# The immediate training can modify the choice reaction time in reaching tasks crossing or not the midline in Stroke patients?

Tamise Aguiar Caires[1]; Gustavo José Luvizutto[2]; Juli Thomaz de Souza[3]; Fernanda Winckler[3]; Rodrigo Bazan[3]; Gabriel Jablonski[4]; Adriano O. Andrade[4], Luciane Aparecida Pascucci Sande de Souza[2]

1 - Mater in Science in Physical Therapy, Federal University of Triangulo Mineiro, Uberaba (MG), Brazil.
2 - Department of Physical Therapy, Federal University of Triângulo Mineiro, Uberaba (MG), Brazil.
3 - Department of Neurology, Psychology and Psychiatry. Sao Paulo State University (UNESP). Botucatu Medical School, Botucatu, SP.
4 - Centre for Innovation and Technology Assessment in Health, Federal University of Uberlândia, Uberlândia, Brazil.

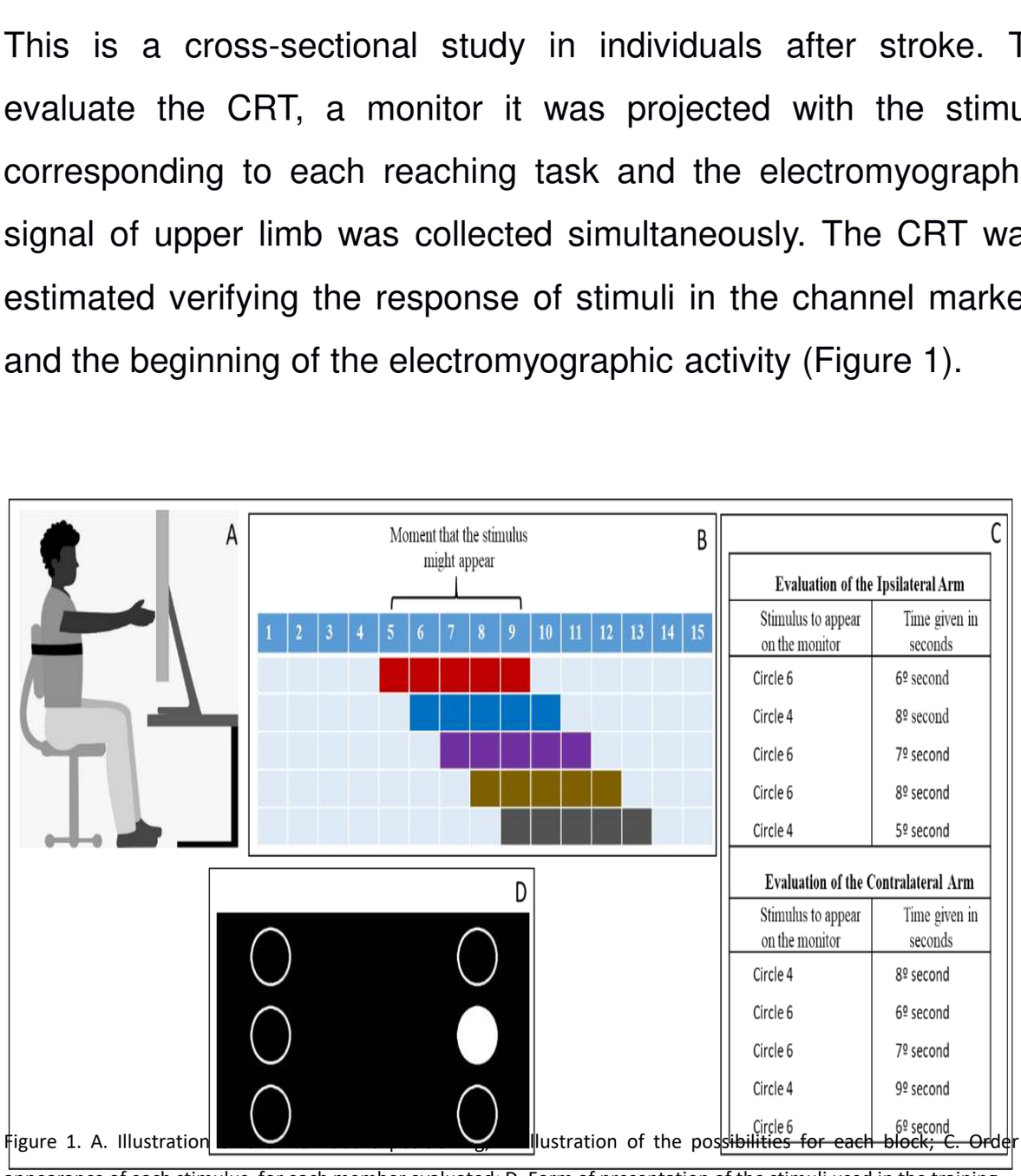
AS08-055

## BACKGROUND

The Choice Reaction Time (CRT) is characterized ability to choose from two or more stimuli, and can be trained during upper limb tasks after stroke. The aim of this study was to investigate whether the CRT is modified after a single reaching training session while individuals crossing or not the midline.

## METHODS

This is a cross-sectional study in individuals after stroke. To evaluate the CRT, a monitor it was projected with the stimuli corresponding to each reaching task and the electromyographic signal of upper limb was collected simultaneously. The CRT was estimated verifying the response of stimuli in the channel marker, and the beginning of the electromyographic activity (Figure 1).




| Evaluation of the Ipsilateral Arm | |
|---|---|
| Stimulus to appear on the monitor | Time given in seconds |
| Circle 6 | 6º second |
| Circle 4 | 8º second |
| Circle 6 | 7º second |
| Circle 6 | 8º second |
| Circle 4 | 5º second |

| Evaluation of the Contralateral Arm | |
|---|---|
| Stimulus to appear on the monitor | Time given in seconds |
| Circle 4 | 8º second |
| Circle 6 | 6º second |
| Circle 6 | 7º second |
| Circle 4 | 9º second |
| Circle 6 | 6º second |

Figure 1. A. Illustration [illegible] B. Illustration of the possibilities for each block; C. Order of appearance of each stimulus, for each member evaluated; D. Form of presentation of the stimuli used in the training.

