidelines produced by the American Academy of Orthopedic Surgeons (AAOS). While the idea of using multiple guidelines such as ACOEM and AAOS may seem a reasonable exercise in order to make a more comprehensive utilization schedule, it raises issues that can trigger unintended consequences.

This study compares the evidence base underlying the ACOEM and the AAOS guidelines, as well as ACOEM and AAOS recommendations for five medical procedures and tests used to treat low back injuries in California workers' compensation. The analysis uses a claim sample of 81,944 open and closed low back indemnity claims with dates of injury between January 1, 1997 and December 2000, with all medical treatment through 2002. The results show that the ACOEM and AAOS guidelines have fundamentally different recommendations in regard to appropriate services and frequency of treatment for low back injuries -- a lack of agreement that will likely produce conflict and debate within the workers' compensation system.

The core issue that must be addressed to resolve this conflict is how to interpret a guideline's lack of specificity or lack of a direct opinion concerning a particular medical service. Without a minimal threshold test for the grade of medical evidence required to approve a test or treatment for its injured workers, the California workers' compensation system will have difficulty finding a solution to its excessive medical inflation and inconsistent and often inappropriate medical treatment. All stakeholders should work from the same scientific evidence base to ensure consistency across all aspects of medical delivery for California's injured work force.

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**About CWCI**

The California Workers' Compensation Institute, incorporated in 1964, is a private, non-profit organization of insurers and self-insured employers conducting and communicating research and analyses to improve the California workers' compensation system.

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**Utilization Review & the Use of Medical Treatment Guidelines in California Workers' Compensation:**

Comparison of ACOEM &amp; AAOS on Medical Testing and Service Utilization for Low Back Injury

**Introduction**

Much of the focus of ongoing workers' compensation reforms in California is on containing medical costs -- which comprise about 60 percent of the ultimate benefit dollars spent in the system. Even though claim frequency has fallen to an all-time low over the past decade (CWCI 2004), aggregate benefit costs in the system have increased steadily, primarily due to growth in the average cost of an indemnity claim. Between 1993 and 2003, for example, the average ultimate medical cost per indemnity claim in California more than tripled from \$8,876 to \$27,197 (WCIRB 2005). Several recent studies have documented significant increases in medical utilization (including the average number of visits and procedures per claim, as well as the extent and duration of treatment) during this period. These studies have concluded that the increases in medical utilization have driven up loss costs and been a primary contributor to California's "crisis" situation of skyrocketing workers' compensation premiums (Johnson 2002, Gardner 2002).

Over the last three years, state lawmakers have responded to the crisis by drafting a series of reform policies. The 2002 reform bill, Assembly Bill 749, called for benefit increases and the partial elimination of the treating physician's presumption of correctness, which multiple studies associated with significant increases in medical utilization (Gardner 2002, Johnson, 2002). That was followed in 2003 by Senate Bill 228, which mandated that the state adopt a workers' compensation medical treatment utilization schedule by December 2004 and specified that the new schedule incorporate evidence-based, peer-reviewed, nationally recognized medical treatment guidelines. The bill also contained 24-visit limits on physical medicine and chiropractic care, two services associated with excess treatment and cost (CWCI 2003). The legislative intent appears to have been multi-faceted. State lawmakers wished to endorse focused, high-quality health care for injured employees by supporting the use of scientifically proven treatments in order to promote recovery and return to maximum functionality, and to decrease the cost of healthcare through the reduction of unproven or unproductive medical care.

The 2003 reform bill also established that evidence-based, peer-reviewed, nationally recognized treatment guidelines would be admissible before the Appeals Board, and that the medical treatment utilization guideline adopted by the Division of Workers' Compensation would be presumed correct on the issues of extent and scope of treatment. Furthermore, SB 228 deemed that,

effective March 22, 2004 until the adoption of the new schedule, the medical care guidelines established by the American College of Occupational and Environment Medicine (ACOEM) would be presumed correct. State lawmakers cited estimates that the medical treatment utilization schedule would significantly reduce workers' compensation medical costs, though a recent CWCI study noted that while the ACOEM guidelines have significant potential to curb unnecessary or inappropriate medical treatment, the guidelines do not address a significant portion of workplace injuries (Harris 2004).

Another provision of SB 228 instructed the Commission on Health and Safety and Workers' Compensation (CHSWC) to conduct a study of medical utilization guidelines, a mandate that culminated with the recent release of a RAND study (Nuckols 2004). The RAND study, with support from other stakeholders' comments, has led the Commission (CHSWC 2004) to recommend that the Administrative Director consider adopting:

1. An interim utilization schedule based on the ACOEM guidelines, replaced with respect to spinal surgery by the American Academy of Orthopedic Surgery (AAOS) guidelines; and
2. Interim guidelines for specified therapies, including podiatry, chiropractic, physical therapy, occupational therapy, acupuncture, and biofeedback.

To gauge the potential effect of changes to the treatment guideline rules and regulations, CWCI developed this two-part analysis. The first part reviews the structure and function of utilization review (UR), while the second part focuses on ACOEM and AAOS treatment guidelines, comparing their opinions and recommendations for specific cost driver medical services for low back injuries as well as the underlying evidence base of scientific literature and medical logic that shapes their recommendations.

The data analysis measures utilization patterns on a large sample of pre-UR reform claims and compares them to recommended treatment levels under the ACOEM & AAOS guidelines. These key cost drivers include:

1. Plain Film X-rays
2. CAT Scans and MRIs
3. Physical Medicine  
(Other than Chiropractic Manipulation)
4. Chiropractic Manipulation
5. Surgical Intervention

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**Part One: A Utilization Review Primer**

Utilization review is the process of reviewing requests for medical tests and treatments for medical necessity, efficacy, and appropriateness.

Current California law requires each employer or their workers' compensation insurer or third party administrator to have a utilization review process that can be used to authorize medical payments for compensable work injury and illness claims. The UR process, which addresses modality, frequency, duration and setting of medical services, must be governed by written policies and procedures consistent with the requirements of Labor Code Section 4610, and must be filed with the Administrative Director of the Division of Workers' Compensation.

With the shift in the presumption of correctness from the primary treating physician's opinion to authorized treatment guidelines under the recent legislative reforms, the use of utilization review in California workers' compensation has soared. Reviewers may conduct UR prospectively, concurrently or retrospectively. Most review is now performed prospectively, though a significant amount of initial care is submitted for retrospective review.

