

# Neurology - Theory into Practice



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# Theory into Practice- Impairment

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Sensory systems
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Visual
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Vestibular
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Somatosensory
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Secondary deficits
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Musculoskeletal
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Joints/bone
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Muscle/ connective tissue
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Cardiovascular system
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Processing
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Cognitive/Perceptual/ Behavioural
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Motor outputting
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Negative feature/Too little
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Positive features/Too much
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Altered quality
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In relation to both mobility and stability
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# Intervention

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- ❑ Motor learning is the process of acquiring new capability to produce skilled movt.- changes that occur depend on the behavioural experience and opportunity to repeat/practice it
- ❑ Patients need to practice mvts that are as close to normal as possible

# Therapy depends on nature of deficit

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- ❑ Primary Deficit: If mvt deficits are:
  - ❑ -largely sensory in nature, Tx may revolve around sensory organisation training.
  - ❑ -more cognitive/ perceptual then Tx may revolve around dual tasking, cognitive and perceptual retraining.
  - ❑ -related to reduced motor outputting, Tx may revolve around activation/ strengthening, task orientated training.
- ❑ Secondary Deficits:
  - ❑ -secondary MSK change Tx may revolve around reducing/ eliminating structural impairments
  - ❑ -if related to secondary CResp change Tx may revolve around increased aerobic fitness

# Problem based approach for patient Tx

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- 4 Stages:
- - Preparation [for activity]
- -Activation [for function]
- -Function [for greater independence]
- -Practice [for carry-over]

# Repetition

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- Repetition practice needs to be of skilled/functional tasks
- - neither repetition of unskilled movts nor strength training results in the same change.
- Salience/attention to task/cognition
- -learning is promoted when attention/ cognitive effort is given to the task:
- Strategies:- increased relevance/importance and hopefully increase motivation
- - instructions/information about the task
- -change and variety in tasks practiced
- - guidance/ facilitation v exploration/discovery

# Types of learning of task

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- ❑ Errorless [actions learnt through exposure] v trial and error learning [mvt occurs and a comparison is made between actual sensorimotor experience and planned/predicted outcome]
- ❑ Learning through observation of others
- ❑ Mental imagery and practice [both sensory and motor input]- can increase the heart and respiratory rate in line with actual activity]
- ❑ Breakdown a complex task may be better than the whole task [we remember more of the beginning and end of a task rather than the middle]

# Augmented feedback [ hands on]

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- ❑ - may be of benefit at start of learning task but should be reduced as the learning task progresses.
- ❑ - may lead to dependency and poor retention of learnt skill
- ❑ - high levels of verbal feedback can reduce internalisation that patients need to do of their own internally driven feedback.
- ❑ High levels of hands on can also reduce the problem solving aspect of learning- trial by trial learning
- ❑ Let patient give feedback on what they are learning



# Strategies to enhance motor recovery

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- 5 R's of Task specific training :
- - should be **RELEVANT** to the patient and to the context.
- -practice sequences should be **RANDOMLY** ordered.
- -should be **REPETITIVE.**
- - should aim towards **RECONSTRUCTION** of the whole task.
- -should be positively **REINFORCED.**

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Thank you for your attention!

**THE END**