

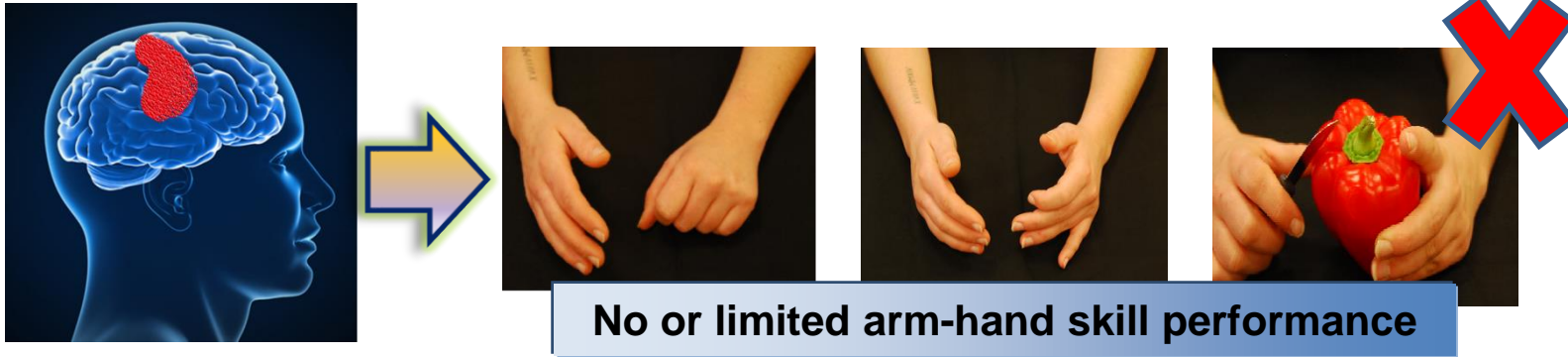
Rehabilitation of the affected arm-hand in sub-acute phase post stroke

Han Franck, OT, PhD

Adelante Zorggroep Centre of Expertise in Rehabilitation and Audiology, The Netherlands

Arm-hand rehabilitation

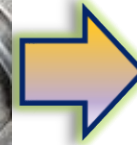
in post-stroke phase



Regain and maintain improvements in arm-hand function and arm-hand skill performance,

Arm-hand rehabilitation

in post-stroke phase



activities & participation

towards actual use of the affected hand in daily life performance

Issues in rehabilitation

of the moderately to severely affected arm-hand

Relearning motor abilities during arm-hand rehabilitation is slow or even absent

50% of the patients with a severe paresis of the arm-hand do not experience recovery, due to absence of ipsilesional cortical excitability.

High co-morbidity levels like cognitive deficits, depression, (shoulder)pain, sensomotor deficits, edema and spasticity

Main issues

In rehabilitation of the moderately to severely affected arm-hand

Interventions to improve and maintain a sufficient level of arm-hand skill performance in moderately to severely affected patients are vaguely described

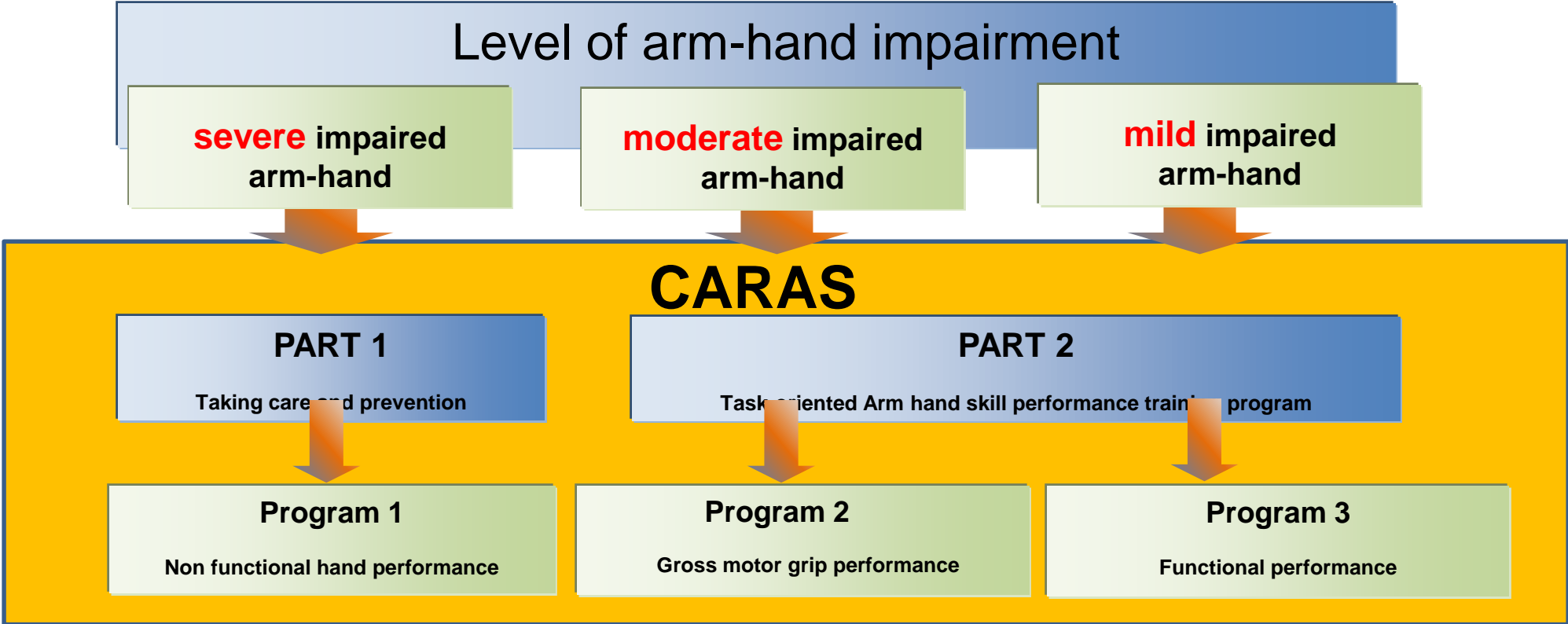
Low level of self-efficacy leads to limited beliefs and self-perceived performance, of the affected arm-hand associated with a sub-optimal use

Added value of novel interventions facilitating voluntary grasp and release movements are not systematically investigated.

