Supplementary Materials:
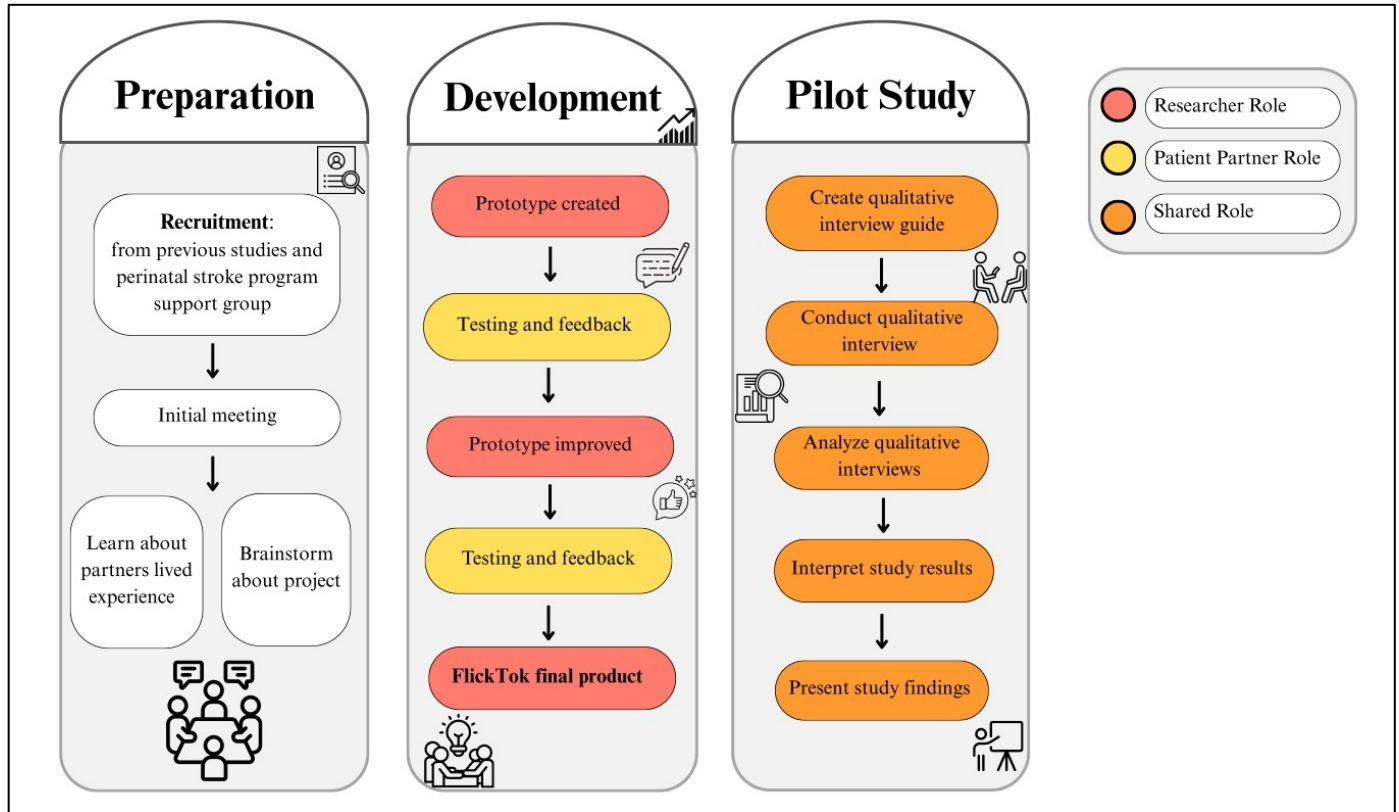

Supplementary Figure 1. Patient partner engagement through the creation and testing of FlickTok

Supplementary File 1: Semi-structured Interview Questions:

1. What is experience with social media? Have you used YouTube or Instagram reels before? How did you find using social media with BCI?

2. Tell me about your Flick Tok experience with BCI/FES and social media?

3. How did your hand/ arm feel during the therapy? What was the feeling? Did it get tired? If so, where? Can you describe the feeling?

4. Did your hand work any better?

5. When were you tired? Was it still enjoyable when tired?
A) how did it feel hours after
B) how did it feel days in between
C) did you notice any functional difference in your hand in between sessions?

