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# Effects of Virtual Reality Training and Constraint-Induced Therapy on Fine Motor Control in an Adolescent with Hemiparesis: Protocol for a Case-Comparison

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## 1. HEMIPARESIS CAUSES

- Hemiparesis is medically defined as a loss of strength or weakness on one side of the body caused by a disruption in the brain, spinal cord, or nerves that connect to the affected muscles<sup>1</sup>.
- Hemiparesis occurs most commonly in children through stroke, central nervous system infection, neoplastic space-occupying lesions, trauma, and developmental abnormalities<sup>2</sup>.

## 2. PURPOSE

- The purpose is to evaluate:
- The effects of virtual reality training on fine motor control in an adolescent patient with hemiparesis
  - Compare this effect to constraint-induced therapy on fine motor control in the same patient.



## REFERENCES



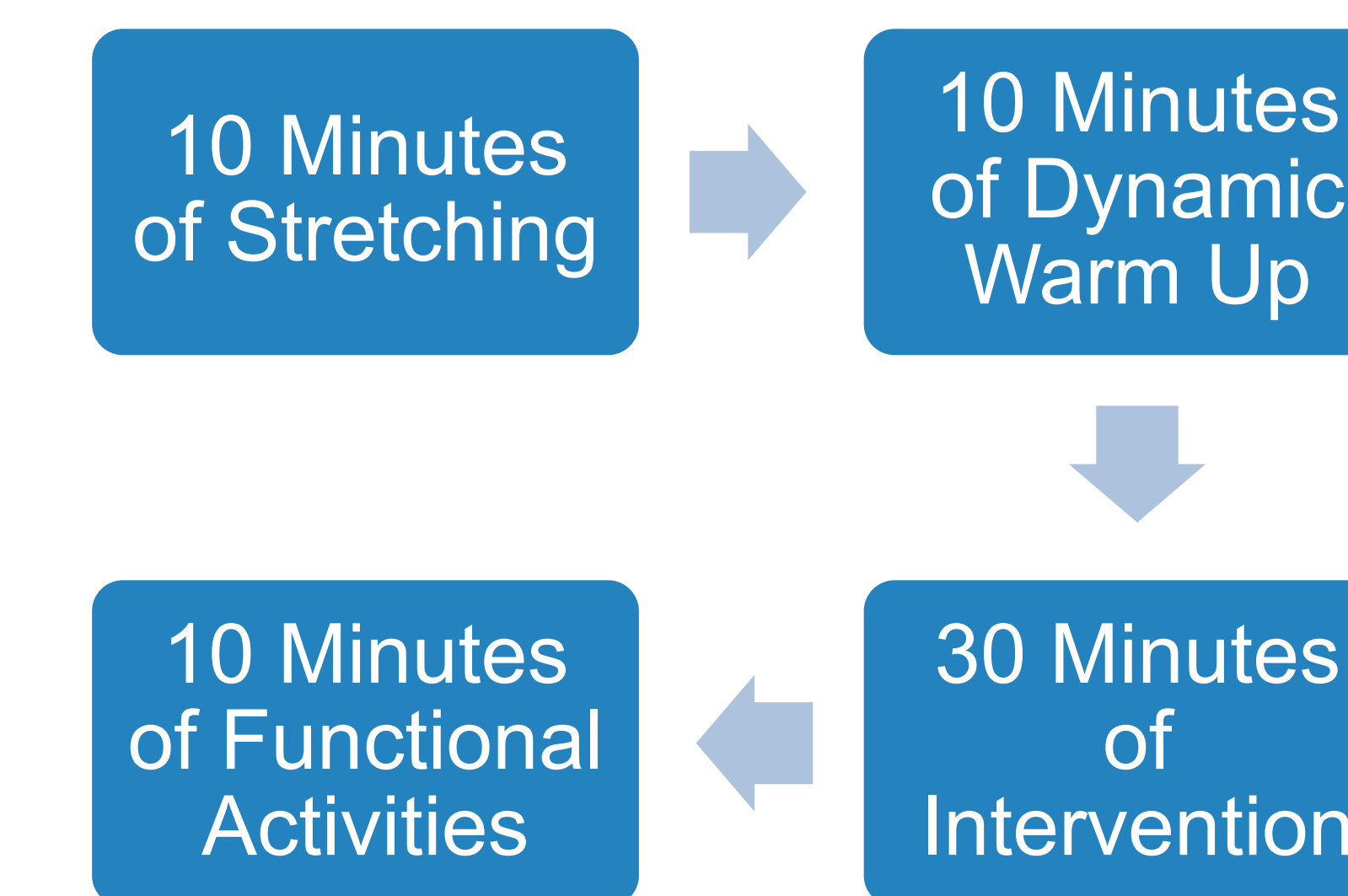
## 4. IMPLICATIONS FOR PT

- Virtual reality games:
  - Usually low cost
  - Easily implemented
  - Can be used in a clinical or home setting
  - Allow children with disabilities to perform tasks they may not usually be able to
- The games, sounds, etc. keep children engaged
- Allows for strengthening and/or coordination training in a “fun” manner
- Opportunities for feedback outside of being told by a therapist/parent

## 3. METHODOLOGY

One participant will be recruited through purposive sampling of adolescents with hemiparesis that fits all inclusion and exclusion criteria.

### Protocol Outline



Each session for both protocols will last 60 minutes and performed twice per week for 4 weeks for a total of 16 sessions.

Outcome Measures: Will be collected before and after each protocol. These include:

- Bruininks-Oseretsky Test of Motor Proficiency, 2<sup>nd</sup> Edition (BOT-2)
- Beery Developmental Test of Visual Motor Integration (VMI)

## 5. DISCUSSION

- There is limited research regarding the effects of virtual reality on fine motor control in adolescents with hemiparesis
- Through this study, we expect to determine the effectiveness of virtual reality on fine motor control in adolescents
- We acknowledge that there are limitations to this study (no blinding, small sample size)
- To ensure that the results of this study will inform physical therapists of the effectiveness of virtual reality training, we aim to publish this study in an academic journal