

Functional Capacity Evaluation of Individuals with Acquired Brain Injury

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Damage to the Developed Brain

- Surgery: intracranial
- Cerebral vascular accident
- Intra-cranial bleeding
- Infections
- Ischemia
- *Trauma
 - Most frequently from MVA, falls, assaults
 - Other causes: sports and recreation
 - Estimated that 50% of all TBI involve alcohol consumption
 - Classified by Glasgow Coma Scale

Functional Capacity Evaluation

- Evolved over the last 40 – 50 years with contributions from occupational therapy, vocational rehabilitation, physical therapy, psychology, kinesiology, physics, ergonomics, and biomechanics
- Systematic, comprehensive objective measurement of an individual's functional abilities
- Purpose: to determine maximum work capacities of an individual
- Markets:
 - Vocational rehabilitation
 - Litigation
 - Disability determination

Types of functional capacity evaluations

- Work sample approach
- Systems of Functional Capacity Evaluations
- Other systems using available equipment:
*BTE Work simulator, Work Cube,
standardized tests*

Occupational Performance Analysis Unit

Based on Canadian Model of Occupational
Performance

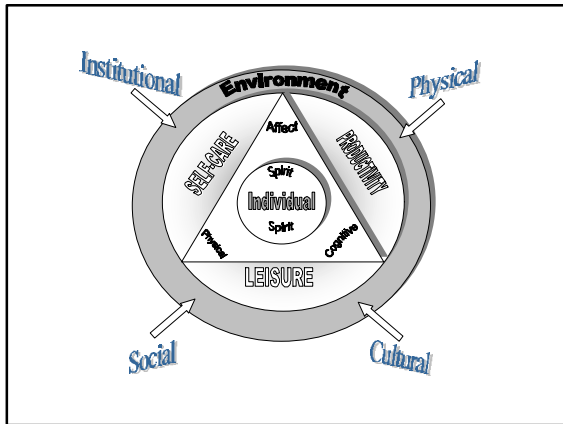
Provides functional capacity evaluations for
medical legal purposes, insurance
companies

OT Badge at Inception

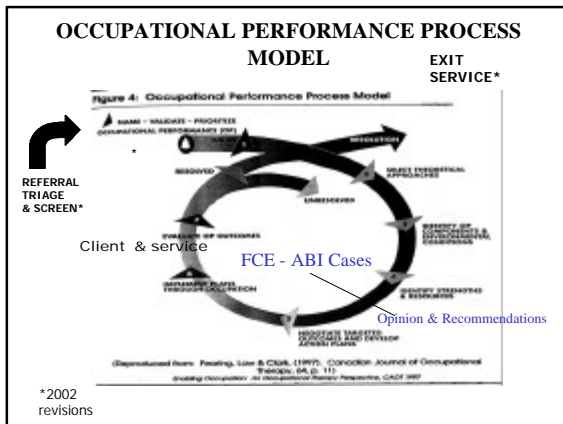


From the Beginning a Holistic Approach

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- ### Protocol
- Intake screen
 - Review available information:
 - Medical history
 - Background information: education, employment
 - Job description if available



- ### Functional Capacity Components
- Interview:
 - Subjective symptomatology
 - occupational performance: ADL, IADL,
 - customary roles pre and post
 - Psychosocial information

- ### Musculoskeletal Evaluation
- Range of motion
 - General strength
 - Grip strength
 - Mobility
 - Endurance
 - Postural evaluation
 - Body composition
 - Sensation

- ### Physical Demands Testing
- Functional Capacities Testing
 - Standing, sitting, walking
 - Mobility: squatting, kneeling,
 - Manual dexterity
 - Climbing
 - Positional work
 - Manual handling
 - Hand assessment
 - Aerobic capacity

Simulations & On-site visits

Work Simulations:

- Using equipment or material to simulate job demands
- Closer match to actual jobs

Actual site visits:

- Job site
- Home visits

Comparison of Testing to Occupation

- Reference published literature
- Job description from employer
- Occupation: Might be housekeeping capacities, self care, leisure