Personnel performing UR should be able to understand the medical management of the case, the criteria for payment recommendations, and the logic of applying the criteria for conducting a review. In general, health professionals such as registered nurses and physicians possess such background and decision-making skills, but non-health care professionals who use written protocols and know when to refer to a health care professional are also able to consistently review treatment requests for care against specific clinical guidelines for diagnostic categories. UR is more efficiently managed when there is administrative support to ensure that the necessary documentation is available and to call for additional information and reports as necessary.

Many payers use a layered review process. At the first level, claims examiners and nurses review claims using support tools and clear indicators. Any cases they are unable to approve are then referred to the next level for physician review.

In UR, medical guidelines provide the clinical rationale to determine whether requested medical services are necessary, efficacious and appropriate. As noted earlier, the medical treatment utilization guidelines adopted by the Administrative Director -- or the ACOEM guidelines

until that adoption -- are rebuttably presumed correct. Utilization guidelines in California workers' compensation must reflect evidence-based, peer-reviewed, nationally recognized standards of care.

Review of requests for payment for initial treatment should be consistent within particular injury or diagnostic categories and based on evidence of effectiveness. As payment for ongoing care is requested, the patient's progress towards recovery, response to previous treatment, and non-medical factors that may delay return to function must also be taken into account. Thus, as treatment continues, those conducting utilization review should consider the patient's clinical condition to determine whether the care is contributing to objective functional improvement. The medical provider may make a case for variance from the guidelines based on the patient's documented individual presentation. In such cases, peer-to-peer review by a physician generally occurs.

Workers' compensation UR generates recommendations regarding payment authorization, but does not mandate how a provider treats a patient. Despite this distinction, some providers do not perform services they assert are important if payment is not authorized. To address this issue, some UR responses now include the specific care that the guidelines recommend.

A treating physician may seek authorization of payment for medical services by telephone, email, fax, and mail, but Labor Code Section 4610 directs that UR time-frames are initiated only by receipt of a written request for authorization (Doctor's First Report of Injury Form or Primary Treating Physician's Progress Report Form). The best practice is to submit these written requests for specific tests/treatments with full documentation. Optimally, the treating physician's request will include:

- a complete history related to the need for treatment
- a focused but complete physical examination
- an accurate diagnosis consistent with the history, physical and tests
- an indication for the test or treatment at that point in time, consistent with evidence-based guidelines
- any contraindications that may exist
- details of previous treatment and functional outcomes of that treatment
- any conditions that may adversely affect the patient

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When the treating physician fails to submit sufficient information on which to base a decision, the utilization reviewer usually asks for the remaining information in writing or by telephone and issues a "delay letter" that defers the decision until after they receive the necessary information. California law calls for the determination of medical necessity and appropriateness of care for an injured worker to be based on the medical treatment utilization guideline, the ACOEM guideline when applicable, or otherwise on the documented benefit of the proposed test or treatment as supported by the literature. In the best cases, high-grade evidence supporting the effectiveness and benefit of providing the service exceeds the risk. If such evidence is not available, then utilization review of the requested medical care should rely on guidelines based on national expert, multi-disciplinary consensus.

The greater the uniformity of the guidelines used, the less disagreement there is, and appropriate care can be authorized and delivered more quickly. Likewise, the more specific the criteria are, the less variable the practices will be and the less resistance will be encountered from the treating community. Less variation is better quality by definition. Less specific criteria make it difficult for reviewers to make consistent decisions and can lead to disagreements and delays. Since criteria should be evidence-based, they should reflect clinical practice guidelines designed to improve the quality of medical practice.

In conducting UR, the reviewer compares the submitted information to criteria that are usually diagnosis related, checking for an appropriate diagnosis and indications for the test or procedure requested, reviewing the amount and results of prior treatment, and any contraindications the patient might have to the test or procedure. If the data submitted match the criteria, payment is generally authorized, but as previously noted, if the reviewer needs additional information, the authorization decision may be delayed. If there is not a match, and the initial review was not performed by a physician, the request is forwarded to a physician for peer review. Prior to denying authorization of payment, the UR staff also may contact the provider to discuss the variance from the guidelines or criteria and to negotiate a service request that can be supported by the guidelines.

For any workers' compensation treatment request -- particularly for repetitive treatments such as physical therapy

or manipulation -- it is important that the recommended services correlate with measurable improvements in function, such as improved work capacity (advance in modified duty) or return to work. If the patient is not objectively improving, then providing more treatment that has already failed is not generally considered reasonable.

It is also important for the reviewer to be sure that the treatment can improve on the natural course of recovery. For many musculoskeletal complaints common in workers' compensation, patients recover in a matter of weeks without special treatment, so the proposed treatment should improve on that time course.

In California, only a physician can deny authorization for payment for tests, devices or procedures. It is thought that a physician can better understand the details of each case and the necessary medical judgment entailed in the request for treatment. If a medical provider's request for medical payment authorization does not appear to meet clear criteria, the best practice is for a physician reviewer to contact the provider to discuss the case and any details that were not apparent in the request. The final decision should be based on the potential benefit to the patient, net of potential risks. The physician reviewer may suggest and discuss therapeutic alternatives that might have a better benefit-to-risk ratio.

California currently has emergency regulations that require prospective or concurrent requests to be answered within 5 working days of the written request, although this can be extended to 14 days if additional information is needed. However, if the patient's condition warrants an expedited review, a response must be given within 72 hours of receipt of the necessary written information. These decisions must be communicated within 24 hours of the time they are made. In the case of retrospective requests, the decision must be communicated within 30 days of receipt of the necessary written medical information. A recent En Banc decision from the Workers' Compensation Appeals Board, *Sandhagen v. Cox & Cox Construction and State Fund* indicates that if these time allowances are not met, the untimely UR report is inadmissible, although the claims administrator may still utilize the Agreed Medical Evaluator/Qualified Medical Evaluator process found in Labor Code Sections 4062.1 and 4062.2 to resolve the dispute. Additionally, injured employees or their attorneys may file for expedited hearings before the Workers' Compensation Appeals Board.



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**Part Two: An Analysis of the ACOEM & AAOS Guidelines****The Evidence Base and Guideline Recommendations**

One of the most important principles in developing any medical treatment guideline is drawn from the Hippocratic oath -- "First do no harm." Taken another way, if there is insufficient high-grade evidence that a test or treatment is safe and effective for its intended use at a specific time in the health problem, it should not be recommended or used on a patient. This is a controversial area in occupational medicine, since many commonly used tests (such as discograms, surface nerve conduction studies, and thermography) and treatments (such as long-term passive and other physical medicine and chiropractic treatments, spine surgery for pain, or IDET -- intradiskal electrothermal annuloplasty) are not supported by proof of effectiveness (Harris 1997; Glass 2004). If the risks or costs exceed benefits, the test or treatment should not be used. For example, early surgery for back nerve root compression, when the condition will usually resolve spontaneously within 4-8 weeks, produces risks and harms greater than potential benefits. This principle also applies to temporary disability and time off work, for which there are clear harms if time off work is excessive (Harris 1997; Glass 2004).

