Striking the Balance: An Analysis of the Cost and Quality of Medical Care in the Texas Workers' Compensation System

A Report to the 77th Texas Legislature

Research and Oversight Council on Workers' Compensation
and Med-FX, LLC.

January 2001

Acknowledgments

The authors would like to thank the Texas Workers' Compensation Commission (TWCC), as well as the insurance carriers and employers who provided the data and staff assistance necessary for the successful completion of this report.

A special thanks goes out to the hundreds of injured workers in Texas and other states who answered the medical care outcomes survey as well as the insurance carriers and utilization review agents (URAs) who participated in surveys and site visits and/or provided information about disability management, fee schedules, medical bill review, case management and utilization management.

The authors would also like to thank the health care providers and employers who answered surveys regarding utilization review, return-to-work and administrative burden issues, as well as the workers' compensation officials in other states who graciously consented to provide information about the structure and effectiveness of their systems' medical cost-control mechanisms.

Finally, the authors would like to thank the following technical reviewers for this report:
Dr. William G. Johnson, Professor of Health Economics, School of Health Administration, Arizona State University
Dr. Gary Franklin, Medical Director, State of Washington Labor and Industries
Dr. Sharon Fox, University of Massachusetts Medical Center
Dr. Glen Pransky, Director, Center for Disability Research, Liberty Mutual Research Center

Research and Oversight Council on Workers' Compensation
9800 North Lamar Blvd. • Suite 260 • Austin, Texas 78753
(512) 469-7811 • Fax: (512) 469-7481 • E-mail: roc@mail.capnet.state.tx.us
Internet: http://www.roc.capnet.state.tx.us

Project Management

Amy Lee of the State of Texas Research and Oversight Council on Workers' Compensation (ROC) served as the Project Manager for this study. D.C. Campbell of the ROC provided valuable analytic and editorial assistance. Scott McAnally, the Executive Director of the ROC, provided guidance and was instrumental in assuring the success of the project. Jerry Hagins edited and formatted the final report for publication.

Authors

Jeffrey S. Harris, M.D., M.P.H., M.B.A., Med-Fx, LLC/University of California at San Francisco School of Medicine/University of Utah School of Medicine

Armand L. Bengle, III, M.B.A., Med-Fx, L.L.C.

Paul K. Makens, Ph.D. Med-Fx, L.L.C.

With expert assistance and support from:

Pamela Beachley, J.D., Austin

William Gaines, Jr., M.D., M.P.H., Scott & White/Texas A&M

Marcy Halterman, D.C., J.D., D.C. Health Center, Bryant/College Station

Steven Minors, D.C., RCRD, Chiropractic Rehabilitation, Austin

John J. Triano, D.C., Ph.D., Texas Back Institute/Kelsey Seybold Clinic/UT Southwestern Medical School/Texas College of Chiropractic

Ken Bence, M.H.A., M.B.A. and the staff of Velocity.net

Table of Contents

List of Tables and Figures

Introduction

In response to rising workers' compensation insurance rates for Texas employers and perceived inadequacies and inequities in benefits for injured workers, the 70th Texas Legislature appointed the Joint Select Committee on Workers' Compensation Insurance in 1987 to conduct an extensive two-year study on problems with the system.[1] Its recommendations formed the basis of the significant legislative and regulatory reforms passed by the 71st Texas Legislature in 1989.

Regarded by most system participants to be a success, the 1989 reforms have resulted in significant improvements in the system, especially in the area of workers' compensation insurance rates.[2] Although touted for their success, many system participants (including employers and injured workers) have expressed concern that the 1989 reforms did not adequately address the cost and quality of medical care provided to injured workers in the system.

Insurance carriers and self-insured employers contend that medical costs are higher in Texas than other states while some injured workers argue that too many barriers exist in the current system, preventing them from receiving quality medical care.

Recent research supports these medical cost and quality of care assertions.[3] According to the National Council on Compensation Insurance (NCCI), policy year 1995 data show that average medical cost per claim in Texas exceeds the national average by almost 80 percent ($4,912 in Texas compared to $2,735 nationwide). Another recent report by the Workers' Compensation Research Institute (WCRI) noted that "the average medical payment – paid and incurred – per claim with more than seven days' lost-time in Texas was the highest of the [eight] states in [the] analysis. In claims from [injury year] 1996, the average medical payment per claim was $6,495, 35 percent higher than the average state." A second report by WCRI compared medical costs in seven geographic areas in Texas, demonstrating that the average medical costs per claim differed by as much as 50 percent between low cost areas (Austin/San Marcos) and high cost areas (El Paso).

---

[1] See Joint Select Committee on Workers' Compensation Insurance, *A Report to the 71st Texas Legislature* (Summary). Research Papers of the Joint Select Committee on Workers' Compensation Insurance, December 1988.

[2] In 1992, Texas changed the way it sets workers' compensation insurance rates to a file-and-use system where each insurance carrier is responsible for filing rates based on its own individual loss experience. Additionally, the Texas Workers' Compensation Fund was created in 1992 to increase competition in the voluntary market and serve as the insurer of last resort. Rates have steadily declined since 1991 to more than 30 percent below the 1991 workers' compensation benchmark rate. See Research and Oversight Council on Workers' Compensation, *An Examination of the Strengths and Weaknesses of the Texas Workers' Compensation System*, August 1998.

[3] See National Council on Compensation Insurance, *Annual Statistical Bulletin*, 1999; Fox, Sharon, et al, *Benchmarking the Performance of Workers' Compensation Systems: Compscope Multistate Comparisons*, Workers' Compensation Research Institute, July 2000; Gotz, Glenn A., et al, *Area Variations in Texas: Benefit Payments and Claim Expenses*, Workers' Compensation Research Institute (May 2000); and Research and Oversight Council on Workers' Compensation, *An Examination of the Strengths and Weaknesses of the Texas Workers' Compensation System*, August 1998.

Previous research also explored the reasons for workers' compensation medical cost differences. One study, comparing workers' compensation and general medical care costs in Minnesota in the early 1990s, demonstrated that the cost of workers' compensation medical care for soft tissue disorders like low back pain was about twice that paid in group health, while the differential was only 20 percent for more objective types of injuries such as fractures.[4] These cost differences were attributed primarily to the amount of medical care provided to injured workers under the workers' compensation system rather than price of individual treatments.

Another WCRI study comparing network and non-network workers' compensation medical costs in Texas, Connecticut, and California found that network medical costs for injured workers with back injuries were about 60 percent lower in Texas than non-network cases, compared to the three-state average of 40 percent.[5] Of that 60 percent in savings, 10 percent was due to lower prices, 58 percent was due to the use of fewer services, and 32 percent was due to the mix of health care providers involved.

A fair question is whether higher medical costs result in higher quality medical care. In a 1998 survey of Texas injured workers by the Research and Oversight Council on Workers' Compensation (ROC), 79 percent of respondents said that their health care provider gave them "adequate medical care that met their needs," yet almost half (46 percent) reported that they had difficulty securing some of those treatments.

These concerns led to the passage of HB 3697 by the 76th Texas Legislature in 1999. This legislation required the ROC, in conjunction with the Texas Workers' Compensation Insurance Fund, to conduct a series of studies examining the cost and quality of medical care in the Texas workers' compensation system and report its findings to the 77th Texas Legislature by February 1, 2001.

There are three main goals to the HB 3697 studies:

---

[4] Injuries such as fractures and lacerations are typically referred to as "objective" injuries since there is little discretion in the medical treatment protocols used by health care providers for these injuries. See *Industrial Strength Medicine: A Comparison of Workers' Compensation and Blue Cross Health Care in Minnesota: A Background Report for the Minnesota Legislature*, Minnesota Department of Labor and Industry, 1990. Other studies examining these issues include: Johnson, William, et al*, The Excess Costs of Health Care for Work-Related Injuries*, 1994; Durbin, David, et al, *Workers' Compensation Medical Expenditures: Price vs. Quantity: Implications for a Medical Price Index*, 1993; and Roberts, Karen and Susan Zonia, "Workers' Compensation Cost Containment and Health Care Provider Income Maintenance Strategies," *The Journal of Risk and Insurance*, 1994.

[5] Workers' compensation networks are organizations that contract with insurance carriers to provide discounted medical services, similar to a traditional PPO network arrangement. Some workers in Texas, and more workers in California and Connecticut, receive medical treatment from health care providers who participate both in and outside of networks. In Texas, injured workers have the right to select their initial treating doctor. In California, employers have the ability to direct injured workers to their own doctor for a limited period of time (30 days), while in Connecticut, the employer can direct injured workers to their own doctor for the duration of the worker's medical treatment if the employer contracts with a network provider certified by the state. See Johnson, William, Majorie Baldwin, and Stephen Marcus, *The Impact of Workers' Compensation Networks on Medical Costs and Disability Payments*, Workers' Compensation Research Institute, 1999.

- to investigate the quality and cost-effectiveness of the current workers' compensation health care delivery system, as compared to other health care delivery systems used in Texas and workers' compensation health care delivery systems used in other states;

- to examine workers' compensation medical provider treatment patterns and insurance carrier utilization review practices; and

- to analyze methods to improve worker safety and facilitate an injured worker's ability to return to productive employment following an injury.

This report addresses the first two legislative goals. Two other reports from the ROC, entitled *Returning to Work: An Examination of Existing Disability Duration Guidelines and Their Application in the Texas Workers' Compensation System* and *Recommendations for Improvements in Safety and Return-to-Work Programs* address the third legislative goal.

Data Sources, Methods, and Considerations

This section of the report describes the data sources and research methodology used to complete this study, including the methods used to select state workers' compensation systems for comparison, the methods used to compare similar types of medical conditions and treatments, and survey methods. A more detailed description of each of these data sources and methods can be found in a separate Technical Appendix.

Data Sources. A variety of data sources were utilized in this study, including:

- Medical, claim, and income benefit data from the Texas Workers' Compensation Commission (TWCC);
- Medical, claim, and income benefit data from a large national insurance carrier with significant market share in Texas and other states;
- Medical data from a national workers' compensation data clearinghouse, representing four workers' compensation insurance carriers;
- Medical data from a large group health insurance carrier in Texas covering state employees (data from the Preferred Provider Organization, or PPO, plan);
- Medical and claim data from four large employers with business operations in Texas and other states;
- Outcomes survey data from a random, stratified sample of injured workers in Texas and other states;
- Survey data from employers, health care providers, insurance carriers, and utilization review agents (URAs) on medical treatment and review practices as well as administrative burdens in the Texas workers' compensation system; and
- A sample of existing treatment guidelines developed by medical associations and private entities for commercial use by insurance carriers.

Other Data Adjustment Issues

In order to accurately estimate an injured worker's time off work, each state's income benefit waiting periods and retroactive benefit provisions were adjusted to be consistent with those in Texas (seven day waiting period and four week retroactive period).[6] In addition, lump-sum income and medical benefit payments were excluded from the analysis.

To ensure comparability of statistics across years, analyses were conducted using cut-off points of 6, 12, and 18 months post date-of-injury.

Adjustments were not made to align other state workers' compensation fees to the Maximum Allowable Reimbursement (MAR) levels used in Texas for individual medical treatments. Closer examination highlighted that almost all (roughly 97.5 percent) of the medical bill transactions in other states that corresponded to the treatments with MAR values in Texas were paid below the fee schedule used by Texas. This included New Jersey, which is unregulated and has no fee schedule. The effect of adjusting other state medical fees to the Texas fee schedule would have increased the already large differences between Texas and the other states, but would have no impact on findings, discussions, or conclusions.

Methods for Selecting States. States selected for the multi-state medical cost comparisons were chosen because they:

- have a population size similar to Texas;
- offered insights into innovative and potentially useful medical and disability management methods;[7]
- allow either employer or employee initial choice of doctor;
- have a similar mix of industries to Texas; or
- have available and reliable workers' compensation data.

As a result, eight states (California, Florida, New Jersey, Oregon, Minnesota, Kentucky, Georgia, and Colorado) were selected for comparison with Texas. See Table 1 for a description of the workers' compensation systems in these comparison states.

Methods for Comparing the Cost and Amount of Medical Care. To ensure "apples to apples" comparisons of injuries, similar medical diagnoses were grouped together into diagnostic "buckets" (e.g., one diagnostic bucket covers several similar diagnoses for simple low back pain).[8] In the same fashion, similar types of medical treatments were

[6] In Texas, workers are eligible to receive income benefits if they have been off work or underemployed for at least seven days (this is called the waiting period). An injured worker must be off work or underemployed for four weeks before he or she can receive income benefits for the first seven days of lost time (known as the retroactive period). See Section 408.082, *Texas Labor Code*.

[7] Several states -- notably Colorado, Florida, Minnesota, and Oregon -- were included based on their reputation for innovative medical and disability management practices.

[8] A total of 800 individual ICD9 diagnostic codes, representing 85 percent of total medical payments were grouped into110 diagnostic "super groups."

also grouped into resource buckets (e.g., one category -- office visits -- covers several different medical procedure codes for office visits). These types of groupings are often found in national and state treatment guidelines and allow for more accurate comparisons, since injuries of the same severity are typically grouped together. Similar treatment patterns exist for the groupings of diagnoses used. See Appendix C for a listing of the diagnostic and resource grouping scheme utilized for this study.

In addition to comparisons with other state workers' compensation systems and other health care delivery systems, this report also compares the amount of medical treatment provided to Texas injured workers with national treatment guideline recommendations. A list of the treatment guidelines used for this analysis can be found in Appendix A.

Unless otherwise indicated, the key findings highlighted in this report focus on workers injured in 1997, including all the medical payments made on behalf of those injuries through the end of 1999. Injury year 1997 was chosen for this analysis since most of these workers have reached statutory maximum medical improvement (MMI) in Texas (i.e., 104 weeks from the date the worker began to accrue income benefits).[9] This timeframe after the injury allows for a more complete examination of a worker's medical treatment and return-to-work history.

See Appendix A for a list of references used in this study and Appendix B for a glossary of workers' compensation and medical terms.

[9] See Section 401.011, *Texas Labor Code*.

Table 1
Description of Workers' Compensation Medical System Features, Texas and Comparison States

State	*Initial Choice of Medical Provider*	*Authorize Managed Care Organizations (MCOs) for WC*	*Employment Size/Industry Mix Similar to Texas*	*Comments on System Features*
California	Employer	Authorized	X	Uses treatment guidelines and relative value fee guideline developed for CA.
Colorado	Employer	Authorized		Has doctor certification process; Has certain medical service limits; Uses RVP as basis for fee guideline; Uses peer review group to help agency resolve some medical disputes.
Florida	Employee	Authorized	X	Mandated MCOs for employers; Uses RBRVS as basis for fee guideline.
Georgia	Employee	Authorized		Has certain medical service limits; Uses UCRP as basis for fee guideline; Uses peer review group to help agency resolve some medical disputes.
Kentucky	Employee	Authorized		Medical disputes must be litigated; Uses relative value scale fee guideline developed for KY.
Minnesota	Employee	Authorized		Early adopter of treatment guidelines; Uses RBRVS as basis for fee guideline.
New Jersey	Employer	Authorized	X	Medical disputes must be litigated.
Oregon	Employee	Authorized		Currently pioneering MCO program; Uses RBRVS as basis for fee guideline.*
Texas	**Employee**	**Not Authorized**		**Uses treatment guidelines; Uses MCGraw-Hill RVP and UCRP for basis of fee guideline; Requires pre-authorization of some medical services; Resolves medical disputes administratively.**

Source: Tanabe, Ramona, *Managed Care and Medical Cost Containment in Workers' Compensation: A National Inventory, 1998-1999*, Workers' Compensation Research Institute, 1998; and Med-FX, LLC and the Research and Oversight Council on Workers' Compensation, 2000.

Notes: While many states permit the use of MCOs, MCOs are not necessarily utilized in all of these states. "RBRVS" – Medicare's Resource-Based Relative Value Scale (Medicare's fee guideline); "RVP" – *Relative Value for Physicians* (July 1997) published by St. Anthony's Press; "McGraw-Hill RVP" – *McGraw-Hill Relative Value for Physicians*; "UCRP" – Usual, customary, reasonable, and prevailing charges by health care providers.
* In Oregon, a chiropractor may be a treating doctor for the lesser of 30 days or 12 visits on an initial claim. A chiropractor may be referred by a treating doctor if the worker was previously treated by a chiropractor.

Methods for Examining Factors Associated with Claim Duration, Medical Care Duration, Disability Duration, and Total Medical Costs. A series of regression analyses were conducted on each of the top ten diagnostic groups to determine the factors that impact overall claim duration, temporary disability duration (a proxy for amount of time off

work), overall medical care duration, and total medical costs.[10] Factors examined in each of these analyses included:

- whether the worker had surgery;
- whether worker received Supplemental Income Benefits (SIBs);
- whether there was a reduction in charges for a claim due to a medical necessity review;
- whether there was a reduction in charges for a claim due to bill review;
- the worker's average weekly wage rate;
- whether the worker received any physical medicine treatments in the first 8 weeks after the injury and up to 78 weeks;
- the difference in days between the date of injury and the first date of medical care;
- the number of unique diagnoses assigned to a worker; and
- the number of health care providers who treated the worker.

Survey Sampling and Construction Methods

Injured Worker Survey. The injured worker survey sample was extracted from two data sources: the TWCC database, using lost-time claims incurred in Texas for injury years 1997 and 1998, and the comparable claims databases for three large multi-state employers with significant operations in and out of Texas.

A stratified random sample of 3,772 potential respondents was drawn from the TWCC data and the multi-state employer data sources. The sample was restricted to the comparison states (mostly California and Florida) and Texas. Claims with incomplete contact information (e.g., names, addresses, and phone numbers) were excluded from the sample. Samples were drawn from the following diagnostic groups: neck soft tissue injuries, low back soft tissue injuries, shoulder soft tissue injuries, hand and wrist soft tissue injuries, and hand and wrist superficial trauma injuries (e.g., cuts, contusions, etc.).

The survey instruments were developed using benchmark questions from other survey studies and input from Texas system participant groups. The survey encompassed four areas: satisfaction with medical care; functional status (i.e., whether the worker got better after the injury); economic burden; and return-to-work issues. Both English and Spanish versions of the survey were mailed to every potential respondent along with a cover letter explaining the survey's purpose and importance. Telephone surveys were used to supplement the responses from the mail survey.

Responses regarding an injured worker's functional status were measured using the Short Form-12 (SF-12) Health Survey originally developed by Dr. John Ware, the Medical

[10] A regression analysis is a statistical technique used to isolate the effect of certain factors (such as the number of health care providers who treated the injured worker) on the outcome of a particular variable (such as the duration of medical care provided to the injured worker). It can be used to not only identify whether a relationship exists between the individual factor and the outcome variable, but also the magnitude of the relationship and the expected outcome of the relationship (e.g., the duration of medical care may be expected to increase or decrease as a result of having more health care providers treat the worker).

Outcomes Trust and the RAND Corporation. Qmetric, Inc., the current distributor of this instrument, provided normative data and scored the returned surveys.

A total of 974 injured workers from Texas and 95 injured workers from other states completed the survey. The overall response rate was approximately 40 percent. The response rate within Texas was approximately 50 percent. An analysis of non-respondents showed a statistically significant difference in the response rates of younger female injured workers (i.e., more younger females answered the survey) for both Texas and other states. These differences were deemed to be clinically insignificant for this multistate comparison since a relatively equal proportion of female respondents answered the survey in Texas and other states.

The response rate for out-of-state injured workers (less than 20 percent) was lower than expected. The sample size was adequate, however, to draw comparisons between Texas workers and those of other states as a group, but not to other individual states. It was somewhat difficult to obtain injured worker contact information from other states. As a result, Med-Fx, LLC. and ROC staff believe that future multistate survey efforts like this are better done at a national level. Section III of this report highlights key injured worker survey findings that reflect statistically significant differences between Texas and other states.

Surveys and Interviews with Health Care Providers, Employers, Insurance Carriers, and Utilization Review Agents (URAs). In order to further understand the process used by insurance carriers and URAs to review the medical necessity of proposed treatments and pay medical bills, Med-Fx staff conducted on-site visits and interviews with 20 insurance carriers and utilization review agents (URAs). These 20 carriers and URAs process the majority (approximately 70 percent) of workers' compensation claims in Texas.

Additional surveys and interviews were also conducted with a variety of Texas employers, health care providers, and other state workers' compensation administrators. These surveys focused on identifying administrative burdens in the Texas system as well as highlighting these system participants' previous experiences with utilization review and disability management practices in Texas and other states.

Data/Method Considerations. Each research analysis contains its own cautions and considerations. Although the database collected by TWCC is useful for calculating the cost and amount of medical treatment injured workers receive, it does not contain important information on:

- who the injured worker's treating doctor is;[11]
- whether the injured worker returned to work after the injury;
- injured worker satisfaction with the medical care received;

[11] Treating doctor information is collected by TWCC for use in customer service and dispute resolution, but it is not captured in a way that allows for the systematic identification of medical bills submitted by treating doctors.

- signs, symptoms, and results from diagnostic tests that can be used to validate medical diagnoses; or
- the cost of pharmaceutical drugs.

Similarly, insurance carrier data also does not contain important information on the injured worker's treating doctor, satisfaction with care, return-to-work outcomes or the results of medical history, physical findings and diagnostic tests. It does, however, capture pharmaceutical cost, dose, and quantity information. For this reason, multi-state medical cost comparisons were made using the more complete insurance carrier data.

Additionally, TWCC and insurance carrier data regarding the site of the medical treatment (e.g., inpatient hospital, outpatient medical clinic, etc.) was deemed deficient in many cases or missing. One example of this was the existence of hospital fees in the data for which no corresponding surgical professional fees could be found. For this reason, analyses regarding the frequency and cost of in-patient versus outpatient medical services could not be reasonably completed.

Although the diagnostic groupings created for this study take into account medical conditions with the same level of severity, there may be some severity variations within each diagnostic group that cannot be controlled for statistically. These severity considerations exist in every medical analysis since there is no accepted method to control for injury severity in many medical conditions, and variation cannot be resolved without case-level audits of individual injured workers. It is also important to note that due to missing data, the study does not control for differences in injured worker occupations across states. However, the analyses presented here are by medical diagnostic group (i.e., neck soft tissue injuries in Texas vs. neck soft tissue injuries in Florida) which assumes that the medical treatment for a particular type of injury should be consistent regardless of the injured worker's occupation. System participants interviewed for this study supported this study assumption as well as the assumption that Texas injuries are not more severe than similar types of injuries in other states. Lastly, another important difference between Texas and other states that is not controlled for is the ability of a Texas employer to opt out of the workers' compensation system.[12]

It was somewhat difficult to obtain written survey responses from Texas employers and health care providers regarding their experiences with administrative burdens and utilization review/disability management practices in the current Texas workers' compensation system. The employer survey response rate, after invitation and agreement to participate, was less than 30 percent. The survey response rate for health care providers was less than 50 percent. Insurance carriers and utilization review agents

[12] According to the latest estimates (1996), 39 percent of Texas employers and 20 percent of Texas employees are not covered by workers' compensation insurance. See Research and Oversight Council on Workers' Compensation, *Annual Nonsubscription Survey: 1996 Estimates*, 1996. Previous research found that, controlling for differences in industry assignment of subscribers and nonsubscribers along with industry differences in injury rates, there was no statistically significant difference between the average reported lost-time injury rate among nonsubscribers and subscribers. See Texas Workers' Compensation Research Center, *A Study of Nonsubscription to the Texas Workers' Compensation System: the Employee Perspective*, 1994.

(URAs) were generally more responsive to the surveys (44 percent of URAs and 78 percent of the top 20 insurers responded).

Lastly, for purposes of this report, the term "injury" is used to mean all health-related problems and complaints, and is inclusive of occupational illnesses. This usage is consistent with most workers' compensation literature, statutory language in Texas, and most importantly, common practice.

Overview of the Texas Workers' Compensation System

The Texas workers' compensation system is designed as a "fee for service" system that allows health care providers to submit bills and receive payment for each service they deliver to injured workers without the use of pre-paid case rates, co-payments, deductibles, or co-insurance arrangements.[13]

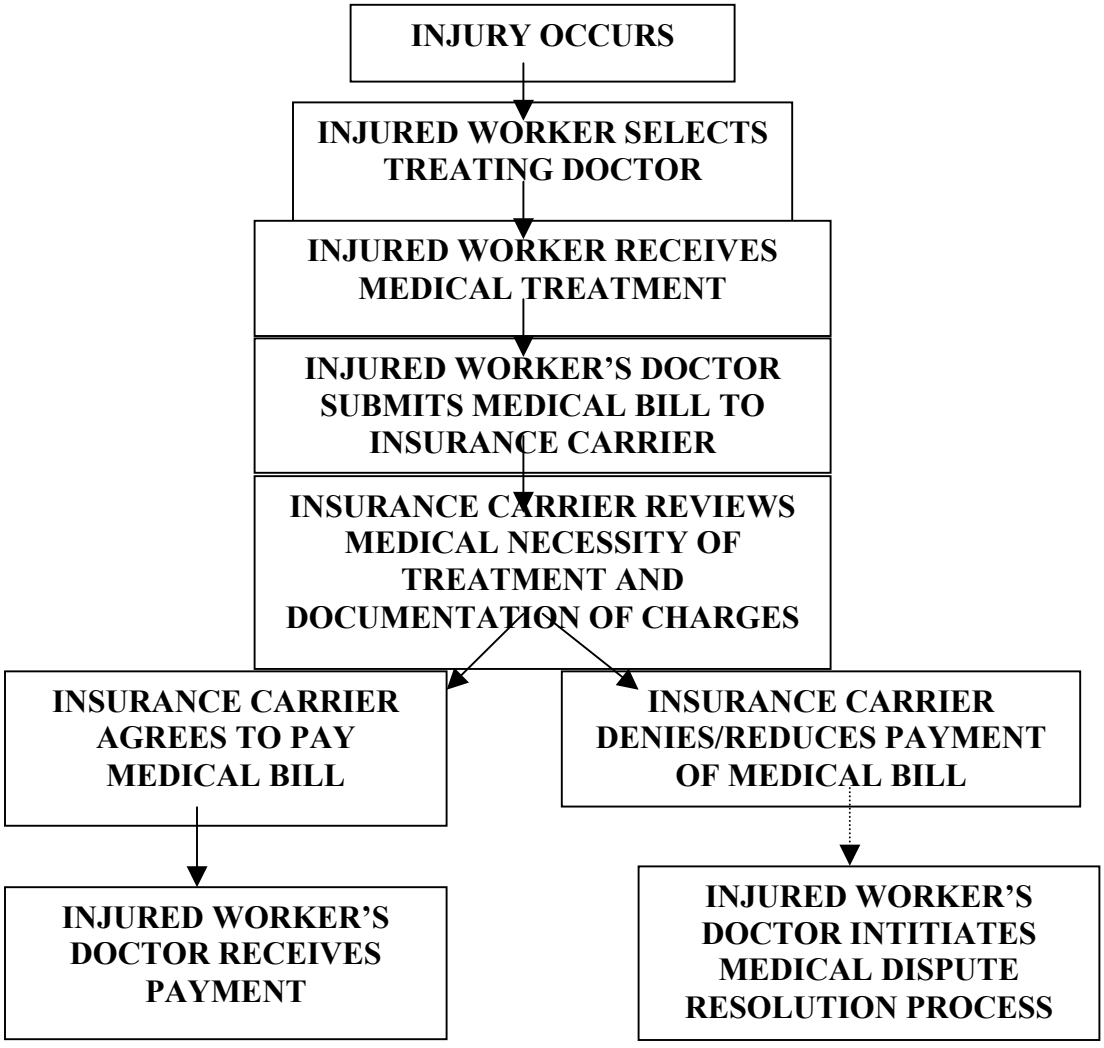
Injured workers in Texas have the ability to select their own initial treating doctor. In turn, the treating doctor provides medical care to the injured worker and submits those bills to the employer's insurance carrier for payment. The insurance carrier -- either internally or through the use of a utilization review agent (URA) -- has the ability to review the medical necessity of treatments provided to injured workers and pays medical bills in accordance with the fee guideline established by the Texas Workers' Compensation Commission (TWCC) (See Figure 1 for an illustration of this process).[14]

Disputes over medical payments or the medical necessity of treatments are handled administratively through TWCC (See Figure 2 for an illustration of the medical dispute resolution process).

