

Outcome-Based Clinical Reporting For Chiropractic Practice

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The objective of the Outcome-Based Reporting is to provide the practicing chiropractic physician with a comprehensive system of utilization and assessment technologies that address critical areas necessary for the effective and efficient management of the patient. The insurance industry emphasizes the following concepts in the design and implementation of many of its healthcare products:

- Quality Care
- Cost Accountability
- Outcome Accountability
- Evaluation of Practice Patterns
- Quality Management and Quality Improvement

Any participant in the health care delivery system must incorporate measures in its delivery system to cover the above-mentioned concepts. The Outcome-Based Reporting System has incorporated these concepts into its design and implementation. Cost-effective managed care programs must be able to properly address the chronic pain aspects of neuromusculoskeletal care.

The Role of Outcome-Based Reporting In Healthcare Delivery

The national health care reform movement initiated by the Clinton Administration, and recent advances in the third party pay industry have radically changed the practice environment for the chiropractic physician in the United States. In 1993, the number of people enrolled in managed care plans (50%) exceeded the number of people enrolled in traditional indemnity insurance (49.9%).

The October 1994 edition of Business Week projected that managed care plans would cover at least 85% of all Americans by 1997. By 1995, nearly three-quarters of the total enrolled workforce was in managed care plans (6). Currently, HMO membership - now nearing 65 million - is growing by 10 percent per year. By the turn of the century, more than 100 million people, or over 40% of the population, will be in prepaid plans (1). As of 1996, approximately 88% of physicians had signed managed care contracts. In comparison, in 1990, only 61% of physicians had signed managed care contracts (6).

Carriers are already utilizing large computer databases to analyze practice patterns and parameters for all types of providers in the American health care system. In 1993, Blue Cross and Blue Shield of the National Capitol Area created a "Select Preferred Provider Program" that included slightly over 50% of the practicing physicians in the area with would service 450,000 subscribers consisting of local commercial accounts, federal employees, and their families. In selecting participating physicians, BCBS utilized a computer-based system known as Pro/File, which uses a proprietary statistical technique to measure and compare practice patterns and patient care patterns. Physician's practice patterns were evaluated against other practitioners in the same community with respect to the following parameters:

- Kinds of services rendered
- Amounts of services rendered
- Costs of services rendered
- Time periods for interventions
- Frequency of utilization of high-dollar diagnostic tests
- Frequency of referrals
- Coding methodology
- Amount billed for codes utilized
- How often patients change doctors or see other physicians

Additionally, the concept of health care rationing may be thrust upon the physician as a means of primary cost-control over the ever-expanding amount that the United States spends on its health care system. Health care spending in the United States increased from \$250 billion per year in 1980 to near one trillion dollars in 1995 (2). In 1996, the United States spent over 1 trillion dollars on health care, the most ever paid for health care by a nation in one year (6). Presently, health care consumes over 14% of the gross domestic product, or almost one-seventh of the nation's output. Spending by category for 1996 was as follows:

<i>Spending Category</i>	<i>\$ Billion</i>
Hospital care	358.5
Physician services	202.1
Drugs and health care products	91.4
Nursing home care	78.5
Admin costs (private insurance)	60.9
Other prof. health services	58.0
Dental services	47.6
Public health activities	35.5
Research/construction	31.5
Home health care	30.2
Other personal health care	27.6

Eddy, in an article from the Journal of the American Medical Association, echoed this concept when he stated: *“although no one knows the correct proportion of the gross domestic product that health care should consume, it is clear that one way or another, sooner or later, the growth must be stabilized”*. He indicated that in an analysis of the increases in health care costs in the United States over the past 30 years, about two-thirds of the excess increase (that portion of the increase which exceeds the general inflation rate and population growth) is caused by increases in the volume and intensity of services.

Paul Ellwood, writing in the New England Journal of Medicine in 1988, stated that *“the democratization of choice and the proliferation of decision-makers within the American health care system will perpetuate and accelerate the restructuring of medicine”*. The central problem identified by Ellwood facing the health care system in this country is the physician’s inability to understand and measure the effect of the choices of patients, payers, and physicians on the patient’s aspirations for a better quality of life. *Ellwood advocated a health care system based upon outcomes management that would allow physicians, payers, and patients to make rational healthcare-related choices due to better available information pertaining to those choices*. This type of outcome system places greater reliance upon standards and guidelines that physicians can use in selecting the appropriate interventions. The outcomes management system advocated by Ellwood would routinely utilize systematic measurements of function and well-being of the patient, as well as disease-specific clinical outcomes measurements.

According to futurist Russell Coile, five years from now, the more sophisticated purchasers of health care will be analyzing insurance plan performance on the basis of functional and clinical outcomes. Some are already moving in that direction(1). The same article out of Medical Economics indicated that while payers aren’t demanding that HMO’s implement measurement systems immediately, they must do so at the purchaser’s discretion. This could force many health plans to engage in outcomes research, but few have so far. A recent study of 30 health plans found that only 6 had any outcomes studies planned or underway. Similarly, a survey of corporations by Business and Health discovered that only 6% of the plans the companies were contracted with were doing that kind of research. According to the author,

“clearly, providers have an opportunity to bridge this gap. But to amass outcomes data, providers must build suitable information systems and large databases. Additionally, their patient populations must be big enough to produce valid data that can help physicians practice better. Consequently, the larger group practices and provider-sponsored networks are best suited to the task.

Health policy experts view outcomes management as the main vehicle that will drive health care reform in this country. The Jackson Hole Group, the think-tank that formulated the concept of “managed competition”, indicated that any program which is proposed for adoption under a national health care reform package must emphasize quality as one of its primary mainstays. Low quality programs promote waste and provider, as well as administrative inefficiency, leading to higher system-wide costs. According to the Jackson Hole Group, quality care can only be obtained when the outcomes for clinical interventions are measured, analyzed, and disseminated to the field practitioner. Bergman (4) states that the challenge of moving quality improvement from its traditional role of ensuring adequate care to a service that helps to measure, monitor, and improve activities for all major clinical practices is daunting. These changes call for more sophisticated information systems that can capture outcomes at the sites of care and new types of quality professionals that are trained in systems analysis and statistical process control. The Outcome-Based Reporting System allow for prospective quality improvement because of standardized, consistent inputs concerning intervention experiences can be measured against known levels of performance.

According to Paul Ellwood, M.D., the only way that doctors will regain control of the health care system is by running the system themselves. But to do that, they’ll have to accept managed care. “I don’t think the game is lost forever”, he says. “But its got to be played by a different set of quality-based rules” (1). Ewe Reinhardt, noted health care economist from Princeton University, indicates that physicians will never regain economic control of the health care system, but if they stand together and show that they can manage care will within budgetary constraints, he says, they could win back much of their financial freedom (1).

A recent article from Medical Economics indicated that there is precious little room to negotiate when a powerful managed care organization imposes its fee schedule. If a carrier dominates the market, a doctor

has to sign on or he can't practice in that town. Therefore, the plan dictates the price and there is nothing the individual doctor can do. Physicians can build leverage by forming large multi-specialty or single-specialty networks, which can negotiate more effectively than smaller practices. Many doctors across the country have found that there is strength in numbers, if they can create cost-efficient, quality-conscious organizations (3).

Chernof indicates that health care systems should focus on developing a common language (data definitions) and data collecting methods (information systems) throughout their systems and across systems to allow comparisons across sites to be meaningful. Providing clean, comparable data, and the resources to appropriately evaluate these data at the facility levels are fundamental health system responsibilities (5).

Outcome assessment is moving to the forefront of the health care system as insurance companies, consumers, and providers seek the most efficient and cost-effective means for patient care.

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5. Chernof, B., and Kaufman, R.L., "Improving quality improvement: A data driven assessment", Western J. Med, 166:151-153, 1997.
6. Business and Health, February, 1998.

Outcome-Based Reporting and the Role of Evidence-Based Medicine

According to experts, a new paradigm for medical practice is coming to the forefront. Evidence-based medicine takes the emphasis off of intuition, unsystematic clinical experience, and pathophysiological rationale as sufficient grounds for clinical decision making and places stress on the examination of available evidence from clinical research. According to the Evidence-Based Medicine Working Group, "evidence-based medicine is an approach to practicing medicine in which the clinician is aware of the evidence in support of his or her clinical practice, and the relative strength of that evidence. Sackett renders the following definition: "*Evidence-based medicine is the conscientious,*

explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research" (1).

Evidence-based medicine is also defined as "an approach to health care that promotes the collection, interpretation, and integration of applicable patient-reported, clinician-observed, and research-derived evidence. The best available evidence, moderated by patient circumstances and preferences, is applied to improve the quality of clinical judgments (2).