The ideal method for basing recommendations for medical treatment is to rely on high-quality studies. However, there are methodological issues with much of the research -- particularly musculoskeletal research -- cited by the guidelines. For example, many of the studies involved small patient populations, reducing the power of the studies and the ability to project the results onto a broader population. Few of the studies cited compared the intervention to a placebo or no treatment; most compared one medical intervention against another -- a less than optimal study design.

Given the research shortcomings and population studies that suggest that the more treatment there is, the worse the functional outcome, it appears that the most specific and conservative guidelines would be preferable for the treatment and management of low back problems. Attention to diagnostic accuracy, scientifically based causation analysis, and disability management are key to producing the desired outcomes of functional recovery and minimization of economic loss to workers.

Medical treatment guidelines, however comprehensive and well-meaning, are not meant to be construed as "cookbook" medicine. Providers must take a variety of issues into account when considering the optimal course of treatment for a patient including the medical evidence base, the need to assess and measure special contributing factors such as "red flags," and the medical history and psychology of a patient.

**ACOEM & AAOS: A Comparison of Guidelines and Their Underlying Evidence Base**

As stated previously, medical treatment guidelines play a crucial role in the UR process. CHSWC, based on the RAND report, has recommended that the Administrative Director implement additional medical treatment guidelines into the UR process beginning with the American Academy of Orthopedic Surgeons (AAOS) guideline on low back complaints. This part of the study looks at the similarities and differences in the recommendations and underlying evidence-base between the ACOEM and AAOS guidelines for the treatment of low back injuries, comparing each guideline's recommendation for five common tests and treatments.

The research summaries cited in the AAOS and ACOEM recommendations are somewhat related. The AAOS bibliography included the Federal Agency for Health Care Policy and Research (AHCPR--now Agency for Healthcare Research and Quality, AHRQ) Clinical Practice Guideline on Acute Low Back Problems in Adults, and applicable Cochrane Collaboration systematic evidence reviews. The ACOEM Guidelines used the AHCPR Clinical Practice Guideline as a starting point for its low back guideline, and used Cochrane Reviews for major input in drafting and updating the recommendations. The ACOEM Practice Guidelines Committee then reviewed and used this evidence.

The ACOEM and AAOS guidelines take a similar approach to red flags (ACOEM and AHCPR) or Critical Exclusionary Diagnoses (AAOS). Red flags are the mechanisms, symptoms and signs that indicate the potential presence of Critical Exclusionary Diagnoses. The red flags are potentially serious indicators of emergent problems that must be evaluated and treated immediately, in lieu of the stepwise approach generally recommended in clinical practice guidelines, depending in turn on functional recovery or other criteria.

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The guidelines differ, however, in their use of medical evidence. The AAOS evidence classification does not follow the accepted levels of evidence used by AHCPR, the British Medical Journal/Clinical Evidence, ACOEM, or the Finnish Occupational Medicine Guidelines. These latter groups and the Cochrane Collaboration – a well-regarded research and reference center for evidence-based medicine – define randomized, controlled trials as acceptable evidence for treatment effectiveness.

The first AAOS levels appear relatively consistent, although “experimental” is not defined. “Experimental” appears to include pre-post, cohort, time, or matched case-control series, which are observational rather than experimental, and are not considered acceptably rigorous in other classifications. Case reports and clinical examples (AAOS Type V) are not considered usable in ACOEM and other guidelines.

**Diagnosis**

Appropriate medical treatment and prevention are based on accurate diagnoses. Some diagnostic criteria are stated at a high level in the AAOS Guideline. The level of detail, however, is not sufficient to permit validation of a stated diagnosis for the purpose of determining the medical appropriateness of testing or treatment -- particularly for a non-medical audience such as insurance adjusters, attorneys and administrative law judges. The ACOEM Guidelines contain evidence-based diagnostic criteria for many common low back problems. Research has shown that workers' compensation medical providers all too often do not report the diagnosis appropriately; instead using unspecific diagnostic codes (Harris 2004). Accurately reported diagnoses are essential for utilization review, and vague or non-specific diagnosis codes make it difficult or impossible to apply guidelines to requested treatment plans.

**Table 1: Comparison of Evidence Classifications**

AAOS		ACOEM	
Evidence Level		Evidence Level	
<b>Type I</b>	Meta-analysis of multiple, well-designed controlled studies, or high-power randomized, controlled clinical trial (RCT)	<b>A</b>	Strong research-based evidence (multiple relevant, high-quality studies)
<b>Type II</b>	Well-designed experimental study or low-power RCT	<b>B</b>	Moderate research-based evidence (one relevant, high-quality scientific study or multiple adequate scientific studies)
<b>Type III</b>	Well-designed experimental studies such as non-randomized, controlled single group, pre-post, cohort, time, or matched case-control series	<b>C</b>	Limited research-based evidence (at least one adequate scientific study of patients with low back pain complaints)
<b>Type IV</b>	Well-designed, non-experimental studies such as comparative and correlational descriptive and case studies	<b>D</b>	Panel interpretation of information not meeting inclusion criteria for research-based evidence
<b>Type V</b>	Case reports and clinical examples		

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**Data Analysis: Actual Utilization vs. ACOEM/AAOS Recommendations**

For this study, the Institute compiled data on injured workers, as well as medical and other benefit payments, from the Industry Claims Information System (ICIS).<sup>1</sup> The analysis focuses on two of the most common diagnostic categories found in workers' compensation: low back - soft tissue complaints (sprains and strains) and low back - nerve involvement. The Institute used medical bill review detail, which contains ICD-9 diagnosis codes and CPT medical procedure codes to derive the diagnostic categories and to analyze medical testing and treatment services for each claim. The claim sample was comprised of 81,944 open and closed indemnity claims with dates of injury between January 1, 1997 and December 2000. Benefit payments reflect the total amount paid on these claims through June 30, 2002.

