



Moving the Brain

Transforming exercise into meaningful movement

Joanne Elphinston

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With our words we can change everything...

- It isn't just the task or the programme that creates change (the "what").
- Developments in neuroscience are giving us new insights into *how* we help a patient to access new movement possibilities.



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To the brain, "movement" and "exercises" are not the same thing.



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- It is less about "the rules" and "getting it right", than about the feel and logic of it...

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The sensational cerebellum



- The cerebellum uses the past to predict the future.
- When a movement is made, a loop between the cerebellum and the motor cortex creates a “template” of the movement.
- Prior to the next movement, the cerebellum generates predictions about the sensory consequences of the movement.



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- The programme is completed before the physical movement has even begun!
- How do we change a movement that has been completed before it has begun?



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Multiple communication loops to different areas of the brain



- The cerebellum's forward controlling role is not just in sensory motor processing, but also in:
 - executive functions (attention, language, memory, imagery, reasoning)
 - perception (what do we think this is?)
 - emotion (e.g. fear conditioning, expectation of pain)



- Schmamann et al 2019; Todd et al 2020; Pupa et al 2014.

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Our next questions therefore are...



Is movement more than “motor”?, and is motor so much more than we routinely consider?



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Tip 1: What does the brain think this is, and therefore what solution is it offering?



- In which direction is this movement?
- Clarify the movement intention for yourself and the patient.
- What is this movement all about? What is its meaning? What is the logic of it?

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