

Motor Control Framework

Physical Therapy
& Human Movement Sciences



Motor Control Framework

1. Observation
and
Description of
Movement

2. Movement
Analysis

3. Plan of Care
to address
Movement
Dysfunction

Hedman LD, Rogers MW, Hanke TA. (1996) Neurologic entry level education: linking the foundation science of motor control with physical therapy interventions for movement dysfunction. Neurology Report, 20, 9-13.

1. Movement Observation/Description

Movement Continuum serves to organize movement observations and descriptions.

Outcome

success of goal attainment in task & environmental context

Initial Conditions

Individual, task, environmental attributes

Preparation

time period when the movement is being organized

Initiation

instant when movement begins:

- timing
- direction
- smoothness

Execution

time period when the body segments are moving

- direction
- amplitude
- speed

Termination

instant when movement stops

- accuracy
- timing
- stability

2. Movement Analysis

Knowledge of the person, task and environment and their interactions leads to hypothesis generation in these 4 domains about a patient's movement.

Neural

the neuronal structures, pathways, and processes that participate in the control of movement

Biomechanical

the structure and properties of muscles, joints, and soft tissues and the physical laws governing movement

Physiological

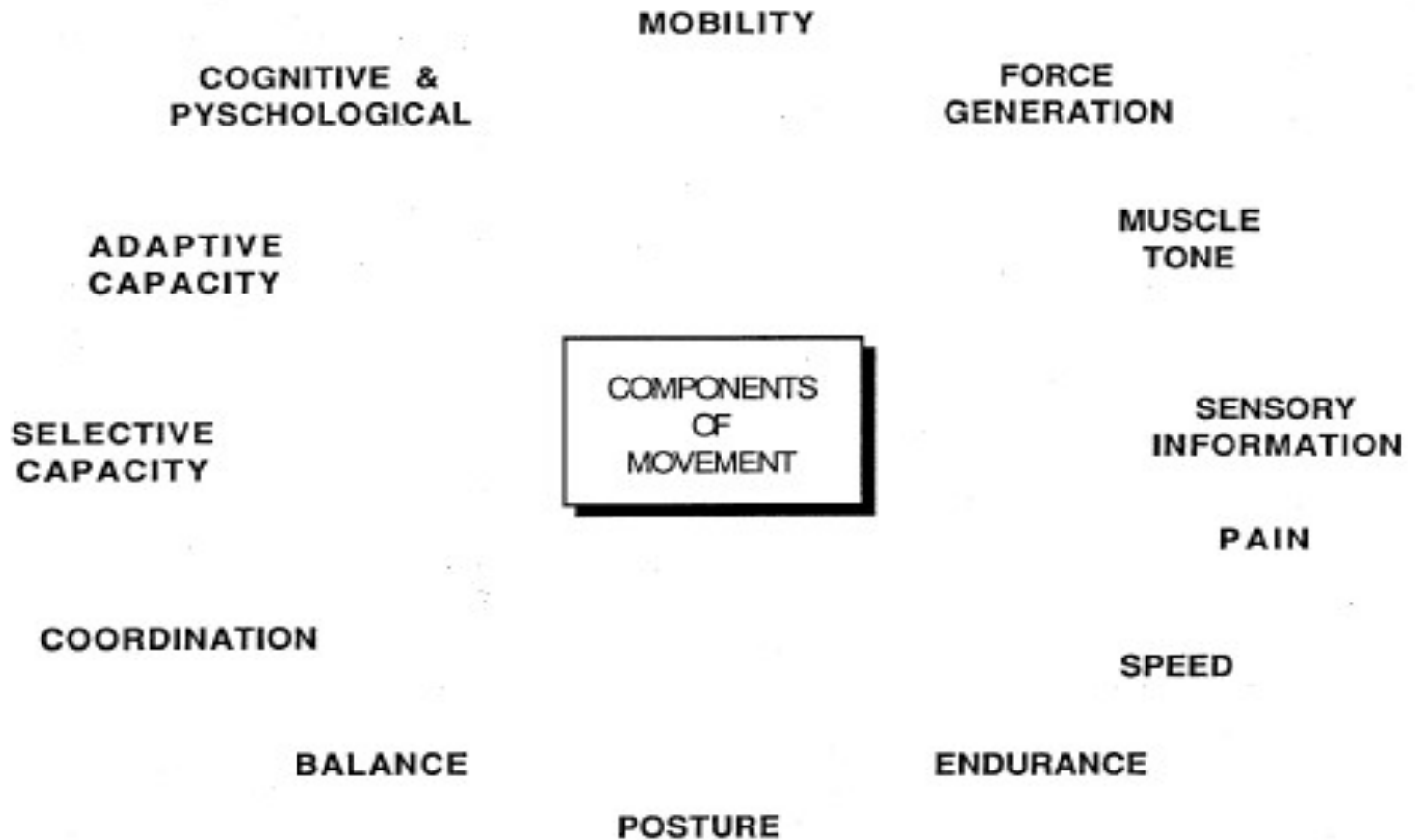
mechanisms of various systems of the body that contribute to the production of movement