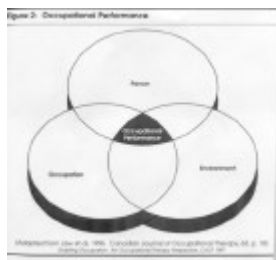
Other considerations

- Distraction based testing
- Emotional responses of client
- Performance approach
- Attention and concentration
- Memory
- Problem solving

Person Occupation Environment Model

- Provides a clear, broad framework for using environment in occupational practice
- Emphasizes the many possibilities and opportunities for accessing environmental resources and reducing environmental barriers to optimize performance
- Concepts are the same as those in CMOP
- Provides a frame work for interactional analysis: P-E; P-O; E-O
- Output: Occupational performance profile

POE Interactions



Person

- Composite of mind, body, and spirit (CMOP)
- Includes cognitive, emotional and physical deficits
- Person is dynamic, motivated, and ever developing
- Engage in various roles

What about the individual with acquired brain injury?

- Mental (cognitive and emotional) impairments result in significant disabilities
- Physical impairments
 - Might be non-existent
 - Important to identify
 - Common physical problems

Cognitive Deficits

- Attention (focus on something)
- Concentration (attention over time)
- Distractibility
- Failure to attend to central or critical elements
- Loss of focus in conversation
- Accentuated with extended mental activity
- Divided attention: shift attention, monitor ongoing activities

Learning and memory

- Intact old learning and procedural memory (over learned skills)
- impaired new learning (registering, storage, retrieval)
- Prospective memory: forgetting appointments
- Incidental memory: result in lost keys, shoes, packages
- Working memory

Factors negatively affecting learning/memory

- material more extensive, complex, recalled after longer time, stressful situation
- Decreased attention or concentration
- slower processing of information
- Depression

Higher Level Cognitive Function

- Inability to abstract
- Decreased ability to conceptualize
- Poor problem solving abilities: inflexibility with thinking, perseveration of same approach
- Speed of information processing: slower
- Comprehending likely outcome of situation or action

Higher Cognitive Functioning

- Executive skills: Planning, organizing, self monitoring, goal directed activities
- Goal setting: formulation, initiation of necessary actions (perceived as amotivated); may be unrealistic
- Insight: unable to evaluate strengths/weakness (“new self”)

Physical deficits

Sensory-motor deficits are common:

- Loss of smell and taste
- Loss or decreased hearing
- Loss of tactile sensation
- Visual disturbances (eye movements)
- Decreased balance (vestibular problems)

Motor Control and Coordination problems

- associated with cases with prolonged loss of consciousness, brain stem damage
- awkward gait
- poor control of hand and arm movements
- difficulty articulating words
- Decreased finger dexterity

Physical deficits

- Fatigue
- Seizure disorders
- Headaches
- Decreased tolerance for alcohol/drugs

ADDITIONAL ASSESSMENT TOOLS

- the short fall of the FCE for the individual with ABI is that it is a relatively structured environment.
- impose structure and environmental controls
- may not generalize to the community or workplace with inherent distractions

Other Tests

Standardized tests

- Valpar 5: Clerical Work Sample
- Pro 3000: Aptitude testing
- Lowenstein Occupational Therapy Cognitive Assessment
- Cognitive Competency Test

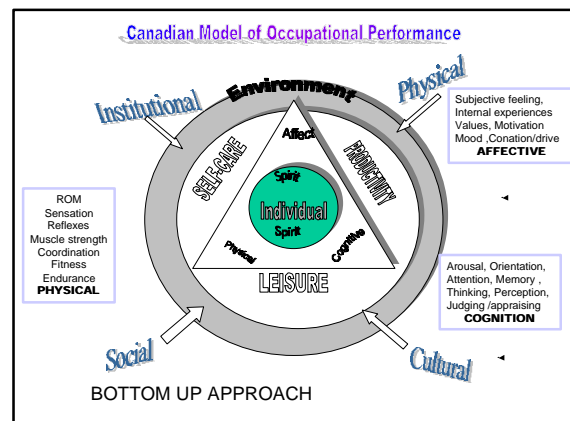
Work Simulations

Questionnaires

- Personal Capacity Questionnaire
- Sickness Impact Profile
- Mayo Portland Inventory (J. Malec & M. Lezak)
- Values and Salience Questionnaire

