

Motor Learning and Stroke Recovery

Variables that influence

- Cognition; attention and concentration
- Motivation: meaningful task?
- Need to set goals
- How you give instructions
- Environmental context
- Good assessment of capabilities

Motor Learning Defined

- Acquisition of **skilled** movement based on **practice** or **experience**
- Within the context of the individual and his/her **environment**
- Leads to relatively **permanent changes** in the capability of making a motor response

Motor Learning

- **Permanent change in motor behaviour**
- How often do you see this in your treatment sessions?
- How often do you see this from treatment session to treatment session?
- How often do you see this on observation on the unit?

- **Learning involves the repeated search for a solution to achieve the desired outcome**
- How often do we set up treatment to promote problem solving?
- How often do we just observe to see if problem solving is occurring during a task?

Criteria:

- Improvement in **performance**
- **Long-term** retention
- Resistance to **contextual change**
- **Generalizability** to similar tasks
- Improved ability to learn a new task

- How do you structure treatment sessions to promote learning? And the inclusion of NEW tasks – challenge!

Phases of Motor Learning

- Cognitive Phase – *e.g. instruction*
- Fixation or associative phase – *e.g. practice*
- Autonomous phases – *e.g. transfer of learning to related tasks*
- Skill decay phase (may or may not occur) – *e.g. renewal of skill*

Feedback

- Intrinsic: visual, proprioceptive, auditory, vestibular
- Extrinsic: verbal feedback from you, audio-video, visual (mirrors)

How to give feedback

- Positive
- Brief
- Specific
- What you observed not inferred
- Problem-solve together not advice
- Timing

Augmented Feedback

- Knowledge of performance
 1. Descriptive vs prescriptive
- Schedule of feedback – best is intermittent; allows intrinsic and client problem-solving to be focus

Practice

- ‘Does not mean repeating the same thing over and over again BUT rather the process of solving this problem again and again.’

Berstein, 1967

Practice

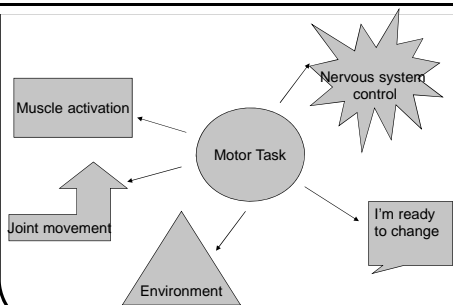
- You present the client with the opportunity to implement a problem-solving process
- Types of practice
 - block
 - random
 - massed

Approaches to Practice

- Whole: practice complete task
e.g reach for a cup
- Part: components of task
e.g. flex elbow in reaching phase
- Adapted: to facilitate success

Task-oriented/Motor learning Approach to Rehabilitation

Model



Principles and Characteristics

- Activity-dependent neuroplasticity
- Motor learning
- Meaningful tasks
- Goal-directed, functional movement
- Use of a natural environment
- Continuum: easy to complex
- Match to ability

Example Treatment session