Behavioral

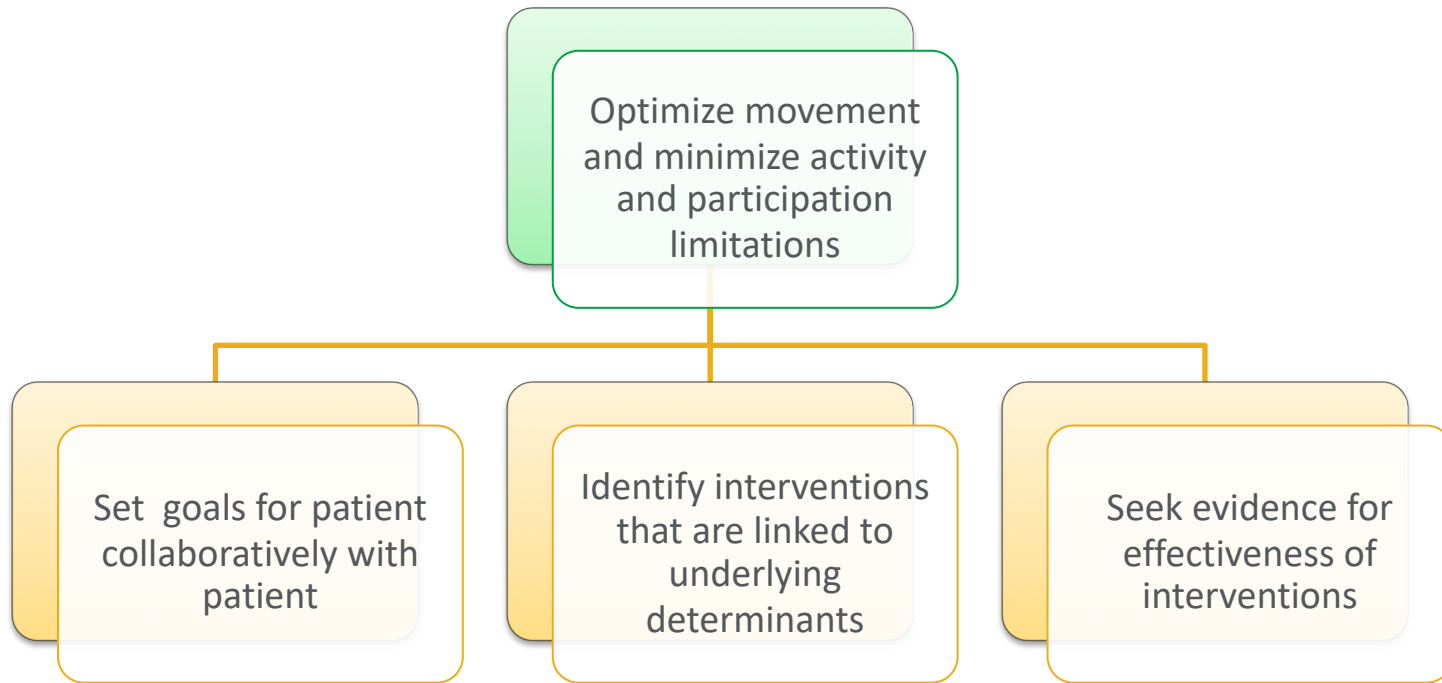
cognitive, motivational, perceptual, and emotional processes, as well as the outcome of movement in terms of either solving a motor problem or satisfying a goal in a particular environmental context

