

Advances and issues in the diagnostic differential of malingering versus brain injury

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Abstract: The past decade has seen numerous advancements in the assessment of malingered brain injury, though the current diagnostic system offers only guidelines in which malingering should be suspected. This article presents an overview of advances in the clinical and neuropsychological assessment of malingering, issues in diagnostic differential, neuropsychological test methods, and special issues presented by the medical-legal context, and other factors which may affect presentations. Cautions and recommendations for practice are presented.

Keywords: Brain injury, malingering, neuropsychological assessment, psychological testing, forensic issues

1. Introduction

The 1990's have seen a dramatic growth in measures, indices, and reviews regarding the assessment of malingering and effort in neuropsychological evaluation [15, 41]. Advances have been made both in the detection of gross exaggeration such as malingering, as well as suboptimal effort. Assessment of brain injury in litigation settings is likely deficient if measures of effort are lacking or if patterns of dissimulation are not examined. However, appropriate cautions are warranted due to the complexity of brain injury, psychiatric manifestations, base rates and the general medico-legal context.

The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) [1] provides some situational and other factors which raise the suspicion of malingering. However, the relevant issue is whether or not there are commonly accepted, reliable, testable, and refutable methods which can assist in differential

diagnosis. Bad or atypical outcomes must be reliably separated into true unfortunate outcomes versus malingering. The current article surveys issues of differential diagnosis and the progress in the past decade in development of methods for this endeavor.

The DSM-IV provides no formal diagnostic criteria for malingering but does define malingering as a "condition that may be a focus of clinical attention". The condition is differentiated from several disorders which may present with similar behavioral characteristics. Essential features involve "... the intentional production of false or grossly exaggerated physical or psychological symptoms, motivated by external incentives ...". While no specific criteria are presented for definitive diagnosis, DSM-IV notes that malingering "... should be strongly suspected if any combination of the following is noted:

1. Medicolegal context of presentation (e.g. the person is referred by an attorney to the clinician for examination).
2. Marked discrepancy between the claimed stress or disability and the objective findings.
3. Lack of cooperation during the diagnostic evaluation and in complying with the prescribed treatment regimen.

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4. The presence of Antisocial Personality Disorder.”

Key elements of the DSM-IV definition of malingering involve judgments about the intention of the person being subject to examination, the presence or absence of false symptoms, the presence or absence of grossly exaggerated symptoms, the presence or absence of external incentives, and a determination that the external incentives are motivating the production of symptoms.

The determination of the presence or absence of grossly exaggerated symptoms relative to expected findings requires that the course and symptoms associated with different types of brain injuries must be well understood by the examiner. The examiner should also be familiar with factors other than malingering which may contribute to otherwise greater than expected complaints.

The criterion of gross exaggeration implies that the severity of symptoms claimed are marked and readily obvious. Individuals claiming mild or partial brain injury with mildly inconsistent test patterns would not seem to meet the definition of gross exaggeration. In contrast, findings of absurd symptoms, obvious dramatic improvements and changes in behavior and functioning outside of examination, and below chance performance on forced choice tests characterize gross exaggeration.

2. Diagnostic differential

DSM-IV has a limited classification scheme for the range of brain injuries which may present for evaluation. With the exception of the proposed diagnosis of Post Concussion Disorder, DSM-IV classifies traumatic brain injuries under the generic schemes of cognitive disorder, NOS, dementia, amnesic disorder, or personality change. There are no specific DSM-IV criteria for the classification of mild versus more severe brain trauma, toxic brain syndromes, anoxic/hypoxic injuries, stages of dementia, etc.

The limited neurological diagnostic scheme of DSM-IV is unfortunate due to the diagnostic complexity of neuropsychiatric differential diagnosis. In the forensic arena, the task involves differentiation between neurological conditions, psychiatric conditions and motivational factors. The task of assessing brain injuries is complicated by the complexity of higher cognitive functions, the variety of presentations associated with different types of acquired brain dysfunction, the fact that serious neurological complications can occur in the

absence of objective findings, and occasional delayed signs of functional impairment [8,13,30–32,42,54,61].

Mild Traumatic Brain Injury (mTBI), may be prone to being misinterpreted as mild or insignificant injury [8,10,30–32,42,54,61]. Minor cognitive disturbances such as inattention, slow processing, intrusive errors, or sequencing difficulties can be problematic in competitive work environments where cognitive demands are high, and where attention or critical decision are important for safety. Minor cognitive disturbances may also be problematic when speed of production or accuracy of clerical skills are important. Complaint of difficulties in job performance or reduced efficiency contrast with more dramatic claims of gross impairment in daily living tasks. The former complaints should not be automatically characterized as gross exaggeration or malingering in mTBI.

DSM-IV differentiates between malingering and other disorders, including Somatoform disorders. These disorders traditionally are conceptualized and understood to be motivated by unconsciously and involuntary processes, as opposed to conscious efforts to achieve gain. They are therefore excluded, by definition, from malingering. Using DSM-IV criteria, persons diagnosed with somatization disorder, undifferentiated Somatoform disorder, conversion disorder, pain disorder, hypochondriasis, and body dysmorphic disorder would also not be classified as malingerers. Factitious disorders also are distinguished from malingering in that there are no external incentives present.

Inversion and Binder [29] suggest that Major Depressive Disorder be added to the listing of differential diagnostic considerations for brain injury versus malingering. They note diminished motivation, reduced cooperation, cognitive slowing, diminished memory and attention are common. They note excessive somatic complaints such as headaches and health worries can represent manifestations of depression and have a potential for being confused with malingering.