[13] A pre-paid case rate refers to one reimbursement amount pre-paid to health care providers for each employee covered under a group health insurance plan regardless of whether the employee uses the medical services.

[14] There are certain treatments and services that require pre-authorization from an insurance carrier before they may be administered to an injured worker. See TWCC Rule 134.600.

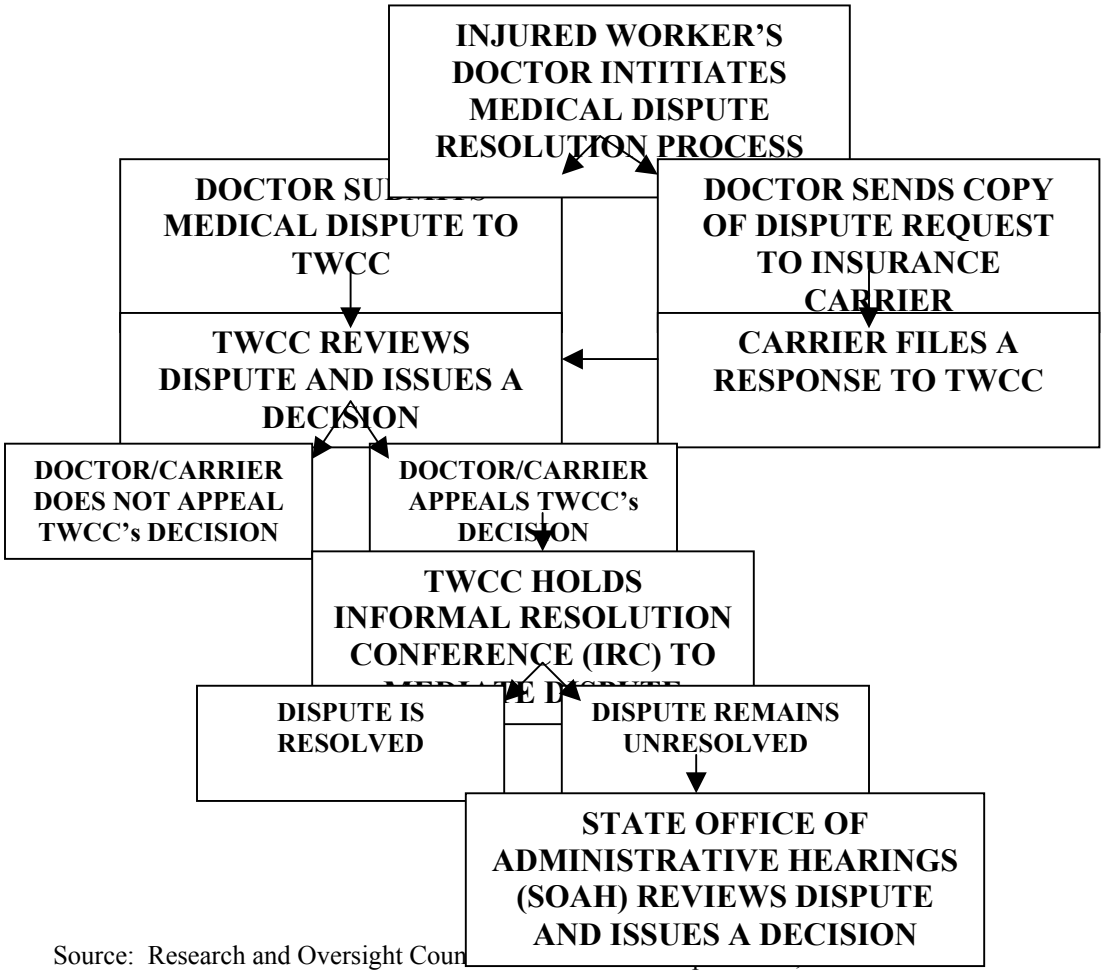
Figure 1
Overview of the Texas Workers' Compensation Medical Treatment and Payment Process[15]



Source: Research and Oversight Council on Workers' Compensation, 2001.

[15] This schematic excludes medical services that require pre-approval from the insurance carrier and spinal surgeries that require a second opinion.

Figure 2
Overview of the Texas Workers' Compensation
Medical Dispute Resolution Process



Source: Research and Oversight Coun

SECTION I: MEDICAL COST TRENDS IN THE TEXAS WORKERS' COMPENSATION SYSTEM

This section of the report highlights medical cost trends in Texas, as well as comparisons with other state workers' compensation systems and a group health care system in Texas. Section II of this report examines the factors driving medical costs in the Texas workers' compensation system.

Medical Cost Trends in Texas

Total workers' compensation medical payments (six months post-injury) rose approximately 15 percent in Texas from injury year 1996 to 1998.[16] This increase is primarily due to an increase in the number of workers' compensation claims filed for these years (including a 14 percent increase in the number of non-reportable, medical-only claims from injury year 1997 to 1998) (see Table 2).[17] Although the non-fatal occupational injury rate has declined in Texas since 1991 (meaning that Texas workers have sustained fewer on-the-job injuries), the total number of workers in Texas has increased over time as a result of the state's robust economy.[18]

Table 2
Distribution of Total Medical Payments in the Texas Workers' Compensation System at 6, 12, and 18 Months Post-Injury

Injury Year	*6 Months Post-Injury*	*12 Months Post-Injury*	*18 Months Post-Injury*
1996	$468,584,385	$629,698,846	$716,664,074
1997	$541,397,920	$694,872,482	$791,235,454
1998	$538,857,950	N/A	N/A

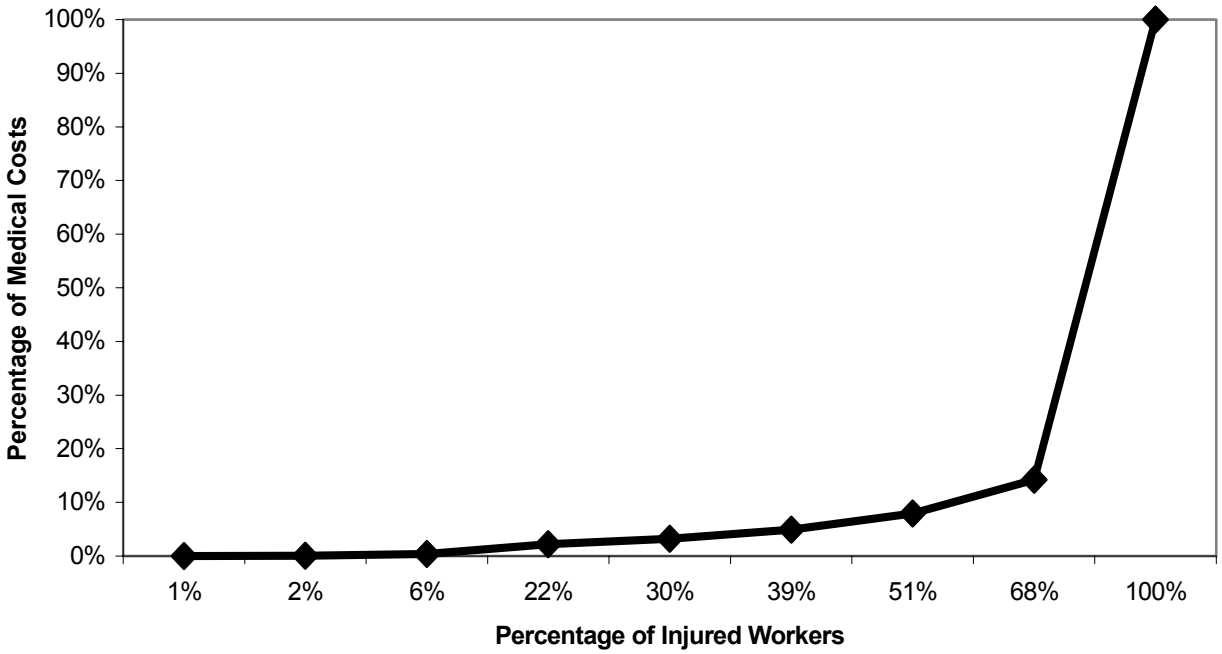
Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on data as of November 1999 from the Texas Workers' Compensation Commission.

A relatively few claims account for the majority of medical costs in the Texas workers' compensation system. As Figure 3 indicates, 20 percent of all workers' compensation claims account for over 80 percent of the medical costs in Texas.

Figure 3
Distribution of Texas Workers' Compensation Medical Costs

[16] Total medical payments listed in this table exclude pharmaceutical costs.
[17] Medical-only claims are those claims in which the injured worker has not lost at least seven days from work. In Texas, an injury is required to be reported if the worker misses at least one day due to an on-the-job injury. See Section 409.005, *Texas Labor Code*.
[18] See Texas Workers' Compensation Commission and U.S. Department of Labor: Bureau of Labor Statistics, *Annual Survey of Occupational Injuries and Illnesses*, 1999.

by Proportion of Claims, Injury Year 1998



Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on data as of November 1999 from the Texas Workers' Compensation Commission.

Texas Medical Costs by Type of Injury

While total medical payments have increased over time in Texas, the distribution of those payments by injury type has remained fairly stable (see Table 3). As Table 3 indicates, low back soft tissue injuries (more commonly known as simple low back sprains and strains) are the most frequent types of injuries in Texas.[19]

[19] As in Texas, low back soft tissue injuries are also the most frequent type of injury in other state workers' compensation systems across the country.

Table 3
Distribution of Total Medical Payments in the Texas Workers' Compensation System For the Most Frequent Types of Injuries, 6 Months Post-Injury

Diagnostic Group	*Injury Year 1996*	*Injury Year 1997*	*Injury Year 1998*
Low Back Soft Tissue Injuries	16.9%	16.6%	17.5%
Shoulder Soft Tissue Injuries	5.9%	6.7%	7.0%
Neck Soft Tissue Injuries	5.3%	5.4%	6.1%
Hand & Wrist Soft Tissue Injuries	2.9%	3.3%	3.4%
Knee Internal Derangement	3.9%	3.9%	3.8%
Hand & Wrist Superficial Trauma	3.3%	4.1%	4.1%
Musculoskeletal – Multiple Body Parts (MBP) Soft Tissue Injuries	3.4%	3.1%	3.2%
Low Back Nerve Compression	2.0%	2.0%	2.4%
Ankle & Foot Soft Tissue Complaints	2.1%	2.3%	2.4%
Hand & Wrist Nerve Compression	2.3%	2.3%	2.4%

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on data as of November 1999 from the Texas Workers' Compensation Commission.

Together, these top ten injury categories account for approximately half of the total medical payments in Texas for each of the injury years examined in this report. Two of these categories, low back soft tissue and hand and wrist soft tissue injuries, are often misdiagnosed as low back nerve compression (e.g., herniated discs) and hand and wrist nerve compression (e.g., carpal tunnel syndrome) injuries, respectively.

Texas Medical Costs by Type of Medical Treatment

Similarly, a relatively few medical treatments and services account for the majority of workers' compensation medical costs in Texas. Five medical treatment areas account for the majority (approximately 91 percent) of total payments made in the Texas workers' compensation system:

- Hospitalization/surgery (48 percent);
- Physical medicine (e.g., manipulations, therapeutic exercises, hot and cold packs, etc.) (21 percent);
- Office visits (with primary and referral health care providers) (11 percent);
- Diagnostic testing (e.g., MRIs, CT scans, plain x-rays, electrophysiology testing) (8 percent); and
- Pharmaceutical drugs (3.5 percent).

Texas Medical Costs by Type of Health Care Provider

As total medical payments have increased over time in Texas, so has the market share of specific health care provider groups. From injury year 1996 to 1998, physical therapists and chiropractors have seen increases in their medical payment market share, while institutional providers (e.g., hospitals) have experienced a significant decline (see Table 4). The market share for osteopaths and medical doctors (M.D.s) has remained fairly stable over time. Interviews with insurance carrier utilization review agents (URAs) support these findings (see Section V of the report for more detailed responses from these interviews).

Table 4
Distribution of Texas Workers' Compensation Medical Payments by Type of Health Care Provider, 6 Months Post-Injury

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Health Care Provider Type	*Injury Year 1996*	*Injury Year 1997*	*Injury Year 1998*
Doctor of Medicine	34.6%	35.1%	34.2%
Doctor of Chiropractic	9.0%	9.3%	12.4%
Doctor of Osteopathy	2.7%	3.1%	3.4%
Doctor of Podiatric Medicine	0.1%	0.1%	0.1%
Licensed Physical Therapist	9.8%	10.6%	12.0%
Licensed Occupational Therapist	1.5%	1.6%	1.6%
Certified Registered Nurse Anesthetist	0.1%	0.1%	0.1%
Institutional Providers (Hospitals)	37.9%	36.2%	31.3%
Other Providers	4.0%	3.7%	4.7%
Invalid Codes	0.3%	0.3%	0.3%

Note: Based on data as of November 1999 from the Texas Workers' Compensation Commission. "Other Providers" include psychiatrists and dentists, among others. "Invalid Codes" indicates that payments were made to health care providers not specified.

Despite the trends toward higher costs in Texas workers' compensation medical claims, only a few health care providers account for the majority of medical costs in Texas. These providers also treat the majority of injured workers in Texas. Approximately 4.5 percent (approximately 2,500 health care providers) account for 70 percent of professional service (i.e., non-hospital) medical costs, while 7 percent (approx. 4,000 health care providers) account for 80 percent of professional service medical costs.

When analyzed further, it appears that an even smaller number of doctors (about 2,200 M.D.s, chiropractors, and osteopaths) can be characterized as "high dollar/high volume" doctors because they treat most of the expensive workers' compensation claims in the state. These 2,200 doctors comprise roughly 5 percent of the approximately 40,000 doctors who submit workers' compensation medical bills in Texas for any given year (see

Table 5).[20] It is important to note that the characterization of "high dollar/high volume" does not necessarily mean that these doctors over-treat. Some of these doctors may be surgeons whose treatments cost more than those of non-surgeons. However, without an individual-level audit, it is difficult to determine whether any of these doctors' practice patterns fall outside of "best practices" benchmarks.

Table 5
Distribution of Texas Workers' Compensation Doctors
by Patient Volume and Total Medical Costs

	Low Dollar	High Dollar	Total
Low Volume	36,903	1,613	38,516
High Volume	1,813	2,198	4,011
Total	38,716	3,811	42,527

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on data as of November 1999 from the Texas Workers' Compensation Commission. "High Volume" doctors saw at least 25 patients in one year. "High Dollar" doctors treated the patients who were among the 20 percent most costly workers' compensation claims.

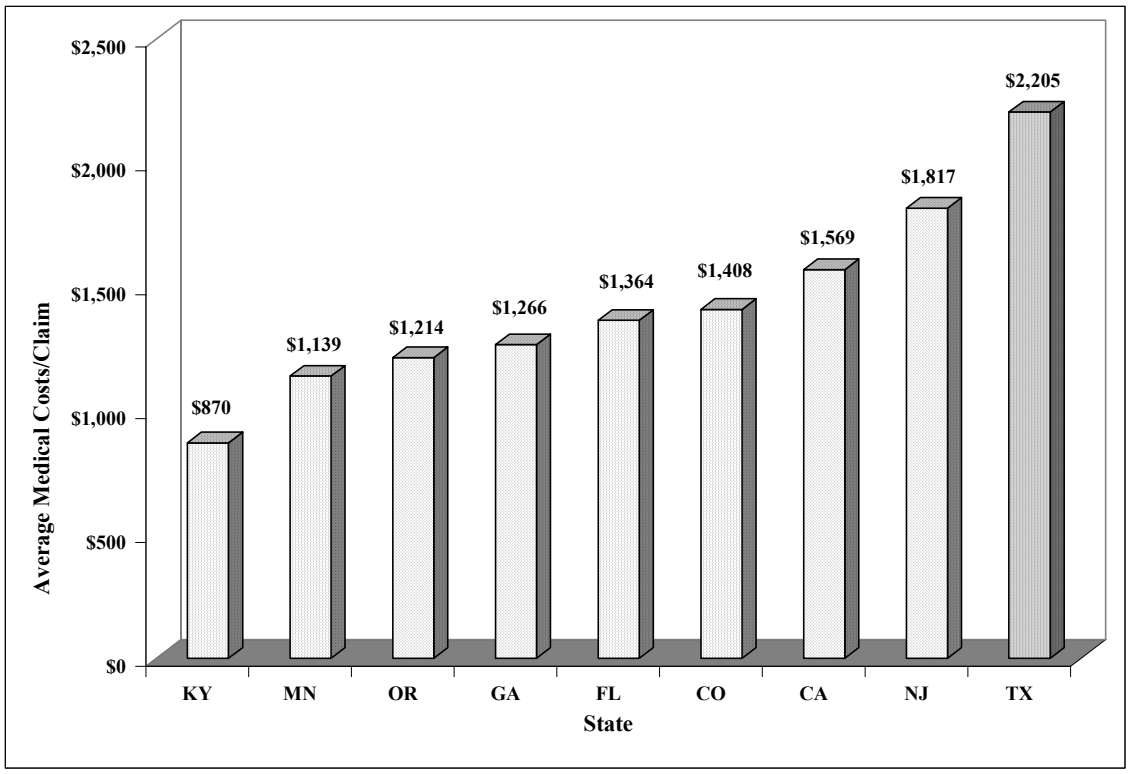
As indicated in Table 5, the majority of doctors treating injured workers in Texas can be classified as "low dollar/low volume" providers.

Comparison of Medical Cost Trends in Texas and Other State WC Systems

In addition to rising medical cost trends in Texas, workers' compensation medical costs are significantly higher in Texas than in other state workers' compensation systems. As Figure 4 illustrates, out of the nine state workers' compensation systems compared in this analysis, Texas has the highest average medical costs per claim (more than 20 percent higher than the second-highest state – New Jersey – and over 2.5 times higher than the lowest-cost state – Kentucky).

Figure 4
Average Workers' Compensation Medical Costs Per Claim,
Texas and Other States, Injury Year 1997, One-Year Post-Injury

[20] Information regarding these doctors' individual medical specialties and whether they are Texas-licensed was not available for analysis.

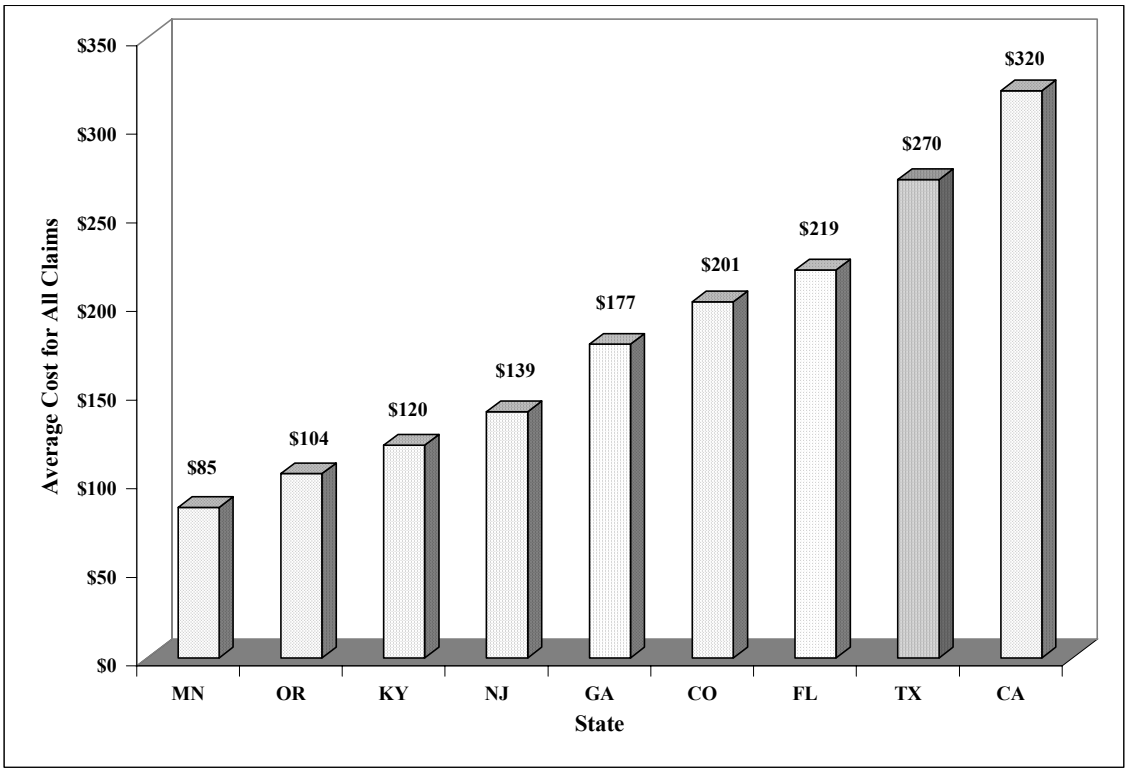


Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on data as of December 1999 from a large multi-state insurance carrier.

Compared with this same group of state systems, Texas also has the second highest average pharmaceutical cost per claim (more than 23 percent higher than the third-highest state – Florida – and more than 2.2 times higher than the lowest cost state – Minnesota) (see Figure 5).

Figure 5
Average Workers' Compensation Pharmaceutical Costs Per Claim, Texas and Other States, Injury Year 1997, One-Year Post-Injury

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.



Note: Based on an analysis of multi-state insurance carrier data, for injury year 1997.

When similar types of injuries were compared in Texas and other states, Texas also had the highest average medical costs for eight of the top ten types of injuries (see Table 6).

Table 6
Comparison of Texas and Other State Workers' Compensation Average Medical Costs Per Claim, 1997 Injuries, One-Year Post-Injury

Type of Injury	CA	CO	FL	GA	KY	MN	NJ	OR	TX
Low Back Soft Tissue Injuries	$2,623	$1,846	$1,919	$1,526	$1,250	$1,512	$2,267	$1,979	**$4,758**
Shoulder Soft Tissue Injuries	$3,213	$2,583	$1,957	$2,007	$1,404	$2,422	$2,578	$2,253	**$3,972**
Neck Soft Tissue Injuries	$3,341	$2,032	$2,022	$2,652	$1,275	$1,728	$3,014	$1,987	**$5,361**
Hand & Wrist Soft Tissue Injuries	$1,758	$1,329	$926	$950	$665	$849	$1,372	$1,103	**$2,213**
Knee Internal Derangement Injuries	$3,367	$2,585	$3,017	$2,528	$1,980	$1,968	**$4,234**	$2,771	$4,183
Hand & Wrist Superficial Trauma Injuries	$668	$552	$568	$465	$416	$481	**$791**	$410	$696
Multiple Body Parts Soft Tissue Injuries	$2,071	$1,982	$1,365	$1,469	$671	$1,144	$1,558	$1,280	**$2,478**
Low Back Nerve Compression Injuries	$5,531	$5,217	$8,275	$5,365	$2,951	$3,167	$9,398	$6,023	**$11,196**
Ankle & Foot Soft Tissue Injuries	$1,528	$1,191	$984	$783	$685	$799	$1,015	$1,104	**$1,651**
Hand & Wrist Nerve Compression Injuries	$5,661	$1,999	$2,827	$3,229	$1,577	$2,737	$4,626	$2,975	**$6,356**

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on data as of December 1999 from a large multi-state insurance carrier.

Comparison of Medical Cost Trends in Texas WC and Group Health Systems

Employers and insurance carriers have often asserted that workers' compensation medical costs exceed similar costs in other health care delivery systems. Previous research in states such as Minnesota and California support these assertions.[21] These studies concluded that the amount of medical treatment provided to injured workers was the driving force in higher medical costs rather than the price of individual medical treatments.

In order to determine whether medical costs are higher for occupational injuries in Texas, Med-Fx and ROC staff obtained a dataset covering State of Texas employees from a

[21] See *Industrial Strength Medicine: A Comparison of WC and Blue Cross Health Care in Minnesota: A Background Report for the Minnesota Legislature*, Minnesota Department of Labor and Industry (1990); Johnson, William, et al., *The Excess Costs of Health Care for Work-Related Injuries*, 1994; Durbin, David, et al., *Workers' Compensation Medical Expenditures: Price vs. Quantity: Implications for a Medical Price Index*, 1993; and Roberts, Karen and Susan Zonia, "Workers' Compensation Cost Containment and Health Care Provider Income Maintenance Strategies," *The Journal of Risk and Insurance*, 1994.

