

Functional Capacity Evaluation -

Unpacking an element of
Human Factors

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Setting the scene – Facts and Figures



- The ILO has estimated that 4% of annual global GDP, or US\$2.8 trillion, is lost due to the direct and indirect costs of occupational accidents and diseases, including lost working time, workers' compensation, interruption of production, and medical expenses



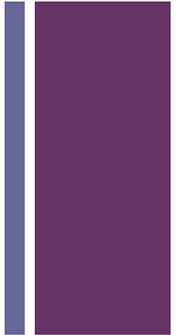
Setting the scene – Facts and Figures



- In South Africa, the Department of Labour reported in 2013/2014 Annual report, COIDA- that an R 2 billion was spent on Occupational related injury claims
- This figure excludes the claims submitted to insurance houses who have Medical schemes and Pensions
- Alexander Forbes for example reports that the South African economy spends at least 40 billion in absenteeism (2012)



Legislative Requirements



■ Health and Safety Legislation

- Occupational Health and Safety Act
- National Rail Safety Act
- Mines Health and Safety Act
- Compensation of Injuries & Disease Act (COIDA)
- Labour Relations Act
- Basic Condition of Employment Act
- Labour Relations Act
- Skills Development Act
- Employment Equity Act

■ The Code of Good Practice on dismissal , Schedule 8

- Pensions and Medical Schemes
- World Health Organisation

NOTE : POLICY on Amendment of the Compensation for Occupational Injuries and Diseases Act. Developing a rehabilitation, re-integration and return-to-work policy for injured and diseased workers to ensure integration with other South African Policies and Programmes, which provide a framework for rehabilitation of people with disabilities which stresses the importance of vocational integration

+ Bold new concept, WHO

The World Health Organization's International Classification of Function, Disability and Health

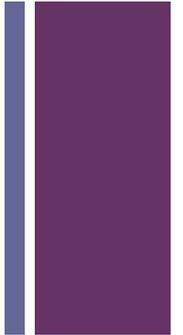
This new classification system is based upon a biopsychosocial model of disease of which pain physicians are very aware of

It includes the body or organ systems that are affectedbut also adds a dimension of functioning to incorporate all bodily functions, activities, and participation.

+ Legislation

Occupational Health and Safety Act

- Every employer must provide and maintain as far as reasonably practicable , a workplace that is safe and without risk to the health of their employees (Section 8)
- Must undertake a planned /periodic programme of medical surveillance which includes, clinical, biological or other medical tests of employees
- Mines Health and Safety Act (same)



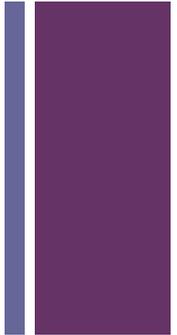
+ Legislation

- The Human factors standard addresses biomechanical testing to assess functional abilities of job demands – SANS 3000-4 :2011
- Compensation for Occupational Injuries and Diseases
- **Draft Bill on Rehabilitation of injured employees**



+ Functional Capacity

- Establishes physical limitations and/or capabilities
 - Ability/capability /potential to work
- Determines extent of impairment
 - Disability /Temporary/ Permanent /Partial
- Determine fitness for work
- Assists in decision making process for the on-going management of an individual(pre, periodical and post employment)
- Identifies whether specific inherent criteria are met
- Ensures good quality of life
- e.g. ill-health and retirement applications
- Also includes substance abuse – Addictions



+ Equipment





Return to work Management

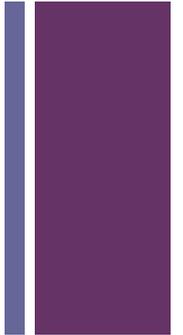


Return to work interviews assist by identifying possible causes of

- frequent sick absenteeism and employers can determine if any health risks may impact on productivity,
- the employer is able to obtain the necessary information to avoid or deter these health risks in the workplace and
- is therefore able to guide the employee in obtaining appropriate assistance