Less attention has been given to whether anxiety disorders figure into the differential diagnosis of malingering. Post Traumatic Stress Disorder (PTSD) needs to be considered in the diagnostic differential of brain injury versus malingering. Persons with PTSD may have altered, partial or no recall of aspects of the traumatic event. Lack of cooperation, avoidance and even non-disclosure in these cases may represent manifestations of anxiety avoidance. Absent potential “organic indicators”, there is a risk that irritability and anger outbursts, mood disturbance, difficulties in concentration or task completion, memory failures for some/

all of the events to which exposed, or delayed onset of symptoms, etc. could be mistaken for symptoms of malingering in PTSD cases (See Parker, this issue, for a further discussion of PTSD versus brain injury). LoPiccolo and colleagues [34] also have suggested the need to consider additional anxiety disorders such as dissociative disorders.

3. Conceptual models

Models seek to predict and explain while diagnostic criteria relate to classification. Diagnostic criteria assist in describing, communicating, and ensuring commonalities in clinical and research populations. This promotes the advance of science and treatment.

Assessment of performance is often characterized as a dichotomous dimension of motivated vs. malingering. There is a need to use a broader and more continuous conceptualization of malingering, exaggeration, and response bias. There is also a need to elucidate the degree of certainty which can be established from various sources of information and data.

Rogers [49,50] reviewed malingering models which were categorized as pathogenic, criminologic and adaptational. Pathogenic models view malingering to be caused by a mental disorder. According to LoPiccolo and colleagues [34], malingering is the result of tensions between unconscious character pathology and the conscious production of symptoms. In LoPiccolo's model it is believed anxieties cause boundary blurring or problems between conscious and unconscious defenses, resulting in the worsening of mental disorders and the appearance of "true symptoms".

Rogers [49,50,52] argues that the DSM approach to malingering is an example of a "criminological" model of malingering and that it is vague, binary, unsupported by research, moralistic and should be abandoned. Rogers [50] notes DSM assumptions about situations in which malingering reflects a view of malingerers as "bad persons", in bad circumstances, and performing badly. Rogers alternatively posits malingering can be better understood from an "adaptational" perspective. In this model, malingering persons are conceptualized as consciously engaging in a cost-benefits analysis influenced by perceptions of the likelihood of success.

Rogers [49] reviewed "detection models" of malingering and concluded they offer "considerable promise" in the identification of malingering. Based upon his review, he offered specific recommendations

for evaluating possible malingering including the utilization of standardized measures, structured interviews, and collateral sources. Convergent evidence for malingering is established when indiscriminate endorsement of symptoms occurred, rare psychiatric symptoms were endorsed, "blatant" symptoms were endorsed, and when there were inconsistencies evident in collateral data.

While others share Rogers views as to the inadequacy of DSM (see below), it is important to note that many contemporary writers including neuropsychologists continue to advocate for the DSM nosology [34, 48]. Many neuropsychologists now question the utility and applicability of the DSM-IV system to neurocognitive disorders.

Behavioral criteria were suggested by Larrabee [33] who suggested an indexing of scores to expectancies for prototypical patient pathology groups, with improbable scores representing potential evidence for less than best effort. Similarly, others have suggested excessive degrees of claimed disability, and symptom complaints inconsistent with known injury parameters, to be potential markers for malingering [9,44,65].

Greiffenstein and colleagues [20] advanced grouping criteria by operationalizing observable or measurable criterion into 1) "improbably poor performances on two or more neuropsychological measures" 2) "total disability in a major social role" 3) "contradiction between collateral sources" and 4) "claims of remote memory loss." More recently, Faust and Ackley [16] have suggested several manifestations of "intentional" performance decrements including poor effort, symptom exaggeration, symptom fabrication, deliberate distortion of historical data, a deliberate presentation of a "false baseline" of premorbid function, and a denial of strengths, positive abilities and resources.

Zasler and Martelli [65] offer hallmarks for the detection of "response bias" specifically in mild traumatic brain injury (mTBI). The authors indicate that concern about response bias arises when there are nonorganic, absurd, extreme, overly specific and improbable symptoms. Concerns about malingering are also reported to be warranted when there are inconsistencies between the self-report and disease course, between sequential histories, or between the presentation and behavior outside the office. They suggest examination of level and patterns of neuropsychological and psychological test performance.

Non-organic sensory/ motor physical examination findings, failure on physical examination procedures assessing malingering, and "pseudoneurologic" find-

ings in the absence of expected “pathologic findings” were cited by Zasler and Martelli [65] as indicators of response bias in mTBI. Concerns are noted when there is a “lack of objective signs of neurological impairment”. However, the latter may be problematic in the assessment of mTBI since imaging studies and neurological examination are, almost by definition, likely to be normal.

The developing support for a model which specifies an incremental degree of certainty related to brain injury versus malingering, based upon convergence of multiple sources of information, is also exemplified in the classification of performance by Slick and colleagues [56]. Information is garnered from neuropsychological testing data, evidence from self-report, records, observations and collateral sources, symptom inconsistency with known patterns of brain functioning, and evidence of exaggerated or fabricated psychological dysfunction. Performance is classified as “definite”, “probable” or “possible” malingering.

4. Clinical assessment of malingering

Several approaches to the detection of malingering [28] have relied on common inaccurate beliefs regarding patterns of neuropsychological consequences of head injury [21,64]. Significant advancement in the conceptual and diagnostic criteria for malingering and response bias is evident, even in the abbreviated summary provided above. Paralleling advancements in the conceptualization and operationalism of malingering are advances in the clinical practice of assessing for malingering.

Thorough assessment is accomplished through the integration of diverse methods of evaluation and other sources of data, interpreted by a qualified individual with appropriate training in neurological, psychiatric and neuropsychological disorders. The underlying assumption is that consistency of problems across procedures (interviews, tests and observations) is more difficult to feign than on any one procedure alone. Information gathered may involve records, medication history, interview material, questionnaires, depositions, prior and subsequent evaluations, collateral interviews, results of physical evaluations and tests, as well as standardized protocols, and psychological or neuropsychological tests.

