



Rethink **FUNCTIONAL** Assessment  
Realize **OUTCOMES**

## Integrating the Multidimensional Task Ability Profile in Medical-Legal Evaluation

Applicability with the AMA 6<sup>th</sup> Edition Guides to the Evaluation of Permanent Impairment



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## The Multidimensional Task Ability Profile (MTAP) Introduction

The Multidimensional Task Ability Profile (MTAP) is a web-based and computer-administered patient reported outcome measure designed to assess physical function. The MTAP identifies specific functional limitations and the general effect of these limitations on a person's ability to work, provide self-care in activities of daily living (ADLs), and participate in other home or community activities.

The MTAP assesses a wide range of ADLs, from self-care, to cooking and light housekeeping, to heavy home maintenance and lawn gardening tasks. Through serial testing the MTAP can monitor treatment progress, maximum functional improvement and treatment outcomes. Automated scoring and reporting mechanisms, including the **"Patient Report Card"** and **"Workability Report"** prepared in the patient's native language (English or Spanish), are practical features of the software.

### The Multidimensional Task Ability Profile (MTAP) is utilized to quantify functional limitations that occur in Impairment Ratings.

The MTAP will augment an impairment rating by quantifying and documenting specifically which ADLs and type of functional losses are affected by an impairment (validates the impairment correlated with functional and ADLs loss). In the AMA 6<sup>th</sup> edition, the MTAP scores can help provide a Grade assignment for functional history adjustment (Functional History grade modifier). The Functional Assessment or history considers the functional impact of the condition, disorder or disease.

The AMA Guidelines (5th and 6th Editions), Medicare and the National Institutes of Health currently recommend and describe the importance of utilizing Patient Reported Outcome Measure (PROs) to assess physical function in combination with other objective findings in order to establish impairment, disability, and function. The full body functional assessment capability of the MTAP and its ADLs measurements can be correlated to the majority of musculoskeletal as well as many other organ system impairments that affect physical function and may realize disability.

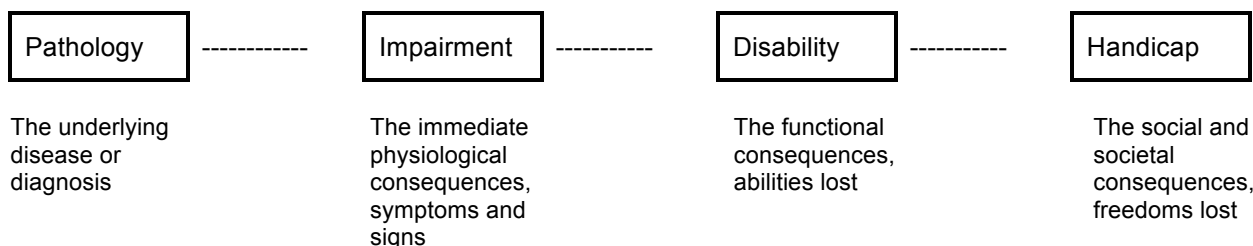
### The AMA 6<sup>th</sup> edition describes an Impairment, Disability and Handicap as:

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

**Disability:** Activity limitation and/or participation restrictions in an individual with a health condition, disorder, or disease.

Impairment ratings enable the physician to render a quantitative estimate of losses of the individual as a result of a health condition, disorder, or disease. Impairment ratings are defined as anatomic, structural/functional and diagnostic criteria; physicians are generally familiar with these criteria based on their broader training and clinical experience. Most physicians are not trained in assessing the full array of human functional activities and participations that require a comprehensive disability determination.

**Figure 1-2 World Health Organization's International Classification of Illness**



**Impairment rating:** Consensus-derived percentage estimate of loss of activity reflecting severity for a given health condition, and the degree of associated limitation in terms of ADLs.

The relationship between impairment and disability remains both complex and difficult, if not impossible, to predict. In some conditions, there is a strong association between level of injury and the degree of functional loss expected in one's personal sphere of activity (mobility and ADLs). The same level of injury is in no way predictive of an affected individual's ability to participate in major life functions (including work) when appropriate motivation, technology, and sufficient accommodations are available. Disability may be influenced by physical, psychological, and psychosocial factors that can change over time.

**The Guides are not intended to be used for direct estimates of: work participation restrictions.** Impairment percentages derived according to the Guides' criteria do not directly measure work participation restrictions. The intent of the *Guides* is to develop standardized impairment ratings to be used.

**In disability evaluation:** the impairment rating is one of several determinants of disablement. Impairment ratings can be readily calculated or estimated by a physician but disability requires further integration of psychological, social, vocational, and avocational issues.

## **Domains of Personal Function.**

There are two domains of human personal function that are most often affected by impairments and for which well-accepted measurement tools exist, and hence they are of particular interest to the impairment rater. These are mobility and "self-care", which can be further defined and categorized as follows.

### **Mobility**

*Transfer:* Movement of one's body position while remaining in the same point in space (e.g. supine to side lying, supine to sit, sit to stand).

*Ambulation:* Movement of one's body from one point in space to another (e.g. walking, stair climbing, wheelchair locomotion).

### **Self-Care**

*Activities of Daily Living (ADLs):* Basic self-care activities performed one's personal sphere (e.g. feeding, bathing, hygiene, and dressing: See Table 1-1).

Table 1-1

Self-Care

Activities of Daily Living (ADLs)

Bathing, showering  
 Bowel and bladder management  
 Dressing  
 Eating  
 Feeding  
 Functional mobility  
 Personal device care  
 Personal hygiene and grooming  
 Sexual activity  
 Sleep/rest  
 Toilet hygiene

Instrumental Activities of Daily Living (IADLs)

Care of others (including selecting and supervising caregivers)  
 Care of pets  
 Child rearing  
 Communication device use  
 Community mobility  
 Financial management  
 Health management and maintenance  
 Home establishment and maintenance  
 Meal preparation and cleanup  
 Safety procedures and emergency responses  
 Shopping

## Functional Assessment.

Functional Assessment or History considers the functional impact of the condition, disorder or disease. Grade assignment for functional symptoms is based on subjective reports that are attributable to the impairment. These reports may include a self-report tool that is administered, scored, and assessed for consistency with the clinical presentation and for credibility. **The guides recommend instruments that incorporate Rasch analysis or other mathematical manipulations to enhance validity and reliability for robust consistency.** Functional History Grade Modifier should be applied only to the single highest Diagnosis-Based Impairment. Specific jurisdictions may modify this process such that Functional History Adjustment is considered for each Diagnosis-Based Impairment or not considered at all as a Grade Modifier.

Table 1-3

ICF Codes and Functional Levels

5-Scale Taxonomy

ICF Code

Xxx.0 NO problem (none, absent, negligible...)  
 Xxx.1 MILD problem (slight, low...)  
 Xxx.2 MODERATE problem (medium, fair...)  
 Xxx.3 SEVERE problem (high, extreme...)  
 Xxx.4 COMPLETE problem (total...)

## Basic Component of the Impairment Template

Each grid has a structure that includes the following components.

- **Impairment class:** 5 classes whenever possible; classes 0 to 4 have been chosen to be consistent with ICF taxonomy.
- **Impairment percentage:** Range within each respective impairment class.
- **Impairment criterion 1:** History of Clinical Presentation - historical data to support the diagnosis-based or regional nature of the impairment class.
- **Impairment criterion 2:** Physical Findings - examination findings for reach impairment class.
- **Impairment criterion 3:** Clinical Studies or Objective Test Results - specified where applicable for each impairment class.
- **Impairment criterion 4:** Functional History or Assessment - evidence of symptomatic dysfunction and functional loss due to impairment. Note: Criterion #4 is best realized by the use of a published PRO.

## Upper Extremity: Steps in Determining Impairment Rating.

When evaluating an individual with an upper extremity impairment, first obtain the patient's detailed history and perform a thorough and careful physical examination; then follow these suggested steps.

1. Record process and results using the Upper Extremity Impairment Evaluation Record.
2. Obtain detailed history and perform appropriate physical examination explained in section 15.1a.
3. Review clinical studies as explained in section 15.1b.
4. Determine diagnoses and those that are to be rated.
5. Determine the DBI for each ratable diagnosis using the regional grids as explained in sections 15.2 and 15.3.
6. **Use the adjustment grids for functional history, physical examination and clinical studies as described in section 15.3a through 15.3c to define the grade modifier for each factor. Functional history adjustment is performed only for the single most significant diagnosis unless otherwise specified or stated by the jurisdiction. (MTAP can Help ID Grade Modifier)**
7. Adjust the DBI as explained in section 15.2.
8. If there is more than one ratable diagnosis, combine the final impairment value at the upper extremity level.

### **Functional History:**

The completed ADLs Questionnaire is evaluated by comparing the individual's answers on the questionnaire to the answers to inquiries about ADL difficulties when the physician takes a history from the individual. Consistency is further evaluated by the physician directly observing the individual performing specific activities.

Additional measure of the consistency of ADL difficulty is to compare the answers on the Activities of Daily Living Questionnaire to the answers on Patient Reported Outcome measures (PRO). Logically, these statements follow the consistency relationship between the answers to the PRO and answers to the Activities of Daily Living Questionnaire.

The physician who is rating the impairment should make allowances for comorbidity that potentially explains illogical answers. Thus, if an individual with a rotator cuff tear indicates difficulty walking due to the rotator cuff tear, the answer is not logical. If, however, the individual also has a significant knee or hip arthritis and bilateral upper limb impairments preclude the use of a cane, the patient's answers about difficulty walking may be logical.

