



Functional Capacity Evaluation

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Functional Capacity Evaluation

- An objective and comprehensive assessment of an individual's physical and functional abilities
- Used to determine an individual's ability to safely perform work related physical demands and meet positional tolerance demands



What is a Functional Capacity Evaluation (FCE)?

- A systematic process of measuring and developing an individual's capacity to dependably sustain performance in response to broadly defined work demands.

Leonard N. Matheson, PhD., Anderson GBJ, Demeter SL, Smith GH, eds. Disability Evaluation. Functional Capacity Evaluation. Chicago, IL: Mosby Yearbook, 1996

Functional Capacity Evaluation

- An administrative assessment of the extent to which an individual's medically determinable impairment(s), including any related symptoms, such as pain, may cause physical or mental limitations or restrictions that may affect his or her capacity to do work- related physical and mental activities.

[SSR 96-4p](#), "Titles II and XVI: Symptoms, Medically Determinable Physical and Mental Impairments, and Exertional and Non-exertional Limitations.

Residual Functional Capacity

- What an individual can still do despite his or her limitation.

SSR 96-8p: POLICY INTERPRETATION RULING TITLES II AND XVI: ASSESSING RESIDUAL FUNCTIONAL CAPACITY IN INITIAL CLAIMS.

- Does not represent the *least* an individual can do despite his or her limitations or restrictions, but the most.

FCE – Any Occupation

- Used to quantify worker traits in dealing with common physical work demands such as sitting, standing, walking, balancing, climbing, reaching, stooping, kneeling, crouching, lifting, carrying, pushing and pulling listed in the Dictionary of Occupational Titles, Fourth Edition when there is no specific job to which the worker will return.

Cheng, Andy Shu-Kei, Cheng, Stella Wai-Chee, The Predictive Validity of Job Specific FCEs on the Employment Status of Patients with Non-Specific Low Back Pain. JOEM., Volume 52, Number 7, July 2010.

FCE – Own Occupation

- Requires a specific job to which the returning worker is known and a job analysis or accurate job description have already been conducted to identify the critical job demands (Own Occupation).
- Should include a specific match of the physical abilities of the worker to the physical demands of a specific job.

Cheng, Andy Shu-Kei, Cheng, Stella Wai-Chee, The Predictive Validity of Job Specific FCEs on the Employment Status of Patients with Non-Specific Low Back Pain. JOEM., 52.7, July 2010.

FCE – Work Capacity Evaluation

- Used to determine the potential for the worker to be able to withstand the basic demands of competitive employment particularly full-day workplace tolerance and daily attendance.
- Hart, D L DL; Isernhagen, S J SJ; Matheson, L N LN. Guidelines for functional capacity evaluation of people with medical conditions. The Journal of orthopaedic and sports physical therapy, 18. 6, December 1993: 682-686.

How does a physician determine if an individual can return to work?

- Physical Examination?
- Diagnostic Testing?
- Subjective Reporting?
- Experience?
- Educated Guess or Estimation?

Netherlands Study

- The IPs change their judgment of the physical work ability of claimants with MSDs in the context of disability claim procedures more when FCE information is provided.
- Physical work ability is not only important in situations of disability claim procedures, but also in RTW and rehabilitation programs.

Wind, H, Goutte, V, Kuijer PPFM, Sluiter JK, Frings-Dresen MHW , Effect of Functional Capacity Evaluation information on the judgment of physicians about physical work ability in the context of disability claims., Int Arch Occup Environ Health. 2009 October 82(9): 1087-1096.

FCE Time Frame

- 3 to 4 hours dependent upon the functional ability of the individual
- Dependent upon the job specific nature of the testing process.
- Dependent on whether the testing is for work tolerance levels for an 8 hour day or a job match for physical demand functioning

Overview of the Physical Demand Levels of Work

- Sedentary
- Light
- Medium
- Heavy
- Very Heavy



Sedentary Work

- 10 pounds of force occasionally *and/or*
- negligible amount of force frequently or constant
- sitting most of the time
- walking or standing occasionally may be required



Light Work

- Up to 20 pounds of force occasionally *and/or*
- Up to 10 pounds of force frequently
- Walking and/or standing usually required for more extended periods of time



Medium Work



- Up to 50 pounds of force occasionally *and/or*
- Up to 20 pounds of force frequently *and/or*
- Up to 10 pounds of force constantly to move objects

Heavy Work



- Up to 100 pounds of force occasionally
and/or
- Up to 50 pounds of force frequently
and/or
- Up to 20 pounds of force constantly to move objects

Very Heavy Work

- > 100 pounds of force occasionally *and/or*
- > 50 pounds of force frequently *and/or*
- > 20 pounds of force constantly to move objects



Frequency of Work Demands

- Occasional: 0 - 33% of the workday or up to 2 ½ hours per day.
- Frequent: 34 - 66% of the workday, 2 ½ to 5 ½ hours per day.
- Constant: 67 - 100% of the workday, > 5 ½ hours per day.
- U.S. Department of Labor, Dictionary of Occupational Titles, Fourth Edition, Revised, 1991, p. 1003.

