



# EFFECT OF BOTOX AND THERAPY ON SPASTICITY IN CEREBRAL PALSY: A CRITICALLY APPRAISED TOPIC

Rachel Bray MOT/S, Tatum Cabot MOT/S, Peyton Clark MOT/S, Cameron Goodman MOT/S, Tarason Moore MOT/S, and Claire Napier MOT/S  
 Faculty Advisor: Anita Witt Mitchell, PhD, OTR, FAOTA  
 Practitioner-Mentor: Morgan Henry, MOT, OTR/L (Le Bonheur Outpatient Rehabilitation – East)  
 University of Tennessee Health Science Center



## BACKGROUND & RATIONALE

Children diagnosed with Cerebral Palsy often experience upper limb spasticity resulting in difficulty with activities involving motor function.

Le Bonheur Children's Hospital uses Botox in combination with occupational and/or physical therapy to reduce spasticity but lack a proper protocol to follow for treatment.

## PICO QUESTION

In children under the age of 18 diagnosed with Cerebral Palsy, is the combination of Botox injections and OT and/or PT effective for decreasing spasticity in the upper extremity?

## SEARCH METHODS

### DATABASES

- PubMed, Google Scholar, EBSCO, CINAHL Complete, and Clinical Key

### LIMITS

- Publication dates of 2012-2022, English Language

### INCLUSION CRITERIA

- Children ages 0-18
- Cerebral Palsy (upper extremity spasticity)
- Receiving OT and/or PT
- Botox injections in upper extremity

### EXCLUSION CRITERIA

- Comorbidities such as orthopedic conditions, neurological conditions, etc.
- Intervention involving only the lower limbs

## SEARCH TERMS

(Children OR Adolescents) AND ("cerebral palsy" OR "Spastic paralysis") AND (Botox OR "Botulinum toxin" AND "Occupational therapy" OR "Occupational rehabilitation" AND "Physical Therapy" OR "Physical rehabilitation") AND (Increasing AND ROM OR "range of motion" OR movement AND "upper extremity" OR "upper body")

## MAIN FINDINGS

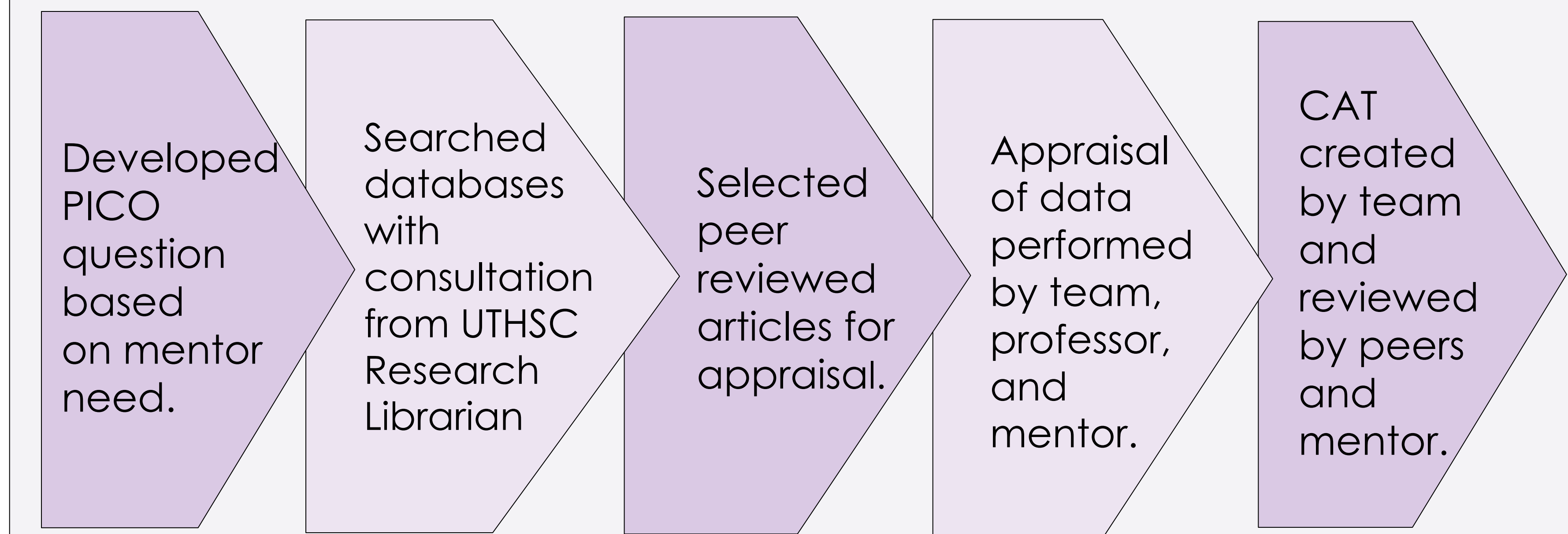
| Study   | Intervention/Duration  | Findings |
|---|--|----------|
| <b>Level I</b>  |  |          |
| <b>Dimitrova et al. (2021)</b><br>• RCT<br>• <b>QS = 84%</b>          | • OT: 1 hour/week for 12 weeks   | +        |
| <b>Level II</b>   |  |          |
| <b>Delgado et al. (2020)</b><br>• Small Scale RCT<br>• <b>QS= 90%</b> | • Home program: minimum five 15 min sessions per week  | +        |
| <b>Karaca et al. (2015)</b><br>• Cohort Design<br>• <b>QS= 68%</b>    | • Inpatient: 5x per week for 2 weeks<br>○ OT – 45 min<br>○ PT – 45 min<br>○ Group Therapy – 45 min<br>• Home program: follow-up testing for up to 6 months | +        |
| <b>Lidman et al. (2015)</b><br>• Small Scale RCT<br>• <b>QS = 84%</b> | • OT home program: 7 hours/week for 8 weeks<br>• Splint (static circular splint) 8 hours/night for the 8 weeks   | +        |
| <b>Level III</b>  |  |          |
| <b>Hoare et al. (2013)</b><br>• RCT<br>• <b>QS = 91%</b>              | • CIMT and BOT: 60 minutes, 2x/week, for 8 weeks<br>• CIMT: glove worn for 3 hours/day, 7 days/week, for 8 weeks   | +        |
| <b>Lin et al. (2015)</b><br>• Time Series<br>• <b>QS = 65%</b>        | • OT: 2-3x/week for 12 weeks   | +        |

Key: + = statistically significant decrease in spasticity

## LIMITATIONS

- Small sample
- Lack of placebo group
- Unblinded designs
- Insufficient study length

## EVIDENCE-BASED RESEARCH PROCESS



## CLINICAL BOTTOM LINE

There is strong evidence that Botox combined with occupational and/or physical therapy decrease upper limb spasticity and increase upper body function in children with Cerebral Palsy.

## RECOMMENDATIONS FOR IMPLEMENTATION

- We recommend occupational and/or physical therapy following Botox injections to decrease spasticity in the upper extremity.
- Across the study, evidence shows that as little as 60 minutes, 2x/week for 8 weeks or 1 hour/week for 12 weeks is effective for decreasing spasticity.

## REFERENCES