The results of the analysis are presented in the following series of Time-Based Utilization Tables. The time-based tables compare utilization patterns for indemnity claims at discrete time periods following the date of injury. The legend of terms used in these tables follows:

- **Time Category:** The five intervals at which the accumulated volume of claims involving a specific medical service or procedure was measured. The study recorded claim volume at 1, 2, 3, 6, and 12 months from the date of injury.
- **Total Claims:** The number of indemnity claims in the claim sample within a specific diagnostic category.
- **Claims with Medical Resource:** The subset of claims within each diagnostic category in which the particular medical service, such as an X-ray or physical medicine, was present.
- **Percent of Claim Pool:** The proportion of claims in each diagnostic category that received that particular medical service (Claims with Medical Resource/Total Claims).
- **Utilization:** The mean and median (50th percentile) number of visits for a particular medical test or procedure for the subsample of claims in each diagnostic category that involved those tests or procedures.

1. ICIS is a proprietary database maintained by the California Workers' Compensation Institute that contains detailed information, including employer and employee characteristics, medical service information, and benefit and other administrative cost information on over 2 million workplace injuries.

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**Plain Film X-Rays**

Tables 2A – B provide data on the use of plain film X-rays in low back soft tissue and low back nerve root involvement cases.

**Pre-UR Guideline Utilization**

Among the 74,343 low back soft tissue complaints (sprain or strain cases) in the study sample, 70.2 percent involved one or more visits for plain film X-rays, while 81.8 percent of the low back claims with nerve involvement involved one or more X-ray visits. In nearly half of the claims in both of these diagnostic categories, X-rays were taken within a month of injury.

**ACOEM**

Strains, nerve roots, the sciatic nerve and the spinal cord cannot be visualized on plain films with enough detail to be clinically useful. According to ACOEM, X-rays for all categories of work-related low back problems should be limited to assessing the infrequent presence of red flags.<sup>2,3</sup> In addition, physician discretion to use X-ray testing is supported for other significant issues such as patient reassurance. Therefore, the ACOEM guidelines would have recommended a small percentage of the total number of X-rays for both low back soft tissue and nerve involvement categories.

**Table 2A: Time-Based Utilization – X-rays**

Time Category	Low Back – Soft Tissue Complaints					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	74,343	74,343	74,343	74,343	74,343	74,343
Claims with Medical Resource	36,229	41,414	44,097	47,662	50,161	52,161
Percent of Claim Pool	48.7%	55.7%	59.3%	64.1%	67.5%	70.2%
<b>Utilization</b>						
Total Visits (Mean)	1.2	1.4	1.6	1.9	2.2	2.7
50th Percentile (Median)	1	1	1	1	2	2

**Table 2B: Time-Based Utilization – X-rays**

Time Category	Low Back – Nerve Involvement					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	7,601	7,601	7,601	7,601	7,601	7,601
Claims with Medical Resource	3,572	4,350	4,809	5,396	5,809	6,221
Percent of Claim Pool	47.0%	57.2%	63.3%	71.0%	76.4%	81.8%
<b>Utilization</b>						
Total Visits (Mean)	1.3	1.6	1.8	2.3	2.6	3.2
50th Percentile (Median)	1	1	1	2	2	2

**AAOS**

X-rays are not mentioned in the Phase I (first 4-6 weeks) section of the AAOS guidelines. We assume, therefore, that they are not recommended, with the possible exception of “critical exclusionary diagnoses” (which appear to be similar to ACOEM red flag diagnoses). In Phase II (after 4-6 weeks), X-rays are discussed, but the conditions under which they should be used are unclear.<sup>4</sup> Apparently, if the clinician suspects a critical exclusionary diagnosis

on clinical grounds, or spinal stenosis or spondylolisthesis, plain films would be appropriate. The latter two conditions are not work-related, but degenerative or congenital. If loosely interpreted as disregarding the primacy of the clinical exam, the guideline could be used to justify the very large number of films obtained after 4-6 weeks; but carefully and appropriately interpreted, the AAOS guideline would recommend only a small fraction of the current number of X-rays being obtained.

2. For example, red flags for spinal fracture in the patient history include falls from a height or a high-speed vehicle accident. Red flags for spinal fracture in the physical examination include percussion tenderness over specific spinous processes. Historical red flags for tumors of the spine include severe local pain over the spine itself, a history of cancer, pain at rest, and others. ACOEM Occupational Medicine Practice Guidelines, ed.2, p. 289, Table 12-1

3. ACOEM Occupational Medicine Practice Guidelines, ed. 2, p. 303

4. AAOS Clinical Guideline on Low Back Pain/Sciatica (Acute) (Phases I and II), 2002. page 5; "If no response at 4 to 6 weeks, then a diagnosis is obtained from diagnostic studies (e.g. X-ray, MRI) ."

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**Computer Axial Tomography (CT) Scans & Magnetic Resonance Imaging (MRI)**

Tables 3A – B provide data on the use of CT Scans and MRI imaging in low back soft tissue and low back nerve root involvement cases.

**Pre-UR Guideline Utilization:**

During the study period, 34.6 percent of California workers' compensation claimants diagnosed with low back soft tissue pain or strain had MRIs or CT scans. These claims involved an average of 1.6 visits for these procedures. Among the back injuries with nerve involvement, 56.7 percent of the claims involved an MRI or CT scan, averaging 2.6 visits for these procedures over the study period. About one out of every eight low back soft tissue cases and nearly a quarter of the low back injuries with nerve involvement, involved an MRI or CT scan within two months of injury.

**ACOEM**

The ACOEM guidelines evidence base recommends that imaging (MRI, CT etc.) be used to confirm clinical findings and clarify the anatomy prior to surgery for conditions proven to benefit from surgery. If surgery is not contemplated, imaging will not affect the course of treatment.<sup>5</sup> However, based on the expected surgical rate for soft tissue injuries (Harris 2004), the ACOEM-expected recommendation rate for MRIs or CT scans would be minimal. The surgical rate (assuming all surgeries were justified) for disk displacement and stenosis cases

**Table 3A: Time-Based Utilization – CT/MRI**

Time Category	Low Back – Soft Tissue Complaints					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	74,343	74,343	74,343	74,343	74,343	74,343
Claims with Medical Resource	3,118	9,028	13,355	19,480	22,553	25,757
Percent of Claim Pool	4.2%	12.1%	18.0%	26.2%	30.3%	34.6%
<b>Utilization</b>						
Total Visits (Mean)	1.1	1.1	1.1	1.2	1.4	1.6
50th Percentile (Median)	1	1	1	1	1	1

**Table 3B: Time-Based Utilization – CT/MRI**

Time Category	Low Back – Nerve Involvement					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	7,601	7,601	7,601	7,601	7,601	7,601
Claims with Medical Resource	793	1,866	2,522	3,358	3,867	4,309
Percent of Claim Pool	10.4%	24.6%	33.2%	44.2%	50.9%	56.7%
<b>Utilization</b>						
Total Visits (Mean)	1.5	1.6	1.6	1.9	2.2	2.6
50th Percentile (Median)	1	1	1	1	1	1

is 9.6 percent (Harris 2004), so in nerve involvement claims, actual use of these procedures (56.7 percent of the cases) is 5.9 times the ACOEM-expected rate.

