Review of Major Disability and Compensation Systems in the USA ... 2
Functional Outcomes of Lumbar Spinal Fusions for Workers Compensation Patients .......................... 11
CME Questions ................................................. 17
Answers To CME Questions From Vol 6, No. 1 .................................................. 17
AMA 6 Based CME Questions File .................. 18

Original Research Article
A Nation-Wide Study of Psychosocial Strain at Work as a Predictor of Seeking Medical Attention ............... 20
Symptom-Based Illness and Work: Methodologies for Decision-Making in Disability Determination ........... 25

Review of Major Disability and Compensation Systems in the USA

A Nation-Wide Study of Psychosocial Strain at Work as a Predictor of Seeking Medical Attention

Symptom-Based Illness and Work: Methodologies for Decision-Making in Disability Determination
Review of Major Disability and Compensation Systems in the USA

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Abstract: This overview examines the historical origins of the major U.S. disability systems and highlights the fundamental similarities and contrasts between them.

It is written in the Bible that “if any would not work, neither should he eat.” Hence there has been a long-standing expectation among individuals within society that members must contribute individually to benefit and share collectively. It appears equally true that individual members who cannot contribute because of disability may be exempt from such expectation and yet still enjoy benefits to which other group members are entitled. It is also possible for an individual to exploit society through unfair and exaggerated claims of disability, which becomes an issue of social justice. Although social justice systems compensate in some way for bodily illness or injury, they must also afford protection against benefits being paid to those who choose not to be productive and fake or exaggerate their disability. Disability and compensation systems provide rules defining disability and entitlement as well as procedures for determining who qualifies as disabled. These rules are intended to provide fair and equitable distribution of limited system resources to those whose needs are greatest and whose disabilities are most compelling.

Within the United States, various disability and compensation systems have arisen to ensure that members of society with a medically determinable impairment that may lead to disability have recourse to compensation from various avenues, including state and federal workers’ compensation laws, veterans benefits, and social welfare programs where appropriate. These systems have diverse historical origins and statutory requirements; consequently, there remains considerable variability between them with respect to definitions of disability, entitlement, benefits, claims application procedures, adjudication, and the role and relative weight given to medical versus administrative deliberations. In most cases, a medical determination of physical or psychological impairment is necessary, and in some cases the physician is empowered to render an opinion regarding the nature and extent of medically determined impairment resulting in disability. It is imperative that physicians be familiar with precise meanings and definitions of the terms impairment and disability, as well as the fundamental requirements, nuances, and jurisdictional variations of the particular disability system within which they are working.

EVIDENCE FROM PRIMITIVE AND PREHISTORIC SOCIETIES

Tolerance of and care for the disabled may be elemental components of our social fabric rooted in the very origins of human society. From the outset, our earliest ancestors may have been afforded communal benefits in terms of improved odds of survival of hereditary and acquired physical impairments that might otherwise prove fatal to the individual.

Evidence exists within contemporary species of nonhuman social primates to suggest that this is so. For example, individual society members frequently suffer incapacitating injuries and disfigurement during their lifetime, yet survive...
into adulthood and thrive within their group. To illustrate, Schultz 29, 30 describes advanced crippling arthritic changes in 55% of skeletons from mature and aged specimens of wild-shot gibbons, who are traditionally socially monogamous. Furthermore, diseases affecting dentition (including severe caries, alveolar abscesses, and maxillary sinus infections) and those that produce pathological and disfiguring changes in the skull are commonly seen among free-ranging chimpanzees and gorillas. Many arboreal primates are prone to life-threatening falls and, if not killed outright, can frequently survive joint dislocations, single and multiple fractures of limb bones, and even cranial fractures. Such fractures may heal to a serviceable degree, or with nonunion, lead to pseudarthrosis and foreshortening of limbs in some cases.30 The relationship between observed patterns of social behavior within higher primate species and the incidence, prevalence, morbidity, and mortality associated with such disabilities remains incompletely understood, but a facilitative and supportive role is suggested.

Among the earliest evidence of survival and recovery from major trauma among prehuman hominid species is a fossil specimen of Australopithecus from Kenya that is believed to be between 1 and 2 million years old.21 The remains include the neck and proximal shaft portion of a left femur that reveal signs of a healed fracture callus distal to the lesser trochanter, suggesting that the original owner once survived a catastrophic and potentially disabling injury.

Other evidence from the fossil record suggests that severe trauma was indeed prevalent among Pleistocene human populations and that survival was clearly possible after catastrophic injury. Perhaps the best example of this can be seen among skeletons excavated at Shanidar Cave in northeastern Iraq, dating to approximately 60,000 years ago. Partial skeletons of nine Neanderthals from the site have been described.33 Four of the six reasonably complete adult skeletons show some form of trauma-related abnormality, and at least two were severely incapacitated by their injuries. The best known of these, Shanidar 1, was an adult male who died between 35 and 50 years of age after surviving a crushing blow to the left orbit, frontal, and zygomatic portion of the skull during his lifetime. As a result of this injury, he was presumably blind and severely disfigured from enucleation of his left eye, and apparently suffered right arm and leg paralysis and associated long-bone atrophy/hypotrophy and joint deformity. Ultimately, he suffered an amputation of the right elbow, and was later killed when a ceiling collapsed on him. In another well-known Croatian Neanderthal site at Krapina, the remains of an amputated and healed proximal half of a right ulna have been found.25 These findings reflect a remarkably high incidence of traumatic injury and recovery coupled with a level of societal development in which the disabled were well cared for by other members of the group.33

Excavations from an Upper Paleolithic (11,000 years old) site in southern Italy yield evidence of dwarfism in a hunter-gatherer society. An adolescent individual has been described with characteristic deformities reflecting severe growth deficiency and restrictions in elbow mobility. These physical impairments undoubtedly interfered with the individual's participation in subsistence activities and may have been a substantial handicap for such a nomadic hunter-gatherer. Yet there is no evidence of nutritional stress according to skeletal and dental indicators (i.e., dental hypoplasia). Furthermore, the individual received a funeral, as evidenced by his burial in an important cave—a privilege typically reserved for those of special social status among the group at that time. Consequently, the capacity for group acceptance and support, despite severe nontraumatic handicaps that would limit the ability to contribute to group subsistence, was already evident among the stone-age populations of Europe.4

These examples are but a brief account of the widespread acceptance of the physically disabled in prehistoric societies, as evidenced by the fossil record.

HISTORICAL EVIDENCE

Historical evidence suggests that social justice and systems of compensation have existed and been linked since ancient times. Records exist from ancient Persian societies detailing compensation for injuries suffered in relation to the social order of that time. As far back as 4000 years ago, Babylon compensated for loss of life or limb while in service of the state. For example, the Code of Hammurabi (1750 BC) was an ancient Babylonian legal code, written in cuneiform, and containing laws purportedly given to King Hammurabi by Shamash,
the Babylonian god of justice. The code represents an advanced attempt to legislate justice in moral, social, and economic spheres with provisions that decreed punitive action to be taken against a person causing bodily injury, and it bears a striking resemblance to the Mosaic laws. Among these was the principle of Lex Talonis, the “law of retaliation” or “principle of equivalence,” which existed to compensate for wrongful bodily injury but dictated that societal retribution should be the same in kind as the offense, as in an “eye for and eye and a tooth for a tooth.”

The Laws of Eshnunna were a more enlightened yet contemporary approach, as evidenced from the cuneiform text of the Old Babylonian kingdom of Eshnunna. The laws were a compilation of rules and ordinances recommending monetary compensation for bodily harm, as the writing attests: “If a man bit and severed the nose of a man, 1 mina silver he shall weigh out. An eye, 1 mina; a tooth, 1/2 mina; an ear, 1/2 mina. A slap in the face, 10 shekels silver he shall weigh out.”

Among the ancient Egyptians, similar laws provided compensation for wrongful acts resulting in injury. Punitive actions, often severe, could be taken against physicians for acts of malpractice, such as amputating a physician’s hands for causing blindness to a patient after removal of cataracts.

Evidence of social compensation exists for other Western societies, including the ancient Greeks, who provided compensation for injured parties. The soldiers or survivors of Alexander the Great’s army were compensated for losses of life and limb incurred during the course of military service. In Roman society, compensation was available for both free men and slaves, yet social status dictated that slaves received less compensation than free men. Furthermore, Roman masters were obligated to care for their injured slaves. The concept of Respondeat Superior was also introduced, which created the legal obligation of a master to answer for the wrongful doings of his servants. This concept still exists in common law and in military doctrine in which subordinate members who are bound to obey their superiors in turn derive legal protection and immunity for actions taken and consequences of following orders.

Around the birth of Christ the Germanic and Nordic tribes (Lombards) were establishing themselves on the western edge of the Roman empire as civilized members of the empire. Consequently, the blood feud formerly used as a means of securing justice, was formally prohibited and the state assumed the role of administering justice between the injured and the accused. The compensation for injuries was based on a “whole person” concept Each tribesman was considered to have an intrinsic monetary value—his wergeld or “man value”—which varied according to social status and was typically worth 200 Roman solidi. This was the value of his life, or 100% whole-body impairment. There was a schedule for all sorts of injuries, from as trivial as injury to a toe to loss of limbs, eyes, and life itself. An even greater compensation was awarded for cosmetic loss; thus if one knocked out one’s molar tooth, the compensation was eight solidi (4% of the wergeld), but loss of a tooth that showed on a smile was equal to 16 solidi (8% of the wergeld). The impairment values are extraordinarily similar to those used today.

State-sponsored care for the poor and disabled without a responsible party (the concept of social security) has a tradition in history as well. The first state-sponsored social security system was established by Muslims in 640 AD during the reign of the second Caliph Omar. The state treasury provided monthly benefits to those afflicted with blindness, and to widows and orphans.

During the Middle Ages a paternalistic system existed in which feudal lords were obligated to care for subjects within their serfdom who became ill or injured. Various craft guilds were formed and developed an early form of disability insurance whereby healthy members of the guild contributed regularly to a fund that was made available to members in the event of injury or illness.

Social compensation systems were not unique to civil society. During the sixteenth and seventeenth centuries the buccaneers of America were engaged in acts of maritime piracy against vessels of trade between Europe and the colonies. Their system of laws was embodied in the ship’s “articles of association” and was agreed to by signature of each crew member at the outset of any voyage. The articles specified sums of salary to be paid to the captain and various crew members, the source being the common stock of illegally acquired goods from that
particular expedition. Furthermore, they contained an early form of workers’ compensation agreement to recompense crew members for serious bodily harm suffered during the voyage. An example follows:

“...they order for the loss of a right arm 600 pieces of eight or 6 slaves; for the loss of a left arm 500 pieces of eight or 5 slaves; for a right leg 500 pieces of eight or 5 slaves; for a left leg 400 pieces of eight or 4 slaves; for an eye 100 pieces of eight or 1 slave; for a finger of the hand the same reward as for the eye.”

**CHANGES OF INDUSTRIALIZED SOCIETY**

During the nineteenth century, London society regarded the working class and poor in terms of three categories—those who would work, those who could not work, and those who would not work. “Poor laws” were devised to determine those destitute but worthy of charity versus those deserving punishment. Sums of money were set aside under the auspices of local parishes and able-bodied members of the parish regularly contributed to the fund. Such funds were to be used to aid the lame, blind, elderly, and otherwise disabled poor. A board of commissioners was appointed to manage these funds by overseeing their disbursement. An able-bodied person who refused to work risked imprisonment or other punishment and faced “life on the street” unless he could successfully plead his case before such a commissioner.