Texas-based group health insurance carrier.[22] This group health plan is a Preferred Provider Organization (PPO) model, which allows state employees to choose a health care provider from within a network of providers across the state. Medical coverage is subject to an annual $200 deductible that is waived if the employee chooses a network provider (co-payments still apply, currently $15 per visit up to a maximum of $500 for in-network services and $1,500 for out-of-network services). Medical bills are reimbursed at a rate of 90 percent if network providers are used, compared to 70 percent if the employee selects non-network providers. In addition to these financing differences, group health claims are also subject to treatment utilization restrictions and negotiated price discounts.

To ensure that medical cost comparisons remain consistent, a dataset covering injured State of Texas employees was used to compare with state employees in the group health plan described above.[23] Although only injured state employees were used for these comparisons, there are remarkable similarities between the state employee workers' compensation dataset and the entire population of workers' compensation claims in Texas, notably in the types of injuries (injury distribution) and geographic location. Overall comparisons of these claim populations can be found in the Technical Appendix.

When compared with the state employee group health plan, workers' compensation medical costs for injured state employees were approximately six times higher per worker ($578 per worker in this group health system compared to $3,463 per worker in the Texas workers' compensation system, 18 months post-injury -- see Figure 6).[24] Deductibles, co-payments and coinsurance under the group health system are estimated to represent approximately 17 percent (or roughly $490) of this difference. The remainder of this difference can be accounted for by higher amounts of medical treatment in workers' compensation (often called treatment utilization), lower individual treatment prices in group health (due to PPO or other negotiated discounts), and the coverage of costly medical services such as work hardening/conditioning under the workers' compensation system.[25]

Figure 6
Average Medical Costs Per Claim, Top 10 Diagnostic Groups

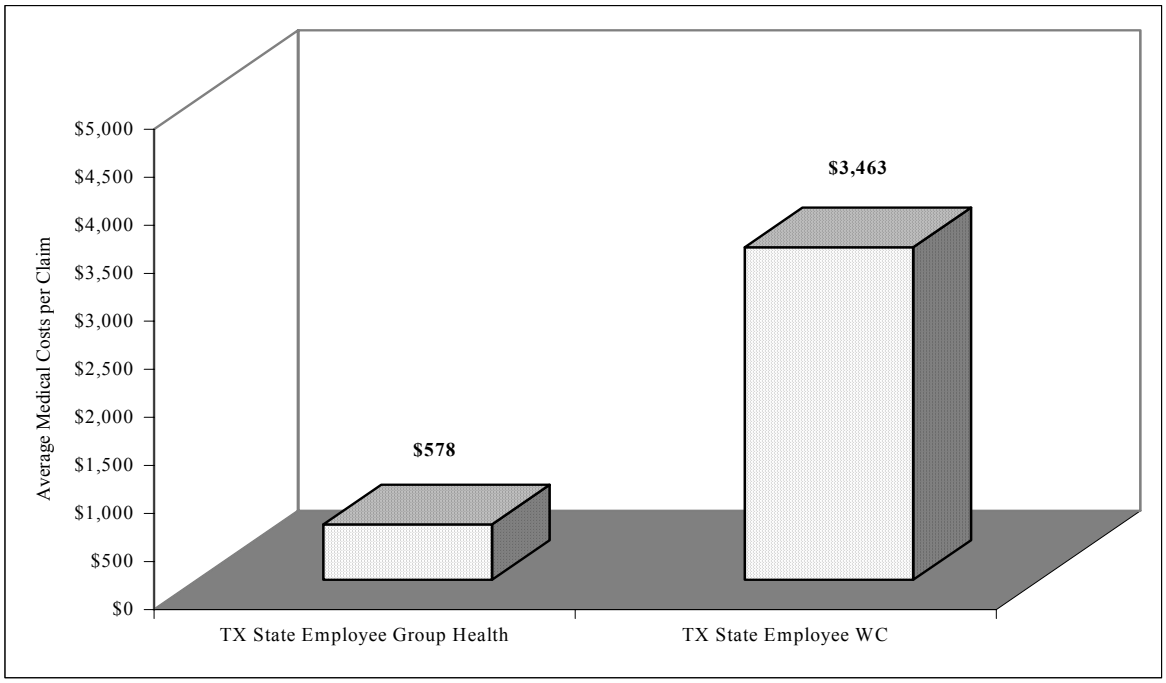
[22] Confidentiality concerns precluded obtaining the entire dataset. The dataset included the same sets of diagnoses used for the multi-state medical cost comparison, but does not include data on health care provider charges.

[23] State of Texas employees are covered by the State Office of Risk Management under Chapter 501 of the *Texas Labor Code*.

[24] The average cost figures for this group health and workers' compensation comparison does not include pharmaceutical costs, since neither the group health nor the TWCC databases used capture this information. Group health and workers' compensation medical cost comparisons were conducted using an 18-month cutoff point to provide ample time for medical treatment after an initial diagnosis in the group health dataset. This cutoff point differs from the one-year post-injury point used in the multi-state comparison.

[25] One study estimated the average cost of work hardening/work conditioning services to be approximately $14,000-20,000 per worker who received those services. See Tsourmas, NF, M.D., "Functional Restoration: the Worth of Pre-Screening," *Texas Workers' Comp Advisor,* January 27, 2000.

Texas Workers' Compensation and Group Health, 18 Months Post-Injury



Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of TWCC data for injury year 1997 and state employee group health data for incurred years 1996-1998.

When similar types of injuries were compared in the group health and workers' compensation systems, Texas had higher average medical costs for the top five types of injuries (see Table 7).

Table 7
Average Medical Costs Per Claim, Top 5 Diagnostic Groups
Texas Workers' Compensation and Group Health, 18 Months Post-Injury

Health Care Delivery System	*Neck Soft Tissue Injuries*	*Low Back Soft Tissue Injuries*	*Shoulder Soft Tissue Injuries*	*Hand & Wrist Soft Tissue Injuries*	*Knee Internal Derangements*
Group Health	$425	$401	$817	$476	$1,379
Workers' Compensation	$3,698	$4,319	$4,015	$2,710	$5,552

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of TWCC data for injury year 1997 and state employee group health data for incurred years 1996-1998.

In addition to overall cost differences, the cost of individual medical treatments is lower under the group health system due to the impact of PPO discounts as well as the impact of co-payments and deductibles. For example, the average medical payment for a

manipulation (CPT code 97260) was $17.50 in this group health system, compared to $35 under the current TWCC *Medical Fee Guideline* (1996), while the average medical payment for an MRI scan of the thoracic region (CPT code 72146) was $543 under group health compared to $823 under the current TWCC *Medical Fee Guideline.*[26] It is estimated that PPO discounts under this group health system result in a price savings of approximately 10 percent on office visits and physical medicine and 15 percent on diagnostic tests compared with the current workers' compensation fee guideline.

[26] The workers' compensation maximum reimbursement value (MAR) for this medical procedure is for a standard MRI (approximately 13-24 slices) and includes both a professional and technical component.

SECTION II:
MEDICAL COST DRIVERS

Prior research has shown that it is typically the amount of medical treatment (often called treatment utilization) that drives high medical costs, rather than the price of individual medical treatments and tests. The findings in this section support these conclusions by comparing the utilization and duration (i.e., the length of medical treatment) of medical care given to Texas injured workers with trends found in other state workers' compensation systems, group health, and national treatment guidelines.

Comparison with Other State Workers' Compensation Systems

As previously indicated, five medical treatment types (surgery and related hospitalization, physical medicine, office visits, diagnostic tests, and pharmaceutical drugs) account for the vast majority of medical costs in Texas. Out of the nine workers' compensation systems compared in this study, Texas has either the highest or the second-highest utilization rates for each of these treatment types.

Surgery. For four of the six most frequent types of injuries, Texas has the highest average number of surgeries per injured worker who received surgery (see Table 8). Interestingly, there were fairly high surgery rates in every state for soft tissue injuries. Most nationally-accepted treatment guidelines do not typically recommend surgery for "soft tissue" injuries, since the vast majority of these workers recover with conservative treatment rather than surgery.[27] Further, the failure rates for surgery for these conditions are quite high. Without an individual claim audit, however, it is not conclusively clear whether these "soft tissue" surgeries are clinically indicated or the result of a misdiagnosis, mis-reporting of subsequent diagnostic codes that would indicate surgery, or inappropriate care.

Table 8
Average Number of Surgeries Per Injured Worker Who Received Surgery,

[27] Examples of these guidelines include: The American College of Occupational and Environmental Medicine's practice guidelines, the Agency for Health Care Policy and Research guideline on acute low back problems, the *Medical Disability Advisor*, the Mercy chiropractic guidelines, and the Milliman & Robertson workers' compensation health care management guideline, among others.

Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	2.5	2.7	2.5	2.1	2.1	1.9
KY	1.9	2.5	1.8	1.9	1.7	1.8
NJ	2.7	2.3	**4.8**	1.8	2.3	1.7
OR	1.9	2.0	1.8	2.1	1.6	1.5
MN	2.1	1.7	2.0	1.8	1.7	1.6
CA	2.6	2.4	2.6	2.1	2.3	**2.1**
CO	2.4	2.0	1.8	1.9	1.6	1.8
GA	2.2	2.5	3.6	**2.3**	2.1	1.5
TX	**3.4**	**3.4**	2.7	**2.3**	**2.7**	1.9

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data. Each surgery included in this table may include multiple individual surgical procedures.

Compared with other states, Texas also had the highest number of injections per worker (see Table 9). In particular, Texas had very high rates of epidural steroid injections (an average of 6.8 per worker) and trigger point injections (an average of 9.9 per worker).[28]

[28] Epidural steroid injections include the injection of steroids and/or anesthetic outside the covering of the spinal cord or spinal nerve roots to decrease inflammation and nerve root compression, or to diagnose the source of pain. Trigger point injections are injections into a tender spot of the muscles intended to decrease pain and break a cycle of pain and spasm.

Table 9
Average Number of Injections Per Injured Worker Who Received Injections, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for Top 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	4.5	7.3	6.9	6.9	2.9	3.4	2.6
KY	3.0	3.3	5.7	3.8	2.0	1.6	2.5
NJ	3.6	5.4	4.5	**8.0**	2.9	2.5	2.3
OR	2.5	3.7	4.0	3.7	2.2	1.6	2.1
MN	2.2	4.2	2.5	3.7	1.8	1.8	2.3
CA	3.9	6.1	5.7	4.5	2.6	3.7	2.5
CO	3.2	7.0	4.1	3.8	2.6	1.8	2.2
GA	3.5	3.2	5.2	**8.0**	3.2	2.5	2.6
TX	**6.2**	**10.2**	**10.0**	5.1	**3.6**	**4.9**	**3.0**

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data. Includes therapeutic injections such as trigger point, facet, and epidural steroid injections. Lytic and radiologic injections are not included.

Physical Medicine. Physical medicine is a broad category that includes a variety of medical treatments and services such as manipulations, therapeutic exercises (also known as "active therapy"), modalities (also known as "passive therapy"), functional capacity evaluations, and work hardening/work conditioning.[29] Although every type of health care provider (including medical doctors and osteopaths) can and does provide this type

[29] Work conditioning services are guided activities designed to improve the muscular and cardiovascular condition of de-conditioned injured workers in order to prepare them to return to work. Work hardening services include the progressive simulation of work tasks in order to increase a worker's physical endurance and ability to stay at work. The TWCC Treatment Guidelines recommend using modified or light duty in lieu of work hardening services. A preliminary analysis indicated that Texas had very high utilization rates for these services; however, health care providers admit that these services are often vaguely defined. Without further research into the ways work hardening/work conditioning services are defined and coded in Texas and other states, publication of utilization rates may be misleading.

of treatment to workers, chiropractors and physical therapists typically provide many of these services (either on their own or as a referral from another doctor). Overall, physical medicine utilization rates in Texas are higher for similar types of injuries in Texas; however, without an individual claim audit, it is difficult to know whether these treatments are clinically appropriate.

As Table 10 indicates, Texas has the highest average number of manipulations per injured worker. These differences may be the result of service limits that some states place on this type of care (e.g., Oregon places some restrictions on the timeframe that chiropractors may serve as a treating doctor) or the restrictions on the types of services that certain health care providers may perform (e.g., New Jersey and Kentucky limit the scope of practice for chiropractors to manipulations of the spine and adjacent tissues). According to most nationally-accepted treatment guidelines, there is less scientific support for the use of manipulations in low back nerve compression injuries.

Table 10
Average Number of Manipulations Per Injured Worker Who Received These Services, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for Top 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	8.7	10.9	7.4	9.5	9.9	10.2	7.9
KY	14.4	21.1	15.3	18.9	13.2	12.7	5.3
NJ	11.9	10.9	10.0	24.8	15.3	12.8	8.5
OR	8.5	9.8	7.6	12.4	10.4	11.3	7.0
MN	11.7	14.3	10.7	18.5	11.8	16.3	7.0
CA	23.7	**29.5**	26.1	36.5	19.4	25.0	14.3
CO	12.4	16.0	13.1	13.8	10.8	10.6	8.2
GA	7.5	9.4	5.6	7.0	9.7	10.8	7.0
TX	**26.4**	28.5	**27.2**	**38.2**	**21.5**	**27.5**	**24.3**

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data. Includes manipulations conducted by all health care provider types (including M.D.s, P.T.s, and Osteopaths). For comparability purposes, office visits to chiropractors were included in manipulation rates rather than office visit rates since it more accurately reflects the common usage of those medical procedure codes.

Texas ranked second to New Jersey in the average number of therapeutic exercise treatments (e.g., assisted exercises, active one-on-one therapy) performed per injured worker, but closer to the averages of the other comparison states (see Table 11). However, in the average number of physical medicine modalities (e.g., hot and cold packs, massage) received per injured worker, Texas again ranked second but very close to the highest-ranked state, California (see Table 12). Texas had the highest physical modality rates per injured worker for low back nerve compression and hand and wrist soft tissue injuries.

Table 11
Average Number of Therapeutic Exercise Treatments Per Injured Worker Who Received These Services, Texas and Other States,

Averages for the Top Six Diagnostic Groups
(highest rates are shaded below)

State	Overall Utilization Rate for Top 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	16.2	17.6	13.8	25.3	20.6	18.9	14
KY	13.0	13.0	9.6	49.0	17.6	15.9	17.6
NJ	**30.0**	**30.3**	**24.3**	**56.8**	**40.1**	**37.3**	**20.1**
OR	11.1	10.8	10.2	19.6	13.1	11.3	10.1
MN	13.7	13.6	14.3	24.3	16.3	15.1	10.8
CA	18.3	19.7	16.2	22.2	22.9	27.7	16.9
CO	16.0	15.0	17.3	30.5	16.4	8.7	13.5
GA	18.0	13.4	17.1	12.4	25.8	17.3	12.8
TX	19.2	21.3	18.4	34.4	23.5	24.0	17.7

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data. Therapeutic exercise treatments include items such as active therapy and assisted exercise.

Table 12
Average Number of Physical Medicine Modalities Per Injured Worker Who Received These Services, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for All 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	16.2	19.8	13.9	29.6	20.8	16.1	13.6
KY	16.7	26.8	17.3	46.7	17.8	16.1	12.8
NJ	30.4	38.8	25.4	35.1	38.3	**51.1**	25.8
OR	16.3	18.5	14.8	23.1	19.6	18.7	13.8
MN	13.4	16.5	11.4	15.1	14.0	21.8	15.9
CA	**36.6**	**49.4**	**38.8**	49.2	**40.1**	46.7	28.0
CO	6.6	9.9	6.1	12.4	6.4	10.7	5.9
GA	15.3	18.2	13.6	27.8	18.0	28.9	15.5
TX	33.9	44.7	35.6	**54.4**	33.8	41.5	**28.2**

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data.

Health care providers perform functional capacity examinations (FCEs) to determine an injured worker's physical limitations (e.g., the worker's lifting capacity and ability to sit or stand for specified period of time). The results of these examinations are often used to decide whether an injured worker can be released to return to work, as well as what modified job duties an injured worker may perform. As Table 13 indicates, Colorado had the highest average number of FCEs per worker, while the Texas rate fell just below the nine-state average (2.3 in Texas compared to a nine-state average of 2.4). The rate in Texas, however, is expected to increase in the future as a result of the implementation of House Bill 2513 in 1999 (76th Legislature) which gave TWCC the authority to require an injured worker's treating or examining doctor to provide an FCE upon request from an employer or insurance carrier.[30]

[30] In response to HB 2513, TWCC implemented Rule 129.5 in July, 2000.

Table 13
Average Number of Functional Capacity Examinations Per Injured Worker Who Received These Services, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for All 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	1.8	1.9	1.8	2.0	1.4	2.6	1.6
KY	2.3	2.4	1.6	N/A	**4.1**	1.4	3.2
NJ	2.9	1.7	3.4	**6.3**	2.3	2.3	2.3
OR	1.6	1.6	1.6	1.7	1.4	1.6	1.5
MN	3.1	2.1	**4.1**	1.0	2.4	**3.5**	2.7
CA	2.1	2.1	2.1	1.3	2.2	2.4	2.1
CO	**3.2**	**3.6**	1.8	N/A	3.2	1.5	**6.4**
GA	2.7	2.1	3.0	1.0	3.1	2.5	2.1
TX	2.3	2.4	2.3	3.6	1.8	3.1	2.1

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data.

Office Visits. Health care providers use office visits to diagnose, treat, and evaluate the medical progress of injured workers. Texas has the second-highest overall average number of office visits per injured worker (close behind California) and the highest rates for neck and low back soft tissue injuries and low back nerve compression injuries (see Table 14).

Table 14
Average Number of Office Visits Per Injured Worker Who Received These Services, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for Top 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	4.4	6.0	5.5	7.3	5.1	5.8	3.8
KY	4.5	6.4	5.6	8.5	5.2	6.1	4.1
NJ	5.5	7.1	6.4	9.4	6.7	8.7	5.0
OR	4.4	6.5	6.1	10.6	5.3	5.4	3.8
MN	4.5	6.6	5.5	6.4	5.8	5.6	3.8
CA	**7.6**	10.4	9.0	14.3	**8.9**	**11.2**	**7.4**
CO	6.2	8.0	7.2	13.7	8.8	7.1	5.9
GA	4.3	5.6	5.1	10.4	4.9	6.7	3.8
TX	7.2	**11.5**	**10.6**	**25.5**	8.8	10.5	6.4

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data. For comparability purposes, office visits made by chiropractors were included in manipulation rates rather than office visit rates, since that more accurately reflects the common usage of those medical procedure codes.

Diagnostic Tests. Diagnostic tests are valuable tools used by health care providers to identify medical problems and determine the appropriate course of treatment for the injured worker. Although these tests can provide important information, they must also

be clinically appropriate so as to avoid producing misleading results that could lead to inappropriate treatment.

As Tables 15 and 16 indicate, Texas and Georgia have the highest overall average number of CT scans per worker and Texas has the highest rates for hand and wrist soft tissue injuries. Texas ranks a close second for neck and low back soft tissue injuries and low back nerve compression injuries. The overall average utilization rates for MRI scans are fairly consistent across states, however, Texas and California have a significantly higher number of MRIs for hand and wrist nerve compression injuries. Nationally-accepted treatment guidelines typically do not recommend the use of MRI and CT scans for most uncomplicated soft tissue injuries.[31]

[31] MRIs are generally recommended to confirm physical exam findings before nerve compression, and knee and shoulder internal derangement surgeries.

Table 15
Average Number of CT Scans Per Injured Worker Who Received These Services, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for Top 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	2.0	2.1	2.2	1.8	1.8	N/A	1.7
KY	2.1	2.9	2.2	1.5	1.6	N/A	2.0
NJ	2.1	1.9	2.4	1.0	1.4	**7.0**	1.1
OR	2.3	2.4	2.3	2.3	2.0	2.5	2.1
MN	2.3	1.7	2.5	1.5	3.0	N/A	2.5
CA	2.6	2.5	2.8	**4.0**	2.7	2.3	1.9
CO	2.7	1.7	**3.5**	1.0	2.4	N/A	1.6
GA	**3.1**	**4.5**	2.8	2.3	**4.4**	N/A	2.0
TX	**3.1**	3.8	3.2	3.3	2.2	2.0	**3.2**

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data.

Table 16
Average Number of MRI Scans Per Injured Worker Who Received These Services, Texas and Other States, Averages for the Top Six Diagnostic Groups (highest rates are shaded below)

State	Overall Utilization Rate for All 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	1.6	1.8	1.6	2.0	1.5	1.5	1.6
KY	2.0	**2.7**	2.0	1.8	1.8	1.0	1.6
NJ	1.5	1.7	1.4	**3.1**	1.5	1.4	1.4
OR	**2.4**	2.4	**2.5**	**3.1**	**2.3**	2.3	**2.5**
MN	1.7	1.5	1.9	2.2	1.6	1.3	1.4
CA	1.8	2.2	1.8	1.8	1.7	**2.7**	1.6
CO	2.0	2.0	2.1	2.3	2.1	1.0	**2.5**
GA	2.1	2.3	2.1	2.0	2.0	1.3	2.0
TX	2.2	2.6	2.2	2.2	2.2	**2.7**	2.3

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data.

Compared with other states, Texas has significantly higher electrophysiology testing rates per worker (see Table 17). Texas's overall rate is more than twice Colorado's rate and is highest for low back, shoulder, and hand and wrist soft tissue injuries as well as low back nerve compression injuries.

Table 17
Average Number of Electrophysiology Tests Per Injured Worker Who Received These Services, Texas and Other States, Averages for Top Six Diagnostic Groups (highest rates are shaded below)

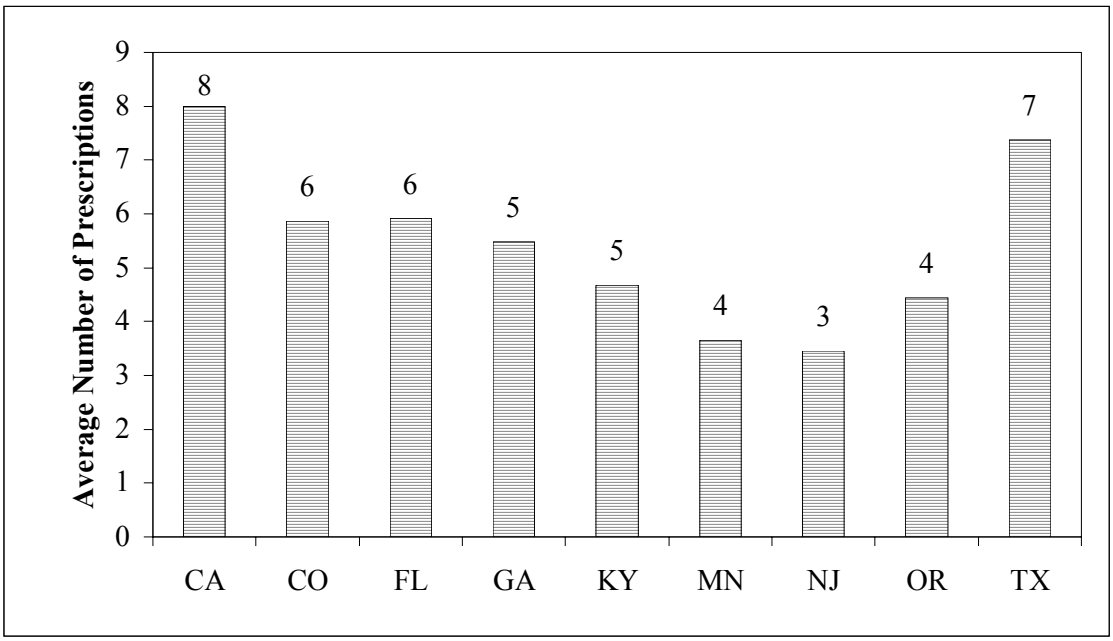
State	Overall Utilization Rate for Top 10 Diagnostic Groups	Neck Soft Tissue Injuries	Low Back Soft Tissue Injuries	Low Back Nerve Compression Injuries	Shoulder Soft Tissue Injuries	Hand & Wrist Nerve Compression Injuries	Hand & Wrist Soft Tissue Injuries
FL	6.5	6.9	5.8	6.6	6.1	8.1	6.6
KY	6.7	7.4	9.2	3.0	7.7	5.0	6.7
NJ	8.9	9.9	7.8	11.3	7.7	**12.2**	9.7
OR	3.4	3.9	3.1	2.4	3.6	3.4	3.3
MN	8.4	7.4	6.1	1.0	7.9	9.1	8.4
CA	9.9	**11.4**	11.0	11.3	8.1	8.7	9.2
CO	4.7	4.1	5.1	4.0	4.3	5.0	4.6
GA	8.5	9.1	6.5	9.0	7.6	9.7	8.8
TX	**10.8**	10.6	**12.1**	**11.9**	**10.6**	10.0	**10.9**

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data. Electrophysiology tests include items such as nerve conduction velocity (NCV) and electomyographic (EMG) studies.

Pharmaceutical Drugs. A preliminary analysis of pharmaceutical data suggests that high pharmaceutical costs in Texas and California are in large part the result of a higher average number of prescriptions provided to injured workers in those states (see Figure 7). Other cost factors may include the use of generic drug alternatives and pharmaceutical formularies in states that actively use managed care arrangements for workers' compensation cases.

Currently Texas does not require generic alternatives, nor does it have a pharmaceutical formulary in workers' compensation care. Additionally, many injured workers complain that they have difficulty getting their prescriptions filled since pharmacies are not guaranteed payment if the prescription is later deemed medically unnecessary by the insurance carrier. Further research is required to determine ways to improve the delivery of medically necessary and effective drugs to injured workers.

Figure 7
Average Number of Prescriptions per Worker, Texas and Other States



Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Percentage of Injured Workers Receiving Medical Treatment. A higher percentage of workers in the Texas workers' compensation system received medical treatment than workers with the same type of injury in the comparison states (see Table 18 for examples of surgery and physical medicine treatments for workers with low back soft tissue injuries).

