

Izabela Z. Schultz and Catherine M. Chlebak

Introduction: Predicting Disability

Clearly, developing an effective model in disability prediction research forms a central bridging issue in the relationship between disability and impairment. Significant barriers for the development of a disability prediction and determination model in medicolegal settings include ambiguity and multiplicity of definitions of pain, impairment, and disability, as well as methodological challenges in assessment and in work disability prevention and reduction (Schultz, 2008; Schultz & Chlebak, 2013; Schultz, Stowell, Feuerstein, & Gatchel, 2007). In the context of minimal availability of graduate and postgraduate training opportunities in the field of disability determination (Schultz, 2009), for clinicians, the demands of a stressed workers' compensation and other disability insurance systems (in particular, an increasing proportion of higher compensation costs arising from complex pain and mental

health disability cases) might have exceeded research developments in the field (Gnam, 2005). This area forms a uniquely difficult area of research and practice in medicolegal settings.

Defining Disability and Impairment: Dissecting the Relationship Challenges

Theoretical Foundations

The concepts of disability and impairment are frequently intertwined in research literature, where often models and definitions of disability embed impairment definitions. The conceptual foundations emerge from a fragmented research history, creating three theoretical frameworks: biomedical, social construction, and biopsychosocial (Bickenbach, Chatterji, Badley, & Ustin, 1999; Lutz & Bowers, 2007; Schultz, Krupa, & Rogers, 2011; Schultz, Stowell et al., 2007; Schultz, Winter, & Wald, 2011; Schultz, Winter et al., 2007). These frameworks have themselves produced six models of occupational disability with parallel return-to-work models: biomedical, psychosocial, forensic, economic, ecological, and biopsychosocial. Differing research traditions, key tenets and values, constructs, emphasis on the individual, environment and disability determinants, and practice implications are represented in these models (Schultz, Stowell et al., 2007; Smart, 2001).

I.Z. Schultz, Ph.D., R.Psych, A.B.P.P., A.B.V.E
Counselling Psychology Program, Department of
Educational & Counselling Psychology, and Special
Education, UBC, 2125 Main Mall, Vancouver, BC,
Canada V6T 1Z4
e-mail: ischultz@telus.net

C.M. Chlebak, M.A., R.C.C. (✉)
Counselling Psychology Program, Department of
Educational & Counselling Psychology, and
Special Education, UBC, Vancouver, BC, Canada
e-mail: cchlebak@shaw.ca

Recent developments have collapsed these models into four groups of biomedical and forensic, psychosocial, ecologic/case management and economic, and biopsychosocial (Schultz, Stowell et al., 2007). Our *handbook* reviews and updates these models from current research perspective, highlighting their strengths and limitations (Knauf & Schultz, 2013).

Stepping back, within the biomedical framework, a medical condition produces a disability through an observable deviation from biomedical norms of structure or function (Bickenbach et al., 1999; Boorse, 1975, 1977; Schultz, Crook, Fraser, & Joy, 2000; Schultz, Stowell et al., 2007; Smart, 2001). Here, psychological injury is informed and governed by the psychiatric field, specifically the diagnostic manuals (i.e., the *Diagnostic and Statistical Manual of Mental Disorders-IV-TR* [DSM-IV-TR; American Psychiatric Association [APA], 2000] or the *Diagnostic and Statistical Manual of Mental Disorders-5* [DSM-5; APA, 2013]) and the practice of treating most mental diagnoses psychopharmacologically, with the associated dramatic growth in this form of treatment across all age groups (Comer, Olfson, & Mojtabai, 2010; Mojtabai & Olfson, 2008, 2011).

The social construction approach assumes that disability is a complex set of conditions, relationships, and activities, not just an attribute of an individual, that have been largely produced by the individual's social environment (Bickenbach et al., 1999; DePoy & Gilson, 2004; Olkin & Pledger, 2003; Tate & Pledger, 2003). *Disability* is conceptualized in terms of how a specific environment creates social and physical barriers to hinder functioning and full participation (Linton, 2001). Thus, disability is viewed as dependent on societal response; with an appropriate response, disability would be nonexistent (Smart, 2001; Smart & Smart, 2007). With impairment and disability, a distinction is made. Disability is based on demands and supports within a specific environment where the specific impairment occurs (Schultz, 2008).

The biopsychosocial theory integrates clinical and social approaches. Classic work by Engel proposed a micro- (interactional), meso- (organi-

zational or community), and macro- (structural) ecological and structural levels to predict social and clinical outcomes (1977; Tate & Pledger, 2003). This approach has evolved to highlight disability as multifactorial, including environmental, personal (Fine & Asch, 1988; Meyerson, 1988), psychosocial elements (Schultz et al., 2000; Tate & Pledger, 2003). An interactive disability model has also been postulated—disability is viewed as situational and functional limitations that can be altered by social and environmental factors (Verbrugge & Jette, 1994). Other evolvments include the Institute of Medicine (Pope & Tarlov, 1991) and World Health Organization's (WHO) International Classification of Impairments, Disabilities, and Handicaps (ICIDH) model (1980).

The most recent iteration of the biopsychosocial model is the WHO's International Classification of Functioning, Disability, and Health model (ICF). The disablement concept, previously focused on handicap, impairment, and disability, has been replaced by a more inclusive concept of enablement. Participations, impairments, and activities now form the new focus. More specifically, *disablement* is viewed as difficulty encountered with any or all of the interconnected functional areas: activity limitations, participation restrictions, and impairments (problems with body structure or structure) (WHO, 2001).

The dimensions of disablement have implications on systemic and clinical interventions (Bickenbach et al., 1999). At the *impairment* level, rehabilitative or medical responses are the most appropriate; here, the medical model is an accurate disablement representation. Evaluating an individual's performance against a set or standardized environment identifies activity limitations. Appropriate responses are to strive to extend or correct a range of an individual's own capabilities through rehabilitation or to provide assistive devices to compensate for activity limitations. Participation, where an individual's actual social and physical environment is included and the primary interventions either add environmental facilitators or remove environmental barriers to full participation.

This ICF model is intended as worldwide reference tool for assessing individual functioning and disability. Complex and dynamic interactions among disability, impairment, and other personal and contextual factors are shown here; specifically, impairment is viewed as reflecting a reciprocal relationship with activity. Activity, in turn, is conceptualized as a reciprocal interaction with participation. Contextual factors, including environmental and personal, mediate the relationship between disability and impairment (WHO, 2001).

Within the psychological injury, pain, and law field, this paradigm is considered the most promising development theoretically. Here, the strengths are in recognizing the dynamic relationship between the individual and the environment, a functional focus, and the absence of stigmatizing, diagnostic labels. Its approach is relational, dynamic, and multifocal, integrating medical and social perspectives, and supports operationalization in health and social sciences (Peterson & Paul, 2009). The ICF model has also demonstrated utility as a “standard for defining concepts, building constructs, hypothesizing relationships, and proposing new theories that will further research and psychology” (Peterson, 2011, p. 4). The alignment of these strengths with key disability determination objectives supports utilization of the ICF model within the psychological injury and pain field. For this field, it is important to move beyond the assessment of the individual (as complicated it might already be) to assessing environmental supports and demands including the community, workplace, and the family and their relationships with health and personal factors. These systems interactively produce activity limitations and participation restrictions that are disabling (Schultz, 2009).