Among the changes brought about as nineteenth-century society became increasingly industrialized was the increase in the proportion of society members working for low wages. Fear of injury or death in the workplace was a significant concern. Local governments became increasingly concerned with strategies for provision of medical service to the poor and destitute, the systematic and equitable spreading of costs of indigent care, and compensating for lost wages among the working and middle class.

Medical care was often provided by low-paid or unpaid doctors in training at hospitals maintained through charity and public subsidy. Medical insurance policies, per se, did not exist, and workers often went into debt or failed to pay medical bills altogether. Workers fearing loss of income because of injury or illness resorted to the purchase of disability insurance to provide “sick pay” or “death benefits” to cover funeral costs.

**COMMON LAW AND THE RISE OF TORT CLAIMS**

The United States inherited most of its common law from England, which has its roots dating back to the twelfth century in the reign of King Henry II when he delegated his judicial powers to various magistrates and judges. The country was divided into six circuits, and the king appointed three judges for each circuit who were charged with deciding civil cases based on precedent (prior decisions and the common customs of society), hence the term *common* law. This is based on the legal doctrine of *stari decicis*, which means “let the decision stand.” The idea is to have a certain predictability in the law for those cases with circumstances similar to cases from the past. The aspect of common law most applicable to the practice of disability medicine involves tort liability. A tort is defined as a “breach of duty that gives rise to an action for damages” and implies civil wrongdoing. Typically, there are four elements of a tort claim that must be proved before an adjudicating authority: (1) a legal duty existed, (2) a breach of legal duty occurred, (3) this breach of duty was the proximate or direct cause of harm or injury, and (4) harm or damage occurred as a result.

Liability under common law was often the only recourse whereby an injured worker could obtain compensation after injury in the workplace. It was burdensome to the plaintiff in terms of time and expense, and exceedingly difficult to prove employer negligence in a court of law because of three powerful defense strategies available to the employer that were often referred to as the “unholy trinity” or the three “Wicked Sisters.” The first defense was contributory negligence. If claimants could be shown to have contributed to their injuries through their own negligent actions, this would preclude their ability to recover damages against the employer, regardless of the extent of employer negligence. A second defense involved assumption of risk. If it could be shown that an injury was related to the inherent risks of the job, of which the worker knew or should have had prior knowledge, the injured worker could not recover damages by virtue of having accepted the job and thereby assumed its hazardous risks. A third defense...
was the “fellow servant doctrine.” An employee could not recover damages if it could be shown that the injury resulted from a fellow worker’s negligent actions. With these three defense strategies, it was unlikely that an injured employee could collect for damages under common law, where less than one in five tort claims were settled in favor of the plaintiff.\textsuperscript{20}

At present, tort claims may arise out of a personal injury caused by motor vehicle accidents, toxic exposure, medical malpractice, or defective products. Criteria for recovery for damages may vary depending on jurisdiction.

**WORKERS’ COMPENSATION**

Because of inadequacies of recovery from claims under common law, various workers’ compensation statutes were enacted around the turn of the century. A Workmen’s Accident Insurance Law was passed in 1884 as part of a comprehensive social insurance system in Germany. In England the Employers’ Liability Act of 1880 and the Workers’ Compensation Act of 1887 were passed to afford disability insurance protection to injured workers. In 1907 at St. Petersburg, Russia a disability indemnification schedule was introduced for regional bodily injury according to the concept of the “whole person.”

In the United States the first Workers’ Compensation Act was enacted in 1908 as a Federal Employers Liability Act, which was designed to provide for injured railroad workers. Wisconsin became the first state to sign Workers’ Compensation into law on May 3, 1911\textsuperscript{21} and New Jersey followed suit in 1912.\textsuperscript{22} The California Industrial Accident Act of 1914 created a schedule of indemnification according to claimant’s age, occupation, and physical impairment. By 1949 all states had enacted a Workers’ Compensation Law, which is now mandatory in most employment in almost all states.

Under Workers’ Compensation, a “no fault” system was adopted to resolve the dilemmas of the tort claims process by providing automatic coverage to employees whose claims of injury arise “out of and in the course of employment.” In exchange, covered employees forego the right to sue the employer in most instances, except in cases of wanton neglect.

**SOCIAL SECURITY**

A loosely structured welfare system existed within the United States as far back as colonial times.\textsuperscript{37} Initial programs were informal, voluntary, and operated at the community level. By the early 1900s social and state-funded programs were in place. The Social Security Act of 1935 was the first federally mandated program and was implemented during the administration of Franklin D. Roosevelt as an attempt to create a federal social welfare system after the Great Depression. Initially, the program was intended to address the needs of individuals disadvantaged by means of old age, unemployment, disability, or death of a spouse. Under Title II of the act, an Old Age Insurance pension was established for workers when they reached 65.

The Social Security Administration (SSA) is the largest disability program in the United States, assisting between 33\% and 50\% of all persons qualified as disabled.\textsuperscript{7} It includes two separate disability benefits programs. The first is Social Security Disability Insurance (SSDI), a program established in 1956 to create a separate fund for workers over age 50 who were totally and permanently disabled. SSDI is federally administered through the SSA and funded through a payroll tax that combines deductions for old age and disability (OASDI). The application process is initiated at the state level with the Bureau of Disability Determination. To be eligible, an individual must have worked in a job covered by SSDI for a minimum period (in general, 5 of the 10 years preceding the onset of disability). Pension benefits are provided to disabled individuals who have contributed through payroll taxes (FICA) during the requisite period, and whose disability involves total incapacitation.

Supplemental Security Income (SSI) is a second disability benefits program within the SSA, which operates as a federal-state partnership. SSI provides benefits to disabled individuals whose income and assets meet minimum criteria according to a “means test.” It is funded through general revenue (i.e., income tax revenues) and does not require work history for eligibility. For further detailed discussions of SSA, SSDI, and SSI, see Chapter 9.
FEDERAL EMPLOYERS LIABILITY ACT

The Federal Employers Liability Act (FELA) was enacted in 1908 to provide disability benefits to employees of the interstate railroad industry for job-related injuries. At that time railroads were the largest employer and rail work was exceptionally hazardous. Before passage of the act, injured employees would seek redress under tort claims as previously described. FELA limited employer defenses to only contributory negligence (and now modified to comparative negligence for which an award is apportioned according to percentage of employer versus employee culpability) and increased employers’ awareness for liability and incentive for prevention of workplace injuries.

FELA remains a potentially adversarial system in which the injured employee may negotiate an out of court settlement. Alternatively, a claimant may file suit for personal losses against the railroad in either a state civil court or federal court. Under FELA, a claimant must prove negligence on the part of the railroad. In turn, the railroad may assert a defense of comparative negligence, whereby recovery for damages can be proportionately reduced. FELA enables a claimant to recover economic damages as well as compensation for pain and suffering. Additional benefits might include retirement and sickness and disability annuities.¹⁰

JONES ACT (MERCHAND MARINE ACT)

The Jones Act (Merchant Marine Act) of 1920 is similar to FELA but covers civilian sailors for permanent injury suffered while in the service of a ship in navigable water. To collect, the claimant must bring suit against the master or owner of the ship. Cases are typically settled out of court because seamen are regarded as wards of the states and thereby enjoy liberal treatment by the court system in general.

FEDERAL WORKERS’ COMPENSATION PROGRAMS

Federal Employees Compensation Act

The Federal Employees Compensation Act (FECA) was enacted to provide compensation benefits to civilian employees of the federal government for work-related disability. Presently, it covers more than 3 million civilian employees of the U.S. Government, Postal Service, and Peace Corps, as well as such nonfederal employees as state and local law enforcement personnel and employees of the Civil Air Patrol. FECA is a no-fault system and, consequently, a federal employee cannot sue the federal government or recover damages under any other statute for work-related injuries. Changes in the law in 1974, whereby continued pay was offered to workers injured on the job, resulted in a dramatic increase in the incidence of claims.” There is no time limit on wage loss or medical benefits and no cap on medical benefits. FECA is federally administered under the Office of Workers’ Compensation Program (OWCP) in Washington, D.C.¹¹

Longshore and Harbor Workers’ Compensation Act

The Longshore and Harbor Workers’ Compensation Act (LHWCA) was enacted in 1927 to provide compensation benefits to shoreside maritime employees for occupational disabilities received while engaged in longshore work, ship building and repair, and other maritime activity. It is a no-fault system federally administered under the U.S. Department of Labor.”

Federal Black Lung Program

The Federal Black Lung Program was created by the Federal Mine Safety & Health Act of 1977 to provide coverage for coal miners engaged in surface or underground activity. The act provides monthly pension and medical benefits for total disability caused by pneumoconiosis (black lung) arising from employment in and around coal mines.¹⁶ It is administered through the U.S. Department of Labor.

The diagnosis of pneumoconiosis under the act may be ascertained through findings on a chest x-ray according to the International Lunge Office (ILO) Classification system. Chest x-rays of claimants are read by “B-readers,” who are medical specialists with certification by the National Institute of Occupational Health and Safety (NIOSH) to read chest x-rays of dust-exposed individuals according to the ILO classification. The miner
must also show total disability from pulmonary causes as documented by pulmonary function testing. The U.S. Department of Labor has published predetermined disability standards for spirometric values and arterial blood gas values against which a disability claim is referenced. It is estimated that the average cost per miner found eligible for disability benefits under the program is from $350,000 to $500,000 over their remaining life span.

Physicians desiring to serve as evaluators for claims arising within FECA, LHWCA, and the Federal Black Lung Program should contact the Office of Workers’ Compensation Programs (OWCP), 200 Constitution Avenue, Room 53522, Washington, DC 20210.

DEPARTMENT OF VETERANS AFFAIRS

The Department of Veterans Affairs (VA) was established in 1930 as the Veterans Administration to “consolidate and coordinate” government activities affecting American veterans of war. The Veterans Benefits Administration (VBA) was originally established as the Department of Veterans Benefits within the VA in 1953 to administer the GI Bill and VA compensation and pension programs. Presently, the Compensation and Pension Service rests within the VBA.

Eligibility for compensation and pensioning within the VA is extended to all veterans who receive honorable or general discharge from active military service. Entitlement decisions are administratively handled by the Adjudication Division of the Compensation and Pension Service. Service-connected entitlement refers to conditions determined by adjudication to be related to injury or disease incurred or aggravated while on active duty, whereas non-service-connected entitlement refers to conditions determined to be unrelated to active duty. VA benefits include disability pensions in the form of monthly monetary support to the veteran because of service-connected disability, or to a spouse, child, or parent of the veteran in the event of service-connected death. Additional benefits include hospitalization and medical care, orthotic and prosthetic devices, durable medical equipment, and allowances for adaptive modifications to the veteran’s home and/or motor vehicle where necessary.