PERSON

- Medical history
- Ongoing mental status examination
- Presence of psychiatric phenomena: depression, anxiety



Affect

Affect: emotional responses during the interview and evaluation

- Consider congruence between content and affect
- Irritability, inappropriate responses, tearfulness, emotional outbursts
- Frustration tolerance/impulse control
- Motivation/approach to tasks
- Response to entire testing: compliance, negative self perceptions
- Approach to task: need for encouragement
- rushed performance (lack of commitment to the process)
- Social interaction with the evaluator: appropriateness, confrontational
- Your emotional response to the client

Cognitive

- Attention, concentration: observe during standardized tests
 - Decline in performance, e.g. with demand for longer
 - Divided attention (clerical work sample)
 - Environmental distractions: natural, imposed
 - Structure versus unstructured
- Memory:
 - instruction following
 - Complexity of information
 - historical information (subjective, objective)
 - Prospective memory
 - Working memory

Cognitive

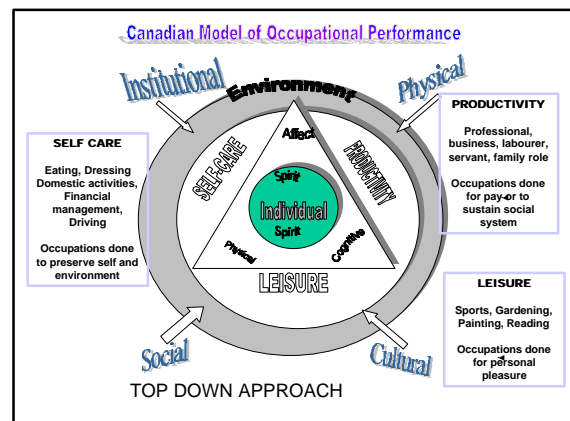
- Insight: interview; interview with significant other
- Executive functions (planning, organizing problem solving): work simulation, novel tasks
- Problem solving: e.g. tool use, in situ, Pro 3000
- Perceptual organization: Valpar 9, Pro 3000, Lowenstein
- Executive function: work simulations
- Ability to abstract: understanding of tasks
- Drive
- Spirituality

Physical Function

- Musculoskeletal examination
- Mobility screening
- Evaluate Physical Functioning when performing work samples:
 - impact of fatigue on performance: endurance as well as cognitive functioning
- Heart rate monitor
- Aerobic fitness

OCCUPATION

- Self directed tasks and activities that an individual engages in
- Developmentally appropriate roles: self care, productivity, leisure
- Intrinsic need for self-maintenance, expression, and fulfillment through work and leisure activities
- some meaningful activities
- obligations/duties

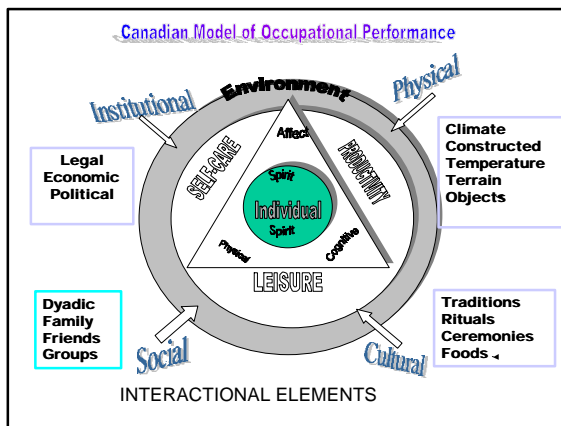


Assessment of Occupation

- Customary roles: establish with background document review, interview, significant others
- Variety tasks required to fulfill roles, consider the demands of tasks/ performance
- Work samples & simulations: consider characteristics and demands of the task (physical cognitive, emotional, social)
- Leisure: social contact, solitary activities
- Housekeeping: independence, simulations
- Self-care: basic, grooming
- Productivity:
 - Competitive employment:
 - possible alternatives (volunteer activities)
 - Accommodations: routine, degree of structure