5. Self-report and collateral interview

The clinical interview itself remains a significant source of information. Clinical interview data provides information regarding current and historical complaints as well as a basis for comparison with psychometric and behavioral observations. A detailed interview provides information regarding past medical and psychological history, psychosocial data, educational history, vocational history, substance abuse history, historical strengths and weaknesses in abilities, military service, developmental periods, etc. Information is obtained regarding injuries and parameters such as loss of consciousness (LOC), length of retrograde amnesia (RA), post-traumatic amnesia (PTA), onset of symptoms, frequency, severity, intensity, impact of symptoms in daily functioning, changes over time, etc.

Observations made during the interview can reveal behavioral inconsistencies or the presence of obvious old scars in an individual denying prior injuries. A careful clinical interview may reveal inconsistencies which raise the suspicion of malingering. Especially salient are omissions and inconsistencies which are self-serving in nature. However, some caution is required in interpreting omitted or inconsistent information. More research about base rates of such omissions or inconsistencies in litigation and non-litigation settings would be helpful.

Collateral interview data is often helpful in eliciting complaints the patient may be reluctant to self-report. Reticence about reporting symptoms may be due to general personality characteristics, embarrassment, or the lack of self-awareness sometimes seen in brain injuries. A collateral interview also often allows for assessment of a possible co-dependent relationship or better assessment of other factors, which would be helpful in differentiating between a somatoform or malingering diagnosis.

Progress has been made in the study of patient and collateral agreement in TBI [12]. Collateral interviews can assist in assessing the veracity of client complaints. For example, in a study of suspected malingerers and a TBI sample, Sbordone, Seyranian, and Ruff [55] recently demonstrated the potential utility of comparing patient reports with reports of significant others.

6. Review of records

Review of prior collateral records is important to establish expectations about premorbid functioning and

previous medical conditions. Records from ambulance and paramedics may contain critical information by first responders [6,15]. Records can help establish basic expectations about the degree of injury based on length of loss of consciousness, retrograde and anterograde amnesia, post-traumatic seizures, and other medical complications associated with head injuries. Careful review of records can also assist in determining whether the course of complaints is consistent with diagnosis and to determine if there have been subsequent injuries or iatrogenic factors contributing to current complaints.

Examination of ongoing post-accident records can reveal marked inconsistencies between self-report of symptom onset and documentation of previous similar complaints. Obviously suspicious patterns of reporting increasing periods of trauma-induced LOC or amnesia with each sequential healthcare visit have been occasionally noted by the authors. Review of records can establish a pattern of complaints that are secondary to untreated depression. The latter is likely common in systems in which psychiatric or psychological care is underutilized or over-managed.

Review of records is not always uncomplicated. Assessment of mental and physical function can vary widely between settings. Detection of mental status changes in trauma cases may be precluded, complicated or masked by emotional reactions to trauma, sedation or other medication effects at the time of emergency care. In some instances chart notes may shed little light on what actually occurred [4,9]. Examples of a glass eye which was "equal and reactive to light", or "no obvious abnormalities of the head" in an individual with a prominent craniotomy scar underscore the dangers of accepting medical records as gospel.

A balanced review of records should include consideration of what is in the record, as well as what is missing. While denial of unnecessary procedures and evaluation is critical to containing health care costs, the structure of impairment systems and managed care cost-cutting often leads to strategies of avoiding use of specialists, who may use more sensitive procedures. Examination of records for denials or failures to obtain recommended tests or examinations can help in the determination if the absence of objective findings is due to excessive worry about a clean-running machine or a failure to look under the hood.

7. Neuropsychological test data

Neuropsychological assessment provides a testable and refutable method of detecting consequences of

brain injuries and provides data regarding potential malingering. Numerous reviews of the theory, methodology and specific tests designed to detect malingering of memory complaints and/or suboptimal motivation for best performance appear in recently published literature [15,16,25,29,33,56].

Rogers et al. [51] identified six strategies that can be incorporated into neuropsychological assessments to detect feigned impairment, including floor effect, performance curve analysis, atypical performance, magnitude of error, symptom validity testing, and psychological sequelae.

Tests have been specifically developed to aid in the detection of malingering in TBI populations. Older, "simpler" measures such as the Rey Fifteen Item Test (RFIT) [2] and a dot counting task have been critiqued, but have continued proponents and a long history of research and use [5,15,29]. Symptom validity testing (SVT) involves the use of a two-alternative forced-choice test [43]. Performance is compared to that expected by chance or against known samples. Many of these procedures look difficult yet are simple enough that persons with substantive neuropathology (e.g., dementia) generally do well on them. For example, the Test of Memory Malingering (TOMM) [62], Computerized Assessment of Response Bias (CARB) [11], Portland Digit Recognition Test (PDRT) [7] and Word Memory Test (WMT) [23] are neuropsychological tests developed specifically to assess effort with respect to memory function. Substantive reviews of "forced choice" methods and specific procedures can be found in the literature [15,25,29].

General advantages of using SVTs developed in the past decade include good face validity, availability of empirically derived "cut-off" scores and discriminant validity [51]. A potential disadvantage, based on the author's experience, is that the length and repetitive nature of some SVTs may cause some patients to "tune-out", become annoyed, stop attending and, in so doing, perform poorly. Depressed subjects may potentially become overwhelmed by the appearance of task difficulties and thus do poorly. These factors can be addressed and controlled, however, and should not figure significantly in decisions to not use SVTs.

An alternative to procedures specifically designed to assess memory malingering or suboptimal effort involves data collected from commonly employed, standard psychological and neuropsychological tests. For example, researchers have examined whether the pattern of recall vs. recognition or the serial position of word list items yields differing patterns of performance

between known injured and simulators / malingerers of brain injury. Results have been used to devise decision rules or “cutting scores” to identify less than optimal effort or even possible malingerers (i.e. fewer than 6 items recognized on the Rey Auditory Verbal Learning Test (RVLT) [29] .