If an individual has multiple answers that are not logical or multiple answers that are not consistent, the PRO should not be used to assign impairment ratings. In this case, Functional History is not used as a Grade Modifier. Respectively, if the PRO possesses Rasch analysis and INFIT/OUTFIT scores, as in the MTAP, consistency will be confirmed mathematically.

A number of self-reported functional assessment measures that address upper extremity function were considered and are listed in Table 15-40. A simple scoring rubric was used to compare the measures, assigning a value of 1 to a "should" criterion that was met and a value of 3 to a "must" criterion that was met. A total score of 66 was possible. At the time the AMA 6<sup>th</sup> edition was published, the *Quick/DASH* appeared to be the most acceptable functional assessment measure. The MTAP is referenced on table 15-40 and scored 55/61 points prior to undergoing Rasch analysis and several publications when the AMA 6<sup>th</sup> edition was published. The MTAP and the HFS possess many of the same upper extremity questions and functional tasks as the Quick DASH and thus possesses a high correlation to each other.

**Table 15-40** Self-Report Functional Assessment Measures

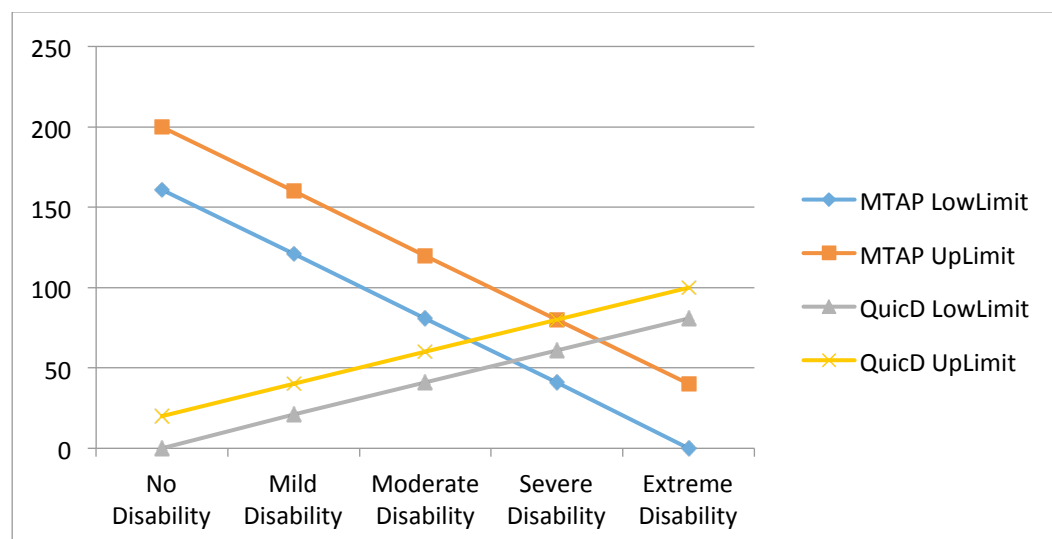
<b>Instrument</b>	<b>Source</b>	<b>Total Score</b>
<i>Quick</i> DASH	Beaton et al, 2005	61
Disabilities of the Arm, Shoulder and Hand (DASH)	Solway et al, 2002; Upper Extremity Collaborative Group 1996	58
Hand Function Sort (HFS)	Matheson et al, 1996, 2001	56
<b>Multidimensional Task Ability Profile (MTAP)</b>	<b>Mayer et al, 2005</b>	<b>55</b>
Functional Health Status Questionnaire (FHS)	Hart & Wright, 2002	54
Upper Extremity Function Scale	Pransky et al, 1997	53
Short Form-36 Health Questionnaire (SF-36)	McHorney et al, 1993, 1994; Ware, 2000; Ware & Sherbourne, 1992	49
Michigan Hand Outcomes Questionnaire (MHQ)	Chung et al, 1998, 1999	48
Sequential Occupational Dexterity Assessment (SODA)	Van Lankveld, 1998; Van Lankveld et al, 1996	45
Individual-Rated Wrist/Hand Evaluation (PRWHE)	MacDermid, 1996; MacDermid & Tottenham, 2004	41
Maximum Total Score		66



**Table 15-7** Functional History Adjustment: Upper Extremities

	<b>Grade Modifier 0</b>	<b>Grade Modifier 1</b>	<b>Grade Modifier 2</b>	<b>Grade Modifier 3</b>	<b>Grade Modifier 4</b>
Class Definitions	No problem	Mild problem	Moderate problem	Severe problem	Very severe problem
	Asymptomatic	Pain/symptoms with strenuous/vigorous activity; +/- medication to control symptoms	Pain/symptoms with normal activity; +/- medications to control symptoms	Pain/symptoms with less than normal activity (minimal); +/- medications to control symptoms	Pain/symptoms at rest; +/- medications to control symptoms
		Able to perform self- care activities independently	Able to perform self-care activities with modification but unassisted	Requires assistance to perform self- care activities	Unable to perform self- care activities
Quick DASH Score	<b>QD: 0-20</b> <b>MTAP 200- 161</b>	<b>QD : 21-40</b> <b>MTAP : 160-121</b>	<b>QD : 41-60</b> <b>MTAP : 120-81</b>	<b>QD : 61-80</b> <b>MTAP : 80-41</b>	<b>QD : 81-100</b> <b>MTAP: 40-0</b>

\*MTAP calibrated to Quick/DASH Functional History adjustment Grid. QD, indicates = Quick/DASH.



\*MTAP calibrated to Quick/DASH scores.

## Spine: Steps in Determining Impairment Rating.

### Diagnosis-Based Impairment

Impairment ratings are calculated using the DBI method in which impairment class (IC) is determined by the diagnosis and specific criteria and then adjusted by considering non-key factors or grade modifiers.

### Functional History

A proper functional history enables the physician to determine the impact of a given spine or pelvis-related condition on basic function and activities as they pertain to ADLs. Cross-validation of the patient's reported functional limitations can occur by observing his or her activities in the examination room. The patient will usually be observed performing simple routine activities, including sitting, standing, walking and transitioning from sit to stand or supine to stand. The physician should note inconsistencies and lack of congruence between reported limitations and observed activities when evident. MTAP PRO scores will help obtain the proper functional adjustment grid after mathematically confirming consistency.

A functional assessment tool may be used in addition to further evaluate this parameter. One example of a functional assessment tool, the Pain Disabilities Questionnaire (PDQ), is included in the AMA 6<sup>th</sup> appendix. The PDQ has been validated as an instrument for quantifying patient reports of function. The physician is expected to weigh the patient's subjective complaints and score on the functional assessment tool relative to the expected severity of a given condition. The grade modifier that reflects functional assessment may or may not be accepted as a variable in the impairment calculation. If multiple regions of the spine are being rated, the examiner should consider the relative contribution of each of these diagnoses to the functional complaints. At the time that the AMA 6<sup>th</sup> edition was published, validated PROs that were recommended included the PDQ. **The MTAP is presently published and validated with the incorporation of Rasch analysis and calibrated to the PDQ and required functional adjustment grids.**

### Steps in Performing an Impairment Rating

1. Perform history and physical examination, and determine if individual is at MMI.
2. Establish the reliable diagnosis for each region of the spine to be rated.
3. Use the appropriate regional grid to determine the impairment class.
4. **Use the adjustment grids to identify the grade modifiers for Functional History, Physical Exam, and Clinical Studies, as applicable. Then apply the Net Adjustment Calculation to determine the net adjustment and modification of the default value "C" within the class.**
5. Use the regional grid to identify the appropriate numerical impairment rating for the impairment class and grade.
6. Combine whole person impairments (WPI) for multiple spinal regions when appropriate using the Combined Values Chart in Appendix at the end of the book.

## Adjustment Grid: Functional History

Grade assignment for Functional History is based on patient self-reports that are attributable to the impairment. Grading is based on the extent to which functional symptoms interfere with different levels of activity as summarized in Table 17-6, Functional History Adjustment. As explained in Section 1.8e, History of Clinical Presentation, in general individuals with no symptoms will be assigned grade modifier 0 and those with constant symptoms accompanied by functional deficits that persist despite treatment will be a grade modifier 4. **MTAP functional score can be used in correlation with Table 16-6 to provide the most appropriate Functional Grade modifier after mathematically confirming consistency.**

Functional History grade modifier should be applied only to the single, highest spine-related DBI if multiple regions are being rated. Specific jurisdictions may modify this process such that Functional History adjustment is considered for each DBI or not considered at all as a trade modifier.

**Table 17-5** Adjustment Grid Summary

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

**Table 17-6** Functional History Adjustment: Spine

Functional History Factor	Grade Modifier 0	Grade Modifier 1	Grade Modifier 2	Grade Modifier 3	Grade Modifier 4
Activity	Asymptomatic; problem resolved; inconsistent symptoms	Pain; symptoms with strenuous/vigorous activity	Pain; symptoms with normal activity	Pain; symptoms with less than normal activity (minimal activity)	Pain; symptoms at rest, limited to sedentary activity
PDQ or alternative validated functional assessment, scaled appropriately	No Disability PDQ 0  <b>MTAP : 200-181</b>	Mild disability PDQ 0-70  <b>MTAP : 180-141</b>	Moderate disability PDQ 71-100  <b>MTAP :140-91</b>	Severe disability PDQ 101-130  <b>MTAP : 90-41</b>	Extreme disability PDQ 131-150  <b>MTAP :40-5</b>

\*PDQ indicates Pain Disabilities Questionnaire. MTAP Indicates: Multidimensional Task Ability Profile

## **Lower Extremities: Steps in Determining Impairment Rating.**

1. Perform history and examination and determine if individual is at MMI.
2. Establish the appropriate diagnosis for each part of the lower limb to be rated.
3. Use the regional grid in the corresponding region to determine the associated class.
4. **Use the adjustment grid and the grade modifiers, including functional history, physical exam, and clinical studies, to determine what grade of associated impairment should be chosen within the class defined by the regional grid.**
5. Use the regional grid to identify the appropriate impairment rating value for the impairment class, modified by the adjustments as calculated.
6. Combine lower extremity percentage using the Combined Values Chart in the same extremity as appropriate. If both lower extremities are involved, convert impairments to whole person and combine.

