Chapter 16
Methods of Ascertainment of Personal Damage in the USA

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Abstract The chapter illustrates the historical, judicial, and juridical framework of personal injury assessment and compensation in the USA, describing the expert's qualification and competences and detailing the ascertainment methodology and criteria of evaluation utilized for identifying, describing, and estimating any personal injury, its temporary and permanent consequences, and the causal value/link between the event and the injury and between the injury and the impairment/ disability.

16.1 Historical, Judicial, and Juridical Overview

It is written in the Bible that "if any would not work, neither should he eat" [1]. Hence, there has been a long-standing expectation among individuals within any 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. Thus, disability assessment 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. These systems' rules and laws have been around since the beginning of history and are

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elemental components of our social fabric, rooted in the very origins of human society.

16.2 Global Historical Overview of Personal Injury Evaluation and Compensation

Historical evidence suggests that social justice and systems of compensation have existed globally and have been linked since ancient times [2]. 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 [2]. 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 Talionis, 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 an eye and a tooth for a tooth" [3].

The Babylonian 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, ½ mina; an ear, ½ mina. A slap in the face, 10 shekels silver he shall weigh out" [4].

Among the ancient Egyptians, similar laws provided compensation for wrongful acts resulting in injury. Punitive actions, often severe, could be taken against doctors for acts of malpractice, such as amputating a doctor's hands for causing blindness to a patient after removal of cataracts [5].

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 [6]. Furthermore; Roman masters were obligated to care for their injured slaves. The concept of *Respondeat Superior* ("let the master answer") was also introduced, which created the legal obligation of a master to answer for the wrongful doings of his servants. These concepts still exist in common law and in military doctrine in which subordinate members who are bound to obey legal orders from 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 wergild 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 wergild), but loss of a tooth that showed on a smile was equal to 16 solidi (8 % of the wergild) [7]. The impairment values are extraordinarily similar to those used today.

State-sponsored care for the poor and disabled without a responsible party (the contemporary 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 Umar. The state treasury provided monthly benefits to those afflicted with blindness and to widows and orphans [8].

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 [9].

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 8 or 6 slaves; for the loss of a left arm 500 pieces of 8 or 5 slaves; for a right leg 500 pieces of 8 or 5 slaves; for a left leg 400 pieces of 8 or 4 slaves; for an eye 100 pieces of 8 or 1 slave; for a finger of the hand the same reward as for the eye" [10].

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.

The following overview examines the historical origins of the major US laws and disability assessment and compensation systems, highlighting the fundamental similarities and contrasts between them.

The US legal system is complex due to its large territory (50 state jurisdictions plus 2 commonwealth territories); however, it is essentially based on four basic types of law: constitutional, statutory (legislative), common law (judicial precedent), and administrative law. These basic types are found in all 50 states and in the federal and other administrative systems but with different interpretations resulting sometimes in conflict with other sister jurisdictions; the same factual controversy may be decided in favor of the defendant in New York, but against the same defendant a couple hundred miles south in Virginia. Additionally, in some cases, the plaintiff could win in New York under New York state law but lose in the same state under federal law.

Generally, the US Federal Constitution is the final arbiter of any controversy as it relates to constitutionally guaranteed rights and federal law. This creates predictability and uniformity in the US federal law with the US Supreme Court being the final authority in deciding what the federal law across the USA is [11]. This still leaves various individual state laws at conflict with other states, even those that share a common border. The judicial branch of the government is mainly responsible to interpret the federal and state laws, including the language of constitutions. Unlike the constitutions of many other nations, the US Constitution is the supreme law of the land and, along with the individual constitutions of each state, outlines the powers of the federal and state government and the executive, legislative, and judicial authority.

Moreover, the federal and individual state constitutions guarantee certain legal protection for individuals against governmental action, thereby placing limitations upon governmental powers and creating individual liberties that guarantee individual rights. These fundamental inalienable rights of individual citizens include the right to procreation, the right to marry, the right to privacy, the right to travel, and the right to vote, as well as prohibition against governmental taking of private property without just compensation. Individual freedoms constitutionally protected also include the freedoms of speech, press, religion, association, and bearing arms.

The US statutory (legislative) laws, both federal and state laws created by elected legislative bodies, supersede all other types of law except constitutional law. US federal statutory laws preempt the state laws. These laws can be changed by repeal or modified by further legislation; however, they are all subject to judicial interpretation which sometimes results in varying interpretation of the same law in different jurisdictions. As mentioned earlier, all laws in the USA are subject to the ultimate authority of the US Constitution and its interpretation by the US Supreme Court, resulting in final resolution of a certain case or controversy or dispute.

It is noteworthy that in the USA, the majority of the individual state's legal systems (contract law, property law and tort law/law of delict, etc.) are based on common law (judge-made law) which was inherited from England dating back to

colonial times. The common law has its roots dating back to twelfth-century England in the reign of King Henry II when he delegated his judicial powers to various magistrates and judges. The country was divided into a number of circuits, and the king appointed 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. Common law relies on the legal doctrine of *stare decisis*, which means "let the decision stand." The idea is to have certain predictability in the law for those cases with circumstances similar to cases from the past. Thus common law is a body of law that is based on the precedent value of past decisions of the court, decisions of other courts within the same judicial system, public policy, and/or legal reasoning. Prior decisions of the court are interpreted as having precedent value, furnishing examples or authority when considering an identical or similar case. If the same question of law is raised in another case, the court would attempt to adhere to its prior decision(s).

Common law interpretations can vary between various jurisdictions, but it is subordinate to statutory law as well as state and federal constitutions. Therefore, the elements of common law that offend the prevailing contemporary political and economic ideology can be countered by legislative action, resulting in the statutes that override the common law. However, the judges ultimately interpret these statutes and determine whether the Constitution or certain statutes are applicable or even relevant to the particular facts of a case before the court, hence giving the judiciary ultimate and wide discretion in many cases.

Administrative law is the body of law that covers complex technical and specialized areas often considered to be procedurally unwieldy for the legislature to deal with on a continuing basis. Administrative law is therefore administered under the jurisdiction of an administrative agency that is specifically created by statute for the purpose of promulgating rules and regulations to govern in a specialized area of public interest. Several examples of such administrative agencies include the Environmental Protection Agency and the Department of Labor, with its various injured workers' compensation programs. These agencies, even though quasi-independent, must create rules and regulations that are consistent with the original legislative action, i.e., enabling acts that created the particular administrative agency and are subject to other hierarchies of laws including statutory and/or constitutional law.