Tests studied to date include, but are not limited to the Wechsler Memory Scale – Revised (WMS-R) [38, 39], California Verbal Learning Test (CVLT) [59,63], the Wisconsin Card Sort (WCST) [5], as well as the Rey-Ostereith Complex Figure Test (RCFT) [36] and many of the tests in the Halstead-Reitan Battery. Discriminant function analysis has been employed with several word list learning tasks including the RVLT and CVLT [37,57]. For example, Mittenberg, Rothok, Russell, and Heilbronner [40] proposed regression formulas to evaluate atypical performance on cognitive and neuropsychological test batteries. There now is a rather substantial literature and a number of reviews involving the above procedures [15,20,29,39,56,57,59].

Performance curve analysis consists of analyses of performance on test items across a broad range of difficulty. Essentially, the examinee’s average performance on test items is compared against average item difficulty with the expectation that response accuracy will decrease as item difficulty increases. Frederick and Foster [18] and Frederick et al. [19] presented large-scale studies demonstrating the effectiveness of a performance curve strategy to identify invalid responding. More recently Frederick et al. [17] applied this method to validity indicator profiles of a large sample of criminal defendants.

Technical aspects of test construction and empirical knowledge about the nature of normal and impaired memory provide a wealth of information which can be helpful in assessing the reliability and likely validity of test performance. Approaches using standard neuropsychological instruments can be used to help assess the consistency of performance between tests, within measures (such as “easy vs. difficult” items), expected differences between recall vs. recognition measures, obtained versus expected serial order position and recall, and consistency over serial reassessments [46,47]. Results must be considered in the context of the psychometric properties of the tests, base rates, situational factors, medication, and appropriate expectations for the disorder such as age, education, relevant history, and injury severity criteria.

Advantages of using commonly used existing instruments to assist in diagnosis of malingering include increased time savings and the ability to compare results

with expectations based upon a wealth of published literature. It may be more difficult for “sophisticated” malingerers to monitor and alter patterns of cognitive performance in a credible fashion when the complex patterns of performance on a particular test or test batteries are well-studied and researched. A challenge in the use of indices based upon current tests, is the identification of cutting scores giving adequate sensitivity while remaining specific to malingering [57].

Reitan and Wolfson [46,47] have presented a series of studies concerning a promising standardized approach which measures consistency of performance across two administrations of the same tests. This approach may minimize the danger of subjective judgments based on multiple comparisons of tests and subtests. Effects of examining and comparing scores from tests or subtests administered on different days of weeks may also need to be further studied.

Malingering can be manifest across a variety of symptom presentations including cognitive, affective and somatic domains. Individuals suffering brain injury may understandably report a greater number of somatic symptoms and cognitive complaints. Efforts to correct for the somatic reporting of symptoms on traditional personality measures have also been critiqued. Hoffman et al. [27] examined the effects of closed head injury severity and involvement in litigation on the (Minnesota Multiphasic Personality Inventory – II (MMPI-2). Hoffman and colleagues [27] examined methods of adjusting MMPI-2 profile scores based upon norms for individuals with neurocognitive disturbance. They concluded that current methods of correcting MMPI-2 profiles in this manner may be misleading in some cases of closed head injury.

The MMPI and MMPI-2 contain a number of scales sensitive to the overendorsement of items, with the most consistent support seen for the “F” scale. Beery and Butcher [3] have reviewed and summarized the MMPI literature as it relates to the detection of feigned head injury. Moderate support for an index based on the magnitude of the difference between a scale comprised of infrequently endorsed items and a measure of defensiveness (F-K), scales specifically composed in an effort to assess dissimulation (Ds/Ds2) and a measure of infrequently endorsed items towards the end of the test (Fb) were noted. While another measure of infrequently endorsed items (Fp) and a measure designed to assess exaggeration of symptoms, the Fake Bad Scale (FBS), also were found to be promising, at the time of their review, the authors felt these scales yet lacked adequate empirical support. They found that only a

subset of mTBI patients with strong evidence for malingering also over-reported psychological symptoms. These findings implied that personality test validity indicators may not always be sensitive to response bias in brain injury.

8. Special problems

The significance associated with the patient's level of cooperation and the significance of a diagnosis of antisocial personality disorder has also been criticized by some. Rogers [50] noted that a strong suspicion of malingering may be inappropriate for individuals with antisocial personality disorder (ASP), based on his review that the malingering base rate is between 3–8% in ASP's. Rogers, as one example, has asserted that uncooperative attitudes are not limited to malingerers or with Antisocial Personality Disorder. He notes that all involuntary patients, psychiatric patients who deny psychopathology, many substance abusers, and those with eating disorders would be classified as likely malingerers based on poor cooperation. On the other hand, Pursich [45] points out that many malingerers often present as at least superficially cooperative.

Examination of psychometric data offers the promise of establishing an objective and quantitative approach to the study of malingering versus brain injuries. Since conditions can be controlled and the results quantified, this offers a significant advance relative to subjective judgments of patients' behaviors in the examination room, waiting area or videotape. However, the simplicity of statistical analysis must also be considered in the context of the complex variables which may affect such performance [26,58].

Progress has been made in assessing the impact of "coaching" or instructional sets on detection of malingering. For example, recently published research [14] examined the ability of criteria developed by Tenhula and Sweet [60] to detect malingering in the context of coached instructions to avoid malingering. In another recent example, Suhr and Gunstad [57] examined the effects of warnings that validity would be assessed on the Auditory Verbal Learning Test (AVLT) and forced choice procedures. The authors found that procedures could remain successful in identifying individuals instructed to malingering.

9. Complicating factors posed by the medicolegal context

Problems inherent in deducing the intentions of persons being examined are not unique to brain injury. A great challenge in the evaluation of malingering is the general medico-legal context. Unfortunately, the clinician may sometimes face the task of separating "bad people, behaving badly" [50] from bad systems, behaving worse.

