



Introduction

We at the Family Physiotherapy Centre Of London are proud to team up with Isernhagen Work Systems (IWS) to setup a Functional Abilities Evaluation based on over 15 years of research. The IWS system uses the kinesiophysical approach in evaluating the injured worker's abilities. The FAE uses a unique approach to physical examination by allowing the worker to test for maximum objective strength without fear of injury. In this kinesiophysical method of testing, it is the therapist skilled in musculoskeletal function, not the worker who evaluates precise physical and functional abilities

WHY THE KINESIOPHYSICAL APPROACH HAS BEEN RECOMMENDED WORLD WIDE

The kinesiophysical evaluation approach is based on physical movement. Physical and occupational therapists have a strong background in kinesiology, which is **the study of physical movement**. During any physical activity, sets of muscles are used in certain sequences. When activity is light, only the primary muscles needed to make the movement are used. When a movement becomes heavy, or an individual becomes fatigued, accessory muscles automatically contract to assist the prime movers. The appearance of these accessory muscles is involuntary and normal when higher levels of effort are required. Therefore, the objective observation of accessory muscles is one indication of a high or maximum effort. Other changes that normally occur with heavier or maximum effort are in body mechanics, balance, posture, heart rate, respiration and movement quality.

THE HIGHEST FUNCTIONAL LEVEL

In the kinesiophysical approach, **maximum function** is determined by observing physical efforts at low, medium and high levels of activity. The client who is reaching a maximum does so gradually. It is possible for the evaluator to see initial early signs of fatigue, uncoordination and change in body mechanics. The evaluator is then primed to recognize when maximum safe function has occurred. At a maximum level of functioning, there will be accessory muscle involvement, change in body mechanics to become more efficient, fatigue patterns, and the beginning of dysfunctional movement changes in weight bearing and balance. Maximum function is defined as the greatest safe ability of a client, either in repetitions or weight capacities.



SAFETY FIRST

The kinesiophysical approach also stresses **safety**. A professional who understands safety concepts and medical contraindications will not allow an individual to be injured while in their care. This ethical consideration should extend also to clients involved in functional capacity evaluation. If, in fact, we believe there is a difference between safe body mechanics and unsafe body mechanics, then only safe body mechanics should be allowed in testing situations. It is potentially harmful to the client if an evaluator notices unsafe procedures yet allows it to continue. Not only is the client at risk of injury during the testing situation, but the professional is allowing unsafe behaviors without the benefit of professional advice. If, for example, one were evaluating a client using a cane who was walking downstairs in a manner that could cause a fall, the professional would certainly stop the unsafe activity. The same professional manner is needed for work-injured clients. To assist the client in producing maximum activity, the therapist should indicate that only safe procedures are allowed. Therefore, if the client begins to become unsafe or dysfunctional, the test will be stopped. This allows the client to put their safety into the hands of a professional who can observe them better than they can observe themselves. It is also important for the evaluator to note when the client is aware of safe and unsafe procedures.

The way safety is determined by the evaluator depends upon the test item. If lifting is involved, a statement on safe body mechanics must first be made. Secondly, there must be an adherence to the safe body mechanics principles during the testing situation. Any deviation from safe body mechanics should be dealt with by stopping the activity. Fatigue patterns and increased heart rate and blood pressure will produce some indications that maximum function is approaching. This will alert the therapist to monitor safe body mechanics during the lift. If there is an indication the person has gone beyond the ability to maintain these safe positions, the test should be stopped and scored at the highest level at which safety was maintained. The kinesiophysical approach takes into consideration the use of only safe body mechanics, and all tests are stopped if safety is questioned. If a person is pushing him or herself beyond the limits where safe movements are observed, the test should be stopped.

In addition, heart rate and blood pressure will be monitored according to the administering clinic's safety guidelines.

BEHIND THE WORK LIMITATIONS

The importance of the kinesiophysical approach becomes even clearer when physical musculoskeletal findings are correlated with functional findings/observations. The reason behind each functional work deficiency is noted and based on musculoskeletal observations. For example, it is not enough to determine that a worker can only lift ten pounds from the floor. There is always a question of, "Could he lift more if he were trained? Is ten pounds a load he can do repetitively?" The reasons behind this ten-pound limitation will help in determining answers to those questions. In one case, the



weight limit might be due to weak quadriceps function that does not allow lifts to be maintained at a safe level beyond ten pounds. If quadriceps strength is the problem, then one option for increasing the lifting load would be to increase quadriceps strength. On the other hand, low back instability may be the problem. If that is true, then the low back stabilizers have to be addressed as far as strength and endurance. If decreased aerobic conditioning is the problem, then there will have to be an aerobic and cardiovascular program implemented in order to allow the capacity for this much repetitive lifting. One other possibility is that ten pounds can be lifted but degenerative changes in the knees will not allow for repetitive lifting. Only one or two lifts will be safe. In this case, the worker cannot be modified, so the job will have to be the changeable component. Identifying the physical limitations behind the maximum capacity is critically important in case management.