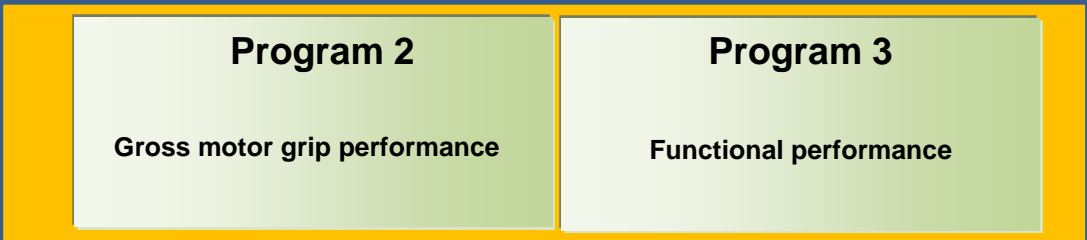
Serious arm-hand capacity problems hampering engagement in intensive arm-hand training interventions in the critical window of opportunity

Concise Arm and Hand Rehabilitation Approach in Stroke (CARAS)

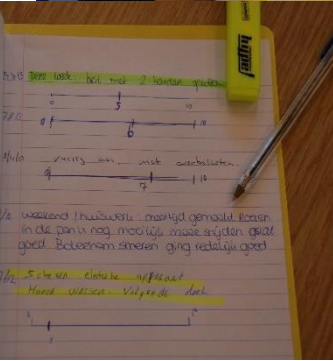
A practical and evidence-based framework for clinical rehabilitation management



Concise Arm and hand Rehabilitation Approach in Stroke (CARAS) (Franck et al; Open Journal of Occupational Therapy, 2015)



1. Principles of self-efficacy



2. (Intensive) task-oriented training method



Moderately to severely impaired. Task: Prepare food, cutting vegetables

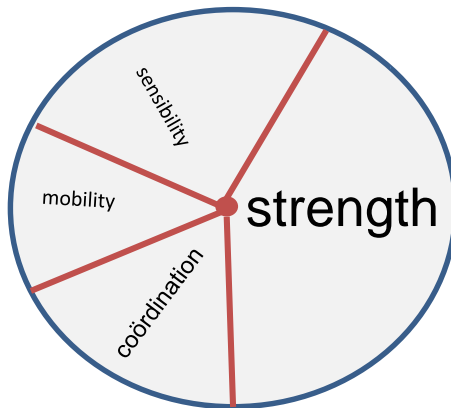


Diagnostics

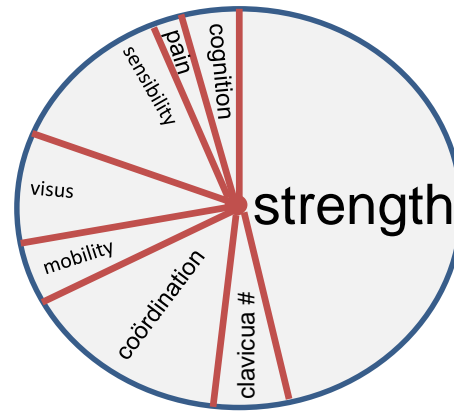
(Sensory-motor) functions

Underlying assumptions can be made about: 'why' the activity has not been performed correctly?

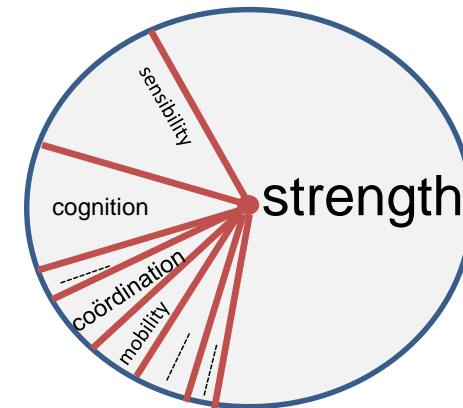
mild impaired
arm-hand



moderate impaired
arm-hand



severe impaired
arm-hand



Week activity

Week of participation: **1** 2 3 4 5 6

Activity: Cutting vegetables

Underlying (core) problem: Strength scap/glenoh/..
Propriocepsis/ bodymap/..

Goal related exercises:
(regular exercises at page 11)

1. stretch exercise 11b
2. scapular exercise 1a
3. kinematic chain exercise 6
4. functional strength task

Goal Rating

Monday: 0 **4**

Wednesday: 0 **5**

Friday: 0

Oefening 11b

1. Leun met beide armen in evenwijdige positie zover mogelijk naar achteren.



2. Probeer tijdens het inademen de borst naar voren te bewegen terwijl de handen op dezelfde plek geïsoleerd blijven.



Oefening 1a

1. Duw de onderarm richting de bank.



2. Duw uw hand richting uw voet, en hou deze positie 3 seconden vast.



Oefening 6

1. Hou het touw strak gespannen.



2. Probeer met gestrekte arm het gespannen touw om je hand te wikkelen.

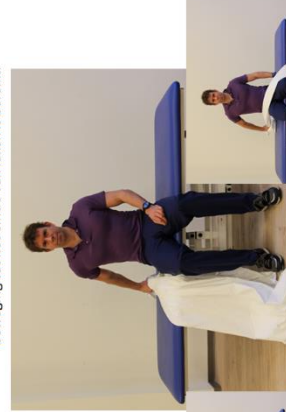


Oefening 7

1. Plaats de hand naast het bovenbeen en pak het laken vast.



2. Trek het laken naar achteren door de arm naar achter te bewegen. Herhaal deze beweging tot het einde van laken is bereikt.