Title 38 of the Code of Federal Regulations contains both the VA’s Schedule for Rating Disabilities (Part 4) and other VA regulations pertaining to compensation and pension (Part 3). Volume I of Title 38 contains Parts 0 to 17. Ten of the 16 body systems in the rating schedule have been recently revised. The 1997 edition does not contain the current versions of rating systems for muscle injuries and cardiovascular system, which were published in the Federal Register on June 3, 1997 and December 11, 1997, respectively. Each went into effect 30 days after the date of publication. They are available online through the Library of Congress website at lcweb.loc.gov.

The process of compensation requires a veteran to apply for compensation for a particular condition. The claim must be well-grounded, which means certain legal requirements must be met. If they are, the rater in a regional office may grant the benefit if the medical evidence of record is sufficient on which to rate (e.g., the service medical records may suffice in a recently discharged veteran), and the regulatory and statutory requirements for service connection are met. Some conditions may only be service connected directly; that is, there must be evidence that the condition began while the veteran was in the service. Many chronic conditions may be service connected if they began within a 1-year period after service was completed; some may be service connected much later if linked to service (e.g., because of herbicide or radiation exposure while in service). If a medical examination is needed, the rater will request one from a VA medical facility through a computerized request process. Some of the examinations may be contracted out if, for example, the required specialist is not available at a particular VA facility.

The VA examiner will receive a computer-generated set of worksheets for guidance as to the requirements of the particular examinations requested. If the examination, and any requested opinions about relationships, etc., are sufficient for rating purposes, the rater will apply the medical information to the rating schedule and assign a rating. Rating decisions require either one or two signatures. A physician need not sign any rating. Physicians make diagnoses only and give medical opinions or interpretations.
There is a local appellate process for veterans who have been denied benefits. Beyond that, there is the Board of Veterans Appeals in Washington, D.C., and, finally, there is the U.S. Court of Veterans Appeals. Rarely, cases may go to the Federal District Court and have the potential to go the Supreme Court. In the almost 10 years since the Court of Veterans Appeals began, a large body of case law has developed. Private medical evidence is considered as valid as VA medical evidence if it is sufficient for rating purposes, and veterans may apply for benefits with only private medical evidence. Examination guideline worksheets are available online in the benefits section of the VA's website at www.va.gov.

### AMERICANS WITH DISABILITIES ACT

The Americans with Disabilities Act (ADA) was enacted in 1992 to guarantee equal rights for disabled individuals to employment opportunities, public transportation, and public access. The ADA broadly defines disability as “... a physical or mental impairment that substantially limits one or more of the major life activities of the individual; or a record of such an impairment; or being regarded as having such an impairment.” Discrimination against the disabled in the workplace is prevented under Title 1 (Employment), which applies to businesses in the private sector with 25 or more employees. Title 1 compels the employer to afford equal employment opportunities to an “otherwise qualified” individual with a disability, who meets the “essential functions” of an employment position with or without “reasonable accommodation.” “Such accommodation can include structural modifications at the work site to improve access, availability of modified duty, adaptive equipment and devices.” Accommodation is reasonable if it does not pose an “undue hardship” (logistically or financially) on the employer, or pose a “direct threat” to the health and safety of disabled individuals and their co-workers. The Equal Employment Opportunity Commission (EEOC) oversees compliance with the law and has an excellent technical manual for those who wish to further educate themselves on the topic.

### FAMILY MEDICAL LEAVE ACT

The Family Medical Leave Act (FMLA) was enacted in 1994 to provide up to 12 weeks of unpaid leave under circumstances of medical necessity. The law applies to employers of 50 or more persons, and employees become eligible after having worked for the employer for 12 months or at least 1250 hours during the period before the requested leave. Leave may be granted to either gender and for purposes of the birth or adoption of a child, care of immediate family members, or an employee's own illness. It provides for unpaid leave and continued hospitalization and life insurance protection to an employee during the period of absence.

### PRIVATE DISABILITY SYSTEMS

It is estimated that 40 million Americans have private, long-term disability insurance, usually through the workplace. Private insurance plans lack statutory provisions in favor of contractual language that stipulates the criteria for disability and entitlement as well as the benefits of coverage under the policy. Employees who become disabled are initially covered by short-term disability for a period typically of 90 days. If the period of disablement must be extended, a long-term disability policy takes effect after 90 days.

Long-term disability policies may be individual or group policies. Group policies are typically sold to companies and are more affordable than individual policies. Group policies provide coverage to disabled employees who are unable to perform the requirements of their usual and customary job over a finite and specified period, typically 2 years; subsequently, the disabled will continue to receive benefits only if they are unable to perform the functions of “any occupation” as provisionally defined by the policy. Individual policies are available at higher premiums but may afford greater duration of protection to the individual who ultimately cannot perform his or her particular job over an extended, and perhaps indefinite, period.
Private disability generally pays up to 60% of the individual’s wages, to a maximum allowable cap, and may have built-in cost-of-living allowances with adjustments for future inflation.

SUMMARY

Systems of social justice exist to ensure equitable compensation and societal care for the disabled. It is quite probable that caring and concern for the disabled has been an integral part of human society from its earliest inception. Rules governing societal compensation for losses suffered are common throughout antiquity and remain with us to date. Disability systems in the United States have diverse historical origins, and a considerable diversity remains in respect to the definitions of disability, means of entitlement, benefits, provisions for application, and the role of and weight given to medical disability examinations. This historical overview is intended to acquaint physician disability examiners with the fundamental requirements and variations among the disability systems within which they may choose to work.

REFERENCES

Functional Outcomes of Lumbar Spinal Fusions for Workers Compensation Patients

S. Edward Said, M.D., F.R.C.S.(c), Associate Professor of Orthopedic Surgery, West Virginia University School of Medicine
Nicholas Said, MD, BScEE, MBA, West Virginia University School of Medicine

ABSTRACT:
A retrospective study of 42 consecutive patients who had lumbar spinal fusions following work injuries and were seen for independent medical examination with average follow up period of 31 months.

74% of patients had pain score of 5 or above on the pain intensity scale (0-10), 66% of patients required narcotics on a regular basis for pain control and 76% were unable to return to work at the time of evaluation. 60% of patients had severe limitations of activities of daily living and 79% felt no improvement or worse post surgery.

Unfavorable functional outcomes were seen in this group of workers compensation patients following lumbar spinal fusion. The unfavorable outcomes were independent of the number of levels fused, length of follow-up period, and for repeat surgery.

Low back injuries and low back pain remain one of the leading causes of disability in the workplace. Most work related low back injuries are treated conservatively with various modalities. A few fail conservative therapy and undergo lumbar fusions.

The results of lumbar fusions are well documented in the literature, nevertheless; only a few reports document the outcomes of lumbar fusion in workers compensation patients. The goal of lumbar fusion is not just to achieve solid fusion between vertebrae. Rather, it should improve pain, work capacity and quality of life.

This review is focused on the functional outcomes of lumbar fusions in the workers compensation population. Outcomes studied include pain resolution, return to work, functional status, performance of activities of daily living (ADL), and patient’s own assessment of improvement following surgery. It is often difficult to evaluate fusion rates, especially with current internal fixation devices and instrumentation. Solid fusion, or lack of it, is frequently presumed. For this reason, fusion rates were not investigated in this review.

MATERIALS AND METHODS
42 patients with lumbar fusions as a result of a work injury were seen by the author from 2000 – 2005 for independent medical examination. The minimum follow-up period for inclusion in the study was 12 months with a range from 12 – 155 months and an average of 31 months. 22 patients were evaluated over 24 months following lumbar fusion surgery. The evaluation included extensive records and investigations review, detailed history, and physical exam.

There were 29 males and 13 females. The average age at the time of evaluation was 44 years, with a range of 22 to 76 years. The average time elapsed between work injury and lumbar fusion was 29 months, with a range from 5 to 96 months.

39 patients (93%) were employed in physical types of jobs and 3 patients (7%) did office or administrative work. Factory work, construction and nursing or nursing assistants represented 63% of employment types.

The diagnoses prior to surgery are listed in Table I. The most common diagnosis prior to lumbar fusion surgery was discogenic pain.
Table I – Diagnosis prior to lumbar fusion vs Number of Patients

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discogenic pain</td>
<td>23</td>
</tr>
<tr>
<td>Discogenic pain post discectomy</td>
<td>7</td>
</tr>
<tr>
<td>Lumbar disc hernia</td>
<td>3</td>
</tr>
<tr>
<td>Spondylolesthesis/spondylolysis</td>
<td>5</td>
</tr>
<tr>
<td>Spinal canal stenosis</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

22 patients had one level fusion, 18 patients had two level fusion, and 2 patients had three level fusion. Types of fusions are listed in Table II with interbody fusion being the most common type.

Table II – Fusion Types vs Number of Patients

<table>
<thead>
<tr>
<th>TYPE OF FUSION</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anterior Interbody with prosthetic devices</td>
<td>20</td>
</tr>
<tr>
<td>Posterior Interbody with pedicular fixation</td>
<td>11</td>
</tr>
<tr>
<td>Posterolateral with pedicular fixation</td>
<td>6</td>
</tr>
<tr>
<td>Posterolateral without instrumentation</td>
<td>4</td>
</tr>
<tr>
<td>Combined anterior interbody and posterolateral</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
</tr>
</tbody>
</table>

Discograms were performed in 27 patients (64%). All discograms showed concordant pain at one or more levels.

Fusions were performed by spine trained orthopedic surgeons in 25 patients, by neurosurgeons in 12 patients, and 5 patients had fusions by general orthopedic surgeons.

RESULTS

Pain – 31 patients (74%) had a pain score of 5 or higher on the Pain Intensity Scale (PIS) at the time of evaluation with pain medication. 11 patients (26%) had pain score below 5. 28 patients (66%) required Class II or Class III narcotics (23 were on Class II narcotics and 5 were on Class III narcotics) on a regular daily basis for pain control. 2 patients (5%) required narcotics on an occasional basis. 5 patients (12%) required non-narcotic pain medications (i.e. Tramadol, anti-inflammatory medications). 7 patients (17%) required no pain medications. 18 patients (43%) were being treated at pain management clinics at the time of evaluation. 3 patients had spinal cord stimulators and 4 patients were being evaluated for insertion of spinal cord stimulator, at time of evaluations, for pain control.

Return to Work – 32 patients (76%) were unable to return to work at the time of evaluation. 5 patients (12%) returned back to sedentary employment. 5 patients (12%) returned back to their regular employment. 8 patients (19%) were granted social security disability at an average age of 39 years at the time of the evaluation.

Functional Limitations – We used the U.S. Department of Labor Employment criteria for functional status. 30 patients (72%) were able to function at or below sedentary employment status. 9 patients (21%) had functional status compatible with light employment and 3 patients (7%) had functional status compatible with heavy work. 11 patients (29%) walked with a cane at the time of evaluation and 1 patient required ankle foot orthosis (AFO) for ambulation.

Activities of Daily Living (ADLs) – 25 patients (60%) reported severe limitation of ADLs and required help with many of these activities, i.e. personal care hygiene, cooking, housecleaning, washing dishes, laundry, mowing grass or doing yard work. 17 patients (40%) had mild or no limitations of activities of daily living and required help with few ADLs or no help at all.

Patient’s Own Assessment – 33 patients (79%) indicated that they did not improve or were worse following lumbar fusion, at time of evaluation. 9 patients (21%) reported improvement following fusion surgery.