Applied Perspectives

Adding to the complexity, from the three major theoretical frameworks of biomedical, social construction, and biopsychosocial, three applied perspectives of disability emerge to impact research and practice, including in forensic appli-

cations and in varying interactions: legal and administrative, scholarly research, and clinical (Altman, 2001; Schultz, 2005, 2008).

Legal/Administrative Applications

Private and public administrative bodies have developed their own legal disability definitions due to the legal ramifications such as benefits, rights, and responsibilities. However, Altman (2001) has noted that disability is often defined as “situations associated with injury, health, or physical conditions that create specific limitations that have lasted (or are expected to last) for a named period of time” (p. 98). For disability compensation systems, such as workers’ compensation and long-term disability insurance companies, a historical preference for administrative disability definitions is shown. These narrow and functionally specific definitions usually highlight the need for “objective proof” of impairment to justify work disability (Schultz, 2005, 2008). Such standards of proof vary widely across jurisdictions and systems.

Within the public area, disability is defined more broadly, moving away from more narrow, function-specific definitions (Schultz, 2008). One example is within the American with Disabilities Act (ADA, 1990) (Schultz, 2008; Smart, 2001). Disability is defined here as (1) a physical or mental impairment that substantially limits one or more of the major life activities of such individuals, (2) a record of such impairment, or (3) being regarded as having such an impairment (Sec. 3 [2] 42 U.S.C. 12102 1990). Impairment is classified as “any emotional or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, or specific learning disabilities” (29CFR Part 1630.1[h2]). Classification as an “individual with disability” involves evidence showing (1) a physical, cognitive, or intellectual, and psychiatric condition or multiple mental impairment conditions; (2) discrimination and/or stigma; and (3) a significant limitation in at least one major life activity (Schultz, 2008; Smart, 2001).

Federal and state agencies use definitions specific to the service provided. For example, with social security disability benefits, individuals are

required to have a severe disability that is (1) predicted to last minimally 1 year or result in death and (2) prevents work at a “substantially gainful activity level.” Currently, this organization does not recognize the American Medical Association (AMA) Guides’ rating impairments. Veterans Affairs is another agency utilizing their own criteria for disability rating (Feinburg & Brigham, 2013).

Within this arena, the definitions of disability draw heavily on both biomedical and social construction traditions (Smart, 2001). Schultz (2008) observed that, because the relationship is undefined between these two theories, ongoing legal difficulties and risks are fueled. For individuals with minimal limitations, such as stuttering, obesity, facial disfigurement, and mental health disabilities, the ADA definition for disability may be met because of the experience of stigma and or discrimination (Schultz, 2008; Smart, 2001; WHO, 2001). Across systems and programs, impairment is defined as more consistent and measurable; however, disability is viewed as a social construct and thus different weights and benefits are assigned. In one system, an individual can be “disabled” and in another not, based on the same impairment (Feinburg & Brigham, 2013).

Comparing these fields, a divergence in conceptualizing disability is seen: one is narrow in its scope to create financially viable and objectively verifiable compensable solutions for the institutions granting disability status, and the other shows a broader perspective to ensure equal rights for individuals with disability. This trend persists today (Schultz, 2005, 2008).

Scholarly Research

The definitions of work disability in rehabilitation outcome literature are primarily economically or clinically derived and are even more varied than in legal or clinical definitions. Schultz and colleagues (Schultz, 2005; Schultz, Stowell et al., 2007) named six substantive categories for classifying much of the literature:

- Self-report of disability by an individual with disability, e.g., sickness impact profile (Bergner et al., 1981; Gilson et al., 1975) or the Work Limitations Questionnaire (Amick, Rogers, Malspies, Bungay, & Cynn, 2001;

Lerner et al., 2001) or various other disability indices.

- Report of disability by a clinician and/or significant other.
- Health-care utilization.
- Duration of disability.
- Return to work and/or employability, including cycling between disability and RTW and repeating patterns of return to work.
- Health-care- and wage-loss-based costs of disability.

Examining the definitions, a number of themes emerge. Most definitions are cross-diagnostic and cross-categorical, and a common factor is a function focus. This is despite the multiplicity of disability classifications, such as severe versus mild, absent versus present, acquired versus congenital, and stigmatizing versus non-stigmatizing, and the conceptualization of disability in an “all or nothing” dichotomy or in a continuum (Schultz, 2008, 2009; Smart, 2001).

Fair application for individuals with disabilities, and having a significant body of systematic, evidence-based research, is critical for reliability, validity, and relevance for legal and clinical definitions and related disability determination methodologies. A number of barriers exist, hampering progress. This includes:

- Diversity of approaches and inconsistency among research, clinical, and administrative applications have hampered disability prediction, early identification of high-risk individuals, and disability prevention (Schultz, 2005).
- Definition multiplicity and related methodological approaches create difficulties in integrating research on the relationship between disability and impairment (Linton et al., 2005; Pransky, Gatchel, Linton, & Loisel, 2005).
- Stakeholders (e.g., employers, the government, compensation systems, health care, and societal institutions) are vested in their own desired disability outcomes included in related research (Young et al., 2005).
- Measurement properties, especially validity evidence, have not been considered in the largely market-driven disability determination industry (Schultz, 2005).
- Conceptualization of the biopsychosocial model as a theory and the resulting acceptable

level of specificity for systematic, empirical validation has not yet been reached; this is despite an accumulation of quantitative and qualitative research evidence (Imrie, 2004).

Impairment Determination Practice: The AMA Guides' Approach

Within the clinical realm, health-care providers use disability definitions to predict (provide prognosis of) future function, focusing on the pathology's identification, qualification, and quantification. Prognosis is based on individual characteristics and condition type. The AMA has governed evaluation guidelines that both standardize and create best practices around determining impairment since 1958. Termed the *AMA Guides to the Evaluation of Permanent Impairment* (AMA Guides), they are primarily used as a reference tool to assess compensation losses from illness or injury in compensation and legal settings. This methodology is "intended to assist adjudicators and others involved in the adjudicative process" (Rondinelli, 2009; Rondinelli & Eskay-Auerbach, 2009, p. 27). Significantly, the most recent *AMA Guides, Sixth Edition* (Rondinelli, 2009) has adopted the ICF model of disability, signaling a theoretical departure from the traditional biomedical approaches and associated antiquated language of about 30 years old into a more integrated biopsychosocial paradigm (WHO, 2001). As a result, definitions of disability and impairment have shifted.

For the AMA, disability is defined as an activity or participation limitation in domains including work, society, and home within an impairment context. Disability is conceptualized as a "relational outcome," reflecting an individual's capacity to perform a specific task or activity within a unique environment (Brandt & Pope, 1997). This definition is similar to both the previous iteration of the AMA Guides (Cocchiarella & Andersson, 2000) and the current ICF model (WHO, 2001). The latter defines disability as "an outcome or result of the complex relationship between an individual's health condition and personal factors, and of the external factors that represent the circumstances in which an individual lives" (p. 17). As discussed earlier in this chapter, disability is seen through "activity limitations"

(p. 213); activity is understood as a task execution such as driving or writing, and "participation restrictions" are defined as interactions that impact life experiences (WHO, 2001).

For the *AMA Guides, Sixth Edition*, the definition of impairment has had more significant changes since its previous iteration in 2000, broadening its scope. Currently, impairment is defined as "a significant deviation, loss, or loss of use of any body structure or body function in an individual with a health condition, disorder, or disease" (p. 5). The term "function" includes physiological and psychological elements, while the term "structure" continues to maintain an exclusively medical focus (Rondinelli, 2009). This shift has created some controversy in the medical community, producing an "ambiguous position where impairment seems to require framing in the context of its functional consequences" (Bellamy & Campbell, 2009, p. 47).