Alternatieve oefening:

Active exercises kinematic chain

Moderately to severely impaired. Task: Prepare food, cutting vegetables



Mastery Experience

Self - Efficacy

Goal evaluation form

Prior to the start of the arm-hand training program, the participant extract three to six activities that are both meaningful and challenging to him. Important characteristics of these activities are that they have to be used frequently and be directly related towards home-based activities in daily life of the participant.

The activities are rated by the patient on a six-point ordinal (Likert) scale varying from 'very easy to perform' to 'very hard to perform'

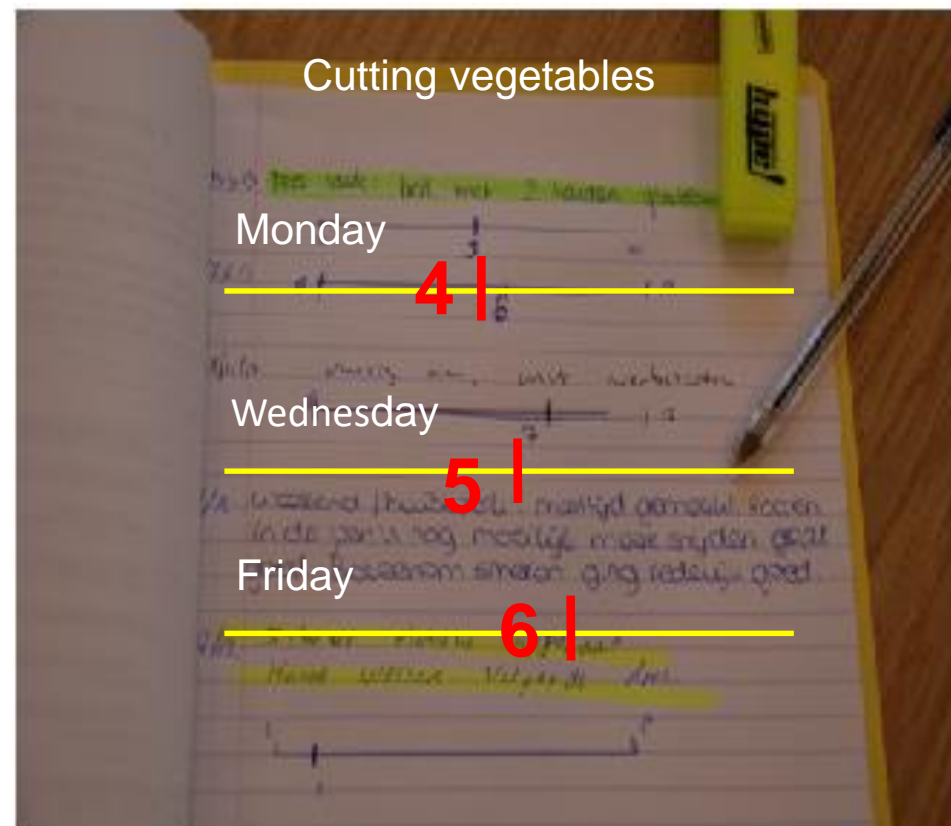
Scores:

- 0 **Very easy** to perform
- 1 **Easy** to perform
- 2 **Quite easy** to perform
- 3 **Neither a problem** to perform
- 4 **Quite hard** to perform
- 5 **Hard** to perform
- 6 **Very hard** to perform

Activities selected in which the participant wants to improve himself

1. **CUTTING VEGETABLES**
2. **STABILIZING BREAD**
3.
4. _____
5. _____

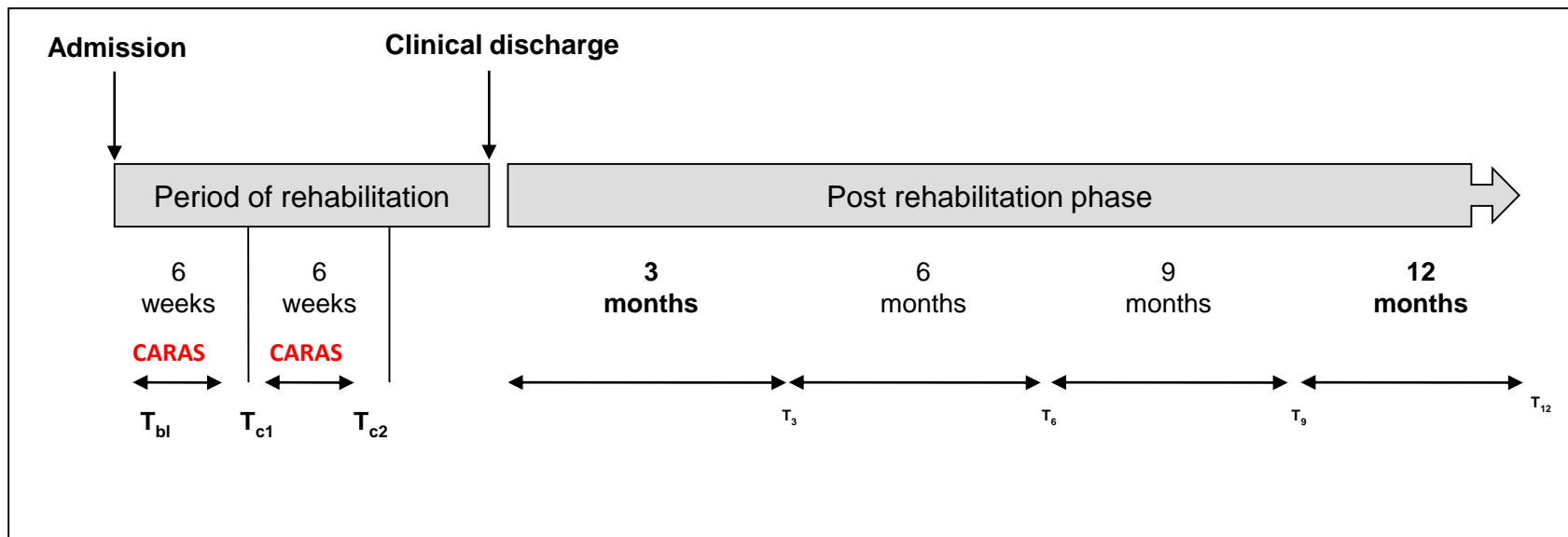
	score		
	0	1	2
1. CUTTING VEGETABLES			
2. STABILIZING BREAD			
3.			
4. _____			
5. _____			