In the near future, evidence-based medicine will have a profound effect on back care in general, and chiropractic practice specifically, as payers, governmental agencies, employers, and consumers look for the best way to spend their health care dollars. Currently, there is a group that has undertaken the systematic examination of the accepted medical literature to determine which sources contain the best available evidence. From this evidence, critical summaries are being generated that will allow for the efficient transfer of research evidence into practice and will provide the basis for a more rational allocation of resources toward known effective treatments (3). The review process will be undertaken by a group of reviewers, or work groups, who will author critical reviews of literature and submit the reviews to a Back Editorial Team. The team will review the material and disseminate it to the next level, the Musculoskeletal Editorial Team. This group will disseminate the reviewed material to the Cochrane Database of Systematic Reviews (online/CDrom/Disk). The Cochrane Database of Systematic Reviews will be accessed by the following groups interested in back care:

- Government
- Payers
- Industry
- Public
- Patients
- Clinicians

The implications of this magnitude of data dissemination are profound. It is conceivable that in several years, payers will discontinue reimbursing for therapies and procedures that do not produce meaningful outcome based on information obtained from an accepted, peer-reviewed database of current literature. It is of paramount importance that provider groups become attuned to the implications that evidence-based medicine will have on their practices.

The Outcome-Based Reporting System will prove its value in this push towards evidence-based health care. Through the cooperative efforts of all providers and the internal data management personnel, meaningful data pertaining to efficacy and outcome can be generated pertaining to chiropractic management of a myriad of musculoskeletal conditions.

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3. Bombardier, C., et al, "The Cochrane Collaboration Back Review Group for Spinal Disorders", *Spine*, 22:837-840, 1997.

Outcome-Based Reporting and the Importance of Chronic Pain Syndrome Identification

Knowledge of back pain is increasing rapidly. Unfortunately, this knowledge is not increasing at the same rate as the costs to society or the patients afflicted with this disorder. A recent analysis of workers' compensation statistics suggests that disability for low back pain is increasing at a rate that is 14 times the rate of population growth (1).

It is a commonly held concept in back care that most acute back pain patients will recover within a short period of time. Within six to eight weeks, 80% will have returned to work. The group of patients, who after 6-8 weeks have not sufficiently recovered to return to work and who fail to demonstrate any signs or symptoms consistent with a back problem, represent the largest proportion of patients in whom severe, disabling, and chronic pain will develop. It is this small group, the 20% who experience chronic pain that will represent at least 80% of the total costs to society for back-related pain (2,3,4,5). Other authors place the rate of chronicity for low back pain as low as 5% to 10% of the total population of patients with low back pain, yet the impact of these patients still accounts for at least 80% of the expenditures for low back pain (5,21). In California, 24% of low back cases account for 87% of the total cost to the system. In Washington (1977), 4.5% of the back injury claimants had partial or total disability claims that accounted for 36% of total compensation funds (32).

Low back pain is the costliest of all musculoskeletal ailments to the American healthcare system. Back injuries are the most frequent cause of disability for those patients under the age of 45 in the United States and are the third most frequent cause of disability for those patients over the age of 45, behind arthritis and heart disease (30,31). For all workers in the United States, low back pain is the leading cause of loss of productivity and lost time from work. After six months, 7% of all patients with low back pain will continue to have symptoms, and by one year, only 2% will still complain of symptoms. The patients represented by the 7% in pain after six months will consume 85% to 90% of the money spent on treatment and compensation for low back pain (29).

For those patients with chronic low back pain whose symptoms persist for more than a few months (10% to 20% of patients), about 50% to 60% will continue to be disabled at the end of one year's time and the majority of this group will continue to be disabled, even after two years (6). From a chiropractic standpoint, back-related areas account for greater than 50% of reported areas of involvement reported by patients suffering from chronic pain syndrome (25). This makes it essential that all new patients entering into a conservative spine treatment practice are screened for evidence of chronic pain syndrome.

The point must be made that *acute back pain and chronic back pain are fundamentally different conditions* (7,13). Acute pain is related in a direct manner to a peripheral stimulus and to actual tissue damage. In chronic pain conditions, chronic pain and disability become increasingly dissociated from the original physical problem and there may be very little evidence of any remaining tissue damage. The focus of the chronic pain and disability patient shifts to the following (8):

- *Emotional distress*
- *Depression*
- *Disease conviction*
- *Illness behavior*

The shift from the acute pain experience to chronic back pain syndrome may be a gradual process that is intimately related to the duration of the condition, with chronic pain patients demonstrating considerably more psychopathology than do acute back pain patients (9).

Chronic back pain is a complex and interactive behavior pattern that cannot be broken down into distinct and independent psychological components (7,10,25). Additionally, reactions to low back pain

are more likely to be functions of psychological and social factors, rather than being reactions to the physical aspect of the patient's back pain (11). Therefore, *treatment of back pain must focus on the physical and psychological aspects of the illness. Attempts at treatment that only emphasize the physical aspect of the disorder will have limited success* (12). It is for this reason that the Outcome-Based Reporting System collects the following patient-generated data:

- Sequential pain drawings
- Sequential visual analog scales for pain intensity
- Sequential numeric rating scales for pain intensity
- Anxiety and depression question battery
- Waddell's symptoms of non-organic pain
- Waddell's signs of non-organic pain
- Self-reported disability
- Physical examination findings

Through sequential administration of the above-mentioned instruments the physician gains an overall picture of the complex nature of the patient's complaint.

Treatment regimens utilized in the acute phase of patient management are primarily based upon repetitive and passive elements. The use of this form of treatment in a repetitive manner with the chronic pain patient tends to aid in the development of a negative spiral of escalating costs and failed treatment. This negative trend has been referred to as the "iatrogenic paradox of chronic pain syndrome" (5).

It is critical that those who provide care for low back pain patients become sensitive to the indications that treatment does not progress along a customary course. When deviations from standard recovery patterns occur, the physician must consider the comprehensive picture of low back pain disability as a distinct complicating factor to the case. Careful decisions must be made regarding the type of continued treatment that is most likely to result in successful case resolution. *Often, this process results in a shift away from passive treatments to patient-centered active rehabilitation* (5).

We must identify the small group of patients comprising the potentially chronic back pain population (10% to 20%) who will go on to become problematic and waste tremendous financial and human resources (5). In order to accomplish this task, a paradigm shift must occur. Customarily,

physicians have defined success with back pain patients in terms of pain relief. In dealing with the chronic back pain population, clinical success defined in terms of pain relief must be relegated to a lesser role. "Pain relief only" regimens should be considered too restrictive and are somewhat misleading to the doctor, in part due to the fact that each person who experiences pain is different, leading to different pain perceptions that must be interpreted by the treating doctor (15). When this problem of pain interpretation is coupled with the fact that chronic pain patients suffer from some form of psychological dysfunction that can impair the patient's ability to reliably report on his or her symptoms and signs, the result can only be confusion. Therefore, this method of measuring treatment success and case prognosis can only be of limited clinical use (7).

Attention must be directed toward psychological dysfunction identification, as chronic pain patients demonstrate significantly more psychopathology than do patients with acute back pain (9). The early recognition of the psychological, as well as the physical sequelae that follow a spinal injury can lead to proper early intervention strategies and the prevention of chronicity (14). Failure to recognize and treat the psychological aspects of chronic back pain often contributes to the development of chronic pain syndrome, in which subjective pain complaints, resultant suffering, and pain behavior are excessive and disproportionate to the actual pathophysiology. The patient's pain no longer serves a useful, adaptive purpose in chronic back pain syndrome and often becomes the disease (16).

Psychosocial function appears to be less susceptible to change than physical function. In addition, psychosocial factors contribute to delayed recovery and prolonged, chronic disability (17). In a recent study, psychosocial function did not improve to the same extent as physical function in conservatively treated patients (18). Another study (33) found that chronic low back pain and a history of low back pain seemed to be associated with a less favorable clinical course. Therefore, early recognition of psychosocial distress is of paramount importance due to the fact that once this form of disability has continued for six months or more, the treatment difficulty increases and prognosis decreases (19).

Psychological distress may be assessed through the use of psychometric testing. Personality changes secondary to pain can be measured on psychological instruments, as many chronic back pain patients have

a pronounced psychological overlay (2,26,27,28). Depression has been linked to chronic low back pain. In one study, there was a close link established between chronic low back pain and depression, with 60% to 100% of chronic low back pain patients demonstrating symptoms of depressive disorders (9). Other chronic low back pain patients may manifest symptoms of anxiety (23). Additionally, there is the greater likelihood of psychological influence in those cases in which the patient has persistent pain beyond the bounds of normal healing time, especially in the absence of complicating factors (6,25,26,27,33). It is therefore essential that the physician utilize a combination of chiropractic, medical, and psychological methodologies to diagnose the chronic pain patient, to improve diagnostic accuracy, and to accurize the treatment and/or referral process; as most patients present with a mix of organic and non-organic symptomatology (24).