FCE Testing Components

Intake Interview

Musculoskeletal Exam

Aerobic Capacity Assessment

Performance Consistency Testing

Material Handling

Positional Tolerance Testing

Exit Testing

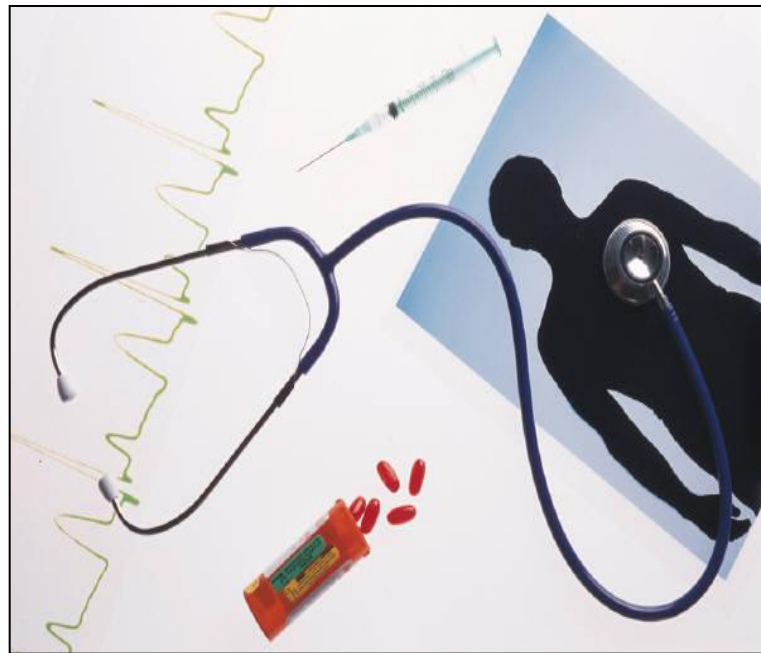
Intake Interview

- Patient Demographics
- Medical History
- Treatment History
- Subjective Pain Report
- Subjective Capabilities/Limitations
- Vocational History
- Sitting Tolerance
- Baseline HR , BP, Respiratory Rate
 - HR <100
 - BP <160/100

FCE Musculoskeletal Screen

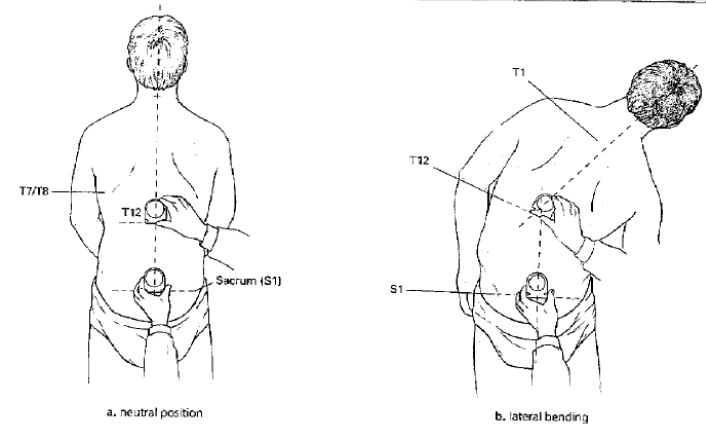
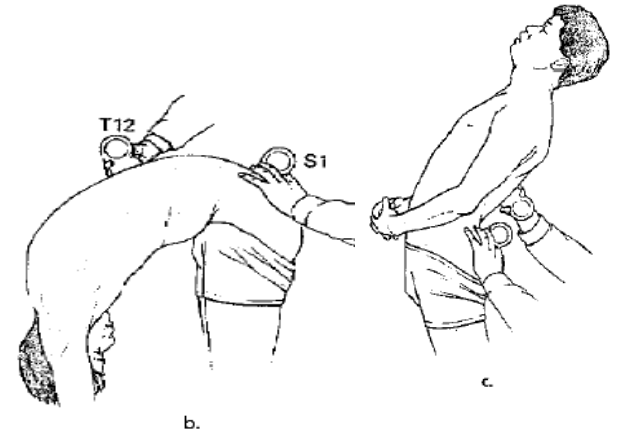
Assessment with objective measurements compared to functional abilities throughout testing