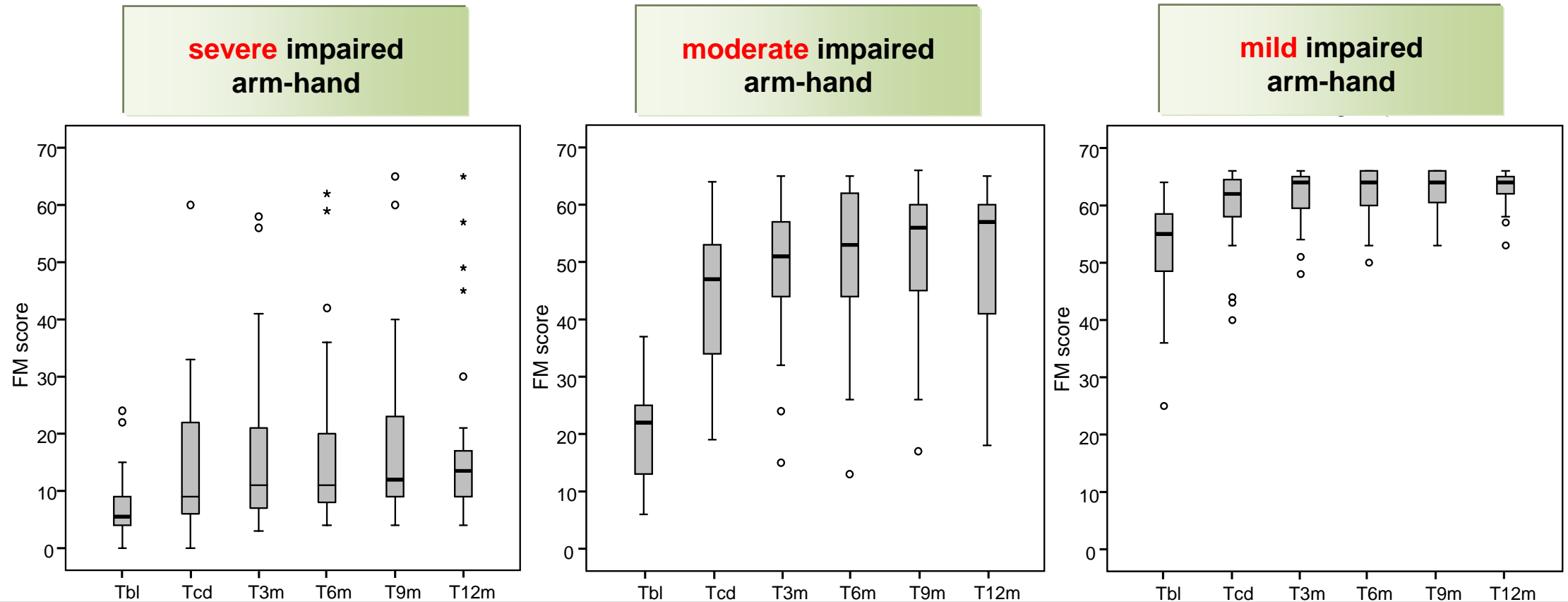
Changes in arm-hand function and arm-hand skill performance in patients after stroke during and after rehabilitation:

“Saving comparative data regarding ‘evidence-based therapy-as-usual”

Subgroup following program 1	Subgroup following program 2	Subgroup following program 3
N = 28	N = 28	N = 33