It is obvious that false claims of brain injury create societal costs in terms of insurance industry profits, public insurance premiums and diversion of scarce resources from the truly deserving to the undeserving. Erroneous classifications of malingering can result in personal loss of employment, criminal charges, denial of benefits, social resources, remedial education and training, medical treatment, or disability income. Fraudulent practices by plaintiffs who hop on buses after an accident and claim injury, and fraudulent practices by insurance companies who systematically employ "independent" review companies to reduce or deny payments are sometimes the focus of media attention. A literal battlefield mentality is sometimes manifest in the increased use of metal detectors at insurance offices and experiences of attorneys, clinicians and adjusters who have had their lives threatened.

Trust and rapport is assumed necessary to generate cooperation and allow individuals to report often sensitive information accurately. In a charged adversarial medicolegal matrix, the victim of traumatic brain injury may come to feel that defense experts presume they are malingering. Individuals may feel any admitted fault or injury they reveal will be cited as the proximate cause of their complaints. Caution is warranted in the simple attribution of lack of cooperation as strong evidence of malingering in these contexts.

10. Problems associated with base rates of malingering

The study and diagnostic differentiation of malingering versus brain injury is complicated by issues in accurately determining base rates. Base rates pose limits on the accuracy of diagnostic classification. Examples of attempts to estimate the prevalence of malingering using applications of symptom validity testing is a "minimal" estimate of 7.5% in a sample of 106 consecutive admissions for neuropsychological evaluation reported by Trueblood and Schmidt [63]. Griffin

et al. [24] using a newly developed index estimated the incidence of malingering in a Social Security sample of 167 applicants to be 19%.

Despite studies such as these, controversies concerning actual base rates are likely to persist since successful malingerers are unlikely to identify themselves [22]. Rogers and Salekin [52] have highlighted this problem in a re-analysis of previous data by noting that estimates of malingering based on many obtained empirical scores can result in classifications from none to all individuals as malingering. Rosenfeld et al. [53] have also urged caution in the offering estimates of the likelihood of malingering, and also cautioned about the use of summary tables such as those published by Mittenberg [38].

11. Summary and recommendations for practice

The above review highlights the growth of measures and procedures for assisting in the objective differentiation of brain injury and malingering. It is recommended based on the current state of knowledge that evaluation of brain-injured clients involved in potential litigation should include neuropsychological testing as well as procedures and measures specifically designed to assess possible malingering. As with the results of all psychological testing, results of tests of malingering should be considered in the context of situational factors and other limitations of our current state of knowledge.

DSM-IV criteria specify that the magnitude of discrepancy between claimed and expected injury is gross [1]. It is recommended that the term malingering be utilized when the claimed deficit consists of gross inability to function in important life roles, other diagnoses have been ruled out, and there is convergence of multiple sources and types of data. The diagnosis should be made only after other conditions have been carefully considered and ruled out with appropriate examinations and diagnostic tests.

Due to general medical and psychological ethics and the foreseeable harm that can befall a brain-injured individual erroneously diagnosed as malingering, it is essential that examinations involving this question involve comprehensive assessment of the individual. Adequate consideration of alternative diagnoses is necessary. Assessment should involve a comprehensive history, consideration of medication effects, review of pre-accident and post-accident records and diagnostic studies, clinical interview, neurological and neuropsychological

evaluations, and collateral sources of information.

Conclusions that an atypical course of presentation, such as increasing complaints long after minor head trauma, represent malingering should be made after consideration of the types of demands that were placed early or late in the course of recovery. It should be recognized that some difficulties related to brain injury may not be apparent until patients return to former roles. Fluctuations related to other external stressors, sleep difficulties, pain levels, medication changes, or fluctuations in general health status also need to be considered and ruled out.

When accurate assessment is precluded because of lack of cooperation or malingering, increased reliance on collateral sources of data and normative expectations is necessary. Discussions of possible malingering must be balanced with a discussion of expectations about the presence or absence of brain damage in the context of these collateral sources of information. For example, in the case of an individual with a well-documented extended length of coma, but who seems to be obviously exaggerating, it is appropriate to note that while the patient appears to be exaggerating symptoms, based on history it would be reasonable to assume there may be some actual persisting deficits.

Collateral records should also be viewed with some skepticism. For example, the blind assumption that imaging studies were correctly read at the time of injury (including, in the authors experience, missed hematomas) can be erroneous. When there is an absence of gross exaggeration or highly atypical symptoms and there are greater than expected deficits, it may be advisable to recommend further independent review of any initial or subsequent imaging studies before a summary conclusion of malingering or exaggeration is made.

Efforts to manage litigation or diagnostic expenses may translate into limitations on the fees or amount of time allotted to evaluate a claim of brain injury. If limitations, external or otherwise have been placed, these should be explicitly stated. Paper reviews or cursory examinations are clearly inappropriate for this purpose. Furthermore, a statement that a diagnosis of malingering does not in and of itself rule out any medical, neurological or psychological condition should be included in any reports when this diagnosis is made.

Advances in our ability to detect efforts to manipulate test results are exciting. Accurate neuropsychological evaluation requires best effort. All examiners should make efforts to establish rapport and generally

encourage patients to do their best. It is important to avoid luring patients into poor performance. Studies into contextual variable, techniques or instructions to maximize best effort in litigating samples are encouraged.

In addition to informing clients and interviewed collaterals about the limits of confidentiality, informed consent should be obtained prior to psychological testing. Informed consent requires a discussion of the nature and purpose of the evaluation and possible outcomes of such evaluation. This also applies to contexts where the possibility of malingering is to be assessed.

Clients and collaterals should be informed that the examiner will conduct assessment of abilities and functioning that is sensitive to brain dysfunction and psychiatric disturbance. Accurate diagnosis of these conditions can aid in understanding of their difficulties and assist treatment planning. Patients undergoing such evaluations should also be informed that the examination and/or interview will include assessment including measures and/or indices which are sensitive to diminished effort and attempts to distort performance. They should be informed that failure to make a good effort could result in invalidating the examination and could effect their benefits, compensation, or future access to health care providers.