- Gait
- Posture
- Flexibility
- Range of Motion
- Muscle Strength
- Neurological
- Special Tests
- Waddell's



Example: Lumbar ROM

- **Flexion:** The individual is asked to forward bend as far as possible. The reading from the inclinometer at S1 is subtracted from the reading of the inclinometer at T12.
- **Extension-** The individual is asked to extend backward from the waist as far as possible. The inclinometers are read from the inclinometer at S1 is subtracted from the reading of the inclinometer at T12
- **Side Bending:** The inclinometers are read from the inclinometer at S1 is subtracted from the reading of the inclinometer T12.



Waddell's Testing

- Non-Organic Physical Signs
 - Tenderness
 - Simulation
 - Distraction
 - Regional Disturbance
 - Over-Reaction
- *Scoring*: If three or more of the categories are positive, then the findings are clinically significant for non-organic low back pain.

Aerobic Capacity/Endurance Test



PURPOSE:

- Determine patients cardiovascular response to stressful activity
- Predict Max VO₂ for classification of aerobic capacity for age and gender.
- Determine Functional MET level in comparison to an 8 hour work day

Isometric Consistency Testing

Statistical consistency:

Coefficient of Variation (CV)

- The coefficient of variation represents the ratio of the standard deviation to the mean, and it is a useful statistic for comparing the degree of variation from one data series to another.
- Isometric – push, pull
- Hand grip strength
- Hand pinch strength

Maximal Voluntary Effort Testing



Interpreting the MVE Results

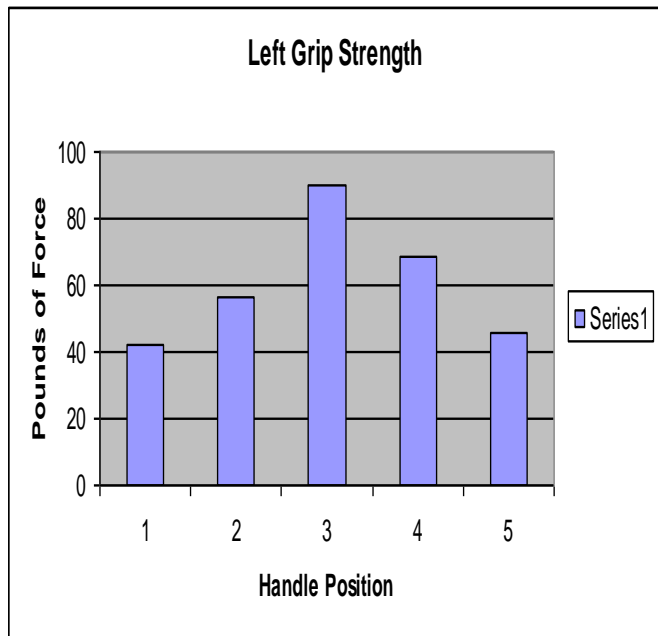
Maximal Voluntary Effort Test	Trails (Pounds of Force)			Average	Standard Deviation	Coefficient of Variation*
	Trial 1	Trial 2	Trial 3			
Right Grip #1 Position	98.00	96.00	99.00	97.67	1.25	1%
Left Grip #1 Position	76.00	43.00	82.00	67	17.15	26%
Right Grip #2 Position	127.00	129.00	131.00	129	1.63	1%
Left Grip #2 Position	54.00	67.00	88.00	69.67	14.01	20%
Right Grip #3 Position	132.00	136.00	138.00	135.33	2.49	2%
Left Grip #3 Position	88.00	120.00	133.00	113.67	18.91	17%
Right Grip #4 Position	117.00	114.00	118.00	116.33	1.70	1%
Left Grip #4 Position	60.00	86.00	99.00	81.67	16.21	20%
Right Grip #5 Position	100.00	100.00	100.00	100	0.00	0%
Left Grip #5 Position	100.00	102.00	107.00	103	2.94	3%

MVE Test: 6 of 10 CV < 15%

Bell Shaped Curve Distributions: 1 of 2

Comments:

Interpreting Grip Strength Testing MVE



- 5 position grip testing
- When 5 test positions are plotted, the means should fall into a “bell shaped” curve even in those with impairment.
 - Stokes 1983, Niebuhr 1990
- #2 position most reliable and reproducible for normative data
- Matheson, L., Curlton, R., Nemeyer L. Grip strength in disabled sample: normative standards. Ind. Rehab Q1 (3) 9, 17-23.