### **Adjustment Grid: Functional History**

Grade assignment for functional symptoms is based on subjective reports that are attributable to the impairment. Grading is based on the extent to which functional symptoms interfere with different levels of activities as summarized in Table 16-6, Functional History Adjustment. As explained in Section 1.8e, History of Clinical Presentation, in general, individuals with no symptoms will be assigned grade modifier 0, and those who are non-ambulatory will be assigned grade modifier 4. **MTAP functional score can be used in correlation with Table 16-6 to provide the most appropriate Functional Grade modifier after mathematically confirming consistency.**

Functional history grade modifier should be applied only to the single, highest diagnosis-based impairment (DBI). Specific jurisdictions may modify this process such that functional history adjustment is considered for each diagnosis-based impairment (DBI) or not considered at all as a grade modifier.

**Table 16-6** Functional History Adjustment - Lower Extremities

	<b>Grade Modifier 0</b>	<b>Grade Modifier 1</b>	<b>Grade Modifier 2</b>	<b>Grade Modifier 3</b>	<b>Grade Modifier 4</b>
<b>Class Definitions</b>	<b>No problem</b>	<b>Mild problem</b>	<b>Moderate problem</b>	<b>Severe problem</b>	<b>Very severe problem</b>
Gait Derangement	None	Antalgic limp with asymmetric shortened stance, corrects with foot- wear modifica- tion and/or orthotics	Antalgic limp (in the presence of objectively defined sig- nificant path- ology) with an asymmetric, shortened stance; stable with use of external orthotic device (e.g. ankle-foot orthosis) routine use of single gait aid (cane or crutch) or positive Tren- delenburg test	Antalgic/un- stable transfers and ambulation requires routine use of gait aids (2 canes or crutches) or KAFO brace.	Nonambulatory
AAOS Lower Limb Instrument (or other inventory)	Normal  <b>MTAP 200-181</b>	Mild deficit  <b>MTAP : 180-141</b>	Moderate deficit  <b>MTAP : 140-91</b>	Severe deficit  <b>MTAP : 90-41</b>	Near total to total deficit <b>MTAP : 40-5</b>

\*MTAP scores calibrated to lower extremity adjustment grids and will need to be correlated clinically to gait and functional history.

## **Pain: Steps in Determining Impairment Rating.**

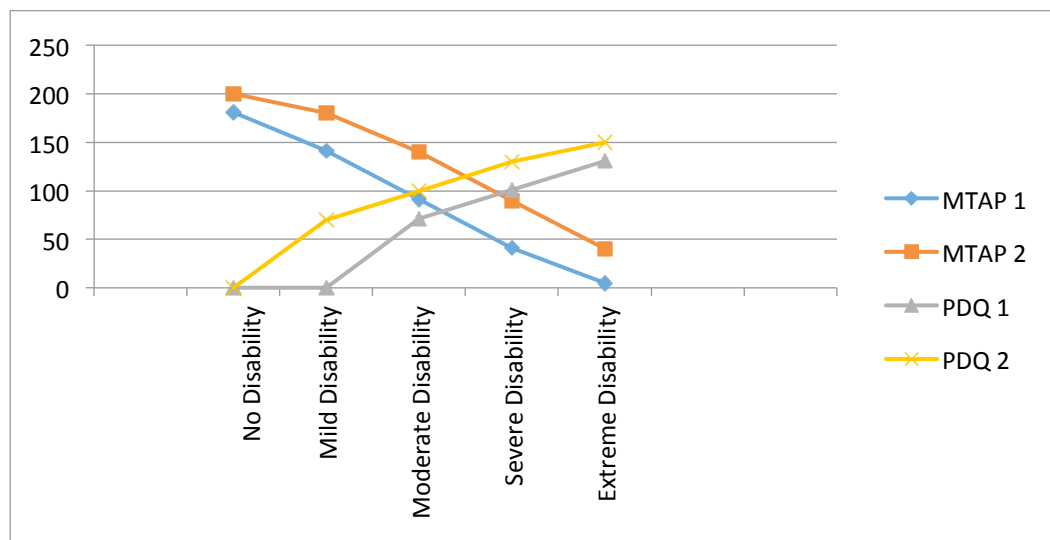
### **Steps of Assessment**

1. Determine that the patient meets the general criteria for performing an impairment rating, as described in Chapter 2. In particular, determine that the patient is medically stable (i.e. has reached Maximum Medical Improvement or MMI).
2. Determine that the patient meets eligibility/criteria for rating PRI. They are:
  - a. Pain has been determined to have a reasonable medical basis; for example, can be described by generally acknowledged medical syndromes.
  - b. Pain has been identified by the patient as a major problem.
  - c. The patient's condition cannot be rated according to principles described in Chapters 4 to 17.
  - d. The PRI rating is not specifically excluded by relevant jurisdiction.
3. If the patient meets criteria for PRI assessment, have him or her fill out the PDQ (Appendix 3-1). Instructions for scoring the PDQ appear in Appendix 3-2.
4. **Determine the patient's presumptive WPI percentage by consulting Table 3-1. As can be seen, by using the categorization of PDQ scores reviewed in Section 3.3c, one can quantify the functional status of the patient. Cross check and correlate MTAP scores and WPI.**
5. Make a clinical judgment about the reliability and credibility of the patient's presentation and modify the presumptive award accordingly within the range available for PRI (0% to 3% WPI). Usually the modification will be in the direction of lowering the award for a patient whose credibility is suspect. However, the examiner has the option of increasing the award (within the limits of the allowable cap) if he or she concludes that a patient has understated the burden of illness.

**Table 3-1**

Pain-Related Impairment and Whole Person Impairment Based on Pain Disability Questionnaire

Degree of Pain Related Impairment	PDQ	MTAP	Whole Person Impairment (%)
None	0	200-181	0
Mild	1-70	180-141	0
Moderate	71-100	140-91	1
Severe	101-130	90-41	2
Extreme	131-150	40-5	3



*\*MTAP calibrated to PDQ scores.*

## Functional Assessment and Impairment, Revisited...

Grade assignment for functional symptoms is based on subjective reports that are attributable to the impairment. These reports may include a self-report tool that is administered, scored, and assessed for consistency with the clinical presentation and for credibility. **The guides recommend instruments that incorporate Rasch analysis or other mathematical manipulations to enhance validity and reliability for robust consistency. MTAP reports include internal reliability checks via INFIT/OUTFIT scores mathematically confirming consistency.**

Published and validated patient reported functional outcomes tools like the MTAP (PDQ or other) allow the physician to standardize the manner in which they choose a Functional History grade modifier. Moreover, the MTAP reporting and specific ADLs category loss can be directly incorporated into the Med Legal report to further describe the impact of the impairment on ADLs and the entire MTAP report can be referenced for complete details.

In order to describe clinical correlation between impairment and ADL deficits, the following example is described: a 50% to 70% Whole Person Impairment (WPI) indicates a severe organ or body system impairment and the lower level ADLs such as Self Care will be highly affected, moreover, the patient will be unable to perform any medium and higher level ADLs. An individual with this type of high WPI will likely be institutionalized or reliant on others for assistance on

self-care, cooking, light housekeeping and transportation. At an extreme level of low function, an individual with 90-100% WPI would be fully dependent on self-care, approaching death. Respectively, where there are minor or lower level impairments, for example: 5% WPI, then the higher level ADLs such as Heavy Housekeeping, Lawn and Garden tasks will be affected and lower level ADLs such as self-care, cooking and housekeeping affected to a lesser extent.

Prior to utilizing the MTAP score to derive to the proper functional history grid modifier, it is important to determine reliability of the test by observing the consistency score on the Health and Behavioral Assessment Report. The INFIT and OUTFIT scores that are in excess of 1.50 indicate unacceptable inconsistency and require clinical confirmation. Once the consistency of the test is verified, the MTAP results can be incorporated into the Med Legal report.

### **Through the IRT and Rasch analysis, the MTAP is validated for clients with secondary gain**

The MTAP was validated on a diverse patient population, including thousands of patients from the workers' compensation and personal injury systems, in which secondary gain is an ever-present issue. The INFIT and OUTFIT scores have been found to be sensitive to outlier responses that allow the clinician to address complex polytrauma cases. In the absence of polytrauma, INFIT and OUTFIT scores that are in excess of 1.50 indicate unacceptable inconsistency and require clinical confirmation. In addition to the manifestation of adverse psychosocial behaviors, some possible reasons for inconsistent INFIT and OUTFIT scores may include but not limited to: poor language proficiency, the misunderstanding of items or questions due to poor literacy, or cognition difficulties. Clinical correlation and or additional psychometric testing is advised with high or unreliable INFIT/OUTFIT scores.