2. Movement Analysis

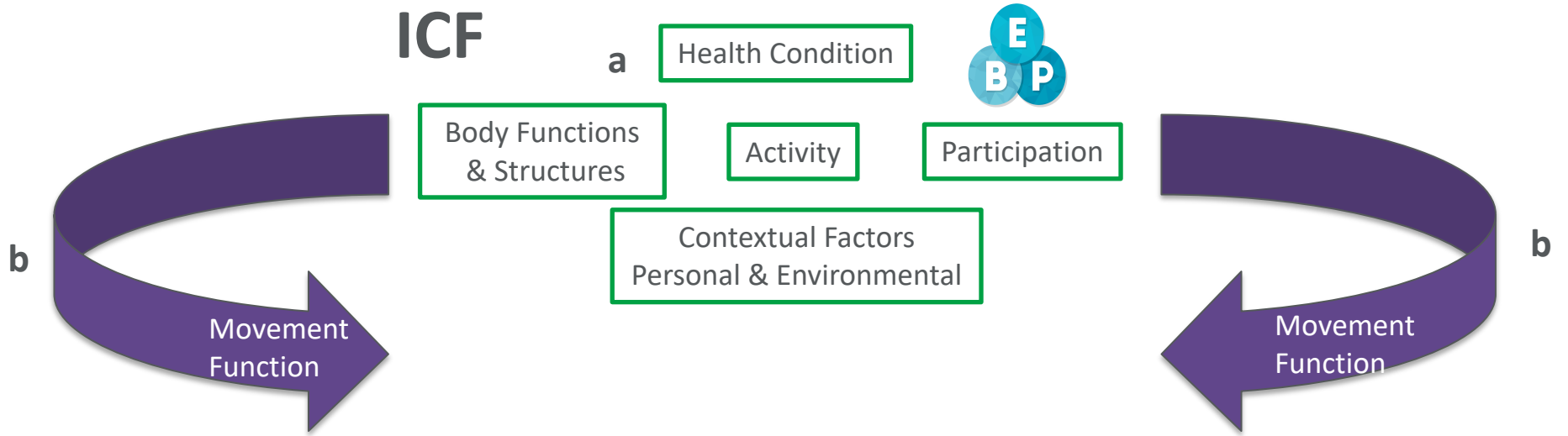
Examine the clinical components of movement to help rule in and rule out hypotheses



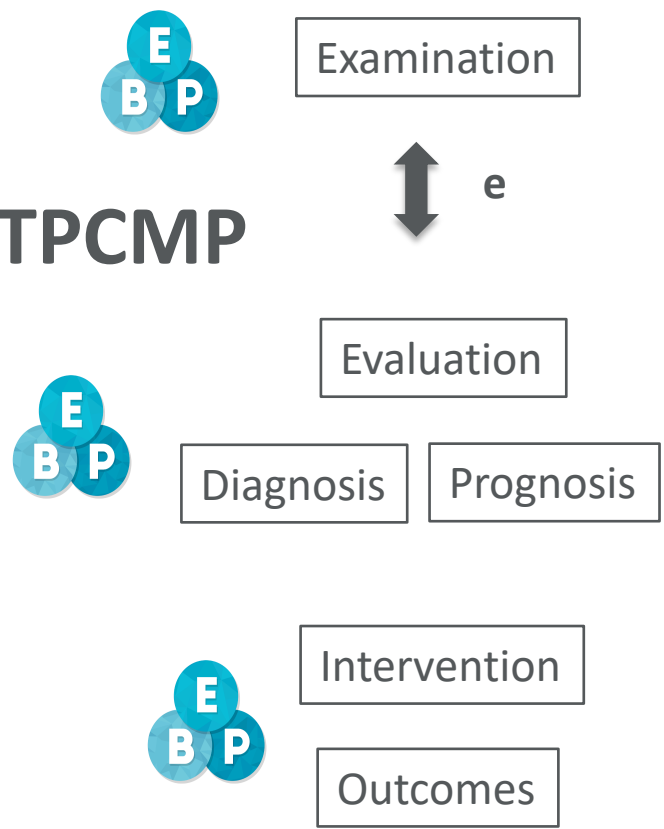
3. Plan of Care to Address Movement Dysfunction