In an attempt to address long-standing validity and reliability issues, in part due to a historical dependency on expert opinion, intuition, and consensus versus systematic, evidence-based research to build the Guides (Rondinelli, 2010), the *AMA Guides Sixth Edition* (Rondinelli, 2009) developed five axioms to define priorities, articulate the shift in paradigm, and provide clarity around use of evidence-based practices, methodological congruity, and diagnosis. The assessment approach has a greater function focus, emphasizes evidence-based research to support decision making, has a reduction in unreliable measures including those for range of motion, and expands their multimodal assessment approach (Rondinelli & Eskay-Auerbach, 2009).

The Guides caution against using impairment ratings as a proxy or a "surrogate" for disability determination (Rondinelli & Eskay-Auerbach, 2009, p. 27). This important assertion contrasts with much of clinical literature, research, and practices where disability and impairment concepts are frequently used interchangeably. Clinicians, instead of focusing on determining impairment and its impacts on work performance, quite regularly provide opinions of disability. Individuals are assessed as "not disabled" or "totally disabled" despite the lack of evidence on the impact of impairment on work ability, general

performance, and workplace characteristic factors. This problem occurs in current clinical and medicolegal contexts and within the measurement field (Schultz, 2005), frequently in cases of chronic musculoskeletal pain disability.

Within medicolegal contexts, an important issue is expectation differences among disability stakeholders. For example, referring sources requesting independent medical examinations with information on work performance impact from clinicians may instead receive opinions on employability (Schultz and Brady, 2003; Schultz, 2005). Professionally, only vocational experts are uniquely prepared to render these opinions—they are qualified to evaluate the impairment context, such as job availability, labor market, and accommodations and thus contribute to determining disability directly based on *both* contextual findings and clinical impairment. However, disability entitlement decisions are often ultimately reserved to judges, disability status adjudicators, and other related triers of fact in the legal system (Schultz, 2005).

The clinical definitions of disability and impairment, unlike legal and administrative definitions, must adhere to methodological evaluation standards of measurability, validity, reliability, and fairness. Within forensic psychology specifically, high-stakes assessments demand adherence to existing best practices and continual improvements based on research advances. Yet, clinicians are pressured to address disability-related issues where evidentiary support or clarity is lacking, moving beyond scientific boundaries. Although the legal field traditionally operates in “black and white contexts,” legal decision-making advancements will most likely occur with recognition of the complexity, of person-environment interaction, and multidimensionality of disability determination (Schultz, 2009).

Disability Determination in Complex Disabilities: Musculoskeletal Pain

Disability determination becomes increasingly challenging with the growing demands involving medicolegal assessments and claims decisions

regarding complex disabilities. Knowledge in defined areas, such as pain or somatic disorders, as well as conditions frequently comorbid with pain in medicolegal assessments, including depression, post-traumatic stress disorder (PTSD), or traumatic brain injury, has been expanding more rapidly than practitioners and researchers can assimilate and integrate the data, improve practices, and develop trans-diagnostic or cross-diagnostic knowledge (Schultz, 2009; Wald & Taylor, 2009). Another factor is the early developmental stages of the measurement properties of the AMA Guides’ procedures (Schultz, 2005). Low back pain, the most common work disability, is an example of a complex disability with determination difficulties. Serious concerns have been documented on reliability issues, including Zuberbier et al. (2001) regarding the range-of-motion physical assessment protocol with the AMA Guides Fourth Edition (1993) and Forst, Friedman, & Chukwu, (2010) on minimal improvements in reliability in assessing impairment ratings from the *AMA Guides Fifth Edition* (Cocchiarella & Andersson, 2000) to the Sixth Edition (Rondinelli, 2009). Interestingly, in the transition to the newest edition, the contentious range-of-motion assessment protocol was removed and replaced by a diagnosis-focused procedure (Rondinelli & Eskay-Auerbach, 2009). For psychiatric disabilities, Bellamy and Campbell (2009) asserted that for the *AMA Guides Sixth Edition*, although permanent impairment determination is more structured and results in an impairment rating (versus earlier guides), validity, reliability, and acceptability are not discussed or described.

Occupational therapists and vocational rehabilitation evaluators tend to determine the majority of work disability cases. However, health professionals not trained specifically in assessing interaction between individual characteristics and environmental demands and supports, namely, forensic psychologists, neuropsychologists, physiatrists, and psychiatrists, are also called upon. Moreover, multiple concerns have been raised by researchers, practitioners, and stakeholders with respect to current and historic disability determination practices, including the absence of appropriate taxonomies and functional impairment conceptualizations, a historical

precedent for psychologists and physicians to focus on individual pathology and diagnosis versus function, confusion and difficulty around relationship between impairment and disability, lack of an environmental/contextual lens in forensic practice to complement the individual focus, and limited psychometrically and biometrically appropriate tools used to evaluate functional impairment in assessments of an ecological nature (except for behavioral scales used with children and individuals with severe disability-related barriers) (Halpern & Fuhrer, 1984; Shriver, Anderson, & Proctor, 2001; Yoman & Edelstein, 1994). In addition, although de-biasing approaches have been advanced in the literature for high-stakes assessments, they have not been consistently implemented in forensic practice and controversies in this area abound, adversely affecting credibility of medicolegal determinations.

Disability Prediction in Complex Pain Disabilities: Searching for an Algorithm

Knowledge mobilization of researched quantifiable predictors of disability to the practice of disability determination in medicolegal contexts is in an early stage. Notably, it is most advanced in musculoskeletal pain disorders. Advancement in the field is hampered by the absence of integrative, empirically supported models of disability prediction for both medicolegal and clinical (prevention, case management, and rehabilitation) applications and the prevalence of outdated biomedical and forensic models of disability determination in compensation and legal settings. Before any compensation-related analyses are completed, decisions on the severity of occupational disability must be made. Yet such decisions, whether made by a vocational expert, a judge, jury, or a compensation specialist, are extremely complex and require bridging impairment and disability via contextual, individual, and work-related factors (Schultz, 2005).

A qualitative exploration of the implicit criteria used in determining occupational disability in psychological injury, and occupational chronic

pain cases within the workers' compensation system, resulted in the formulation of a preliminary decision-making tree informed by Gladwin's ethnographic decision-making model (Beck & Schultz, 2000; Gladwin, 1989). Box 14.1 outlines a number of questions implicated in the subsequent steps of decision making regarding the severity of occupational disability. These questions exemplify a qualitatively determined algorithm used in decision making for occupational disability in a compensation setting to be used for future validation research. Notably, existing pre-

Box 14.1: Decision-Making Steps to Determine Occupational Disability Due to Psychological and Pain Disability (Adapted from Schultz and Brady 2003)

1. Are the symptoms of diagnosable psychological/pain impairment present?
2. Is there a preexisting psychological/pain impairment?
3. Is there a portion of the psychological/pain impairment, which arises from injury at claim?
4. Does the psychological/pain impairment affect current work capacity?
5. Is the person able to return to his/her pre-injury employment?
6. If so, is there a significant risk for deterioration and/or of residual symptoms after return to work?
7. Can a job change attenuate or eliminate the psychological/pain impairment?
8. Does the person have work capacity in a competitive environment?
9. Is the person capable, or expected, to adapt adequately, with or without job accommodation, despite the psychological/pain impairment?
10. Is the person able to perform most activities of daily living despite the psychological/pain impairment?
11. Is there significant executive dysfunction and/or significant lack of adaptability to change and stress?

dictive actuarial formulae and research-supported models of occupational disability are group based. Decision making in an individual medicolegal cases is not permitted due to problems including validity such as sensitivity and specificity (Schultz et al., 2004) and insufficient validation of the model for such applications. At the current state of development and validation, these models are better used to serve in identifying individuals at elevated risk for disability and to apply early intervention and secondary prevention than to aid in disability determination in medicolegal settings.