*Example: Consistent and Inconsistent: INFIT/ OUTFIT scores can be found under Response Consistency section of the Health and Behavioral Assessment Report below (pg. 17).*

#### **Inconsistent INFIT/OUTFIT scores example report verbiage:**

The patient Physical Function score is 11/200 via the MTAP standardized functional outcome tool and demonstrates inconsistent responses. The Health and Behavioral Assessment report notes that the INFIT (2.15) and OUTFIT (4.05) scores that are in excess of 1.50 indicate unacceptable inconsistency and require clinical confirmation.

#### **Consistent INFIT/OUTFIT scores example report verbiage:**

The patient Physical Function score is 113/200 via the MTAP standardized functional outcome tool and demonstrates consistent responses. The Health and Behavioral Assessment report notes that the INFIT (0.61) and OUTFIT (0.86) scores that are below 1.50 indicating acceptable consistency. This demonstrates valid and reliable outcome responses that can be clinically confirmed.

\*Examples of actual AMA 6th Impairment ratings are found in Appendix A, pgs. 29-36



Test Physical Therapy

**Multidimensional Task Ability Profile**  
Health and Behavioral Assessment

**Junior Hernandez**  
(Current) Test A = 08/31/14

1 = Able      2 = Slightly Restricted      3 = Restricted      4 = Very Restricted      5 = Unable      ? = Don't Know

Question	A	Question	A
1) Use a spoon to eat a bowl of soup.	2	26) Unload two 10-pound (4.5-kg) grocery bags from the trunk of an automobile.	2
2) Make a shopping list with a pencil.	2	27) Drive a wood screw with a large screwdriver.	1
3) Turn a lever knob to open a door.	1	28) Use a garden rake to collect leaves from a lawn.	2
4) Pour a cup of coffee from a coffee pot.	3	29) Sand a table with an electric sander.	1
5) Cut a piece of steak with a fork and sharp knife.	2	30) Cut a piece of wood with a hand saw.	2
6) Walk 200 feet (61 m) on a sidewalk.	2	31) Break loose a rusted nut with a hex wrench.	2
7) Cut a coupon from a cereal box.	1	32) Trim a tree with a long handled shear.	4
8) Peel a potato with a potato peeler.	1	33) Unload 20-pound (9.1-kg) grocery bag from the trunk of an automobile.	3
9) Turn a large nut on a bolt until it is finger tight.	2	34) Carry 20-pound (9.1-kg) sack of groceries for 100 feet (30.5 m).	2
10) Walk up a few stairs.	2	35) Lift 20-pound (9.1-kg) tool box from the floor to a bench.	3
11) Remove the lid of a soup can with a rotary opener.	1	36) Lift 20-pound (9.1-kg) milk crate from the floor to eye-level.	4
12) Get out of an automobile driver's seat.	2	37) Use an automobile jack to lift a car.	3
13) Drive a screw with a small screwdriver.	2	38) Dig a hole with a spade shovel to plant a small tree.	3
14) Walk up flight of stairs.	2	39) Carry 20-pound (9.1-kg) bucket up a step-ladder.	3
15) Change a light bulb overhead.	3	40) Use a T-handle wrench to remove automobile lug nuts.	3
16) Climb a step-ladder.	2	41) Carry 30-pound (13.6-kg) bucket in one hand for 50 feet (15.2 m).	4
17) Retrieve a small tool from the floor.	1	42) Use a hoe to mix cement in a wheelbarrow.	3
18) Hammer a large nail into a piece of lumber.	1	43) Drive a stake with a sledge hammer.	4
19) Use a roller to paint an interior wall.	2	44) Carry 50-pound (22.7-kg) crate for 50 feet (15.2 m).	4
20) Hike mile (1.6 km) on a trail in the woods at a leisurely pace.	2	45) Lift 50-pound (22.7-kg) milk crate from the floor to a bench.	4
21) Remove a large nail from a piece of lumber with a claw hammer.	2	46) Lift 50-pound (22.7-kg) milk crate from the floor to eye-level.	4
22) Crawl under a dinner table to retrieve a spoon.	1	47) Push a full wheelbarrow up a ramp.	4
23) Sweep a driveway with a push broom.	2	48) Lift 100-pound (45.4-kg) milk crate from the floor to a bench.	5
24) Use a pair of pliers to tighten a sprinkler.	2	49) Carry 100-pound (45.4-kg) crate for 50 feet (15.2 m).	4
25) Sit in an armchair at a theatre for 2 hours.	3	50) Lift 100-pound (45.4-kg) milk crate from the floor to eye-level.	5

Summary:					Test notes:
Exam	Pain Intensity	Present Health	Start Time	Duration	
A	1	2	6:43 pm	12 minutes	
Pain Intensity: 1-10 (0=No pain; 10=Worst imaginable pain)					
Present Health: 1-4 (1=Excellent; 2=Good; 3=Fair; 4=Poor)					

Response Consistency (Current Test)	
Junior Hernandez is a male in the 'B' age group. Therefore, the statistical match between Junior Hernandez's reported ability and the difficulty of items near his expected ability level is <b>Consistent</b> (INFIT = 0.61). The global statistical match between ability and items at the extremes of difficulty (i.e. very easy and very difficult) is <b>Consistent</b> (OUTFIT = 0.86).	
INFIT and OUTFIT Scores: < 1.5 Consistent; > 1.5 Inconsistent. NOTE: Clinical correlation is advised for inconsistent scores. When there are multiple areas of impairment, individual item responses may be accurate but can lead to inflated INFIT and OUTFIT scores.	

INFIT and  
OUTFIT  
scores →

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## MTAP “Patient Report Card” and corresponding ADLs and Typical Energy Required (METs) in each ADL Category.

### Test Physical Therapy      Multidimensional Task Ability Profile      Junior Hernandez REPORT CARD      November 10, 2014

#### Overall Physical Ability

Your current Physical Ability Score is 179 on a 0-200 scale. This demonstrates an improvement of 43% in physical functioning since August 31, 2014.

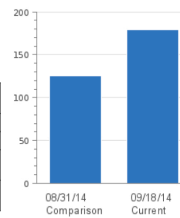
#### Activities of Daily Living (ADLs)

Your ability to perform ADLs has improved 41% since August 31, 2014.

#### Ability to Perform

ADL Category	Comparison 08/31/14	Current 09/18/14
Self Care	Many 79%	Almost all 90%
Cooking, Light House Keeping	Almost all 81%	Almost all 90%
Heavy Housekeeping, Light Gardening, Home Maintenance	Many 64%	Almost all 93%
Outside Home Repair, Lawn and Garden Maintenance	Few 27%	Almost all 81%

Progress Between Tests



#### Physical Demand Characteristics (PDC) of Work

You are able to meet the physical demands for jobs in the Medium work category according to the PDC levels defined by the U.S. Department of Labor. This is an improvement from your PDC level of Light on August 31, 2014.

#### Improvement Potential

You indicated that you have some restrictions with tasks such as those shown below. Let us know if we do not seem to be adequately addressing problems such as these, or if you have recently experienced difficulty in these areas. Most importantly, let us know if you are experiencing difficulty with other tasks that you regularly perform at work or home. We want to do everything we can to help you improve your physical abilities.



Hammer a large nail into a piece of lumber.



Lift 100-pound (45.4-kg) milk crate from the floor to a bench.

Please let us know how we can continue to assist you. Have a great week!

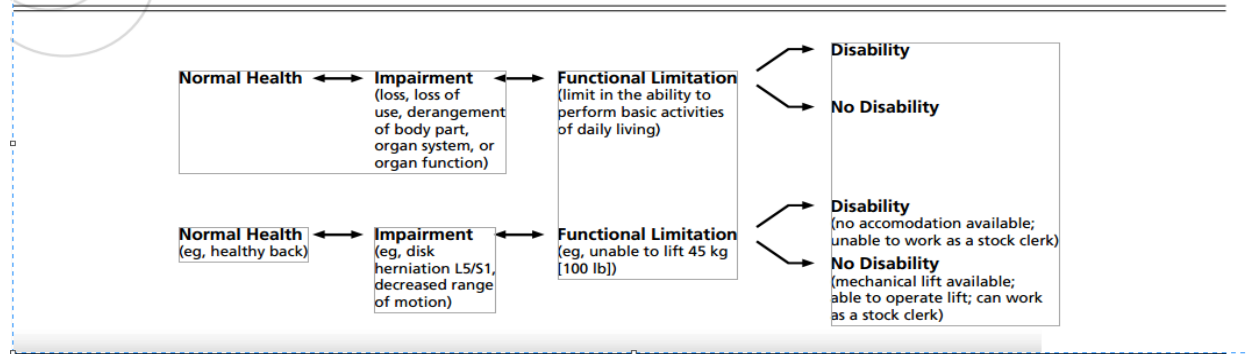
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Provider Signature: \_\_\_\_\_