As Table 18 illustrates, the percentages of Texas workers receiving surgery (2.5 percent for lumbar fusions in Texas compared with the nine-state average of 1.0 percent) and manipulations (45.5 percent for manipulations in Texas compared to the nine-state average of 30.5 percent) are significantly higher than many of the comparison states. This suggests that surgery and manipulation costs in Texas are not only driven by the number of these medical services performed on workers, but also by the percentage of workers receiving these services.

Table 18
Percentage of Injured Workers With Low Back Soft Tissue Injuries Who Received Surgery and Physical Medicine, Texas and Other States
(highest rates are shaded below)

State	Surgery		Physical Medicine	
	Lumbar Fusions	**Laminectomies**	**Manipulations**	**Therapeutic Exercises**
FL	1.1%	3.6%	19.0%	48.0%
KY	0.6%	2.4%	19.6%	29.3%
NJ	1.1%	3.0%	17.1%	48.4%
OR	0.8%	3.8%	45.0%	44.4%
MN	0.5%	2.5%	42.6%	43.3%
CA	0.7%	2.1%	39.0%	**71.9%**
CO	0.7%	3.0%	28.9%	24.4%
GA	0.7%	3.0%	17.8%	50.7%
TX	**2.5%**	**4.9%**	**45.5%**	59.5%

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Comparisons with Group Health

Comparisons with a Texas-based group health insurer reveal that medical care utilization rates are also higher in workers' compensation cases for similar types of injuries. When compared with the State of Texas employee PPO group health plan, injured state employees being treated through workers' compensation had higher surgery, physical medicine, and diagnostic testing utilization rates than those in group health.[32]

Surgery. Compared with similarly diagnosed Texas state employees under the group health system, utilization rates for surgery and injections are higher for state employees injured on-the-job (see Tables 19 and 20). The overall surgery rate differences between these two groups of state employees are not as significant as the differences in injection rates. This suggests that some of the surgery rate differences between Texas and other states may be the result of a different community standard of care for Texas (i.e., more dependence on surgery rather than conservative care as a standard type of medical treatment in Texas).

Table 19
Average Number of Surgeries Per Injured Worker Who Received Surgery, State Employee Texas Workers' Compensation Claims and State Employee Group Health Claims, Averages for Top 10 Diagnostic Groups

Health Care Delivery System	*Average Number of Surgeries*
Group Health	1.8
Workers' Compensation	2.2

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of TWCC and state employee group health data. The rates in this table represent individual surgical episodes.

[32] As previously stated, group health pharmaceutical data was not made available for this analysis.

Table 20
Average Number of Injections Per Injured Worker Who Received Those Services, State Employee Texas Workers' Compensation Claims and State Employee Group Health Claims, Averages for Top 10 Diagnostic Groups

Health Care Delivery System	*Epidural Steroid Injections*	*Facet Injections*	*Trigger Point Injections*
Group Health	2.7	2.9	1.5
Workers' Compensation	4.6	5.8	5.4

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of TWCC and state employee group health data.

Physical Medicine Treatments. A key difference between group health and workers' compensation medical care can be seen in the rates of physical medicine services provided to state employees. As Table 21 depicts, the average number of manipulations and therapeutic exercise treatments per worker is significantly higher in workers' compensation cases. These differences are partially the result of service limits placed on these services in group health.[33]

Table 21
Average Number of Manipulations and Therapeutic Exercises Per Injured Worker Who Received Those Services, State Employee Texas Workers' Compensation Claims and State Employee Group Health Claims, Averages for Top 10 Diagnostic Groups

Health Care Delivery System	*Manipulation*	*Therapeutic Exercises*
Group Health	5.8	7.1
Workers' Compensation	21.6	18.4

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of TWCC and state employee group health data.

Diagnostic Tests. Interestingly, the utilization rates for diagnostic tests under group health and workers' compensation are not significantly different (with the exception of electrophysiology tests). Table 22 highlights the rates for two types of tests: CT scans and electrophysiology tests. While these tests are reviewed for their medical necessity under group health, they are not subject to the same service limits as many other types of medical treatment, such as physical medicine. Further research is required to determine why the rates for electrophysiology tests are higher in workers' compensation cases.

Table 22
Average Number of CT Scans and Electrophysiology Tests Per Injured Worker Who Received Those Services, State Employee Texas Workers' Compensation Claims and State Employee Group Health Claims,

[33] The averages for these services are below the service caps for this PPO plan, suggesting that many group health patients received fewer services than the limit.

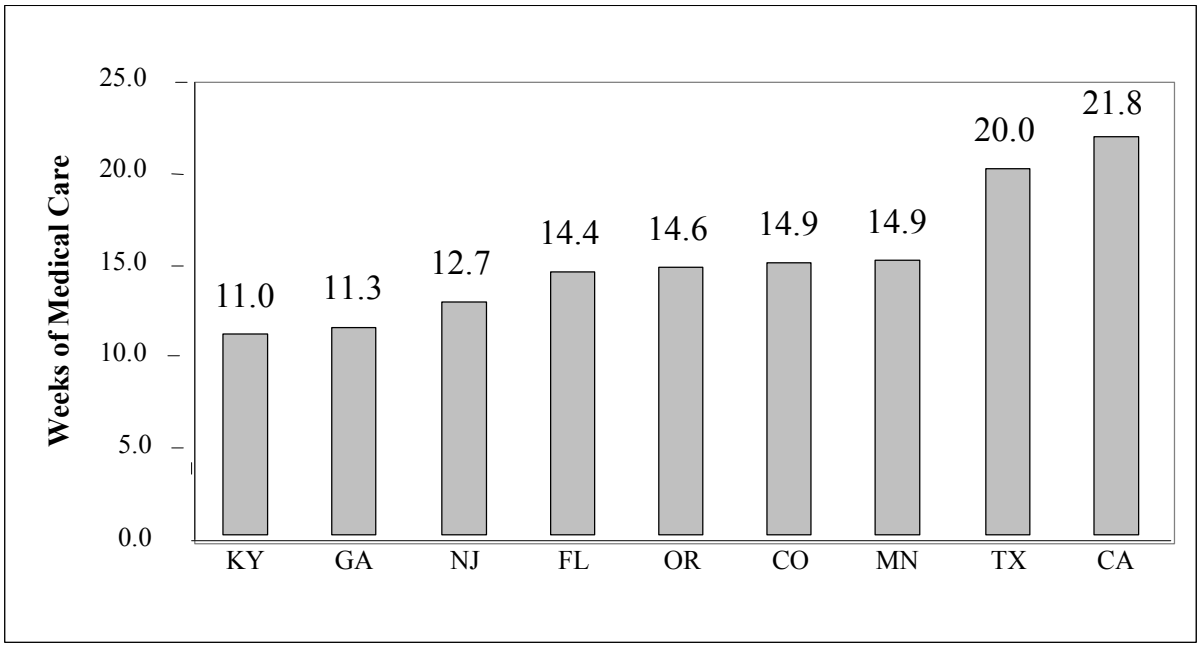
Averages for Top 10 Diagnostic Groups

Health Care Delivery System	*CT Scans*	*Electrophysiology Tests*
Group Health	2.2	3.6
Workers' Compensation	2.6	10.4

Source: MedFx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of TWCC and state employee group health data.

Duration of Medical Care. In addition to receiving more medical treatments, Texas injured workers also have longer treatment durations compared with workers in other states. Of the nine states compared for this study, Texas ranked second only to California in the longest average treatment duration (see Figure 8). Texas has the longest average (mean) treatment durations for neck soft tissue injuries (25.5 weeks) and low back soft tissue injuries (25.5 weeks); however, the median treatment durations for these same injuries are much shorter than the average (means)(median of 7 weeks for neck soft tissue injuries and median of 5 weeks for low back soft tissue injuries). The difference between the average (mean) and median treatment durations are a result of prolonged care for a minority of cases, primarily those 20 percent of claims that account for 80 percent of medical costs. Due to the longer treatment and disability durations seen in Texas, Texas claims continue to accumulate medical costs for far longer on average than comparison states (see ROC's report entitled *Returning to Work: An Examination of Existing Disability Duration Guidelines and Their Application to the Texas Workers' Compensation System* for an analysis of how Texas's disability durations compare with other states).

Figure 8
Average Duration of Medical Care for Top 10 Diagnostic Groups, Texas and Other States



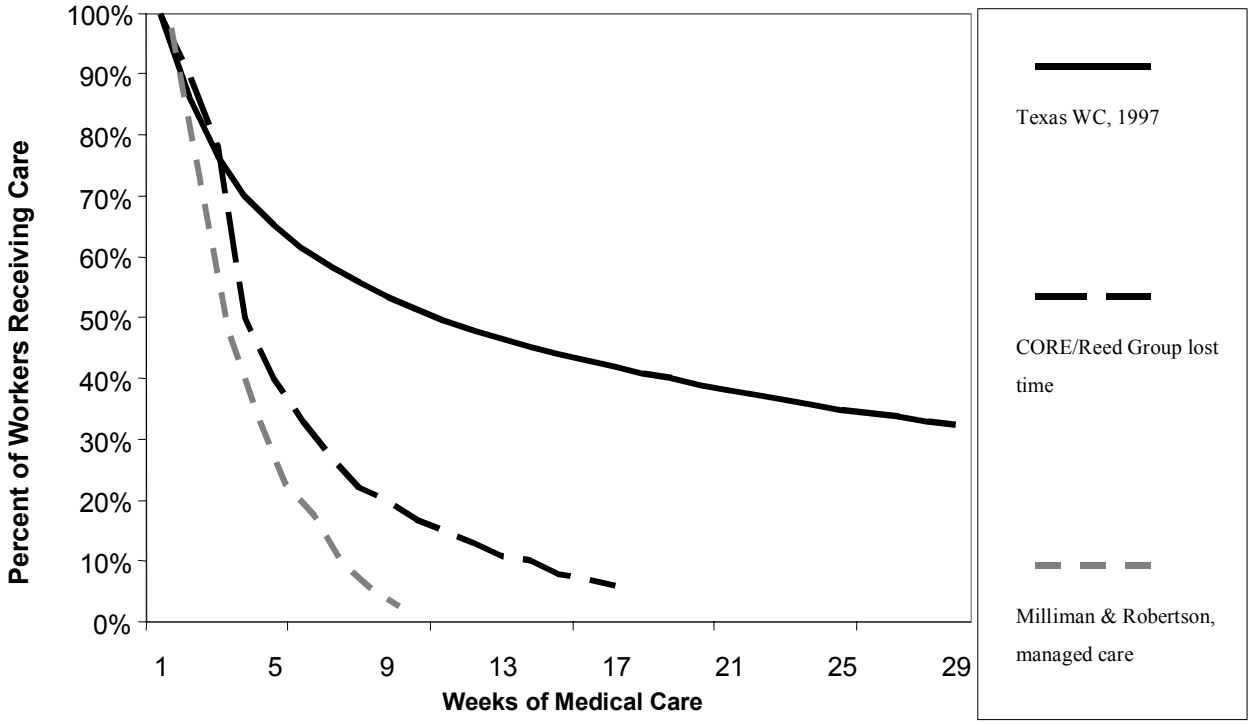
Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on an analysis of multi-state insurance carrier data.

Treatment duration in Texas also exceeds the levels recommended in many nationally-accepted treatment guidelines (including proprietary guidelines used by insurance carriers to review medical care and guidelines developed by medical associations).[34] Figure 9 compares the average treatment duration for low back soft tissue injuries in Texas to recommendations extrapolated from the Milliman and Robertson treatment guidelines and the CORE/Reed Group experience curves.[35]

[34] See The American College of Occupational and Environmental Medicine's practice guidelines, the Agency for Health Care Policy and Research guideline on acute low back problems, the *Medical Disability Advisor*, the Mercy chiropractic guidelines, and the Milliman & Robertson workers' compensation health care management guideline.

[35] In some cases, benchmarks were given for certain population percentiles in these guidelines. In these instances, Med-Fx staff used statistical extrapolations to fill in the curve between the benchmarks since these curves are almost always smooth. Where treatment durations were absent, disability duration information was used to complete the curve since these durations are generally correlated for most lost-time cases.

Figure 9
Comparison of Texas Medical Treatment Durations with National Treatment Guideline Recommendations, Low Back Soft Tissue Injuries



Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Based on TWCC data and information from Bruckman, R.Z., Rasmussen, H. *Health Care Management Guidelines: Volume 7, Workers' Compensation*. Seattle: Milliman & Robertson, 1996; and Reed PO (ed.). *The Medical Disability Advisor, 3rd Edition*. Boulder, CO: The Reed Group, Ltd., 1997.

SECTION III: QUALITY OF MEDICAL CARE

The challenge for every workers' compensation system is to ensure high quality medical care for injured workers while maintaining reasonable costs for employers and insurance carriers. Previous sections of this report have highlighted how Texas compares to other states and health care delivery systems in terms of overall costs and medical care utilization. This section examines the value of the medical care dollar spent in Texas by analyzing the components of quality medical care, including injured worker satisfaction, return-to-work outcomes, and physical and mental functioning outcomes.

To assess satisfaction and outcomes – as well as the factors associated with them – a stratified sample of injured workers in Texas and other states (primarily injured workers from Florida and California) were surveyed. See the methods section of this report for a more detailed description of the survey methodology used in this section.

Choice of Doctor

Workers were first asked who chose their initial treating doctor. More injured workers in Texas reported that they chose their initial treating doctor than did workers in other states (45 percent in Texas compared with 31 percent in the other states).[36] This is not surprising, considering that the comparison states – California and Florida – are all technically employer-choice states and Texas is an employee-choice state. Additionally, 40 percent of Texas injured workers reported that they were not aware they had a choice.

Interestingly, a higher percentage (23 percent) of Texas workers sought treatment from the doctor from whom they normally receive medical care, compared with workers in other states (15 percent).[37]

[36] Difference is statistically significant at the .1 level.
[37] Difference is statistically significant at the .1 level.

Change of Treating Doctor

Approximately the same percentage of injured workers in Texas and other states (51 percent) reported that they had changed their treating doctor. This percentage is significantly higher than the percentage of workers who had submitted a change of treating doctor request to TWCC.[38] This difference may be the result of workers switching from their employer's company doctor to a doctor of their choice in the first 60 days of treatment, because this switch is not officially labeled as a "change of treating doctor" under TWCC rules, but rather as a final determination of the worker's "initial choice" of doctor.[39] Other possibilities could be that workers changed doctors because they saw an emergency doctor initially; that they or their doctor moved; that their doctor stopped seeing workers' compensation patients; or that their doctor died or retired. Changing doctors for these reasons in Texas does not require TWCC's approval and does not constitute a "change" of treating doctor under the *Labor Code*.[40]

The most common reasons workers gave for changing doctors involved dissatisfaction with the manner and care they received (cited by 18 percent of Texas workers and 16 percent of workers in other states) and that the medical treatment wasn't helping their condition (20 percent of Texas workers and 15 percent of workers in other states).[41]

Access to Care

Access to care seemed to be a minor issue for workers in Texas and other states. Only about 22 percent of Texas injured workers said the distance they had to travel to see their doctor was a problem, compared to 20 percent in the other states. These differences are not statistically significant.

In the survey, workers were also asked to compare their access to medical care under workers' compensation to that of the general health care they usually received. Overall, a slightly higher percentage of Texas injured workers rated their ability to see a doctor or nurse more highly under workers' compensation than their normal health care (17 percent of Texas injured workers compared with 11 percent in other states), while a higher percentage of injured workers in other states said that their access to medical care was about the same for workers' compensation as the medical care they normally receive (75 percent in other states compared with 59 percent in Texas).[42] This is likely due to the existence of managed care arrangements for workers' compensation in states like

---

[38] According to a recent ROC study, only an estimated 8 percent of all injured workers and 25 percent of workers with lost time have submitted a change of treating doctor request to TWCC. See Research and Oversight Council on Workers' Compensation, *Change of Treating Doctor Issues in the Texas Workers' Compensation System*, 2000.

[39] See TWCC Rule 126.9.

[40] *Texas Labor Code* Section 408.022 provides for certain restrictions on an alternate choice of doctor.

[41] Differences in dissatisfaction with the manner and care injured workers received in Texas and other states were not statistically significant. However, differences in dissatisfaction that the medical treatment was not helping their condition were significant at the .1 level.

[42] Differences are statistically significant at the .01 level.

California and Florida. Workers in those states are more accustomed to a managed care system for both work-related injuries and their general health care.

Interpersonal Aspects of Care

Injured workers in Texas and other states rated their treating doctors highly when it came to being taken seriously and treated with respect by those doctors, but almost one-third of Texas injured workers did not completely trust their doctors (see Table 23).

Table 23
The doctor I saw most often for my work-related injury or illness...
(percentage responding "strongly agree" or "agree")

Interpersonal Issues	*Texas*	*Other States*
Took my medical condition seriously	82%	88%
Has my complete trust**	68%	74%
Treated me with respect	85%	93%

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: * indicates differences were statistically significant at the .1 level; ** indicates differences were statistically significant at the .05 level; *** indicates differences were statistically significant at the .01 level.

A higher percentage of Texas workers perceived that their treating doctor doubted their injury and cared more about what the insurance carrier thought than their care; and about the same percentage of injured workers in Texas and other states said they questioned the timing of their doctor's impairment rating (see Table 24). Further research is required to determine whether the timing of injured workers' impairment ratings and maximum medical improvement (MMI) dates are clinically appropriate.

Table 24
The doctor I saw most often for my work-related injury or illness…
(percentage responding "strongly agree" or "agree")

Adversarial Issues	Texas	Other States
Seemed to care more about what the insurance company or employer thought than about my care**	23%	11%
Doubted I was really sick or injured	15%	8%
Gave me an impairment rating while I was still having medical problems with my injury or illness**	54%	58%

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: * indicates differences were statistically significant at the .1 level; ** indicates differences were statistically significant at the .05 level; *** indicates differences were statistically significant at the .01 level.

Technical Aspects of Care

A higher percentage of injured workers in Texas and other states reported that their treating doctors provided them with information about their medical treatment, gave them focused medical exams, and tried to understand their daily job tasks and duties (see Table 25). Although the percentages for Texas injured workers were lower than those for workers in other states, these differences were not statistically significant.

Table 25
The doctor I saw most often for my work-related injury or illness...
(percentage responding "strongly agree" or "agree")

Technical Aspects of Care	*Texas*	*Other States*
Tried to understand my daily job tasks and duties	78%	85%
Gave a focused physical exam to check the illness or injury	77%	84%
Explained medical condition in a way that I could understand	83%	90%
Seemed willing to answer medical or treatment questions**	85%	95%

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: * indicates differences were statistically significant at the .1 level; ** indicates differences were statistically significant at the .05 level; *** indicates differences were statistically significant at the .01 level.

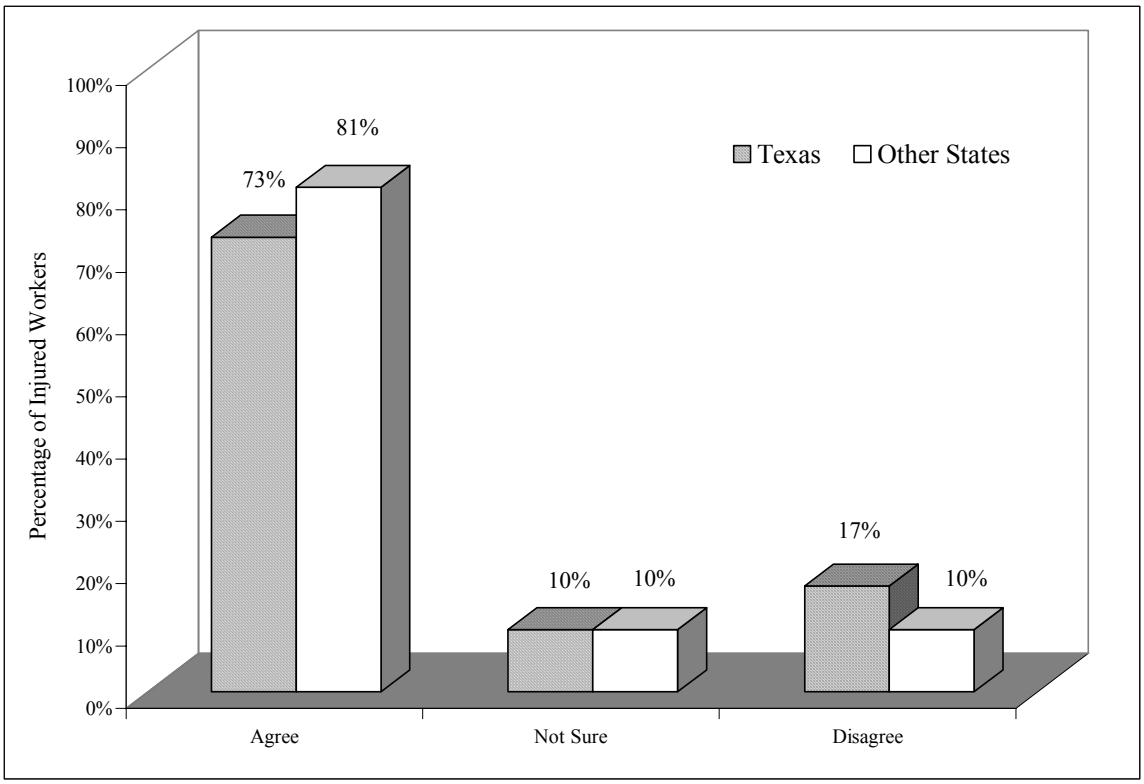
Additionally, a higher percentage of Texas injured workers (21 percent) reported that the insurance carrier declined to pay for a recommended treatment or medication than did injured workers in other states (12 percent).[43] This finding is interesting considering that Texas has higher treatment and testing rates than other states.

Overall Satisfaction with Care

Despite receiving more medical care, Texas injured workers reported that they were not more satisfied with their medical care than injured workers in other states (see Figures 10 and 11).

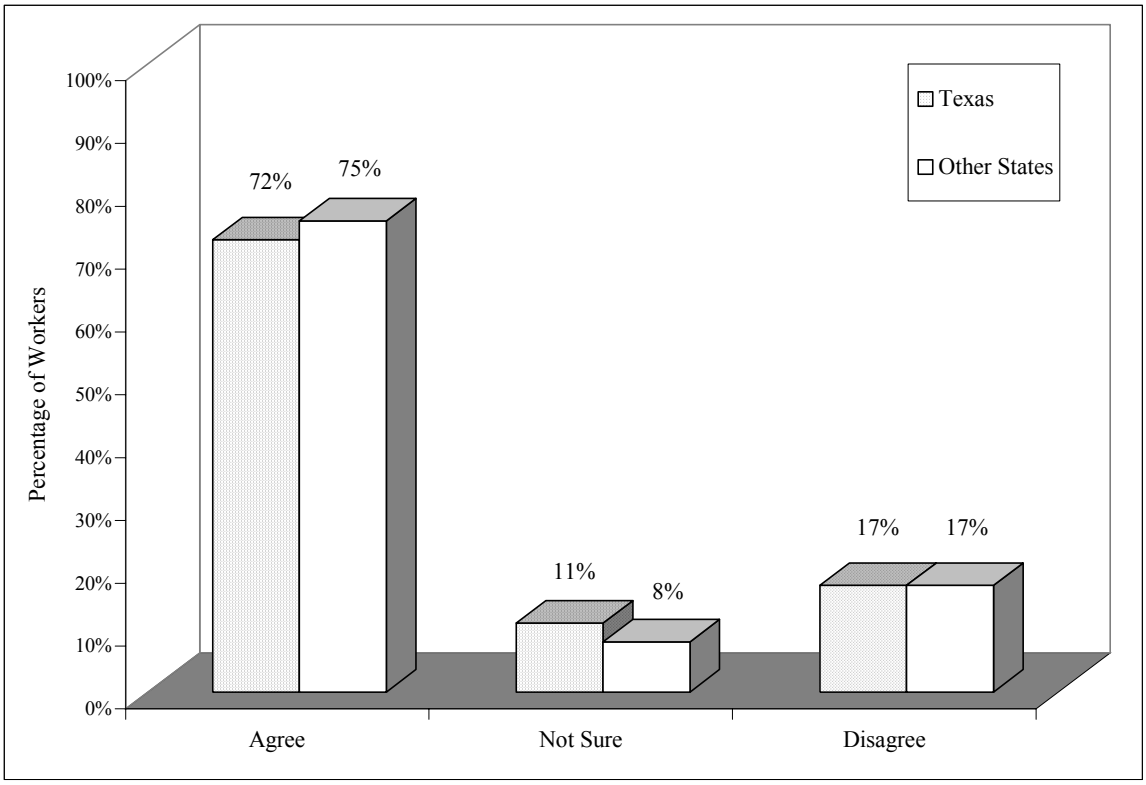
[43] Differences are statistically significant at the .1 level.

Figure 10
The doctor I saw most often for my work-related injury or illness...overall provided me with very good medical care that met my needs



Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: The differences between Texas and other states are not statistically significant.