The psychological factors are useful in predicting outcome to treatment as well. What appears to be the most predictive of outcome is not whether the patient has a functional disease or organic disease, but whether the patient has an abnormal psychological profile (20). Psychometric data predicts subjective response to treatment and rehabilitation with greater accuracy than findings based solely on diagnostic procedures (11,21). Psychometric data is more reliable when psychometric measures are used in combination, or coupled. Using several testing instruments in a clinical situation allows the physician to obtain a better picture of the patient's problem and increases the reliability of the psychometric instruments (22,23). The Outcome-Based Reporting System utilizes several practical reporting instruments that are sequentially administered, thus providing the doctor with vital information essential to accurate case management decision-making. Any clinical protocol for the evaluation and treatment of back pain patients that ignores comprehensive patient assessment and attends only to the physical findings and the patient's self-reported levels of discomfort will only be successful with the acute back pain population and will be remarkably ineffective at dealing with the cost-driving chronic pain population. Kassirer indicated that *"no matter who provides the care, it will never be complete unless those responsible for it seek a far deeper understanding of the patient's social, economic, and ecological context than we do now. Becoming more aware of the psychological and personal barriers to effective care is an essential part of this kind of care"*(34). Thus, the focus of the Outcome-Based Reporting System is to effectively

and objectively manage the physical component of the injury or condition and to monitor for indications of psychological involvement.

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Outcome-Based Reporting System Standardization Advantages

The Outcome-Based Reporting System utilizes standardized paperwork for to drive the reporting system. This represents a shift from current practice, in which offices/doctors utilize different modes for reporting the clinical encounter information. The outcome-related information generated by each patient encounter is incorporated into the health care facility's database. This allows for the development of profiles for patient response across a broad spectrum of diagnoses and clinical presentations.

Design of Outcome-Based Reporting System

The medical and chiropractic literature has clearly delineated those items that adversely affect the course of care, and thereby affect the outcome of the

case. The paperwork used in this system is the result of an exhaustive review of medical and chiropractic literature. The purpose of the retrospective review of literature was to identify the available instruments that could be used to quantify patient care and to identify those items deemed essential for the management of back-related disorders.

Following the identification of those items deemed to be essential to outcome-based patient management, the items were incorporated into a system of paperwork for the chiropractic practice. The Outcome-Based Reporting System then underwent field-testing and further refinements were made. The present system of paperwork is the latest revision of the clinical reporting protocol.

Outcome Based Reporting System Advantages

- The Outcome-Based Reporting System uses a combination of medical and psychological models to monitor the status of the patient.
- The Outcome-Based Reporting System improves diagnostic, treatment, and referral accuracy.
- Possible maladaptive behavior patterns can be identified through the use of the Outcome-Based Reporting System's vehicles.
- The Outcome-Based Reporting System reveals trends in patients (i.e. high pain scales, pain drawings that take on bizarre characteristics over time, pain scales that do not diminish over time) that can lead to poor outcomes (prolonged disability, poor return-to-work, etc.)
- The Outcome-Based Reporting System provides the treating doctor with a means of assessing the patient's illness behavior in a prospective manner.
- The multifaceted picture afforded by the Outcome-Based Reporting System allows the provider to identify low back disability behavior at an earlier point in its development.
- Pain assessment instruments utilized in the Outcome-Based Reporting System permit:
 1. Identification of patients with a high probability for delayed recovery or prolonged disability

2. Identification of patients who may be candidates for more intensive psychological and behavioral evaluation by the appropriate specialist.
3. Assessment of the efficacy of serially administered treatments
4. Excellent predictor of outcome, with patients exhibiting bizarre drawings having poorer outcomes than those who render simple drawings.

The Outcome-Based Reporting System has been designed to provide the doctor with the most up-to-date and valid information to treat the patient in the most effective manner. Additionally, the Outcome-Based Reporting System provides the doctor with vital outcome-related information with minimal time requirements for the doctor.

Role of the Doctor's Office Staff

The doctor's office staff has the very important role of overseeing the implementation of the Outcome Reporting paperwork in the proper manner. The implementation of outcome reporting in the office represents a shift from established methodologies for patient processing, but it is the wave of the future in health care. The current literature is filled with example after example of higher standards for clinical reporting requirements as doctors, governmental agencies, and insurance companies work to provide better quality, more accountable, and more cost-effective health care. In the end, the providers that can accomplish these goals will be the providers at the forefront of health care in this country.

Outcome-Related Information Included in Outcome-Based Reporting System

- Patient demographics
 - Age
 - Sex
 - Marital status
 - Number of children
 - Occupation/employer
 - Spouse occupation
- Past medical history
- Smoking/packs per day
- Drinking
- Previous history of x-rays of back, neck, chest, etc.
- Purpose of appointment
- Number of doctors seen for this condition
- Treatment for other health conditions in past year
- Age when patient first had trouble with back, etc.
- Age when patient first sought treatment for the problem
- Number back pain days in past year
- Length of current condition (days)
- Rating of intensity of pain (0-10)
 - Current pain
 - Average pain
 - Worst pain
- Education level
 - Grade 8 or less
 - Partial high school
 - High school graduate
 - College graduate
 - Masters degree or higher
- Employment status
- Main work activity
- Job satisfaction
- Accident related information
 - Date
 - Time
 - Location
 - Workers' Compensation
 - Auto accident
 - Other form of accident
 - Attorney involvement
- Disability questionnaire to baseline interference with patients Activities of Daily Living (ADLs)
- Anxiety and depression question battery - to identify the presence of underlying psychological complicating factors to the condition
- Waddell's Symptoms - 7 questions to identify the presence of nonorganic symptoms of low back pain
- Referral information
 - Another patient referral
 - Provider directory
 - Yellow pages
 - MD referral
- Symptoms review for current condition that aids the doctor in correlating findings from pain drawings and anxiety/depression questionnaire to identify the presence of psychological complicating factors.
- Pain drawing
 - Location of pain
 - Type of pain

- Character of pain
- Radiation and pain referral characteristics
- Possible presence of psychological underlying factors
- Numeric rating scale (0-100 scale to rate pain)
- Visual analog scale (for rating pain intensity from visit to visit)
- Change of condition since last visit information
 - Much better
 - Better
 - Same
 - Worse
 - Much worse
- Notation of specifics on how condition has changed since last visit (on daily basis)

The information listed above is all contained in the three-page intake paperwork for the Outcome-Based Reporting System. This information is generated in the doctor's waiting room and is rendered prior to history taking. Thus, the doctor is provided with a vast amount of outcome-related case information prior to taking the history. A quick review of the information described above will increase the clinical efficiency of the doctor. Knowledge of these factors will speed up the consultation and accurize the history-taking portion of the initial visit by allowing the doctor to target those significant areas that might have been identified previously by a more exhaustive and time-consuming consultation process.

Details on Information Included in Outcome-Based Reporting System Paperwork

The following will provide more in-depth information pertaining to the items included in the Outcome-Based Reporting System paperwork:

- ***Demographic Information***

Demographic information is necessary in order to start the process of sorting patients into various categories in order to delineate one type of back condition from another. The separation of patients into various categories is necessary in order to properly determine the length of care necessary for different diagnoses and for the same diagnosis in patients with differing characteristics, as identified by the intake reporting forms.

The separation of patients into different groups based upon social, occupational, and demographic and psychological factors is known as case-mix analysis.

The Outcome-Based Reporting System has been designed so that case-mix analysis can be accomplished in the database constructed from the outcome-related information submitted from the various providers.

A number of factors identified in the patient intake forms are associated with difficult case management and poor outcomes to treatment and rehabilitation. As an example, current literature has demonstrated that patients with the following characteristics may do poorer in treatment:

- Blue collar job
- Poor job satisfaction
- Over 40 years of age
- Attorney involvement
- Workers' compensation injury
- Lower educational level (<12th grade)
- Number of doctors seen (>2 to 3)

Occupation and Outcome

According to the literature, blue-collar workers are more likely to suffer from prolonged disability and poorer case resolution than patients with traditional "white collar" occupations. Jobs that involve high degrees of vibration exposure, or bending, twisting, and lifting have been identified as contributing to a likelihood of disability that is twice the rate of disability noted in white collar workers (1,2,3).

1. Kahanovitz, N., Diagnosis and Treatment of Low Back Pain, Raven Press, New York, 1991.
2. Bigos, S., et al, "Back injuries in industry. III. Employee-related factors", Spine, Vol. 11, No. 3, 1986.
3. Volinn, E., et al, "Back sprain in industry: The role of socioeconomic factors in chronicity", Spine, Vol. 16, No. 5, 1991.

Job Satisfaction and Outcome

Employees who have received low supervisory ratings from their supervisors within the past six months are at a risk for disability behavior. The literature is clear in the area of job satisfaction as it relates to treatment outcome and return-to-work, with those employees demonstrating poor job satisfaction having poorer return to work rates (1).

1. Clemmer, D.I., et al, "Low back injuries in heavy industry. I. Worker and workplace factors", Spine, Vol. 16, No. 7, 1991.