Within the USA, under the framework of the complex legal system as described above, various disability and compensation systems arose to ensure that members of society with a medically determinable impairment that may lead to disability have recourse to compensation from various avenues, including tort action in common law against wrongdoers for personal injuries, 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 the 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 doctor is empowered to render an opinion regarding the nature and extent of medically determined impairment resulting in disability. It is imperative that doctors entrusted with assisting the legal system 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.

16.3 Contemporary Disability Compensation Systems in the USA

In addition to the tort claims that may arise out of a personal injury caused by motor vehicle accidents, toxic exposure, medical malpractice, or defective products and adjudicated in the individual state court system, the following are other contemporary disability compensation systems in the USA.

16.4 State Workers' Compensation Laws

Because of inadequacies of recovery for industrial injuries under common law, various workers' compensation statutes were enacted around the turn of the twentieth century in the USA with the goal to provide expeditious resolution of industrial injury claims [12]. The need for workers' compensation laws at the individual state level arose in response to many factors, including the societal change from an agrarian society to an industrial age, resulting in catastrophic injuries causing several hundred deaths in single incidents, such as a mine explosion in West Virginia in 1907 as well as a New York sewing factory fire in 1911. The rise of labor unions and increasing awareness of workers' rights were other major factors in the enactment of various workers' compensation legislation. In addition, the only alternative legal remedy available to these injured workers, the common law of torts, was inefficient and ineffective in most cases due to its very lengthy and often expensive process with several unique defenses available to the defendant. The workers' compensation legislation sought to reduce this burden on the injured worker by providing all parties with a more expedited and responsive process and a no-fault system.

Under workers' compensation laws, 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.

Workers' compensation systems in the USA are mandated by both state and federal legislation to provide economic protection for workers who sustain personal injuries resulting out of and in the course of employment. Generally, this is accomplished through private insurance schemes underwriting the risks of occupational injuries and diseases in return for a premium paid by the employer under the law. Few states serve as the insurer themselves.

The individual workers' compensation legislation in each state has some variation, but common features among all include injured workers' entitlement to benefits if his or her injury is determined to be compensable and can be shown to have arisen "out of and in the course of employment." Historically, workers' compensation statutes are intended to cover injuries that occurred by "accident" (a chance, unexpected, and unintended event) in the workplace at a specific point in time, as opposed to a "disease" entity or condition that arose gradually over time. In reality, this distinction often cannot clearly be made, and coverage is now typically extended to occupational "illness" or disease as well as impairment resulting from "aggravation" of a preexisting and underlying condition [13].

An injured worker is entitled to three types of benefits: survivor benefits in the event of injury or illness resulting in death, medical and rehabilitation expenses, and wage-loss benefits. In the event of death, the surviving spouse and/or children are entitled to funeral expenses and a monthly pension (generally 2/3 of the average monthly wage at time of death up to a maximum cap) which terminates if the spouse remarries or, in the case of children, when they reach the age of 18 (or 22 if they remain a full-time student) or upon marriage. Coverage for medical and rehabilitative expenses is 100 % for authorized services. Wage-loss benefits are paid according to four separate levels of work disability. Temporary disability occurs for the duration of the treatment period and may be total (employee is incapable of any work) or partial (employee is allowed to resume "modified duty" with restrictions) [14].

Upon completion of treatment phase, at the point of maximum medical improvement (MMI) and case closure, the employee may receive compensation for permanent total or partial disability, generally as a lump sum payout calculated according to a predetermined formula specific to each jurisdiction, which takes into account the value of the "whole person" as a number of weeks' pay multiplied by the average weekly wage up to a cap and then multiplied by the impairment percentage of the "whole person."

16.4.1 Medical Evaluation and Reporting Requirements

Within the workers' compensation (WC) system, physicians may be asked to determine causality of a given impairment within medical probability. They may be asked to complete a work status report during various stages of treatment indicating whether or not the employee is ready to return to full or modified duty and to identify activity and material handling restrictions where applicable. They

will be asked to address when MMI has occurred or is expected to occur and to issue an impairment rating for work-related condition(s) if MMI has occurred.

16.5 US Federal Social Security Compensation Laws

A loosely structured welfare system existed within the USA as far back as colonial times [15]. 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 age 65.

The Social Security Administration (SSA) is the largest disability program in the USA, assisting between 33 and 50 % of all persons qualified as disabled [6]. 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 [16].

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.

16.5.1 Federal Workers’ Compensation Laws

The various workers’ compensation schemes at the US federal level are distinct and distinguishable from the state workers’ compensation legislation and include the Federal Employers Liability Act (FELA) which is the sole remedy for the injured railroad worker against the railroad; the Federal Employees Compensation Act (FECA) which is the sole remedy for job-related injuries and diseases sustained by

federal employees including postal workers as well as Peace Corps members against the federal government. Physicians seeking further information as well as opportunities to provide services to these programs should review the Federal Office of Workers' Compensation Programs (OWCP) website at http://www.dol.gov/owcp/. The OWCP also manages the Long Shore and Harbor Workers Act, Federal Black Lung Program, and the Division of Energy Employees Occupational Illness Program.

16.5.2 Federal Employer's 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 (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.

16.5.3 Jones Act (Merchant 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 state and thereby enjoy liberal treatment by the court system in general.

16.5.4 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 three million civilian employees of the US 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, DC.

16.5.5 Longshore and Harbor Worker's 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 activities. It is a no-fault system federally administered under the US Department of Labor.

16.5.6 Federal Mine Workers Compensation Act (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 US Department of Labor.

The diagnosis of pneumoconiosis under the act may be ascertained through findings on a chest x-ray according to the International Labor 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 US 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.

16.5.7 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. They are available online through the Library of Congress website.

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. Disability evaluations are generally performed by doctors at VHA facilities using the Automated Medical Information Exchange (AMIE) data processing system and associated Disability Examination Worksheets and the VA's Schedule of Rating Disabilities (VASR-D) [17].

There is a local appellate process for veterans who have been denied benefits. Beyond that, there is the Board of Veterans Appeals in Washington, DC, and, finally, there is the US 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.

16.5.8 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.

16.5.9 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 h 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, continued hospitalization, and life insurance protection to an employee during the period of absence.