This study improves our understanding of decision-making processes of evaluators making disability determination judgments in clinical and medicolegal settings. Research on the effectiveness of training judges/evaluators in such improved understanding of their implicit decision-making criteria, by making these implicit criteria explicit, would contribute to future training and standardization of approaches in pain and disability policy applications in medicolegal and compensation settings.

Pain Disability Epidemic?

A primary focus of this chapter is on the complex disability, pain. Within the USA, pain is one of the most common symptoms for patients to consult a physician for (Hing, Cherry, & Woodswell, 2006), accounting for about 2.3 % of all visits (Cherry, Burt, & Woodwell, 2001). Pain is considered the most common cause of disability (Feinburg & Brigham, 2013); of this, the majority of costs are attributed to 5–10 % of individuals who also develop chronic pain and disability (Waddell, Aylward, & Sawney, 2002). For medicolegal claims, it has become a “major issue.” Thus, with a diagnosis of chronic pain, an “overwhelming probability” exists that the individual will file a medicolegal claim (Barth, 2009b, p. 1).

Musculoskeletal injuries of the lower back form the largest subgroup of pain disabilities, forming the “leading cause of work disability” for the 45–65-year-old group (Costa-Black, Loisel, Anema, & Pransky, 2010, p. 227; Picavet & Schouten, 2003).

Disappointingly, although no significant change in back pain injury rates have occurred over time, disability related to back pain has increased (Feinburg & Brigham, 2013). This group now forms the largest burden socioeconomically when factoring costs such as health-care payments, productivity losses, work disability burden, and complications, such as a minimum 20 % risk to mortality, permanent disability, and increased probability of mental health problems in the range of 2–3 times (Costa-Black et al., 2010). In the USA, these costs can exceed \$214.9 billion yearly (Praemer, Furner, & Rice, 1999). Indirect costs include social and quality of life losses and personal suffering (WHO, 2003).

Challenges in Pain Assessment

Despite this significant burden and rapid research advances in the field in the last two decades, most forms of chronic pain are still poorly understood; when understood, pain severity is poorly managed (Turk & Melzack, 2011). The most significant challenge lies in its subjectivity, a problem documented as early as the 1960s. Specifically, the pain assessment continues to rely on self-report, yet the pain rater’s ability to retrieve information from memory, including subjective memory, is notoriously prone to error (Broderick et al., 2008). Within the pain disability context, for example, Stone, Broderick, Shiffman, and Schwartz (2004) documented that patients both significantly overestimate and underestimate pain in self-reports of severity. Barth (2009a) summarized existing research in both claims and nonclaims settings and asserted unreliability of self-reporting. For example, one study showed that individuals who had a medicolegal claim reported significantly higher pre-claim functioning than individuals who had not made a claim; this finding was replicated. Another replicated study found that individuals denied preexisting conditions that were particularly relevant for persistent back or neck pain, including histories of back or neck pain complaints and a history of psychological distress. This issue was named as a direct barrier to an objective assessment with the *AMA Guides Sixth Edition* (Rondinelli & Eskay-Auerbach, 2009). Other complications include

confounding psychological, behavioral, personal, and categorical issues (Schultz, 2009).

Another significant challenge to disability determination is the link between pathology and pain. Only a small percentage of individuals with chronic low back pain have a specific injury or diagnosis, with less than 5 % of cases showing potentially serious pathology (Costa-Black et al., 2010); the presented disability is often disproportionate to the evident disease (Dersh, Polatin, Leeman, & Gatchel, 2005). The functional loss experienced by an individual can clearly be linked with pathology or can far exceed expectations; the pain has poor correlation with objective indicators of dysfunction in the body. These hallmarks prove controversial for determining pain impairment using the AMA Guides, which are highly focused on objective findings (Rondinelli & Eskay-Auerbach, 2009). Malingering, symptom exaggeration, and a variety of gains and losses associated with the pain can occur. This topic will be discussed in another section of the present chapter (Choi, Asih, & Polatin, 2013; Feinburg & Brigham, 2013). Within the litigation context, symptom magnification and/or over-endorsement are more common than in general clinical practice, and with purposeful misrepresentation or when the individual presents with diminished credibility, this issue further muddies disability definitions (Feinburg & Brigham, 2013).

Navigating the administrative maze of different benefit systems and definitions of pain, disability, and impairment is another significant issue (Feinburg & Brigham, 2013). Pain, disability, and impairment may be independent or coexist (Robinson, Turk, & Loeser, 2004). The *International Association for the Study of Pain* (IASP) defined pain as a subjective experience that is “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.” Due to its subjective and relativistic nature, this definition is exceedingly difficult to operationalize in medicolegal settings, especially those focusing on “objective proof” of impairment. Further, the Association distinguishes between neuropathic and nociceptive pain. The latter is usually related to impairment, while the

former exists regularly with dysfunction (Feinburg & Brigham, 2013; IASP, 2011). Moreover, within disability research, pain is viewed as a symptom—not a diagnosis, disease, or a clinical sign (Waddell, 2004)—and “managing the pain does not guarantee that the disability will resolve” (Feinburg & Brigham, 2013, p. 1032).

The *AMA Guides Sixth Edition* (Rondinelli, 2009) adheres to the IASP pain definition; the AMA’s chronic pain definition follows established norms of persistent pain of about 3 months for tissue injury. Not surprisingly, difficulty arises with determining impairment and disability related to pain. For the AMA, impairment typically is determined through objective findings, and disability is viewed as an activity limitation and/or a participation restriction resulting from a disease, disorder, or health condition.

In the medicolegal context, impairment related to pain has been a controversial issue. Historically, protocol on impairment determination started in the *AMA Guides Fourth Edition* (1993); the *AMA Guides Fifth Edition* (Cocchiarella & Andersson, 2000) had recommendations that were “at odds with the editorial principles, based on evidence-based medicine, validation, and inter-rater physician reliability” (Atkinson, 2009, p. 79). The ambiguities and inconsistencies of this edition are also documented elsewhere (e.g., Robinson et al., 2004). The *AMA Guides Sixth Edition* (Rondinelli, 2009) is viewed as more simplified in comparison. For example, in the absence of an anatomical and objective impairment, the subjective pain complaint is allotted an arbitrary impairment of up to 3 % (Atkinson, 2009). However, this allotment can only be applied in unusual circumstances, including having no other basis for impairment rating (Rondinelli, 2009).