6. Tell me more about hand therapy experience? Comparing to other hand therapy, what was different about BCI/FES/Social media therapy?

7. Let's talk about your Flick-Tok experience:
   Explain what happened, how did the system work?
   If you had to explain it to a friend what would make it easier to understand?

8. Did you feel in control of technology?
   Where there any issues with technology?
   How did the issues or tech make you feel?
   Did that effect enjoyability?

9. Can you tell me how BCI cap felt? If you could choose, how long would you wear it?

10. ***give form of enjoyability
    - Can you tell me about why you ranked it that way!
    - What could make it more enjoyable

11. *** give tolerability form
    - Can you tell me about why you ranked it that way!

12. If you had the option …How long do feel like you wanted to do it for?

13. Would you like to use it at home?
    - What would you change to use it at home? How long would you use it for/ how often?

14. Anything else you would like to share with me about Flick Tok?

Supplementary Table 2: Qualitative themes and codes

THEME: Participants Perception of Therapy		
Code	**Description of Code**	**Quotes**
General experience	This code speaks about the participants general experience of the therapy (e.g., if it was interesting, if they liked it...).	Fun[...]because I get to work both my body and watch stuff. (Participant E) It was easy and I just felt like time went by quick. I wasn't bored. (Participant J)
Fatigue and comfortability	This code speaks about how their experience with Flick Tok was affected by being tired or uncomfortable from either the BCI, FES or the Flick Tok. This includes the feelings of both hands, body and mind.	I'm just getting tired. I wouldn't say annoyed or in an angry way. I'm just done with it. (Participant J) Sometimes I'm not tired before the therapy, but after my hand's tired, I'm tired. (Participant I)
Comparison with other therapy	This code speaks about how participants compared Flick Tok with other hand therapies they previously received (e.g., CIMT/ bimanual camps, surgeries or at home therapies)	My feelings were, well, with the therapy, it felt good in a way[…] with the camp, I just felt tired all the time. (Participant I) It's helpful for individuals who can't focus. […] I don't want to pick up blocks repetitively for 30 minutes. (Participant B)
Bringing what they do in daily life into therapy	This code speaks about how bringing what they do in daily life (eg. social media or other entertainments) makes Flick Tok feel less like therapy.	I do use [social media] every single day […] it was just a typical day for me. (Participant J) It was kind of getting therapy and then social media is something that I love to do together. It was really fun.(Participant D)

THEME: Effects of Therapy on the Hand and Arm		
Code	**Description of Code**	**Quotes**
How they felt physically	This code speaks how FlickTok therapy made the participant feel physical both during and after therapy.	It felt like my muscles were very tight. (Participant I) It was getting weaker to lift up my wrist more each time we did it. (Participant D) It made every bit of my body tired (Participant F)
Reason to use FlickTok	This code explores reasons why participants want to use Flick Tok	Sometime[..] you have a bad day where your hand just not working that good. So I feel like for that it would be helpful. (Participant J)
Perceived functional changes	This code speaks how participants described functional changes in their upper limb due to the FlickTok therapy.	From the first time compared to today, it was more significantly I could see it, the fingers doing the movement. (Participant K) [I could] pick up a laundry basket. […] It felt like I had more range, and I was able to use it more. (Participant B)

THEME: Technology		
Code	**Description of Code**	**Quotes**
Understanding how the technology works	This code speaks about how participants understood how the technology works.	[You] use your hand to move the swipe on the videos. (Participant A) They put a machine on my hand where it makes my hand move and do movements that I can't usually do on a normal basis. (Participant D)
Description of difficulties with technology	This code speaks about how participants described how the technology performed throughout the three sessions.	It was, it got a little bit, it slower and more laggy towards, it was fine in the first session and then the last two was kind of laggy. (Participant A) I wouldn't flip up my wrist and it would flip the video. I didn't really understand that. (Participant H)
Fascination with the technology	This code speaks about the participants fascination with the BCI/FES therapy.	It was interesting. It was really interesting. (Participant F) It was interesting to see how my hand was able to move with the machine and stuff. (Participant D)
How the technology made them feel	This code speaks about how the technical performance of the therapy made the participant feel.	A little bit frustrated, tiny bit, but I wasn't really, really frustrated. (Participant A) [technology not working was] was stressful and hard. (Participant E) When I tried to move my wrist up, sometimes it didn't go, so I kind of got frustrated (Participant I)