ADL SELF CARE	HEAVY HOUSEKEEPING / LIGHT HOME MAINTENANCE
<b>1.0-2.5 METS</b>	<b>3.5-5.0 METS</b>
bathing or showering, sitting	bathing dog, large
dressing & undressing, standing or sitting	cleaning, house or cabin, general
getting ready for bed, in general	mopping floors
grooming (washing, brushing teeth)	mowing lawn, riding mower
having hair cut or shampooed by someone else	packing/unpacking boxes
low demand sexual activity	picking fruit off trees, picking fruits/vegetables
placing food on plate, cutting food, eating	planting seedlings, shrubs
sitting on toilet, cleaning self	playing active sports with child(ren)
opening containers & taking medication	raking leaves off lawn
talking and eating	trimming shrubs or bushes by hand
<b>LIGHT HOUSEKEEPING</b>	<b>HEAVY HOME MAINTENANCE</b>
<b>1.5-4.0 METS</b>	<b>4.5-6.0 METS</b>
bathing dog, small carpentry, outside	carpentry, outside
child care, seated (dressing, bathing, feeding)	carpentry, refinishing cabinets or furniture
cooking or food preparation	cleaning gutters
gathering clothes to pack, packing suitcase	clearing land, hauling branches
ironing clothes	digging, spading, filling garden, composting
laundry, fold or hang clothes	gardening with heavy power tools
making bed	gardening, general
packing/unpacking boxes, light	hanging storm windows
playing low demand sports with child(ren)	mowing lawn, general
putting away groceries, carrying packages	mowing lawn, walk, hand mower
serving food, setting table	mowing lawn, walk, power mower
knitting, sewing, or wrapping presents	painting, outside home
sweeping floor or sidewalk	painting, papering, plastering, scraping
vacuuming carpet	planting trees
washing dishes	trimming trees
watering lawn or garden, standing or walking	washing fence, painting fence
watering plants	weeding, cultivating garden

## Addressing more complex ADLs, Work and disability.

**Figure 1-1** The Relationship Among the Concepts of Normal Health, Impairment, Functional Limitation, and Activity Disability (Performance Limitation)



**The Guides are not intended to be used for direct estimates of: work participation restrictions.** Impairment percentages derived according to the Guides' criteria do not directly measure work participation restrictions. The intent of the *Guides* is to develop standardized impairment ratings to be used.

**In disability evaluation:** the impairment rating is one of several determinants of disablement. Impairment ratings can be readily calculated or estimated by a physician but disability requires further integration of psychological, social, vocational, and avocational issues.

The medical judgment used to determine the original impairment percentages could not account for the diversity or complexity of work but could account for daily activities common to most people. Work is not included in the clinical judgment for impairment percentages for several reasons: (1) work involves many simple and complex activities; (2) work is highly individualized, making generalizations inaccurate; (3) impairment percentages are unchanged for stable conditions, but work and occupations change; and (4) impairments interact with such other factors as the worker's age, education, and prior work experience to determine the extent of work disability.

For example, an individual who receives a 30% whole person impairment due to pericardial heart disease is considered from a clinical standpoint to have a 30% reduction in general functioning as represented by a decrease in the ability to perform activities of daily living. For individuals who work in sedentary jobs, there may be no decline in their work ability although their overall functioning is decreased. Thus, a 30% impairment rating does not correspond to a 30% reduction in work capability. Similarly, a manual laborer with this 30% impairment rating due to pericardial disease may be completely unable to do his or her regular job and, thus, may have a 100% work disability.

As a result, impairment ratings are not intended for use as direct determinants of work disability. When a physician is asked to evaluate work-related disability, it is appropriate for a physician knowledgeable about the work activities of the patient to discuss the specific activities the worker can and cannot do, given the permanent impairment.

## The MTAP “Workability Report” information can be incorporated into the Medical Legal report and help describe the residual function, ability to perform ADLs and complex activities such as work

The MTAP has been calibrated to then Department of Labor Physical Characteristics of Work (PDC) and therefore can assist physicians with more complex ADLs and work capacity to develop work restrictions or assist with disability. Identify any medical consequences for performing activities of daily living. The physician should also identify any medical consequence of performing work. If requested, the physician may need to analyze different job tasks to determine if an individual has the residual function to perform that complex activity.

The MTAP reporting will provide the current baseline work PDC including: Unemployable, Sedentary, Light, Medium, Heavy and Very Heavy Work PDC categories as described by the US Department of Labor. This information will help guide clinical decisions and provides a simple tool to establish permanent and temporary work restrictions. When serial testing is performed work progress can be verified and the work restriction adjusted until a plateau is established. Descriptions and details of the MTAP linkage with PDC tables are noted below, including PDC chart.

The Workability Report notes the patient's occupation, job demands, and present PDC work level. Moreover the report compares the present work ability to the job requirements and describes if the patient's work status is adequate; below or above the job demands. This information can be easily incorporated into Med Legal Reports for Total Partial Disability (TPD), Total Temporary Disability (TTD), restrictions or modified duty status and permanent work restrictions.

### Example Work Restrictions:

Mr. Smith's job title of Carpenter requires **Heavy** lifting and carrying physical demands from 50 to 100 lbs. As of 10-7-14 he has improved 74% in physical function and can perform **Medium** work physical demands from 20-50 lbs. This MTAP workability report is consistent and correlates to the patient's history, physical exam, diagnostics and his responses to treatment.

Due to Mr. Smith's improvement to date, it is recommended he return to work modified duty eight hours per day and be precluded from **Heavy** work > 50 Lbs. He may be allowed to perform **Medium** work lifting or carrying from 20-50 lbs. Repetitive above shoulder work > than 20 lbs. should also be avoided due to the most recent RTC surgical procedure.

The patient's work status will be updated in 3-4 weeks once work conditioning and physical therapy are completed. Once he meets the **Heavy Work** physical demands, he will return to full unrestricted duties as a Carpenter.

Please see MTAP Workability report November 10<sup>th</sup>, 2014 for complete details.



## Multidimensional Task Ability Profile Workability Report

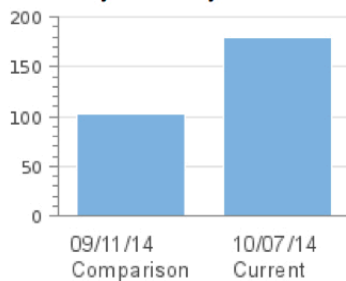
**Darrell Bruga**  
January 19, 2015

### Job Title and Work Demands

Your overall Physical Ability score is 179 on a scale of 0-200. This independent test demonstrates an improvement of 74% in physical functioning since September 2014.

Your current job title, Carpenter, requires physical demands in the **Heavy (50-100 lbs.)** work category according to the Physical Demands Characteristics (PDC) levels defined by the U.S. Department of Labor.

Overall Physical Ability



Physical Demand Characteristics of Work

<sup>1</sup> Current PDC Level. <sup>2</sup> Target PDC Level

Physical Demand Level	Occasional 0-33% of the workday	Frequent 34-66% of the workday	Constant 67-100% of the workday	Typical Energy Required
Sedentary	10 lbs.	Negligible	Negligible	1.5-2.1 METS
Light	20 lbs.	10 lbs.	Negligible	2.2-3.5 METS
Medium <sup>1</sup>	20 to 50 lbs.	10 to 25 lbs.	10 lbs.	3.6-6.3 METS
Heavy <sup>2</sup>	50 to 100 lbs.	25 to 50 lbs.	10 to 20 lbs.	6.4-7.5 METS
Very Heavy	Over 100 lbs.	Over 50 lbs.	Over 20 lbs.	Over 7.5 METS

### Workability

Based on today's MTAP testing you are able to meet the physical demands for jobs in the **Medium (20-50 lbs.)** PDC work category. Therefore you are below your occupational demands. The **Medium PDC** level is an improvement of 74% from September 2014. One of the primary rehabilitation goals will be to enable you to safely and dependably return to work or accommodate to modified or full duty activities. A home exercise plan to achieve your functional goals will be included.

### Improvement Potential

You indicated that you have some restrictions with tasks such as those shown below. Let your provider know if these problems are not being adequately resolved, or if you have recently experienced difficulty with other tasks that you regularly perform at your work or home.



Lift 100-pound (45.4-kg) milk crate from the floor to a bench.



Carry 100-pound (45.4-kg) crate for 50 feet (15.2 m).

Please let us know how we can continue to assist you. Have a great week!

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Provider Signature: \_\_\_\_\_

## How was the MTAP linked and compared to the PDC external work measurements?

The MTAP collects information about physical performance ability and compares it to external work standards to help guide decisions related to work preparedness. Rather than simply collect information about physical performance ability in general, the linking of items to work standards provides the possibility of a crosswalk from MTAP scores to ratings on external scales that are used for return to work, modified work duties or permanent work restrictions.

The development and selection of MTAP items includes the “Physical Demand Characteristics of Work” categorization of the strength demands of jobs, which was developed by the United States Department of Labor. This scale is used in the job analysis systems that the United States Department of Labor has published and used to collect data for the Dictionary of Occupational Titles (DOT). Although the DOT has itself been abandoned by the United States Department of Labor in favor of the O\*NET system, the PDC system continues to be used in rehabilitation around the world and has been adopted by the Economic Resources Institute for the eDOT project, which continues to collect job analysis data in a rapid and dynamic electronic model using the Internet. The PDC categorization system is an important external reference for the MTAP due to widespread adoption by rehabilitation professionals. It allows MTAP scores to be linked to all jobs that are classified according to PDC level. Additional external linkages are available, including linking MTAP responses to levels of activities of daily living (ADL), instrumental activities of daily living (IADL), and to the EPIC Lift Capacity (ELC) test.

