







The Magic Camp Making intervention fun



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11th October 2019, Stockholm







Bimanual skills – in everyday life









Manual Skills in Unilateral Cerebral Palsy (UCP)



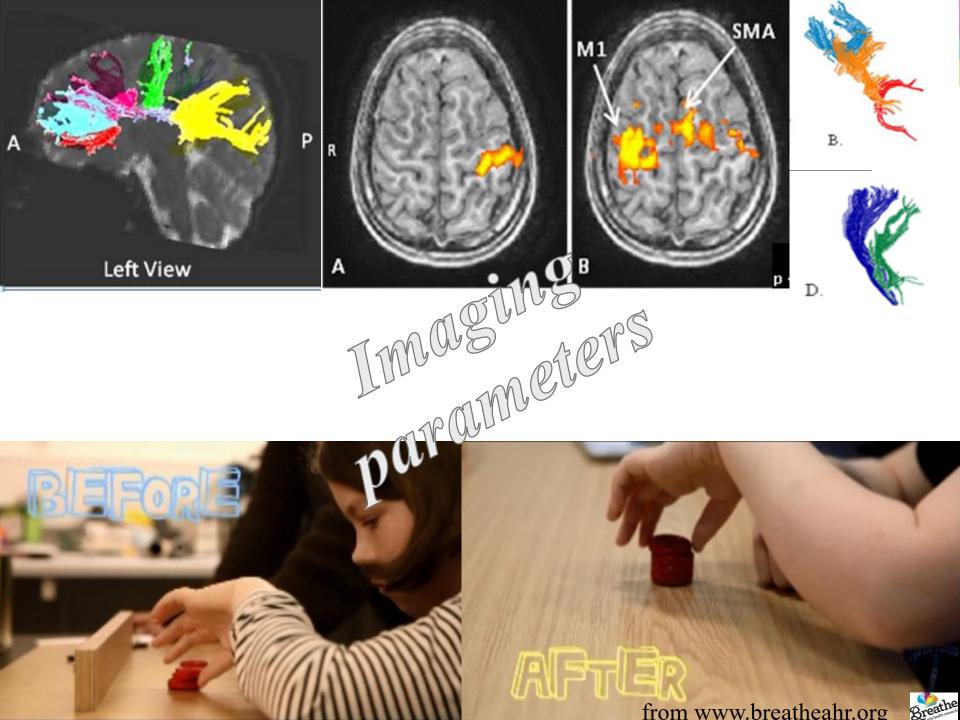
Evidence Based Interventions show benefits from intensive interventions of 60 to 12 hours

6 hrs/day//2 wks to 2 hrs/day/8 weeks How to deliver this?

What makes the difference in outcome?

How do neurological mechanisms underpinning these difficulties influence outcomes?



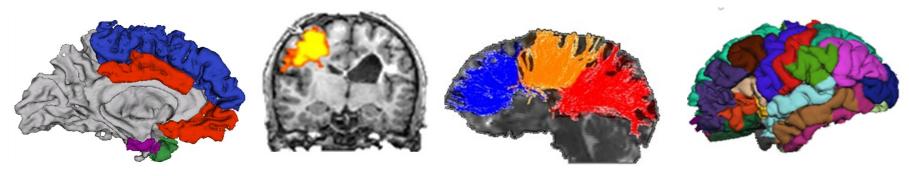








Neuroplasticity reflects the brain's capacity to change and adapt across the life span.



Structures within the brain may work differently or with different connections arising between structures.

- Changes in Activation / Activation patterns
- Changes in Connectivity
- Relationship of neuroplastic changes to functional changes.