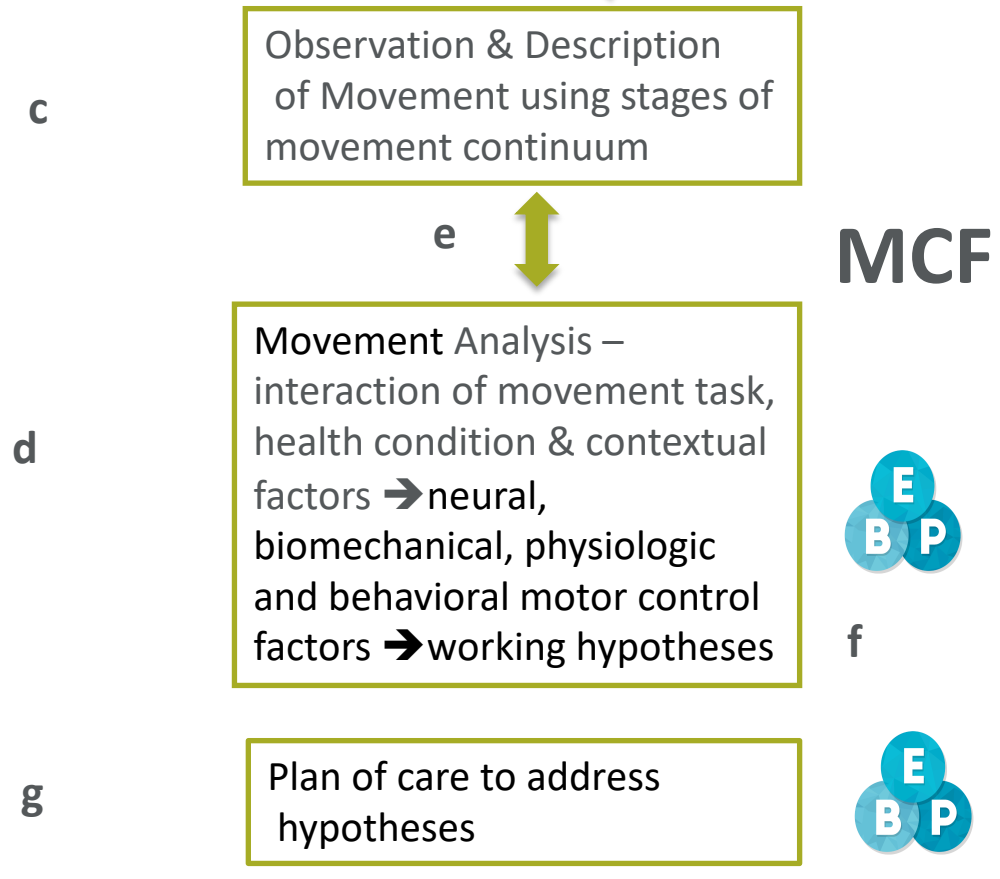
ICF




PTPCMP



MCF





The MCF is not intended to be applied exclusively and is easily integrated in clinical practice with the Physical Therapist Patient Client Management Process (PTCCM),⁸ International Classification of Function and Disability (ICF)⁶ and Evidence Based Practice (EBP).¹⁵ The ICF, representing the whole patient, defines function as a complex interaction between the health condition and context (a). The MCF narrows the focus to *movement related* function (b). The MCF is applied within the basic clinical process described by the PTPCM. As part of the initial examination the PT observes the movement using the movement continuum as an organizing framework (c). The PT begins to analyze the movement in the evaluation stage of PTPCM by integrating knowledge about the health condition, the movement task and information gathered about the person's experience (d). As the PT develops hypotheses about the reasons for the way a person is moving, they may be able to begin to rule in rule out hypotheses through examination (e). The 2 way arrows between movement observation, and analysis and examination and evaluation is meant to reflect this back and forth nature of the process to arrive at working hypotheses (f). Localization of movement dysfunction to motor control factors and knowledge of these factors directs treatment at multiple systems and levels of functioning (g). Principles of EBP are embedded throughout the entire process.