Number of Doctors Seen and Outcome

The number of doctors seen by the patient for a given condition may indicate a patient who is at risk for

disability behavior. In general, the higher the number of providers seen for the same condition, the worse the prognosis.

Smoking and Outcome

Smoking has been identified as a risk factor for extending the course of care and the risk of disc injury. Smoking is directly associated with low back pain (1). Several studies have confirmed the link between severe low back pain and smoking (1,2,4,5). The risk for a patient experiencing low back trouble is increased when cigarettes enter the picture. Daily smoking has been implicated as a factor that can increase the risk for low back trouble (3,13). In a recent study of industrial low back injuries, the risk of a smoker reporting an industrial low back injury was 1.4 times that of a non-smoker (5). The risk of suffering from an acute prolapsed lumbar intervertebral disc is increased for smoking patients who have smoked in the past year (6). Another study by Deyo found that the risk for smokers experiencing low back pain is greatest in young adults less than 45 years of age. The risk steadily increases with cumulative exposure and with the degree of maximum daily exposure (7).

There have been several hypotheses proposed for the link between smoking and low back pain. Smoking is known to induce chronic coughing which elevates the intradiscal pressure and increases the risk of protrusion and prolapse for lumbar discs (1,3,13). Nicotine has been demonstrated to decrease the vertebral body blood flow in animals. Since the disc receives its nutrition via diffusion through the vertebral body end-plates, smoking may adversely affect the metabolism of the lumbar disc and thereby increase its susceptibility to mechanical injury (3,7). Smoking has been linked to osteoporosis in lumbar vertebral bodies. Trabecular microfractures may result due to osteoporosis and create another cause for low back pain (1,3,13). In a recent study of the failure rate of lumbar spinal fusion conducted by Brown, et al, smoking was viewed as a major risk factor for pseudoarthrosis (8). In Brown's study, the success rate for spinal fusion in a non-smoking population was 92%. Conversely, the success rate for spinal fusion in a smoking population of patients dropped to 60%. Thus, the failure rate for spinal fusion in a non-smoking population is only 8% while the failure rate for spinal fusion in a smoking population is 40% (5 times greater than for non-smokers). It was noted that the PO₂ level in smoking patients was 78.5%. The PO₂ level for non-smoking patients was shown to be between 95% and greater

than 97%. The oxygen saturation levels were shown to be much lower for smokers as well. Smokers demonstrated an oxygen saturation level of 92.2%, while non-smokers demonstrated oxygen saturation levels in excess of 95%. Thus, the high rate of pseudoarthrosis was attributed to high carbon monoxide levels producing arterial constriction and inadequate oxygenation of injured tissue (8).

Additionally, smoking has been proposed as a marker for a complex combination of social traits associated with increased risk for low back injury. The habit is most prevalent in the lower socioeconomic groups, for whom job demands, life stress, income, and other health habits may increase the risk for low back pain (9,10). Smoking has also been proposed as a marker for depression and anxiety, two of the major psychological factors faced in low back injured patients (7). In addition to the explanations cited, smokers are a less active group of patients and may demonstrate the tendency toward becoming more sedentary following an injury, which may further prolong the course of care. It is helpful to identify as many factors that may extend the course of care so that a reasonable prognosis may be rendered. Smoking has been identified as a risk factor for prolonged recovery from spinal injury (14).

References:

1. Svensson, H., et al, "low back pain in relation to other diseases and cardiovascular risk factors", *Spine*, Vol. 8, No. 3, 1983.
2. Frymoyer, J.W., et al, "Risk factors in low back pain", *JBJS*, Vol. 65-A, No. 2, 1983.
3. Biering-Sorenson, F., and Thomsen, C., "Medical, social, and occupational history as risk factors for low back trouble in a general population", *Spine*, Vol. 11, No. 7, 1986.
4. Cox, J.W., and Trier, K.K., "Exercise and smoking habits in patients with and without low back and leg pain", *JMPT*, Vol. 10, No. 5, 1987.
5. Battie, M.C., and Bigos, S., "Industrial low back complaints: A broader perspective", *Ortho Clin North Am*, Vol. 22, No. 2, 1991.
6. Kelsey, J.L., et al, "Acute prolapsed lumbar intervertebral disc: An epidemiological study with special reference to driving automobiles and cigarette smoking", *Spine*, Vol. 9, No. 6, 1984.
7. Deyo, R.A., and Bass, J.E., "Lifestyle and low back pain: The influences of smoking and obesity", *Spine*, Vol. 14, No. 5, 1989.
8. Brown, C.W., et al, "The rate of pseudoarthrosis (surgical nonfusion) in patients who are smokers and patients who are non-smokers: A comparison study", *Spine*
9. Millard, R.W., and Jones, R.H., "Construct validity of practical questionnaires for assessing disability of low back pain", *Spine*, Vol. 16, No. 7, 1991.
10. Hildebrandt, J., et al, "The use of pain drawings in the screening for psychological involvement in complaints of low back pain", *Spine*, Vol 13, No. 6, 1988.
11. Hanson, T., and Roos, B., "Microcalluses of the trabeculae in lumbar vertebrae and their relation to bone pain and mineral content", in Frymoyer, J.W., *The Adult Spine: Principles and Practice*, Raven Press, New York, 1991.

12. Kahanovitz, N., Diagnosis and Treatment of Low Back Pain, Raven Press, New York, 1991.
13. Pope, M.H., Frymoyer, J.W., and Andersson, G., Occupational Low Back Pain, Praeger, New York, 1984.
14. Tufo, H.M., Rothwell, M.G., and Frymoyer, J.W., "Managing quality of care for low back pain", in Frymoyer, J.W., The Adult Spine: Principles and Practice, Raven Press, New York, 1991.

Previous History of X-rays

The intake forms contain questions dealing with previous x-rays taken of the low back, neck, chest, and other areas. These questions provide a better record of past trauma to the low back and neck than does the question: "Have you ever had neck pain or back pain?". Many persons may have had traumatic incidents from childhood that resulted in x-rays of the spine, but may not have ever had associated low back or neck pain (1).

1. Biering-Sorenson, F., "Reproducibility of the history of low back trouble", *Spine*, Vol. 9, No. 3, 1984.

Workers' Compensation Injury Information

Workers' compensation injuries generally take longer to treat due to the complexities involved with the case. Financial compensation to injured workers during the period of disability due to a work-related injury can become a disincentive to return-to-work as the disability extends into the chronic phase of care. Additionally, poor job satisfaction can lead to complex case management (1).

1. Barnes, D., "Social factors affecting back pain", in Mayer, T.G., Mooney, V., and Gatchel, R.J., Contemporary Conservative Care for Painful Spinal Disorders, Lea and Febiger, Philadelphia, 1991.

Attorney Involvement and Outcome

The literature has clearly demonstrated that attorney involvement contributes to case chronicity and disability due to factors related to secondary gain (1,2,3,4).

1. Barnes, D., "Social factors affecting back pain", in Mayer, T.G., Mooney, V., and Gatchel, R.J., Contemporary Conservative Care for Painful Spinal Disorders, Lea and Febiger, Philadelphia, 1991.
2. Ciccone, D.S., and Grzesiak, R.C., "Psychological dysfunction in chronic cervical pain", in Tollison, C.C. and Satterthwaite, J.R., Painful Cervical Trauma, Williams and Wilkins, Baltimore, 1992.
3. Kahanovitz, N., Diagnosis and Treatment of Low Back Pain, Raven Press, New York, 1991.

4. Aronoff, G.M., et al, "Pain treatment programs: Do they return workers to the workplace?", *Occupational Medicine: State of the Art Reviews*, Vol. 3, No. 1, 1988.

Age of First Back Trouble

The age of first back-related trouble and treatment for the patient is identified by the questions: "How old were you when you first had trouble with your low back, mid-back, or neck?" and "How old were you when you first sought treatment for this problem?". This information is helpful in identifying the length of the condition and past injuries to the region. This information is incorporated into the outcome database to help separate patients based on length of condition for case-mix analysis purposes.

Number of Back Pain Days and Outcome

The number of back pain days is identified in terms of the number of days in the past year that the patient has had the current problem and the number of days involved in the current episode. This information is directly related to case outcome, with those cases of longer duration being more resistant to treatment than the cases that are of an acute nature. The information from these questions is entered into the outcome database for the purposes of case-mix analysis and profiles are developed on the basis of length of current condition versus length of treatment.

Current, Average, and Worst Pain Intensity and Outcome

The Outcome-Based Reporting System includes a survey of current, average, and worst pain for the condition at patient intake. The questions utilize a 0-10 scale for each question, with the patient checking one box for each question. In general, patients with higher self-reported levels of pain demonstrate poorer outcomes to treatment and rehabilitation.