Evidenced Based Motor Interventions

Constraint Induced Movement Therapy





Hand-Arm Bimanual Intensive Therapy (HABIT)









Magic-themed) Intervention (Green et al, 2013)

Camp: n=10 children per camp (max)

10 days over 2 weeks \times 6 hours per day = 60 hrs

Staffing ratio: avg. 2 adults for 3 children

Morning: learning bimanual magic hand tricks

Afternoon: making costumes/equipment for Magic Show

Final Day = Magic Show











tasks

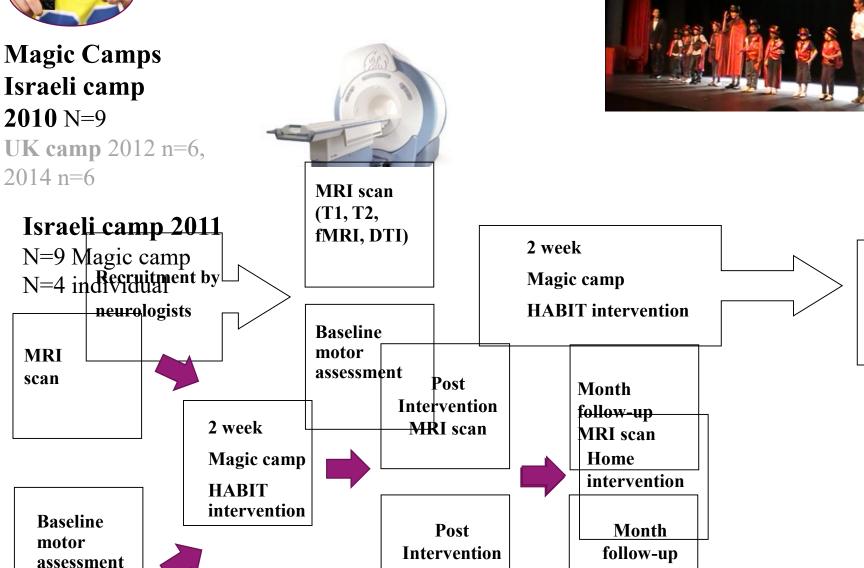




Chopping vegetables for breakfast/lunch



Study: Setup



motor assessment motor

assessment

Post Interver n

and folloup mot

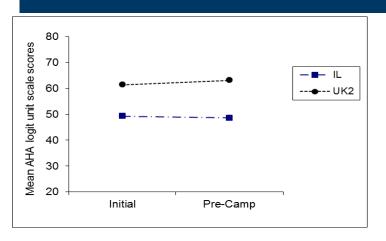
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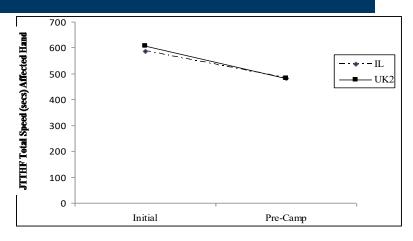




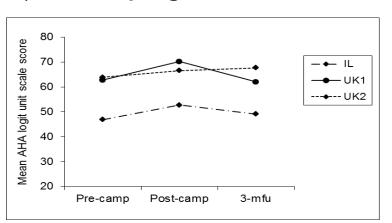


Results: Bimanual and Unimanual Skills



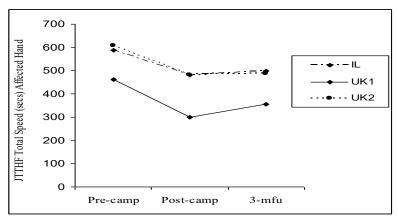


a) Natural progress, Bimanual



c) Intervention effects, Bimanual

b) Natural progress, Unimanual



d) Intervention effects, Unimanual

Reprinted from Green et al., 2013 Developmental Medicine Child Neurology





 WM integrity at the affected PLIC correlated with all hand motor function assessments.

Better connectivity of affected motor tract-> better hand function & some children showing pathways from non-affected hemisphere to affected hand.