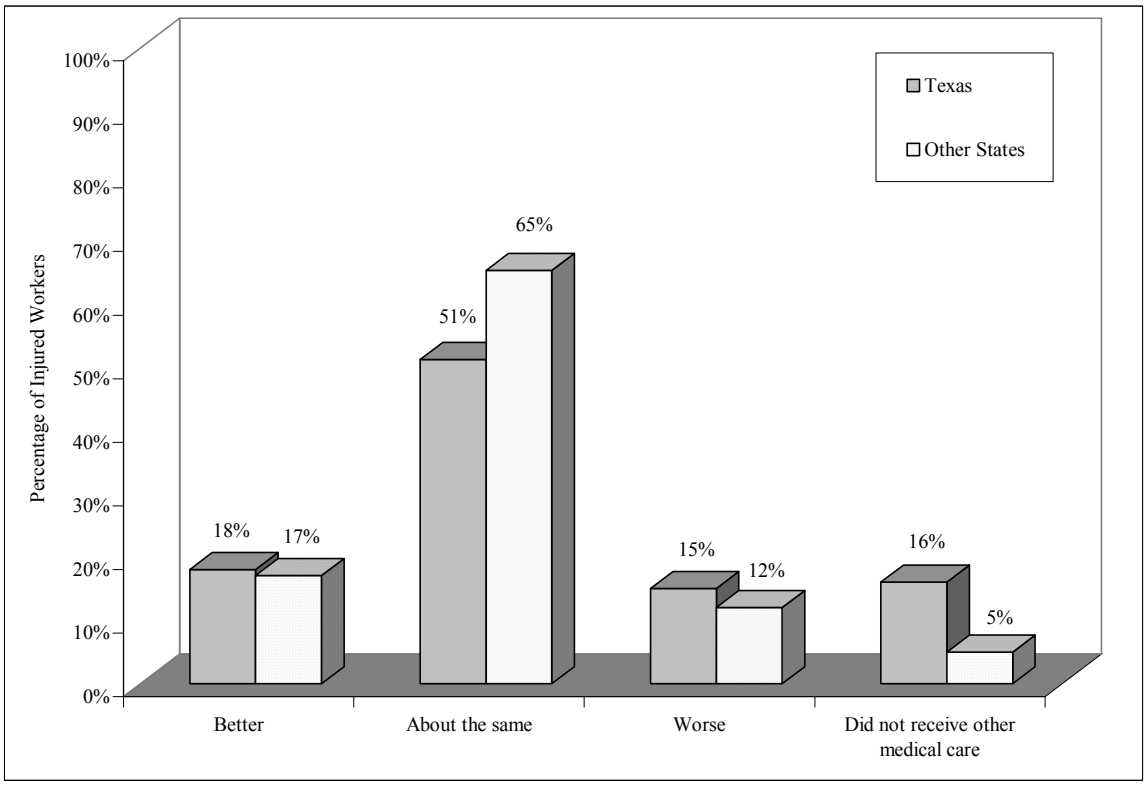
Figure 11
The doctor I saw most often for my work-related injury or illness...is generally the type of doctor I would recommend to a friend or relative for this type of problem



Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: The differences between Texas and other states are not statistically significant.

When asked to compare the medical care they received in the workers' compensation system with the medical care they normally receive, about the same percentage of injured workers in Texas and other states reported that their workers' compensation medical care was either better or worse than they normally receive (see Figure 12). A higher percentage of Texas injured workers reported that they had not received general medical care recently compared with workers in other states. Further research is required to determine whether this difference is a result of a lack of health insurance coverage for Texas workers.

Figure 12
Compared to the medical care you usually receive, the care you received for your work-related injury was…

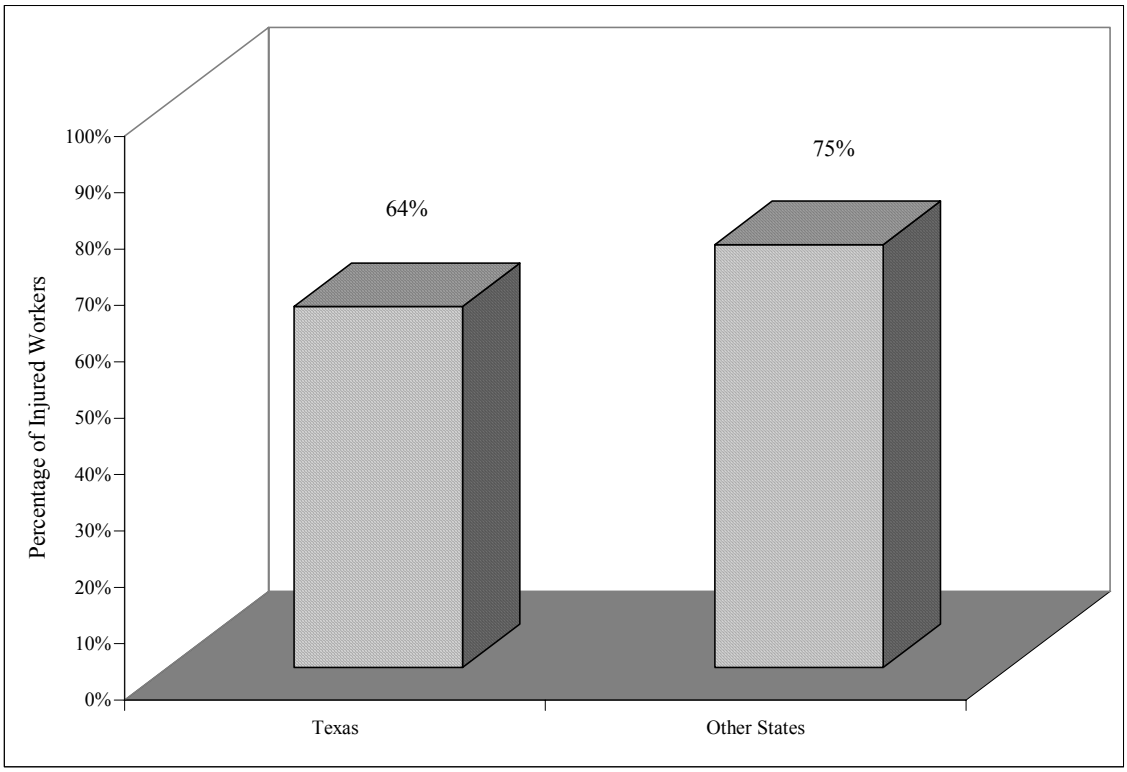


Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Differences are statistically significant at the .01 level.

Return to Work Outcomes

Fewer injured workers in Texas (64 percent) reported that they were currently working more than two years after their injury, compared with injured workers in other states (75 percent) (see Figure 13).

Figure 13
Are you currently working? (percent answering "yes")



Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Differences are statistically significant at the .1 level.

For those who said they were currently working, fewer Texas injured workers said they went back to the same employer as before their injury (62 percent in Texas compared to 79 percent in other states) and were doing the same kind of work they did before the injury (61 percent in Texas compared to 76 percent in other states). Additionally, more Texas injured workers said their current take-home pay was lower than it was before the injury (28 percent in Texas compared to 13 percent in other states).

A higher percentage of Texas injured workers (32 percent) felt that they went back to work too soon, compared with workers in other states (26 percent).[44] This finding is interesting considering that the average amount of lost time in Texas is longer than many of the comparison states.[45]

Economic Impact of Work-Related Injuries

[44] These differences are not statistically significant.
[45] See Research and Oversight Council on Workers' Compensation, *Returning to Work: An Examination of Existing Disability Duration Guidelines and their Application to the Texas Workers' Compensation System*, 2001 (companion volume to this report).

A significant percentage of workers in Texas and other states experienced financial difficulties as a result of their work-related injuries. The most common problems injured workers experienced in the first six months after their injury included using their savings, borrowing money, and having problems paying bills (see Table 26). This finding is of concern, considering that the intent of workers' compensation is to help compensate for the economic as well as the physical impacts of an injury or illness.[46] See the Technical Appendix for a list of economic burdens encountered by injured workers after the first six months.

Table 26
Percentage of Injured Workers Who Reported That They Experienced The Following Economic Burdens as a Result of Their Work-Related Injury

Economic Impact - First Six Months	*Texas*	*Other States*
Dipped into savings	31%	27%
Borrowed money**	24%	14%
Had problems paying bills**	34%	21%

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: * indicates differences were statistically significant at the .1 level; ** indicates differences were statistically significant at the .05 level; *** indicates differences were statistically significant at the .01 level.

Further research is required to determine the reasons for these perceived economic differences (e.g., unionization rates, benefit structure differences, among others).

Outcomes of Care

Quality medical care not only alleviates pain and helps get the worker back to work, but also restores an injured worker's physical and mental functioning abilities. To measure the physical and mental functioning of injured workers in Texas and other states, a standardized set of health survey questions, called the SF-12, was used. Physical functioning is used to measure whether an injured worker gets better or recovers physically after the injury, while mental functioning is used to measure whether an injured worker is likely to experience depression or alienation after the injury.

The SF-12 includes eight concepts commonly represented in health surveys: physical functioning; physical role functioning; bodily pain; general health; vitality; social functioning; emotional role functioning; and mental health. Results are expressed in

[46] In Texas, workers are eligible to receive income benefits if they have been off work or underemployed for at least seven days (this is called the waiting period). An injured worker must be off work or underemployed for four weeks before he or she can receive income benefits for the first seven days of lost time (known as the retroactive period). See Section 408.082, *Texas Labor Code*. Note that California has a three day waiting period for temporary disability benefits while Texas and Florida both have seven day waiting periods. Additionally, California has a 14 day or less retroactive period while Florida has 21 days and Texas has 28 days. Although Texas pays a higher percentage of lost wages (70 or 75 percent) compared to 66 2/3 percent for California and Florida, the earlier eligibility or retroactive periods in those states may play a role in this financial stress. Also, poor return-to-work outcomes may be a factor.

terms of two overall scores: the Physical Component Summary (PCS) and the Mental Component Summary (MCS).

The SF-12 is scored so that a high score indicates better self-reported physical and mental functioning abilities. The PCS and MCS scores have a range of 0 to 100 and were designed to have a mean score of 50 and a standard deviation of 10 in a representative sample of the U.S. population. Thus, scores greater than 50 represent above-average health status, people with a score of 40 function at a level lower than 84 percent of the population (one standard deviation), and people with a score less than 30 function at a level lower than approximately 98 percent of the population (two standard deviations).

Texas injured workers reported lower levels of both physical and mental functioning than did injured workers in other states and the U.S. population as a whole (see Table 27).[47] The statistical significance levels are much higher for the physical functioning scores than the mental functioning scores. This means that the perceived physical functioning differences between Texas injured workers and injured workers in other states are more pronounced. Texas's physical functioning score of 38 also means that Texas injured workers perceived that they physically function at a lower level after their injuries than approximately 80 percent of the general U.S. population.

Table 27
Comparison of Self-reported Physical and Mental Functioning Scores

Scale	*Texas Injured Workers*	*Injured Workers from Other States*	*Significance*	*U.S. Norm*
Physical functioning	37.63	42.40	0.001	50
Mental functioning	44.44	48.53	0.010	50

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

The primary sources of this decrease in physical functioning ability for Texas injured workers were continued difficulties with bending, twisting, and reaching as well as lifting, carrying, and moving objects at work.

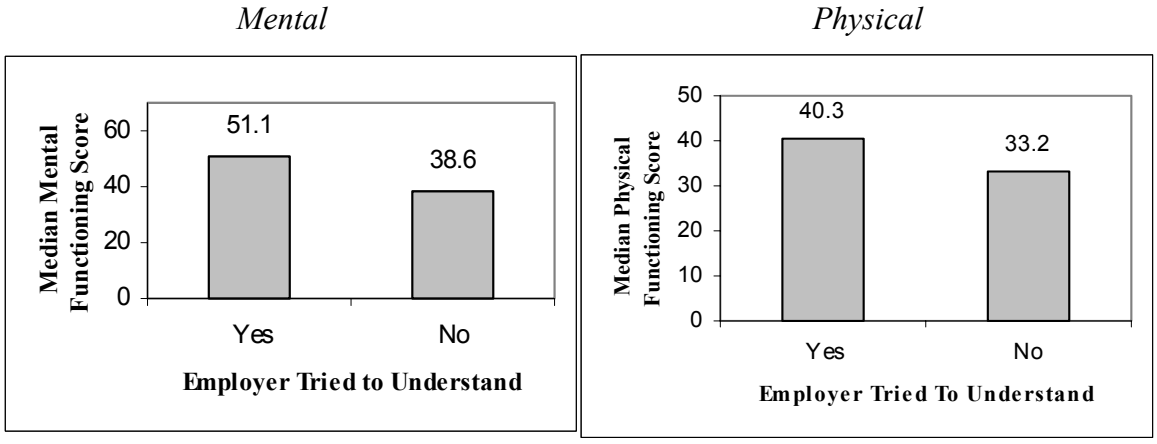
Texas injured workers who reported that their employer worked with their doctor on appropriate modified duty and return-to-work options reported significantly higher levels of physical and mental functioning than those whose employers did not. Median mental functioning scores were at the national average (49.9) when the employer and the doctor worked together, compared to a median score of 38.2, more than one standard deviation lower, when they did not.[48] Median physical functioning scores for Texas injured workers were 39.2 with employer/doctor cooperation and 32.2 without.[49]

[47] Workers in Texas, California, and Florida received psychological services in less than one percent of injuries with over seven days of lost time. See Workers' Compensation Research Institute, *The Anatomy of Workers' Compensation Medical Costs and Utilization: A Reference Book*, 2000.
[48] These differences are statistically significant at the .01 level.
[49] These differences are statistically significant at the .1 level.

See ROC's report entitled *Returning to Work: An Examination of Existing Disability Duration Guidelines and Their Application to the Texas Workers' Compensation System* for a more focused discussion on the economic benefits of modified-duty options and employer/doctor communication. These findings clearly show that modified-duty options and employer/doctor communication can improve an injured worker's reported mental and physical recovery after an injury.

Mental and physical functioning scores were also significantly higher for Texas injured workers when the employer tried to understand what the injured worker was able to do when he or she returned to work (see Figure 14).

Figure 14
Median Mental and Physical Functioning Scores for Texas Injured Workers Who Reported That Their Employers Tried to Understand Their Physical Limitations After They Returned to Work

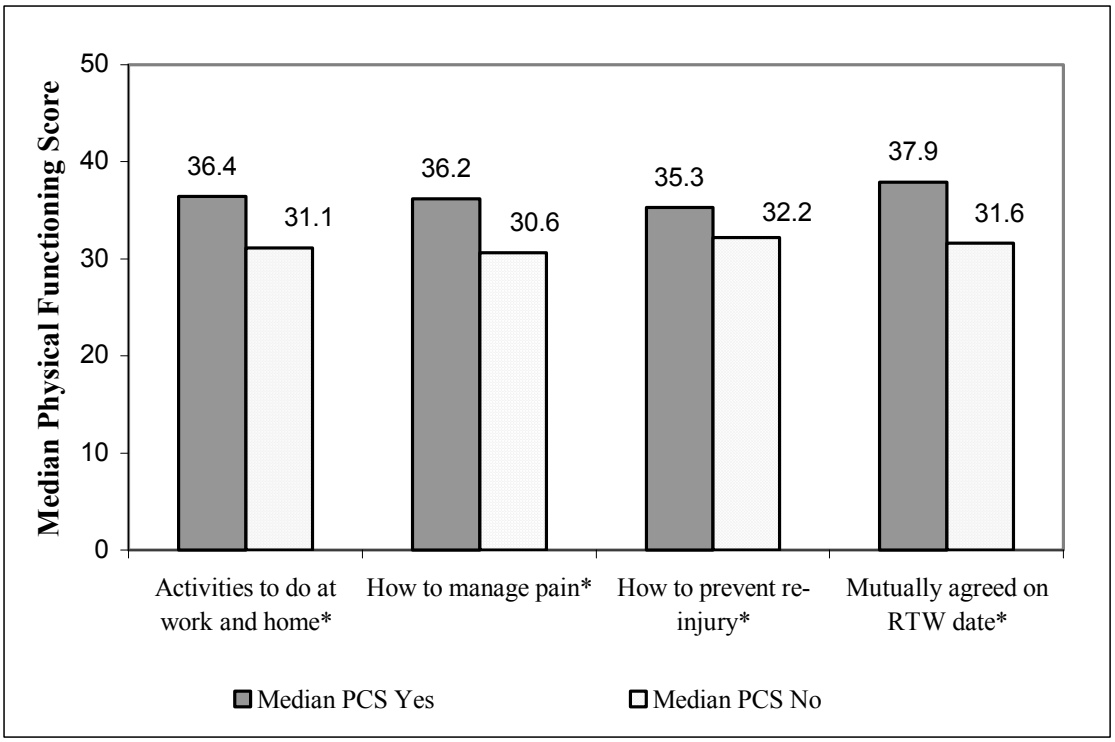


Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Physical functioning score differences are statistically significant at the .1 level and mental functioning score differences are statistically significant at the .01 level.

Physical functioning scores were also significantly better for Texas injured workers when a variety of subjects were discussed between the doctor and the worker. These discussions included activities that could be safely performed, pain management, prevention of re-injury, and an agreed-upon return-to-work date. Mental functioning scores were not affected (see Figure 15).

Figure 15

Median Physical Functioning Scores for Texas Injured Workers Who Reported That Their Doctors Discussed the Following Subjects With Them



Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: * indicates differences were statistically significant at the .1 level.

Additional regression results indicate that the use of surgery and physical medicine treatments had no effect on physical or mental functioning scores. This indicates that increased utilization of surgery and physical medicine treatments (Texas has higher overall utilization rates in both compared to other state workers' compensation systems and group health) is not associated with improvements in an injured worker's physical or mental recovery after an injury.

SECTION IV: GUIDELINE ANALYSIS AND COMPARISON

An important consideration in analyzing the amount and cost of medical care in the Texas workers' compensation system is how actual test and treatment use corresponds to nationally-accepted medical treatment guidelines.

Medical treatment guidelines are used by health care providers, insurance carriers, and system regulators to make decisions regarding the appropriate course of treatment for injured workers. However, the medical treatment and testing recommendations contained in these guidelines may be developed using various methods including scientific evidence, actual resource use statistics, expert consensus, or community consensus.

Guideline Attributes

There are a number of desirable attributes that make medical treatment guidelines enforceable, defensible, and useful. The following list was generated in the course of developing the guidelines for the American College of Occupational and Environmental Medicine (ACOEM), and this guideline has been extensively peer-reviewed by a large group of doctors in specialty societies. According to the ACOEM, the most rigorous guidelines are:

- Based on a careful review and analysis of high-grade evidence. This leads to accurate and reproducible recommendations for diagnosis, testing, and treatment.

- Reviewed by an expert panel in a structured way. Review ensures correct interpretation of the evidence, and allows development of structured consensus in areas where there is less than adequate evidence.

- Time-based. Health problems have a "natural history" of onset and healing that should be improved by treatment, or the treatment is not worth doing. In addition, some tests or treatment may be appropriate at one time during the course of an injury or illness and not at others.[50]

- Quantity-specific. A number of tests and treatments have appropriate quantities that maximize the benefit for the cost and risk involved. Stating these quantities aids medical management.

- Sequential. There is usually an optimally efficient and effective sequence of events for the diagnosis and treatment of various health problems. Guidelines should spell out this sequence.

[50] For the purposes of this report, the term "injury" is used to mean all health-related problems and complaints, and is inclusive of occupational illnesses. This usage is consistent with most workers' compensation literature, statutory language in Texas, and common practice.

- Based on risk/benefit analysis. Some tests and procedures have been evaluated for benefit versus risk. Good guidelines should rank tests and procedures for various conditions in order of risk/benefit ratio, yield, and appropriateness. This should include a list of unproven procedures as well.

- Cognizant of risks for delayed functional recovery. A number of economic, legal, work site, personal, injury-related and psychosocial conditions are known to increase the risk for slow functional recovery and time off work. Knowledge of these risks forms the basis of proactive case management.

- Activity-based. Activity forms an important part of therapy for many common work-related health problems, especially soft tissue injuries.

Table 28 compares the attributes of several state workers' compensation treatment guidelines (including those from Texas, Colorado, California, and Minnesota), the American College of Occupational Medicine practice guidelines (ACOEM), and the low back guideline developed by the federal Agency for Health Care Policy and Research (AHCPR).[51] Like Texas, many states developed treatment guidelines in the early- to mid-1990s in response to escalating medical costs and evidence of poor quality care in workers' compensation cases. The ACOEM and AHCPR guidelines were also developed during this timeframe to provide an independent and professional set of recommendations based on a careful survey and assessment of the scientific literature about diagnosis, testing, treatment, and activity modification.

Table 28
Comparison of State and National Medical Treatment Guidelines

	Treatment Guidelines					
Guideline Attribute	**TX**	**CO**	**MN**	**CA**	**ACOEM**	**AHCPR**
Primarily evidence-based	No	Partial	Partial	Partial	Partial	Yes
Reviewed by expert panel	Yes	Yes	Yes	Yes	Yes	Yes
Contain treatment time frames	By level of care	Yes	Yes	Yes	Yes	Yes
Contain treatment quantities	Some	Some	Some	Some	Implied	Some
Contain treatment and diagnostic sequence/ paths	Some	Implied	Yes	No	Yes	Yes
List test and	No	Implied	Implied	Implied	Yes	Yes

[51] Texas uses a variety of treatment guidelines including a *Spine Treatment Guideline* (recently revised by TWCC in 1999), an *Upper Extremities Guideline* (developed by TWCC in 1996), a *Lower Extremities Guideline* (developed by TWCC in 1998), and a *Mental Health Guideline* (developed by TWCC in 1995).

procedure effectiveness						
List unproven procedures	No	Yes	Yes	Some	Yes	Yes
Describe delayed recovery risks	Implied	Some	Some	Some	Yes	Implied
Contain activity modifications	No	Some	Some	Some	Yes	Some
Contain disability durations	No	Some	No	No	Yes	Implied

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

It is important to note that previous research from the ROC shows that the current Texas treatment guidelines are not used by a significant percentage of health care providers when determining an appropriate course of treatment for injured workers in Texas. Additionally, previous clinical reviews of the Texas guidelines with other state and national treatment guidelines found the Texas guidelines to be vague in many treatment areas, making them difficult to use and enforce.[52] System participants in Texas have recently raised these same concerns.

The following set of tables compares specific treatment and testing recommendations found in these guidelines. As a general matter, Texas guidelines are permissive and non-specific, implying that any test or treatment suggested is appropriate. Other treatment guidelines tend to have quantitative recommendations for treatments and tests, which are generally similar among those guidelines. This is not surprising, since the evidence base used is the same. See the Technical Appendix for more examples of how Texas treatment guidelines compare with other state and national treatment guidelines.

Because the TWCC guidelines do not contain quantifiable recommendations for treatment and testing, Med-Fx staff assembled an interdisciplinary group of Texas health professionals to develop a series of consensus recommendations for soft tissue and nerve compression problems to use as a point of comparison. The recommendations, generally consistent with the California, AHCPR and ACOEM guidelines, are also shown in the Technical Appendix.

Table 29 compares the guideline recommendations for the diagnosis of acute soft tissue injuries. The Texas guidelines give no specific recommendations on the amount or timing of many diagnostic tests.

[52] See Research and Oversight Council on Workers' Compensation, *Workers' Compensation Medical Treatment Guidelines in Texas,* 1999.

Table 29
Comparison of Treatment Guideline Recommendations for the Diagnosis of Acute Soft Tissue Injuries

	Treatment Guidelines					
First 4-6 weeks ("acute phase")	TX	CO	MN	CA	ACOEM	AHCPR
History and physical	Yes	Yes	Yes	Yes	Focused	Focused
Plain x-rays	Yes	To rule out serious conditions only	To rule out serious conditions only	To rule out serious conditions only	To rule out serious conditions only	To rule out serious conditions only
MRI scans	Yes	No	No	No	No	No
Lab tests	Yes	To rule out serious conditions only	To rule out serious conditions only	To rule out serious conditions only	To rule out serious conditions only	To rule out serious conditions only
Physical or functional capacity evaluation	Yes	No	No	No	No	No

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Table 30 compares guideline recommendations for manipulation for different types of injuries. The Texas guidelines are not quantitative while the California, ACOEM, and AHCPR guidelines recommend a 4-week limit for acute back pain.

Table 30
Comparison of Treatment Guideline Recommendations for Manipulation

	Treatment Guidelines					
	TX	**CO**	**MN**	**CA**	**ACOEM**	**AHCPR**
Low back pain	Yes	1-5 treatments for 2 wks, then 1- 3 treatments for next 6 wks	1-5 treatments per week for 2-12 wks +	12 in 4 wks	2 types/ 2 wks+	2 types/ 2 wks+
Low back nerve compression	Yes	1-5 treatments for 2 wks, then 1- 3 treatments for next 6 wks	1-5 treatments per week for 2-12 wks +	No	No	No
Neck pain	Yes	1-5 treatments for 2 wks, then 1- 3 treatments for next 6 wks	1-5 treatments per week for 2-12 wks +	12 in 4 wks	No	N/a
Shoulder pain	Yes	Yes	1-5 treatments per week for 2-12 wks +	Yes	No	N/a
Hand, wrist pain	Yes	Yes	1-5 treatments per week for 2-12 wks +	12 in 4 wks	No	N/a
Hand, wrist nerve compression	Yes	Yes	1-5 treatments per week for 2-12 wks +	12 in 4 wks	No	N/a
Knee ligament or meniscus tear	Yes	Yes	1-5 treatments per week for 2-12 wks +	Yes	No	N/a

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Table 31 compares guideline recommendations for physical medicine modalities for different types of injuries. The Texas guidelines do, in fact, specify an appropriate duration for modalities not accompanying active treatment. The Minnesota guidelines, formulated in 1993, tend to allow more physical medicine than more recent guidelines.

Table 31
Comparison of Treatment Guideline Recommendations for Physical Medicine Modalities

Acute Care	*Treatment Guidelines*					
	TX	**CO**	**MN**	**CA**	**ACOEM**	**AHCPR**
Low back pain	2 wks	2-5x for 3 wks	1 week alone; 12 wks with active treatment	With active treatment	With active treatment	With active treatment
Low back nerve compression	2 wks	2-5x 3 wks	1 week alone; 12 wks with active treatment	With active treatment	With active treatment	With active treatment
Neck pain	2 wks	2-5x 3 wks	1 week alone; 12 wks with active treatment	With active treatment	With active treatment	With active treatment
Shoulder pain	2 wks	2-5x 3 wks	1 week alone; 12 wks with active treatment	With active treatment	With active treatment	With active treatment
Hand, wrist pain	2 wks	2-5x 3 wks	1 week alone; 12 wks with active treatment	With active treatment	With active treatment	With active treatment
Hand, wrist nerve compression	2 wks	2-5x 3 wks	1 week alone; 12 wks with active treatment	With active treatment	With active treatment	With active treatment

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

As previously illustrated in Section II of this report, Texas has high rates of surgery compared with other state workers' compensation systems and group health plans. A factor driving these increased surgical rates may be a lack of specific surgical criteria for work-related injuries in Texas. Surgical criteria typically outline the types of injuries for which specific surgical procedures have been proven effective as well as time periods for conservative treatment that should elapse prior to surgery.

As examples, Tables 32 and 33 compare the diagnostic criteria and surgical indications for lumbar nerve root decompression. Texas guidelines do not contain specific criteria or surgical indications that can be used to determine whether an injured worker requires surgery.