Retaliatory resistance to Independent Medical Examinations may be precipitated by hostile prior interactions with defense experts, adjusters, denied access to health care professionals, or denied coverage for tests, medication or treatment. This must be considered as possible contributor to lack of cooperation if prior examinations appear to have been valid and included appropriate symptom validity measures. Conversely, in these circumstances, careful review of prior records and test patterns may provide further evidence of malingering or response bias.

The use of tests appropriate to the patient's culture and language is important. When cultural or language factors may play a part in the evaluation of malingering, the examiner must discuss potential limitations related to this issue. Research into the assessment of malingering in diverse cultural groups is recommended.

Apparent simplicity in test design and interpretation and cost-driven pressures for easy solutions create a danger that Symptom Validity Tests will be utilized outside of a framework which examines multiple sources of data for convergence. It is recommended neuropsychological tests only be administered in the context of a more comprehensive interview and examination. Due to the complexity of test development and the field of

knowledge, tests should be administered by individuals with appropriate training and supervision in neuropsychology and psychometric theory and principles.

There is a risk of spurious results or selective reporting when multiple measures or indices are utilized. It is recommended that clinicians discuss specific indices and measures examined for evidence of malingering. Clinicians should discuss the concordance or lack of concordance of such measures and any other limitations of the data. Collection of information about base rates of diagnosed or suspected malingering in individual settings, patient ability levels, and other patient demographic variables could establish better estimates of classification rates with a particular measure.

Significantly below chance performance, particularly on multiple measures in a medicolegal context, provides strong evidence for malingering. This likely meets the criterion for the claim of a gross deficit and likely requires a conscious and intentional effort to achieve. In the absence of other convincing explanations, such a performance should be classified as likely malingering.

Re-evaluations of brain injured patients should reflect performance which generally remains stable or improves. Markedly decreased scores in a medicolegal context and in the absence of other intervening variables such as medication, significant medical and neurological changes, severe depression, or further injury, raises suspicion for malingering or exaggeration. When comparing scores it is important to consider practice effects, regression toward the mean, confidence intervals, comparability of test forms and procedures, rapport, sleep, pain, medication, and setting variables [35]. Since malingering of neuropsychological deficits may be independent from malingering of psychological or psychiatric symptoms, caution about generalizing tests or measures of malingering across domains is warranted.

While there may be considerable pressures in the medicolegal context to use terms such as malingering for less than full effort, the term should be used conservatively within the parameters of DSM-IV. Given the current state of knowledge and individual variability regarding outcome, terms such as dissimulation, exaggeration, or negative response bias should be used to describe patterns other than gross fabrication of severe deficits. Production of simply more variable than expected test scores, inconsistent test patterns, or somewhat more impaired scores than would be expected based on skill level of the person and apparent severity of brain injury should not be diagnosed as malingering under existing DSM-IV criteria.

The above review highlights advances that have been made in the assessment of claims of brain injuries. Challenges and obstacles remain in the endeavor of more reliable diagnostic discrimination. These involve, but are not limited to, a limited diagnostic scheme in DSM-IV, normative data for diverse populations, exploring situations which produce false positive results with tests of malingering, and developing a better understanding of situational factors which may influence validity tests. These issues will pose challenges for the next decade of research into this area. If the current advances are consolidated into clinical practice and the challenges noted above are met, the field will continue to be well-served.