What is function Capacity Evaluation

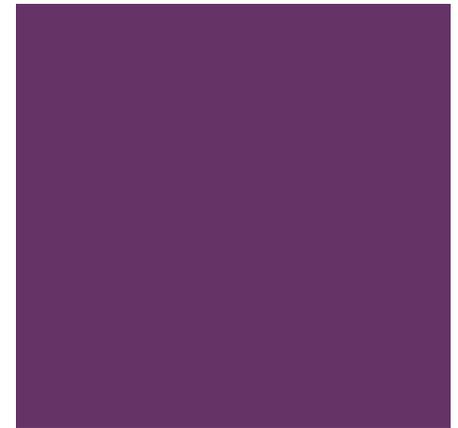


- Assess whether an employee can
 - return to job after an incident, alternative position, re-alignment/transfer
- Determine chronic /severity of a medical condition
- Tests which determines an employees ability to carry out function/duties as per job demand or activities
- Content validity implies the test seems related to the construct which it is intended to measure. Concurrent validity, or criterion-related validity, implies the test is well correlated with an established “gold standard.”
- Although we would ideally like all tests to be measured against such a “gold standard,” **much of medicine cannot be measured as such.**
- The function of an individual is definitely not something that has a universal “gold standard.”
- Construct or convergent validity implies that the test is well correlated with a theoretical expectation, something researchers should be able to elucidate.

What is Function Capacity Evaluation

- FCE can be used to develop a treatment programme, to measure the physical abilities of employee/ patients before and after a rehabilitation programme: +
- to modify a rehabilitation treat something researchers should be able to elucidate.
- Functional independence





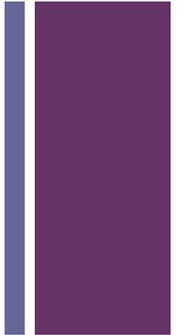
+ Can employees cope at work on their own ???

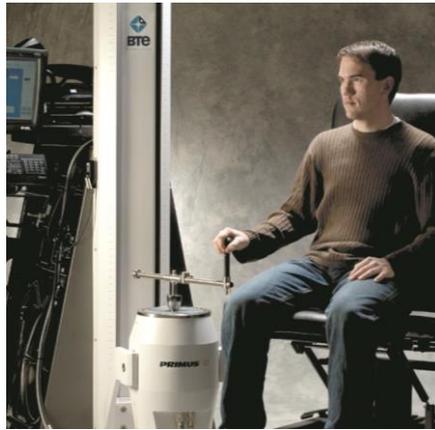
Evaluation of whether an injured worker can work, and to determine when he/she can return to work.

+ Evaluation

Evaluation is a dynamic process in which the evaluator makes a professional, clinical judgement on data gathered during the evaluation

- Assessment of worker's functional capabilities to perform the physical demands of the proposed or current job
- Individual case by case basis
- Evaluation includes , physical examination/screening, including components of neuromusculoskeletal
- Range of movement and strength is evaluated to determine if employee has the capacity to undertake job demands
- Self reported impact of physical abilities and activities is included in evaluation
- Assessment is undertaken over a range of physical job demands of the specified job/duties in question
- Can be performed in the simulated workpalce or in the environment during on the job training





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+ Why is FCE important ?

In order for us to assess function, ideally we would like an instrument that can reliably measure the functional physical ability of a person to perform a work-related series of tasks.