Table 32
Diagnostic Criteria for Lumbar Nerve Root Decompression

Criteria	*Treatment Guidelines*					
	TX	**CO**	**MN**	**CA**	**ACOEM**	**AHCPR**

Nerve root impingement by disc		x	x	x	x	x
Sciatica			x			
LS radiculopathy or radiculitis			x			
Persistent low back pain > leg pain	w/ fusion					
Leg pain > low back pain	x					

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Table 33
Indications for Lumbar Nerve Root Decompression

Criteria	*Treatment Guidelines*					
	TX	**CO**	**MN**	**CA**	**ACOEM**	**AHCPR**
Severe, incapacitating back pain			x	x	x	x
Failure to improve with conservative treatment		x	8 w	4 w	12 w	4 w
OR cauda equina syndrome			x	x	x	x
OR progressive neuro deficits			x	x	x	x
AND dermatomal sensory sx		x	x	x	x	x
OR nerve root motor deficit		x	x	x	x	x
OR appropriate reflex deficit		x	x	x	x	x
OR positive EMG			x			
AND consistent imaging study		x	x	x	x	x
Absence of comorbidity				x	x	x
"surgical indications"	x					
OR confirming Spinal Surgery Second Opinion for ICD-9-722.10	x		x			

Source: Med-Fx, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

This and previous analyses of state and national medical treatment guidelines reveals that:

- In general, state treatment guidelines are less specific than national treatment guidelines and tend to allow more treatment;

- The Texas treatment guidelines do not specify amounts of treatment that would be appropriate, making them less useful for guiding medical management;

- The surgical indications in the Texas treatment guidelines are vague and do not provide guidance for surgical appropriateness; and

- The Texas guidelines also lack an adequate physical medicine sequence (i.e., which treatments should be used for how long before proceeding to the next level of treatment) which may contribute to its higher physical medicine rates.

SECTION V: UTILIZATION REVIEW ANALYSIS

In the current Texas workers' compensation system, insurance carriers and self-insured employers are responsible for monitoring and managing the appropriateness of medical care provided to injured workers and paying medical bills. This responsibility is commonly known as utilization review. According to the *Texas Insurance Code*, utilization review is defined as "a system for prospective or concurrent review of the medical necessity and appropriateness of health care services being provided or proposed to be provided to an individual within this state."[53] In practice, utilization review companies often also provide retrospective review of the medical necessity of treatments and bill review to ensure that bills are paid in accordance with the 1996 TWCC *Medical Fee Guideline*.[54]

Insurance carriers may conduct these reviews internally or contract with third-party utilization review agents (URAs). Self-insured employers are required to use a third-party URA for all of their claims management services.

Unfortunately, there is a fair degree of misunderstanding among system participants about utilization review. There is also disagreement among system participants about the need for the utilization review process, as well as its efficacy. Specifically, health care providers have complained that the utilization review process, documentation requirements, and timeframes are burdensome, resulting in delays in care and reductions in payments. On the other hand, insurance carriers and URAs complain that the documentation provided by health care providers is often inadequate, preventing them from efficiently reviewing the medical necessity of treatments.

Considering the cost and utilization findings presented earlier in the report, it is clear that improvements to the current medical care utilization review process are warranted. To understand more about the way insurance carriers and URAs review the medical necessity of care and review and pay medical bills in Texas, the Med-Fx/ROC team studied the processes and effectiveness of utilization and medical bill review through surveys, site visits, interviews, and data analysis.

Perceptions About Utilization Review

Miscommunication and misunderstanding about the components, requirements, and processes for utilization review can cause friction, delays, and dissatisfaction among system participants. Because of divergent ideas about what utilization review is and how it should be done, health care providers, insurance carriers, and URAs were interviewed to obtain their working definition of "utilization review" in workers' compensation cases (see Table 34). Overall, health care providers, insurance carriers, and URAs generally

[53] See *Texas Insurance Code*, Article 21.58A, Section 2 (20).
[54] Prior to 1997 (75th Legislature), there were no registration or certification requirements for workers' compensation URAs operating in Texas.

agreed on most issues, except that a significantly higher percentage of health care providers believed that decisions about whether injuries are work-related also fall into the definition of "utilization review."

Table 34
Perceptions of Insurance Carriers/URAs and Health Care Providers Regarding the Definition of Utilization Review for Workers' Compensation Claims

UR includes…	*% of Carriers/URAs that Agreed*	*% of Health Care Providers that Agreed*
Review of medical necessity	92%	89%
Work-relatedness decisions	35%	58%
Medical bill review	64%	62%
Medical dispute resolution	54%	62%
Re-bundling of bills	35%	23%
Disability management	35%	27%

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Some of the health care providers surveyed had negative opinions about the role of utilization review. Many of these comments pertained to how the process is managed by insurance carriers and URAs, rather than its structure or intent.

In structured interviews, insurance carriers and URAs were asked to identify issues affecting both the cost and quality of medical care in Texas.[55] Insurance carriers and URAs identified issues including:

- Treatment of body parts that are unrelated to the injury;
- Inappropriate use of physical medicine treatments;
- Health care provider use of "cookie cutter" physical medicine treatment protocols for every worker in order to avoid utilization review;
- Manipulations in multiple body parts and for all types of injuries, including injuries involving major trauma in which manipulation may not be appropriate;
- Exercise maintenance programs that last months to years beyond their useful duration;
- Inappropriate use of surgery when surgery is not clinically indicated;
- Different rates of utilization for similar types of injuries depending on geographic area and type of health care provider; and
- Over-utilization of prescription medicine.

[55] In an attempt to verify insurance carrier/URA perceptions, Med-FX and ROC staff also asked to see any examples supporting these perceptions that could be derived from the carrier's or URA's data system. However, few carriers and URAs could produce any quantitative data to document their perceptions. In general, their data systems do not appear to support regular reporting of medical utilization trends.

Insurance carriers and URAs also reported their perceptions of the problems preventing them from conducting adequate medical necessity reviews, including:

- Lack of adequate medical documentation by health care providers;
- Delayed case management referrals by insurance carriers;
- Vague or permissive TWCC-adopted treatment guidelines;
- Lack of evaluation criteria for work hardening/conditioning and pain management programs;
- Difficulty in obtaining objective Required Medical Examiners (RMEs) to validate treating doctor medical findings;
- Employers who do not cooperate with modified-duty recommendations, delaying recovery and leading to additional tests/treatment; and
- Perceptions that health care providers usually win medical dispute resolution appeals at the State Office of Administrative Hearings (SOAH).

The Process of Utilization Review

When health care providers were asked how URAs make medical necessity decisions, most felt that URAs relied primarily on their background and experience (73 percent) rather than workers' compensation statutes and regulations (58 percent) or evidence-based treatment guidelines (31 percent). As a result, almost two-thirds (62 percent) of health care providers indicated that they thought decisions were made arbitrarily.

After comparing these perceptions with observations collected from site visits with insurance carriers and URAs, it appears that many medical necessity decisions are made using the following criteria (in order of prevalence):

- Background and experience of the carrier or URA;
- Proprietary screening criteria (developed mostly internally by the carrier or URA);
- Texas Workers' Compensation Commission treatment guidelines;
- Texas workers' compensation statutes and regulations; and
- Consensus and evidence-based treatment guidelines (both public and proprietary).

As Table 35 indicates, insurance carriers and URAs are currently using a variety of treatment and/or disability duration guidelines to perform utilization review.

Table 35
Utilization Review Guidelines Currently in Use
for Texas Workers' Compensation Claims

Guidelines	Agents	Insurers	Weighted Average
TWCC Treatment Guidelines	90 %	100 %	92 %
Medical Disability Advisor	70 %	33 %	62 %
Milliman & Robertson Workers' Compensation	50 %	50 %	50 %
HCIA Length of Stay	30 %	75 %	40 %
Texas Chiropractic Association	30 %	50 %	35 %
Milliman & Robertson Inpatient	40 %	0 %	31 %
American Academy of Orthopedic Surgery	20 %	50 %	27 %
Milliman & Robertson Return to Work	30 %	0 %	23 %
InterQual Inpatient criteria	20 %	25 %	21 %
InterQual Workers' Compensation	20 %	0 %	15 %
Optimed	10 %	25 %	14 %
InterQual surgical criteria	0 %	25 %	6 %

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: Each certified or registered URA is required to have copies of the TWCC treatment guidelines. The *Medical Disability Advisor* is a disability duration guideline and not a treatment guideline.

Observations from Site Visits

During site visits, a variety of effective and ineffective processes and practices were observed among insurance carriers and URAs.

Effective utilization review practices included:

- Use of detailed and evidence-based screening criteria for decision-making;
- Increased interaction between adjusters, utilization reviewers, case managers, and bill reviewers (i.e., a team-integrated approach);
- Properly trained reviewers;
- Use of an integrated data system that the review team shares with one another; and
- Consideration of the relationship between the injury and physical work requirements, including:
  - working with the employer on modified work assignments that do not exacerbate the injury or cause subsequent injury;
  - encouraging treatment that encourages physical improvement in those areas critical to safe return-to-work; and
  - identifying early case management referrals.

Ineffective utilization review practices included:

- Acceptance of medical diagnoses without validation;
- Use of "screening lists" that search for key words rather than conducting reviews using the history of the patient and the evidence of effectiveness for the proposed medical treatment in the specific circumstance and timeframe;
- Misapplication of the insurance carrier's or URA's screening criteria (i.e., the proprietary treatment guidelines carriers and URAs use to screen for the medical necessity of treatments);
- Lack of training for staff in areas such as anatomy, physiology, and the clinical evidence that supports the URA's screening criteria; and
- Inadequate provision, collection, and management of information on a worker's clinical condition, physical limitations, and work status to help determine the medical necessity of certain types of treatments and services (e.g., work hardening/conditioning or therapeutic treatments).

Based on the results of these insurance carrier and URA site visits and interviews, it is clear that the use of ineffective review practices is widespread.

One important observation from the site visits was the lack of diagnosis validation. Many injured workers in Texas -- particularly those in the top 20 percent of claims which account for 80 percent of system costs -- have multiple diagnoses, many of which do not appear to be clinically related to the accepted injury. The site visit team did not observe any attempts by insurance carriers or URAs to validate medical diagnoses, especially if those diagnoses had changed, before reviewing the medical necessity of medical treatments or tests.

During these same site visits, some insurance carrier/URA staff expressed their beliefs about workers' compensation utilization review. These beliefs included:

- The doctor's diagnosis must be right;
- Surgery should be authorized early, because it will be needed sooner or later;
- If it is on the TWCC list, it is appropriate to provide the service; and
- Injections and surgery are effective for most low back soft tissue injuries.

However, most evidence-based state and national treatment guidelines analyzed in Section IV of this report conclude that:

- Many diagnoses are inaccurate;
- More than 80 percent of potential surgical cases will resolve without surgery;
- Prior treatments and treatment timeframes should be taken into account when determining a continued course of treatment; and
- Scientific evidence is lacking on the effectiveness of epidural steroid injections or surgery in most soft tissue injuries.

Does Utilization Review Work?

When health care providers, insurance carriers, and URAs were asked to describe why they thought utilization review practices in Texas were effective or ineffective, responses were varied:

Why Utilization Review is Perceived as Effective

- Increases scrutiny/decreases unnecessary medical treatment;
- Prevents misleading or unnecessary tests;
- Limits total number of medical treatments; and/or
- Shortens treatment.

Why Utilization Review is Perceived as Ineffective

- Reviewers are inexperienced and under-trained;
- Cost, delays, and increased paperwork offset savings from unnecessary treatments;
- Significant resources required for effective utilization review;
- Inconvenient and causes treatment delays; and/or
- TWCC's second opinion spinal surgery program is ineffective.

Most tests and procedures are subject to some form of utilization review in Texas, either prospectively or retrospectively.[56] However, the utilization rates for many tests and treatments in Texas exceeds those found in other states and recommended in most state and national treatment guidelines (see Section II of this report). Clearly when compared with other states and guidelines, the current combination of state guideline regulation and insurance carrier monitoring is not effectively controlling the delivery of care.

Results of the Utilization Review Process

Many of the health care providers surveyed reported relatively low denial rates for their own medical practices (usually less than 10 percent). The only exception to this was the report of higher denial rates for physical medicine modalities prescribed or performed by osteopaths (21 percent) and chiropractors (53 percent).

URAs reported similarly low denial rates, but these rates varied significantly. Reported URA referral rates to a physician advisor ranged from 3 percent to more than 50 percent, with the lower end of the range being more common. Denial rates were reported to range from 2 percent to 5 percent, with a few organizations reporting much higher denial rates.

Medical Bill Review

Another important component of effective cost containment is medical bill review (MBR). MBR usually consists of reviewing the medical procedure codes and documentation to determine whether services have been billed correctly and aligning health care provider charges with the maximum reimbursement amounts (MAR) listed in the TWCC *Medical Fee Guideline*. The vast majority of the "savings" from URA medical management services are the result of MBR (an estimated $345 million in reductions for 1997, compared to an estimated $105 million in medical necessity

[56] Spinal surgeries are subject to a separate statutorily-mandated second opinion review process; see Section 408.026 of the *Texas Labor Code*. Although Section 413.013 of the *Texas Labor Code* lists concurrent reviews as one type of review allowed in the Texas system, the system has not set up a method by which this type of review may be conducted.

savings), yet the MBR process simply reduces excess billings to the payment amount required by the system (or, in some cases, a percentage savings for health care providers who enter into PPO-type contracts).[57]

The methods by which insurance carriers or URAs conduct MBR appear to vary widely. Most insurance carriers and URAs have developed their own bill review software to adjust bills to the TWCC *Medical Fee Guideline*, thereby raising the possibility that their interpretations of TWCC medical fee ground rules may vary.

If a medical treatment, test, or service does not have a MAR value assigned to it in the TWCC *Medical Fee Guideline*, insurance carriers are required to reimburse health care providers at an amount that is "fair and reasonable." However, the definition of a "fair and reasonable" reimbursement is open to interpretation, and thus varies. In general, most URAs reported that "fair and reasonable" usually means that the bill will be paid at 80 percent of the amount charged by the health care provider, far higher than other health systems (typically from 50 to 70 percent of charges).

The qualifications and skill levels of URA review staff also varied considerably. One practice that appeared to greatly improve the yield of bill review was manual review by experienced nurses, working in coordination with physician reviewers and case managers when patterns were detected.

URAs reported that some system features hampered their ability to effectively conduct MBR, including:

- No TWCC utilization review criteria for pain management programs;
- No TWCC utilization guidelines/formulary for medication use, particularly new or off-label uses, resulting in over-medication and unapproved uses;
- Unbundling of surgical procedures and physical medicine treatments;
- Hospital bills consistently exceeding the level of "stop loss" so that the bill will revert to payment at 75 percent of charges rather than the specified per diem payments;
- High markups on durable medical equipment (DME) and surgical implants;
- Procedures billed at up to 20 times the Medicare rate; and
- High rates billed for supplies with no documentation to determine the basis for the rates.

Suggestions for Improvement

[57] The estimated $345 million in "savings" for MBR includes $190 million in reductions to the TWCC *Medical Fee Guideline*, $80 million in PPO or other contract discounts, and $75 million in fair and reasonable payment reductions. The estimated $105 million in medical necessity "savings" from utilization review includes $20 million for unnecessary treatments or treatments not according to TWCC guidelines, $20 million for no pre-authorization of required services, $50 million for undocumented medical treatments and tests, and $15 million for treatments unrelated to the injury/injury not work-related/not treating doctor. MBR also does not have much effect on hospital and other facility reimbursements, since those reimbursements are not listed in the TWCC *Medical Fee Guideline* and are subject to "fair and reasonable" reimbursements.

Health care providers surveyed had the following suggestions for improvement (see Table 36):

Table 36
Improvements in Utilization Review Suggested by Health Care Providers

Suggested improvement	*Proportion of Health Care Providers Interviewed*
URA should provide a clear explanation for decision	81%
Cite studies supporting decision	73%
Discuss the case with the treating doctor	69%
Use evidence-based treatment guidelines	65%
Use same specialty provider for reviews	65%
Get better information on each case	54%
Require shorter review time	54%
Electronic submission and feedback	50%
System should provide comparative data on outcomes	46%
Intervene sooner	39%
Use a local provider for review	31%

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Interestingly, some of the suggestions for improvement made by URAs were consistent with health care provider suggestions (see Table 37).

Table 37
Improvements in Utilization Review Suggested by URAs

Suggested improvement	*Proportion of UR Agents Interviewed*
Intervene immediately in case	69%
Use evidence-based treatment guidelines	62%
Obtain better information on case/improve communication with health care providers	62%
Prevent adjusters from overturning URA decisions	54%
Use automated treatment guidelines	54%
System should provide comparative data on outcomes	31%
Provide for co-pays and deductibles for worker	23%
Monitor health care providers on Approved Doctor List	15%
Involve informed injured workers	8%

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.

Regulation of Utilization Review Agents in Texas and Other States

In Texas, regulation of URAs involved in workers' compensation claims began after the 75th Legislature in 1995 amended existing HMO/URA statutes that had previously not

required the certification and/or registration of workers' compensation URAs.[58] As a result, the Texas Department of Insurance (TDI) adopted rules for URAs in workers' compensation cases.[59]

Since the statute confers the authority for regulation of URAs to TDI and the authority for regulation of the *Workers' Compensation Act* to TWCC, the two agencies entered into a Memorandum of Understanding (MOU) in October 1997 to divide duties for URA regulation as the law allows. TDI responds to complaints regarding the certification and registration requirements of URAs, while TWCC handles complaints regarding compliance with the *Workers' Compensation Act* and quality of care issues. However, little activity in URA regulation has resulted, and as of August 2000, no URAs had been fined, de-certified or refused renewal of their certification.

In addition, although the MOU contemplated that TDI and TWCC would share communications regarding the status of complaints and the resulting disciplinary actions, this communication has been lacking. As of August 2000, no URA complaints or information regarding the outcome of the complaints forwarded by TDI had been referred to TDI from TWCC pursuant to this arrangement.[60] Regulation of workers' compensation URAs in Texas, therefore, remains largely a registration process with little if any monitoring of post-registration activities.

The following table summarizes the mechanisms in place to regulate URAs in Texas and other states. URAs must be state-certified in Arkansas and Kentucky, for example, and either certified or registered in Texas. The criteria for certification are generally structural and procedural. No state collects data on URA review patterns for certification purposes.

Table 38
Regulatory Mechanisms for URAs in Texas and Other States

URA Regulatory Mechanism	*States*								
	AR	CA	FL	GA	KY	MN	NJ	OR	TX
Certification	X				X				X
Registration									X
Audits									*
Accreditation				X					
Insurance Dept Regulations	Carriers								X
WC Agency Regulations		X							

Source: Med-FX, LLC. and the Research and Oversight Council on Workers' Compensation, 2000.
Note: * Although the Texas system does not audit URAs, it does regulate insurance carriers for medical compliance on procedural matters.

[58] See *Texas Insurance Code*, Article 21.58A.
[59] See 28 TAC § 19.20119.202.
[60] See 2000 *Biennial Report of the Research of Oversight Council on Workers' Compensation*, p. 47.

Arkansas allows insurance adjusters to perform utilization review, as well. Those activities are regulated by the Department of Insurance in a process parallel to the certification of URAs.

The California Division of Workers' Compensation has promulgated regulations requiring URAs and carriers that perform utilization review to use guidelines and to file them with the Division, but there are no provisions for enforcement or review of the guidelines for appropriateness.

Colorado, Texas, and Utah rely on regulations promulgated by their department of insurance, rather than workers' compensation regulators, to govern the behavior of URAs as well as insurance carriers.

Georgia accepts national accreditation of URAs, although sources in Georgia indicated that the accreditation in which they had participated focused on structure and process, without determining the effectiveness of review or the accuracy of the submitted documents. Accreditation also does not review compliance with state regulations.

In summary, while there is some regulation of URAs in seven of the nine states examined for this report, that regulation is largely a gating or registration procedure. There is an initial application, some degree of review of the application, but then no or minimal with data collection or audits to determine effectiveness or compliance.

System Regulators' Opinions of Effective Cost-Management Mechanisms

When interviewed, system regulators in other states had divergent opinions about which regulatory mechanisms have had positive effects on the cost and quality of medical care in their jurisdiction. However, many of these regulators felt that the presence of managed care arrangements for workers' compensation cases and/or the enforcement of evidence-based treatment guidelines have changed health care provider and insurance carrier behavior to be more consistent with documented "best practices."

In Minnesota, system regulators reported a 30 percent decline in costs for the first year of new managed care regulations. This decrease was believed to be due to increased health care provider accountability and a simultaneous change in the fee schedule. The exceptions to this assessment were California and Florida where the presence of managed care has not reduced overall treatment utilization significantly.

Regulators typically held the belief that many regulatory provisions were not effectively enforced, nor were the staff and processes in place to enforce or monitor most URA regulations. None of the system regulators interviewed could cite ongoing data collection or monitoring to ensure regulatory enforcement or clinical effectiveness. All of the regulators interviewed stated that they collected very little if any data. Regulators, particularly medical directors, felt that data to better understand costs and cost trends in real time would be desirable.

SECTION VI: DATA AND DATA ISSUES

Texas is one of the few states that collect significant workers' compensation medical, claim, and dispute data to fill a variety of statutory mandates. This places its ability to analyze its system and identify issues above that of most states. The ability to maintain and build on the strong foundation of data in place will be key in implementing solutions that address access, cost, and quality of care in the workers' compensation system in Texas.

However, a substantial amount of the data currently being collected are not organized for maximum utility, nor monitored for integrity sufficiently, to allow key analyses in such areas as effective health care delivery and return-to-work success. This is largely due to the rapid start-up required to implement the 1989 reform act and the tendency to design data collection requirements to meet specific statutory programs and their associated rules (and rule changes), rather than view data collection as part of a comprehensive data requirements model.[61]

This section of the report identifies those areas of the workers' compensation system that require additional or improved data collection to support and enforce study recommendations.

In addition to analyzing existing TWCC forms and databases, Med-Fx and ROC staff were able to draw upon observations of health care provider records and insurance carrier/URA data systems during the various site visits. This information was subsequently compared against system needs to determine possible enhancements that might be required. While adding more data requirements to an already complex system might seem to potentially exacerbate existing problems, the following recommendations are offered with the aim of improving the quality of data already collected and expanding the system's monitoring capabilities to achieve greater efficiencies and effectiveness.

Data needed to improve medical management in the Texas workers' compensation system include:

Medical Error Prevention
Diagnosis Validation

Importance: Attempts to compare diagnoses with appropriate medical treatments in other parts of this study revealed many clinically illogical pairings. The ratio of nerve compression diagnoses to soft tissue diagnoses of the same body part is far higher in Texas than in many other states. A significant number of non-traumatic injuries had multiple diagnoses covering a variety of different diagnostic groups and body parts. TWCC treatment guidelines provide little guidance for the validation of diagnoses and

[61] TWCC has recently initiated a long-term (6-8 year) Business Process Improvement project that will address, among other issues, its growing data needs including both data shortcomings and opportunities.

URA site visits demonstrated that reviewers do not routinely validate diagnoses. Taken together, this suggests that some diagnoses may be less than accurate.

Current Data: Currently, few standardized data are collected describing the cause of an injury, subjective symptoms, objective signs, or diagnostic test results. Most state report forms include boxes for the cause of the injury, but this information is either usually missing or in a text form that makes data analysis difficult because it is not coded. The medical portions of current first and subsequent report forms are block text fields, which permit imprecise, incomplete, or no entry of the level of clinical detail suggested by the current TWCC treatment guidelines.

Benefits of collecting additional data: Collecting discrete, routine information about the cause of an injury as well as symptoms (the patient's complaints), signs (problems or abnormalities observed by the treating doctor), and diagnostic test results would allow insurance carriers and URAs to validate diagnoses and identify serious medical conditions that may require immediate attention. It would also allow proper use of review criteria and guidelines, which are diagnosis-based and assume an accurate diagnosis of the health problem.

Collecting these data would help prevent a variety of medical errors, permit integrated case management, and might allow for other types of reimbursement mechanisms such as case rates that depend on appropriate and timely diagnosis.

Costs associated with additional data collection: Health care providers would have to complete forms or electronically enter data with discrete signs, symptoms and mechanisms for the top clinical conditions encountered in workers' compensation (this will cut down on the data collection requirements). This information should already be contained in the injured worker's medical record. If doctors do not submit the data electronically, there may be data entry or imaging costs for insurance carriers. The administrative burden of collecting this additional data could be offset by fewer treatment and payment denials from insurance carriers and URAs due to lack of documentation.

Treatment Plans and Requests

Importance: Treatment plans aid logical thinking about care for specific health problems. When compared and modified over time, treatment plans form a valuable roadmap to aid patient recovery in the most efficient and effective way. Lack of a well thought-out treatment plan often leads to redundant testing, conflicting treatments, or continuing but ineffective treatment, particularly for soft tissue complaints.

Current data: While treatment plans are encouraged by the TWCC treatment guidelines and most insurance carriers' internal operating policies, health care providers often do not submit them. The lack of clear, promptly-submitted treatment plans is in fact cited by many of the URAs surveyed as an example of inadequate health care provider documentation.

Benefits of collecting additional data: Collecting treatment plans in chronological order allows a clear overview of the injured worker's medical progress over time. Longitudinal management of medical care is critical to see whether the patient is functionally recovering more quickly or more slowly than the natural (untreated) resolution of the complaint. Many health problems seen in workers' compensation today will resolve on their own; the key question is how fast and to what degree health care improves the outcome.

Collecting these data would also encourage timely feedback from health care providers and insurance carriers regarding the appropriateness of proposed medical treatments and reduce disputes resulting from miscommunication. Insurance carriers and URAs could review the necessity of proposed treatments as a sequence of events rather than isolate individual treatments for approval or denial. This could reduce treatment delays that currently result from individual pre-authorization requests.

Costs associated with additional data collection: Health care providers would have to complete forms or electronically enter data with specific treatment timeframes, recommended frequencies of tests, procedures, and medication for the top medical conditions encountered in workers' compensation.

Disability Management

Importance: Income benefits paid to injured workers who are off work as a result of their injuries currently account for a significant portion (around 40-45 percent) of paid losses in Texas. By collecting data on the physical abilities of injured workers, availability of modified duty by employers, and essential job functions, as well as return-to-work dates and wage amounts, the system can monitor the progress of medical care and identify injured workers who may need additional return-to-work assistance.