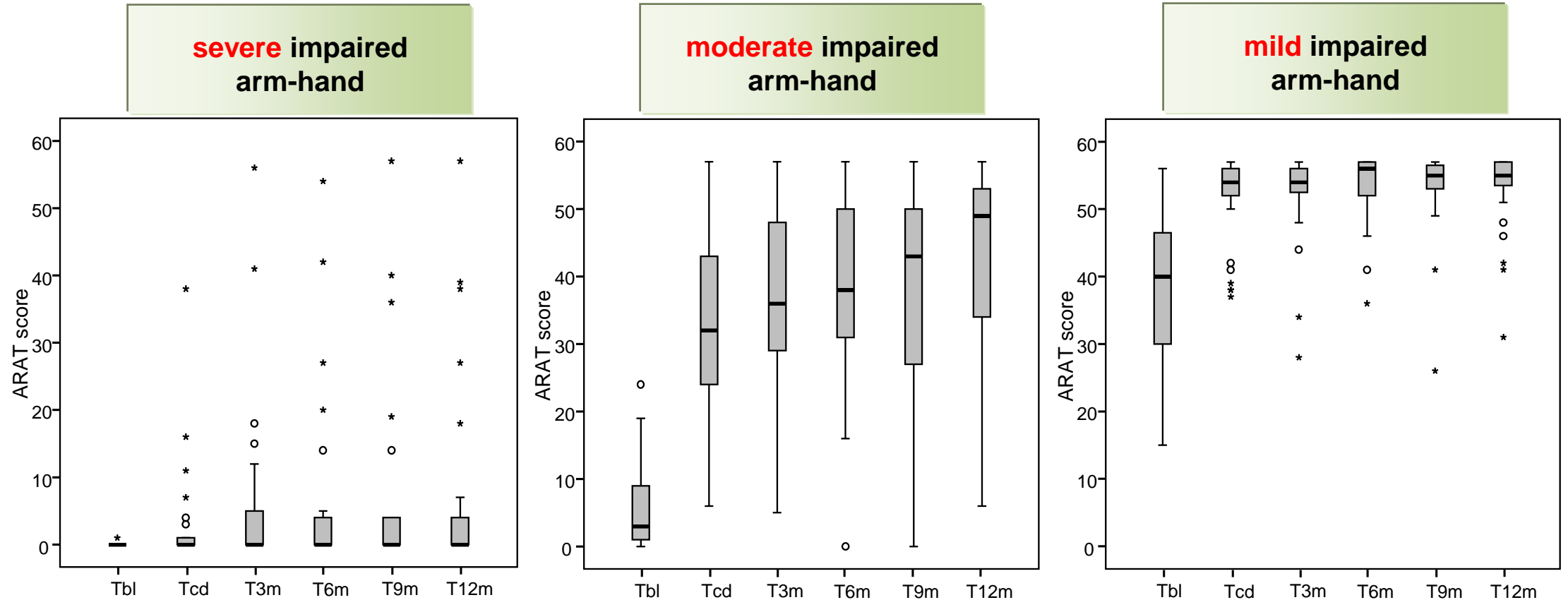


Results at the level of **Function** : Fugl-Meyer Motor Assessment



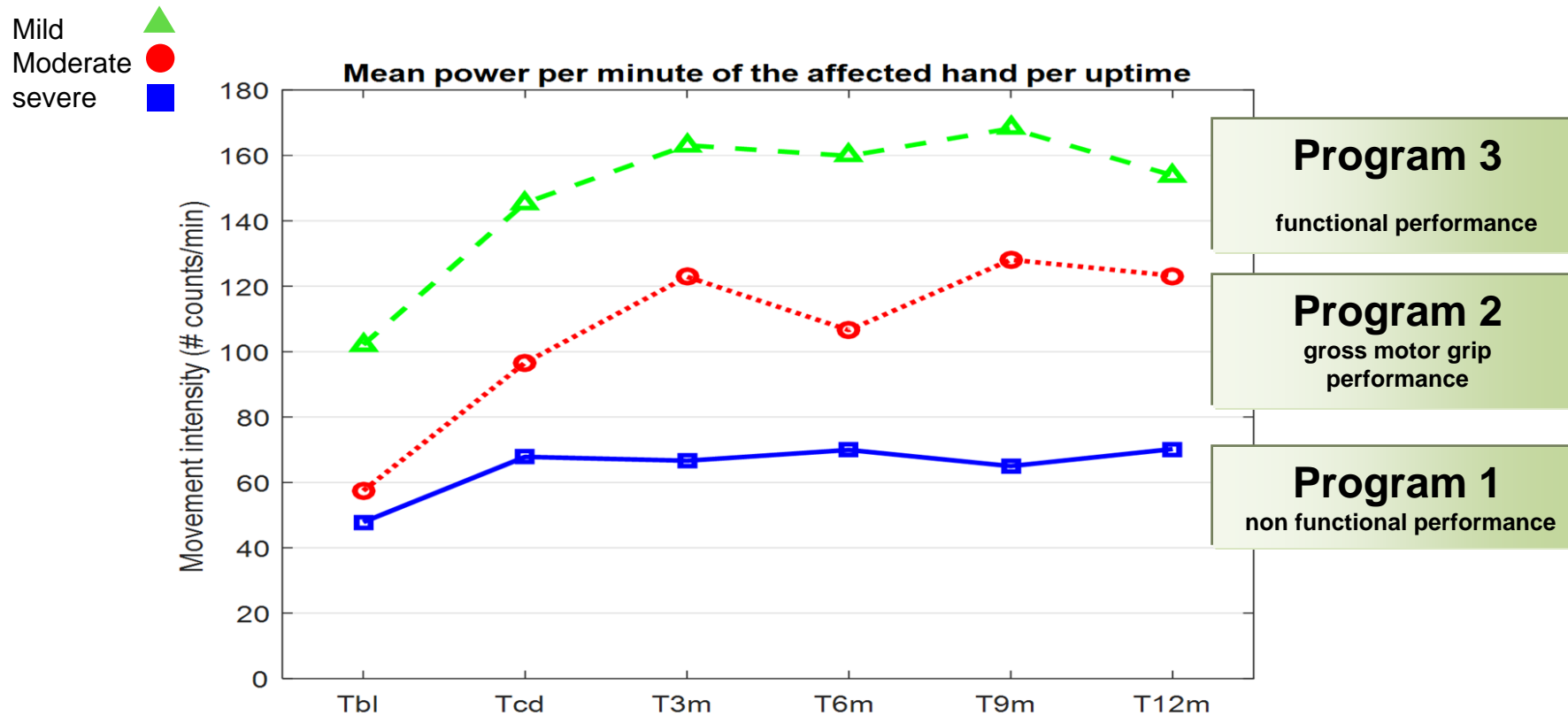
Majority of the participants with a mildly to moderately affected arm-hand demonstrated a significant improvement in arm-hand function