16.6 Private Insurance 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.

16.7 Identification and Description of Medicolegal Expert's Qualifications

Medical expert testimony is required in a variety of disputes before the courts of law in the USA. Claims of medical malpractice resulting in personal injuries to the patients, motor vehicle accidents resulting in bodily injuries, work-related incidents, as well as criminal trial cases, and other similar litigations almost always

require some form of medical expert testimony. Legal systems tend to think that medical sciences have clear and definitive answers to certain factual questions. From the time the Roman doctor Antistius testified before the Roman Senate about the cause of death of Julius Caesar, that of the 23 stab wounds to his body the only fatal wound was to his chest resulting in his death [18], the legal system has relied on forensic evidence from scientific expert witness for the fact-finding.

In the USA, the legal system largely relies on medical and scientific technical experts for personal injury assessment and resulting calculation of damages and disability. This is generally done in the form of evaluation and testimony from an independent scientific expert who is usually qualified by appropriate education, training, knowledge, skills, experience, and abilities. The scientific or technical expert through the special training, knowledge, or experience is able to offer opinion(s) on a particular question in a legal dispute, thereby assisting the legal system in determining what the facts are, relevant to a particular case. It is noteworthy that it is not the scientific expert but rather the judicial process that defines the factual question in the litigation for the expert witness to answer. Different cases require different levels of knowledge, skill sets, and expertise, but all parties are allowed to offer some form of independent medical evaluation to support their claim. Today, many trials in the USA, civil or criminal, state or federal, turn on the testimony of one or more of scientific and/or technical experts.

The laws of expert witness in various US legal systems govern the conduct of the expert witness in that system. The assessment by the expert is usually done in the form of independent review of records and other relevant data as well as an examination of the injured party or deceased if so requested. In some cases, the expert may not have access to the injured party and form an independent scientific opinion by solely relying on the available records, data, and scientific literature.

16.7.1 Independent Medical Examinations

Independent Medical Examinations (IMEs) are examinations performed by a doctor who is not involved in the injured person's care for multiple purposes including determination of physical/mental impairment and disability. IMEs provide medicolegal documentation of fact, analysis, and well-reasoned opinion. The evaluations must be independent, impartial, and without bias. The requester may be the lawyer for any party, the insurer, the employer, state authority, or, in some cases, the court.

IMEs are performed to provide information for compensation case management and for evidence in judicial hearings and other legal proceedings. IMEs are a component of most US workers' compensation statutes as well as common law/tort law, although the specifics vary by state. They are performed at several stages during the course of an injury/illness claim, treatment, rehabilitation, and return to work.

An Independent Medical Evaluation (IME) is different from medical/surgical consultation in the due course of a clinician's practice in that it is almost always a single encounter and no medical care is provided, thereby resulting in no doctor–patient relationship. The key issues associated with an IME differ from clinical consultations in role and focus. The US judicial philosophy views independent assessments by an impartial doctor (other than the treating doctor) to help avoid potential conflicts of interest when analyzing disputed issues in a legal claim of causation, prognosis, need for further treatment, degree of impairment/disability, or work capacity.

In the USA, IMEs may be performed any time there is a dispute, concern, or question regarding the medical treatment or condition of the injured party. These issues include such topics as the following:

- Diagnosis/prognosis
- Proximate causation, and in case of workers compensation claims, work relatedness of an illness or injury
- Identification of other nonmedical factors that can have a significant impact on the outcome of the medical condition or treatment
- Appropriateness of current and proposed medical treatment or diagnostic efforts
- Ability to return to work (fitness for duty) and or appropriate work accommodation
- Maximal degree of medical improvement
- Impairment and disability assessment with quantum for compensation

IMEs can help to untangle the complex relationship between pathology (a medical condition or diagnosis), impairment (an anatomic or functional abnormality or loss), functional limitation (a restriction that can be assessed by objective medical assessment), and disability (inability to perform socially defined activities or roles). For example, the Americans with Disabilities Act defines a disability as "a physical or mental impairment that substantially limits one or more major life activities of such individual, a record of such an impairment, or being regarded as having an impairment." Major life activities include seeing, hearing, speaking, walking, breathing, performing manual tasks, learning, caring for one's self, and working. It is essential that IMEs be performed objectively, using reproducible techniques and agreed-upon standards. Several impairment rating systems exist. The "gold standard" for determining a general physical or mental impairment is the *AMA Guides to the Evaluation of Permanent Impairment* [18]. Specialized systems have been created by the Social Security Administration, the Railroad Retirement Board, and other organizations. Recent publications have added disability duration standards.

Regardless of the referring source, the IME by definition should have unbiased objectivity as one of its primary goals, with emphasis placed on reproducible techniques of examination. Furthermore, the opinions given should be based on the most current scientific knowledge, as well as agreed-upon standards of impairment and disability evaluations such as the *AMA Guides*. IMEs are performed by

doctors in many different specialties. Specialized IMEs are performed by other health professionals, many of whom are licensed to perform these evaluations.

Previously, users of expert witness services and IMEs had long expressed dissatisfaction with variations in quality IMEs. Challenges to the field included (1) poor quality evaluations, (2) unavailability of qualified examiners, (3) absence of educational performance standards, (4) lack of standardized training, and (5) no system for determining the competence of examiners. Inadequate quality of examinations was reflected in many ways. For example, evaluations were often not responsive to the judicial systems' need for validated and scientifically supportable answers to the questions and legal claims. The examiners often failed to understand the critical issues such as definitions of causation, impairment and disability, etc. Assessments in some cases were perfunctory, with conclusions without scientific support. One other major concern was biased evaluations performed by so-called experts lacking current clinical competence.

To overcome these critical quality issues, the American Board of Independent Medical Examiners (ABIME) was created in the USA in 1993 as a nonprofit independent accreditation body to improve the quality of independent medical and impairment examinations [19]. The primary mission of ABIME was to do public good by enhancing the quality of independent scientific evidence presented to the legal system through well-conducted and valid independent medical examinations by creating a voluntary process of standard setting, definition of competencies, and performance evaluation for independent medical examiners.