ENVIRONMENT

- Social
- Physical
- Cultural
- Institutional



Assessment of Environment

Social

- Examine the individuals environments (background documents, interview)
- Looking at environmental conditions and influences (positive or negative)
- Environment is considered to be more amenable to change than the person
- Social network: marital status, friends, acquaintances; education (associations)
- significant other's perception: interview
- Perceived social support: important predictor of life satisfaction
- Societal expectations: employment (common age: young males)

Assessment of Environment

Physical Environment

- Consider external conditions during evaluation (distractions: noise)
- Adaptations required to accommodate physical limitations
- Geographic: Urban or rural
- Availability of transportation
- Accommodation: house, apartment
- Work environments: safety

Assessment of Environments

Institutional

- Legal of insurance policies that impact a person
- Government policies: move toward independent living based on changing definitions of health (social, physical, mental health);
- Funding sources: AISCH,
- Programs in the community

Assessment of Environments

Cultural

- Ethnicity: beliefs, attitudes
- Family: rituals, expectations, implicit rules
- Work place: disapproval or acceptance of certain behaviours
- E.g. blue collar versus white collar
- Relevant activities

Person Environment Occupation Fit

Occupational Performance = transaction between the person, environment, and occupation

Outcomes:

- Good fit = adaptive behaviour and positive affect (satisfaction, pleasure, desire to continue)
- Poor fit: e.g. Competence of the person is too low in relation to occupational demands → maladaptive behaviour (failure in performance), negative affect (stressed, emotional outbursts) (Lawton, 1996)
- Gold standard: what they did before, achievements
- What are the changes have occurred
- Outcome of a good PEO fit is optimal occupational performance
- Outcome of a poor PEO fit is inadequate occupational performance

PEO analysis

Person:

- Variations in performance depends on characteristics of tasks (occupation): on degree of structure, duration of activity, complexity of tasks
- Behaviour (person) is influenced by and cannot be separated by contextual influences
- Motivation: interests, cultural relevance of activity
- Consider situations/conditions that precipitate emotional responses: failure, stress, distraction

PEO Analysis

Occupation

Characteristics of task demands

Independence

Responsibilities

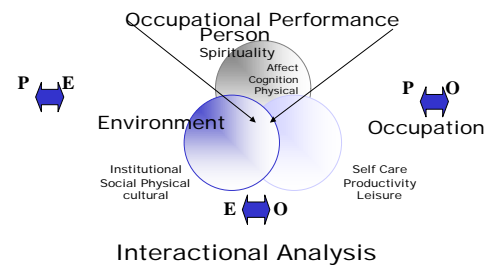
Supervision

PEO analysis

Environment

- provides the context for occupation (e.g. safety)
- Can enable or constrain performance: (e.g. distraction versus quiet environment)
- Environments are continually shifting/changing
- Stability of home environments: impact on significant others

Person Environment Occupation Model - PEO



Accommodations

- Potential accommodations to optimize performance
- Environment/occupation is often more amenable to change than person
 - Consider: shorter duration, cueing, written cues
 - Structure versus unstructured
 - Use of aids (electronic devices, day-timer)
 - Routine, repetition
 - Impact of fatigue on performance: need for breaks
 - Need for education, counseling for significant others
 - Supportive employment approaches
 - Life skills
 - Group home: supervision

Process

- **Triangulation:**
 - History
 - Self report
 - Objective findings

Process requires:

- Experience
- advanced clinical reasoning skills
- collateral thinking process (not linear) as need to thread in constantly
- facilitated by an on going internal peer review process

Case Example

- 24 year old single male
- Living with his parents in their home
- Housekeeping: Primary responsibilities helping with outdoor chores
- Educational background: HS drop out but returned to complete his high school; (was 3 credits short of a diploma)
- Employment : Labourer in lumber mill,
 - Full time for 2 years, good wages
- Vocational plans: Pursue a trade (heavy duty mechanic) in future