 WM integrity at the CC was significantly correlated with performance on the AHA, JTTHF and CHEQ of both the affected and less affected hands

Better connectivity in the Corpus Callosum -> better hand function



Imaging Predictors of Improvement From a Motor Learning-Based Intervention for Children With Unilateral Cerebral Palsy

Neurorehabilitation and
Neural Repair
1–14
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sagepub.com/journalsPermissions.nav
DOI: 10.1177/1545968315613446
nnr.sagepub.com

Mitchell Schertz, MD^{1,2}, Shelly I. Shiran, MD², Vicki Myers, MSc², Maya Weinstein, PhD^{2,3}, Aviva Fattal-Valevski, MD², Moran Artzi, PhD², Dafna Ben Bashat, PhD^{2,4}, Andrew M. Gordon, PhD⁵, and Dido Green, PhD^{4,6}

- MRI showed negative correlations between contralesional brain activation when moving the affected hand and AHA improvements (T2: r = -0.562, T3: r = -0.479).
- FA in the affected PLIC correlated negatively with increased bimanual use on CHEQ at T2 (r = -547) and AHA at T3 (r = -.656).







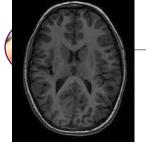
Hindawi Publishing Corporation Neural Plasticity Volume 2015, Article ID 798481, 13 pages http://dx.doi.org/10.1155/2015/798481



Research Article

Brain Plasticity following Intensive Bimanual Therapy in Children with Hemiparesis: Preliminary Evidence

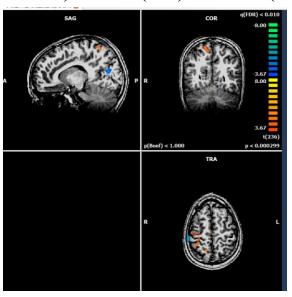
Maya Weinstein,^{1,2} Vicki Myers,^{1,3} Dido Green,⁴ Mitchell Schertz,⁵ Shelly I. Shiran,⁶ Ronny Geva,² Moran Artzi,^{1,3} Andrew M. Gordon,⁷ Aviva Fattal-Valevski,⁸ and Dafna Ben Bashat^{1,3,9}





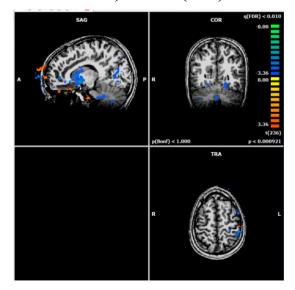
+ Brain change + functional improvement.

Contrast Maps: L hand vs. baseline (Affected) After (red)- before (blue)



- Contrast Maps: R hand vs. baseline
- (less Affected)After (red)- before (blue)

CHILD



Some increase activation post-intervention for the affected left hand in the right motor sulcus, Much greater increase seen at the month follow-up.

Increased activation in the left motor sulcus when moving the right hand at follow-up.

Also increase in passive betas at month follow-up on both sides.

Changes correspond to improvement post-treatment & FU on the Jebsen (unimanual skills)

" to improvement at month follow-up on the AHA (bimanual skills)





What do the children say? Are we listening?

I am a one handed boy – I don't want to be associated with 'them'.

"Games at school – they always chose me last and then the other side gloats when they win."

"They won't sit
next to me (at
school) as they
don't want to catch
my disease!"

About new Friends
..." P (older boy)
because he's grown
up and he's OK"







Background

- Psychosocial factors may influence development of movement efficacy in children with Unilateral Cerebral Palsy (Curtain & Clarke 2005, Gilmore et al 2010, Skold et al 2007, Green et al 2013).
- Up to 61% of children with UCP may have persistent mental health problems affecting perceptions of confidence, competence and positivity (Goodman & Graham 1996; Parkes et al 2008).
- Therapeutic outcomes from interventions for children with UCP are influenced by children's engagement which may be linked to mastery motivation (Miller et al, 2014).
- Yet few studies investigate psychosocial factors underpinning the experiences of children and influence on engagement and therapy outcomes.



Exploration of Experiences of Therapy

A Qualitative study to:

 Explore the expectations and experiences of children with UCP participating in a 60 hour daycamp using a magic-themed bimanual intensive therapy

 Semi-structured interviews before & after camp with children & parents. Interviews analysed with NVivo



Characteristics of participants





Characteristics of participants (n=15) UK summer camp

Age Child: Median (range)	8 years (7 years - 11years 11 months)
Gender Child: males/females	11/4
Gross Motor Classification System	Level I n= 13 / II n=2
Manual Ability Classification System	Level I n=4 / II n= 6 / III n= 5
Pre-camp interviews	Child (n=15); Parent (n=13)
Post-camp interviews	Child (n=14); Parent (n=15)



Interviews Methods & Analysis



Grounded Theory & Thematic Analysis:

to identify, examine and record topics (themes) occurring within the data relating to experience of having a disability, exposure to therapy and expectations for intervention.