Watson (2011) argued that “pain itself cannot be incorporated into an assessment of impairment” (p. 298) because of reliance on subjectivity and self-report versus independent validation. The systemic nature of chronic pain lends itself to assessing the whole person, not one organ or the affected part, adding further difficulty to the assessment process. Ultimately, many pain specialist physicians acknowledge that this procedure

does not adequately attend to functional loss and disability related to chronic pain (Feinburg & Brigham, 2013). Indeed, the *AMA Guides Sixth Edition* (Rondinelli, 2009) acknowledged the significant challenges in rating pain impairment: “to date, there is no consensus among experts about the usefulness and validity of the rating systems for PRI [pain related impairment]...controversies relate to the absence of an objective way to quantify pain or its effect on an individual and are fueled by the...dearth of peer-reviewed literature on the pros and cons of rating PRI” (Rondinelli & Eskay-Auerbach, 2009, p. 44).

In order to mitigate reliability issues and promote consistency, the *AMA Guides Sixth Edition* limited the usage of stand-alone PRI ratings, reserving this system for a “painful condition” that is both not captured elsewhere in the Guides and is a “generally acknowledged medical syndrome” (Rondinelli & Eskay-Auerbach, 2009, pp. 50–52). Here, the rating primarily focuses on observed behaviors, including verbal reports and nonverbal pain behaviors. No reliability or validity research has been conducted on PRI assessments; assessment decisions are made solely using clinical judgment (Rondinelli, 2009). Clearly, a heavy reliance on subjective self-reporting plays a significant role in reliability reduction as well. These divisive issues hamper progress within chronic pain assessment. Bellamy and Campbell (2009) offered that appropriate physician training, requiring candidates to exceed the minimum reliability and validity requirements, is one interim solution. Impairment assessment is completed when the patient has reached “the point at which a condition has stabilized and is unlikely to change (improve or worsen) substantially in the next year, with or without treatment” (Rondinelli, 2009, p. 26) or maximal medical improvement. Difficulties exist in reviewing health stability, determining probability of function restoration, and managing pain flare-ups as part of the initial screening (Feinburg & Brigham, 2013).

An estimated rating then is derived from the *Pain Disability Questionnaire* (PDQ), a self-report assessment tool that measures how pain affects function and daily living activities.

This measure was designed to address chronic pain associated with musculoskeletal disorders and has excellent psychometric properties including strong reliability, validity, and responsiveness (Gatchel, Mayer, & Theodore, 2006). The results are then categorized into five degrees of disability ranging from none to severe, following the ICF model of disability. A whole-person impairment percentage between 0 and 3 % is awarded, which can be adjusted by the physician based on a clinical assessment of the patient’s reliability and credibility. Here, the AMA attempts to include a biopsychosocial approach, moving away from an assessment exclusively based on alteration or loss of organ parts or function. They capped the percentage awarded based on long-standing controversy on the ratings themselves, which carries forward from the *AMA Guides Fifth Edition*. However, since the last edition, the rating scheme was simplified, again based on criticism from the medical community (Rondinelli, 2009; Rondinelli & Eskay-Auerbach, 2009; WHO, 2001).

The independent medical evaluator (IME) may hold a different opinion than the treating physician. The physician is noted to take a patient advocate role, may have little experience or desire to comment on disability, and have challenges in defining disability. Regularly, conflict and distrust occur among the IME, claimants, and claim examiners based on doubt and skepticism around the claimant’s pain complaints and reported functional capacity (Barth & Brigham, 2005; Feinburg & Brigham, 2013).

Clinical assessment, which informs forensic psychology, demands a biopsychosocial approach to address the dynamic and complex interaction of social, psychological, and biological factors (Costa-Black et al., 2010; Schultz, 2005; Soucy, Truchon, & Côté, 2006; Waddell & Aylward, 2009). Individuals who have similar injuries and pathologies may thus present distinctly differently, adding degrees of difficulty in assessing (Feinburg & Brigham, 2013). Overall, the *AMA Guides Sixth Edition* (Rondinelli, 2009) offers a modest step towards a biopsychosocial approach, but does not fully resolve ongoing impairment determination issues from current measurement science perspective.

DSM-Based Diagnostic Perspectives on Pain

According to the *DSM-IV-TR* (APA, 2000), three types of chronic diagnosable pain conditions were postulated, two of them diagnosed as mental health disorders: *pain disorder associated with psychological factors*, where psychological factors were judged to have a major role in the onset, severity, exacerbation, or maintenance of pain, and *pain disorder associated with both psychological factors and a general medical condition*, where both psychological factors and a general medical condition are judged to have important roles in the onset, severity, and exacerbation of pain. The third type of pain disorder, associated with a general medical condition, was considered to be a medical and not a mental disorder and thus not included in the *DSM-IV-TR*. These definitions and classification of pain disorder, although acknowledging an importance of both medical and psychological factors, were more consistent with the anachronistic mind-body Cartesian model of pain than with current advances in pain science and the inclusive IASP definition of pain. Clinicians in medicolegal settings struggled to diagnose chronic pain conditions using *DSM-IV-TR* classification because pain is best understood in a biopsychosocial framework and it is difficult, if at all possible, to diagnose a purely psychogenic or purely medically produced chronic pain condition. By default, pain disorder associated with both psychological factors and a general medical condition was therefore often selected as a diagnosis.

The newly published *DSM-5* (APA, 2013) subsumed chronic pain and pain disorders under a broad diagnostic umbrella called *somatic symptom disorder*. Individuals can be diagnosed with this disorder regardless of having a medical diagnosis (e.g., cancer, fibromyalgia, or spinal cord injury). The diagnostic criteria include (A) one or more somatic symptoms that are distressing or result in significant disruption of daily life; (B) excessive thoughts, feelings, and behaviors related to the somatic symptoms or associated health concerns as manifested by one of the following: (1) disproportionate and persistent thoughts about the seriousness of one's symptoms,

(2) persistently high level of anxiety about health or symptoms, and (3) excessive time and energy devoted to these symptoms or health concerns; and (C) the state of being symptomatic is persistent (typically more than 6 months). The diagnostic specifier, called "with predominant pain," is applied to individuals with a preponderance of pain symptoms. In addition, there are three levels of severity of this disorder, mild, moderate and severe, depending on which diagnostic criteria are fulfilled.

Although the new diagnostic category does recognize the significance of psychosocial factors in pain, it places diagnosis of chronic pain primarily in the realm of mind and psychiatry, still not fully embracing the biopsychosocial model. The inclusion of pain (and other somatic) symptoms, regardless of diagnosis and medical etiology, in the context of psychopathology is controversial. Many patients with cancer, spinal cord injury, or complex acute and post-acute orthopedic injuries will meet the broad diagnostic criterion of "disproportionate and persistent thoughts about the seriousness of one's symptoms" (APA, 2013, p. 311). While it is unclear what "disproportionate" means, and against which norms this descriptor should be measured, the persistence of thinking of severe and potentially life-threatening pain (such as in cancer or neuropathic pain) is common among individuals with serious illness or disability. In this context, over-pathologizing the typical and expected pain experience and conceptualizing it as a mental disorder is an example of diagnostic threshold and construct validity issues with which *DSM-5* proponents have been struggling. Negative social and treatment implications of having been labeled as having "a diagnosable mental disorder," in addition to suffering due to severe and persistent pain arising from a diagnosable and known pain-producing condition (which often warrants persistent thinking about it due to its pervasive, preoccupying, and disruptive nature), abound. As Young aptly put it, placing pain disorder among somatic disorders "leads to the types of problems that the *DSM-5* draft is trying to rectify in this regard. Clinicians still might gravitate away from it if they feel it is pejorative to the client.