Disability Questionnaire and Outcome

The Outcome-Based Reporting System intake paperwork utilizes a seven question disability questionnaire that pertains to a variety of activities of daily living essential for normal function. In general, the By having the patient indicate those areas and types of activities they are having problems with and the magnitude of the disability related to the problem, the doctor can do the following:

- Baseline the patient's loss of function due to the current condition

- Follow recovery of those areas of loss of function on subsequent office visits
- Examine those activities of daily living that the patient is having problems with so that activity modification can be implemented and rehabilitation measures can be tailor-made to the patient's needs, thus increasing the patient's satisfaction with care.
- *Provide a better explanation to utilization management personnel involved in precertification of services as to the nature of the patient's complaint and the rationale for the doctor's treatment plan. Specifics detailing the goals for the treatment plan based on targeted improvements in the patient's activities of daily living may be promulgated based on the self-reported disability information provided in the Outcome-Based Reporting System intake paperwork.*

Anxiety and Depression Questions and Outcome

The anxiety and depression battery is found on the lower left-hand side of the second page of the Outcome-Based Reporting System intake paperwork. Chiropractors must be able to identify the psychosomatic symptoms that may accompany a spinal pain syndrome. There are a total of 18 questions in this section on the patient intake form. The first nine (9) questions comprise the *Anxiety Battery* and the second nine (9) questions comprise the *Depression Battery*. Questions

Questions contained in the *Anxiety Battery* include the following:

- Have you felt keyed up, on edge?
- Have you been worrying a lot?
- Have you been irritable?
- Have you had a difficult time relaxing?
- Have you been sleeping poorly?
- Have you had headaches or neck aches?
- Have you had any of the following: trembling, tingling, dizzy spells, sweating, urinary frequency, or diarrhea?
- Have you been worrying a lot about your health?
- Have you had a difficult time falling asleep?

Interpretation of the Anxiety Battery of questions is accomplished by summing up the total number of "YES" responses to the first four questions. If the patient marks "YES" to two of the first four questions or more, then continue to add up the total number of "YES" responses to the first nine questions. When anxiety scores are greater than 5,

the probability of the patient having a clinically significant anxiety disorder rises sharply. A score of 5 (five) on the anxiety battery indicates that the patient has a 50% chance of having a clinically significant anxiety disorder.

Questions contained in the Depression Battery include the following:

- Have you had low energy?
- Have you had loss of interests?
- Have you lost confidence in yourself?
- Have you felt hopeless?
- Have you had difficulty concentrating?
- Have you lost weight (due to poor appetite)?
- Have you been waking up early?
- Have you felt slowed up?
- Have you tended to feel worse in the morning?

Interpretation of the Depression Battery is accomplished by adding up the number of "YES" responses to the first four questions. If the patient marks "YES" to one or more of the first four questions, continue to add up the number of "YES" responses for the entire battery. A patient with a depression score of two (2) has a 50% chance of having a clinically significant depression disorder. When depression scores are greater than two (2), the probability of having a clinically significant depression disorder sharply rises. Should the patient demonstrate high scores on either of the preceding scales, one should consider the presence of a nonorganic pain syndrome to be highly probable. Cross-referencing with the pain drawing and visual analog scales may be helpful.

Waddell's Symptoms of Nonorganic Back Pain

The patient intake forms also contain the seven-question battery designed by Waddell to identify the presence of nonorganic back pain in patients with back-related complaints. These questions are found on the lower right side of the second page of the intake questionnaire. In this question battery, the questions include the following:

- Do you get pain at the tip of your tail bone?
- Does your whole arm or leg ever become painful?
- Does your whole arm/leg ever become numb?
- Does your whole arm/leg ever give away?
- Have you had any pain free times in the past year?
- Have you had any intolerance to treatments or reactions to treatments?

- Have you ever been to the emergency room for back pain?

In Waddell's system, more than two inappropriate responses may lead one to suspect that the case has a non-organic element which must be investigated during the patient's physical examination and must be accounted for during the formulation of the patient's care plan (1,2,3,4,5). The inappropriate responses for Waddell's symptoms of nonorganic back pain are as follows:

Inappropriate Responses

- "YES" responses to questions: **1,2,3,4,6,and 7**
- "NO" response to question: **5**

In the cases where there are more than two inappropriate responses, the doctor should examine the other outcome instruments for the presence of other non-organic symptoms and case-mix factors that may indicate non-organic features in the case. Additionally, the examination of the patient should include a review of the patient's physical presentation for the presence of non-organic signs. Physical signs present in patients with chronic pain syndrome (nonorganic signs) may include any of the following:

Physical Signs Present in Chronic Pain Syndromes

1. The patient may call attention to the pain problem with **abnormal pain behaviors** that may consist of the following:
 - Grimacing
 - Holding the breath
 - Frequent shifts of posture
 - Verbal reports of pain (most common)
 - Groaning
 - Sighing
 - Attention-getting maneuvers
2. Patients may ambulate with an inconsistent antalgic limp.
3. Patients may demonstrate **limited ranges of motion that are pronounced when being specifically tested - yet are unlimited when attention is not focused on the part being tested.**
4. Patients may demonstrate **inconsistency of tenderness with respect to the location or locations of pain and the absence of pain when attention is focused elsewhere.** When a painful area is provoked manually during an examination of a patient with organic pain, the

flinch is immediate due to spinal reflex activation. When a patient exhibits pain of a non-organic nature there is a delayed flinch due to cortical reflex activation, which is slightly delayed. Crosschecking for the presence of a non-organic flinch response is accomplished by touching the area a second time during the examination when the patient's attention is directed to another phase of the examination process.

5. Patients may demonstrate a **glove and stocking pain or sensory disturbance without attendant evidence of polyneuropathy.**
6. **Ratcheting:** The patient may demonstrate ratcheting response to manual muscle testing, or there may be inconsistent weakness noted. In some cases, weakness may correspond to non-anatomical areas.
7. **Inconsistency may be noted upon re-examination of the involved areas.**
8. **The patient may also inhibit deep tendon reflexes.** Cross-check for this feature of non-organic disease may be accomplished by rapidly switching back to the first tendon while testing a second tendon. The maneuver may catch the patient off guard.

Waddell's Signs of nonorganic behavior may be utilized to ascertain whether the patient is demonstrating physical signs of attendant non-organic pain. There are five (5) types of signs that may be present in the examination of a non-organic patient. It is recommended that these signs be incorporated into the examination whenever the patient demonstrates abnormal symptoms during the initial intake battery of tests.

Waddell's Signs of Non-organic Behavior

Tenderness

- Tenderness in non-organic patients may be superficial and the skin will be tender to light pinch over a wide area of the spine.
- Tenderness will be non-anatomical. Deep pain may be felt over a wide area that is not localized to one structure. The pain may often extend into non-related areas in the thoracic spine, pelvis, etc.

Simulation tests: These are tests that mimic standard orthopedic tests, yet do not provide enough stress on the structures being tested to elicit symptoms.

- **Axial loading:** Vertical loading of a patient's spine is accomplished by lightly pressing down on the top of the patient's head. This test may produce mild neck pain (this is common) but will not cause low back pain or sciatic-like pain. A non-organic pain response is noted when the patient complains of low back or leg-related complaints subsequent to this maneuver.
- **Rotation:** Rotation of the patient's shoulders and pelvis in the same plane is done as the patient stands in a relaxed posture with the feet together. In this test, leg pain in the presence of nerve root irritation may be produced, but low back pain produced by this maneuver is considered to be a non-organic response.

Distraction tests: These are findings that are present during one portion of the examination and then disappear during another phase of the exam. Distraction is best accomplished via indirect observation. An example of a non-organic finding is the case of a limitation of straight leg raising that improves upon distraction of the patient's attention.

Regional disturbances: The key feature of a regional disturbance is the divergence from accepted neuroanatomical relationships.

- **Motor disturbances:** Patients may exhibit partial ratcheting or cogwheeling of many muscle groups that cannot be explained on a localized neurological basis.
- **Sensory disturbances:** Glove and stocking sensory loss in the same area as the cogwheeling or ratcheting muscle findings with no rational explanation.

Overreaction: Patients may express reactions to the examination via any of the following:

- Disproportionate verbalization
- Facial expressions
- Muscle tension and tremor
- Collapsing
- Sweating

Scoring System for Waddell's Non-organic Signs

- Any individual sign counts as a positive sign

- A finding of three (3) or more of the five types of signs (*tenderness, simulation tests, distraction tests, regional disturbances, and over-reaction*) is clinically significant.
- Ignore isolated positive signs.

Referral Information

On the bottom right hand corner of the second page of the intake paperwork there is a section that states the following:

How did you learn of this office?

- ρ Another patient referred me
- ρ Provider directory
- ρ Yellow pages
- ρ MD referral. Who?

This data is entered into the corporate database in order to track referral sources.