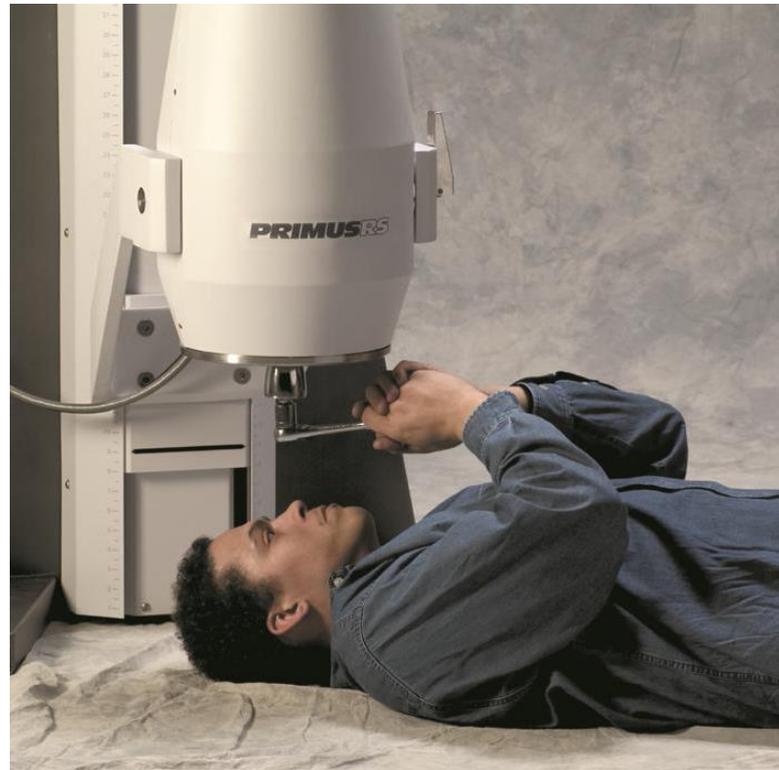
- Pre –employment for placement and medical screening
- Periodical medicals
- Transfer and exit medical
- Incapacity Management/Case Management
- Management of post injury
- Vocational Rehabilitation , treat an individual to expedite return to work
- Reasonable accomodation
- Employer retains their productive employees
- Claims Management – Absorbed though better management of injured employees

+ Some FCE examples

Pulling



Rotated movements



+ Objective Testing

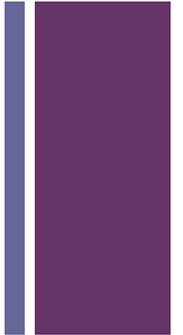


Wrist Testing





Human Performance -Evaluation



- The following components may be assessed:
 - pushing, pulling, lifting, carrying, crouching, kneeling, stooping, bending, standing, sitting, walking climbing, crawling , overhear reaching, forward reaching, handling ,fingering , gripping and feeling
- The evaluator must observe and analyse the body mechanics used by the employee during assessment of specific functional abilities

+ Safety

The main focus of an FCE must be the prevention of further injury:

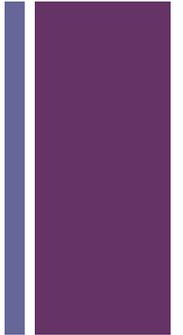
During the evaluation an number of factors are fundamental to the safety of the employee

- The injury/medical condition must be medically stable
- The evaluator must use his/her professional judgement in determining the safe maximal level for each test component
- Standardised decision making for each criteria of test
- The evaluator should use professional judgement to decide whether the FCE should continue , if the employee continues to use unsafe body mechanics
- FCE evaluators must have the necessary education, training and competencies to undertake the tests

+ Reports

The report should include : (see template)

- Injury/diagnosis
- Results of subjective interview
- Result of self report(what employee says about his health/injury status)
- Current work status and performance
- Results of physical examination /screening
- Behavioural aspects, including pain behaviour and effort
- Pace of work
- Clinical observations including body mechanics
- Functional abilities for the assessed physical demands
- Capacity to perform specific duties when requested
- Job matching as required
- Recommendations and Conclusions



+ Treatment Data



+ Job Functions

- Many jobs or individual job tasks have multiple components which makes human reliability crucial : **driving a train for example**

■ Primary Tasks

- Musculoskeletal requirements. It is not possible to simply document a jobs essential functions.
- A jobs secondary or support functions could create a risk to the employee as well as some employees as well.
- Sensori motor requirements : to operate the footplate correctly e.g. eye hand coordination/eye leg coordination
- Perceptual cognitive skills regarding safety awareness e.g. depth perception

+ Job Functions

- To design a prevention programme and help address possible future accommodation issues, one must breakdown the components of all the jobs functions.
- Also referred to as **TASK ANALYSIS**



+ Job Evaluation

- There are systems and equipment on the market to assist with the evaluation
- FCE is done in a “simulated environment”
- Isometric Testing /Evaluation
- Equipment (calibrated) provides for an accurate and reliable measurement of abilities and functionality of job demands
- Facilities for evaluation must be conducive, space, and privacy is paramount
- the need to design a prevention programme and help address possible future accommodation issues, one must breakdown the components of all the jobs functions.