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References

- [1] American Psychiatric Association, *Diagnostics and Statistical Manual of Mental Disorders*, (4th ed.), American Psychiatric Association, Washington, DC, 1994.
- [2] P.A. Arnett, T.A. Hammeke and L. Schwartz, Quantitative and qualitative performance on Rey's 15-item Test in neuropsychological patients and dissimulators, *The Clinical Neuropsychologist* **9** (1995), 17–26.
- [3] D.T.R. Beery and J.N. Butcher, Detection of Feigning of Head Injury Symptoms on the MMPI-2, in: *Detection of Malingering During Head Injury Litigation*, C.R. Reynolds, ed., Plenum, New York, 1998.
- [4] J.T. Beetar and J.M. Williams, Malingering response styles on the memory assessment scales and symptom validity tests, *Archives of Clinical Neuropsychology* **10**(1) (1995), 57–72.
- [5] L.C. Bernard and W. Fowler, Assessing the validity of memory complaints: Performance of brain damaged and normal individuals on Rey's Task to detect Malingering, *Journal of Clinical and Experimental Neuropsychology* **15** (1990), 170–182.
- [6] L.C. Bernard, M.J. McGrath and W. Houston, The differential effects simulating Malingering, Closed Head Injury and other CNG pathology on the Wisconsin Card Sorting Test: Support for the "pattern of performance hypothesis", *Archives of Clinical Neuropsychology* **11** (1996), 231–246.
- [7] L.M. Binder, Assessment of Malingering after Mild Head Trauma with the Portland Digit Recognition Test, *Journal of Clinical and Experimental Neuropsychology* **15** (1993), 170–182.
- [8] T.J. Blakely and D.E. Harrington, Mild Head Injury is not always mild: Implications for damage litigation, *Medicine, Science & the Law* **33**(3) (1993), 231–242.
- [9] J. Brandt, Malingered Amnesia, in: *Clinical Assessment of Malingering and Deception*, R. Rogers, ed., Gullford, New York, 1988.
- [10] R.C. Cantu, Guidelines for Return to Contact Sports After a Cerebral Concussion / Death on the Gridiron: Second Impact Syndrome (These Recommendations are Globalized to Other Concussions), *Physician & Sports Medicine* **14** (1986), 75–83.
- [11] R.L. Conder, L.M. Allen and D.R. Cox, *Computerized Assessment of Response Bias Test Manual*, Cognisyst, Durham, NC, 1992.
- [12] C.P. Cusick, K.A. Gerhart and D.C. Mellick, Participant-proxy reliability in Traumatic Brain Injury outcome research, *Journal of Head Trauma Rehabilitation* **15**(1) (2000), 739–749.
- [13] C.A. Czubaj, Traumatic Brain Injury – An intellectual's need for cognitive rehabilitation, *Education* **117**(1) (1996), 51.
- [14] M.A. DiCarlo, J.D. Gfeller and M.V. Olivieri, Effects of coaching on detecting feigned cognitive impairment on the Category Test, *Archives of Clinical Neuropsychology* **15**(5) (2000), 399–413.
- [15] L.M. Etcoff and K.M. Kampfer, Practical guidelines in the use of symptom validity and other psychological tests to measure malingering and symptom exaggeration in traumatic brain injury cases, *Neuropsychology Review* **6** (1996), 171–201.
- [16] D. Faust and M.A. Ackley, Did you think it was going to be easy? Some methodological suggestions for the investigation and development of malingering techniques, in: *Detection of Malingering During Head Injury Litigation*, C.R. Reynolds, ed., Plenum, New York, 1993.
- [17] R.I. Frederick, R.D. Crosby and T.F. Wynkoop, Performance curve classification of invalid responding on the validity indicator profile, *Archives of Clinical Neuropsychology* **15**(4) (2000), 281–300.
- [18] R.I. Frederick and H.G. Foster, Multiple measures of malingering on a forced-choice test of cognitive ability, *1991 Psychological Assessment: A Journal of Consulting and Clinical Psychology* **3** (1991), 596–602.
- [19] R. Frederick, S. Sarfaty, J. Johnson and J. Powel, Validation of a detector of response bias on a forced-choice test of cognitive ability, *Psychological Assessment* **3** (1994), 596–602.
- [20] M.F. Greiffenstein, W.J. Baker and T. Gola, Validation of Malingered amnesia measures with a large sample, *Psychological Assessment* **6** (1994), 218–224.
- [21] Gouiver, Presthold and Warner, A survey of common misconceptions about head injury and recovery, *Archives of Clinical Neuropsychology* **3** (1988), 331–343.
- [22] I. Grant and W. Alves, Psychiatric and psychosocial disturbances in head injury, in: *Neurobehavioral Recovery from Head Injury*, H.S. Levin, J. Grafman and H.M. Eisenberg, eds, Oxford University Press, 1987, pp. 233–261.
- [23] P. Green, L.M. Allen and K. Astner, *Word Memory Test (WMT), for the assessment of malingering and memory*, CogniSyst, Inc., Durham, NC, year?.
- [24] G.A.E. Griffin, J. Normington, R. May and D. Glassmire, Assessing dissimulation among Social Security disability income claimants, *Journal of Consulting & Clinical Psychology* **64**(6) (1996), 1425–1430.
- [25] J.M. Gutierrez and R.C. Gur, Detection of malingering using forced-choice techniques, in: *Detection of Malingering During Head Injury Litigation*, C.R. Reynolds, ed., Plenum, New York, 1998.
- [26] R. Hart, M.F. Martelli and N.D. Zasler, Chronic Pain and neuropsychological functioning, *Neuropsychological Review* **10**(3) (2000), 131–149.
- [27] R.G. Hoffman, J.G. Scott, M.A. Emick and R.L. Adams, The MMPI-2 and closed head injury severity, *Journal of Forensic Neuropsychology* **1**(2) (1999), 3–14.

