

## Translating Evidence into Physical Therapy Practice: How Evidence-Based is your Facility?

Incorporating new evidence-based physical therapy recommendations into current practice is a challenge facing rehabilitation professionals in clinics, hospitals, and long-term care facilities. These new treatment methodologies require a shift away from teaching compensatory strategies to an increased emphasis on active movement and strength training as well as more intensive practice.

Limitations of time, personnel and equipment all impact on the ease with which these evidence-based therapy recommendations are implemented. Nevertheless, there is an onus on facilities to evaluate how their current physical therapy programs measure up to the challenge in order to ensure that they provide optimal service. This note provides a brief overview of the evidence base for current neurologic and geriatric physical therapy programs and for some of the new tools and movement enablers designed for the modern rehabilitation setting.

### KEY FEATURES OF EVIDENCE-BASED NEUROLOGICAL REHABILITATION

In a recent article, Damiano elaborated on the main message of the 2005 III STEP Symposium on translating evidence into practice<sup>1</sup>. She emphasized that therapists need to identify more ways to help clients incorporate "activity, activity, activity" into their lifestyles. In order to achieve this goal of more active rehabilitation, the evidence points to the following key recommendations:

- Therapy has to be intensive
- Therapy has to be less passive and more client-initiated
- Therapy has to include strength training
- Therapy has to include increased mobility

Dromerick et al has termed some of these newer treatment approaches as "activity-based therapies" including constraint induced therapy, robotic therapy and treadmill training techniques<sup>2</sup>. By breaking down motor behavior into a number of subcomponents, it is possible to create a coherent plan of action to incorporate the above recommendations. The needs of the individual recovering from stroke, for example, or the geriatric client wishing to maintain or regain more functional ability, can be characterized under five aspects of motor behavior: a) sensory motor control and coordination; b) strength; c) range of motion; d) balance; and e) mobility.

A recent review of the literature on Stroke Rehabilitation conducted by Dr. Teasell and colleagues<sup>3</sup>, as well as a large body of evidence pertaining to these five aspects of human motion suggest the following:

1. The most effective way to improve control and coordination after stroke is by providing intense and speed-sensitive active training<sup>4-9</sup>. Methodologies that have strong evidence base are biofeedback and combinations of electrical stimulation with voluntary movement.



2. The most effective way to improve strength is to provide progressive resistance training tailored to the individual's needs (e.g., hip, knee, shoulder, etc.). It has been made clear that strength is essential to function. Elastic resistance and light bar bells, though necessary tools at times, cannot provide the same benefit as machines that are designed to progressively increase the resistance to the targeted joints<sup>10-15</sup>.
3. An intense program of stretching or serial bracing can improve passive range of motion. An intense and speed-sensitive active training best treats active range of motion, similar to motor control.
4. Improving balance is a complex process that requires increased strength and motor control. Again, dedicated technologies that provide intense, speed-sensitive balance training for specifically targeted impairments would be most effective at improving static and dynamic stability<sup>16</sup>.
5. Experts agree that the provision of repetitive training of available (and less available) movement is essential to the recovery of mobility<sup>17</sup>. Technologies such as Body Weight Support (BWS) are especially effective at enabling safe and productive training<sup>18-22</sup>.

So, how would one determine in 'objective' terms whether his/her clinic is an evidence based service for physical rehabilitation? The following questions should be helpful in determining if the rehabilitative efforts at a given clinic conform with current knowledge and recommendations associated with evidence:

1. Does your service provide strength training for individuals post-stroke? If yes, what methods and equipment are used?
2. What methods do you use to improve motor control?
3. What type of equipment do you use to treat balance problems?
4. How do you treat active range of motion problems?

5. The research evidence supports body-weight support as an optimal training method for improving gait after stroke. Does your facility have body-weight support equipment and technology for gait re-training?

Furthermore, it might be even possible to estimate the degree of evidence-based service at a facility by constructing a ten-point scale. The first three to four points could determine the degree (weak, moderate or strong) to which a particular technique is supported by theory. The next three to four points would determine the level of evidence already supporting the general approach or family of techniques of a similar nature. The final three points would be given if the particular tool used in therapy is supported by evidence. For example, progressive resistance training of the quadriceps muscle to improve gait efficiency should receive 9-10 points on such a scale; strengthening is strongly suggested by theory<sup>10</sup>, there has been ample research showing the association between strength and function and, finally, there has been specific evidence connecting progressive resistance training of the quadriceps muscle with improved gait<sup>23</sup>. Conversely, a clinic might still employ a technique that is not supported by modern theory or by direct or indirect data. Such technique, even when promoted by post-graduate courses, would be given zero points according to the above scale.

Another way to grade evidence would be to evaluate it according to the quality of the study (e.g., the nature of the design) and the strength of recommendations regarding the tools or techniques considered by the clinician. On such ordinal scale, an intervention might be supported by good evidence (top of the scale) or there may actually be good evidence to reject it (bottom of the scale).

#### NEUROGYM® ENABLERS: TOOLS FOR IMPLEMENTING EVIDENCE-BASED REHABILITATION

Whether a decline in motor ability is due to a neurological condition or simply due to inactivity, therapists and nursing staff, if they wish to follow evidence-based recommendations, will have to have a means to get their clients moving. The NeuroGym® line of equipment was developed by a physical therapist specifically for this purpose. Practical body-weight support devices like the **Sit-to-Stand Trainer** and the **Bungee Mobility Trainer** are powerful tools to help improve client mobility. Other portable devices like the **NeuroGym Ankle Trainer** and the **Pendulum Stepper** are designed for effective, versatile strengthening exercises. The **NeuroGym® Trainer**, a comprehensive biofeedback system combines movement-specific training in motor control, balance, and coordination with speed-sensitive motivational computer games.

The evidence-base for new approaches to rehabilitation in neurologic and geriatric populations continues to expand the expectations for physical therapy treatment outcomes. Many modifiable factors, such as muscle strength, joint range of motion, and mobility, can be positively influenced with appropriate treatment methods and training intensity. The NeuroGym® line of enabling equipment helps clinicians fulfill the type of therapy and exercise programs that laboratory studies in the movement and basic sciences are suggesting would be most effective.

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