This strong kinesio-physical attribute of linking the abilities and limitations to musculoskeletal and physiological functioning explains present limitations as well as helps to identify solutions.

SUMMARY

The kinesio-physical approach is one that utilizes the medical/kinesiological knowledge of a specific professional (physical or occupational therapist) to indicate:

- Maximum objective strength of an individual.
- Tolerance levels to activities based on objective physical observations.
- Safety procedures to ensure no injuries during the testing situation and that the client is aware of the difference between safe and unsafe procedures.
- Linking of functional deficiencies with physical causes.
- Ability to identify sub-maximal efforts and the presence of a self-limiting individual.
- A very specific objective informational report that includes observations, conclusions and recommendations.

NOTE: *The knowledge and observational criteria utilized in the IWS method have been studied for accuracy and reliability. The criteria have been subjected to scientific analysis and found to be highly reliable.*



MEDICAL/LEGAL CREDIBILITY

The first step to medical/legal credibility is to utilize a medical procedure or evaluation format that is respected in the medical community. This is one which has clear policies and procedures, one that has trained the therapist in the procedures, has clear criteria for testing and scoring, uses a standardized approach, etc. In developing the IWS FCE, we insured medical/legal credibility through the following:

- ***Use of PTs and OTs as Evaluators:*** The IWS FCE uses PTs and OTs as evaluators. These are professionals trained in anatomy, physiology, kinesiology, and pathology. We are the professionals who can link the activity with the limitations. We can identify whether the limiting factor is a result of reports of pain, decreased range of motion, decreased strength and endurance, decreased aerobic capacity, decreased coordination, decreased sensation, increased gait deviation, decreased balance, etc. This linking of the limitations to the activity is very helpful in determining appropriate recommendations and return to work guidelines.
- ***Standardized Protocol with Clear Criteria for Testing and Scoring:*** The IWS FCE is a standardized evaluation. All of the parameters for performance are outlined in a policy and procedure manual. Therapists should have a good understanding as to the testing position, appropriate equipment to use, possible interfering difficulties, etc. The procedure manual is a thorough overview of the evaluation and can be used for reference at any time. In addition, training is performed by an IWS faculty member who has specific knowledge and expertise regarding the FCE. Therapists are taken through the standardized format for the 29 activities with emphasis on appropriate documentation.
- ***Safety Parameters are Inherent in Testing:*** It is the IWS belief that the worker should be safe for all activities. If the worker is unable to assume a safe position, re-instruction is provided and the worker/client may try the activity again. If the worker is unable to correct and perform safely, the activity is stopped. The IWS activities replicate work and/or activities of daily living. We believe by emphasizing safety, this further emphasizes the worker's safe performance outside of the testing atmosphere. Prior to the FCE, a brief musculoskeletal physical examination is performed to identify any contra-indications. This is meant to be a brief physical overview to identify the worker's range of motion, muscle strength, areas and reports of discomfort, etc. Blood pressure and pulse are taken. Additionally, a heart rate monitor is worn by the worker during testing. Target heart rate is determined so that it is clear when the worker is getting into aerobic distress.

To further illustrate the need for safety parameters during FCE testing, let's take the example of a worker calling on Day 2 saying, "I hurt myself during your test



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yesterday,” and he’s on his way to his attorney’s office. Since the IWS FCE requires safety and thorough documentation, the therapist should be able to easily refute the worker’s charge. The therapist would refer to the score sheets and provide an accurate, objective, and clear picture of his performance. The therapist would emphasize what he was like when activity was stopped, i.e., heart rate, body position, body mechanics, use of accessory muscles, client’s reports of pain, etc. These findings will support that no injury occurred, he was fine, etc., etc. Without safety parameters, this could be a very difficult case to prove.