### Physical Demand Characteristics (PDC) of Work.

Physical Demand Level	Occasional 0-33% of the workday	Frequent 34%-66% of the workday	Constant 67%-100% of the workday	Typical Energy Required
<b>Sedentary</b>	10 lbs.	Negligible	Negligible	1.5 - 2.1 METS
<b>Light</b>	20 lbs.	10 lbs.	Negligible	2.2 - 3.5 METS
<b>Medium</b>	20 to 50 lbs.	10 to 25 lbs.	10 lbs.	3.6 - 6.3 METS
<b>Heavy</b>	50 to 100 lbs.	25 to 50 lbs.	10 to 20 lbs.	6.4 - 7.5 METS
<b>Very Heavy</b>	Over 100 lbs.	Over 50 lbs.	Over 20 lbs.	Over 7.5 METS

(U.S. Department of Labor, 1972)



Pictures allow for calibration and MTAP items are *linked* to demonstrable physical ability



PDC Level: Heavy



PDC Level: Heavy

## How can the MTAP assist with return to work?

An important focus of the MTAP is the functional capacity of the evaluatee in terms of the demands of competitive employment. This focus allows important comparisons to job demands data. The comparison between the MTAP and the United States Department of Labor Physical Demands Characteristic system allows a crosswalk of the MTAP results and interpretation in terms of the evaluatee's ability to work. The Ability Scores of applicants, employees, and workers returning from medical leave can be compared to the difficulty of the job tasks, allowing the decision-making of employers, health care professionals, and insurance claims professionals to have a strong and defensible objective basis. Most importantly, the MTAP Workability Report and Patient Report card are useful tools to help promote discussions between patients and providers regarding functional improvement and stimulate return to work.

## The MTAP was cross validated and compared with “Objective” Functional Capacity Testing (FCE).

A Functional Capacity Evaluation (FCE) is a comprehensive battery of objective performance based tests that is routinely used to determine ability for work, leisure or activities of daily living. FCEs can help determine decisions about: treatment effects (comparing baseline performance and progress), return-to-work and job-placement decisions, impact on work performance of leisure and non-work-related illness and injuries, disability and impairment reporting, treatment plans and case management. The Employment Potential Improvement Corporation (EPIC) or EPIC Lift Capacity (ELC) compared in research studies to the MTAP, is an evidenced based FCE that is well published and utilized as one of the gold standard FCEs utilized worldwide.

The MTAP uses sophisticated statistical analyses including item response theory (IRT) and Rasch analysis to calibrate MTAP items with actual objective testing (FCE) in order to maximize the precision of assessing an individual's overall function. This modern approach to test analysis provides a more robust item calibration and proportional evaluation of total scores. The MTAP was found to be highly correlated to the EPIC Lift Capacity (ELC) test. The MTAP is reliable ( $r = 0.98, p < 0.05$ ) and correlates highly with actual physical function as assessed during objective FCE lifting tasks ( $r = 0.89, p < 0.05$ ).

## EPIC Lift Capacity/ELC:



Note: The subject wears a heart monitor during the FCE to continuously record performance data while they lift, carry and perform various work tasks with blinded weights. The EPIC/ELC possesses published normative performance data that allow comparison within age and gender categories.

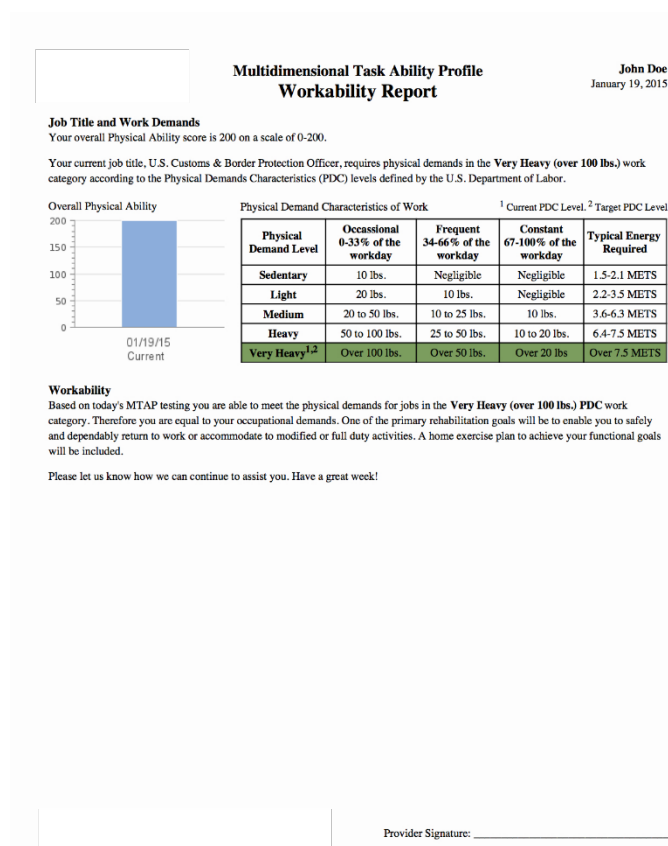
### **Should the MTAP be utilized in combination with FCE testing?**

The robust predictive ability of the MTAP allows it to be used in conjunction or in place of traditional objective performance measures that may be more time-consuming, impractical and expensive. Many FCEs possess performance tests that are routinely provided but do not help determine the disability reporting or return to work (RTW) conclusions. A self-report score indicating adequate ability in one or another FCE construct provides justification to not test that construct unless there is some other reason to test. Given the demonstrated linkages between the MTAP and the EPIC Lift Capacity test, it is now possible to check consistency of effort across platforms, using different measurement systems. Conversely, when the results of one test confirm the results of the other test, the results of both can be accepted with increased confidence.

For example, the real-time use of the MTAP by the patient in parallel with a functional capacity evaluation will identify mismatches. The FCE professional's resolution of the mismatch should sharpen the disability determination and improve intervention and patient compliance.



## MTAP Workability report VS FCE summary sheet.



## Spine and Sport Functional Capacity Evaluation Summary Page

Patient: John Doe Date: March 29, 2013 Age: 38 Weight: 215 lb. Height: 76"

Referral Source: Veterans Administration Date of injury: January 2007 Claim# XXXXXX8157

Referring Provider Nguyen, Quinh-Giaol, MPl Authorization# 305049-4

Employer: U.S. Customs & Border Protection Job Title: U.S. Customs & Border Protection Officer

DIAGNOSIS: Degenerative disc disease, lumbar spine Blood pressure: 125/85mmHg

More than four hours of physical testing, report preparation, research, calculations and editing were performed in the completion of this Functional Capacity Evaluation.

The information contained in this report is intended to be used in conjunction with the physician's assessment of the patient when determining return to work status. Please call if you have any questions or need additional information regarding the Functional Hand Evaluation.

Subjective Complaints:	Usual Pain Severity: <b>0-1/10</b>	Worst Pain Severity: <b>9/10</b>
	Usual Pain Frequency: <b>Intermittent</b>	Worst Pain Frequency: <b>Occasional</b>
Perceived Ability:	Multidimensional Task Ability Profile (MTAP): <b>200/200, Very Heavy Work</b>	
Waddell's Nonorganic Signs:	Total Score = <b>0/5</b> (Scores of 3 or more are significant for nonorganic physical signs)	
Reliability:	Tested <b>reliable</b> on all aspects of the FCE. Consistent global effort.	
Objective PDC:	<b>Very Heavy Work, up to 100 pounds</b>	
Pinch Strength:	<b>Excellent bilaterally.</b>	
Jamar Power Grip:	<b>Excellent bilaterally</b>	
Hand Dexterity:	<b>Average bilaterally</b>	
Functional Occupational Duty Simulation:	<b>Able to perform</b> all essential job duty simulation for U.S Customs & Border Protection	

### Normative Data for EPIC Tests:

#### Lifting Capacity:

% Loss of Lift Capacity

**0%**

*\*Note: The % Loss of Lift Capacity, Disability Category determinations, and Work Restrictions outlined in this report are based entirely on FCE objective measurements and do not take into consideration subjective factors of disability, or the primary treating physician's clinical opinions.*

## What is the science behind the MTAP that helps objectify subjective information? MTAP incorporates the item response theory (IRT) and Rasch Analysis to provide a more robust patient reported outcome tool.

Although item calibration and rating scale calibration is widespread in the field of Education, the need for such calibration has only recently been appreciated in Healthcare. Educators have recognized the problems created by the use measurements from non-calibrated instruments for decades, resulting in the development of computer-intensive analytic methods to empirically calibrate items and rating scales with item response theory (IRT) models. The IRT approach to measurement is based on the assumption that the relationship between each evaluatee and each item is necessary to understand, requiring statistical methods that investigate the relationship.

The item calibration and Rasch analysis includes the ability to predict how a subject or evaluatee would likely answer or respond to certain items to a high degree of probability. The Rasch item response theory provides an INFIT score as an indicator of responses different from the expected response pattern on items near the ability level of the evaluatee. This INFIT score provides a method to examine reliability of the match of the evaluatee to the items. The OUTFIT score

is sensitive to items that are outliers, either very easy or very difficult, compared to the evaluatee's Ability score. This OUTFIT score reflects unusual responses that are at the extremes of the evaluatee's Ability score.

In recent years, the methods of Rasch and other item response theorists have been applied in Healthcare to improve the psychometric reliability and validity of measures and are being used in the National Institutes of Health Patient Reported Outcomes Measurement Information System (PROMIS) project. These procedures allow the proportional calibration of ordinal self-report items on an interval scale. This improves the reliability and validity of the instrument and allows higher levels of sensitivity and specificity.

### **The MTAP consistent with EBM guidelines and has established validity and reliability testing.**

The MTAP meets the new recommendations for documentation of patient reported functional outcome measures (Medicare, Official Disability Guidelines (ODG), American College of Occupational and Environmental Medicine (ACOEM), and the American Medical Association (AMA) Guides to the Evaluation of Permanent Impairment, 5th and 6th editions).