- Familiarisation with the data in the transcripts
- Generation of initial codes
- Themes coded to establish meaningful patterns
- Review of themes
- Defining and naming themes

Nvivo 10 was used to identify frequencies, co-occurrence and emphasis, and display relationships between different themes



Perceptions of Therapy





Researcher:

Can you tell me how you feel (like/dislike) having to do these exercises?

7 year old boy

Annoying I have to do them every time and XXX watches and whatever stretches and things and annoying I have to go outside of the class with three others every day.

Annoying - lasting for a months, I hate physio Too much Yea - four months 12 months we have to do them for months for 12 months very annoying (again animated)

every year every year.

I might not have any exercises (new school)





Thematic extraction identified four main themes relating to:

- 1. Self-concept
- 2. Achievement Behaviour
- 3. Socialisation
- 4. Perceptions of therapy



Pre Intervention





Theme 1 – Self Concept

- •Children were reluctant to talk about what it is like to have a hemiplegia (n= 8 no answer) Others provided very limited responses
- •Many children (n=8) and parents (n=7) used **negative terms** reflecting annoyance, frustration or negative comparisons, with a desire for the affected hand to be like the other hand.
- •A lack of confidence in using the weaker hand was reported from many children (n=8) and parents (n=10).



Post Intervention





Theme 1 – Self Concept

- •Children reported increased confidence in using their helper (affected) hand (n=5).
- •Parents (n=5) commented that children seemed more intrinsically motivated to use their helper hand in everyday activities
- •Children (n=7) and parents (n=9) reported on the benefits of the camp for friendships and confidence.





What do the children say before?

Experiences and Self-concept

A bit weird, Because I I'd sit with them at lunch time and play with them and do lots of magic tricks and have fun and all that kind of stuff.

Annoying, I have to do them (exercises) every time and ,....

all the goodness in it and all the strongness in it but this hand hasn't really (any)thing in it



Pre Intervention





Theme 2 – Socialisation

- •Children's responses (n=12) reflected social awkwardness with a lack of elaboration on questions related to activities undertaken with friends or no description of what they do together and no friends were named.
- ■Parents' responses (n=9) reflected more pronounced social difficulties: difficulties forming friendships, difficulties mixing with others, not able to do the same things as peers, or commenting the child only did activities when with cousins or family members.



Post Intervention





Theme 1 – Socialisation

- •Children commented on new friends and the value of certain activities particularly the play after lunch
- •Few children mentioned specific friends they had made on the camp
- •For some children it was their first experience of being with 'similar others'.





What do the children say after? Socialisation and self-concept

Umm I just ignore it. I don't really feel bad about it.

I like being different, so I like having hemiplegia, because you're different, you're not the same. You're different in your own way*

... but then do a bit of practising and will get better probably (so it will get better you think with practice

What are Clinically Meaningful Outcomes?

Thank you for turning my disability into an ability

Thank you for pushing us, Thank you for not giving up on us.

Thank you for not feeling sorry for us.

"My hand is feeling much better now and the hemiplegia is coming away!"

"Now that I can carry my own tray, I am no longer last. I can start the games and conversations after lunch"







Marnie Kimelman Trust



Thanks to our partners & funders The children and their families

























The Tel Aviv Sourasky Medical Center











Maya Weinstein, Dr Mitchell Schertz, Dr Shelly Shiran, Vicky Myers, Moran Artzi, Dr Lian Ben-Sira. Dr Ronni Geva. Dr Varda Gross-Tsur, Dr. Dafna Ben Bashat, Dr. Aviva Fattal-Valevski Dr Verity McClelland, Dr Gareth Barker, **Dr Geoff Charles-Edwards**, **Dr Andrew Gordon Becca Krom**



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