- ***Two Days of Testing to Evaluate Performance Over Time:*** Most typically you will hear from an injured worker that “it is not what I do today but rather how what I do today influences tomorrow.” The IWS FCE is realistic in understanding that predicting the worker’s ability over time is nearly impossible with a “one-shot” approach. Therefore, the IWS FCE is a 5-hour evaluation, typically performed three hours on Day 1 and two hours on Day 2. The therapist is, therefore, able to document whether there were any changes as a result of one day of testing. We can actually verify and document difficulties. The worker cannot come back and say, “I really can’t lift 50 pounds” if they demonstrated during the testing that they could lift 50 pounds from the floor. Additionally, by using an interactive method, we find that workers are much more likely to buy into testing and work to their full capacity.
- ***Clear, Objective, Clinical Documentation and a Readable FCE Report:*** IWS has developed an Objective Scoring Definition for therapists to utilize. This assists in placing the worker in the rare, occasional, frequent, or continuous category of work. We have taken great steps to put down on paper exactly what is happening to an individual at each level. We do not rely on guesstimates but rather on objective, observable, clinical findings. This accurately places an individual in the appropriate category of work and makes an accurate predication of the worker’s ability over time.
- ***Compare the Worker’s Performance During the Evaluation to Work Activities:*** Many evaluations today do not focus on return to work. Some use categories from the Dictionary of Occupational Titles. IWS takes the approach of matching the worker with the actual job demands of the job in question. This provides a very clear and definitive return to work statement. This is appreciated by all of those involved in the return to work process. This further eliminates the use of guesstimating whether the worker can return to work and allows the therapist to utilize objective information and identify where there is a job match and where there is not.

IWS’s philosophy and providers are committed to safely returning the worker to work in a timely manner. Employers, insurers, physicians, etc., can count on an objective evaluation of the worker’s safe abilities using the IWS FCE.



RELIABILITY OF FCE ITEMS

Test-Retest Reliability of the Isernhagen Work Systems Functional capacity Evaluation in Patients with Chronic Low Back Pain; S Brouwer, MF Reneman, PU Dijkstra, JW Groothoff, JMH Schellekens, and LN Göeken

Reliability of Safe Maximum Lifting Determinations of a Functional Capacity Evaluation; DP Gross, MC Battie; Physical Therapy, Vol 82, No 4, April 2002

Reliability of Independent Observer Judgments of Level of Lift Effort in a Kinesiophysical Functional Capacity Evaluation; SJ Isernhagen, DL Hart, LM Matheson; WORK 12, 1999, 145-150

The Reliability of Determining Effort Level of Lifting and Carrying in a Functional Capacity Evaluation;

M Reneman, et. al; University Rehabilitation Center Beatrixoord, The Netherlands; WORK, Winter 2002

Therapist's Ability to Identify Safe Maximum Lifting in Low Back Pain Patients During Functional Capacity Evaluation; R Smith; JOSPT, Vol 19, No 5, May 1994

RELIABILITY AND VALIDITY OF FCE ITEMS:

Measuring Maximum Holding Times and Perception of Static Elevated Work and Forward Bending in Health Young Adults; M. Reneman; et al; University of Groningen, The Netherlands; JOR, Vol 11, No 2, June 2001

VALIDITY STUDIES: FCE RELATIONSHIP TO WORK AND LIFE:

Construct Validity of a Kinesiophysical Functional Capacity Evaluation Administered Within a Worker's Compensation Environment; DP Gross, Michele C Battie; JOR, Vol 13, No 4, December 2003

Relationships Among Lifting Ability, Grip Force, and Return to Work; LM Matheson, SJ Isernhagen, DL Hart; Physical Therapy, Vol 82, No 3, March 2002

Functional Capacity Evaluation: Ecological validity of three static endurance tests

M. Reneman, et. al; Occupational Assessment Center Beatrixoord, The Netherlands; WORK 16, 2001

Concurrent Validity of Questionnaire and Performance based Disability Measurements in Patients with Chronic Non-Specific Low Back Pain

M Reneman etal; University Hospital Groningen; Haren, The Netherlands; JOR, Sept 2002

FUNCTIONAL TESTING IN PREVENTION-OUTCOMES:



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Prewrite Screen: Is it Helpful in Reducing Injuries and Costs?; Jean Gassoway, Valerie Flory, Lakeland Regional Health System, St. Joseph, MI; WORK 15, 2000, 101-106

IWS FCE 6-Month Outcome Study

Demonstrates proof of effectiveness in returning workers to work. Outcome Study results show 60% of workers return to work following the IWS FCE. Most significant is these workers have been off work an average of 10 months; therefore, these are considered very positive outcomes.

IWS Prewrite Screen Cost- Saving Results:

- Decreased injuries
- Decreased Workers' Compensation costs
- Decreased employee turnover

IWS PWS validation ensures compliance with ADA and Human Rights legislation—IWS has never been legally challenged in over 15 years

Summary

We are able to have clients evaluated within 2 weeks of receiving the referral. The reports are designed to be simple and readable. Included is an executive summary indicating the capabilities and precautions for the worker. The reports can be customized to fit the needs of each customer. For further information please give us a call or email us at FCE@fpclondon.com

Sincerely,

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