- [28] G.L. Iverson, M.D. Franzen and L.M. McCracken, Application of a forced-choice memory procedure designed to detect experimental malingering, *Archives of Clinical Neuropsychology* **9** (1994), 437–450.
- [29] G.L. Iverson and L.M. Binder, Detecting exaggeration and malingering in neuropsychological assessment, *Journal of Head Trauma Rehabilitation* (2000), 829–858.
- [30] B. Jordan and J. Bailes, Concussions may spell later trouble for football players. Research presented at the American Academy of Neurology's 52nd annual meeting in San Diego, CA, April 29–May 6, 2000.
- [31] R. Kant, L. Smith-Seemiller, G. Isaac and J. Duffy, Tc-HMPAO SPECT in persistent post concussion syndrome after mild brain injury: Comparison with MRI/CT, *Brain Injury* **11**(2) (1997), 115–124.
- [32] J.P. Kelly, M. Ramundo, D.J. Thurman, B.J. Zink and N. Walsh-D'Epiro, Improving outcome after brain trauma, (emergency handbook), *Patient Care* **331**(13) (1997), 36.
- [33] G.J. Larrabee, Neuropsychological outcome, post Concussion Symptoms, and Forensic Considerations in Mild Closed Head Trauma, *Seminars in Clinical Neuropsychiatry* **2** (1997), 196–206.
- [34] C.J. LoPiccolo, K. Goodkin and T.T. Baldewicz, Current issues in the diagnoses and management of malingering, *Annals of Medicine* **31** (1999), 166–174.
- [35] R.J. McCaffrey, K. Duff and H.J. Westervelt, *Practitioner's Guide to Evaluating Change with Neuropsychological Assessment Instruments*, Kluwer Academic/Plenum Publishers, New York, 2000.
- [36] J.E. Meyers and M. Volbrecht, Detection of malingerers using the Rey Complex Figure and Recognition Trial, *Applied Neuropsychology* **6**(4) (1999), 201–207.
- [37] S.R. Mills, S.H. Putnam, K.M. Adams and J.H. Ricker, The California Verbal Learning Test in the detection of incomplete effort in neuropsychological evaluation, *Psychological Assessment* **7** (1995), 63–471.
- [38] W. Mittenburg, R. Azrin, C. Millsaps and R. Heilbronner, Identification of malingered head injury on the Wechsler Memory Scale-Revised, *Psychological Assessment* **5** (1993), 34–40.
- [39] W. Mittenburg, S.T. Theroux Fichora, R.E. Zielinski and R. Heilbronner, Identification of malingered head injury on the Wechsler Memory Scale-Revised, *Professional Psychology: Research and Practice* **5** (1995), 491–498.
- [40] W. Mittenburg, A. Rotholc, E. Russel and R. Heilbronner, Identification of malingered and head injury on the Halstead-Reitan battery, *Archives of Clinical Neuropsychology* **11** (1996), 271–281.
- [41] K. Nies and J.J. Sweet, Neuropsychological assessment of malingering: A critical review of past and present strategies, *Archives of Clinical Neuropsychology* **9** (1994), 501–552.
- [42] NIH Consensus Development Panel Rehabilitation of persons with traumatic brain injury, *NIH Consensus Statement* **16**(1) (1998), 1–41.
- [43] L. Pankrantz, Symptom validity testing symptom retraining: Procedures for the assessment treatment of functional sensory deficits, *Journal of Consulting and Clinical Psychology* **47** (1979), 409–410.
- [44] L. Pankrantz, Malingering on intellectual and neuropsychological measures, in: *Clinical Assessment of Malingering and Deception*, R. Rogers, ed., Guilford, New York, 1988.
- [45] A.D. Purisch, Assessment of deception and malingering, Workshop presentation at the 2nd annual assessment psychology conference, Nova University, December 12, 1999.
- [46] R. Reitan and D. Wolfson, The question of validity of neuropsychological test scores among head-injured litigants: Development of a dissimulation index, *Archives of Clinical Neuropsychology* **11** (1996), 573–580.
- [47] R.M. Reitan and D. Wolfson, Consistency of neuropsychological test scores of head-injured subjects involved in litigation compared with head-injured subjects not involved in litigation: Development of the Retest Consistency index, *Clinical Neuropsychologist* **11**(1) (1997), 69–76.
- [48] C.R. Reynolds, Common sense, clinicians, and actuarialism in the detection of malingering during head injury litigation, in: *Detection of Malingering in Head Injury Litigation*, C.R. Reynolds, ed., Plenum Press, New York, 1998, pp. 261–286.
- [49] R. Rogers, Models of feigned mental illness, *Professional Psychology: Research and Practice* **21** (1990), 182–188.
- [50] R. Rogers, *Clinical Assessment of Malingering and Deception*, (2nd ed.), Guilford Press, New York, 1997.
- [51] R. Rogers, E.H. Harrell and C.D. Liff, Feigning neuropsychological impairment: a critical review of methodological and clinical considerations, *Clinical Psychology Review* **13** (1993), 255–274.
- [52] R. Rogers, R.T. Salekin, K.W. Sewell, A. Goldstein and K.A. Leonard, Comparison of forensic and non-forensic malingerers: a prototypical analysis of explanatory models, *Law and Human Behavior* **22** (1998), 353–366.
- [53] B. Rosenfeld, S.A. Sands and W.G. Van Gorp, Have we forgotten the base rate problem? Methodological issues in the detection of distortion, *Archives of Clinical Neuropsychology* **15**(4) (2000), 349–359.
- [54] R.J. Sbordone, G.D. Seyranian and R.M. Ruff, Are the subjective complaints of traumatically brain injured patients reliable? *Brain Injury* **12**(6) (1998), 505–515.
- [55] R.J. Sbordone, G.D. Seyranian and R.M. Ruff, The use of significant others to enhance the detection of malingerers from traumatically brain-injured patients, *Archives of Clinical Neuropsychology* **15**(6) (2000), 465–477.
- [56] D.J. Slick, E.M.S. Sherman and G. Iverson, Diagnostic criteria for malingered neurocognitive dysfunction: proposed standards for clinical practice and research, *The Clinical Neuropsychologist* **13** (1999), 545–561.
- [57] J.A. Suhr and J. Gunstad, The Effects of Coaching on the Sensitivity and Specificity of Malingering Measures, *Archives of Clinical Neuropsychology* **15** (2000), 415–423.
- [58] J. Suhr, D. Tranel, J. Wefel and J. Barrash, Memory performance after head injury: Contributions of malingering, litigation status, psychological factors, and medication use, *Journal of Clinical and Experimental Neuropsychology* **19**(4) (1999), 500–514.
- [59] J.J. Sweet, P. Wolfe, E. Sattlberger, B. Numan, J.P. Rosenfeld, S. Clingerman and K.J. Nies, Further Investigation of Traumatic Brain Injury Versus Insufficient Effort with the California Verbal Learning Test, *Archives of Clinical Neuropsychology* **15** (2000), 105–113.
- [60] W.N. Tenhula and J.J. Sweet, Double cross-validation of the Booklet Category Test in detecting malingered traumatic brain injury, *The Clinical Neuropsychologist* **10** (1996), 104–116.
- [61] S. Thornhill, G.M. Teasdale, G.D. Murry, J. McEwen, C.W. Roy and K.I. Penny, Disability in Young People and Adults One Year After Head Injury: Prospective Cohort Study, *British Medical Journal* **320** (June 2000), 1631–1635.
- [62] T.N. Tombaugh, The Test of Memory Malingering (TOMM): Normative data from cognitively intact and cognitively impaired individuals, *Psychological Assessment* **9**(3) (1997), 260–268.

- [63] W. Trueblood and M. Schmidt, Malingering and other validity considerations in the neuropsychological evaluation of mild head injury, *Journal of Clinical and Experimental Psychology* **15** (1993), 578–590.
- [64] B. Willer, W.E. Johnson, R.G. Rempel and R.A. Linn, Note concerning misconceptions of the general public about brain injury, *Archives of Clinical Neuropsychology* **8**(5) (1993), 461–465.
- [65] N.D. Zasler and M.F. Martelli, Assessing Mild Traumatic Brain Injury, in: *The American Medical Association Guides Newsletter*, 1998, pp. 1–6.