**AAOS**

The AAOS guidelines recommend using MRIs to diagnose conditions after 4-6 weeks.<sup>6</sup> The references cited about MRIs do note the high rate of false positive MRIs in asymptomatic individuals.<sup>7</sup> If one loosely interpreted the guideline as advocating use of MRIs to diagnose all persistent back complaints, many MRIs could be

ordered. Conservatively interpreted, understanding the supporting literature, fewer would be done. The guideline does not, however, limit the use of imaging specifically to those instances in which it would affect the course of treatment. CTs are mentioned as options in characterizing spondylolisthesis and spinal stenosis, which are not work-related conditions. Therefore, there should be a very limited number of CT scans in these diagnostic groups unless MRIs were not available.

5. ACOEM Occupational Medicine Practice Guidelines, ed.2, p. 303.

6. AAOS Clinical Guideline on Low Back Pain/Sciatica (Acute) (Phases I and II), 2002 page 7; "If no response at 4 to 6 weeks, then a diagnosis is obtained from diagnostic studies (e.g. X-ray, MRI) (p.5). " (p.6, with reference to herniated disks). Also, "the MRI is recommended as the diagnostic test of choice in chronic, unremitting low back pain when additional diagnostic information is required."

7. AAOS Clinical Guideline on Low Back Pain/Sciatica (Acute) (Phases I and II), 2002, page 9.

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**Physical Medicine (Other Than Chiropractic Manipulation)**

**Pre-UR Guideline Utilization**

Physical medicine constitutes more than one-third of all outpatient medical care costs in California workers' compensation (CWCI 2003). These types of services are especially prevalent in low back injury cases, with 79.1 percent of low back - soft tissue injury claims and 84.7 percent of low back claims with nerve involvement receiving physical medicine services. These low back - soft tissue claims and low back - nerve involvement claims measured an average of 25.3 and 38.8 physical medicine visits respectively. Nearly 60 percent of the low back soft tissue cases and more than half the low back nerve involvement cases involved physical medicine visits within a month of injury.

**ACOEM**

According to the ACOEM guidelines evidence base, the expected number of physical medicine visits would be two or less, for teaching a home exercise program.<sup>8</sup> There is an exception for a brief therapeutic trial of physical therapy, but it should be discontinued if it does not clearly lead to functional improvement.<sup>9</sup> The ACOEM guidelines evidence base shows that at-home use of cold or heat was found to be as effective as therapist application of these modalities.<sup>10</sup>

**Table 4A: Time-Based Utilization – Physical Medicine**

Time Category	Low Back – Soft Tissue Complaints					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	74,343	74,343	74,343	74,343	74,343	74,343
Claims with Medical Resource	44,568	50,534	52,724	55,655	57,362	58,768
Percent of Claim Pool	59.9%	68.0%	70.9%	74.9%	77.2%	79.1%
<b>Utilization</b>						
Total Visits (Mean)	4.8	7.4	9.4	13.9	19.0	25.3
50th Percentile (Median)	4	6	6	8	10	11

**Table 4B: Time-Based Utilization – Physical Medicine**

Time Category	Low Back – Nerve Involvement					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	7,601	7,601	7,601	7,601	7,601	7,601
Claims with Medical Resource	3,884	4,697	5,052	5,635	6,035	6,438
Percent of Claim Pool	51.1%	61.8%	66.5%	74.1%	79.4%	84.7%
<b>Utilization</b>						
Total Visits (Mean)	6.0	9.6	12.7	19.8	28.5	38.8
50th Percentile (Median)	5	8	10	14	18	21

The guideline panel also found that there was insufficient evidence of effectiveness for traction, ultrasound, massage, diathermy, biofeedback, transcutaneous electrical nerve stimulation (TENS), magnet therapy, acupuncture, neuroreflexotherapy, or lumbar supports.<sup>11</sup>

**AAOS**

The AAOS guideline recommends home heat and cold, rather than those modalities applied by a therapist. However, it states that “all forms of non-operative therapy would be available” in Phase I.<sup>12</sup> Physical therapy is not defined. In

Phase II, exercise is recommended for herniated disks and unremitting low back pain, however, the studies used to support the recommendation do not show a strong effect. There are no constraints on the use of any form of active or passive therapy mentioned.

8. ACOEM Occupational Medicine Practice Guidelines, ed.2, p. 299.

9. ACOEM Occupational Medicine Practice Guidelines, ed.2, p. 300.

10. ACOEM Occupational Medicine Practice Guidelines, ed. 2, p. 299.

11. The Guidelines take the position that unproven modalities should not be used. ACOEM Occupational Medicine Practice Guidelines, ed. 2, p. 48, 308.

12. AAOS Clinical Guideline on Low Back Pain/Sciatica (Acute) (Phases I and II), 2002, pg 5.

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**Chiropractic Manipulation**

**Pre-UR Guideline Utilization**

Just over 19 percent of low-back soft tissue claims in the study sample involved chiropractic manipulation. The average number of chiropractic visits for these claims was 29.9. For the nearly 35 percent of the claims for low back injury with nerve involvement, the average number of chiropractic manipulation visits was 40.5. In 5.3 percent of the low back soft tissue claims and 12.1 percent of the low back nerve involvement claims the first chiropractic manipulation visit occurred within a month of injury.

**ACOEM**

The ACOEM guidelines recommended chiropractic manipulation as effective for approximately 12 visits within the first three to four weeks for low back complaints without nerve involvement.<sup>13</sup> The ACOEM guidelines noted that there was no evidence to support chiropractic manipulation for low back injuries with nerve involvement, although it is included as an “optional” treatment.