The ABIME board of governors' members are representatives from multiple medical specialties that oversee multiple committees comprising of the examination committee, the standards committee, the ethics committee, etc. The exam committee, the most robust of ABIME committees, is comprised of doctors from dozens of medical specialties, assisted by Human Resources Research Organization (HumRRO) from Washington, DC, an independent professional examination organization responsible for producing the psychometrically validated standardized ABIME examination. Human Resources Research Organization (HumRRO) worked with ABIME to define specific competencies, design an examination that is rigorous and fair, prepare and validate a large pool of test items (questions), perform statistical quality control, and insure integrity of the examination.

The ABIME examination was based on an exhaustive analysis of the job tasks of an independent medical examiner and expert witness. From this job task analysis, the examination committee defined an examination blueprint with the knowledge, skills, and abilities of the content areas of an independent medical examiner. Questions for each version of the examination are drawn from a large pool, to which new questions are continually being added. The examination is continuously revised by regular meetings of the examination committee, working closely with our psychometric consultants.

Requirements for certification by ABIME include (1) a current, unrestricted, medical license or registration with appropriate health regulation authority in the jurisdiction where the candidate resides and practices; (2) a clear record with no disciplinary action for unethical or other offense as imposed by a State Board of

Medical Licensure or similar authority within the last 5 years; (3) board certification in a specialty recognized by the American Board of Medical Specialties, or the American Osteopathic Association, or equivalent from a foreign jurisdiction or documentation that an applicant has been involved in the practice of medicine, including residency (postdoctoral training) years, for a period of 5 years prior to their submitting an ABIME application; (4) completion of at least 30 h of ABIME sponsored continuing medical education (CME) in impairment and disability assessment and independent medical examination within the 3 years prior to taking the examination, 50 h of CME in this field is strongly recommended; (5) signed agreement to abide by the ABIME Guidelines of Conduct; and (6) satisfactory completion of a rigorous written examination of approximately 120 multiple-choice questions.

To encourage awareness of ongoing developments in this rapidly changing arena, ABIME certification is valid for a 5-year period. Recertification requirements include passing the current examination or following an alternate pathway consisting of education and completion of an independent study of prescribed journal articles and submission of answers to CME questions.

From September 1994 through December 2014, for a period of over 20 years, 10,875 doctors from19 countries in the world and all 50 states in the USA took the ABIME qualification examination. 7582 successfully passed the qualification exam and were awarded the prestigious ABIME CIME diploma certificate, valid for 5 years, and are known as certified independent medical examiners, CIME. Certified independent medical examiners are also eligible to participate in the ABIME Board of Registry. The Board of Registry publishes an annual international directory of certified independent medical examiners. This directory, which is also available online, is available to all CIMEs, workers' compensation boards, insurers, employers, managed care organizations, lawyers, and others. The Board of Registry also publishes the Disability Medicine Journal and oversees management of the Alternate Pathway Program for recertification. The International Board of Registry Directory is an increasingly valuable resource for those requiring IMEs. CIMEs have also indicated that the directory has led to increased referrals. The directory is also available online at www.abime.org.

The ABIME Board of Advisors, an organizational entity created by ABIME's board of governors, has over 30 members from various countries and multiple specialties, provides advice and consultation, and helps ABIME develop working partnerships with many employers, insurers, state workers' compensation boards, federal agencies, national organizations, and professional societies. These members of the board of advisors serve as the ambassadors for ABIME in their respective regions and specialty.

Response to ABIME has been highly favorable both nationally and internationally and from the communities it serves and the doctors and other scientific experts involved in this field. Many participants in the arena of independent medical examinations have emphasized the need for quality and consistency among examinations and voluntarily support the nonprofit mission of ABIME. As the number of

doctors competently performing IMEs grows, demand will grow to enhance the sophistication of state and national benefit systems.

Challenges include difficulty differentiating work and non-work-related events, distinguishing between impairment and disability, defining work ability, clarifying direct threat to one's self and others, interfacing with adversarial and often dysfunctional systems, iatrogenic components to disability, and inappropriate diagnostic testing and treatment.

16.8 Personal Injury Ascertainment Methodology

Generally, an independent medical evaluation methodology involves the review of all of the following elements of a claim:

- History of presenting injury or illness
- Chief complaints
- Detailed inventory of abilities to perform activities of daily living
- Review of systems
- Family and personal history
- Occupational history and exposure history
- Physical examination
- Review and interpretation of any available laboratory data imaging studies
- Review of available relevant records
- Clinical impression (s) diagnosis(es)
- Prognosis
- Appropriateness of current treatment or proposed treatment if not at MMI
- Maximal degree of medical improvement (MMI)
- Future medical care assessment in catastrophic injuries with financial estimate only if expert, in addition to being an IME, has special training, and has a bona fide accreditation in life care planning
- Impairment assessment using the *AMA Guides* (gold standard)
- Disability assessment if practical or task restrictions
- Apportionment (if indicated)
- Fitness for duty/work capacity
- Causation, apportionment if applicable
- Psychosocial barriers to recovery if relevant

An IME history should be sufficiently comprehensive, yet relevant to the inquiry, and must focus on the questions raised in the case by the referring agency usually contained in the initial retainer or referral letter. Sufficient information should be obtained to address the issues raised. This generally includes all of the following:

16.8.1 History of the Present Injury or Illness

The following have to be taken into account:

- Claimant's reported mechanism of acute injury and or onset of illness, causation, and review of all the details surrounding injury, for example, in claims of fall, the height of fall, the body parts involved, onset and chronology of symptoms, all the treatment to date, compliance with the treatment, and the outcome
- If claim of occupational injury or illness, then a detailed review with claimant of all the various job tasks that are perceived to have caused the injury or illness. In the case of claims of musculoskeletal disorders without acute injury, history of frequency of various tasks requiring repetitions, lifting, bending and postural variables, etc. In the case of claims of toxicological injuries/illness, include a review of chemicals used, particularly the names of the specific chemicals, and onset of symptoms, including positive and negative
- Claimant's injury related perception of injustice and expectations for recovery from the condition
- Work and disability status since the injury or onset of the illness
- Claimant's self-reported pre-injury health status and the pre-injury functional status, including review of preexisting conditions, previous injuries, and previous use of medications should be noted (both prescribed and non-prescribed as well as illegal drugs) including any allergies, etc.
- History of related symptoms such as sleep disturbances, anxiety, depression, or symptoms of other mental and behavioral disorder should be explored.
- Family history of illnesses, injury, or disability
- Social history, including alcohol use, tobacco use (described in dose particularity such as pack year of cigarette smoking), and hobbies
- Educational and vocational history
- Review of systems

16.8.2 Current Chief Complaints

Current chief complaints identifying the body parts involved and the specific type and location of the symptoms include the nature, pattern, and quality of pain if any, aggravating and relieving factors, and the effect on activities of daily living. Examiner should review in detail the claimant's current perceived functional status, including the ability to carry out daily living, recreational, and work activities, with consistencies and inconsistencies noted. Obtaining this history requires an oral interview with follow-up questions, paying particular attention to common ADL, both basic such as toileting, bathing, grooming, and feeding, to advanced ADL such as driving, shopping, traveling, and financial and household management, social functioning, etc. Detailed description of activities must be documented.