Pinch Strength Testing



- Pinch Strength
- Force Measure
- Consistency
- Tip Pinch
- Palmar Pinch
- Key Pinch

Consistency Between Test Batteries

Cross-reference testing analysis

- Consistency between subjective, objective and functional data
- Consistency between presentation when client aware and unaware they are being observed
- Repeating similar movements in different contexts to see if they create the same difficulty or symptoms
- Physiological response to activity
- Biomechanical response to activity

Material Handling Tasks



- Lifting is described by research as a whole body activity that is a synthesis of biomechanical, cardiovascular, metabolic and psychophysical aspects.
 - Occasional
 - Frequent and/or Job Specific
- Pushing
- Pulling
- Carrying
 - Occasional
 - Frequent

Lifting

- **Lifting:** Upward displacement of an object with a mass that is accelerated vertically through the application of force along the direction of the lift.
- **Lowering:** Downward displacement of an object with a mass that is decelerated vertically through the application of force against the direction of the lower.
- Progressive loading format.

Lifting Assessment

Progressive lift capacity testing is terminated for the primary reasons:

- Physiologic limitation - exceeds safe HR limit or has abnormal HR or BP response; has difficulty breathing or hyperventilates.
- Biomechanical limitation - inability to maintain safe body mechanics.
Kinesiophysical changes consistent with safe limit.
 - Gross D, Battie D, Construct Validity of a Kinesiophysical Functional Capacity Evaluation Administered within a Worker's Compensation Environment. J Occup Rehab 13(4):287-295, 2003.
 - Reneman M, Fokkens A, Dijkstra P, et al. Testing Lifting Capacity: Validity of Determining Effort Level by Means of Observation. Spine 30(2), 2005.
- Psychophysical limitation
 - Self-perceived as being too heavy to lift safely
 - Symptom limitation - pain, numbness, pins and needles, nausea, dizziness

Positional Tolerances

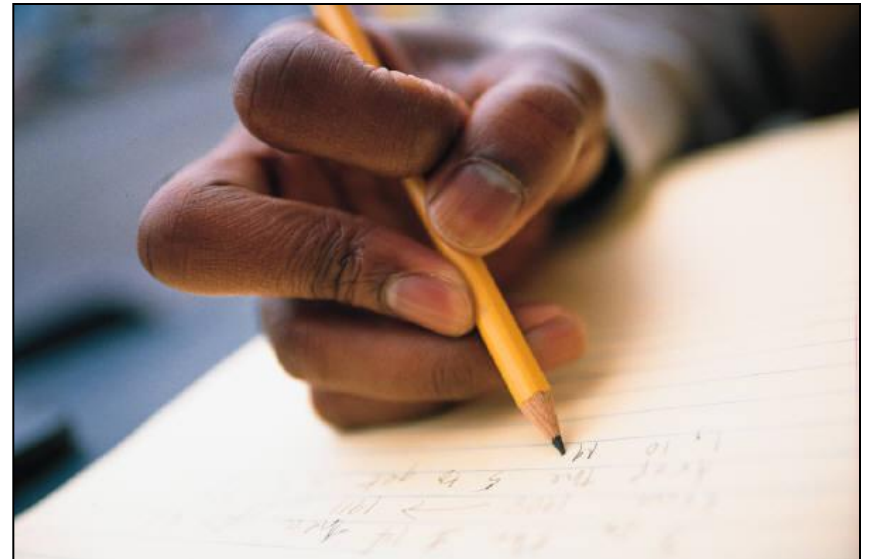
- Sustained or repetitive positioning with negligible force or weight involved.
- Positions/actions required for daily job or living tasks
- Test may involve generic approach for Any Occupation or a job-specific approach for Own Occupation

Positional Tolerance Tasks

- Sitting
- Standing
- Walking
- Bending
- Stooping
- Kneeling
- Crouching
- Crawling
- Climbing (stairs, ladders)
- Balancing
- Reaching multiple levels
- Object Handling
- Fingering
- Grasping (simple/firm)
- Gross/Fine Hand Manipulation

Upper Extremity Coordination, Speed and Strength

- Manual Dexterity
- Fine Finger
Dexterity
- Hand Grip Strength
- Finger Pinch
Strength



Questions



Thank You

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