OUTCOMES AND LENGTH OF FOLLOW-UP PERIOD: We looked at 22 patients separately who had evaluation at least 24 months or longer following lumbar fusion. The range was 24 months to 155 months and average of 45 months.

Pain – 18 patients (82%) reported a pain score of 5 or above on VAS. 14 patients (64%) were taking Class II or Class III narcotics on a daily basis for pain control.
Return to Work – 16 patients (73%) out of 22 patients were unable to return to work at time of follow-up.

Functional Limitations – 19 patients (86%) out of 22 were functioning at or below sedentary level of employment.

Patient’s Own Assessment – 19 patients (86%) out of 22 reported no improvement or being worse following fusion.

There was no statistical significance (P>.05) regarding pain, return to work, functional status, and patient’s own assessment between patients followed for 24 months or longer and the whole group.

SECOND SURGERY: 19 patients (45%) had a second surgery either for refusion (16 patients) or to address complications (3 patients). Second surgeries are listed in Table III.

<table>
<thead>
<tr>
<th>Second Surgery</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postero-lateral fusion with pedicular fixation</td>
<td>10</td>
</tr>
<tr>
<td>with or without decompression</td>
<td></td>
</tr>
<tr>
<td>Anterior interbody fusion</td>
<td>3</td>
</tr>
<tr>
<td>Posterior interbody fusion</td>
<td>2</td>
</tr>
<tr>
<td>Postero-lateral fusion with decompression, no</td>
<td>1</td>
</tr>
<tr>
<td>instrumentation</td>
<td></td>
</tr>
<tr>
<td>Repair of dural leak</td>
<td>1</td>
</tr>
<tr>
<td>Evacuation of epidural hematoma</td>
<td>1</td>
</tr>
<tr>
<td>Removal of posterior instrumentation</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
</tr>
</tbody>
</table>

THIRD SURGERY: 3 patients had a third surgical procedure. One had posterior spinal osteotomy for flat back deformity; one had removal of posterior instrumentation, decompression, and refusion; and one patient had posterior decompression.

OUTCOMES FOLLOWING REPEAT SURGERY: 3 patients (16%) showed some improvement following the second or third surgical procedure. Of these three, two showed modest improvement and were able to return to sedentary employment with pain medication. The other patient had significant improvement and returned to regular work without pain medications.

16 patients (84%) showed no improvement or became worse following repeat surgery, remained on narcotic medications for pain control, and were unable to return to work.

OUTCOMES AND NUMBER OF LEVELS FUSED: 24 patients had one level fusion, 16 patients had two level fusion and 2 patients had three level fusion. Outcomes for pain, return to work, functional status, and patient’s own assessment following lumbar fusion did not reach statistical significance (P>.05) for patients who had one level fusion compared to those who had two or more levels fused.

COMPLICATIONS: There were 9 complications (22%) following lumbar fusions. Complications are listed in Table IV.

<table>
<thead>
<tr>
<th>Complications</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat back deformity</td>
<td>2</td>
</tr>
<tr>
<td>Dural leak</td>
<td>1</td>
</tr>
<tr>
<td>Epidural hematoma with partial Cauda Equina Syndrome</td>
<td>1</td>
</tr>
<tr>
<td>Ankle weakness (required AFO for walking)</td>
<td>1</td>
</tr>
<tr>
<td>Vertebral osteomyelitis</td>
<td>1</td>
</tr>
<tr>
<td>Superficial wound infection</td>
<td>2</td>
</tr>
<tr>
<td>Failure of instrumentation with broken pedicle screw</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>9</td>
</tr>
</tbody>
</table>

DISCUSSION: Low back injuries are common in workers with work-related injuries and frequently result in chronic symptoms, recurrence, and prolonged disability. The treatment of chronic low back pain in patients with work injuries is challenging. Failure of conservative therapy is not uncommon in this group of patients and few are considered for spinal fusions.

The number of spinal fusions performed in the United States has been steadily increasing in the past decade. The annual number of spinal fusion surgeries rose by 77 percent between 1996 and 2001, according to the Agency for Healthcare Research and Quality.
The indications for spinal fusions are not well understood and many indications are controversial.\textsuperscript{9,10} According to the Cochrane review\textsuperscript{11}, there is no acceptable evidence (strength D) of the efficacy of any form of fusion for degenerative lumbar spondylosis, back pain, or instability. Fusions for unstable fractures, high grades or progressive spondyloslesthesis, and symptomatic iatrogenic or degenerative severe instability seem to be reasonable indications.

The purpose of this review is to report the functional outcomes of lumbar fusions in patients with work injuries who are receiving worker's compensation. Turner et al\textsuperscript{12} reviewed 47 spinal fusion studies (1966-1991) with satisfactory results averaging 68%; while Franklin et al\textsuperscript{13} reported 68% work disability and 23% reoperation rate two years following lumbar fusions, for workers receiving worker's compensation in the state of Washington. DeBerard et al\textsuperscript{14} reported 25% total permanent disability and 24% reoperation rate for postero-lateral fusions for patients receiving worker's compensation in the state of Utah. 41% of patients in the DeBerard study reported no change or worsened quality of life. Deberard et al\textsuperscript{15} reported better functional outcomes for the BAK interbody fusions compared to postero-lateral fusions in compensated patients.

This study reports functional outcomes for 42 consecutive compensated patients following lumbar spinal fusions seen in independent medical exam (IME) setting by the same observer. This review found a high percentage of unfavorable outcomes. 76% of patients were unable to return to work, 66% of patients remained on narcotic medication for pain control and 79% of patients reported no improvement or worsening following fusion. These outcomes seem to be more in line with the lumbar fusion outcomes reported for Washington state worker's compensation.

The reoperation rate was 45%, the majority for repeat fusion. Repeat surgery was not associated with significant improvement of outcomes, with 84% of reoperated patients remaining off work and on regular narcotic medication for pain control. The high reoperation rate compared to other studies may be due the current thinking prevalent at the time of the study, that 360° fusion may be needed, particularly for discogenic pain.\textsuperscript{15} Pain alone is a poor indication for fusion. Patients receiving worker's compensation for back injuries have significant psychosocial factors associated with chronic low back pain.\textsuperscript{16,17,18} Psychosocial co-morbidities are frequently associated with poor outcomes.\textsuperscript{19,20}

The role of discography in the detection of pain generators and the correlation of discography with favorable response to fusion surgery is controversial.\textsuperscript{21} Carragee et al studies\textsuperscript{22,23,24,25} showed poor correlation and specificity in multiple discographies with clinically relevant pathology.

Carragee et al\textsuperscript{26,27} in other studies showed significant correlation between patients' psychometric profiles and their responses to provocative discography and the development of chronic low back pain. Discography pain provocation may not be reliable in a group of patients receiving worker's compensation with a high incidence of abnormal psychometrics. In this group maybe it is more prudent to design a test built on pain resolution rather than provocation.

Many of the patients in this study were evaluated in an IME setting on multiple occasions before and after fusion surgery. There are usually psychosocial and clinical red flags associated with poor outcomes. These include anger, dissatisfaction with job, dissatisfaction with claim handling by employer and/or worker's compensation, depression, anxiety, stress, intractable severe low back pain, severe lower extremity pain in the absence of nerve root compression on imaging studies, and non-dermatomal or non-myotomal neurological deficit. Intractable severe low back pain may be an indication of sensitization of central neuromodulators of pain and may not respond to surgical intervention.

Psychosocial co-morbidities should be evaluated, addressed and treated before surgical fusion is considered, rather than after failure of surgery. Poor outcomes of spinal fusion have devastating consequences on workers with low back injuries. Compensated workers with chronic low back pain, being considered for spinal fusion surgery, should undergo extensive psychometric testing prior to surgery.
The Minnesota Multiphasic Personality Inventory-2 (MMPI-2) has been widely used in the past for predicting treatment outcomes for low back pain. However, the predictive value and utility of the MMPI in spine surgery has been questioned. Recently Gatchel reported that the disability profile of the MMPI-2 was more useful than the traditional MMPI in a study of 1,489 patients with chronic occupational spinal pain. The poor outcomes reported in this study, for lumbar fusions for compensated workers with chronic low back pain, should not serve as a reason to withhold treatment from this group of patients. Rather, it should serve as valuable information for patients, spinal surgeons, and worker's compensation insurers, when lumbar fusion surgery is considered.

The weakness of this study is the retrospective nature of the cohort and a verified outcome measure was not used. The study does not include all lumbar fusions done for compensated workers during the study period. Nevertheless, all injured workers are required by the state run worker's compensation insurance of West Virginia, to have an IME following lumbar fusions. The IME examiner is selected by Worker's Compensation of West Virginia, solely on the basis of the patient's address. Accordingly, selection bias is unlikely.

The strengths of the study include extensive review of pre-operative records, investigation, post-operative review of records, review of all opinions and observations by other health care providers and specialists for every patient. Each patient included in the study had a detailed spine and neurological exam. Only credible information was taken into account. An independent examiner, other than the operating surgeon, evaluated every patient. Surgeons frequently view their own surgical outcomes more favorably than patients.

**SUMMARY:** Unfavorable outcomes for pain, return to work, restoration of function, and patient's own assessment were found in injured workers receiving worker's compensation, following lumbar fusions. The length of follow-up period and number of fusion levels did not reach statistical significance for outcome change. The reoperation rate was 45% and complication rate was 22% in this group of patients. Reoperation did not seem to improve outcomes.

Detailed psychometric testing and psychosocial co-morbidities should be addressed and treated before lumbar fusion is considered for compensated workers with chronic low back pain.

More research is needed to better define indications, patient selection, and to improve outcomes of lumbar fusions for chronic low back pain in workers receiving worker's compensation.

**REFERENCES**


ACKNOWLEDGEMENTS:
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CME QUESTION FILE

The following CME Questions are based on the foregoing article: Functional Outcomes of Lumbar Spinal Fusions for Workers Compensation Patients (ANSWERS will follow in the next issue).

1. For the injured workers with back pain which of the following statement is correct.

   A) Conservative therapy is successful in the majority of cases.
   B) Conservative therapy is successful in the minority of cases.
   C) Conservative therapy is not successful and usually not worthwhile
   D) Surgical treatment is usually required

2. The ultimate goal of lumbar spinal fusion is:

   A) To obtain solid union between 2 vertebrae.
   B) To reduce spinal instability
   C) Improve nerve function
   D) Improve pain, work capacity and quality of life

3. Satisfactory results according to 47 lumbar spinal fusion studies reviewed by Turner et al averaged.

   A) 80%
   B) 42%
   C) 68%
   D) 25%

4. Provocative discography results

   A) Has essential role in the detection of pain generator
   B) Identified clinically relevant pathology
   C) Has good correlation of spinal fusion outcome
   D) None of the above

5. The most useful predictor of outcome following lumbar spinal fusions.

   A) Psychological co-morbidities
   B) Number of levels fused
   C) Type of lumbar spinal fusion procedure used
   D) Obtaining a solid fusion.

6. Favorable outcome following lumbar spinal fusion is related to:

   A) Repeat surgery
   B) Solid fusion
   C) Time from injury to spinal fusion
   D) None of the above

7. According to the Cochrane review: there was no acceptable evidence of the efficacy of any form of fusion for:

   A) Degenerative lumbar spondylosis
   B) Chronic low back pain
   C) Lumbar instability
   D) All of the above

8. Lumbar spinal fusions for work related injuries were associated with:

   A) Favorable outcome for return to work
   B) Unfavorable outcome for return to work and pain reduction
   C) High patient satisfaction
   D) None of the above

Answer Key for CME Questions from Disability Medicine Vol. 6, #1


Please pick the best answer of the 4 possible answers from the following.