Results at the level of **Capacity:** Action Research Arm Test



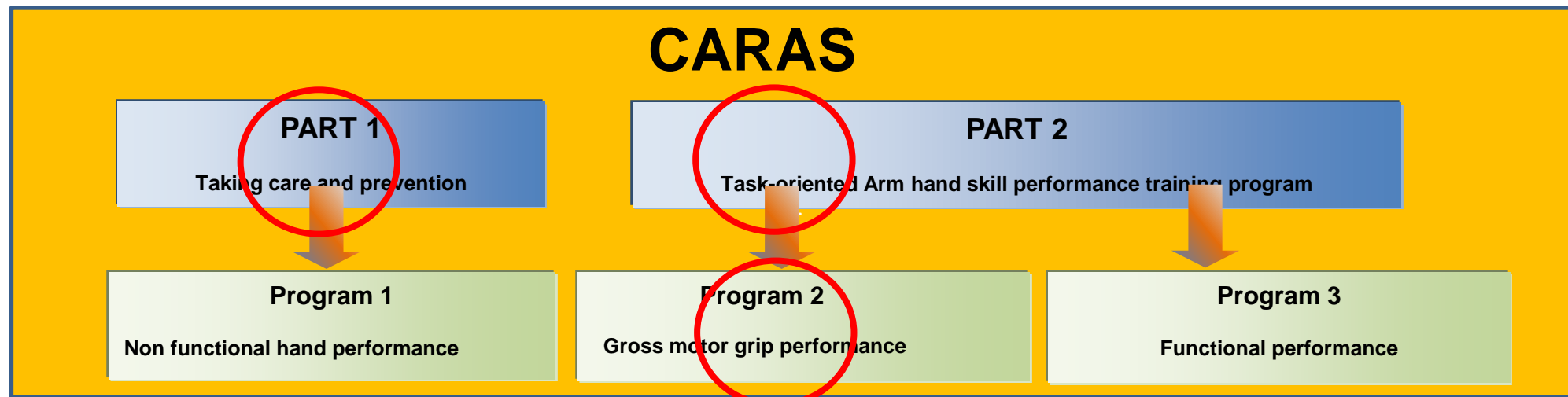
Majority of the participants with a mildly to moderately affected arm-hand demonstrated a significant improvement in arm-hand skill performance

Changes in **actual** arm-hand use in stroke patients during and after clinical rehabilitation