**Table 5A: Time-Based Utilization – Chiropractic Manipulation**

Time Category	Low Back – Soft Tissue Complaints					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	74,343	74,343	74,343	74,343	74,343	74,343
Claims with Medical Resource	3,962	6,024	7,144	9,147	11,265	14,187
Percent of Claim Pool	5.3%	8.1%	9.6%	12.3%	15.2%	19.1%
<b>Utilization</b>						
Total Visits (Mean)	5.6	7.9	10.3	15.8	21.7	29.9
50th Percentile (Median)	4	6	7	9	12	15

**Table 5B: Time-Based Utilization – Chiropractic Manipulation**

Time Category	Low Back – Nerve Involvement					Total Claims
	1 Mo.	2 Mo.	3 Mo.	6 Mo.	12 Mo.	
Total Claims	7,601	7,601	7,601	7,601	7,601	7,601
Claims with Medical Resource	930	1,299	1,503	1,826	2,155	2,637
Percent of Claim Pool	12.1%	17.1%	19.8%	24.0%	28.3%	34.7%
<b>Utilization</b>						
Total Visits (Mean)	7.4	9.0	22.0	22.0	31.0	40.5
50th Percentile (Median)	7	9	12	17	21	23

**AAOS**

The AAOS guideline recommends “manual therapy” without limitation in Phase I. In Phase II, the guideline notes that there is little support in the literature for the use of manipulative or passive therapy in unremit-

ting low back pain. These modalities are not mentioned in the discussion of herniated disks. Therefore historic levels of chiropractic utilization could continue for 4-6 weeks, but then no further manipulation is recommended.

13. ACOEM Occupational Medicine Practice Guidelines, ed. 2, p. 298. The Guidelines accepted the recommendation of the Mercy Guidelines, which were for 3 visits a week for 4 weeks.

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**Back Surgery (Laminectomies and Spinal Fusions)**

**Pre-UR Guideline Utilization**

From 1997 through 2000, 12.2 percent of California workers' compensation indemnity claimants diagnosed with low back conditions with nerve involvement, and 3.0 percent of those diagnosed with low back pain or strain, underwent laminectomy and spinal fusion surgery. The low back nerve involvement claimants who underwent these procedures averaged 2.8 surgery visits, while the low-back soft tissue surgical patients averaged 2.2 laminectomy/fusion visits.

**ACOEM**

According to the ACOEM evidence-based guidelines, only patients with severe disease benefit from surgery in the first three months. The Federal PORT study noted that spinal fusions have a very low success rate in the absence of serious conditions

such as fractures, and are therefore not recommended (Deyo 1994). More than 80 percent of patients with nerve root compression due to herniated (protruded) disks (HNP) recover with or without surgery, making initial conservative treatment the option of choice.<sup>14</sup> For the nerve involvement category, only cases with disk protrusion or stenosis are considered candidates. Under the ACOEM guidelines, fusions or laminectomies would not have been recommended in any of the soft tissue cases, or in any of the cases in which Sciatica and Neuritis were diagnosed. According to the data, 88 percent of the fusions and laminectomies performed on the low back claim sample would not have been recommended. In addition, the overall surgical mean values of 2.2 surgery visits for soft tissue complaints and 2.8 surgery visits for nerve involvement show the high incidence of multiple surgeries -- another dimension of the high degree of apparent inappropriate utilization.

**Table 6: Overall Utilization – Surgery (Laminectomy/Fusion)**

Time Category	Low Back Injuries	
	Soft Tissue Complaints	Nerve Involvement
Total Claims	74,343	7,601
Claims w/Med Resource	2,199	931
Percent of Claim Pool	3.0%	12.2%
Utilization		
Total Visits (Mean)	2.2	2.8
50th Percentile (Median)	1.0	1.0

**AAOS**

Early surgical intervention is recommended for herniated disks for critical exclusionary diagnoses such as cauda equina syndrome, and for persistent and severe pain. The guideline has no clear distinction between leg and back pain as there has been in ACOEM and other guidelines. In chronic unremitting low back pain, the guideline states that a small number of patients with "...a symptomatic and correctable lesion that would doom conservative care..." would be surgical candidates.<sup>15</sup> What those lesions are is not specified, nor are there criteria for the surgical approach.

14. ACOEM Occupational Medicine Practice Guidelines, ed. 2, p. 306.  
 15. AAOS Clinical Guideline on Low Back Pain/Sciatica (Acute) (Phases I and II), 2002.



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Table 7 summarizes the similarities and differences between ACOEM and AAOS medical treatment guidelines in a side-by-side comparison. (Note: The technical appendix section contains additional tables that compare recommendations concern-

ing medical services across specific back conditions, including acute low back pain, chronic low back pain and herniated nucleus pulposus. The tables also include the key reference articles cited by the ACOEM and AAOS guidelines.)

**Table 7: Summary of ACOEM & AAOS – Recommended Medical Services**

Service	ACOEM	AAOS
<b>Plain Film X-rays</b>	Limited to red flag assessment.	Allows X-rays if no response at 4-6 weeks.
<b>Physical Medicine</b>	1-2 visits for home exercise program. Optional recommendation for relaxation techniques, home application of heat/cold, shoe insoles, and corsets at work. Traction, TENS, Biofeedback, Shoe Lifts, and Corsets are not recommended	Allows physical therapy but there are no limits re: frequency or duration.
<b>CT/MRI</b>	Limited to red flag assessment. Recommended if not responding to treatment and patient is considering surgery. Diskography and CT Diskography are not recommended.	Allows if no response at 4-6 weeks
<b>Chiropractic Manipulation</b>	Recommends manipulation during first month if no nerve involvement. Manipulation for those with radiation is an "Optional" treatment. Manipulation Under Anesthesia (MUA) is not recommended.	Allows manual therapy in both Phase I and II, but there are no limits re: frequency or duration (Does state that there is little value in Chronic Phase)
<b>Spine Surgery</b>	Surgery is not recommended for: <ul style="list-style-type: none"> <li>• Patients with back pain alone, no red flags, and no nerve root compression</li> <li>• Spinal stenosis within the first 3 months of symptoms</li> <li>• Spinal stenosis when justified by imaging rather than functional status</li> <li>• Fusion in the absence of fracture, dislocation, complications of tumor or infection</li> </ul>	Surgery should be considered if <ul style="list-style-type: none"> <li>• Pain is persistent and severe, and the history, physical findings and diagnostic studies are compatible with a specific root lesion</li> </ul>

**Discussion**

The shift to evidence-based medical treatment guidelines is a change of massive proportions, and presents significant implementation challenges for the California workers' compensation system. Prior studies have shown the limitation of the ACOEM guidelines (Harris 2004, Nuckols 2004) in addressing all injuries and medical treatment options. While the idea of using multiple guidelines such as ACOEM and AAOS may seem a reasonable exercise in order to make a more comprehensive utilization schedule, it raises several utilization review issues that can trigger unintended consequences. In California workers' compensation, any and all guidelines that the Administrative Director adopts into the utilization schedule will be presumptively correct and have equal weight under the law. The results of the comparative analysis show that ACOEM and AAOS guidelines have fundamentally different recommendations in regard to appropriate services and frequency of treatment for low back injuries. This lack of agreement, regardless of how the two guidelines might be implemented, will likely create conflict and debate within the workers' compensation system.