Symptoms Review

The top half of the third page of the patient intake paperwork contains the symptoms review. The systems review incorporated into the Outcome-Based Reporting System was developed to aid the doctor in better assessing the severity of the anxiety or depression that may be present in the case upon initial presentation. Psychological distress is a well-recognized complicating factor in back-related complaints. Frymoyer found a high degree of anxiety, depression, and stressful events among men with low back pain (1). Additionally, depression and lowered self esteem contribute to inactivity secondary to a low back injury (2). A combination of anxiety and a heightened sense of body awareness (3,4) characterize psychological distress seen in the acute phase of an injury. In order to better understand the magnitude of depression and anxiety the patient exhibits, the symptoms review contains physical signs of anxiety and depression placed at random intervals between other systems-related items.

1. Frymoyer, J.W., et al, "Epidemiological studies of low back pain", Spine, Vol. 5, No. 5, 1980.
2. Fordyce, W., et al, "Pain complaint-exercise performance relationship to chronic pain", Pain, 10:311, 1981.
3. Murphy, K.A., and Cornish, R.D., "Prediction of chronicity in acute low back pain", Arch Phys Med Rehabil, Vol. 65, June 1984.
4. Waddell, G., et al, "A concept of illness tested as an improved basis for surgical decisions in low back disorders", Spine, Vol. 11, No. 7, 1986.

Signs of anxiety scattered throughout the symptoms include the following:

- Shakiness
- Muscle aches
- Muscle twitches
- Joint stiffness
- Muscle jerks
- Grinding of teeth
- Tingling in feet
- Tingling in hands
- Fainting
- Sleeping difficulties
- Forgetfulness
- Disability in concentrating
- Irritability
- Restlessness
- Trembling
- Cold/clammy hands
- Tendency to sweat
- Difficulty swallowing
- Upset stomach
- Nausea
- Vomiting
- Abdominal pain
- Diarrhea
- Constipation
- Weight loss
- Burning in stomach
- Chest pain
- Difficulty breathing
- Rapid heart beat
- Impatience
- Insomnia
- Choking feelings/sensations
- Lump in throat
- Sighing
- Eyelid twitching
- Dry mouth
- Frequent urination
- Urinary urgency
- Menstrual irregularities
- Inability to relax

Signs of depression included in the symptoms review include the following:

- Tingling in feet
- Tingling in hands
- Dizziness
- Sleeping difficulties
- Blurred vision
- Poor appetite
- Upset stomach

- Nausea
- Vomiting
- Rapid heart beat
- Diarrhea
- Constipation
- Weight loss
- Difficulty breathing
- Insomnia
- Dry mouth
- Burning, unpleasant taste
- Menstrual irregularities
- Decreased sex drive
- Fatigue
- Feelings of loss of control

Outcome-Based Reporting System: Pain Assessment

The Outcome-Based Reporting System utilizes three separate instruments to assess the patient's current level and character of pain: the pain drawing, the visual analog scale, and the numeric rating scale. The Outcome-Based Reporting System utilizes these three instruments to accurately and reliably gather information relative to the patient's subjective complaint in a reliable and reproducible manner.

Traditional forms of progress notes (SOAP notes) have proven to be ineffective in communicating the necessary data needed to quantify cases with the advent of stringent utilization review. Patient rendered subjective data is the key to understanding the complex nature of the neuromusculoskeletal case and provides a standardized methodology for clinical reporting.

Pain Drawing and Outcome

Pain drawings allow the doctor to focus on the physical nature of the complaint as well as identifying the possible presence of underlying psychological factors involved in the case. The identification of underlying psychological complicating factors is important because attempts at care that only emphasize the physical basis for the complaint will have limited success (1,2) and the failure to recognize and manage the psychosocial aspect of chronic pain often contributes to the development of chronic pain syndrome (3,4).

Pain drawings quickly enable the treating doctor to assess the patient's level and character of pain. The pain drawing can also demonstrate whether the

patient is demonstrate symptoms consistent with an organic lesion (one in which the history and physical findings are consistent), whether the patient is amplifying pain levels, or if there are non-organic (psychosocial) factors involved in the case.

The following information pertains to the general usage of pain drawings and lends credence to the value of pain drawings as a primary diagnostic instrument for patients with back-related pain:

- Pain drawings provide the doctor with the patient's rendering of their organic symptoms and are valid for detecting very specific abnormalities, such as herniated discs or sciatica (5,6,7,8).
- Pain drawings are valid for detection of overt mental abnormalities, such as those seen in regional psychogenic pain disturbance (5).
- Pain drawings afford details to the doctor on the patient's level of psychological distress(6,8).
- Pain drawings most simply illustrate the illness behavior by providing physical information about the pattern of pain and by providing psychological information relative to a patient's presentation of pain (9,10,11).
- Pain drawings are useful in identifying patients who have a high probability for delayed recovery and who may go on to prolonged disability (12).
- Pain drawings can be used as a screening tool for the selection of patients who may be candidates for more intensive psychological and behavioral evaluation (10).
- Pain drawings may be used to assess the efficacy of serially administered treatments for outcome purposes (10).

Pain drawings have been linked to outcome assessment by a number of researchers. Current data pertaining to outcome assessment and pain drawing usage indicates the following:

- Psychologically disturbed patients, as identified through pain drawing interpretation, did more poorly after 12 months of care than did non-disturbed patients (13).
- Wide-spread, nonanatomical pain was prevalent with patients responding more poorly to

treatment and who were more likely to be incapacitated by their illness (14).

- Pain drawings are one of the best predictors, apart from non-organic signs from the physical examination (Waddell's Signs), back pain versus leg pain, and the Hy scale from the MMPI (15).
- Nonorganic patients have reduced function, less successful rehabilitation, greater recurrence rates, and a greater history of work absenteeism (16).
- Patients who are inclined to be preoccupied with somatic complaints, or their implications, tend to benefit the least from care (17).
- Pain drawings play a critical role in the Outcome-Based Reporting System due to the above-mentioned features. The pain drawings are generated at each office visit and aid in the identification of the patient with the emergent functional overlay (psychosocial complicating factors), as these patients demonstrate complicated courses of care and more prolonged duration of care.
- The utility of pain drawings for the measurement of psychological dysfunction is well documented. The following pertains to pain drawing and psychological dysfunction measurement:
 - Psychologically disturbed patients have poorer responses to care (13)
 - Anxiety often leads to a more dramatic display and higher pain drawing scores (18).
 - Pain outside the body may indicate symptom magnification (18).
 - Changes in the pain drawing score can document a patient's changing perception of pain and shifting pain patterns (18).
 - Diffuse pains graded at maximum levels of severity are more likely to be associated with depression (19).
 - Pain drawings in organic chronic low back pain should match the organic diagnosis. Pain drawings in chronic psychogenic back pain tend to be bizarre and the pain may spread to non-anatomic areas (20).

- In Ransford's study, 93% of the patients with pain drawing scores that were greater than or equal to 3 also had elevated Hs-Hy scales on the MMPI, indicating that a pain drawing score of 3 or more points represented a pain perception influenced by psychological factors (21).
- The number of body areas reported as painful correlates positively with psychological disturbance (9, 21).
- Prechronic back pain patients complain of pain over a larger area of their bodies (i.e., numerous sites) and they have more musculoskeletal symptoms that are deep and central, rather than peripheral (13).
- There is a link between the psychopathological characteristics, including somatization and affective disturbance, and the pain extent (22,23,24).
- Patients with inappropriate pain drawings show a higher level of general distress and seem to be more somatically preoccupied (25).
- Patients who do not demonstrate differences in pain sensation and pain behavior between periods of movement tend to show fewer positive physical findings, a greater reliance on medications, and tend to demonstrate more emotional distress (26).
- Higher pain drawing scores may be a marker for behavioral dysfunction (10).
- Non-anatomical drawings are due to a psychological, or functional overlay. When the patient is less emotionally involved with the pain, the pain drawing takes on a simpler form and the drawing scores are very low (27).

Pain Drawing Scoring System

As previously stated, pain drawings enable the treating doctor to rapidly assess the patient's level and character of pain. The pain drawing can demonstrate whether the patient is exhibiting symptoms consistent with an organic lesion, whether the patient is amplifying pain levels, or if there are non-organic (psychosocial) factors involved in the patient's case. Several pain drawing rating systems have been proposed for the analysis of pain

drawings. Ransford, et al (21) developed a numerical system for scoring pain drawings in the late 1970's, which was later revised by Hildebrandt (6).

The following methodology (6,21) for scoring the pain drawing may prove to be of use in communicating the relative level of psychological involvement demonstrated by the drawing and also serves as a means of ascertaining the level of psychosocial involvement present in the drawing. With this scoring system, a score of three or more is generally thought to represent pain perception that may be influenced by psychological factors. Some of the readily apparent expressions of psychological distress include pain distributions that are non-anatomical, pain distributions that are of a bizarre nature, drawings that demonstrate "expansion" or "magnification of symptoms, and drawings that demonstrate "look how back I am indicators". The following breaks down the previous four areas of drawing features in more detail:

Unreal Drawings (If one or more of the following pain localizations are drawn in, 2 points are assigned).