1. The Most common “key factor” used in the AMA Guides 6th ed. to determine the appropriate impairment class in the regional grids for conditions being rated in Musculoskeletal System is which of the following?
   a. Clinical Studies or Objective Test Results
   b. Range of Motion
   c. Diagnosis
   d. Physical Examination or Physical Findings

2. In the Impairment Classification Grids of the AMA Guides 6th ed, the following is generally true:
   a. The initial assigned rating is the maximum value of the defined range.
   b. The initial assigned rating is the middle value of the defined range.
   c. The initial assigned rating is the minimum value of the defined range.
   d. The initial assigned rating depends on factors other than the “key” factor.

3. Objective Test Results is often the most appropriate “key factor” for impairment criterion for the following Organ systems:
   a. Nervous System
   b. Musculoskeletal
   c. Cardiac, pulmonary, and renal
   d. Mental and Behavioral

4. Which of the following impairments are not ratable under the AMA Guides, 6th edition?
   a. Mental or behavioral impairments
   b. Pain impairments
   c. Anticipated future impairments.
   d. Visual impairments.

5. According to the AMA Guides, 6th ed, using the regional impairment grids, the diagnosis results in assignment to an impairment class with the impairment number in mid position as default. This is further refined (final impairment number) by the following information:
   a. the need for surgical treatment of the condition
   b. duration of symptoms
   c. functional status, physical examination findings, and clinical studies
   d. Examining doctor’s experience and clinical Judgment

6. Which statement most accurately describes pain ratings according to the Pain Chapter in the AMA Guides (6th edition)?
   a. Objective criteria are well standardized.
   b. The tissue oriented disease model is the best measure of pain.
   c. Pain ratings are best understood using the biopsychosocial model.
   d. Pain ratings are capped at 3% WPI only.

7. According to the methodology in the AMA Guides 6th, the total whole person impairment from any and all injuries from one upper limb may:
   a. Never exceed 30%
   b. Never exceed 40%
   c. Never exceed 50%
   d. Never exceed 60%

8. All of the following is correct regarding the AMA Guides 6th edition Except?
   a. The diagnosis-based approach is expected to continue to enhance inter-rater agreement
   b. The addition of functional assessment is not expected to enhance content validity.
   c. The impairment percentages are given based on claimant’s self report
   d. The concept of impairment remains the same as in previous editions
9. The ICF (International Classification of Function) model of disablement used in the AMA Guides 6th edition, goes beyond the previous ICIDH model because it
   a. Is bi-directional and interactive
   b. Is more enabling
   c. Takes better account of personal & environmental modifiers
   d. All of the above

10. The AMA Guides 6th edition Impairment ratings take into account all of the following except:
   a. Physical abnormality due to illness or injury
   b. Objective findings
   c. Examiners own views/expert opinions of fairness of compensation in that case
   d. Impact upon Activities of Daily Living (ADLs)

11. According to the methodology in the AMA Guides 6th Ed, the pain rating:
   a. Can be added to rating from other chapters in the AMA Guides 6th ed
   b. Can be combined with the rating from other chapters in the AMA Guides 6th ed
   c. Stands alone and can neither be combined nor added to any other organ rating.
   d. Can be added to other rating, if an examiner believes that claimant is credible

12. According to the AMA Guides (6th Edition), which of the following is correct regarding chronic regional pain syndrome (CRPS)?
   a. Type I (CRPS I) and causalgia are interchangeable.
   b. CRPS I impairment is calculated without consideration of the involved nerve.
   c. CRPS II impairment is calculated without consideration of the involved nerve.
   d. The methodology of calculating impairment requires that the diagnosis must be at least two-year duration and confirmed by at least two doctors and with exclusion of a comprehensive differential diagnosis.

13. The neuropsychologic test used most frequently to assess an organic brain injury is the:
   a. Minnesota Multiphasic Personality Inventory (MMPI).
   b. Halstead-Reitan Inventory.
   c. Multidimensional Pain Inventory.
   d. Rorschach Test.

14. Which of the following rating scales is not directly used to determine Mental and Behavioral Disorders impairment in the AMA Guides 6th edition?
   a. Psychiatric Impairment Rating Scale (PIRS)
   b. Brief Psychiatric Rating Scale (BPR)
   c. Minnesota Multiphasic Personality Inventory Scale (MMPI)
   d. Global Assessment of Function (GAF)

15. According to the AMA Guides (6th Edition) which of the following statements is the best definition of "disability?"
   a. Decreased functional capability
   b. The sum of all improvement
   c. The difference between what a person can do and wants to or needs to do
   d. Inability to obtain gainful employment

16. If an assistive device cannot easily be removed, e.g., an implanted lens, a physician rating impairment should:
   a. estimate what the rating would have been without the assistive device.
   b. evaluate the organ system's functioning with the device in place.
   c. calculate an impairment rating based on findings prior to application or insertion of the assistive device.
   d. decline to perform the rating.

17. Diagnosis-based impairments (DBI) of the musculoskeletal system according to the AMA Guides 6th edition include all of the following except:
   a. Five impairment classes (0-4)
   b. Five grades within each class
   c. Functional history, physical exam and clinical studies are non-key factors used to determine grade within the impairment classes
   d. If all non-key factors exceed the key factor they move the impairment rating up into the next higher class

18. A properly prepared medical impairment evaluation report will enable non-medical recipients of that report to determine:
   a. Whether physical examination findings are correct.
   b. Whether the examinee is disabled.
   c. Bias on the part of the evaluator.
   d. Whether the AMA Guides procedures were properly followed.
Introduction
While most world economies focus on increased productivity in people's working life, some researchers are concerned with the negative consequences sometimes brought about by the demand for high levels of productivity, intense competition and insecurity among employees (1). The awareness of the importance of psychosocial and mental well-being at work is high, even if psychosocial strain is a widespread phenomenon in the Western world (2, 3, 4). Mental disorders affect the lives and well-being of millions of people throughout the world, and some of them have their origins in people's work situation. However, Schaufeli and Enzmann (4) are among those who assume that problems linked to psychosocial strain have not increased, but that people are now more inclined to describe their problems in psychosocial terms, therefore making them more visible. Nevertheless, many employees in Western societies experience a lack of psychosocial well-being, and absence from work due to sickness has been defined as a problem for the economy (5).

Social inequalities in health continue to be a key public health problem (6, 7, 8), in spite of economic growth in many countries. Gender is a significant and consistent predictor of health and well-being, as women in general are, for example, more likely than men to be diagnosed with mental illness (9, 10). Results are mixed regarding the relationship between burnout and gender (11). Schaufeli and Enzmann (4) showed that women generally score higher on emotional exhaustion than men. On the other hand, the results presented by Bekker et al (11) on nurses in the Netherlands, a female-dominated profession, showed higher emotional exhaustion in men than in women.

Psychosocial work environment
A certain part of the health problem encountered today stems from unhealthy work conditions (6, 5). Theories about the relations between work conditions and the well-being of the employees are far from new, and they are still under formulation. While service jobs have become the major employment sector in Western countries (1), the focus on the psychosocial environment has become stronger. For example, research on stress and burnout has increased, and the factors that should be taken into account in measuring psychosocial strain are discussed and strongly debated (1). Despite large number of scientific papers published on psychosocial work environment, many of the long-standing questions have not yet been convincingly answered (12, 13).

Finding work mentally exhausting is considered to be the most obvious manifestation of burnout and psychosocial strain. Some studies even mention finding work mentally difficult and stressful (14, 15, 5). A study on work organization and well-being in geriatric care showed that mental exhaustion and finding work mentally difficult was associated with a number of factors concerned with the organizational factors of work, such as the pressure of time, unsatisfactory communication with supervisors, and difficulty in harmonizing demands and expectations of patients, employees and supervisors. (14). Self-reported physical and psychological symptoms, due to various medical conditions, can be early warning signals of future sick
leaves (16). Results of various studies are, however, mixed regarding the relevance of exhaustion and work dissatisfaction for absenteeism. According to Bekker et al (11) symptoms related to burnout appeared to be the most prevalent diagnosis in the category “psychological health problems” that were the reasons for sickness absence and work disability in a Dutch study from 2001. However, when burnout is considered to mediate between a certain person and job characteristics on the one hand, and sickness absence on the other, some authors have argued that burnout explains only a small percentage of the variance in absenteeism, or even fails to explain any part of it (11, 17).

Studies on burnout and psychosocial strain have to date mainly been done in the human services, such as in the health and educational sectors but not as much in another service branches such as banks.

Aims of the study
The aims of the study were twofold: firstly, to analyze the occurrence of psychosocial strain, measured by mental exhaustion, self-assessed stress and finding work mentally difficult, (i.e. components often linked to burnout), among women and men in different professional groups among bank personnel in Iceland; and secondly, to analyze whether there was a connection between these factors and seeking medical attention for various conditions.

Methods
We conducted a cross-sectional nation-wide study among all employees in all branch offices in the banking service in Iceland. In March and April 2002, the Union of Icelandic Bank and Finance Employees, in cooperation with the authors, distributed questionnaires on working conditions to the 1847 employees. We asked three questions that related to how the employees felt at work. The questions were: if the employees were often or always mentally exhausted after the working day, if they found work rather or very mentally difficult and if they found work rather or very stressful. These questions were taken from the General Nordic Questionnaire for Psychological and Social Factors at Work (18). The response possibilities were five-faceted: “very seldom or never”, “rather seldom”, “sometimes”, “rather often” and “very often or always”. Further we asked if the employees had consulted a medical doctor within the last 12 months due to various medical conditions. Here the response possibilities were two-faceted: “yes” and “no”. These questions have been used for work-environment studies for some years in Iceland. The questionnaires were distributed at each workplace and subsequently returned to the Administration of Occupational Safety and Health, by persons so designated at the workplaces.

To assess the association between position in the bank and the psychosocial strain questions; being mentally exhausted at the end of the day, finding work difficult or finding work stressful, crude odds ratios were calculated. Odds ratio (OR) is an indicator used to estimate risk (19). Subsequently, three logistic regression analyses were conducted, to assess adjusted OR taking gender, age, marital status and position into account (20). The analyses were performed using the Statistical Package for the Social Sciences 7.5.1 software (21). The level of significance was set at 95%.

Results
The response rate at the branch offices was 80% (n = 1475). The majority of the respondents, 81% (n = 1982) were women, 13% (n=188) were men and 6% (n=95) did not answer the question on gender. The average age was relative high; the majority of the employees, 65% (n=918), were over 40 years of age and thereof 32% (n=456) were over fifty years old. Only 13% (n=186) were younger than 30 years old. There was no significant difference between the age of women and men. The largest group was service representatives, or 6% (n=510), bank clerks were 5% (n=352), bank secretaries were 17% (n=232) and supervisors or managers were 17% (n=237). Other employees were 5% (n=69). Women were about 99% of the bank clerks, 94% of the bank secretaries and 91% of the service representatives. More than every second male employee, or 53%, was in a managerial position, compared with 11% of the women. The majority of the employees (82%) were married, 10% were single, 6% divorced and 2% widowed. About 26% had worked five years or less in the bank sector, whereas 67% had worked 10 years or longer. The women had a longer period of employment than the men.

