Hand Dominance Re-training following polytrauma or limb loss

Katie Yancosek, OTR/L, CHT
Objective

Raise awareness of hand dominance and discuss treatment options for re-training/transfer.

Ultimate Goal: IMPROVE FUNCTIONAL OUTCOMES via RELEVANT CLINICAL CARE PATHWAYS
"You have repetitive motion injury. Try using the TV remote with the other hand."
What is hand dominance?

Hand dominance is the preferential use of one hand over the other for single limb or bi-manual tasks.

In bi-manual tasks one hand is the **main executor** and one is the **supporter**.
Hand Dominance

• The dominant hand is affected (acute or chronic) more often than the non-dominant hand

• Traditional medical disability ratings consider hand dominance as a main factor
Hand Dominance

• Limb dominance is evident in most primates and in some lower animals (ex: frogs, rabbits)
• Why do we exhibit hand dominance? unknown and still debated
• Hand dominance may be a continuous variable rather than a dichotomous variable (left-ambidextrous-right vs. left or right)
  – Edinburgh Handedness Inventory=Laterality Quotient
Hand Dominance

• 9/10 people are right handed
• Greater than 60% of the 10% of lefties are male
  – One theory relates to in-utero exposure to testosterone
• “Dexterity” comes from the root word dexterous which means right-sided
HAND DOMINANCE

Is the peripheral manifestation of cerebral dominance

**Strongly LINKED TO LANGUAGE:** gesturing, speech, and writing
Hand dominance primarily defined by the writing hand
Who should receive hand dominance re-training?
WHO

Brachial plexopathies, Hemiparesis following stroke, Chronic Regional Pain Syndrome, Mutilating hand Injuries: burns, crush injuries, multi-tissue injury, Amputation
Why address hand dominance re-training?
WHY...

Loss of dexterity in dominant hand means many things.....
• A functional state of single-handedness
• Limited **dexterity**, strength, endurance, speed (awkward and slow movement)
• Loss of occupational/social roles
  – Hand shaking, embracing, self-expression: jewelry (bracelets, watches, wedding rings), nail painting
  – Work
  – Sports/leisure
  – ADL
Why retrain hand dominance?

Current Functional Status: Impaired

Goal: Functional Independence and participation
Because hand dominance is the pervasive use of one hand over the other, and we need to be purposeful, not passive, in our approach!
“You’ll have to forgive Sidney. The left and right hemispheres of his brain are currently engaged in a struggle for dominance...”
WHY

Offer your clients POWER and CONTROL
HOW do we facilitate a hand dominance transfer?
Can we actually **facilitate** HDT?

**YES**
- Hand dominance changes across time
- Lateralized practice
- Environmental influences
- Neuroplasticity: dynamic systems capable of CHANGE

**NO**
- CNS stability:
- Innate left-handers
- Obstetrical Erbs Palsy
One-handed ADL

See Backpack list under Resources Tab

• Adaptive equipment
• You-tube videos: hair-tying, shoe-tying, neck-tie tying, jewelry application
Handwriting For Heroes

Learn to Write with Your Non-dominant Hand in Six Weeks

Kathleen E. Yancosek, MS, OTR/L, CHT
and Kristin Gulick, OTR/L, CHT

Illustrated by Erin M. Spears
Two studies

• Efficacy trial (with non-impaired participants) made statistically significant improvements in dependent variables of legibility, letters-per-minute, velocity (x and y axes)

• Clinical effectiveness trial (with impaired military members) show similar results
Description of Intervention

• 42 day massed-practice, task-oriented approach with focus on handwriting activities that progress from simple to complex.

• Four main sections: 1. daily exercises/writing activities, 2. homework, 3. therapist’s tips, and 4. web site companion

  www.handwritingforheroes.com
“Do we have to know all the letters? I don’t use them all when I text.”
1st Study: Participants wrote 32 minutes per day
Clinical effectiveness study: COPM: writing in college (taking notes, taking tests), paying bills, filling out forms in the hospital, journaling, writing to-do lists, writing letters, signing one’s name
REHAB

RE-HABIT
Language-based activities

• *Writing
• Drawing/Painting
• Texting/Typing
Power-based

• Hammering
• Washing mirrors
• Weight training
Precision Pouring
Integrate Prosthesis
Sports-based HDT
WHEN do you start? Consider:

- Co-morbidities and concomitant injuries
- Prior level of function (PLOF) and current occupational demands (B) and (I)ADL
- Patient’s goals
- Time since loss of dominant hand function
- (in non-amputee population) PROGNOSIS of recovery of function
- Laterality
References