- Total leg pain
- Frontal aspect of both legs
- Unilateral or bilateral anterior tibial pain
- Back of leg, (Isolated, knee included)
- Circumferential thigh pain
- Lateral whole leg pain (trochanteric and lateral thigh area allowed)
- Bilateral foot pain
- Circumferential foot pain
- Anterior knee pain, ankle pain
- Spotted bounds of pain scattered about the whole leg
- Whole abdomen pain

Drawings that demonstrate "expansion" or "magnification" of pain (one or two points per area, depending upon the extent)

- Back pain radiating to the iliac crest, groin, or anterior perineurium - coccyx pain allowed (NOTE: RULE OUT SACROILIAC JOINT DYSFUNCTION)
- Pain drawn outside the body as an indicator of magnification

Drawings that incorporate "I particularly hurt here" indicators (Each category scores one point)

- Additional explanatory notes
- Circling of painful areas
- Drawing lines to demarcate painful areas

- The use of arrows to describe anatomically non-explainable pain
- The use of additional symbols

Drawings that incorporate “Look how bad I am” indicators (Score one point for small areas and score two points for larger areas)

- Additional painful areas of trunk and head drawn in
- Additional painful areas of the neck drawn in
- Additional painful areas of upper extremities drawn in

Uden (7) proposed an observational system for the assessment of the pain drawing. This system of interpretation relies on the first impression formed by the doctor who is familiar with back-related disorders after viewing the pain drawing. In this system of analysis, the provider categorizes the pain drawing into one of four categories: organic, possibly organic, possibly non-organic, or non-organic. This rating system demonstrated that even when a person inexperienced with the use of pain drawings views the initial drawing, the intra-examiner reliability was 80% and the inter-examiner reliability was 70%.

Please note: It is not the intention to use pain drawings in the Outcome-Based Reporting System to diagnostically label any mental disorder. Patients demonstrating possible problems should be referred to the proper provider(s).

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Visual Analog Scale and Numeric Rating Scale

The Outcome-Based Reporting System is designed to capture the relevant case-related data in a timely manner. This feature allows the clinician to accurately identify those patients at risk for chronicity and poor treatment outcome. In this reporting system, the patient’s self-reported levels of pain are measured upon intake and at each office visit

through the Visual Analog Scale (VAS) and the Numeric Rating Scale (NRS). These instruments accompany the pain drawing.

The visual analog scale and numeric rating scale are simple reporting instruments that can accurately quantify a patient's pain level for the doctor. These scales are preferable to longer testing instruments, as they place minimal demands upon the sick patient (1,4,5). The numeric rating scale is highly accurate for quantifying a patient's subjective pain level. The numeric rating scale has the highest diagnostic yield for the chronic pain population, and its accuracy is followed closely by the accuracy of the visual analog scale (7,8). Combining the visual analog scale and numeric rating scale in clinical situations results in a higher diagnostic yield in pain reporting (3,5). With respect to the numeric rating scale, the greater the self-reported pain levels from the patient, the greater the probability of continued symptoms and disability (9). Pain that does not change with each successive office visit and does not drop below a grade of "3" with rest is suspected to be related to psychological problems, neoplastic disease, or non-degenerative spinal disease (6).

The Visual analog scale is highly accurate for the measurement of pain intensity for chronic low back pain patients. Chronic low back pain patients represent between 10% and 20% of patients with low back pain, but account for as much as 90% of expenditures for low back pain in the United States. The validity of the 10-centimeter visual analog scale has been established and there is evidence that the 10 centimeter scale graded into 1 centimeter intervals is more reliable (1,2). The horizontal visual analog scale is preferred to the vertical visual analog scale in chiropractic practice, as some patients may mistake the vertical version of the scale for a representation of the spine (3).

Collins, et al (10) published a study dealing with the interpretation of the visual analog scale's pain data with respect to moderate and severe pain levels. The study group consisted of 1,080 patients, with 736 patients reporting moderate pain and 344 patients reporting severe pain. The authors found that baseline scores for patients with moderate pain differed significantly from baseline scores for patients with severe pain. Results from the study are summarized below:

- **Moderate Pain:** 85% scored over 30 millimeters on the visual analog scale, with a mean of 49 millimeters.

- **Severe Pain:** 85% scored over 54 millimeters on the visual analog scale, with a mean score of 75 millimeters.

Any frequent pain greater than "5" indicates magnification or expansion of the patient's painful syndrome. As with any testing instrument utilized in clinical practice for the assessment of the patient's pain perception, the accuracy of one instrument is enhanced by the addition of other instruments. In the protocols utilized in the Outcome-Based Reporting System, the visual analog scale is combined with the numeric rating scale and the pain drawing to establish a baseline for the patient on the initial office visit and subsequently, for daily charting purposes. The combination of these three pain reporting instruments allows for the rapid and accurate assessment of the intensity, location, and type of pain the patient is experiencing, as well as providing a means to quantify the patient's progress in a subjective manner.

Several carriers define maximum medical improvement under chiropractic care as a plateau in progress in which there is "less than 20% improvement over a treatment trial period of two to three weeks". The visual analog scale and numeric rating scales provide the doctor with readily available numerical data to assess the patient's progress and to determine if the patient has reached a plateau. The numerical data captured on the patient's response to treatment is also entered into a diagnostic code-specific database to document the efficacy of chiropractic care for the codes submitted by practicing doctors.

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Outcome-Based Reporting System Targeted Approach to Patient Management

In the Outcome-Based Reporting System, neuromusculoskeletal patient management is centered around the basic premise that in the typical case, the patient should progress down a projected course leading to final case resolution. In this approach to case management of spine-related disorders, there are three basic pathways of patient response to conservative neuromusculoskeletal treatment: Track A, Track B, and Track C.

The sequential pain-related numerical data from the visual analog scale and numeric rating scales provide the doctor with progressive evidence of the efficacy of the treatment plan selected for the patient and provide the doctor with a means of rapidly assessing the patient for the attainment of short and long-term treatment goals. Plateaus may result in care. A plateau of care is defined in terms of a two to three week period of treatment in which the patient’s symptomatology does not make progressive improvement. One carrier has defined a plateau as *less than 20% improvement over a course of 2-3 weeks of conservative care.*

Track A: The patient responds rapidly to care. The patient suffers from a minor injury and case resolution occurs within the first few weeks. The patient makes a rapid recovery, reaching pain-free levels within the first few weeks of care. The patient demonstrates minimal significant examination findings, which may include any or all of the following:

- Onset of the condition is within the past 7 days
- This is the first complaint to injury to the area
- There is no past history of similar problems
- There are no extenuating factors in the case (little to no evidence of psychosocial involvement)
- There is no presumptive neural compression symptomatology
- There are limited orthopedic findings
- There is limited segmental dysfunction (subluxation)

- There are minimal to normal findings on imaging, laboratory studies, and other physical medicine diagnostic studies
- The pain drawing demonstrates a pain pattern that is localized, simple, and central, with little to no pain referral
- The patient marks a minimal amount of symptoms on the symptoms review

At the beginning of the fourth week, (if care lasts that long) a re-examination should be performed to determine if there is documentable need for continuation of care. If such need is found, the doctor should formulate a treatment plan that moves the patient from passive therapy to a more active care plan. Short and long term treatment goals should be identified, with quantifiable targets set forth for the measurement and attainment of the short and long-term goals.

Before release from care, the patient should be educated on back injury prevention and instructed in *Activities of Daily Living (ADLs)*.

Track B: The patient has an unfavorable response to care in the first month of treatment and generally demonstrates signs of an organic lesion that may be better managed by other providers, or more aggressive therapy options. Referral to the appropriate provider generally occurs by 4-8 weeks into the case. These patients may also be demonstrating signs of a functional overlay in the developmental stages. The Outcome-Based Reporting System reporting forms should be examined carefully for evidence of a functional overlay. In the case that a functional overlay exists that may be complicating care, the patient should be referred for psychological intervention.

Track C: The patient has a slow, but progressive response to conservative care. Plateaus may occur during the course of treatment. The patient may also demonstrate relapses in symptomatology. Plateaus and relapses are managed by the application of the appropriate intervention strategies. Co-management is possible for the care of these patients.

Normal care of this patient should progress away from passive modalities to more active forms of care as the second month of care begins, at the latest. At any time during the conservative care regimen, when the patient regresses or plateaus, the patient should be reassessed for the need for continued conservative care or possible referral.

Patients in Track C may present with any or all of the following features:

- Onset may be from one day to greater than 7 weeks
- Possible functional overlay may be present - examine Outcome-Based Reporting intake and subsequent forms for evidence of functional overlay (nonorganic findings)
- The injury may be the initial injury to the region or may be a subsequent re-injury to the same area
- There may be a possible past history of similar problems
- The pain may be localized or non-localized to the area of injury, with or without radiation of pain
- There may be single or multiple injury sites
- There may be moderate to significant orthopedic findings
- There may be evidence of neural compression present consisting of loss of deep tendon reflexes, loss of motor strength, or loss of sensation to a given dermatome(s)
- The patient may exhibit moderate to marked segmental dysfunction (subluxation)
- The patient may demonstrate minimal, moderate, or significant findings on imaging, laboratory work, or other physical medicine diagnostic studies.