Medical history

- Motor bicycle accident in 1994
- Ambulance:Glasgow coma scale: 7/15
- Transferred to an acute care hospital, admitted for 3.5 weeks
- Hospital:Glasgow Coma Scale: 6/15 (severe TBI)
- CT scan: right subdural hematoma with mild to moderate shift of the brain contents to the left
- Right temporal lobe contusion (bruise)
- Basal skull fracture
- Laceration of the right knee capsule
- Compound fracture right femur
- Fracture of the right thumb
- Compression fracture of T8
- Bilateral mandibular compound fracture

Treatment

- Surgical procedures for repair of fractures
- Stabilized medically
- Glenrose Rehabilitation Hospital: Program for individuals with ABI for one month
- Outpatient clinic: intermittent follow-up for approximately 1.5 years until August 1996
- Also attended outpatient groups in the evening during this time including a memory group, substance abuse group, and individual sessions with a psychologist for anger management in 1995

Functional Capacity Evaluation

Physical:

- Capacity for light to medium level work
- standing tolerance of up to 90 minutes providing he can shift his weight frequently
- walking tolerance of up to 15 minutes continuously on non-resilient surfaces; limited by left knee pain
- climbing of stairs and ladders on an occasional basis

Decreased tolerance:

- tasks requiring repetitive and resistive right hand/wrist movements
- low level positions that increase strain on his left knee
- prolonged and repetitive back extension and flexion
- rapid alternate and coordinated bilateral hand movements

Cognitive Function

- Observed during evaluation
- ability to apply common sense understanding to deal with concrete problems and follow detailed but uncomplicated instructions
- demonstrated poor performance on clerical tasks with decreased attention to details
- decreased memory for specific information related to the task
- Lack of insight into changes

Aptitudes

Average:

- manual dexterity
- motor coordination
- finger dexterity

Above average:

- colour discrimination
- spatial perception
- form perception
- eye-hand-foot coordination

Below average:

- General learning
- Verbal ability

Emotional Function

- Polite, pleasant demeanour
- little variation in affect
- responses slightly elevated
- laughing or smiling no matter describing difficulties or positive life events
- Incongruent with content of conversation
- Self report: angry easier (confirmed by significant other)
- Lack of initiative/motivation (client & significant other)

Occupation

Job Site Visit:

- Interview with employer
- Observations on site

Customary Rotations required:

- Rough cutter
- Fork lift operator
- Stacking wood

MANAGER'S PERCEPTIONS

Affective function

- Easy going and pleasant
- Always seems to be happy
- Able to hand out insults to co-workers
- Able to take insults from co-workers

Cognitive Function

- "Not the same person" when he returned to work
- Slower in mental capacity (communications unclear)
- Speech is different (slurred)
- Sometimes forgets earlier conversations (repeats same request)

MANAGER'S PERCEPTIONS

Functional Consequences:

- unable to keep up the pace of the work on the rough cutter position
- Slowed the pace of other team workers on the assembly line team
- unable to make quick decisions regarding quality of boards
- unable to flip & perform the complex sequence of cutting, inspecting, flipping and tossing the board to the correct area
- Team sometimes needed more time to meet their quota for production

Analysis: PEO

Analysis of information obtained through:

- Medical history
- Performance during evaluation (physical and mental)
- Subjective information: client, manager, significant other
- Job site information
 - Occupation (Job)
 - Environment
 - P-O-E: Performance (attempts to return to work)
- Statistics/literature regarding return to work

Person-job-environment fit:

- Match the skills and abilities of the individual, the demands of the activity, and the social and cultural environments
- Identifying risk factors in the environment that require intervention include physical and psychosocial

Case Analysis:

Several physical and cognitive demands exceeded his capacities

- Physical demands:
 - Demand for heavy manual handling
 - Aerobic demand: fatigue
 - Repetitive upper extremity work and speed required
- Cognitive demands:
 - Familiar work tasks
 - Sequencing of multiple responses (physically and cognitively)
 - Quick decision making

Environment

Barriers to return to work:

- Safety
- Quotas

Facilitation of return to work:

- Familiar environment
- Culture
- Employer willing to accommodate
- Available job with lighter physical demands and cognitive demands

Research at U of A

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