

Thinking Outside the “Biomechanical Bubble”

Using Skill Dependent vs. Use Dependent Treatment Techniques

To Maximize Functional Outcomes

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How many times as a therapist have you gotten that client that presents with an obvious biomechanical problem like a stiff joint after a fracture and/ or weak grip strength after surgery? Perhaps the injury was from a motor vehicle accident or simply a fall but he or she also reports pain, decreased memory, problem solving, demonstrates poor proprioception, learned nonuse / guarding of the affected extremity, etc.

Especially in a primarily orthopedic setting, it's easy to rely on generic handouts, exercises found on computer exercises programs, and tools frequently found in a therapy clinic address the biomechanical deficit like therabands, putty, weights, etc. Is there anything wrong with these treatment techniques? If your goal as a therapist is to strictly address such areas as ROM and strength then of course not, but are these the very BEST treatment techniques to target the client's functional needs as a whole?

Over the past 10+ years there has been exciting research in the area of neuro rehabilitation that has focused on maximizing patients function by making a change at the cortical level. These are called “skill dependent” treatments. We see many of these concepts are being embraced with clients with an obvious neurological impairment such as stroke and TBI patients. Since most clients are neuro patients at some level, shouldn't we strive to integrate of these concepts with all patient populations over “use dependent treatments” like pegs and putty? How many times have you had patient report a decline in memory, problem solving, in addition to a biomechanical problem? With the aging population what client wouldn't benefit from a “skilled dependent” over “use dependent treatment” to enhance one biomechanically as well as cognitively?

So what exactly is a “skilled dependent treatment”? According to the research, inducing long-term plasticity in motor maps appears to be limited to behavioral experiences devoted to the development of new motor skills. Nudo (Muscle Nerve 2001), Jones (Stroke 2009). Task-specific and repetitive exercise are key factors in promoting synaptogenesis and are central elements in rehabilitation of motor weakness following a stroke. O'Dell (Annu Rev Med 2008) Changes in the functional plasticity of the motor cortex are skill-dependent rather than simply use dependent. Nudo (Phys Med Rehabil Clin N Am 2003).

So how can we transform our typical “use dependent treatments” to be skilled dependent in the hand therapy setting? If we follow the concepts of the Motor Relearning Program, we analyze the task, practice the missing component, practice the task and perform transference of training. So for a functional deficit such as being unable to wash one's hair, we figure out what part of the task is giving him or her problems. In this example, if the task can't be complete because he or she lacks enough strength and motion in their fingers, instead of just providing tendon gliding exercises we can provide a “skilled dependent treatment” like teaching the client a magic trick or craft activity that requires the same ROM demands. Once they have mastered that skill in isolation to the functional activity, then the activity itself could be integrated back into the task of washing one's hair.

The job of a therapist is never easy. Trying to find methods that keep clients focused and excited about participating in the rehabilitation process can often be a challenge. But by providing the patient with a new skill that is of interest to them, we have not only helped them biomechanically but also cognitively. Additionally, by engaging in an activity that is of interest to that client, we can also help distract them from pain, frustration, boredom, etc.

True growth as a therapist and educator demands creativity and “thinking outside of the box” or this case the “biomechanical bubble”. Let's remember our roots as occupational or physical therapist as we strive to treat the client as a whole to help him or her return to their premorbid activities. Just think about using a hybrid approach to treatment with functional goals to enhance not only gross & fine motor skills but also cognitive skills, sensory motor and communication skills. These techniques can be used in a variety of settings, including but not limited to the outpatient setting, but also schools, hospitals, nursing homes, and home. We can enhance carry over outside of the therapy session and potentially put the FUN back into function!

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