At the conclusion of care, the patient should receive instruction on performance of activities of daily living and on techniques that will assist in the avoidance of further injury to the involved area.

Factors That May Complicate the Course of Care

The following represents a list of complicating factors in the management of a musculoskeletal injury:

- Multiple injury sites - This may present a problem in the case of a worker's compensation injury in proving compensability. A direct link (causal relationship) must be established through documentation to the compensable body injury area to assure reimbursement.
- Age of the patient
- Deconditioned physical status
- Duration of condition (length of immobilization)
- Presence of underlying systemic conditions that may hamper the healing process:
 - a. Diabetes mellitus
 - b. Pre-existing arthritides

c. Smoking

d. Osteoporosis

- Pregnancy
- Work-related activities
- Previous untreated injuries to the same area
- Exacerbation of injury occurring during the course of care - especially in the scope of employment in the case of a work-related injury - that is the result of an on-the-job injury.
- Occupation: Blue-collar jobs have been identified as high-risk occupations for prolonged disability and poor case resolution. Jobs that involve a high degree of vibration exposure or bending, twisting, and lifting have been identified as contributing to a level of disability that is twice the rate noted for white collar workers.
- Low supervisory ratings from employer
- Number of providers - The number of providers seen for a condition may indicate a patient at risk for disability. In general, the more providers seen for the same condition the worse the prognosis.

Intervention Strategies for Primary, Secondary, and Tertiary Levels of Care

The following is a list of intervention strategies compiled through a consensus process involving all provider groups in the Texas Workers' Compensation System. The mode for intervention strategies is strongly correlated to the length of the case.

Interventions vs. Length of Condition:

Primary Intervention Phase:	< three months
Secondary Intervention Phase:	3-6 months
Tertiary Intervention Phase:	> than 6 months

Primary Intervention Strategies

- Analgesics: Pain control or symptom control
- NSAIDS
 - Education
 - a. Biomechanical counseling, back schools
 - b. Neuromuscular education
 - c. Anatomical education
 - d. Home programs
- Passive physical therapy modalities
- Active and assisted physical medicine procedures
- Exercises (McKenzie, etc)
- Limitation of activity

- a. Modified bed rest
 - b. Modified work
 - c. Work cessation consideration
- Braces
- TENS
- Injections
 - a. Epidural steroid injections
 - b. Trigger point injections
 - c. Facet injections
- Manual medicine treatment

Secondary Intervention Strategies

- Reactivation care
 - a. Physical therapy
 - b. Rehabilitation
- Work hardening
- Aerobic conditioning
- Reconditioning
- Educational programs with emphasis on strength and conditioning
- Early non-operative exercises for early deconditioning
- Limited psychological intervention
- Limited detoxification intervention
- Limited program activity with access to health care providers as consultants
- Diagnostic injections
 - a. Selective nerve root injury
 - b. Spinal block
 - c. Brevital study
- Rule in/out first surgery
- Post-surgical rehabilitation
- Manual medicine treatment

Tertiary Intervention Strategies

- Chronic pain management program
- Functional restoration program
- Manipulation under anesthesia
- Manual medicine treatment

Workers' Compensation Fraud

According to national claims data, workers' compensation expenditures have reached the level of 12 billion dollars per year. Fraud and abuse are becoming more prevalent in the workers' compensation ranks. It is estimated that approximately 10% of all workers' compensation claims paid annually are paid in fraudulent claims. Fraud and abuse also add to the complexity of case management for the clinician, as patients involved in

fraudulent claims activity will tend to have poorer outcomes to treatment due to the secondary gain factor. The following are several key indicators of fraudulent claims activity that the doctor should investigate while taking the history on a patient suffering from any work-related injury:

- ***Delayed notice of injury:*** Be wary of the alleged injury that occurs first thing on Monday morning, or late on Friday afternoon and is not reported until Monday morning. These injuries may be the result of some nonwork-related activity on the weekend.
- ***Employment change:*** Be wary of the injury that occurs immediately before or after an industrial dispute, job termination, layoff, end of a big project, at the conclusion of seasonal work, or if the injured worker is a short-term contract employee.
- ***Holiday blues:*** Watch out for the injury that occurs a day or two before or after a holiday.
- ***Use of a Post Office box as an address:*** Employees involved in fraudulent claims activity may use a P.O. box as an address to avoid investigative surveillance.
- ***No witness to the accident, or the witness to the accident is of questionable character:*** Be wary of an accident that has no witnesses and the injured worker's own description of the accident does not support the cause of the injury or the clinical findings. Also, be cognizant of the worker who has a poor record with compensable injuries and provides a questionable version of the incident.
- ***History of claims:*** Be on the lookout for a patient who gives you a history of previous workers' compensation injuries.
- ***Late reporting:*** The injured worker seeking care who delays in reporting the claim without a reasonable explanation may be engaging in fraudulent claims activity.
- ***Conflicting descriptions:*** Be watchful for incidences when the employee's account of the accident does not agree with the medical history or the examination findings; or, if the employer's first report of the claim or circumstances does not match the injury mechanism, circumstances, or location.

- ***Patient who is hard to reach:*** Be on the lookout for the patient who is difficult to contact at home when they are allegedly disabled and/or their partner or another family member is the contact person for the injured worker. Also included in this category is the continual use of an answering machine to screen calls.
- ***Treatment:*** The index of suspicion should be raised when an injured worker refuses a diagnostic test or procedure to confirm the nature or extent of the injury. Also be wary of the patient who travels to seek medical treatment from a number of different doctors, or travels to an area that is far away from his or her home or workplace to seek treatment.
- ***Work history:*** This can be an indicator of fraudulent claims activity. Look for the injured worker who has a history of unstable employment, drug abuse, alcohol abuse, poor work attendance, or overuse of sick leave.
- ***Back injury:*** Back injuries are one of the most common types of injuries reported by workers filing fraudulent claims.
- ***Disgruntled employee:*** Injured workers about to be reassigned, demoted, or passed over for a promotion may file fraudulent claims.
- ***Injured worker who seems to be unusually familiar with the claims handling procedure:*** This may indicate that the patient may have filed one or more workers' compensation claims in the past.
- ***Patient who has a side business:*** Patient may be engaged in a business "on-the-side", is in college, or may have some other financial motivation for filing a fraudulent claim.
- ***Employee who has made a recent large purchase***
- ***Injury occurring in an area where employees are not normally located***
- ***Injured worker who seeks a quick settlement***

Please consider these elements when taking a history, examining, and treating a work-related injury.

Medical Records Review Guidelines for Chiropractic Offices

The following is a checklist that is based upon the criteria by which the medical records of a practitioner are assessed and rated. These guidelines are set forth by the National Commission for Quality Assurance (NCQA) and are adhered to by many health plans. This checklist is presented in order that each office can rapidly determine the level of compliance with the established standards for medical records.

- Each page in the record contains the patient's name and/or ID number.
- Personal/biographical data includes the address, employer, home and work telephone numbers, and marital status.
- All entries in the medical record contain author identification.
- All entries are dated.
- The record is legible to someone other than the writer.
- Significant illnesses and medical conditions are indicated on the problem list.
- Medications, allergies, and adverse reactions are prominently noted in the record. If the patient has no known allergies or history of adverse reactions, this is appropriately noted in the record.
- Past medical history (for patients seen three or more times) is identified and includes serious accidents, operations, and illnesses. For children and adolescents (18 years of age and younger), past medical history relates to prenatal care, birth operations, and childhood illnesses.
- For patients 14 years of age and older, there are appropriate notations concerning the use of cigarettes, alcohol, and substances (for patients seen three or more times, query for substance abuse history)
- The history and physical records appropriate subjective and objective information pertinent to the patient's presenting complaints.
- Laboratory and other studies are ordered, as appropriate.
- Working diagnoses are consistent with findings.
- Treatment plans are consistent with diagnoses.
- Encounter forms or notes have a notation, when indicated, regarding follow-up care, calls, or visits. The specific time of return is noted in weeks, months, or as needed.
- Unresolved problems from previous office visits are addressed in subsequent visits.
- If a consultation is requested, the record contains a note from the consultant in the record.

- Consultation, laboratory, and imaging reports that are filed in the chart are initialed by the primary care physician to signify review. If the reports are presented electronically, or by some other method, there is also representation of physician review. Consultation, abnormal laboratory and imaging study results have an explicit notation in the record of follow-up plans.
- There is no evidence that the patient is placed at inappropriate risk by a diagnostic or therapeutic problem.
- An immunization record has been initialed for children, or an appropriate history has been made in the medical record for adults.
- There is evidence that preventative screening and services are offered in accordance with the organization's practice guidelines.