About 15% of the respondents (n=211) said they were often or always mentally exhausted at the end of the working day. The same proportion, 15% (n=226) said they had experienced rather or very much stress recently, and 27% said they had recently experienced stress to some extent. About 34% (n=469) of the employees said they found their job rather or very mentally difficult.
The male rather than the female employees at the banks were more likely to experience psychosocial strain, (measured by mental exhaustion, finding the work mentally difficult or feeling stressed) (table 1). Supervisors at the branch offices were more likely to experience psychosocial strain than other employees. Looking only looked supervisors, we also saw that the men felt more psychosocial strain than the women, especially related to the question of how mentally difficult the supervisors found their job.

Table 1. Psychosocial strain measured by the extent of being often or always mentally exhausted after the working day, finding work rather or very mentally difficult, and finding work rather or very stressful.

<table>
<thead>
<tr>
<th>Mentally exhausted</th>
<th>Work mentally difficult</th>
<th>Work stressful</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>15.1% (N= 177)</td>
<td>32.7% (N=377)</td>
</tr>
<tr>
<td>Men</td>
<td>17.0% (N=32)</td>
<td>47.3% (N=88)</td>
</tr>
<tr>
<td><strong>Position</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cashier</td>
<td>10.5% (N=36)</td>
<td>22.7% (N=78)</td>
</tr>
<tr>
<td>Bank Clerk</td>
<td>13.5% (N=31)</td>
<td>21.2% (N=48)</td>
</tr>
<tr>
<td>Service representative</td>
<td>18.1% (N=91)</td>
<td>30.8% (N=190)</td>
</tr>
<tr>
<td>Supervisor</td>
<td>18.8% (N=44)</td>
<td>56.3% (N=129)</td>
</tr>
<tr>
<td>Other staff</td>
<td>11.1% (N=4)</td>
<td>20.6% (N=17)</td>
</tr>
</tbody>
</table>

Psychosocial strain and medical conditions

Those who were often or always mentally exhausted at the end of the working day and those who found work rather or very stressful, were more likely than others to have consulted a medical doctor due to various medical conditions like chronic fatigue, anxiety, depression, sleeping disorders, headaches and muscular rheumatism (Table 2). In both cases the ORs were highest for chronic fatigue (6.5/5.3) and anxiety (4.2/5.8). ORs for seeking medical attention were higher than 2.0 in eight of ten disorders presented in the table among the employees who found work rather or very stressful, and in five of 10 among those who were often or always mentally exhausted at the end of the working day. Finding work mentally difficult was also associated with more frequent visits to doctors, with ORs elevated above 2.0 for two disorders. More women than men had consulted a medical doctor due to all the medical conditions we studied, whether we were looking at mental exhaustion, mentally difficult work or stressful work.

In Table 3 we explored mental strain among different professional groups adjusted for gender, age and marital status. In general, supervisors and service representatives still complained more than others of being mentally exhausted and of finding work difficult or stressful. Supervisors in particular were more likely than others to find work mentally difficult (OR=4.94) or stressful (OR=2.12) and to be mentally exhausted (OR=1.96).

In Table 4, the associations between visits to doctors due to several medical conditions were explored, adjusting for gender, age, marital status and position. Some of the medical conditions were significantly associated with the work-related psychosocial strain factors. The odds ratios for having consulted doctors because of chronic fatigue were between 2.84 (stressful work) and 3.95 (mentally exhausted), and for anxiety between 2.68 (stressful work) and 1.92 (mentally exhausted). Odds ratios for depression were elevated among those who...
were often or always mentally exhausted after work and among those who found work stressful. The odds ratios for having consulted a doctor because of high blood pressure were also elevated among those who often felt stressed at work. The odds ratios for having consulted a doctor because of asthma were elevated among those who were mentally exhausted and found work mentally difficult.

### Discussion and conclusions

This study aimed to highlight the potential magnitude of the association between psychosocial strain and different medical conditions among employees in Icelandic banks. The study findings are important as they show the magnitude of the here-and-now relationship between professional, group, psychosocial factors and seeking medical attention in the past 12 months. The findings are nation-wide and are therefore accurate as such, given the limitation of the method used. The findings, however, do not give indications of causal relationships and should not be interpreted in such a fashion. Relations were found between psychosocial strain, measured by mental exhaustion, finding work difficult or stressful and visits to doctors. The self-assessed strain was higher among men than women, although women more often visited medical doctors because of various symptoms.

The employee’s psychosocial strain was closely connected to various types of medical conditions, especially the psychiatric ones. We agree with Shirom (22) who states that studies on burnout lack attention to the relationships between burnout symptoms and mental disorders like depression and points out that this is also true when working with psychosocial strain as defined in this article.

In our study supervisors as well as service representatives had higher odds than other employees of being mentally exhausted and finding work mentally difficult or stressful. However, the bank clerks were the professional group within the banks who had most often consulted a medical doctor due to the medical conditions.

The work environment should be healthy and safe for all concerned parties, in accordance with the law set by parliament. The Act on Working Environment, Health and Safety in Workplaces (22) states that supervisors, who belong to a risk group in the present study, have a certain responsibility to ensure a healthy environment for their employees. While supervisors in the branch offices are not per se senior managers in the bank system, they are however responsible for the respective branch office or unit within it and for meeting the increased demands for rationalization and competition with other banks and branch offices. They can therefore be in the position of having to balance incompatible demands, from employees on the one hand and from their superiors on the other, which can be difficult and stressful. Most of the supervisors are men, who are a minority group in the banks.

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**Table 3.** The association between being mentally exhausted, finding work mentally difficult or stressful, with gender, age, marital status and professional group:

<table>
<thead>
<tr>
<th>Gender (Male=1)</th>
<th>Mentally exhausted</th>
<th>Finds work mentally difficult</th>
<th>Finds work stressful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odds ratio</td>
<td>55.0% CI</td>
<td>Odds ratio</td>
<td>60.0% CI</td>
</tr>
<tr>
<td>Lower</td>
<td>0.91</td>
<td>0.59</td>
<td>1.00</td>
</tr>
<tr>
<td>Upper</td>
<td>1.48</td>
<td>0.82</td>
<td>1.19</td>
</tr>
</tbody>
</table>

**Table 4.** Odds ratio and 95% confidence intervals (95% CI) from three logistic regression models for having consulted a medical doctor due to various medical conditions and the extent of being often or always mentally exhausted after the working day, finding work rather or very mentally difficult, and finding work rather or very stressful, adjusted for gender, age, marital status and position:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mentally exhausted</th>
<th>Finds work mentally difficult</th>
<th>Finds work stressful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odds ratio</td>
<td>95.0% CI</td>
<td>Odds ratio</td>
<td>95.0% CI</td>
</tr>
<tr>
<td>Lower</td>
<td>1.12</td>
<td>0.99</td>
<td>1.10</td>
</tr>
<tr>
<td>Upper</td>
<td>1.34</td>
<td>1.34</td>
<td>1.34</td>
</tr>
</tbody>
</table>

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**Table 4.** Odds ratio and 95% confidence intervals (95% CI) from three logistic regression models for having consulted a medical doctor due to various medical conditions and the extent of being often or always mentally exhausted after the working day, finding work rather or very mentally difficult, and finding work rather or very stressful, adjusted for gender, age, marital status and position:

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<tr>
<td>Upper</td>
<td>1.34</td>
<td>1.34</td>
<td>1.34</td>
</tr>
</tbody>
</table>
It is possible that the female working culture at the branch offices and the gender role stereotypes play some part in the fact that the men in this study experience more psychosocial strain than women. However, this could also be a selection bias, with men with these tendencies being better accepted in the banks than at other workplaces, resulting in a selection of men with these tendencies in the banking services.

The strength of the study, and what distinguishes it from other studies in the field, is that it was carried out on a nation-wide basis and among employees in every branch office of all banks and saving banks having ten employees or more in an entire country. The number of participants was sizeable and the response rate of 80% quite acceptable.

The answers from a nation-wide study like this are of importance in identifying the picture of psychosocial strain at work and its connection to medical illnesses, a picture which can give a warning signal of work-related health problems, attendance, and absenteeism. It is important to take these factors into account when working with prevention and rehabilitation in the workplace.

References:

SYMPTOM-BASED ILLNESS AND WORK: METHODOLOGIES FOR DECISION-MAKING IN DISABILITY DETERMINATION

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ABSTRACT:
Methodologies currently in use for making return-to-work (RTW) decisions concerning persons with symptom-based illnesses include 1) reaching agreement on a RTW plan, 2) use of published guidelines, 3) functional capacity evaluations, 4) probability-based clinical decision making, and 5) weight of evidence decisions. This article discusses the strengths and weaknesses of each methodology.

ABBREVIATIONS USED: AMA = American Medical Association, CFS = Chronic fatigue syndrome, FCE = Functional capacity evaluation, FM = Fibromyalgia, FSS = Functional somatic syndrome, IBS = Irritable bowel syndrome, IEI = Idiopathic environmental Illness, MCS = Multiple chemical sensitivities, PV = Predictive value, RSI = Repetitive strain injury, RTW = Return to work, SBI = Symptom-based illness, SSA = Social Security Administration, TN = True negative, TP = True positive, USDOL = United States Department of Labor, WC = Workers’ Compensation

INTRODUCTION
Physicians tend to view poor health as disease, an impairment in body structure or function. Patients more often view poor health as illness, their personal experience of not feeling well.1,2 A symptom-based illness (SBI), or functional somatic syndrome (FSS),3 is a “physical illness without an organic disease explanation and devoid of demonstrable structural lesion or established biochemical change.”4 The medical literature is rich with studies of SBIs and characteristics of patients with SBIs.3-14 In spite of that extensive literature, no consensus has developed relative to the most effective way to heal patients with symptom-based illness. Patients who do not feel sufficiently healed often restrict their activities to a level below that required for work outside the home. This article discusses one aspect of managing patients with SBIs, restoring the ability to work.

Tasks, abilities, work activities, and work context are important factors in describing the nature and intensity of work. As a frame of reference, this paper will focus on the ability of a person with a SBI to perform Sedentary work as defined in the USDOL Dictionary of Occupational Titles: lifting no more than 10 pounds occasionally, standing or walking no more than 2 hours of an 8-hour workday, with no significant stooping or crouching.15
Conditions that can be considered to be SBIs or FSSs include chronic fatigue syndrome (CFS), multiple chemical sensitivities (MCS)/idiopathic environmental intolerance (IEI), fibromyalgia (FM), and a number of locally symptomatic conditions including irritable bowel syndrome (IBS) and repetitive strain injury (RSI). Several authors have observed considerable overlap among FSSs. 70% of patients with FM may meet criteria for CFS. 92% of patients with CFS and 77% of patients with FM may meet criteria for IBS vs. 18% of controls. Sustaining the ability to work can be a challenge for persons with SBIs. Workers with SBIs who are covered by Workers’ Compensation and other disability insurance programs often apply for benefits based on their perceived inability to perform even sedentary work due to the severity of their symptoms. Disability insurance benefits can be substantial – disability payments to claimants with FM in Canada may have been as high as $200 million in 1989, probably substantially higher for all carriers in the United States currently. Workers’ Compensation and other insurers commonly request Independent Medical Examinations (IMEs) when workers’ medical evidence of impairment does not appear consistent with restrictions or limitations claimed by the worker or specified by the treating physician. A recent New York Times article stated that “Independent medical exams are among the most disputed components of New York’s troubled Workers’ Compensation system.” This article questioned the validity and consistency of some IMEs. In this setting of uncertainty and dispute, it may be helpful to review the process of decision-making when making RTW judgments. This article examines methodologies that are currently in use for assessing the capacity for work in persons with SBIs.