Or, they might unjustly gravitate to it if they wish to emphasize that the patient's medically unexplained symptoms are emotional in their etiologies" (2010, p. 292).

Future research and clinical applications will demonstrate the scope of the impact of the over-inclusive nature of *somatic symptom disorder* diagnosis on future practice, policy, and empirical investigations, not only in the area of pain disability but in health sciences in general. In the meantime, clinicians are expected to exercise caution and thoroughly validate, qualify, and justify their diagnostic statements regarding *somatic symptom disorder* while actively de-biasing their opinions. Inter-rater reliability research for this diagnosis is highly recommended.

Prediction of Musculoskeletal Pain Disability: Searching for an Actuarial Formulae

For musculoskeletal pain, particularly back conditions, empirical, multivariate formulae that predict disability from early clinical signs have reached an impressive 80 % accuracy rate for return-to-work outcomes (Burton, Waddell, & Main, 2003; Linton et al., 2005; Schultz, Crook, Berkowitz, Milner, & Meloche, 2005; Schultz & Gatchel, 2005). Research barriers to advancement include cohort-sample makeup, outcome measure articulation, methodological issues, system-based barriers, heterogeneous follow-up measures, generalization problems to other settings, jurisdictions, and populations, and guideline flaws (Heymans et al., 2006; Linton et al., 2005; Soucy et al., 2006). For employment, rendering evidence-based expert opinions requires an understanding of age of injury onset, chronological age, longitudinal disability course, and psychosocial factors (Schultz, 2009). Hirsh, Molton, Johnson, Bombardier, and Jensen (2009) emphasized for another complex disability, spinal cord issues, the importance of the individual—no “one-size-fits-all” formula exists—and the inclusion of other elements such as cultural background, minority status, gender, and age in psychological injury, pain, and the field of law.

Future work in disability determination will require inclusion of “nontraditional” psychological

literature, such as counseling, community, health, and organizational psychology and related health disciplines such as nursing, vocational rehabilitation, occupational and rehabilitation medicine, and occupational therapy. Modifiable and non-modifiable predictors of occupational disability are *both* individual and workplace oriented. A systematic review of these factors was provided in a study by White et al. (2013). Despite empirical support for their significance and modifiability, most of the system-based factors predictive of disability are not covered in medicolegal disability determinations. Approaching psychological injury/pain cases with a transdisciplinary or interdisciplinary approach is recommended (Schultz, 2009).

Subjectivity, Malingering, and Motivational Issues in Pain Disability

As described, significant pain assessment challenges exist. Within a medicolegal setting, this includes the subjective presentation of pain as defined by the IASP and the *AMA Guides Sixth Edition* (2011; Rondinelli, 2009), which contrasts to the demand for objective evidence by the court system, and the fact that most pain is unattributed to a medical cause (Derish et al., 2005). Other issues include pain defying the biomedical model prevalent in law, the inability to classify pain as either a diagnosis or an injury, questions around if pain itself is a mental disorder, and challenges in interpreting and applying the pain disorder diagnosis using the psychiatrically based *DSM-IV-TR* (APA, 2000) and its over-inclusive successor, *DSM-5* (APA, 2013).

These issues make many researchers, clinicians, and disability stakeholders suspicious of secondary gain and malingering. Researchers postulate that coping and motivational factors mediate disability and impairment (Roessler, 1989; Schultz & Brady, 2003). Coping processes, outcomes, and factors like avoidant coping and catastrophizing have significance as disability predictors (Dunn & Dougherty, 2005; Elliott, Kurylo, & Rivera, 2005; Heinemann, 1995;

Johnson, Zautra, & Davis, 2006; Schultz & Stewart, 2008; Wegener & Shertzer, 2006). More recent research demonstrated the importance of understanding the roles of *perception of injustice* (Sullivan, Feuerstein, Gatchel, Linton, & Pransky, 2005; Sullivan et al., 2008; Sullivan, Adams, & Ellis, 2013), *expectations of return to work* (Schultz et al., 2004, 2005), and the *perception of uncertainty* (Stewart, Polak, Young, & Schultz, 2012) in the development and maintenance of occupational disability and in disability prevention interventions. Unfortunately, these significant psychosocial predictors of disability, despite availability of research-based measurement tools, are not identified routinely within determination of disability (Schultz, 2009). On a positive note, in forensic neuropsychological assessments, determination of assessment validity and testing effort is considered a practice standard (Rohling & Boone, 2007), although methodology in this field continues to require further research and refinement.

Gain as a term implies benefit and, within the medicolegal arena, carries negative connotations, particularly the term secondary gain, often equated with financial gain (Choi et al., 2013). This oversimplification in conjunction with limited understanding of motivational concepts (Schultz, 2009), misinterpretation of constructs (Kennedy, 1946; Mendelson, 1994; Schultz et al., 2000), and the practice of interchangeably applying ill-defined, unsavory “code words” such as malingering, faking, subjective complaints, psychological overlay, exaggeration, illness behavior, lying, deception, and symptom magnification have produced significant challenges for the medicolegal field. The misinterpretation of secondary gain has been itself detrimental to developing important and accurate losses and gains motivational constructs associated with disability (Dersh et al., 2005; Fishbain, Cutler, Rosomoff, & Rosomoff, 1994; Kwan, Ferrari, & Friel, 2001; Leeman, Polatin, Gatchel, & Kishino, 2000).

Psychological literature paints a more complex picture, identifying multiple types and layers of losses and gains experienced by an individual. As a start, however, losses are simply defined as a reduction of an individual’s invested resources (Harvey,

2000). Choi et al. (2013) conducted a literature review and summarized the losses into three levels: primary or initial losses (e.g., job loss, personal injury, loss of autonomy and independence, discrimination, and loss of roles), secondary losses or losses that develop from and can initiate primary losses (e.g., financial loss, loss of roles, self-esteem, autonomy, and capacity, community approval, work social relationships, meaningful relating to society through work, recreational activities, respect from those in helping professions and social network, anger and guilt from disability, social stigma, and new role being undefined and uncomfortable) (Dersh et al., 2005), and tertiary losses. These final losses are linked with an individual’s illness and is experienced by those other than the individual (e.g., financial hardship, increased responsibility and decreased autonomy, guilt, and stigmatization) (Choi et al., 2013).

Gains are also subdivided into three categories: primary, secondary, and tertiary gains. Primary gains are achieved when a physical symptom reduces inner conflict, stress, or anxiety (e.g., chronic pain can mediate primary gains [Dersh et al., 2005]); secondary gains are created by others and received by an individual; and tertiary gains occur when others, such as significant others and health-care providers, carry on individual’s symptoms (e.g., financial gain, decreased conflict, sympathy from others, increased dependency, gratification of altruistic needs, admiration from others, being viewed as “compassionate”) (Choi et al., 2013; Ferrari & Kwan, 2001; Kwan et al., 2001).

Secondary gains are often associated with financial gain with the medicolegal field and have both external and internal presentation. For the former, this includes aforesaid financial gain such as wage replacement; subsidies; and settlement; avoiding sex; holding a spouse in a marriage or relationship; protection from legal and other obligations such as probationary demands and child-support payments; vocational retraining; skills upgrade; and job manipulation such as promotion; prevention of termination of layoff; and handling of work adjustment or human resources department difficulties. Internal secondary gains include dependence; anger towards stakeholders

such as the compensation or legal system, employer, or family; being taken care of; getting sympathy and concern from family and friends; getting “off the hook” from undesirable obligations; differing communication patterns compared to when healthy; drug use; and avoidance of social roles (Dersh et al., 2005).