16.8.3 Physical Examination

After obtaining the consent, a careful physical examination must be performed and should include the examiner's observation of the examinee's general presentation, behavior, affect, mental status, appropriateness, station, gait, posture, and body movements as well as vital signs, etc. Then a detailed examination of the specific body system involved should be carried out and recorded. For example, in musculoskeletal complaints or when nerve or nerve root compression is suspected, a complete neurologic examination of the affected area and related areas is mandatory. However, the examiner must be careful not to do unnecessary body part examination for areas that are not relevant to the claim of injury. For example, for a claim of injury to the shoulder or wrist, a pelvic or rectal exam is clearly unnecessary, but on the other hand, for the claims of myelopathy with bowel or bladder symptoms, rectal exam is appropriate to determine anal sphincter tone.

Non-physiologic findings should be noted. Such findings might include back pain with axial loading, inappropriate responses to stimuli, and other findings that do not correspond to known anatomic or physiologic problems. Behavioral assessment, including the examinee's responses during the physical assessment, should be noted. In some cases, a formal mental status examination may be indicated. Pain and functional status inventories may supplement the evaluation of behavioral and psychological factors and provide information on the perceived level of function and disability. These questionnaires can provide an indication of behavioral overlay and psychological problems that might contribute to delayed recovery or dysfunction at work or at home. The *AMA Guides to the Evaluation of Permanent Impairment, 6th Edition*, endorses a number of functional assessment questionnaires. These tools can provide consistent and standardized self-report data.

Physical examination may be augmented with laboratory and imaging studies. For example, in claims of pulmonary problems, in addition to examination of chest, various respiratory function tests including lung volumes, imaging procedures, challenge testing, and exercise testing may be necessary.

16.8.4 Review of Available Medical and Other Records

A complete review of available records is useful in understanding the facts of the case which may or may not have been described accurately by the claimant to the examiner. Records should be organized chronologically and reviewed, and appropriate excerpts relevant to the issues in the claim should be recorded as part of the report. In some highly disputed cases, where exaggeration or fraud is suspected, the independent medical examiner may be provided with video surveillance recordings and reports. Surveillance is most useful when an individual is observed engaging in activities that cannot be reconciled with the claimed injury or stated inabilities. For example, a person with a claim of injury claiming that they are unable to use the

right upper limb in any activities of daily living but then are recorded on surveillance video to be riding motorcycles, taking out garbage, walking dogs, etc., all of these activities performed with the robust use of the right upper limb. However, the examiner must not solely rely on these video surveillance tapes to form the opinion as there are pitfalls including identity issues, duration of the activity, as well as bias that can occur from reviewing these tapes before a full evaluation. It is prudent that the examiner first reviews the entire case including examinee interview and physical examination and review of all the available medical records and uses the video surveillance tape not as a primary source of evidence but rather as adjunct evidence to form the final opinion in the case.

16.9 Evaluation Criteria

The American Medical Association (AMA) Guides to the Evaluation of Permanent Impairment (Guides) are the recognized international standard for assessing impairment and are ultimately used by adjudicators to assign disability benefits. The *Guides* are a tool to translate human pathology resulting from trauma or disease process into a percentage of the whole person impairment [20]. The primary purpose of the *Guides* is to rate impairment to assist adjudicators and others in determining the financial compensation to be awarded to the individuals who, as a result of injury or illness, have suffered measurable, physical, and/or psychological loss.

The *Guides 6th Edition*, published in 2008, introduced new approaches to medical rating of permanent impairment (PI), a key component of determining permanent impairment and partial disability awards (PPD) for workers' compensation (WC) and other benefit programs including numerous international jurisdictions such as Australia, New Zealand, South Africa, etc. using the *Guides*-based impairment rating as a threshold to determine the severity of personal injury to access the general damage (pain and suffering, etc.) award in common law tort claims of personal injuries, e.g., motor vehicle accidents [21].

Several methodologies and schedules have existed since the beginning of recorded history to allow for monetary compensation for the injured, sick, and disabled. Even though the process of the development of the *AMA Guides* started in 1958, the underlying principles of the *Guides* reflect the cumulative experience of mankind over the centuries. The journey of the *Guides* began five decades ago in the USA as a tool for adjudication of workers' compensation claims. However, with accumulating experience and increasing use in other legal systems, the *Guides* spread across the globe. In addition to its use in adjudication of workers' compensation claims across the globe, the *Guides*, in the past two decades, have also been increasingly used outside of the workers' compensation arena in helping adjudicate the claims of personal injuries from areas other than workers' compensation, mainly in claims of personal injuries from automobile accidents.

The disability determination process requires an initial determination of permanent medical impairment according to specific medical criteria. In order to improve consistency with the ratings system so that two doctors assessing the same claimant would have a similar assessment, the American Medical Association (AMA) has produced a rating manual (the *Guides*) as a benchmark to assist doctors in measuring and rating medical impairments [22]. One of the goals is to create a standardized objective reference. The *Guides* are periodically updated and revised to the current 6th edition. These updates are similar to revisions that occur with other texts, replacing outdated information with current data and consensus reflective of current best practices.

The *Guides* define the terms commonly encountered in medical disability evaluation as follows:

Impairment—a significant deviation, loss, or loss of use of any body structure or function in an individual with a health condition, disorder, or disease.

Disability—an umbrella term for activity limitations and/or participation restrictions in an individual with a health condition, disorder, or disease.

Impairment rating—a consensus-derived percentage estimate of loss of activity, and which reflects severity of impairment for a given health condition and the degree of associated limitations in terms of activities of daily living (ADLs).