Current Data: Although encouraged to do so by the current TWCC treatment guidelines, insurance carriers and health care providers often do not collect information about essential job functions, available modified-duty options, injured workers' physical abilities and limitations, or job hazards that could aid in the development of a comprehensive disability management plan. Without this information, the opportunity for early worker education and counseling, problem solving, and appropriate modified-duty placement is diminished.

It is important to note that the recently implemented TWCC-73 form helps to improve data collection on an injured worker's physical restrictions; however, this form is currently submitted to insurance carriers only and not to TWCC, making it difficult to determine whether it is effective in improving return-to-work outcomes. Further, an injured worker's return to work date and post-injury wages are currently not reported directly to TWCC. As a result, there are significant data collection and processing issues that currently preclude the accurate determination of return-to-work outcomes in Texas.

Benefits of collecting additional data: Data on physical status, work restrictions, essential job functions, availability of modified-duty options, and workplace hazards are critical to identifying safe modified-duty opportunities for injured workers. Direct data on return-to-work dates and wage amounts are also needed to gauge the effectiveness of return-to-work efforts.

States such as Florida and Oregon have seen significant improvements in their return-to-work outcomes after improving their return-to-work data collection efforts and implementing employer incentive programs.[62]

Costs associated with additional data collection: Employers would have to submit information on essential job functions and the availability of modified duty for injured workers to insurance carriers and health care providers. In return, health care providers would supplement the information currently captured on the TWCC-73 form along with an agreed-upon return-to-work date. Insurance carriers would coordinate this information, along with the information they currently collect on return-to-work dates and wages, to form a comprehensive set of return-to-work data that could be used to identify extended absences from work and encourage the implementation of early case management techniques.

Resource Consumption Monitoring
Identification of Treating Doctor and URA
Outcomes Monitoring

Importance/Benefits of collecting additional data: Monitoring the amount of medical care provided to injured workers as well as the outcomes of this care allows the system to provide feedback to health care providers and insurance carriers for self-improvement; however, it cannot be done without the proper identification of the treating doctor and URA, information that TWCC does not currently capture. Continued identification and monitoring of the amount as well as the outcome of medical care would also allow the system to identify health care providers and insurance carriers/URAs who may require disciplinary action.

Outcomes data would allow system participants to correlate the use of medical treatments, tests, and services and modified-duty options with injured worker access to care, satisfaction with care, health care provider treatment practices, insurance carrier utilization review practices, injured worker mental and physical functioning outcomes, and injured worker economic impacts.

Current Data: Currently, the system does not collect standardized data on process or functional outcomes, nor does it systematically allow the identification of the injured worker's treating doctor and the URA involved in a claim. This precludes the system

[62] See Florida's *Statistical Supplement to the 2000 Annual Report*, Division of Workers' Compensation, Bureau of Research and Education, Florida Department of Labor and Employment Security, 2000; and Research and Oversight Council on Workers' Compensation, *Return-to-Work Programs in Oregon and their Applicability to Texas,* 1997.

from providing constructive feedback regarding practice and review patterns to the health care provider and URA communities.

The collection of functional outcome data is currently intermittent and usually in response to special study requests. This in effect mandates periodic, expensive studies aimed at evaluating the quality of medical care.

Costs associated with additional data collection: Insurance carriers would have to report the treating doctor's license number, as well as license numbers on all referral providers on medical bills to TWCC.

An ongoing survey of injured workers would need to be conducted at a fixed interval post-date of injury. This would permit identification of trends over time and timely evaluation of the impact of statutory and/or regulatory changes made to the system.

CONCLUSION AND POLICY OPTIONS

The research studies commissioned by HB 3697 confirm earlier perceptions by system participants that Texas workers' compensation medical costs exceed those in other states and other health care delivery systems. These cost differences result primarily from more medical testing and treatment provided to Texas injured workers for longer periods of time than for workers with similar injuries in other state workers' compensation systems and in group health plans.

Despite extensive, and often excessive medical treatment, Texas injured workers do not appear to be more satisfied with their medical care than do workers in other states, and fewer report that they have physically recovered and are back at work earning the same amount of money they made prior to their injuries.

While the responsibility for this medical cost trend largely falls to health care professionals who provide the medical care and insurance carriers whose responsibility it is to review the appropriateness of care and pay medical bills, the system's administrators must also take responsibility for the lack of coordinated and consistent monitoring of medical issues since the system underwent reform in 1989. Less than adequate resource allocation and inconsistent regulatory efforts by system administrators have bred variation in medical treatment and review practices, which has not only affected the cost and quality of medical care provided to injured workers in Texas, but also contributed to health care provider practice patterns that differ for occupational and non-occupational injuries.

Accordingly, improvements in the collection and use of workers' compensation data are necessary to effectively monitor the quality and cost of medical care provided to injured workers in the future. Specifically, additional attention should be placed on collecting medical outcome, treating doctor, and insurance carrier utilization review data for benchmarking purposes.

After examining all of the policy options laid out in this report, policymakers and system regulators should consider developing a comprehensive plan to address the amount of medical care provided to injured workers, the price of individual treatments and services in workers' compensation, the method by which the system resolves disputes, and the method by which the system regulates doctors and insurance carrier URAs. Regardless of the legislative and regulatory options policymakers choose to pursue, striking the balance between the cost and quality of care remains difficult, and will continue to plague the system in the future without improved monitoring and cooperation from all system participants.

The Basis for Reform – An Objective to Guide the System's Design

An important objective of the Texas workers' compensation system is to provide appropriate medical care designed to facilitate recovery and help the injured worker get

back to work as quickly and safely as possible. Achieving this objective is a cooperative effort.

Health care providers must validate medical diagnoses and determine an appropriate course of treatment for the injured worker using evidence-based treatment guidelines and their own professional judgement. This treatment should always be directed towards the ultimate goal of successfully returning the injured worker to work. Treating doctors, in particular, have special responsibilities to plan and coordinate the treatment from all referral health care providers; communicate treatment and recovery expectations with the injured worker; and work with the injured worker's employer on an effective transition plan that takes into account the injured worker's essential job functions and physical limitations.

In return, employers must communicate those essential job functions and, whenever possible, provide viable modified-duty positions that help the injured worker successfully reintegrate into the workplace.

Insurance carriers and URAs must utilize evidence-based treatment guidelines and sound medical judgement when making decisions regarding the appropriateness of medical treatment. These decisions should be clearly communicated to the injured worker's treating doctor and consider both the diagnosis and the entire proposed course of treatment.

Finally, injured workers must take an active role in their physical and financial recovery by making informed decisions regarding the choice of their treating doctor; cooperating with their doctor's treatment recommendations; understanding the statutory and regulatory provisions of their benefits; and participating with their doctor and employer in the development of their return-to-work transition plan.

Options for Reform of the Texas Workers' Compensation System

Achieving quality and cost effective medical care for injured workers in Texas will be challenging, given current expectations, communication issues, data collection strategies and practice/review patterns. There is no one simple solution.

It is clear that purely cost-containment or regulatory approaches are less likely to produce the desired results than would a comprehensive and coordinated strategy that promotes best treatment and utilization review practices through pricing reforms, communication, monitoring, dispute resolution, and finally regulation. Policy options that address each of these reform components as well as the implementation considerations for each of these options follow.

MEDICAL PRICING REFORMS

The following policy options were identified in the area of medical pricing:

1. ***Revision to fee guidelines.*** *Update the TWCC fee guidelines to correspond with other commonly-used medical fee standards.*

   Policymakers may consider one or more of the following options in updating the standards:

   - Convert to the most current CPT (current medical procedural terminology) codes.

   - Establish a fee guideline or individual reimbursement amounts for outpatient surgical services. These services are not currently covered under the fee guideline and are currently subject to "fair and reasonable" reimbursement amounts. Establishing standardized reimbursement amounts would reduce many fee disputes over what is "fair and reasonable."

   - Tie workers' compensation medical fees to a national standard, such as Medicare's Resource Based Relative Value Scale (RBRVS) or to a market-based standard such as the negotiated MCO and PPO discounts found in group health; or

   - Implement case rates (i.e., one reimbursement amount pre-designated for a particular kind of injury rather than reimbursement at the individual treatment level. These rates would provide one reimbursement for a particular category of injury, with more discretion to the provider in how worker's care is managed.

     The latter two options would require legislative changes to be implemented.

2. ***Use of generic equivalents and development of a formulary.*** *Require the use of generic prescription drugs where a generic alternative is available, and allow for the reimbursement of certain over-the-counter drugs if prescribed by a doctor. Consider establishing a workers' compensation prescription drug formulary.*[63]

   This option would require changes to current TWCC Medical Fee Guideline.

[63] A formulary is a list of allowable drugs, reimbursement amounts, and dosage guidelines.

COMMUNICATION AND UTILIZATION IMPROVEMENTS

The following policy options were identified to improve communication between system stakeholders regarding the cost and quality of medical care for workers' compensation cases.

1. ***Replace current treatment-guidelines with an evidence-based model.*** *Require TWCC to replace ineffective and vague treatment guidelines with evidence–based guidelines that contain recommendations regarding the amount and duration of medical treatment.*

   This option does not require legislative changes to be implemented.

2. ***Implement an input-based mechanism for new treatments or drugs.*** *Allow system participants – including health care providers, injured workers, insurance carriers, and employers – to petition TWCC for the inclusion of new medical treatments and drugs into the system. TWCC would review the medical evidence on the safety and efficacy of the proposed treatment or drug and determine whether it should be reimbursed under the Texas workers' compensation system.*

   This option does not require legislative changes to be implemented.

3. ***Emphasize the use of treatment plans.*** *In order to improve communication in the system regarding the expectations of medical treatment, consider requiring treating doctors to establish and report a treatment plan to the insurance carrier and injured worker for more serious injuries. Allow these treatment plans to be the basis by which the injured worker's treating doctor and the insurance carrier agree on what care is medically necessary.*

   Make treatment plans subject to voluntary pre-authorization (i.e., the treating doctor asks the insurance carrier to pre-certify the recommended treatment in the plan) and/or concurrent review by the insurance carrier (i.e., as the treatment plan changes or develops over time, the insurance carrier works with the treating doctor to determine whether changes are medically necessary).

   This option may require legislative changes to be implemented.

MONITORING AND REGULATION OF HEALTH CARE PROVIDERS AND UTILIZATION REVIEW AGENTS (URAs)

The following policy options were identified to improve monitoring of health care providers and URAs in the Texas workers' compensation system:

1. ***Training for providers in the system.*** *Require additional training and/or certification requirements for doctors who regularly participate in the Texas workers' compensation system (including injured worker treating doctors and insurance carrier review doctors). Training may include best practices for testing and treatment of common health problems among workers, workers' compensation rules and regulations, the importance of safe return-to-work options for injured workers, the role of the treating doctor as the medical care gatekeeper, and the method for assigning impairment ratings. Exceptions for these training/certification requirements may be made for emergency care or out-of-state doctors.*

   This option may require legislative changes to be implemented.

2. ***Monitoring of doctors and URAs.*** *Require TWCC to establish a systematic monitoring program of doctors and insurance carrier URAs as required by Section 413.002 of the Texas Labor Code. This could be accomplished by benchmarking doctors and URAs against state-adopted standards of care (e.g., the evidence-based treatment and disability management guidelines adopted by the state) as well as their peers' practice/review patterns. The results from these statistical profiles should trigger TWCC to conduct clinical and process audits of individual doctors or URAs and recommend disciplinary action.*

   This option does not require legislative changes to be implemented.

3. ***Improve regulation of URAs.*** *Promote efficient, consistent, and high quality medical reviews from insurance carriers and their URAs through increased system regulation.*

   Policymakers may consider one or more of the following options for regulation:

   - Require insurance review doctors to be Texas-licensed and on TWCC's Approved Doctor List (ADL);

   - Keep the current insurance carrier URA certification process in accordance with the Texas Insurance Code, and use the results from the statistical profiles and clinical audits to identify and remove the certification of outlier URAs;

   - Create a pilot project to consolidate utilization review services for workers' compensation cases under a single URA for public entities such as the state and universities; and/or

- Eliminate the current statutory URA certification process and require that all insurance carriers use a single state URA vendor or select list of vendors.

These options would require legislative changes to be implemented.

4. ***Improve regulation of health care providers and the Approved Doctor List (ADL).*** *Ensure access to efficient and high quality health care providers for injured workers by improving the regulation of the TWCC Approved Doctor List (ADL).*[64]

   Policymakers may consider one or more of the following options for regulation:

   - Keep the existing list of approximately 80,000 doctors, and using the results from the statistical profiles and clinical audits to identify and remove outlier doctors;

   - Eliminate the current list and automatically re-enroll doctors whose statistical and clinical profiles meet state standards of high quality medical care, while rejecting or offering provisional enrollment to those who do not meet state standards;

   - Enforce the current change of treating doctor provisions in the *Texas Labor Code* to allow workers to change treating doctors based on determinations of medical necessity and restrict changes aimed at securing new impairment ratings or medical reports. Require TWCC to change an injured worker's treating doctor if it determines that the worker is not receiving adequate medical treatment;

   - Create a pilot program to allow the state to set up or endorse a Managed Care Organization (MCO) or Preferred Provider Organization (PPO) for state employees and present the results of this pilot to the Legislature next session;

   - Allow Texas employers to voluntarily set up workers' compensation MCOs/PPOs according to state-set standards; and/or

   - Consider limits on the injured worker's initial choice of doctor to a specified period of time after the injury.

   All, but the first option would require legislative changes to be implemented

[64] Section 408.023 of the *Texas Labor Code* describes the formation of the Approved Doctors List (ADL). The list was originally formed by including each doctor licensed in the State of Texas on January 1, 1993. Each doctor who has been licensed to practice in Texas since that date has been added to the list. TWCC has the authority to delete and reinstate a doctor from this list.

MEDICAL DISPUTE RESOLUTION

The following policy option was identified in the area of dispute resolution.

1. ***Improve TWCC's access to medical expertise.*** *Require TWCC to use Texas-licensed doctors (either as contracted peer reviewers or as medical panelists) to make decisions on medical necessity disputes, pre-authorization disputes, and change of treating doctor decisions, in accordance with the statute. Additionally, require TWCC to utilize this medical expertise in its regulation of outlier doctors and URAs.*

   This option may require legislative changes to be implemented.

RETURN TO WORK

The following policy option was identified in the area of return to work.

1. ***Provide incentives to employers.*** *Build on the legislative changes made by HB 2513 (76th Legislature) by providing incentives to employers who implement an integrated accident prevention and disability management program that includes modified duty options for injured workers. Incentives could include mandated scheduled rating credits on employers' workers' compensation insurance premiums or other financial incentives (e.g., wage subsidies or state-sponsored worksite modification grants). These financial incentives have been used successfully by other state workers' compensation systems (e.g., Oregon) to encourage return to work.*[65]

   This option would require legislative changes to be implemented.

[65] See Research and Oversight Council on Workers' Compensation, *Return-to-Work Programs in Oregon and Their Applicability to Texas* (August 1997).

APPENDIX A

REFERENCES

Abbreviations

Acta Orthopedic Scandinavia Supplement.....*Acta Orthop Scand suppl*
Agency for Health Care and Policy Research.....*AHCPR*
American Association of Occupational Health Nurses Journal..*AAOHN J*

American Chiropractic Association News.....*ACA News*
American Family Physician.....*Am Fam Physician*
American Journal of Industrial Medicine.....*Am J Ind Med e*
American Journal of Psychiatry.....*Am J Psychiatry*
American Journal of Physical Medicine and Rehabilitation.....*Am J Phys Med Rehabil*

American Journal of Public Health.....*Am J Pub Health*
Annuals of Internal Medicine.....*Ann Intern Med*
Archives of Physical and Medical Rehabilitation.....*Arch Phys Med Rehab*
Arthritis Care Research.....*Arthritis Care Res*

Arthritis Research.....*Arthritis Rheum*
British Journal of Industrial Medicine.....*Br J Ind Med*
British Medical Journal.....*BMJ*
Canadian Medical Association Journal.....*CMAJ*
Clinical Journal of Pain.....*Clin J Pain*
Clinical Orthopedics.....*Clin Orthop*
Clinical Research.....*Clin Res*
Disability and Rehabilitation.....*Disabil Rehabil*
Family Practice.....*Fam Pract*
Health Psychology.....*Health Psychol*
Industrial Labor Relations Review.....*Ind Labor Rel Rev*
International Journal of Disability Studies.....*Int J Disab Studies*
Journal of the American Medical Association.....*JAMA*
Journal of Applied Psychology.....*J. Appl Psychol*
Journal of Bone and Joint Surgery in America.....*J Bone Joint Surg Am*
Journal of Clinical Epidemiology.....*J Clin Epidemiol*
Journal of Clinical Psychology.....*J Clin Psychol y*
Journal of General Internal Medicine.....*J Gen Intern Med*
Journal of Occupational and Environmental Medicine.....*J Occ Env Med*
Journal of Occupational Medicine.....*J Occup Med*
Journal of Psychosomatic Research.....*J Psychosom Res*
Journal of Rheumatology.....*J. Rheumatol*
Managed Care Quarterly.....*Manag Care Q*

Medical Care.....*Med Care*
Neurologic Clinics.....*Neurol Clin*
New England Journal of Medicine.....*NEJM*

Occupational and Environmental Medicine ..... *Occup Environ Med*
Occupational Medicine ..... *Occup Med*
Orthopedic Clinics of North America ..... *Orthop Clin NA*
Psychosomatic Medicine ..... *Psychosom Med*
Physiotherapy Research International ..... *Physiother Res Int*
Quality of Life Research ..... *Qual Life Res*

Review of Economics and Statistics ..... *Rev Econ Stat*
Scandinavian Journal of Public Health ..... *Scand J Pub Health*
Scandinavian Journal of Rehabilitation Medicine ..... *Scand J Rehabil Med*
Scandinavinan Journal of Work, Environment, and Health ..... *Scand J Work Environ Health*
Social Science in Medicine ..... *Soc Sci Med*
Social Security Bulletin ..... *Soc Sec Bull*

Agency for Health Care Administration and Florida Department of Labor and Employment Security, Division of Workers Compensation. *Medical Practice Guidelines: Universe of Florida Patients with Neck Pain or Injury.* Tallahassee: Agency for Health Care Administration, 1996.

Agency for Health Care Administration and Florida Department of Labor and Employment Security, Division of Workers Compensation. *Medical Practice Guidelines: Universe of Florida Patients with Low Back Pain or Injury.* Tallahassee: Agency for Health Care Administration, 1996.

Agency for Health Care Administration and Florida Department of Labor and Employment Security, Division of Workers Compensation. *Catalog of Endorsed Practice parameters and their Sources, 1993-1995.* Tallahassee: Agency for Health Care Administration, 1995.

American College of Radiology, Taskforce on Appropriateness Criteria. *Appropriateness Criteria for Imaging and Treatment Decisions.* Reston, VA: American College of Radiology, 1995.

American Academy of Neurology. *Clinical Practice Guidelines for Neurological Conditions*. Chicago: American Academy of Neurology, 1995.

American Academy of Orthopedic Surgeons. *Clinical Guideline on Wrist Pain*. Rosemont, IL: American Academy of Orthopedic Surgeons, 1996.

American Academy of Orthopedic Surgeons. *Clinical Guideline on Shoulder Pain*. Rosemont, IL: American Academy of Orthopedic Surgeons, 1996.

American Academy of Orthopedic Surgeons. *Clinical Guideline on Ankle Injury*. Rosemont, IL: American Academy of Orthopedic Surgeons, 1997.

American Academy of Orthopedic Surgeons. *Clinical Guideline on Low Back Pain*. Rosemont, IL: American Academy of Orthopedic Surgeons, 1996.

American Academy of Orthopedic Surgeons. *Clinical Guideline on Knee Pain*. Rosemont, IL: American Academy of Orthopedic Surgeons, 1996, 1997.

American Medical Association. *Current Procedural Terminology: CPT-2000.* Chicago: American Medical Association, 2000.

American Physical Therapy Association. *Guide to Physical Therapist Practice.* Alexandria, VA: American Physical Therapy Association, 1999.

Anderson R, Meeker WC, Wirick BE, Mootz RD, Kirk DH, Adams A. A Meta-analysis of clinical trials of spinal manipulation. *J. Manip Physiol Therap*, 1992; 15: 181-194.

Arkansas Workers Compensation Commission. *WCC Rule 30: Medical Cost Containment Program*. Little Rock: State of Arkansas Workers Compensation Commission, 1987, 2000.

Arkansas Workers Compensation Commission. *WCC Rule 33: Managed Care*. Little Rock: State of Arkansas Workers Compensation Commission, 1999.

Australian Chiropractic Association. *Clinical Parameters for Australian Chiropractic Practice.* DRAFT. Sydney: Australian Chiropractic Association, 2000.

Beard RE, Pentikainen T, Pesonen E. *Risk Theory: The Stochastic Basis of Insurance*, *Third Edition*. London: Chapman and Hall, 1969.

Bernard BP (ed.). *Musculoskeletal Disorders and Workplace Factors*. Cincinnati: National Institute for Occupational Health and Safety, 1997. DHHS (NIOSH) Pub. No. 97-141.

Bigos S, Bowyer OR, Braen GR, Brown K, Deyo R, Haldeman S, et. al. *Acute Low Back Problems in Adults: Clinical Practice Guideline No. 14.*. Rockville, MD: Agency for Health Care Policy and Research, 1994. AHCPR Pub. No. 95-0642.

Bishop YMM, Feinberg SE, Holland PW. *Discrete Multivariate Analysis.* Cambridge: The MIT Press, 1975.

Borenstein DG, Wiesel SW, Boden SD. *Low Back Pain: Medical Diagnosis and Comprehensive Management, Second Edition.* Philadelphia: W.B. Saunders Co., 1995.

Borenstein DG, Wiesel SW, Boden SD. *Neck Pain: Medical Diagnosis and Comprehensive Management.* Philadelphia: W.B. Saunders Co., 1996.

Bronfort G. Spinal manipulation: Current state of research and its indications. *Neurol Clin NA*, 1999; 17: 91-111.

Bruckman RZ, Rasmussen H. *Healthcare Management Guidelines: Volume 7, Workers Compensation*. Seattle: Milliman & Robertson, 1996

Bruckman RZ, Harris JS. Occupational Medicine Practice Guidelines. In Harris, J.S. (ed)., Managed Care in Occupational Medicine. *Occupational Medicine State of the Art Reviews*, 13(4), 1998, pp. 679-691.

Carey TS, Garrett JM, Jackman A, Hadler N. Recurrence and care seeking after acute back pain: results of a long-term follow-up study. *Medical Care*, 1999; 37: 157-164.

Carter JT, Birrell LN (eds). *Occupational health guidelines for the management of low back pain at work – principal recommendations.* London, Faculty of Occupational Medicine, 2000.

Colorado Workers Compensation Division. *Low Back Pain Medical Treatment Guideline.* Denver: Colorado Department of Labor and Employment, 1993, 1995, 2000.

Colorado Workers Compensation Division. *Lower Extremity Medical Treatment Guideline.* Denver: Colorado Department of Labor and Employment, 1995, 2000.

Colorado Workers Compensation Division. *Upper Extremity Medical Treatment Guidelines.* Denver: Colorado Department of Labor and Employment, 1995.

Colorado Workers Compensation Division. *Reflex Sympathetic Dystrophy/Complex Regional Pain Syndrome Medical Treatment Guideline.* Denver: Colorado Department of Labor and Employment, 1996.

Colorado Workers Compensation Division. *Medical Fee Schedule.* Denver: Colorado Department of Labor and Employment, 1995.

Danish Institute for Health Technology Assessment. *Low Back Pain: Frequency, Management and Prevention from an HTA Perspective.* Copenhagen: Danish Institute for Health Technology Assessment, 1999.

David HA, Moeschberger M. *The Theory of Competing Risks*. London: Griffin, 1978.

Department of Consumer and Business Services, Workers Compensation Division. *Department of Consumer and Business Services Web Site (regulations, fee schedule, reports, etc.).* Salem, OR: State of Oregon, Department of Consumer and Business Services, Workers Compensation Division, 2000.

Dillane JB, Fry J, Kalton G. Acute back syndrome: A study from general practice. *Br. Med. J.*, 1966; 2:82-84.

Eccleston SM, Yeager CM. *Managed Care and Medical Cost Containment in Workers Compensation: A National Inventory, 1997-1998.* Cambridge, MA: Workers Compensation Research Institute, 1997.

Field MJ, Lohr KN (eds.) *Guidelines for Clinical Practice: From Development to Use.* Washington, D.C.: National Academy Press, 1992.

Ferguson SA, Marras WS, Gupta P. Longitudinal quantitative measures of the natural course of low back pain recovery. *Spine*, 2000; 25: 1950-1956.

Fleiss, J. *Statistical Methods For Rates and Proportions, Second Edition*. New York: Wiley, 1981.

Florida Department of Labor and Employment Security, Division of Workers Compensation. *Florida Workers Reimbursement Manual for Ambulatory Surgical Centers.* Tallahassee: Florida Department of Labor and Employment Security, Division of Workers Compensation, 1992.

Florida Department of Labor and Employment Security, Division of Workers Compensation. *Florida Workers Reimbursement Manual for Work Hardening Programs and Pain Programs.* Tallahassee: Florida Department of Labor and Employment Security, Division of Workers Compensation, 1992.

Florida Department of Labor and Employment Security, Division of Workers Compensation. *Florida Workers Compensation Fee for Services Health Care Provider Reimbursement Manual.* Tallahassee: Florida Department of Labor and Employment Security, Division of Workers Compensation, 1995, 1997.

Florida Department of Labor and Employment Security, Division of Workers Compensation. *Florida Workers Compensation Reimbursement Manual for Hospitals*. Tallahassee: Florida Department of Labor and Employment Security, Division of Workers Compensation, 1999.

Florida Department of Labor and Employment Security, Division of Workers Compensation. *Health Care Provider Certification Rule.* Tallahassee: Florida Department of Labor and Employment Security, Division of Workers Compensation, 1995.

Frank J, Brooker A-S, DeMaio SE et al. The Natural History of Low Back Pain: An Overview for Occupational Physicians. In Harris, J.S., Loeppke, R.R., (eds.), *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998.

Frazier CB (ed). *HCPCS.* Salt Lake City: Medicode, 1998.

