Neurology Section Practice Issues Forum 2013

Heather Hayes, PT, DPT, NCS
Catherine Lang, PT, PhD
Beth Crowner, PT, DPT, NCS, MPPA
Mary Beth Osborne, PT, DPT
Katie Olson, PT, DPT, NCS

Objectives

Following this PRACTICE ISSUES FORUM, participants will be able to:
1. Understand the term intensity and its multiple definitions.
2. Cite evidence that increased intensity of treatment intervention improves patient outcomes.
3. Identify creative methods of providing efficient intensive interventions across the continuum of care.
4. Identify and apply a framework for the provision of increased intensity across the continuum of care.
5. Recognize the importance of integrating personal and contextual factors into the design of patient specific intensive interventions.

Strategies for Maximizing “Intensity” Across the Rehabilitation Continuum

WHAT DO WE MEAN BY “INTENSITY”?

Why Dosage Prescription for Neurologic Rehab?

- Optimal dosage for our patients to make functional changes?
- Or to make neuroplastic changes?
- Or both?
- What are we measuring?

Define our DOSAGE terms in neurologic rehab, specifically the term INTENSITY.
Intensity defined in general

Webster's Dictionary: “the quality of being intense, specifically, extreme degree of anything”.

The term intensity...

“Several animal studies have shown that neurorecovery and functional performance are enhanced after cortical infarction when postinjury training incorporates motor tasks of greater complexity and higher-intensity demands than training conditions that do not.”

Intensity defined

- Defined as number of repetitions provided
  – (Repetitions - COMPONENT OF VOLUME)
Intensity defined

- Defined in terms of number of hours of consecutive therapy.\(^2\)
- Number of repetitions within a set duration.\(^3\)
  - DURATION
  - DURATION AND COMPONENT OF VOLUME

Intensity defined

- Defined as the average hours of therapy provided per day across the entire length of stay.\(^4\)
  - DURATION AND FREQUENCY

Summary

- We need to maximize intensity
  - Clarify our term intensity (several options to increase intensity)
    - Increase VOLUME, number of reps, amount of practice
    - Increase DURATION of practice
    - Increase FREQUENCY of practice
    - Increase DIFFICULTY of task
  - What is the purpose for increasing intensity?
Case example: Parkinson Disease in the Outpatient Setting

Beth Crowner
PT, DPT, NCS, MPPA

Case example: Recovery post-stroke in the Inpatient Rehabilitation Setting

Katie Olson, PT, DPT, NCS

Case example: Recovery post-TBI in the Residential Community Setting

Mary Beth Osborne, PT, DPT

Intensity in Neurorehabilitation**
Catherine E. Lang PT, PhD

**refer to second handout in outline form

Evidence-based Practice

EBP is “integration of best research evidence combined with clinical expertise and patient preferences” 6

Contextual and Personal Factors

The importance of incorporating patient preferences
Personal perception and personal factors

Incorporating health-related quality of life into the International Classification of Function, Disabilities and Health

Personal Factors
- Gender
- Race
- Age
- Fitness
- Lifestyle
- Coping styles
- Profession
- Personal experiences
- Habits
- Upbringing
- Education

Personal Perception

A subjective view which attributes value or meaningfulness to an experience. It is how we perceive goodness or badness of an experience.

Meaningfulness

The level of importance we assign to life events and activities. May be reflected by well-being or satisfaction with life.
How to Provide Adequate Intensity

1. What problems are a priority that should be addressed in PT?
2. What interventions will best address the problems?
3. How can intense intervention be provided in PT and in the home/community in a safe and effective manner?
4. What are important considerations for instruction for practice at home?

References


Extra References

1. Current status of neurorehabilitation services, mainly illustrated with stroke examples
   - Access to services is limited, with ¼ of people with stroke receiving no rehabilitation.

   - Lengths of stay are short in all settings: initial hospitalization, inpatient rehabilitation, outpatient rehabilitation, and home services.

   - Realistic expectations for how much change occurs is important for clinical management
     - IRF example from the Brain Recovery Core in Saint Louis MO:
       - Ave Berg Balance Scale score change = 18 ± 12 pts
       - Ave gait speed change = 0.46 ± 0.45 m/s
       - More mild people improve more while more severe people improve less
       - Admission BBS and FIM walk item scores can predict discharge walking ability (Bland et al. 2012)

   - Regardless of where you live, not much movement practice occurs outside therapy sessions (Bernhardt et al. 2004, 2008; Lang et al. 2007; Kimberley et al. 2010)

   - Intensive behavioral experience, i.e. large amounts of challenging practice, are needed to take advantage of the remarkable adaptive capacity of the nervous system (as reviewed by Warraich & Kleim 2010 and many others)
• The amount of functional task practice in therapy sessions is about an order of magnitude lower than in brain plasticity studies (Lang et al. 2007, 2009)

2. Overview of data on intensity
• Several important issues make it confusing to interpret the available data on intensity:
  o Intensity is usually measured as additional time scheduled for therapy
  o Across studies, large variations in therapy content exist between experimental and control groups
  o Sample sizes are relatively small and often from single sites
  o Samples are made up of select patients with mild-to-moderate motor deficits, few non-motor impairments, and willing volunteers

• Early and frequent mobilization during the initial hospitalization may be beneficial, AVERT Phase II RCT (Bernhardt et al. 2008; Sorbello et al. 2009; Cumming et al. 2011; Van Wijk et al. 2012)

• Across nations, more time in therapy generally leads to better outcomes, CERISE comparative effectiveness project (DeWit et al. 2007)

• For the UE, increased intensity did not lead to larger increases in function, VECTORS Phase II RCT (Dromerick et al. 2009)

• Independent of specific therapy, more may be a little better, but only up to a point, illustrated with UE trials of increased intensity (Sunderland et al. 1992; Kwakkel et al. 1999; Lincoln et al. 1999; Platz et al. 2001; Rogers et al. 2003; Blennerhassett & Dite 2004; Desrosier et al. 2005; Higgins et al. 2006; Duncan et al. 2006; Pang et al. 2006; Ross et al. 2009; Harris et al. 2009; Donaldson et al. 2009; Han et al. 2012)
• For gait, more practice appears to result in better outcomes (Horn et al. 2005; Moore et al. 2010; Veerbeek et al. 2011; Rose et al. 2010)

• Data from other patient populations indicates small but positive, short-term benefits, e.g. PT vs. no PT or placebo for PD (Tomlinson et al. 2012)

3. Possibilities and practical tips to increase intensity
   • People can do more than we think (Birkenmeier et al. 2010; Moore et al. 2010)

   • Different people will likely need different doses

   • Increasing movement speed as a way to increase intensity (DeJong et al. 2012)

   • Measurement and feedback about results as a way to increase effort, SIRROWS RCT (Dobkin et al. 2010)

• Additional suggestions
  o Measure effort (e.g. HR, RR, RPE) and performance
  o Minimize time “off” – stop giving rest breaks
  o Don’t underestimate the importance of physical fitness; consider prioritizing over “neuro” PT; dose/intensity relationships are much clearer
  o Practice the hardest activities (Hornby, Straube, & colleagues)