Independent medical examination (IME)—a usually one-time evaluation performed by a licensed doctor/surgeon who is not treating the patient or claimant in order to answer questions posed by the party requesting the IME.

Maximum medical improvement (MMI)—the point at which a condition has stabilized and is unlikely to change (improve or worsen) substantially in the next 12 months, with or without treatment. While symptoms and signs of the condition may wax and wane over time, further overall recovery or deterioration is not anticipated. However, both the name given to and exact definition of this status somewhat vary depending on the jurisdiction in the USA.

Permanency and MMI—related concepts which simply mean that a person with an injury, after having received adequate medical, surgical, and rehabilitative treatment and having achieved clinical and functional stability, is now as good as they are going to get. Other synonymous terms in use according to jurisdictional preference include fixed and stable, maximum medical recovery, maximum medical stability, medically stationary, etc. These terms are useful to enable the injured person to exit the temporary disablement stage of recovery, thereby facilitating claim settlement and case closure.

Apportionment—an estimate of allocation of contributions among various causes of impairment. The extent to which each of two or more probable causes were responsible for an effect (injury, disease, impairment, etc.). Hence, the first step in apportionment is scientifically based causation analysis. Second, one must allocate responsibility among the probable causes and select apportionment percentages consistent with the medical literature and facts of the case in question. Arbitrary, unscientific apportionment estimates, which are nothing more than speculations, must be avoided.

Combined Values Chart—a method used to combine two or more impairment percentages that takes into account the impact of impairment from one body part on impairment of another body part. Thus, the largest of multiple impairment numbers is deducted from the first 100 % whole person, and the subsequent numbers are deducted from the remaining person value and not the whole person. This concept is based on the mathematical formula $A + B(1 - A) =$ combined values of A and B. Combining, as opposed to adding, ensures that the total value will not exceed 100 % whole person impairment. Combining must be done at the same hierarchal level and follow the rules as prescribed in the *AMA Guides* [22].

Cause—in general, anything that produces an effect. In medicine, cause refers to an identifiable factor (e.g., genetic abnormality, toxic or infectious exposure, trauma) that results in injury or illness. The cause or causes must be scientifically probable following causation analysis.

Causation—one of the many key questions asked of an independent medical examiner or expert witness is the issue of causation due to its significant economic implications to the parties involved in a legal dispute. The term causation may have different contextual meanings in Medicine vs. Law, and the doctor needs to understand this difference [23].

Medical causation—is biological in nature and is established through scientific analysis of sufficient rigor to demonstrate a cause and effect relationship with a high degree of certainty, e.g., with a statistical probability or P-value of 0.05 or less (or the probability of being wrong 5 % or less). For example, a doctor can reasonably conclude, within medical probability, that asbestos can cause mesothelioma in an individual exposed to some based upon a review of the credible medical evidence in the peer-reviewed scientific literature which has established a causal relationship in this case.

Medical causation—Hill's Criteria of Causation is a generally accepted scientific analysis to establish scientifically valid causal connections between disease and the causative agents. Austin Bradford Hill (1897–1991), a British medical statistician, originally presented these as a way of determining the causal link between a specific factor and a disease. These criteria require analysis of following elements in the context of facts in a given case and are minimal conditions necessary to provide adequate evidence of a causal relationship between an incidence and a consequence.

(1) Temporal relationship between cause and effect

    The effect has to occur after the cause (and if there is an expected delay between the cause and expected effect, then the effect must occur after that delay).

(2) Strength of association

    Association does not mean causation and requires the review of validated scientific literature for studies demonstrating strength of association between cause and effect. The larger the association, the more likely that it is causal; however, small association does not mean that there is not a causal effect.

(3) Dose–response relationship or biological gradient

Greater exposure generally leads to greater incidence of the effect. However, in some cases, the mere presence of the factor can trigger the effect. In other cases, an inverse proportion is observed: greater exposure leads to lower incidence.

(4) Consistency

Consistent causal relationship findings observed by different observers with different samples strengthen the probability of a cause and effect.

(5) Biological plausibility

A biological/scientific plausible mechanism between cause and effect is an important link for greater confidence in the conclusion of causation. However, lack of current knowledge of unknown mechanism may limit the use of this criterion.

(6) Specificity

Causation is probable if a very specific population at a specific site and disease with no other likely explanation. The more specific an association between a factor and an effect is, the bigger the probability of a causal relationship.

(7) Coherence

Coherence between epidemiological and laboratory findings increases the probability of an effect. However, lack of such experimental/laboratory evidence cannot nullify the epidemiological effect on associations.

(8) Consideration of alternative explanations and analogy is useful.

(9) Experiment helpful in some circumstances.

Legal causation—as defined in civil litigation generally has two prongs. First, an act (e.g., a tort) must be the cause in fact of a particular injury, which means that an act or omission was a necessary antecedent to the personal injury. Legally, this issue is analyzed by determining whether the injury would have occurred "but for" the act alleged to be the cause. If an injury would have occurred independent of the alleged act or omission, cause in fact has not been established, and no tort has been committed. When multiple acts/factors have led to a particular injury, the alleged act or omission is determined to be the cause in fact only if the evidence demonstrates this to have played a substantial role in causing the injury. Second, it must also be established simultaneously that the alleged act was the proximate cause of an injury before the legal liability will be imposed. The concept of *proximate cause* is very critical as it limits the scope of liability to those injuries that bear some reasonable relationship to the risk created by the wrongdoer. Proximate cause is evaluated in terms of whether a reasonable person should have foreseen the injury resulting from the act. If a given risk could not have been reasonably anticipated, proximate cause has not been established, and no liability will be attached.

In summary, legal causation is mainly a question of "foreseeability." An actor is liable for the foreseeable but not the unforeseeable consequences of his or her act. For example, it is foreseeable that someone who is left alone on a beach in a drunken stupor at low tide may die from drowning in the rising tide rather than from the excessive alcohol or drugs they have ingested. However, it is not foreseeable

that such an individual will be struck by lightning and killed by that event. In such case, the liability for drowning could have a proximate cause in law (for causing death) for anyone who is found responsible for contributing directly to someone's drunken stupor and leaving them exposed to the risk of death by drowning, but not to the risk of death from being struck by lightning, due to its remoteness in probability.