The motor training of reaching was performed after CRT evaluation using six targets, with a randomized location into five blocks, totaling fifty repetitions in a single session.

**Statistical Analysis:** For statistical analysis was using a student's t-test and Cohen's D to compare pre- and post-intervention.

## RESULTS

Seven individuals were included (5 males, 63.14± years, 23.71±5.17 of Mini-mental state examination and Fugl-Meyer of 21.14±8.04). The CRT showed a no significant difference before and after training (p=0.086). When individuals crossed the midline (Figure 2) Cohen's d showed high clinical relevance (d=1.31) to the compromised limb after training.

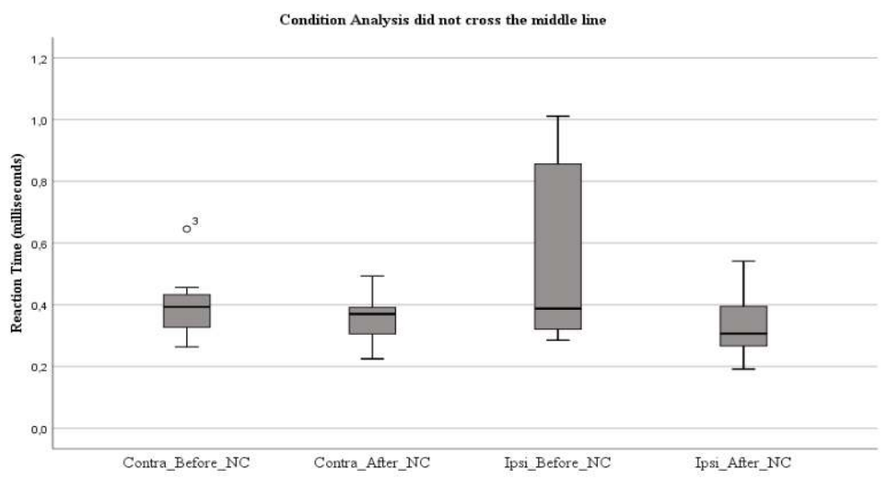



Figure 2. Box Plot of the CRT before and after training when individuals did not cross midline. Caption: Contra: contralateral limb to the lesion; Ipsi: Ipsilateral limb to the injury; NC: did not cross midline.

When participants crossed the midline (Figure 3) there was no significant difference for both limbs, shows a moderate clinical relevance (d=0.6) to the compromised limb.

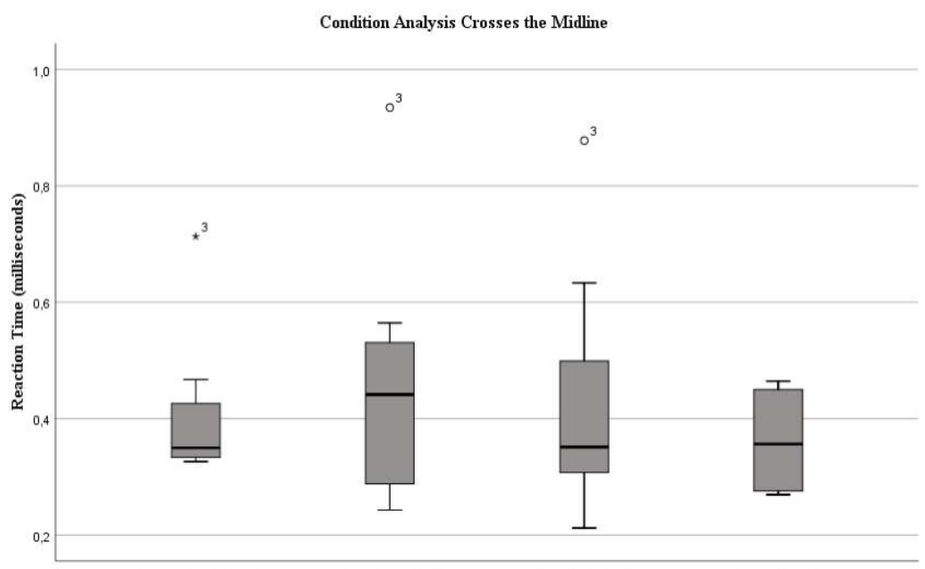



Figure 3. Box Plot of the CRT before and after training for the cross midline condition. Caption: Contra: contralateral limb to the lesion; Ipsi: Ipsilateral limb to the lesion; C: crossed the midline.

## CONCLUSION

It was concluded the training proposed can decrease the reaching CRT of simpler tasks, that do not cross the midline.

## REFERENCES

CAURAUGH, J.H.; KIM, S.B; DULEY, A. Coupled bilateral movements and active neuromuscular stimulation: Intralimb transfer evidence during bimanual aiming. Neuroscience Letters, v. 382, p. 39–44, 2005.

CAURAUGH, J.H; KIM, S.B. Stroke motor recovery: active neuromuscular stimulation and repetitive practice schedules. Neurol Neurosurg Psychiatry, n.74, p. 1562–1566, 2003.

POHL, P.S, et al. Implicit learning of a motor skill after mild and moderate stroke. Clinical Rehabilitation, v.20, p. 246-253, 2006.

THEO M. A process-oriented model of human motor behavior: toward a theory-based rehabilitation approach. Physical Therapy, v.71, n.2, 1991.