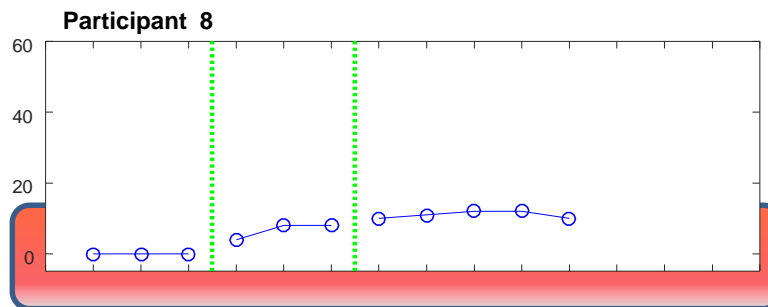
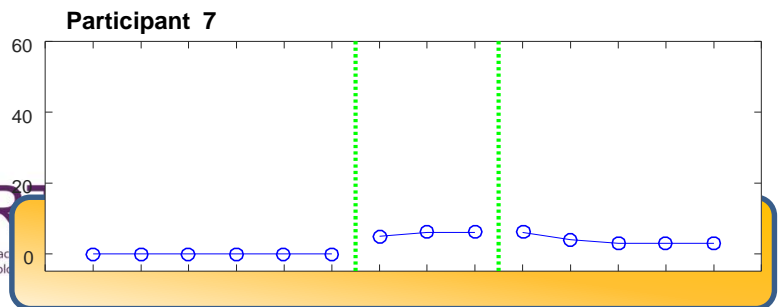
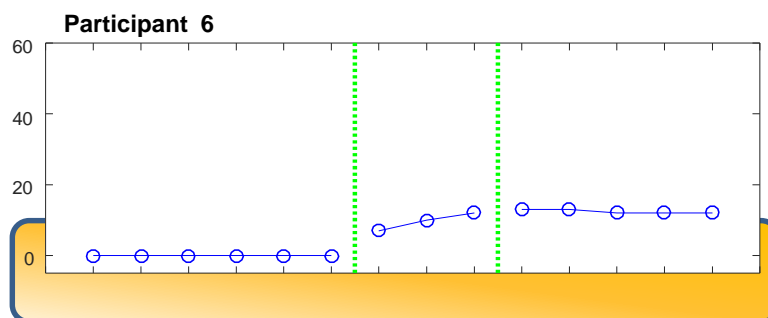
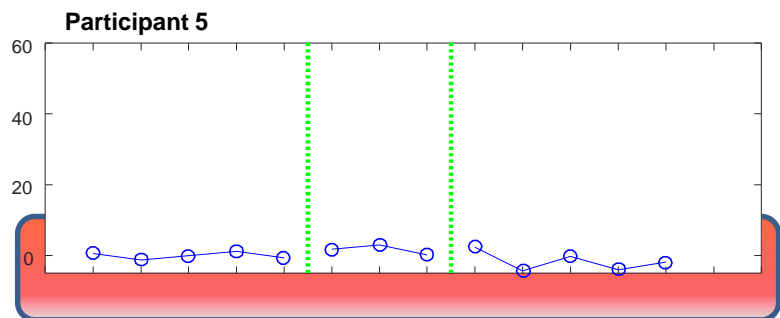
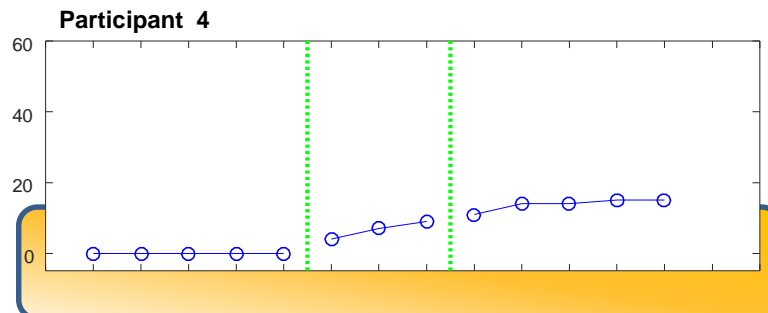
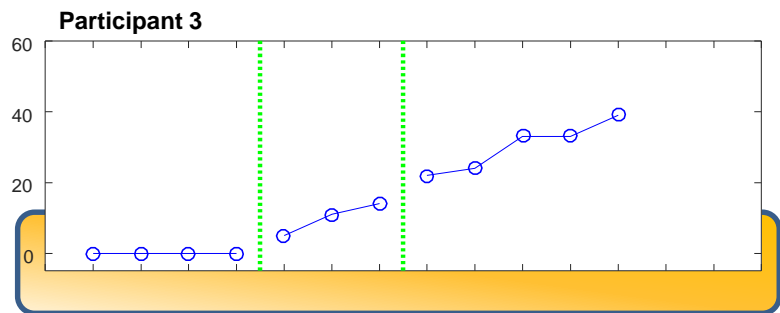
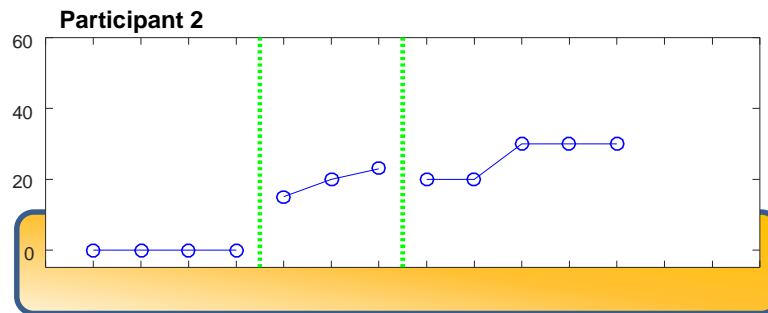
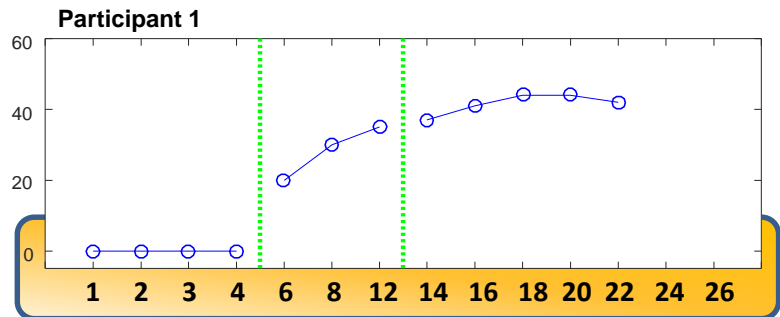