Two important concepts and terms pertaining to causation in relation to a preexisting and underlying condition are aggravation and exacerbation. *Aggravation* refers to a permanent worsening of a preexisting condition that occurs when a physical, chemical, biological, or other factor results in an increase in symptoms, signs, and/or impairment that never returns to baseline or what it would have been except for the aggravation. *Exacerbation* refers to a temporary worsening of a preexisting condition after which the individual recovers to his or her baseline functional status or what it would have been had the exacerbation never occurred.

16.10 Summary of the Current *AMA Guides 6th Edition* Core Methodology

The *Guides* is a tool designed to translate human pathology arising from a trauma or disease and manifested as a structural and/or functional loss at an organ system level into a percentage estimate of loss to the whole person. The document comprises of 634 pages with 17 chapters. The first two chapters outline the key concepts and underlying methodology of the *Guides*. The rest of the 15 chapters deal with a specific human body system, providing specific guidance for that particular body organ or system.

The international classification of functioning, ICF, provides the current conceptual framework, classification, and terminology of disablement adopted for the *Guides 6th Edition*, and the terminology is imbedded in the AMA definitions of *impairment, disability*, and *impairment rating* listed above. It also serves to identify five possible functional levels for purposes of impairment class distinctions adopted throughout the *AMA Guides 6th Edition* to promote conceptual congruity and operational uniformity across organ systems and in particular to identify the five possible impairment classes for the "diagnosis-based impairment (DBI)" method for the musculoskeletal organ system and most other organ systems.

The diagnosis-based impairment (DBI) platform places emphasis upon a diagnosis-based approach to impairment rating. This particularly applies to impairment ratings within the musculoskeletal organ system. Diagnosis-based impairment (DBI) grids are provided for each of these anatomical regions as follows:

- Spine—cervical spine, thoracic spine, lumbar spine, and pelvis
- Upper extremity—digits/hand, wrist, elbow, and shoulder
- Lower extremity—foot & ankle, knee and hip for the lower extremity

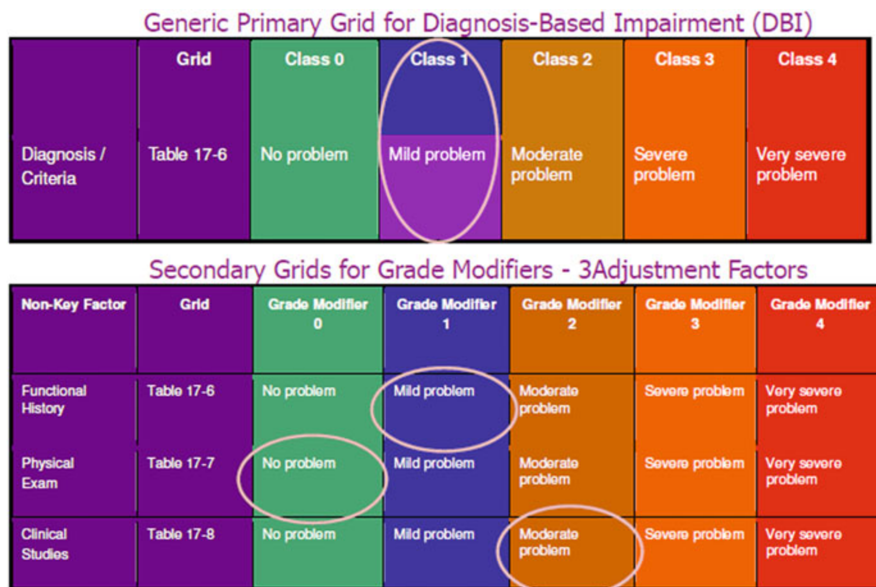
Each grid has five potential impairment classes (Class 0–4) consistent with the ICF classification system, and each covers a broad and precise array of diagnoses ranging from soft tissue conditions (nonspecific, chronic, or recurrent) to muscle–tendon and/or motion–segment injuries (sprains, strains, tendinopathies) to ligament, bone, and joint injuries (fractures, dislocations, arthrodesis, etc.).

The impairment rating using the DBI approach becomes a two-step process whereby initial assignment to an "impairment class" requires the rating examiner to identify the most appropriate diagnosis, and each diagnostic-based impairment class has an available range of impairment values arranged within five grades labeled A–E with an initial "default" mid-range value at grade C. The impairment rating (value) is then adjusted within range of grades A–E as a second step, using three separate criteria (functional history, examination findings, and clinical test results) to independently validate the diagnosis and severity of the condition. This second step is termed grade modification, which is a simple triangulation method. Using the metrics associated with each of these results enables a final numerical adjustment upward for less favorable outcomes or downward for more optimal outcomes according to the specific result in each case.

To illustrate using the musculoskeletal organ system, the first step in the impairment rating (IR) process is to determine permanency at *maximum medical improvement (MMI)*. Next is to assign the diagnosis and pick the appropriate impairment class within the appropriate DBI grid. Each impairment class (IC) has an available range of five discrete impairment scores (grades labeled A–E), and the "default" position is the middle score value at grade C. This initial fix on impairment value then goes through further refinement through the second step.

The second step follows whereby three separate "grade modifiers" are independently used to score level of severity (i.e., grade on a scale of 0–4) according to functional history (GMFH), physical examination findings (GMPE), and clinical study results (GMCS), respectively. The final step is to calculate the sum of the differences in numerical severity of the impairment grade modifiers minus IC, respectively, to triangulate the final impairment score within the impairment class according to the formula (GMFH − IC) + (GMPE − IC) + (GMCS − IC). If the sum is zero, the final IR remains at the default middle value. If the sum is + 1 or −1, the IR score moves one position to the right or left, respectively; if it is +2 or −2, it moves two positions to the right or left, respectively (Fig. 16.1).

This methodology simultaneously allows the rater to capture important and useful information on clinical severity and functional outcome for any given condition and to modify the final rating according to precise criteria of severity rather than solely on "clinical judgment." It further provides greater precision and resolution of impairment ratings with a broader array of diagnostic choices than was previously available under the DRE methodology and offers a more transparent pathway to the final impairment determination in all cases.



Generic Primary Grid for Diagnosis-Based Impairment (DBI)

	Grid	Class 0	Class 1	Class 2	Class 3	Class 4
Diagnosis / Criteria	Table 17-6	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

Secondary Grids for Grade Modifiers - 3Adjustment Factors

Non-Key Factor	Grid	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Functional History	Table 17-6	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Physical Exam	Table 17-7	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
Clinical Studies	Table 17-8	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem

Fig. 16.1 Diagnosis-based impairment methodology summary—*AMA Guides 6th Edition*

16.10.1 The Constitution and Fundamental Principles of the AMA Guides 6th Edition

(1) Concepts and philosophy of Chapter 2 of the *Guides 6th Edition* contains the fundamental principles of the *Guides*.