CLINICAL DECISION-MAKING IN DISABILITY EVALUATION

Clinical decisions are based on multiple information sources that are difficult to quantify. Patient characteristics, including social class, ethnic background, gender, appearance, height, and weight, can influence a physician’s judgment. Physician characteristics are also important, including specialty, personality, and age. The setting in which care is delivered and the quality of the doctor-patient relationship are additional variables. The observation that clinical findings explain severity of illness in less than 10% of back injury claims illustrates the uncertainty that surrounds assessment of work capacity in patients with back pain. Lacking a correspondence between clinical findings and illness severity, physicians consider factors other than physical impairment when performing impairment ratings. They “rate the disability of the individual as they perceive it.” Physician perception of disability under conditions of uncertainty can be influenced by a variety of conscious and unconscious thought processes.

Heuristics, or general rules of thumb, form the basis of many judgments made in settings of uncertainty. These heuristics are subject to predictable biases and inconsistencies, and may lead to errors of which the physician decision-maker may be unaware. Early in the process of gathering information to reach a decision, the decision-maker’s accuracy reaches a ceiling. As he or she gathers additional information, confidence in the decision increases while accuracy does not. If additional items of information are highly correlated (rather than independent), the value of the additional information in reaching an accurate decision actually decreases. However, the higher the apparent correlation between additional items, the higher the confidence of the decision maker may be. Thus, even the most experienced decision-maker tends to become overconfident in his or her decisions. Corrective action is available, but is likely to be taken only if the decision-maker recognizes the need for such action.

In a 1994 study of primary care patients, the prevalence of a mood disorder was 2% in patients with no physical symptoms. The prevalence of a mood disorder in patients with one symptom was 12%, with 4-5 symptoms was 44%, and with 6-9 symptoms was 60%. Corresponding prevalence figures for an anxiety disorder were 1%, 7%, 30%, and 48%. The physician who concludes that a person with 9 symptoms is more physically disabled than the person with 5 symptoms may base his or her decision on the probably flawed assumption that all symptoms are based on dysfunction of separate organ systems, when in fact the person’s multiple symptoms may be highly correlated indicators of anxiety or depression.
This observation is supported by a previous study, in which 56% of persons claiming disability were found to have at least one psychiatric disorder.\textsuperscript{6}

In addition, a physician who has limited experience in managing complex issues surrounding return-to-work (RTW) in a patient with symptom-based illness may be comparing his or her patient to a small, unrepresentative sample of patients.\textsuperscript{7} Physicians who infrequently see patients who present as unable to work due to symptom-based illness are less likely to have personal experience that is representative of the population of working and non-working patients with persistent physical symptoms. The multiple sources of bias that can influence decision-making under conditions of uncertainty suggest the potential benefit of a systematic approach to disability decision-making.

**METHODOLOGIES FOR CREATING RETURN-TO-WORK PLANS**

**Methodology #1: Reach Agreement on a Return-to-Work Plan**

Kleinman proposes a 5-step process for primary care physicians in caring for patients whose illness (perceived personal and social problems caused by the perception of poor health) appears out of proportion to disease (malfuctioning of physical or psychological processes). The steps are 1) learn how the patient explains his or her illness, 2) explain the physician’s view of the patient’s symptoms, 3) compare the patient’s view with the physician’s view, 4) identify all illness problems and conflicts in need of attention, and 5) develop a treatment plan based on mutual understanding of problems and goals.\textsuperscript{2} Through such a biopsychosocial process, the physical, psychological, and social barriers to successful RTW can be identified and addressed in a context that makes sense to both patient and physician.\textsuperscript{28}

The process of reaching agreement on a RTW plan is an attractive methodology because this process is designed to reduce conflict. When this methodology is applied successfully, all parties agree on an arrangement that is affirmed to be fair, safe, and acceptable to all. When such agreement cannot be reached, additional approaches must be considered in order to reduce conflict over return-to-work.

**Methodology #2: Published Guidelines**

In a chapter in the AMA Guides to the Evaluation of Permanent Impairment 5\textsuperscript{th} Edition\textsuperscript{9} devoted entirely to the rating of pain, the authors note that the subjective nature of pain reporting is at odds with the Guides’ use of objective measures to estimate impairment. The authors note that “an ideal rating system would validate the genuine suffering of individuals and resist influence by those who exaggerate their incapacity for secondary gain,”\textsuperscript{9} while acknowledging that it is exceedingly difficult to create such a system.

The Guides are intended to provide a numerical measure of “impairment,” defined as “a loss, loss of use, or derangement of any body part, organ system, or organ function.”\textsuperscript{9} The authors note that this measure of impairment is not a measure of “disability,” defined as “an alteration of an individual’s capacity to meet personal, social, or occupational demands or statutory or regulatory requirements because of an impairment.”\textsuperscript{9} This view is consistent with the principle that the role of physicians is in the determination of diagnosis, impairment, restrictions, and limitations - but not of disability. Disability is an administrative determination\textsuperscript{0} within the province of insurers, administrative agencies, and employers.\textsuperscript{31} From the standpoint of persons with SBIs, it is noteworthy that the symptom of pain in excess of the person’s medically-determinable impairments can increase the impairment percentage of the whole person by a maximum of 3%. For the purpose of determining if a person with SBI is able to perform sedentary work, this figure might be more useful if there was general agreement on the percentage of whole-person impairment that would justify a presumption of inability to work. There is currently no such agreement within the scientific or professional community.

The AMA also publishes The Guides Casebook, a case-based companion to assist with interpretation of the Guides. The impairment rating for the FM case illustration in this reference is 0%. In the discussion of the derivation of this impairment rating, the casebook notes the similarity between FM and other conditions including muscle contraction headache, irritable bowel syndrome, and dysmenorrhea.
in which “symptoms are reported, but no impairment is provided.” The casebook notes that future research may facilitate development of criteria for evaluating impairment in persons with FM. While the AMA Guides are not intended to provide direct guidance for RTW decisions, other published guidelines are designed for that purpose.

Several useful guides for returning patients to work are available, including the Utah Medical Association Workplace Functional Ability Guidelines. Disability duration guidelines are provided by sources including The Medical Disability Advisor, Milliman and Robertson Healthcare Management Guidelines, and the Official Disability Guidelines published by the Work Loss Data Institute. These published guidelines are widely used in the Workers’ Compensation and disability insurance industries, primarily as screening aids and anchors that are modified according to patient-specific data. Comment in the medical literature concerning use of these guidelines has been surprisingly sparse, with authors voicing opinions that rigorous and visible scientific method should be demonstrated in support of guidelines and that guidelines should take into account the “array of social, family, and economic issues that impact clinical decision-making.”

Methodology #3: Functional Capacity Evaluations

A Functional Capacity Evaluation (FCE) measures an individual’s tolerance for a set of specified activities, over a 1-2 day testing period. A FCE can be a great help in estimating the work capacity of a patient who is motivated to RTW. If the patient performs comfortably at a certain work intensity and is motivated to RTW, the physician can confidently write a RTW prescription specifying that work intensity. One of the reasons for this confidence is that the predictive value (negative) of the FCE considered as a diagnostic test is likely to be high in this situation.

When viewed as a diagnostic test for ability or inability to perform sedentary work in a patient with symptom-based illness, a FCE can be considered positive (abnormal) if the worker performs at a level below sedentary intensity during testing. The FCE can be considered negative (normal) if the worker demonstrates the ability to perform at the sedentary intensity level. The formula for predictive value of a negative test in this setting is

\[
\text{Predictive value (negative test)} = \frac{\text{Number of workers with a normal test who are able to work}}{\text{Number of workers with a normal test result}}
\]

If the patient states a strong desire to work, appears highly motivated to work, and appears to be medically able to work, the physician will probably be confident in the patient’s ability to work even before the FCE is performed. Another way of stating this might be that the prior probability is high that the patient is able to work, or that the prevalence of “ability to work” is high in the population of motivated, able-bodied workers.

The predictive value of a diagnostic test for “ability to work” when applied to an individual patient is heavily dependent on the prevalence of “ability to work” in the population to which the patient belongs. The prevalence of “ability to work” is uncertain in a population of workers with SBI who state that they are unable to work and are applying for disability insurance benefits, because there is no “gold standard” test that can determine the patient’s true ability to work. Without a gold standard definition of “ability to work,” the numbers of True Positive (TP), True Negative (TN), False Positive (FP) and False Negative (FN) results of any diagnostic test for “ability to work” are uncertain as well. Without accurate estimates of numbers of TP and TN test results, test parameters such as sensitivity, specificity, and predictive value cannot be directly calculated.

Sensitivity, specificity, and predictive value are the major parameters by which the usefulness of a diagnostic test as a decision-making tool is evaluated, where sensitivity = TP / (TP + FN), specificity = TN / (TN + FP), predictive value of a positive test = TP / (TP + FP), and predictive value of a negative test = TN / (TN + FN). Based on these parameters cannot be derived directly for any currently-available test of ability to work in a population of patients with SBI whose motivation to work is questionable, since neither “ability to work” nor “motivation to work” can be measured directly by any known methodology. Estimation of these parameters is possible using...
Bayesian statistics. The accuracy of such estimates would depend upon the accuracy of the proxies chosen for “ability to work” and for “motivation to work.”

FCE’s currently estimate “ability to work” by documenting a subject’s actual performance of specified tasks in a testing environment. A subject’s motivation is inferred from the subject’s consistency of performance over several trials of the same task, with consistency of performance.

A reasonable experimental design to estimate sensitivity, specificity, and predictive value for FCEs in workers with SBIs might be as follows. Subjects with SBIs who are working full-time outside the home could be recruited. A second population of subjects with SBIs who perceive that their symptoms prevent them from working could then be recruited. The “working full-time” status of the first population could be viewed as a proxy for “able to work” (and assumed to represent “motivated to work” as well). The “not working due to symptoms” status of the second population could be viewed as a proxy for “unable to work.” The assumption that the second population is a suitable proxy for “not motivated to work” would be less defensible, and might be strengthened by other measures of motivation such as response to questionnaire items, identified opportunities for secondary gain, reports of family and workplace contacts, etc. Samples of both populations could then undergo identical FCEs with blinding of investigators to work status. Subjects who were working and demonstrated inability to perform sedentary work on FCE would be considered False Positives, and those who were not working yet demonstrated ability to work on FCE would be considered False Negatives. Sensitivities and specificities could be calculated from observed TP, TN, FP, and FN rates. Prevalence of ability to work in the population of patients with SBIs could be estimated, and used with Bayes’ Theorem to calculate predictive values for FCE in a patient with SBI.