With chronic pain, secondary losses often outweigh secondary gains. In fact, although the gains may extend disability, the losses are often more powerful psychological factors (Worzer, Kishino, & Gatchel, 2009). Leeman et al. (2000) explained how losses can infiltrate all life areas, impacting social relationships, self-esteem, general world view, employment, financial stability, autonomy, and familial roles. The losses can trigger secondary emotional difficulties, such as anxiety and depression. No evidence suggests that secondary gains can be equated with malingering; resolving litigation or compensation issues does not reduce disability (Bellamy, 1997; Fishbain et al., 1994; Guest & Drummond, 1992; Mendelson, 1994; Norris & Watt, 1983). Poor prognosis in disability claims does not equate with secondary gains. Instead, research has linked it with sick-role reinforcement (Turk, 1997), reduced treatment responsiveness (Hadjistavropoulos, 2004), fear of disability, denial and guarding against getting well due to adversarial challenges (Bellamy, 1997), presence of psychiatric conditions, and patient-clinician relationship difficulties (Allaz et al., 1998).

Researchers have named other impactful losses. Robinson, Gardner, and Luft (1993) documented contextual factors related to the losses, including compensation laws, socioeconomic and workplace factors, and mixed messages from physicians, IMEs, claims adjusters, attorneys, and employers. “Social iatrogenesis” was a term coined by Bellamy (1997) regarding disease production by well-intentioned social programs, symptom rationalization and somatization, and patient-physician relationships. Not surprisingly, research within the medicolegal context has extended to examining perceived justice and fairness within the legal system. Themes include linking disability determination with current understanding of the relationship between perceived

injustice and disability; acknowledging further the impact of perceived justice on the compensation process; and encouraging legal professionals to observe for intangible psychosocial issues, particularly regarding breach of contract, and to ask psychologists to evaluate the same. A brief summary of current research is presented below.

Franché et al. (2009) developed and validated an assessment tool examining perceived injustice in relation to heightened disability and pain behavior. Four theoretical domains of justice, namely, procedural, informational, distributive, and interpersonal, underpin this measure. With further validation research using other populations and jurisdictions, this measure could be used in determining disability (Schultz, 2009). Sullivan et al. (2008), Sullivan, Davidson, Garfinkel, Siriapaipant, and Scott (2009) developed another measure of perceived justice. They reported that an increased perception of injustice is linked with more protective pain behaviors compared to a decreased injustice perception. This is regardless of physical task demands. Both authors postulated the significance of evaluating perceived injustice as a key predictor of disability and as a potential intervention target. Relatedly, Hayman (2009) argued that psychological injury and law have more to learn from third parties acting in bad faith and attorneys in regard to complicating the complainant’s psychological outcomes after claim events. They discussed the evolution of law in acknowledging intangible losses, in particular mental distress from a contract breach between a disability insurer and claimant where the claimant has been wrongly denied benefits.

Within the medicolegal context, malingering is often linked with secondary gain. In fact, malingering is associated with a small subset of individuals (i.e., 1.25–10.4 % [Fishbain, Cutler, Rosomoff, & Rosomoff, 1999]) engaged in exploitive behaviors for reward gain. This includes having a history of manipulative behaviors, presentation of life outside of the claim as orderly and “normal,” and exhibiting noncompliance with treatment (but will attend all disability evaluations for the goal of claim validation) (Leeman et al., 2000; Robinson, Rondinelli, Scheer, & Weinstein, 1997). The *DSM-IV-TR* defined malingering as

“the *intentional* production of false or grossly exaggerated physical or psychological symptoms, *motivated* by external incentives” (p. 739) (emphasis added). The *DSM-5* included malingering under V-codes associated with the same category as before, now called nonadherence to medical treatment, and provides the same problematic and poorly validated diagnostic criteria as *DSM-IV-TR*: medicolegal context, discrepancy between the person’s claimed stress or disability and the objective findings, lack of cooperation, and the presence of an *antisocial personality disorder* (APA, 2000, 2013). A related but broader issue is deception, understood as an attempt to induce in a perceiver a false judgment or belief by deliberately providing false information (Craig & Badali, 2004).

Issues in Assessing Secondary Gain and Malingering in Pain

Assessing for secondary gain and malingering pain is a complex and challenging clinical and medicolegal task with difficulties including:

- Secondary gain issues such as measurement difficulties due to its psychoanalytic origin, conflicting psychological theories, and abuse of term in forensic practice.
- Oversimplification of complex motivational processes, including isolating the gains from the losses, “partial” malingering, exaggeration, proving intentionality of behavior, and malingering being associated with self-deception.
- Usage of dichotomous, moralistic, and anachronistic thinking (i.e., malingerer versus “honest”) occurs regularly in clinical and forensic settings. In fact, most individuals have secondary gains.
- Highly variable and often exaggerated base rates of malingering behavior (Fishbain et al., 1999).
- Research design difficulties such as a paid simulation design versus using actual individuals that malingers, claim status used as a proxy for malingering, equating unreliable effort in testing with malingering, and lack of control for non-malingering factors that impact effort

(e.g., fatigue, pain, ADHD, dissociation, and seizures).

- Lack of empirical evidence for most methods of malingering detection (with the possible exclusion of isokinetic testing as demonstrated by Fishbain et al. (1999)); methods lacking evidentiary support include facial expressions, grip strength, isometric techniques, clinical examination methods, and forced choice methods.
- No evidence for the association between Waddell signs and secondary gain and malingering (Fishbain Cutler, Rosomoff, & Rosomoff, 2003, 2004). In fact, the signs were developed to determine good outcome from surgery, not to detect malingering (Feinburg & Brigham, 2013).

In addition, practice in this area, due to its construct validity and empirical support issues, in the context of polarization and politicization of opinions, continues to be prone to clinicians’ bias in assessment. This problem is often associated with an assessor’s confirmatory bias (a tendency to support an initial hypothesis) and a fundamental attribution error (a tendency to attribute observed individual behavior to a person rather than situation or the interaction between a person and situation), and a host of other cognitive and potentially also cultural biases. It is important to use systematic measures to de-bias high-stakes pain disability assessments, by the generation and exploration of alternative hypotheses, delayed judgment, maintaining detailed case notes and observations, the use of multimethod approaches, and the application of complex clinical conceptualizations to avoid case simplification and premature termination of assessment (APA Task Force on Guidelines for Assessment and Treatment of Persons with Disabilities 2012; Sandoval, 1998).

Knowledge Mobilization in Pain Malingering: Examples of Challenges of Translating Research into Practice

Bianchini, Greve, and Glynn (2005) proposed five potentially promising criteria for diagnosing malingering-related pain disability.