(2) No impairment of the body may exceed 100 % of the whole person; no impairment arising from a member or organ of the body may exceed the amputation value of that member.

(3) All regional impairments in the same organ or body system shall be combined as prescribed by the existing rule, starting at the same level first and further combined with other regional impairments at the whole person level.

(4) Rating of the impairment must be done in accordance with the relevant organ or system chapter where the injury primarily arose or where the greatest dysfunction consistent with the pathology remains, but not both.

(5) Only permanent medical impairment can be rated and only after maximum medical improvement (MMI) has been certified.

(6) A valid impairment evaluation requires a three-step approach as follows: Step 1 involves *clinical evaluation* which includes a relevant history obtained both from the claimant as well as for the review of medical records and relevant physical examination that includes the alleged injured body parts and the related structures. Step 2 includes *analysis of the findings* which discusses how the specific history and the objective findings of the clinical evaluation

support conclusions as to relevant diagnoses and MMI. Step 3 includes the *description of how the impairment rating was calculated* based on the *AMA Guides* criteria. This step is accomplished by including an explanation of each impairment value with reference to the diagnosis and other rating criteria as well as various table numbers and page numbers referenced from the *Guides*. The aim of this three-step process and report writing is to make the rating sufficiently transparent so that if the first two steps are fully described, any knowledgeable observer may check the finding against *AMA Guides* criteria.

(7) An evaluating doctor must use knowledge, skills, and abilities that are generally expected by the medical scientific community to arrive at the correct impairment rating according to the *Guides*.

(8) The *Guides* is based on objective criteria. The doctor must use clinical knowledge, skills, and abilities in determining whether or not the measurements, test results, or written historical information obtained are consistent and concordant with the pathology being evaluated. If the findings or an impairment estimate based upon such findings conflict with established medical principles, they cannot be used to justify an impairment rating.

(9) Range of motion and strength measurement techniques should be assessed carefully in the presence of apparent self-inhibition secondary to pain or apprehension.

(10) The *Guides* does not permit rating of future impairment.

(11) If the *Guides* provide more than one method to rate a particular impairment, the method producing the highest rating must be used ("law of liberality").

(12) Subjective complaints that are not clinically verifiable are generally not ratable according to the *Guides*.

(13) Round all fractional impairment ratings, whether immediate or final, to the nearest whole number, unless otherwise specified.

16.11 Summary and Conclusions

The medical practitioner who engages in the medicolegal practices of impairment rating and disability determination in the USA can frequently be called upon to perform an independent medical examination (IME). The doctor participating in such evaluation must be familiar with the emerging field of disability medicine, described as a subspecialty of clinical medical practice which encompasses the identification, prediction, prevention, assessment, evaluation, and management of impairment and disability in both human individuals and populations [23].

The IME is typically performed at the request of a party to a disputed claim and is provided by a clinician who is not personally treating the claimant for the purpose of rendering an impartial medical opinion regarding various aspects of the claim. The medical examiner is called upon to review necessary and appropriate records provided in support of the positions being contested and to personally interview and examine the claimant in most cases. The IME examiner must then answer a series of

common interrogatives "within medical probability" relating to the following items of interest:

– What is the diagnosis and causal relationship, if any, to work place injury?
– What is the current diagnostic and treatment plan?
– Has necessary and appropriate testing been done and treatment been provided? What additional (if any) testing and/or treatment are indicated beyond this point?
– What other medical or nonmedical factors might be having a significant impact upon the outcome of this particular case?
– Is the claimant at "maximal medical improvement (MMI)" with respect to the condition in question? If so, when did MMI occur? If not, when is MMI expected to occur?
– If claimant is at MMI, what is the medical impairment rating?
– What restrictions and accommodations are medically necessary, feasible, and applicable to the workplace in relation to the claimant's ability to go to work and be at work, engage in sustained material handling, and to perform certain activities while on the job?

The IME examiner's opinions are expressed "within medical probability" which means the likelihood exceeds 50 % (more likely than not), as opposed to "medical possibility" (likelihood less than or equal to 50 %).

Since the IME process places the doctor in the role of expert witness, the potential for adversarial relationships exists between the medical examiner and claimant who may find the doctor's opinion and or testimony unflattering to their position and thereby leading to action which may have legal consequences for the IME examiner. For example, even though the medical examiner is not directly treating the claimant, and the traditional doctor–patient relationship does not exist, he or she is obligated to provide an assessment which conforms to medical standard of care, and in some instances, malpractice liability may apply.

Furthermore, it should be noted that the medical disability evaluator or independent medical examiner acting as an "expert witness" may no longer be shielded from civil liabilities in the manner typically afforded to any other witness in the judicial process. In the past two decades, various state courts have held independent medical examiners and expert witnesses without any doctor–patient relationship accountable to their examinee in terms of ordinary negligence [24, 25], and at least one case found that a doctor owed a patient/claimant a duty of care even though no formal doctor–patient relationship clearly existed [9].

The IME examiner should not only be aware of the legal liabilities in the overall practice of their specialty but also the additional liability exposure from their work as an independent medical examiner. It should be noted, however, that even though the recent case law in some jurisdictions has significantly removed the traditional immunity from medical malpractice claims against IME providers with no doctor–patient relationship with their examinees, there still remains a great need in the US judicial system for IME/expert medical witness services.

Practitioners interested in the practice of Disability Medicine and intending to serve as independent medical examiners are encouraged to attend several of the

high-quality training programs offered in the USA to independent medical examiners and expert witnesses with the goal to empower them with the knowledge, skills, and abilities necessary to practice as an independent medical examiner and/or expert witness in the field of Disability Medicine. They must also be familiar with the applicable edition(s) of the *AMA Guides* in order to provide competent and accurate medical impairment ratings appropriate to WC and personal injury claims upon request. Doctors and others wishing to learn more are encouraged to visit the following web sites for available courses and other educational venues and resources of interest:

– American Medical Association. Available at: www.ama-assn.org
– American Board of Independent Medical Examiners. Available at: www.abime.org

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