It is likely that such a study would find that subjects who were working performed significantly better on FCEs than subjects who were not working. It is likely that very few subjects who were working would fail to demonstrate ability to perform sedentary work on an FCE. It is also likely that a substantial number of SBI patients who perceived themselves as unable to work would fail to demonstrate ability to perform sedentary work. The calculated specificity of FCE is likely to be very high. The calculated sensitivity of FCE could be high as well. Would these calculated parameters mean that FCE was a valid and reliable test for predicting ability to work in a population of patient with SBI?

The validity of a test is a measure of the test’s ability to measure what it purports to measure. The validity of a FCE rests on the test’s ability to “predict or reflect the client’s performance in a target work setting or predict an overall level of work if there is no target work setting.” This “predictive validity” is one aspect of “criterion validity.”

Criterion validity is a measure of the accuracy of a test’s predictions with regard to a criterion outside the test, in comparison with an independently-defined measure of the patient’s true status, or gold standard. A major problem with establishing the validity of a test measuring work performance is the lack of a gold standard by which to judge the accuracy of the test’s predictions. Consistency of effort, as measured by coefficient of variation between successive trials of the same task, has been the primary determinant of whether a FCE is considered “valid.” Yet Simonsen found no evidence that the coefficient of variation could be used independently to measure sincerity of effort. Fishbain, et. al. concluded that “repetitive testing with the coefficient of variation was not a reliable method for discriminating a real/best effort from a malingered effort.” King et. al. agree, stating “a reliable and valid method of determining subject participation is vital, but none has been supported by current research.

Sincerity of effort is particularly important to the validity of a test of ability to work in patients with SBIs who present themselves as unable to work and are actively seeking financial support on the basis of inability to work. Some clinicians utilize additional tests of sincerity of effort, including history, physical examination, descriptions of pain behavior, Waddell’s non-organic physical signs, absence of expected increase in pulse rate on palpation of a painful area, active range of motion exceeding passive range of motion, and absence of expected vicarious
Lechner, et. al. concluded that signs such as these have not been sufficiently well studied to recommend their use to measure sincerity of effort. As is the case for FCEs, the predictive values of these tests as measures of ability to work are uncertain.

In spite of the questions surrounding FCE validity in workers with SBIs, FCEs are often used as de facto diagnostic tests of “ability to work” in this population. Several factors account for this practice. First, there are few alternative diagnostic tests to help evaluators predict ability to work in this population. Second, the numerical data included on a FCE report appear similar to data generated by echocardiograms and other medical tests of function that are less influenced by uncertainties such as patient motivation, sincerity of effort, and generalizability from standardized reference populations. Third, testing an examinee for ability to work by observing his or her performance of work activities has an intuitive appeal. These same factors make referring physicians reluctant to question or challenge the validity of FCE data in predicting whether or not an individual with a SBI is able to work.

Even if sensitivities and specificities of FCEs were estimated by the study outlined above, these parameters alone would not be sufficient to guide the clinician in making a RTW decision concerning an individual patient. Decisions about individuals are best based on diagnostic tests with known positive or negative predictive values. The predictive value of a positive test is calculated from sensitivity and specificity by Bayes’ Theorem, according to the formula below:

\[ PV(+) = \frac{(Sensitivity)(Prevalence)}{(Sensitivity)(Prevalence) + (1-Specificity)(1-Prevalence)} \]

In order for the sensitivity and specificity of a diagnostic test to be useful in estimating its predictive value in an individual patient, the prevalence of the condition in the population to which the patient belongs must be known. Since the “true” capacity for work is unknown in a population of persons with SBI who perceive themselves as unable to work, the prevalence of “inability to work” in this population is unknown as well.

The sensitivity of a diagnostic test is a poor proxy for predictive value in an individual patient when the prevalence of the condition in question is either low or unknown. The clinical judgment of an experienced physician who has training and experience in functional status assessment, and is able to give appropriate weight to a variety of independent predictors of functional capacity, may be less dependent on uncertain or nonexistent prevalence data and will likely a better proxy for predictive value under such conditions of uncertainty.

In summary, the validity of FCE data for prediction of ability to work in a population of patients with SBI who are applying for disability benefits may be substantially lower than, for example, the validity of FCE data for persons who are already working and are being tested for the capacity to work at a higher level of intensity. As Sullivan and Loeser note, “A PCE (physical capacity evaluation) may be a reliable measure of function without being a valid measure of functional capacity.” (emphasis added)

Wunderlich documents similar concerns voiced in a 1998 Social Security Administration (SSA) Disability Determination workshop, observing that “Functional status measurements are fine when individuals are motivated to reveal their functional ability. However, SSA will run into trouble when applying functional assessment measures to people who are motivated to show that they ‘are disabled.’” It may be reasonably valid to perform a FCE to determine a safe level of work intensity in a patient with SBI who is working, is participating actively in a program to improve ability to function, and who expresses an interest in trying to work at a higher intensity level. It may also be reasonable to perform a FCE on a patient with a SBI in order to gather data on the patient’s performance, while documenting illness behaviors and other pieces of information that might be helpful to an evaluating physician or agency. However, a FCE is “not a stand-alone test.” As is the case with other diagnostic studies, FCE data is best weighted according to its predictive value for work capacity considering the population to which the patient belongs and data specific to the individual patient. Consumers of this data can accord the information whatever importance they feel is indicated, depending on the specific clini-
cal situation.

**Methodology #4: Probability-based Testing of Decision Options**

Evidence-based medical decision-making can be summarized as a sequence of steps, each building on the one before.7, 53 One useful medical decision-making model is based on the probability that a medical condition is present, with decision aids designed to guide the decision of whether to perform diagnostic testing or to treat the condition without testing. Modified to a RTW problem, the “medical condition” could be operationalized as “able to perform sedentary work,” and the “treatment” as “recommend RTW with restrictions and limitations appropriate to sedentary work.” Since this methodology depends on the sensitivity and specificity of diagnostic tests measuring “ability to work,” this methodology suffers from the same limitations that affect the usefulness of FCEs in determining work capacity in persons with SBIs. Less dependent on the sensitivity and specificity of individual diagnostic tests is the Weight-of-Evidence (W-of-E) methodology.

**Methodology #5: Weight of Evidence**

Professionals who are entrusted with making RTW decisions all use this methodology to some degree. This is deductive decision-making, applying all available person-specific information to a general body of principles, laws, or contract provisions in order to make a RTW determination that is appropriate to an individual person.54 Insurance professionals assess person-specific evidence to see if the circumstances fall within the terms of the contract. Judges consider evidence presented to make a decision based on laws and regulations. Physicians use judgment based on their study, training, and experience in treating patients to specify appropriate work restrictions and limitations.

Preponderance or weight-of-evidence (W-of-E) judgments are based on the principle that all of the evidence viewed as a whole may justify a conclusion that none of the individual pieces of evidence alone can justify.55 56 This principle is the basis for the methodology of systematic reviews or meta-analyses, in which findings are pooled from many published articles in order to permit greater understanding of a topic. The Greek root meta identifies the capacity of meta-analysis to “transcend” the individual pieces of original data, to achieve greater understanding by re-analysis of the data.56, 57 In a process analogous to the rigorous weighting of individual studies by methodological quality in systematic reviews,56, 57 clinicians make intuitive judgments concerning the significance and relevance of each piece of medical evidence in light of all other evidence, in order to specify appropriate restrictions and limitations consistent with a patient’s work capacity. When performed conscientiously by clinicians with appropriate training and experience, expert judgment based on W-of-E has many methodological strengths.

First, the W-of-E methodology is not dependent on one or two factors that may be highly uncertain, such as the prevalence of “true” inability to work in a population of patients with FM or the clinical discriminators that could reliably identify a person with FM who is truly unable to perform sedentary work. Second, the W-of-E methodology includes careful consideration of all available information that is specific to the individual patient. Sir William Osler recognized the importance of knowing as much about the patient as possible when he said, “It is more important to know what kind of a person has a disease than what kind of disease a person has.”58 This person-specific information helps to elevate the expert’s judgment to a “strong” version of the preponderance of evidence rule, above a weaker methodology based on “inferential evidence alone.”59 Third, the W-of-E methodology offers the clinician the opportunity to discuss the significance and relevance of each piece of medical evidence if requested. This discussion makes visible the way in which the clinician’s opinion was constructed, allowing outside evaluators to judge the merits of the clinician’s analysis of each piece of evidence as well as conclusions drawn from the evidence as a whole. Lastly, the W-of-E methodology permits the clinician to draw on any of the other methodologies and decision aids cited above to assist in making the most rigorous analysis possible given the inherent uncertainty of the clinical situation. While the W-of-E methodology has many strengths, W-of-E judgments still leave substantial room for disagreement concerning the capacity of persons with SBIs to work.

Treating physicians may have had little or no
formal training in disability evaluation. Practicing physicians may have given little thought to the complexities and implications of disability evaluation—physical, psychological, social, and legal—or to the effect on patients who are labeled as permanently unable to perform gainful work. A well-meaning physician who enables a person to be granted disability status in spite of substantial capacity for activities at home and in the community may be unnecessarily limiting the person’s opportunities and quality of life.

Decisions concerning a worker’s restrictions and limitations are medical, while decisions about whether a non-working person qualifies for disability insurance benefits are administrative. As Sullivan and Loeser point out, “the difference between compensable and non-compensable disability is not a medical difference. … Ratings exist to sort those who, in whole or in part, cannot work from those who will not work. … The distinction between cannot and will not is especially difficult in patients suffering from chronic pain.”

Sullivan and Loeser note that “impairment, … is determined in part by patient values, goals, and motivations.” It is currently not possible to measure the effect of those values, goals, and motivations on a patient’s functional capacity. As Sullivan and Loeser observe, “the rewards offered by the environment always shape what level of discomfort is tolerable.” The availability of compensation has been noted to increase the base rate of symptom magnification from 8% to 30% in general medical cases. In a study of whiplash injuries in Canada, the change to a “no-fault” system and the elimination of “pain and suffering” compensation resulted in fewer claims and shorter time to claim resolution. A rigorous and well-supported IME can help to create an environment which favors achievement of optimal functional capacity.

CONCLUSION

Breslin observed that it was common for clinicians to treat only physical causes of pain, seeing their role as “to treat pain in people.” Rather, a more appropriate objective might be “to treat people in pain.”

“From this perspective, it is nonsensical to wonder if a patient has ‘real’ versus ‘unreal’ (imaginary) pain, ‘organic’ versus ‘psychological’ pain, or ‘legitimate’ versus ‘hysterical’ pain. Pain is an intensely subjective and personal experience, and even if no physical explanation for it can be found, all pain is real.”

Thorough physician assessment of appropriate work restrictions and limitations in recognition of the patient’s chronic pain can provide outcome goals toward which effective treatment can be directed. A key step in achieving important functional goals is patient agreement with the treatment plan. A thorough and well-documented IME, in combination with all of the other available assessments and clinical information, can provide the treating physician with valuable information concerning a patient’s functional capacity. The treating physician can use this information to inform ongoing discussions with the patient toward gaining agreement on a treatment plan to achieve goals that are important to the patient and other interested persons. Focusing the treatment plan on goals that the patient has participated in selecting and that are consistent with agreed-upon restrictions and limitations may help to move forward to process of functional restoration in patients with symptom-based illnesses.

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