Majority of the participants with a mildly to moderately affected arm-hand demonstrated a significant improvement in actual arm-hand use

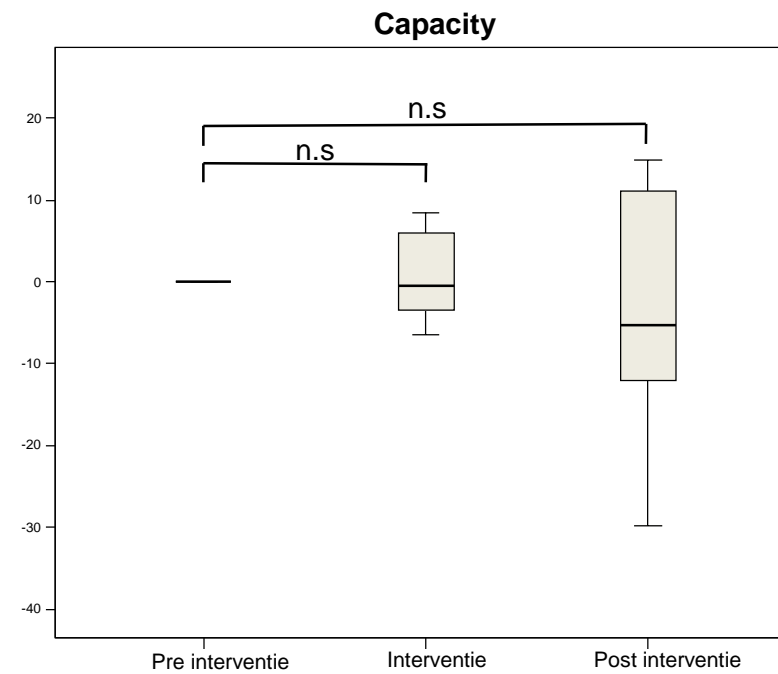
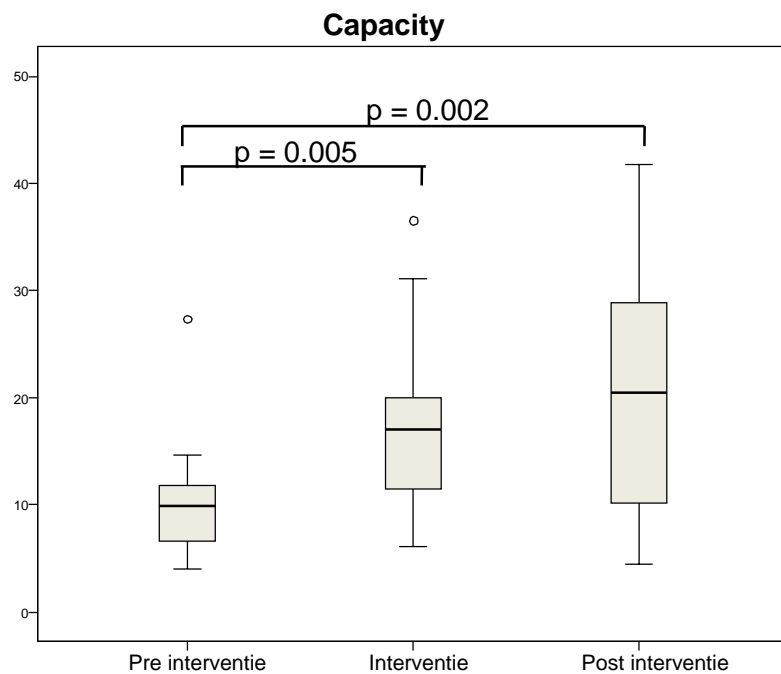
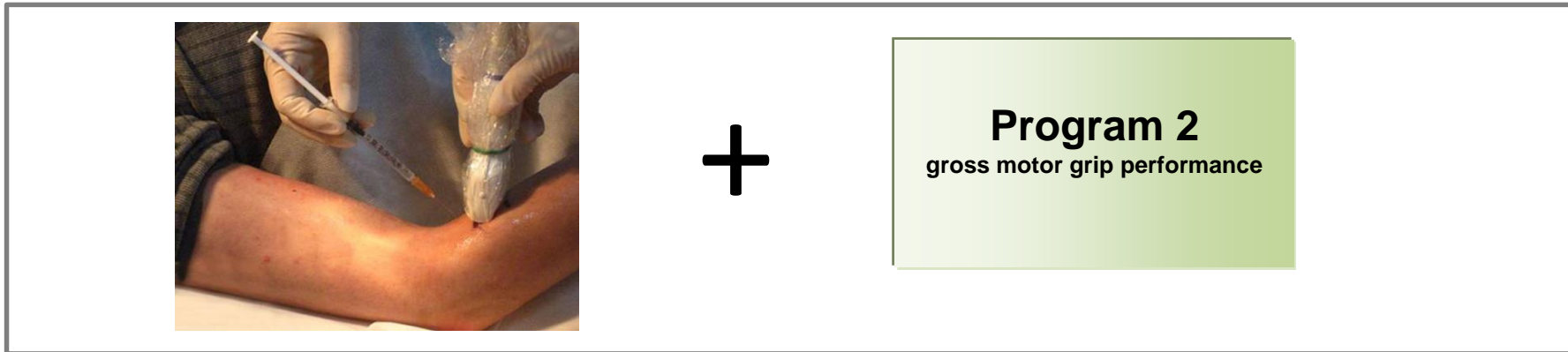
Dynamic handorthosis combined with electrical stimulation in stroke patients with a moderately to severely affected arm-hand



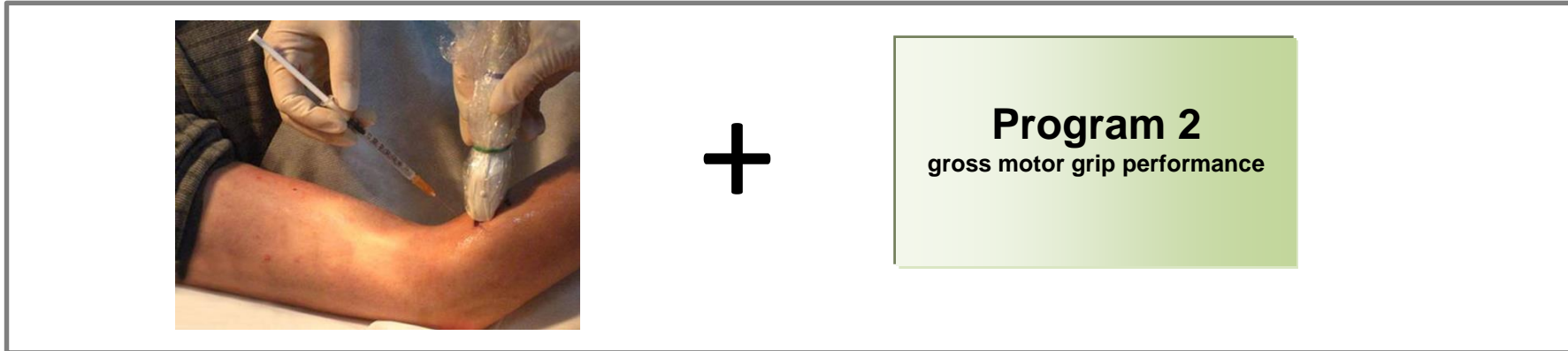
Arm-hand capacity



Reduction of spasticity to improve arm-hand skill performance in stroke patients with a moderately to severely affected arm-hand



Reduction of spasticity to improve arm-hand skill performance in stroke patients with a moderately to severely affected arm-hand



Botulinum toxin & arm-hand skill performance training leads to significant improvements.

Added-value of Botulinum toxin on arm-hand function / arm-hand skill performance were not found

Take home messages

With respect to actual arm-hand-use it could be concluded that a vast majority of patients admitted to CARAS program 2 and program 3, improved on arm-hand function, capacity and actual arm-hand use.

moderately to severely affected patients appeared to be facilitated by dynamic hand orthoses or botulinum toxin in conjunction with CARAS

CARAS' defined content combined with the longitudinal database on the development of arm-hand function and arm –hand skill performance can be used as a reference database

Thank you for your attention!