They recommended examining evidence for (A) significant external incentives; (B) physical evaluation; (C) cognitive/perceptual examination (neuropsychological testing); (D) self-report; and (E) behavior meeting criteria B, C, and D, not fully accounted for by other psychiatric, neurologic, or developmental factors. Strengths of this approach include attempts to operationalize malingering, standardize assessment, and stimulate research and use of qualifiers such as “probable,” “definite,” and “possible.” This approach shows superiority to the *AMA Guides Sixth Edition* assessment protocol, which nearly exclusively relies on subjective reporting methods using nonempirically validated methods. This extends to the five assessment factors offered for physicians to consider in assessment of malingering and effort issues, namely, (1) congruency with established conditions, (2) consistency over time and situation, (3) consistency with anatomy and physiology (recommending Waddell’s signs, known to be an unreliable source for assessing secondary gain issues, as a tool, and suggestions towards inclusion of other factors such as cultural considerations in the assessment), (4) interobserver agreement from relatives and other professionals, and (5) “inappropriate” illness behavior (Rondinelli, 2009, pp. 38–39). Despite promise with Bianchini et al.’s (2005) approach, though, weaknesses hamper this method. They include criterion C (neuropsychological testing), not having proven relevancy for pain evaluation, no empirical basis or psychometric data to support the criterion, bias and judgment error possibilities in the “discrepancies” assessment, and the extreme complexity in clinical administration of the assessment, which impacts reliability (i.e., the more complex clinical judgment required, the lower the reliability of measurement). Surveillance sample problems (i.e., no norms, context recognition, or randomization [samples of convenience used]), difficulties with representativeness of observations, outdoor activities, and ignoring of pain and distress variability pose another issue. Other weaknesses include no built-in bias removal methodology, use of a simplified concept of malingering

(i.e., yes or no), controversies around the Fake Bad Scale (FBS) on the *Minnesota Multiphasic Personality Inventory* (MMPI-II) (Butcher, Gass, Cumella, Kally, & Williams, 2008), and unresolved issues of intentionality measurement.

Caution concerning judgments of deception or malingering in pain is warranted, as explained by Craig and Badali (2004), following evidence-informed considerations:

- No specific markers are identified; the task requires judgment of the pattern of evidence.
- People can be successful in both exaggerating and suppressing evidence of pain.
- Judgments of deception require a judgment of conscious intent.
- Specific signs associated with deception often are observed in honest people.
- Absence of physical pathology consistent with self-report is only suggestive.
- Lack of treatment adherence is commonplace among honest people.
- Self-report is vulnerable to bias.
- Nonverbal behavior can be dissimulated, but self-monitoring is less rigorous.
- Distinction between evidence-based and speculative observations needs to be recognized.
- Financial compensation is not invariably linked to pain-related disability.
- Neither demographic nor personality characteristics predict pain deception.
- Unclear symptom presentation typifies some painful conditions and some honest people.
- Psychometric scales addressing credibility are not specific to lying about pain.
- Inconsistencies during assessment are not unique to those engaged in deception.
- Medically incongruent pain behavior is not specific to deception.
- Confidence in complex judgments is usually unrelated to detection accuracy.

Understanding these important considerations in clinical forensic assessment of musculoskeletal pain and in disability determination is bound to improve their methodological standards and make them more science based, objective, and bias-free. Inclusion of this body of knowledge in training of future and current pain impairment and disability assessors is paramount.

Best Practices on Assessment of Malingering and Effort Issues in Pain Disability

Research evidence supports a number of best practices to help mitigate the significant challenges in assessing malingering and effort issues in pain disability, as delineated below:

- Assess all motivational factors. This includes primary, secondary, and tertiary gains and losses involved in disability claims and the relationships among them. Include an economy of gains and losses. Perceived secondary and tertiary losses, for example, might enable disability particularly when the losses increase feelings of helpless and hopelessness. An individuals' motivation to return to work is assumed to increase as secondary losses outweigh secondary gains (with the converse applicable as well) (Choi et al., 2013).
- Use a multimethod approach. That is to say: observe verbal and nonverbal cues over time; review a full range of records; analyze test results; use tests of symptom validity and validity scales on known emotional status measures (ensure that tests have good psychometric properties and are fair with respect to disability type, gender, age, ethnicity, and cultural factors); as well as review qualitative patterns and collateral data.
- Never rely on single source of evidence or salient data.
- Apply bias removal techniques before rendering an opinion (Sandoval, 1998). Use complex case formulation, delay judgment, and generate alternative hypotheses.
- Do not diagnose malingering unless proof of intentional falsification of symptoms is present.
- Do not use "code words" to imply possible exaggeration or malingering without actually saying so directly and presenting evidence to support it.

These recommended evidence-informed practices, which are quite universal across health professions involved in these determinations, would benefit from inclusion in newly developed training and licensing programs for medicolegal

evaluators of musculoskeletal pain and disability. Furthermore, the actual assessment of motivational factors in pain, often casually performed in current clinical practice, deserves words of caution. This assessment area constitutes the most challenging and error-prone part of any pain disability or impairment assessment, and it requires a thorough knowledge of current construct validity issues, psychosocial research base (with its limitations), and psychometrically sound instruments. Clinicians without specialized training in this field, who provide direct or oblique opinions on these matters, are vulnerable to assessment validity problems and violation of professional and ethical standards of practice.

Conclusions: Towards the Future

Medicolegal controversies in diagnosis, assessment, and determination of musculoskeletal pain-related impairment and disability continue despite recent research advances and proliferation of new science-based methodological approaches within the context of ongoing validation and the refinement of the biopsychosocial model of pain disability. These ongoing issues are best addressed with the advancement of knowledge and research in the field, together with prompt knowledge mobilization to reach clinicians-users in forensic practice contexts. Existing clinical and evidentiary gap areas include:

- Standardization of musculoskeletal pain assessment, validity, reliability, and fairness of utilized diagnostic and predictive methodologies (including AMA Guides, *DSM-5*, and various pain assessment and test protocols) in musculoskeletal pain.
- Balancing idiosyncratic clinical and empirically based procedures; effectiveness of de-biasing approaches.
- Risk for disability determination formulae for different contexts, populations, and types of musculoskeletal pain.
- Balancing sensitivity and specificity in empirical predictive models of disability.
- Complexity of the relationship between pain-related impairment and disability.

- Inclusion of contextual factors, such as occupational demands and supports and other environmental/system factors, together with implementation of construct- and evidence-supported methodology in the assessment of effort, malingering, and economy of primary, secondary, and tertiary gains and losses.

Forensic psychologists particularly are challenged with translating conceptual, research, and methodological advances regarding psychosocial factors associated with musculoskeletal pain disability to the medicolegal practice. Difficulties include the inclusion of an appropriate balance between: (1) individual psychosocial predictors of pain disability, such as beliefs, expectations, coping, catastrophizing, perception of uncertainty and perception of injustice, fear and avoidance of movement, and pain behavior, such as guarding, and (2) quantitative and qualitative assessment data and job, workplace, and other system-related factors (e.g., Schultz & Stewart, 2008; White et al., 2013).

Since the introduction of the then revolutionary IASP definition of pain 15 years ago, knowledge in the field of pain and pain disability has accumulated rapidly. Now, both pain scientists and clinicians may be ready for an empirically and conceptually informed update of the definition of pain that would facilitate its operationalization. Forensic practice, theory, and research in the musculoskeletal pain field does require a consistent and updated definition of pain in order to eliminate disconnection areas among them and to advance valid, reliable, and fair diagnostic and prognostic approaches.

Pain disability stakeholders, including individuals with pain, justice and compensation systems, health-care and rehabilitation systems, policymakers, and employers and unions ultimately have a vested interest in improved translation of science to practice in the field. This is despite differing definitions of disability and social and economic agendas. As physicians, psychologists, occupational therapists, and vocational rehabilitation professionals share similar conceptual and methodological challenges in the medicolegal context, multidisciplinary approaches to knowledge-translation efforts and

development of evidence-informed practice guidelines will be beneficial.

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