THEME: Future Considerations		
Code	**Description of Code**	**Quotes**
Preferred length of therapy	This code indicates for how long participants would like to use Flick Tok.	Honestly, because it's scrolling. I would wear it forever. (Participant L) Maybe an hour if it was stuff like videos or shorts that I liked (Participant E)
More appropriate for younger participants	This code explores the appropriate age for FlickTok to be used, so it is effective.	I feel like it would've been better when I was younger and actually doing physiotherapy on the regular […] now that I'm older and busy, I don't know if I'd have the time to do it. […] I'm at the age now where I've already not had it for so long that it's like I'll be okay without it (Participant J)
Experience with equipment	This code speaks about the participants experience with the BCI cap, the gel and wires associated. This code also contains suggestions for how to change or adapt this equipment.	Put a material underneath the chin that doesn't rub. Create friction for the skin because that's kind of what causes the itchiness (Participant L) I've got a lot of hair and I don't like the gel in my hair. (Participant J) Get better internet. (Participant E)
General thoughts about use of FLICK-TOK at home	This code explores how the participants feel about using Flick-Tok at home.	If I did use it, I would use it more just to reduce the tone because that's what I did find most helpful. (Participant J)
Length of time to use FLICK-TOK at home	This code explores how often and how long participants expect to use FlickTok at home, both daily usage time and number of days per week.	Honestly, because it's scrolling. I would wear it forever. (Participant L) 45 minutes at most (Participant G)
Scheduling into daily life when using at home	This code describes difficulties of integrating Flick-Tok into participants' lives because of busy schedules.	Maybe every day if I could, if it didn't have hockey. (Participant E) Depending if I have homework or not. (Participant D)

Extra technical methodology and rationale:

Cohen's kappa (κ) was calculated to quantify agreement in attempt accuracy. Each session video was reviewed at 0.5× playback speed to allow careful frame-by-frame categorization of movement attempts.

The real-time BCI processing window evaluated attempted actions based on brain signals every 2 seconds in continuous, non-overlapping windows. If the "swipe" action was detected at any point in this 2-second window, once the 2-seconds finished a signal would be sent immediately to the FES-device for activation. Simultaneously, the FlickTok application would provide the user with visual feedback that a swipe action had been detected (See figure 1). The time required for the FES to initiate would take 0.5 second approximately, and the visual feedback would take ~0.5 seconds. The approximate longest chain of feedback that would happen during the experiments would happen if the user started to attempt a movement right as a new 2-second window occurred. If the classifier correctly identified this attempt, then it would take ~3 seconds for the FES activation + visual feedback to be given to the user. If the BCI system did not identify this in the first 2-second window, we allowed a second 2-second window to "count" as a successful activation (max total 4 seconds).

Cohen's Kappa Calculations:

Session 1

Participant	True positive	False positive	True negative	False negative
01-1043	38	2	3	3
01-2035	51	13	5	0
01-2037	44	2	4	3
01-2002	47	13	11	4
01-1057	29	4	3	0
01-2177	33	11	1	2
01-2028	20	2	1	10
01-1101	17	12	4	6
01-1068	42	4	14	20
01-1031	70	6	1	0
01-1027	51	8	8	3
01-1023	50	4	8	1

Session 2

Participant	True positive	False positive	True negative	False negative
01-1043	121	5	1	5
01-2035	105	33	5	0
01-2037	31	18	18	7
01-2002	65	20	31	10
01-1057	73	32	22	1
01-2177	82	10	0	3
01-2028	88	7	6	3
01-1101	39	23	8	8
01-1068	83	16	2	1
01-1031	213	6	5	6
01-1027	75	12	22	14
01-1023	85	6	10	8

Session 3

Participant	True positive	False positive	True negative	False negative
01-1043	81	9	6	8
01-2035	57	8	24	8
01-2037	28	9	21	11
01-2002	55	10	24	4
01-1057	46	2	18	7
01-2028	82	17	4	6
01-1101	44	27	7	5
01-1068	48	12	7	4
01-1031	105	1	2	10
01-1027	87	21	17	4
01-1023	96	5	7	3