The core issue that must be addressed to resolve this conflict is how to interpret a guideline's lack of specificity or lack of a direct opinion concerning a particular medical service. Pioneers of evidence-based medicine research such as the Cochrane Collaboration stress that a medical test or treatment should only be ordered when there is sufficient high-grade evidence that it is safe and effective. Others have argued that the lack of high-grade evidence is not reason enough to deny injured workers their treatment of choice.

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California's experience over the last 10 years shows a clear and significant association between the lack of a scientific process for evaluating the efficacy of medical services and tests and increases in utilization and costs, longer treatment periods, more lost time from work, and increased levels of attorney involvement and litigation – all characteristics of sub-optimal system performance. This is particularly true with services that lack such sufficient high-grade evidence in the treatment of low back injuries, such as physical medicine, chiropractic treatment, and back surgery. In order for the California workers' compensation system to find a solution to its excessive medical inflation and poor quality indicators, it must create a minimal threshold test for the grade of medical evidence required to approve a test or treatment for its injured workers. The higher the grade of medical evidence and the more specific the guideline, the more certain a stakeholder can feel that a provider's treatment plan is of the highest order and puts the needs of the injured worker first. The lower the grade of medical evidence and specificity, the less likely that a guideline will be able to help reduce treatment variability, raise quality of care, speed recovery and lower medical cost.

**Applying the Evidence Base: Current Implementation Challenges for Stakeholders**

All stakeholders should work from the same scientific evidence base to ensure consistency across all aspects of medical delivery for California's injured work force. Each stakeholder will have different roles and responsibilities, as well as challenges in implementation.

In the interim, injured workers, physicians and claims administrators and their various support systems

and representatives must continue their efforts to reconcile a 10-year legacy of uncontrolled utilization and double-digit medical inflation with a new and more conservative standard of care based on high-quality medical evidence.

**Injured Employees:** Evidence-based medicine works best when the information is available to health care consumers at the point of need. In addition to their injuries, workers already face an unfamiliar, complicated benefit system with a well-documented inability to provide the right information at the right time (Sum 1996). If one overlays the complexities of evidence-based treatment guidelines without the associated support and encouragement of treating physicians, the injured workers' anxiety and fear will impact the outcome of their medical care.

**Physicians and Other Healthcare Providers:** Practice guidelines form the basis for operation of an evidence-based medical organization, and research shows that successful implementation of such guidelines can dramatically improve patient outcomes (NCQA, 2003). To ensure that the promise of improved medical results comes to fruition, physicians must have a comprehensive knowledge of the guidelines and apply them consistently and with confidence. Healthcare providers need to reconcile the findings of high-grade medical evidence with the individual clinical and psychological needs of their patients, encouraging and reassuring them that evidence-based medicine represents the best medical judgment regarding their treatment plan.

Physicians also must report ICD-9 diagnoses codes and descriptions accurately and to the maximum specificity in medical reports and billings. Accurate diagnosis reporting

will facilitate utilization review, reduce the frequency of requests for additional information and subsequent delays, and speed authorization and the provision of medical services.

**Claims Administrators, Case Managers and Managed Care Organizations:** A recent study demonstrated that many reimbursement decisions that allow or disallow care are made with an inconsistent medical basis (Harris, 2003). Claims adjusters and their administrative support systems should be trained to use the same criteria as providers in managing the administrative components of benefit delivery and adjudication. To reach the common goal of improved medical care, claims administrators need to adhere to a common medical standard established by the guidelines, limit disputes, and communicate fully with injured workers, their representatives and their physicians.

**Regulators and Appeals Board Judges:** California law requires that regulators of the California workers' compensation system reevaluate medical treatment guidelines. Regulators may wish to analyze the initial impact of ACOEM as well as the other statutory controls designed to curb excess medical utilization before embarking on a "patchwork" solution of multiple guidelines containing variable grades of medical evidence. Regulators also may wish to consider taking specific action to increase the effectiveness of utilization review by ensuring that medical providers use ICD-9 diagnosis codes that describe the injured workers' condition as specifically as possible in all submitted medical bills and reports.

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**Appendix—AAOS vs. ACOEM Testing and Treatment Recommendations**

**Table 8: Testing Recommendations for Acute Low Back Pain**

TEST	AAOS		ACOEM	
	Recommendation	Evidence	Recommendation	Evidence
Plain Low Back Films	Not discussed	Not cited	<ul style="list-style-type: none"> <li>To confirm fracture, cancer, and infection (red flags)</li> <li>Oblique films not routinely recommended</li> </ul>	Bigos, 1994 Kendrick, 2001 Kerry, 2000
Discography	Not discussed	Not cited	Not recommended	Carrageel, 2000 (4 articles)
Myelography	Not discussed	Not cited	Not discussed	Not cited
CT	Not discussed	Not cited	<ul style="list-style-type: none"> <li>To confirm occult spinal fracture</li> <li>To detect dissecting aortic aneurysm</li> </ul>	Bigos, 1994
MRI	Not discussed	Not cited	<ul style="list-style-type: none"> <li>To detect dissecting aortic aneurysm</li> </ul>	Bigos, 1994

**Legend:**

Not discussed – no explicit recommendation for the test or treatment relative to the injury

Not cited – no reference articles list for the test or treatment

**Table 9: Testing Recommendations for Chronic/Unremitting Low Back Pain\***

TEST	AAOS		ACOEM	
	Recommendation	Evidence	Recommendation	Evidence
Plain Low Back Films	To obtain a diagnosis at 4-6 weeks if there is no response	Not cited	Not recommended	Bigos, 1994
Discography	Should not be used alone to predict the need for surgical intervention. [...sensitive but not very specific test...psychological barriers ...reduce the predictive value ...even further.]	No Level I or II evidence	Not recommended	Carragee, 2000 (4 articles)
Thermography	Not discussed	Not cited	Not recommended	Bigos, 1994
CT	Not discussed	Not cited	Not discussed	Not cited
MRI	To obtain a diagnosis if no response at 4-6 weeks when additional diagnostic information is required	Ehni, 1969	To distinguish disc herniation from scar tissue associated with prior surgery	Bigos, 1994

\* If this [a diagnosis of spondylolisthesis and evaluation for instability and neurologic deficit] is positive, then an ongoing more sophisticated diagnostic battery of tests including MRI, CT, myelogram CT, bone scan discography... would be appropriate.