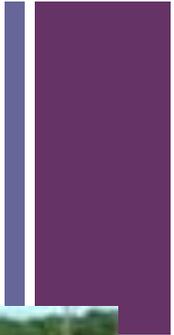
+ Job Evaluations

Relevant information is also included prior to FCE

- Medical reports
- Fatigue (shift rosters) , leave schedules ,
- Job analysis
- Rehabilitation
- Medical investigations (where applicable)
- Rehabilitation and progress reports
- Employees home (life-work) activities , which include hobbies etc.
- Incident investigation reports • Medical claims submitted to other treating physicians



+ Evaluation for train services





EQUIPMENT FOR FCE

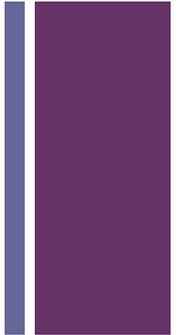


EVALUATION





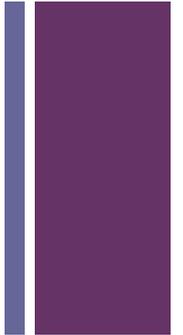
Human Performance -Evaluation



- **Musculoskeletal** : Gross motor , whole body movements , including lifting m and strength components
- **Sensorimotor**: Typically considered fine motor but any task that requires a light touch , good proprioceptive skills or rapid hand motions with minimal force. Examples in include pinching , threading and writing
- Psychometric
- Behavioural



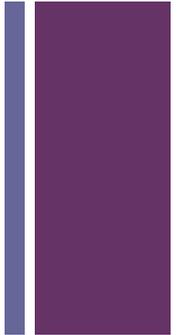
Human Performance -Evaluation



- **Perceptive Motor:** Tasks involving perceiving a change environment and making the correct motor response. Examples would include driving , tracking on a computer screen (TCO's) or any balance critical skills. E.g. people participating in motor sports
- **Perceptive Cognitive :** Tasks involving perceiving and correctly interpreting different levels of stimuli. This include quality inspections , ensuring by sight and sound that the machine is running correctly or any job that requires some kind of taste and smell interpretation .
- **Cognitive :** Aspects of the job that requires higher level thinking or creative work



Bibliography



- 1. Gouttebarga V, Wind H, Paul P, Kuijer FM, Frings-Dresen Reliability and validity of functional capacity evaluation methods: a systematic review with reference to Blankenship system Ergos work simulator, Ergo-kit, and Isernhagen work system. *Int Arch Occup Environ Health*. 2004;77:527–537. [[PubMed](#)]
- 2. Reneman MF, Brouwer S, Meinema A, Dijkstra PU, Geertzen JHB, Groothoof JW. Test-Retest Reliability of the Isernhagen Work Systems Functional Capacity Evaluation in Adults. *J. Occupational Rehabilitation*. 2004;14(4):295–305. December.
- 3. Brouwer S, Reneman MF, Dijkstra PU, Groothoff JW, Schellekens JMH, Goeken LNH. Test-Retest Reliability of the Isernhagen Work Systems Functional Capacity Evaluation in Patients with Chronic Low Back Pain. *J. Occupational Rehabilitation*. 2003;13(4):207–218. December.
- 4. Gross DP, Battle MC, Cassidy JD. "The Prognostic Value of Functional Capacity Evaluation in Patients with Chronic Low Back Pain: Part 1: Timely Return to Work. *Spine*. 2004;29(8):914–919. [[PubMed](#)]
- 5. Gross DP, Battle MC. The Prognostic Value of Functional Capacity Evaluation in Patients with Chronic Low Back Pain: Part 2: Sustained Recovery. *Spine*. 2004;29(8):920–4. [[PubMed](#)]
- 6. Gross DP, Battié MC. Factors influencing results of functional capacity evaluations in workers' compensation claimants with low back pain. *Phys Ther*. 2005;85(4):315–22. Apr. [[PubMed](#)]