Reliability and validity was established in J Occ Med, Mayer, et al., 2005. Subsequent studies followed with item response theory calibration (IRT) and Rasch analysis, J Occ Med, Matheson, et al., 2006. Validated to actual physical performance (FCE's), The Spine Journal, Vert Mooney, et al., 2010. Additional reliability, validation and cross-cultural adaptation to Spanish, Verna, et al., 2012. Several additional studies have been published with comparison to various outcome measures and FCEs, which are readily available on PUB Med: <http://www.ncbi.nlm.nih.gov/pubmed>.

## MTAP Validity, Reliability, EBM and Publications

### Peer-Reviewed Manuscripts

Verna JL, Matheson LN, Gables S, Hause R, Mayer JM. Development and Reliability Testing of Spanish Language and English Language Versions of the Multidimensional Task Ability Profile. *Journal Occupational Rehabilitation*, 2013 Jun;23(2):220-7.

Mooney V, Matheson LN, Verna JL, Leggett S, Dreisinger T, Mayer J. Performance-integrated self-report measurement of physical ability. *The Spine Journal* 10 (2010) 433–440.

Matheson L, Mayer JM, Mooney V, Sarkin A, Dreisinger T, Verna J, Leggett S. A method to provide a more efficient and reliable measure of self-report physical work capacity for patients with spinal pain. *Journal of Occupational Rehabilitation*, 2008;18(1):46-57.

Mayer JM, Mooney V, Matheson LN, Erasala GN, Verna JL, Udermann BE, Leggett S. Continuous low-level heat wrap therapy for the prevention and treatment of delayed onset muscle soreness of the low back muscles *Archives of Physical Medicine and Rehabilitation*, 2006;10.

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Mayer JM, Mooney V, Matheson LN, Leggett S, Verna JL, Balourdas G, DeFilippo G. The reliability and validity of a new computerized pictorial activity and task sort. *Journal of Occupational Rehabilitation*, 2005;15(2):185-95.

Matheson LN. History, design characteristics, and uses of the pictorial activity and task sorts. *Journal of Occupational Rehabilitation*, 2004;14(3):175-95.

## Bibliography - Spinal Function Sort and Hand Function Sort - Pencil and paper instruments from which the MTAP was derived

### Peer-Reviewed Manuscripts

Robinson RC, Kishino N, Matheson LN, Woods S, Hoffman K, Unterberg J, Pearson C, Adams L, Gatchel R. Improvement in postoperative and nonoperative spinal patients on a self-report measure of disability: The Spinal Function Sort (SFS). *J Occup Rehabil*, 2003;13(2):107-13.

Matheson LN, Kaskutas V, Mada D. Development and construct validation of the Hand Function Sort. *J Occup Rehabil*, 2001;11(2):75-86.

Sufka A, Hauger B, Trenary M, Bishop B, Hagen A, Lozon R, Martens B. Centralization of low back pain and perceived functional outcome. *J Orthop Sports Phys Ther*, 1998;27(3):205-12.

Gibson L, Strong J. The reliability and validity of a measure of perceived functional capacity for work in chronic back pain. *J Occup Rehabil*, 1996;6(3):159-75.

Matheson LN, Matheson ML, Grant J. Development of a measure of perceived ability. *J Occup Rehabil*, 1993;3(1):15-30.

## Bibliography – EPIC Lift Capacity Test

### Peer-Reviewed Manuscripts

Matheson LN, Verna J, Dreisinger TE, Leggett S, Mayer J. Age and gender normative data for lift capacity. *Work*. 2014;49(2):257-69.

Matheson LN, Leggett S, Mooney V, Schneider K, Mayer JM. Contribution of aerobic fitness and back strength to lift capacity. *Spine*, 2002;27(11):1208-12.

Jay MA, Lamb JM, Watson RL, Young IA, Fearon FJ, Alday JM, Tindall AG. Sensitivity and specificity of the indicators of sincere effort of the EPIC Lift Capacity Test on a previously injured population. *Spine*, 2000;25(11):1405-12.

Gibson L, Strong J. The reliability and validity of a measure of perceived functional capacity for work in chronic back pain. *J Occup Rehabil*, 1996;6(3):159-75.

Matheson LN, Mooney V, Holmes D, Leggett S, Grant J, Negri S, Holmes B. A test to measure lift capacity of physically impaired adults: Part II. Reactivity in a patient sample. *Spine*, 1995;20(19):2130-4.

Matheson LN, Mooney V, Grant J, Affleck M, Hall H, Melles T, Lichter R, McIntosh G. A test to measure lift capacity of physically impaired adults: Part I. Development and reliability testing. *Spine*, 1995;20(19):2119-29.

## Appendix A

### Example #1:

#### Lumbar Spine Impairment Rating:

The diagnosis is consistent with “intervertebral disc herniation and/or AOMSI, at multiple levels with medically documented findings; with or without surgery and with documented signs of bilateral or multiple radiculopathy at the clinically appropriate levels, present at the time of the examination,” and therefore is assigned to Class 4 with a default impairment C, **29% whole person impairment (WPI)** per table 17-4, page 570.

#### Adjustment Grids:

The adjustment grids are used to assign a grade within the class defined by the regional grid. The grade within a given class is determined by considering Functional History, Physical Examination Findings, and the results of relevant Clinical Studies. Refer to section 17.3, page 566.

**Functional History Adjustment Grid:** The Pain Disability Questionnaire (Appendix figure 17-A) was utilized to capture the patient’s functional history related to her condition as it pertains to ADL’s. The Multidimensional Task Abilities Profile (MTAP) was performed in order to derive at a proper functional grid modifier. The patient scored 70/200, demonstrating severe disability and correlating to a Grade 3 modifier. She is unable to perform several self-care functions, no outside home repairs, lawn and garden maintenance, very little housekeeping, light gardening and home maintenance

The MTAP score was cross validated with the Pain Disability Questionnaire (PDQ) of 125. This PDQ score matches the MTAP score and correlates with a Grade modifier 3, based on pain and symptoms with severe disability, per table 17-6, page 575.

#### Details on: Activities of Daily Living:

Self-care	Almost all, 89%.
Cooking and light housekeeping	Some, 43%.
Heavy housekeeping, light gardening, Home maintenance	A few, 30%.
Outside home repair, Lawn and garden maintenance	None, 0%.

An example of an affected mobility ADLs: She noted greater than moderate difficulty: “walking 200 feet (61 meters) on the sidewalk and walking up a few stairs, traveling and driving greater than hour, lifting objects weighing greater than 10 pounds” as measured on the MTAP, a published patient reported functional measurement.

**Physical Examination Adjustment Grid:** Grade modifier 2, per table 17-7, elements of the Physical Examination Adjustments included a lumbar neural tension signs, diminished light touch with or without minimal abnormal sensation for pain, active movements against gravity showed decreased motor strength 4/5, bilateral lower extremities, positive straight leg raise on the right, positive Bragard’s test on the right.

**Clinical Studies:** Clinical studies/imaging studies should be excluded as grade modifiers because they are part of the class determination.

#### Net Adjustment Formula Calculation:

CDX – Class of Diagnosis = 4

GMFH – Grade modifier for functional history = 3

GMPE – Grade modifier for physical examination = 2

GMCS – Grade modifier for clinical studies = N/A

Net Adjustment = (GMFH-CDX) + (GMPE- CDX) + (GMCS-CDX)  
(3-4) + (2-4) + (N/A)

Net Adjustment = -3

### **Impairment Summary:**

Therefore, the net adjustment of -3 moves the impairment from the default Grade C of 29% to Grade A 25%, which equals **25% whole person impairment rating for the lumbar spine.**

The MTAP and PDQ scores were consistent and correlated to the patient's history, diagnostic testing and physical examination. Finally, the 25% WP impairment value adequately encompasses the patient's excess pain and severe disability (Inclusive/within CDX).

### **Example #2:**

#### **CRPS multiple body parts:**

#### **Impairment Rating:**

The patient's present medical condition is ratable using the AMA Guides to Evaluation of Permanent Impairment, 6<sup>th</sup> edition. The patient has been determined to be at maximum medical improvement. The CRPS type I has been present for longer than a year and diagnosed by more than one physician.

#### **Upper Extremities:**

Functional history is determined to be consistent with other ADL testing and observation, table 15-7, page 406, Functional History Adjustment, upper extremities, the description = **grade modifier 4** (81-100 Quick DASH). This grade 4 modifier denotes a very severe problem with pain symptoms at rest, controlled with medication, unable to perform self-care. **Cross validation with the MTAP PRO scored a 35/200 correlating once again to a "Very severe problem", Grade modifier 4.** (She can perform 57% of self-care with varied assistance from her husband.) The MTAP and Quick Dash correlate highly and demonstrate the same ADL intolerance.

#### **Functional Assessment:**

**QuickDASH = 93 total points, consistent with history, examination and other ADL measures (ADL questionnaire and the MTAP). The MTAP was 35/200.**

#### **Table 15-8, physical examination, adjustment grids for the upper extremity**

Physical examination findings are best characterized as very severe and thus **grade 4** for the left upper extremity and moderate, **grade 2**, for the right upper extremity.

#### **Table 15-9, clinical studies**

**Not applicable.** Unfortunately, we have reports of a positive bone scan and X-ray, however, none have been submitted for review. Therefore, this finding cannot be utilized objectively.