Gordon SL, Blair SJ, Fine LJ. *Repetitive Motion Disorders of the Upper Extremity.* Rosemont, IL: American Academy of Orthopedic Surgeons, 1995.

Haldeman S, Chapman-Smith D, Petersen DM Jr. *Guidelines for Chiropractic*

Quality Assurance and Practice Parameters. Gaithersburg, MD: Aspen Publications, 1993.

Harris JS. Clinical Practice Guidelines: Development, Use and Evaluation. *J. Occ. Env. Med.*, 1997; 39(1):23-34.

Harris JS et. al., *Occupational Medicine Practice Guidelines: Evaluation and Management of Common Health Problems and Functional Recovery in Workers.* Boston: OEM Health Information Press, 1997.

Harris JS, Bombardier C. Practice Guidelines. In Harris JS, Loeppke RR (eds.), *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998, pp. 173-178.

Harris JS. Payers' Use of Practice Guidelines. in Harris JS, Loeppke, RR (eds.) *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems,* Beverly Farms, MA: OEM Press, 1998, pp. 242-244.

Harris JS. The ACOEM Occupational Medicine Practice Guidelines. in Harris JS, Loeppke RR (eds.) *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998, pp. 179-183.

Harris JS, Miller LA. Sources and Uses of Occupational Medicine Data. in Harris JS, Loeppke RR (eds.) *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998, pp. 111-117.

Harris JS, Guillen K. Information Systems for Health Care Delivery: Business Process Models, Goals, and Design. in Harris JS, Loeppke RR (eds.) *Integrated Health Management: The Key*

Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems, Beverly Farms, MA: OEM Press, 1998, pp. 104-110.

Harris JS. Managed Occupational Health, in Harris, J.S. (ed). *Managed Care: Occupational Medicine State of the Art Reviews*, 13(4),1998, pp. 625-643.

Hart LG, Deyo RA, Cherkin DC. Physician Visits for Low Back Pain: Frequency, Clinical Evaluation, and Treatment Patterns from a U.S. National Survey. *Spine*, 1995; 20: 11-19.

HCIA. *Length of Stay by Diagnosis and Operation, Southern Region.* Baltimore: HCIA, Inc., 1999.

Iezzoni LI (ed.) *Risk Adjustment for Measuring Healthcare Outcomes*. Chicago: Health Administration Press, 1997.

Industrial Medical Commission. *Treatment Guidelines.* San Francisco: State of California, Department of Industrial Relations, Industrial Medical Commission, 1997.

Institute for Health Care Quality. *QualityFIRST Clinician Reference Guidelines.* Minneapolis: Health Risk Management, Inc., 1992-2000.

InterQual Products Group. *Indications for Workers Compensation Clinical Management: Injury Management.* Marlborough, MA: HBO & Co., 1996, 1999, 2000.

IntraCorp. *Clinical Guidelines.* Philadelphia: IntraCorp, 2000.

Jarvis KB, Phillips RB, Danielson C. Managed care preapproval and its effect on the cost of Utah worker compensation claims. *J. Manip Physiol Therap,* 1997; 20: 372-376.

Johnson WG, Baldwin ML, Butler RJ. The costs and outcomes of chiropractic and physician care for workers compensation back claims. *J. Risk and Insurance*, 1999; 66: 185-205.

Kalbfleisch JD, Prentice R. *The Statistical Analysis of Failure Time Data*, New York: Wiley, 1980.

Kane RL. *Understanding Health Care Outcomes Research*. Aspen: Aspen Publishers, 1997.

Kaplan RS, Norton DP. *The Balanced Scorecard*. Boston: Harvard University Press, 1996.

Kentucky Health Policy Board. *Clinical Practice Parameter for Acute Low Back Problems in Adults.* Frankfort, KY: Kentucky Department of Workers Claims, 1996.

Koes BW, Bouter LM, van Mameren H, Essers AHM, Verstegen GJMG, Hofhuizen DM et al. A randomized clinical trial of manual therapy and physiotherapy for persistent back and neck

complaints: subgroup analysis and relationship between outcome measures. *J. Manip and Physiologic Therap*, 1993: 16:211-218.

Koes BW, Bouter LM, van Mameren H, Essers AHM, Verstegen GJMG, Hofhuizen DM et al. A randomized clinical trial of manual therapy and physiotherapy for persistent back and neck complaints: physical outcome measures. *J. Manip and Physiologic Therap*, 1992: 15:16-23.

Labor Cabinet, Department of Workers Claims. *Workers' Compensation Medical Fee Schedule for Physicians.* Frankfort, KY: State of Kentucky, Labor Cabinet, Department of Workers Claims, 1996, 1998.

Labor Cabinet, Department of Workers Claims. *Hospital Fee Schedule.* Frankfort, KY: State of Kentucky, Labor Cabinet, Department of Workers Claims, 1996, 2000.

Labor Commission, Division of Industrial Accidents. *Utilization Review Standards. Bulletin No. 9-97.* Salt Lake City: State of Utah, Labor Commission, Division of Industrial Accidents, 1997.

Labor Commission, Division of Industrial Accidents. *Workers Compensation Fee Schedule.* Salt Lake City: State of Utah, Labor Commission, Division of Industrial Accidents, 1996, 1999.

Matsen II FA, Fu FH, Hawkins RJ (eds.). *The Shoulder: a Balance of Mobility and Stability.* Rosemont, IL: American Academy of Orthopedic Surgeons, 1993.

Mont D, Burton JF Jr., Reno V. *Workers Compensation: Benefits, Coverage and Costs.* Washington, D.C.: National Academy of Social Insurance, 1999, 2000.

Mosser G. Clinical process improvement: Engage first, measure later. In Harris JS, Loeppke RR (eds.), *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998, pp. 233-241.

Owings MF, Kozak LJ. Ambulatory and Inpatient Procedures in the United States, 1996. *National Center for Health Statistics. Vital Health Stat, 1998; 13 (139).*

New Jersey Department of Labor, Division of Workers' Compensation. *New Jersey Division of Workers' Compensation Web Site: www.state.nj.us/labor/wc.* Trenton: State of New Jersey, Department of Labor, Division of Workers' Compensation, 2000.

New Mexico Workers Compensation Administration. *Rules Governing Payments for Health Care Services.* Albuquerque: State of New Mexico, Workers Compensation Administration, 1996, 1999.

New Mexico Workers Compensation Administration. *Labor and Workers' Compensation Statutes (Title 11).* Albuquerque: State of New Mexico, Workers Compensation Administration, 1996.

Office of the Revisor of Statutes. *Treatment Parameter Rules.* St. Paul: State of Minnesota, Department of Labor and Industry, 1995.

Optimed Medical Systems. *Optimed Clinical Protocols.* Lexington, MA: SHPS Optimed, 2000.

Oregon Department of Consumer and Business Services, Workers Compensation Division. *Carpal Tunnel Syndrome Diagnosis and Treatment Guideline.* Salem, OR: State of Oregon, Department of Consumer and Business Services, Workers Compensation Division, 1994.

Owings MF, Kozak LJ. Ambulatory and Inpatient Procedures in the United States, 1996. *National Center for Health Statistics. Vital Health Stat, 1998; 13 (139).*

Owings MF, Kozak LJ. Ambulatory and Inpatient Procedures in the United States, 1997. *National Center for Health Statistics. Vital Health Stat, 1999; 13 (144).*

Panel Publishers. *Driving Down Health Care Cost: Workers Compensation.* New York: Aspen, 1995-99.

Papageorgiou AC, Croft PR, Thomas E, Ferry S, Jayson IV M, Silman AJ. Influence of previous pain experience on the episode incidence of low back pain: results from the South Manchester Back Pain Study. *Pain*, 1996: 66: 181-185.

Reed PO (ed.). *The Medical Disability Advisor, 3rd Edition*. Boulder, Co: The Reed Group, Ltd., 1997.

Research and Oversight Council on Workers Compensation. *Survey of Texas Doctors Who Participate in the Workers' Compensation System.* Austin: Research and Oversight Council on Workers Compensation, 1996.

Research and Oversight Council on Workers Compensation. *Experiences of Doctors Who Practice in the Workers' Compensation System.* Austin: Research and Oversight Council on Workers Compensation, 1996.

Research and Oversight Council on Workers Compensation. *An Examination of the Strengths and Weaknesses of the Texas Workers' Compensation System.* Austin: Research and Oversight Council on Workers Compensation, 1998.

Shekelle PG, Adams AH, Chassin MR, Hurwitz EL, Phillips RB, Brook RH. *The Appropriateness of Spinal Manipulation for Low Back Pain.* Santa Monica, CA: RAND Corporation, 1991.

Shekelle PG, Coulter I. Cervical spine manipulation: summary report of a systematic review of the literature and a multidisciplinary expert panel. *J. Spinal Disord,* 1997; 10: 223-228.

Shields J, Zhu ST. *Income Replacement from Temporary Income Benefits Under the Texas Workers' Compensation System.* Austin: Texas Workers Compensation Research Center, 1995.

Sinclair S. The role of clinical evidence in policy making. In Harris JS, Loeppke RR (eds.), *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998, pp. 224-227.

Stano M, Smith M. Chiropractic and medical costs of low back care. *Medical care*, 1996; 34: 191-204.

State Board of Workers Compensation. *Schedule of Fees for Physicians, Surgeons, Pharmaceutical, Home Health Care and Hospitals for Services Rendered Under the Georgia Workers Compensation Law.* Atlanta: State of Georgia, State Board of Workers Compensation, 1998.

State Board of Workers Compensation. *The Workers Compensation Medical Fee Schedule for Services Provided Under the Georgia Workers Compensation Law.* Atlanta: State of Georgia, State Board of Workers Compensation, 2000.

State of California, Department of Industrial Relations, Division of Workers Compensation. *State of California Workers' Compensation Official Medical Fee Schedule*. San Francisco: State of California, Department of Industrial Relations, Division of Workers Compensation, 1995, 1999.

State of Minnesota, Department of Labor and Industry. *Medical Services and Fees.* St. Paul: State of Minnesota, Department of Labor and Industry, 1993, 1994, 1995.

Sullivan T (ed.) *Injury and the New World of Work.* Vancouver: UBC Press, 2000.

Texas Chiropractic Association. *Texas Guidelines for Chiropractic Quality Assurance and Practice Parameters.* Austin: Texas Chiropractic Association, 1994.

Texas Osteopathic Medical Association. *Guidelines for Osteopathic Manipulative Treatment in Patient Management*. Austin: Texas Osteopathic Medical Association, 2000.

Texas Workers Compensation Commission. *Spine Treatment Guideline.* Austin: Texas Workers Compensation Commission, 1995.

Texas Workers Compensation Commission. *Upper Extremity Treatment Guideline.* Austin: Texas Workers Compensation Commission, 1998.

Texas Workers Compensation Commission. *Lower Extremity Treatment Guideline.* Austin: Texas Workers Compensation Commission, 1998.

Texas Workers Compensation Commission. *Mental Health Treatment Guideline.* Austin: Texas Workers Compensation Commission, 1995.

Texas Workers Compensation Commission. *Acute Care Inpatient Hospital Fee Guideline.* Austin: Texas Workers Compensation Commission, 1997.

Texas Workers Compensation Commission. *Medical Fee Guideline.* Austin: Texas Workers Compensation Commission, 1991, 1996.

Treatment Guidelines Committee, Utah Labor Commission. *Treatment Guidelines.* Salt Lake City: Utah Labor Commission, 1993, 1995.

Triano JJ, McGregor M, Hondras MA, Brennan PC. Manipulative therapy versus education: programs in chronic low back pain. *Spine,* 1995; 20:948-955.

Triano JJ, McGregor M, Skogsbergh DR. Use of chiropractic manipulation in lumbar rehabilitation. *J Rehab Res and Dev,* 1997; 34: 394-404.

United States Chamber of Commerce. *Analysis of Workers Compensation Laws.* Washington, D.C.: United States Chamber of Commerce, 1996-2000.

van den Hoogen HJM, Koes BW, van Eijk JTM, Bouter LM, Deville W. On the course of low back pain in general practice: a one-year follow-up study. *Ann Rheum Dis,* 1998; 57: 13-19.

van Tulder MW, Koes BW, Bouter LM, Conservative treatment of acute and chronic nonspecific low back pain. *Spine,* 1997; 22: 2128-56.

Wallace P. Guideline implementation in managed care organizations. In Harris JS, Loeppke RR (eds.), *Integrated Health Management: The Key Role of Occupational Medicine in Managed Care, Disability Management and Integrated Delivery Systems*, Beverly Farms, MA: OEM Press, 1998, pp. 228-232.

Waxman R, Tennant A, Helliwell P. A prospective follow-up study of low back pain in the community. *Spine*, 2000; 25: 2085-2090.

Williams DA, Feuerstein M, Durbin D, Pezzullo J. Health care and indemnity costs across the natural history of disability in occupational low back pain. *Spine,* 1998; 21: 2329-2336.

APPENDIX B
GLOSSARY

Charges:	Amounts billed to a payer by providers
Comparators:	Comparison categories or sub-populations
Contrast scan:	A computerized tomographic or magnetic resonance scan using radio-opaque material to improve the ability to detect scarring, restrictions and other abnormalities.
Diagnostic bucket:	A group of synonymous diagnostic terms and their associated codes for a medical condition, for example “low back pain”
Diagnostic clusters:	See diagnostic bucket
Discogram:	Injection of contrast material into intervertebral disks to identify leaks and to reproduce pain symptoms.
Durable medical equipment:	Long-lasting medical equipment such as wheel chairs, braces and special beds
Duration of medical care:	The time from the first date medical care was sought to the date of the last medical service provided
Electromyography:	Measurement of electrical discharges from active cells such as nerve and muscles; test performed to identify neurological or musculoskeletal disorders
Epidural steroid injection:	Injection of steroids and/or anesthetic outside the covering of the spinal cord or spinal nerve roots to decrease inflammation and nerve root compression, or to diagnose the source of pain
Facet joint injection:	Injection of steroids and/or anesthetic into the joints between the vertebrae to diagnose a source of pain or to reduce inflammation
Fluoroscopic control:	Injection or procedure under direct x-ray visualization to ensure correct placement relative to bony structures

Fusion:	Bridging of two or more vertebrae or other bones to prevent motion; the procedure may be done to protect the spinal cord, to make an unstable joint more useful, or to attempt to reduce pain
Impingement syndrome:	Pain and reduced range of motion of the shoulder due to local inflammation
Indemnity cost:	The cost of wage replacement payments made to injured workers
Laminectomy:	Removal of the lamina of the spine to provide access to or decompression of the spinal cord or nerve roots
Lytic injection:	Injection of a substance that effectively kills a nerve or other tissue; done in an attempt to stop pain impulses
Medical cost:	The cost of medical care provided to injured workers
Meniscus:	A shock-absorbing fibrous insert between the bones of a joint, such as the knee or the jaw (temporomandibular joint).
Mini-buckets:	Sub-groups of resource buckets; examples include laminectomies and fusions as subsets of spinal surgery
Modalities:	Passive treatments intended to decrease pain and inflammation of muscles and joints; ideally used to allow progressive resumption of activity
Nerve conduction velocity:	A study using low intensity current to determine how fast nerves conduct electricity; the speed of conduction is slowed when a nerve is damaged or compressed
Non-subscriber:	An employer who does not participate in the Texas workers' compensation system but may provide benefits for occupational injury through self-financing or other accident and health insurance coverage arrangements.
Paid cost:	The amount paid to providers after reductions from billed charges to the fee schedule (MAR), fair and reasonable levels, contract agreements such as PPO discounts, and denial of payment for lack of medical necessity, lack of treating doctor status, etc.
Patellofemoral syndrome:	Pain in the knee from compression of the knee cap (patella) against the underlying bones, with or without cartilage damage; usually caused by tight ligaments or occasionally misalignment of the femur and tibia

Physical medicine:	Sometimes also called manual medicine; includes physical activity training, manipulation, and passive treatments to reduce pain and inflammation (modalities)
Prosthesis:	An artificial replacement for a damaged or missing part of the body; examples include limb replacements, artificial joints and artificial eyes
Reportable:	An injury required to be reported by a regulatory authority such as the Texas Workers' Compensation Commission or the federal Occupational Safety and Health Administration
Resource bucket:	A group of similar tests or treatments; examples include imaging, manipulation, or surgery
Rotator cuff syndrome:	Pain in the rotator cuff of the shoulder due to inflammation or a tear in the cuff ligaments
Rotator cuff tear:	A tear in the ligaments of the rotator cuff of the shoulder
Sensitivity:	The ability to detect an abnormal situation
Specificity:	The ability to correctly detect an abnormal situation
Super group:	A group of diagnostic buckets that have similar treatment recommendations
Trigger point injection:	Injection into a tender spot of the muscles intended to decrease pain and break a cycle of pain and spasm
Utilization review:	Review of medical information to determine consistency with treatment guidelines, and clinical appropriateness at the time of the request, for purposes of authorizing payment for services
Vertebral corporectomy:	Removal of a vertebral body
Work conditioning:	Guided activity to improve muscular and cardiovascular condition in order to return a deconditioned worker to physical functioning levels necessary to perform work activities
Work hardening:	Progressive simulation of work tasks to increase a worker's endurance and ability to stay at work
Yield:	The proportion of positive results of a test

APPENDIX C
DIAGNOSTIC AND RESOURCE GROUPINGS ("BUCKETS")

Diagnostic Grouping Listing

Super-group	*Body Part*	*Description*
000	Not Grouped	Not Grouped
001	Systemic - Poisoning	Toxic exposure, effects
002	Systemic - Fluid, acid, base disorders	Fluid, electrolyte disorders
009	Systemic - Symptoms only	Symptoms, unspecified injury
011	Eye, orbit - Laceration	Laceration
012	Eye, orbit - Unspecified injury	Allergy, irritation
014	Eye, orbit - Fracture	Skeletal trauma
018	Eye, orbit - Hemmorhage	Hemmorhage
019	Eye, orbit - Symptoms only	Symptoms, unspecified injury
022	Head - Headache	Neurologic problems
023	Head - Laceration	Superficial trauma
024	Head - Fracture	Skeletal trauma
027	Head - Burn	Burn
028	Head - Hemmorhage	Hemmorhage
029	Head - Unspecified injury	Symptoms, unspecified injury
031	Neck - Nerve irritation	Soft tissue complaints
032	Neck - Nerve compression	Disc displacement
033	Neck - Laceration	Superficial trauma
034	Neck - Dislocation	Skeletal trauma
035	Neck - Cord compression	Myelopathy
038	Neck - Degenerative disc disease	Degenerative disease
041	Thoracic spine - Strain, sprain	Soft tissue complaints
041	Thoracic spine - Regional pain	Soft tissue complaints
043	Thoracic spine - Dislocation	Skeletal trauma
051	Low back - Enthesopathy	Soft tissue complaints
052	Low back - Abrasion, contusion	Superficial trauma
053	Low Back - Fracture	Skeletal trauma
054	Low Back - Spinal stenosis	Nerve compression
055	Low back - Cord compression	Myelopathy
058	Low back - Degenerative disc disease	Degenerative disease
059	Low back - Unspecified injury	Symptoms, unspecified injury
061	Shoulder - Strain, sprain	Soft tissue complaints
062	Shoulder - Abrasion, contusion	Superficial trauma
063	Shoulder - Dislocation	Skeletal trauma
064	Shoulder - Tendon, ligament rupture	Ligament, tendon rupture
069	Shoulder - Unspecified injury	Symptoms, unspecified injury
071	Elbow - Enthesopathy	Soft tissue complaints

072.....Elbow - Abrasion, contusion.....Superficial trauma
073.....Elbow - Fracture .....Skeletal trauma
074.....Elbow - Nerve compression.....Neuropathy
081.....Hand, wrist (inc. forearm) - Regional pain .....Soft tissue complaints
082.....Hand, wrist (inc. forearm) - Abrasion, contusion .....Superficial trauma
083.....Hand, wrist (inc. forearm) - Dislocation.....Skeletal trauma
084.....Hand, wrist (inc. forearm) - Nerve compression .....Neuropathy
085.....Hand, wrist (inc. forearm) - Amputation .....Crush, amputation
086.....Hand, wrist (inc. forearm) - Infection, bacterial .....Infection
087.....Hand, wrist (inc. forearm) - Burn .....Burn
089.....Hand, wrist (inc. forearm) - Unspecified injury .....Symptoms, unspecified injury
091.....Hip, thigh - Strain, sprain.....Soft tissue complaints
092.....Hip, thigh - Laceration.....Superficial trauma
101.....Knee - Enthesopathy.....Soft tissue complaints
102.....Knee - Abrasion, contusion.....Superficial trauma
103.....Knee - Fracture .....Skeletal trauma
105.....Knee - Meniscus tear .....Internal Derangement
109.....Knee - Unspecified injury.....Symptoms, unspecified injury
111.....Ankle, foot (inc. lower leg) - Strain, sprain .....Soft tissue complaints
112.....Ankle, foot (inc. lower leg) - Abrasion, contusion .....Superficial trauma
113.....Ankle, foot (inc. lower leg) - Fracture .....Skeletal trauma
114.....Ankle, foot (inc. lower leg) - Nerve compression .....Neuropathy
115.....Ankle, foot (inc. lower leg) - Crush injury .....Crush, amputation
116.....Ankle, foot (inc. lower leg) - Infection, bacterial .....Infection
121.....Respiratory - Airway disease.....Airway disease
122.....Respiratory - Inhalation injury.....Toxic exposure
129.....Respiratory - Symptoms only .....Symptoms, unspecified injury
141.....Gaatrointestinal - Hernia.....Hernia
149.....Gastrointestinal - Stress .....Symptoms, unspecified injury
152.....Genitourinary - Abrasion, contusion.....Superficial trauma
156.....Genitourinary - Infection, bacterial.....Infection
159.....Genitourinary - Unspecified injury.....Symptoms, unspecified
171.....Dermatologic - Foreign body.....Superficial trauma
172.....Dermatologic - Allergy.....Allergy, irritation
176.....Dermatologic - Infection, bacterial .....Infection
179.....Dermatologic - Symptoms only.....Symptoms, unspecified injury
181.....Neurologic - Nerve irritation .....Soft tissue complaints
182.....Neurologic - Concussion.....CNS trauma
189.....Neurologic - Symptoms only.....Symptoms, unspecified injury
191.....Musculoskeletal - Symptoms only.....Soft tissue complaints
192.....Musculoskeletal - Abrasion, contusion.....Superficial trauma
193.....Musculoskeletal - Fracture.....Skeletal trauma
194.....Musculoskeletal - Nerve compression .....Neuropathy
195.....Musculoskeletal - Crush injury.....Crush, amputation
195.....Musculoskeletal - Crush injury.....Crush, amputation
196.....Musculoskeletal - Infection, bacterial.....Infection

197.....Musculoskeletal - Burn.....Burn
198.....Musculoskeletal - Degenerative disc disease.....Degenerative disease
199.....Musculoskeletal - Unspecified site.....Symptoms, unspecified injury
231.....Trunk - Strain, sprain.....Soft tissue complaints
232.....Trunk - Abrasion, contusion.....Superficial trauma
233.....Trunk - Fracture.....Skeletal trauma
238.....Trunk - Burn.....Burns
239.....Trunk - Unspecified injury.....Symptoms, unspecified injury
241.....Health system contact - Examination.....Examinations
249.....Health system contact - Unspecified injury.....Symptoms, unspecified injury
252.....External cause - Laceration.....Superficial injury
259.....External cause - Unspecified injury.....Symptoms, unspecified injury
272.....Complications of care - Laceration.....Superficial trauma
279.....Complications of care - Unspecified injury.....Unspecified injury
282.....Ear - Foreign body.....Superficial trauma
283.....Ear - Noise exposure.....Acoustic trauma
293.....Dental - Fracture.....Skeletal trauma
303.....Abdomen - Abrasion, contusion.....Superficial trauma
311.....Psychiatric - Anxiety.....Mood disorders
981.....Unspecified site - Strain, sprain.....Soft tissue complaints
982.....Unspecified site - Abrasion, contusion.....Superficial trauma
985.....Unspecified site - Allergy.....Allergy, irritation
986.....Unspecified site - Infection, bacterial.....Infection
988.....Unspecified site - Burn.....Burns
989.....Unspecified site - Unspecified injury.....Symptoms, unspecified injury

Resource Bucket Groupings

Resource Bucket	*Description*
1	Office visits, consults
2	Ophthalmologic services
3	ENT services
4	Pulmonary medicine
5	Allergy, immunology
6	Dental
7	Medical-legal services
8	Special services and reports
9	Medical management
10	Physical medicine modalities
11	Physical medicine, other
12	Physical Medicine Manual Therapy
13	Chiropractic services
14	Osteopathic services
15	Outpatient facility
16	Ambulatory, other
17	Hospital, other outpatient
18	MRI scans
19	CT scans
20	Other radiology
21	Pathology
22	Lab
23	Electrophysiology

24	Emergency services
25	Transportation
26	Skin, subcutaneous inc. burns
27	Opthalmologic surgery
28	Auditory system surgery
29	Respiratory surgery
30	Cardiovascular surgery
31	Digestive surgery
32	Urinary tract surgery
33	Male genital surgery
34	Female genital surgery inc. deliveries
35	Endocrine surgery
36	Musculoskeletal surgery except spinal
37	Musculoskeletal surgery spinal proc
38	Neurological surgery except spinal
39	Neurosurgery spinal proc
40	Hospital inpatient surgical
41	Anesthesia
42	Hospital outpatient surgical
43	Ambulatory surgery outpatient
44	Pharmacy
45	Other non-surgical services
46	Inpatient services
47	Inpatient physician services
48	hospital inpatient medical

49	Invasive cardiology
50	Neonatal
51	Oncology
52	Hospital NOC
53	Psychiatric services
54	Hospital inpatient psych
55	Hospital inpatient rehab
56	Rehab
57	Physical Medicine Functional Capacity Evaluations
58	Physical Medicine Therapeutic Procedures
59	Physical Medicine Work Hardening and Conditioning
60	Skilled nursing, nursing homes
61	Home health
62	DME
63	Supplies
64	Not otherwise assigned
65	Manipulation under anesthesia
66	Other surgical
67	Venipuncture, needles
68	Casts
69	Simple lacerations