**Table 10: Testing Recommendations for Herniated Nucleus Pulposus**

TEST	AAOS		ACOEM	
	Recommendation	Evidence	Recommendation	Evidence
Plain Films	Not discussed	Not cited	Not effective to confirm nerve root compromise	Bigos, 1994
CT	Not discussed	Not cited	Recommended for bony source of compression only	Bigos, 1994
Myelography and CT Myelo	Not discussed	Not cited	Not discussed	Not cited
MRI	To confirm the diagnosis of herniated nucleus pulposus	Not cited	<ul style="list-style-type: none"> <li>To confirm the clinical diagnosis of nerve root, cauda, or cord compromise prior to surgery</li> <li>To distinguish disc herniation from scar tissue associated with prior surgery</li> </ul>	Bigos, 1994

**Medical Treatment Guidelines for Low Back Injury:**

Comparisons Between Actual (Pre-SB228), ACOEM & AAOS-Expected Levels of Medical Testing and Service Utilization

**Table 11: Treatment Recommendations for Acute Low Back Pain**

TREATMENT	AAOS		ACOEM	
	Recommendation	Evidence	Recommendation	Evidence
<b>Passive Modalities</b>	<ul style="list-style-type: none"> <li>Self-applied thermal modalities</li> <li>All forms of non-operative treatment would be available...</li> </ul>	Not cited	<ul style="list-style-type: none"> <li>Self-applied thermal modalities</li> <li>2 visits for teaching and review</li> <li>No evidence of effectiveness for acupuncture, biofeedback, diathermy, inferential therapy, laser, magnet therapy, massage, TENS, PENS, traction</li> </ul>	Bigos, 1994 Furlan, 2002 Ghoname, 1999 Hsieh, 2002 Kovacs, 2002 Jellema, 2001 Urrutia, 2002 van der Heijden, 1995 van Tulder, 1997, 1999, 2000d, 2003
<b>Active Physical Therapy and Self-Administered Exercise</b>	<ul style="list-style-type: none"> <li>An active exercise program is appropriate...[a]ll forms of non-operative treatment would be available ...</li> </ul>	Dettoni, 1995 Faas, 1995 Leclaire, 1996 Malmivaara, 1995 Underwood, 1998	<ul style="list-style-type: none"> <li>2 visits for teaching and review</li> <li>Low level aerobic exercise</li> <li>Stretching, specific low back exercises [All self-administered]</li> </ul>	Bigos, 1994 Hagens, 2000 Hilde, 2002 Linz, 2002 Schonstein, 2003 van Tulder, 1997, 2000 Waddell, 1997 Zigenfus, 2000
<b>Chiropractic Manipulation</b>	Manual therapy	Not cited	<ul style="list-style-type: none"> <li>Up to 4 weeks of chiropractic manipulation.</li> <li>MUA not recommended</li> </ul>	Haldeman, 1993 Cherkin, 1998 Mohseni-Bandpei, 1998 West, 1999
<b>Laminectomy</b>	Not discussed	Not cited	Not recommended	Deyo, 1994
<b>Fusion</b>	Not discussed	Not cited	Not recommended	Deyo, 1994

**Table 12: Recommendations for Herniated Nucleus Pulposus**

TREATMENT	AAOS		ACOEM	
	Recommendation	Evidence	Recommendation	Evidence
<b>Passive Modalities</b>	Not discussed	Not cited	Vax-D not recommended	Gose, 1998
<b>Active Physical Therapy</b>	Exercise programs may be instituted if the pain decreases	Not cited	Not discussed	Not cited
<b>Chiropractic Manipulation</b>	Not discussed	Not cited	Not recommended	Studies cited do not address HNP
<b>Laminectomy</b>	Consider with: <ul style="list-style-type: none"> <li>Proven HNP and nerve root lesion if pain is persistent and severe</li> <li>Pain is increasing in severity</li> <li>Motor, bowel, bladder dysfunction</li> </ul>	Hurme, 1987 Deyo, 1992 Albert, 1996 Komori, 1996 Donceel, 1999	<ul style="list-style-type: none"> <li>Serious spinal pathology or nerve root dysfunction not responsive to conservative therapy (and obviously due to a herniated disk) after one month in absence of red flags *</li> <li>Chemonucleolysis, percutaneous and endoscopic discectomy not recommended</li> </ul>	Boult, 2000 Gibson, 2000 Malter, 1996
<b>Fusion</b>	Not specifically discussed for HNP	Not cited	Not specifically discussed for HNP. Prostheses not recommended.	Fritzell, 2001 Gibson, 2000

\* Increases the need for future surgery; long-term benefits unclear.

**Medical Treatment Guidelines for Low Back Injury:**

Comparisons Between Actual (Pre-SB228), ACOEM & AAOS-Expected Levels of Medical Testing and Service Utilization

<b>Table 13: Recommendations for Chronic/Unremitting Low Back Pain</b>				
<b>TREATMENT</b>	<b>AAOS</b>		<b>ACOEM</b>	
	<b>Recommendation</b>	<b>Evidence</b>	<b>Recommendation</b>	<b>Evidence</b>
<b>Passive Modalities</b>	Not discussed	Not cited	Not recommended	Bigos, 1994 Beurskens, 1997 Cherkin, 2001 Kovacs, 2002 van Tulder, 2000d
<b>Active Physical Therapy and Self-Administered Exercise</b>	Exercise and exercise-based therapy	Manniche, 1991 Hansen, 1993 Alaranta, 1994 Frost, 1995 O'Sullivan, 1997	Exercise programs/back schools including cognitive-behavioral components	Hilde, 2002 Karjalainen., 2001 Guzman, 2001 Schonstein, 2003 van Tulder, 2000c Vendrig, 1999
<b>Chiropractic and Osteopathic Manipulation</b>	Not recommended	Not cited	Not recommended	Bigos, 1994 van Tulder, 2000
<b>Laminectomy</b>	Not recommended	Not cited	Not recommended	Bigos, 1994 Fritzell, 2001
<b>Fusion</b>	Only for painful anatomic lesion, no psychosocial barrier to recovery	Fritzell, 2001	Not recommended	Bigos, 1994 Lee, 1995

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