#### Average Grade Modifier

Left upper extremity:  $4+4+NA=8/2=4$  or consider  $4+4+3/3$  (if we included positive imaging for RSD)  $=3.6$ . Therefore, objectively, **the average grade modifier is 4.**

Right upper extremity:  $2+2+NA=4/2=2$  or  $2+2+3/3=3.33$ . Therefore, the **average grade modifier is 3.**

#### Table 15-26, page 454, Complex Regional Pain Syndrome, type I, upper extremity impairment

Left upper extremity: **Assign class 4, very severe** based on the severity of functional difficulties documented via MTAP and Quick DASH; able to perform only 57% of self-care with assistance needed and many of the ADL classes, including but not limited to self-care, cooking, light housekeeping and unable to perform heavy chores, lawn, garden or home maintenance. Utilizing my best clinical judgment justifies a **grade D**, awarding 80% upper extremity impairment (UEI). **80% UEI is equivalent to 48% whole person impairment (WPI)**, page 420, table 15-11.

Right upper extremity: **Assign class 3, moderate**, however, the patient has less symptoms compared to the left upper extremity, including similar functional deficits as the left upper extremity but to a lesser extent, expressed within my best clinical judgment. Therefore, since the objective criteria points for Complex Regional Pain Syndrome are less than or equal to 8, the individual is assigned to **class 3** on page 454, table 15-26, severity moderate, with a **default grade modifier of 20%**. Using my best clinical judgment, I determined that this does not require adjustment within the class and awarded her a **20% right upper extremity impairment, converted to a 12% whole person impairment** utilizing table 15-11 on page 420.

#### Lower Extremities:

The bilateral lower extremities are graded in a similar manner for CRPS type I. The condition is ratable after a year. There have been several physicians who concur with the diagnosis. The patient notes through a detailed history that the symptoms come and go, such as stiffness, pain, hot and cold sensitivity. No antalgia or limp was observed or reported. The patient reports swelling and color changes, complaints of strength and range of motion deficits. Minimal range of motion and strength deficits were apparent during the examination.

#### Physical examination:

There was no edema or atrophy observed, no color changes. Ranges of motion and strength were slightly diminished. It was difficult to determine hair and skin changes. However, it is difficult to explain her condition with any other differential diagnoses.

#### Clinical Studies:

None were reported for review.

#### Differential Diagnosis:

The diagnosis of depression has been noted, however, no other differential diagnosis. Work-relatedness has been noted in addition to the upper extremities. The diagnosis is therefore, as for the upper extremities, Complex Regional Pain Syndrome, type I, table 16-13. Diagnostic Criteria for Chronic Regional Pain Syndrome have been confirmed and noted, including but not limited to disproportionate pain to any inciting event, reported symptoms in the following categories (sensory, vasomotor, pseudomotor and motor trophic). Table 16-14, Objective Diagnostic Criteria Points for Chronic Regional Pain Syndrome notes three positive findings, including trophic changes with smooth, nonelastic skin and joint stiffness and vasomotor skin temperature is cool and hypersensitive to light touch.

Table 16-6, page 516, Functional History Modifiers:

The patient possesses a **grade 1, mild** problem, page 516, and table 16-6. The functional modifier was confirmed through an activities of daily living description log, correlated with the lower extremity Multidimensional Task Abilities Profile questions previously described in this report.

Physical Examination Modifiers:

The patient has a **grade 2, moderate/mild** problem.

Clinical Studies:

Table 16-8, not applicable.

Average Grade Modifiers:

$1+2+NA=1.5$ , rounded up to 2. This places the patient in **class 2**, table 16-15, Complex Regional Pain Syndrome type I lower extremities, with  $\leq 6$  points. However, table 16-14, Objective Diagnostic Criteria Points for Complex Regional Pain syndrome is 3 points, which will therefore assign **class 1**, which will provide a default **grade C** modifier with mild severity. Utilizing my best clinical judgment, I will decrease the **grade C or 7%** to a **grade B or 3%** lower extremity impairment bilaterally, totaling **6% lower extremity impairment**. This converts to a **2% whole person impairment** as per page 530, table 16-10.

The upper extremity and lower extremity impairments can now be combined to provide a whole person impairment rating. Therefore, the left upper extremity 48% whole person impairment can be combined with the right upper extremity 12% whole person impairment, utilizing the combined values chart on page 604: **48 combined 12=54% whole person impairment**. The 54% whole person impairment can be combined with the 2% bilateral lower extremity whole person impairment, equaling a **55% whole person impairment**.

**Impairment and functional loss discussion:**

The patient's **55% whole person impairment** affects the following activities of daily living to a mild to minimal lower extremities and a severe affect and problem to the upper extremities confirmed via MTAP and Quick DASH published patient reported outcome measures.

She can perform most self-care but does need assistance from her husband, especially on bad days, for even dressing and/or bathing. The water temperature has to be established before she can shower or bathe. She notes that, most days, she will get up and get dressed, and lie on the couch and watch television. She has difficulty with meal preparation and therefore her husband prepares meals or they eat out a lot. She tries to keep up with housekeeping but she can only perform light housekeeping. Any forceful gripping activities or movements increase the pain. Her symptomatology is aggravated by hot and cold.

Finally, the 55% whole person impairment provided adequately encompasses the patient's excessive pain (inclusive/within the CRPS type I rating/CDX).



### **Example # 3 (inconsistent):**

#### **Lumbar Spine Impairment Rating:**

The diagnosis is consistent with Sprain /Strain medically documented findings; now resolved, or continued complaints of low back pain with no objective findings”, and therefore is assigned to Class 0 with a default impairment C, 0 % **whole person impairment (WPI)** per table 17-4, page 570.

#### **Adjustment Grids:**

The adjustment grids are used to assign a grade within the class defined by the regional grid. The grade within a given class is determined by considering Functional History, Physical Examination Findings, and the results of relevant Clinical Studies. Refer to section 17.3, page 566.

**Functional History Adjustment Grid:** The Pain Disability Questionnaire (Appendix figure 17-A) was utilized to capture the patient’s functional history related to the condition as it pertains to ADL’s. The Multidimensional Task Abilities Profile (MTAP) was performed in order to derive at a proper functional grid modifier. The patient scored 11/200, demonstrating very severe problem/ extreme disability and correlating to a Grade 4 modifier. The MTAP, was cross validated with the Pain Disability Questionnaire (PDQ) score was: 150, extreme disability. Per table 17-6. Pp575. **Grade modifier 4.**

However, the patient history, examination and diagnostics did not support any level of impairment or functional loss. Examination procedures were inconsistent with relation to an injury or impairment. The patient Physical Function score is 11/200 via the MTAP standardized functional outcome tool and demonstrated inconsistent responses. The Health and behavioral assessment report notes that the INFIT (2.15) and OUTFIT (4.05) scores that are in excess of 1.50 indicate unacceptable inconsistency and require clinical confirmation.

The patient lacks physical findings with relatively normalized exam including normal ROM, negative orthopedic or neurological testing, yet reports moderate to severe subjective complaints. Moreover, the patient’s history was irregular and not credible with the reported injury and the patient appears to be catastrophizing or misrepresenting the alleged events of the reported injury.

The inconsistent functional scores and ADLs categories on the MTAP report card are consistent with a highly impaired individual reliant on others for most ADLs, approaching death. However, this individual drove themselves to the appointment and opened the door on their own volition. The patient reports severe difficulty with all ADLs categories:

**Self-care, almost all (8%);**

**Cooking and light housekeeping, most (5%);**

**Heavy housekeeping, light gardening and home maintenance, some (0%);**

**Outside home repair, lawn and garden maintenance, very few (0%);**

**He is unable to participate in hobbies and is noted to have difficulty with most activities of daily living, but reports that he does not have assistance with self-care**

**Physical Examination Adjustment Grid:** Grade modifier 0, per table 17-7, Negative SLR, no radicular pain and invalid examination.

**Clinical Studies:** Clinical studies/imaging studies should be excluded as grade modifiers because they are part of the class determination.

Net Adjustment Formula Calculation:

CDX – Class of Diagnosis = 0

GMFH – Grade modifier for functional history = 0

GMPE – Grade modifier for physical examination = 0

GMCS – Grade modifier for clinical studies = N/A

$$\text{Net Adjustment} = (\text{GMFH-CDX}) + (\text{GMPE- CDX}) + (\text{GMCS-CDX}) \\ (0-0) \quad + (0-0) \quad + (\text{N/A})$$

Net Adjustment = 0

**Impairment Summary:**

Therefore, the net adjustment of 0 moves the impairment from the default Grade 0 Grade 0, 0 %, which equals **0% whole person impairment rating for the lumbar spine.**

The MTAP and PDQ scores were consistent negatively correlated to the patient's history, diagnostic testing and physical examination. The patient's severe pain and the effect on ADL's are accurately reflected in the combined total 0 % WPI. In my opinion that the patient may have suffered from a slight injury but has long recovered without impairment or disability. It is evident by the irregular history, lack of diagnostics objective testing, positive Waddell's scores and inconsistent patient reported functional outcome scores.

From all available subjective and objective data, it appears that that the patient has a tendency to exaggerate and catastrophize non-existing physical findings. Additional psychometric testing such as the Battery for Health Improvement 2 (BHI-2), Pain Catastrophizing Scale (PCS) or other validated testing. Please see the Multidimensional Task Abilities Profile Health and Behavioral Profile January 15, 2015, for more complete ADL information.

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