



**HAL**  
open science

## Shoulder weakness induces trunk compensation after a stroke

Germain Faity, Denis Mottet, Karima Bakhti, Jérôme Froger, Isabelle Laffont

► **To cite this version:**

Germain Faity, Denis Mottet, Karima Bakhti, Jérôme Froger, Isabelle Laffont. Shoulder weakness induces trunk compensation after a stroke. 16th world congress of the ISPRM, Jul 2022, Lisboa, Portugal. . hal-03778164

**HAL Id: hal-03778164**

**<https://hal.science/hal-03778164>**

Submitted on 15 Sep 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution - ShareAlike 4.0 International License

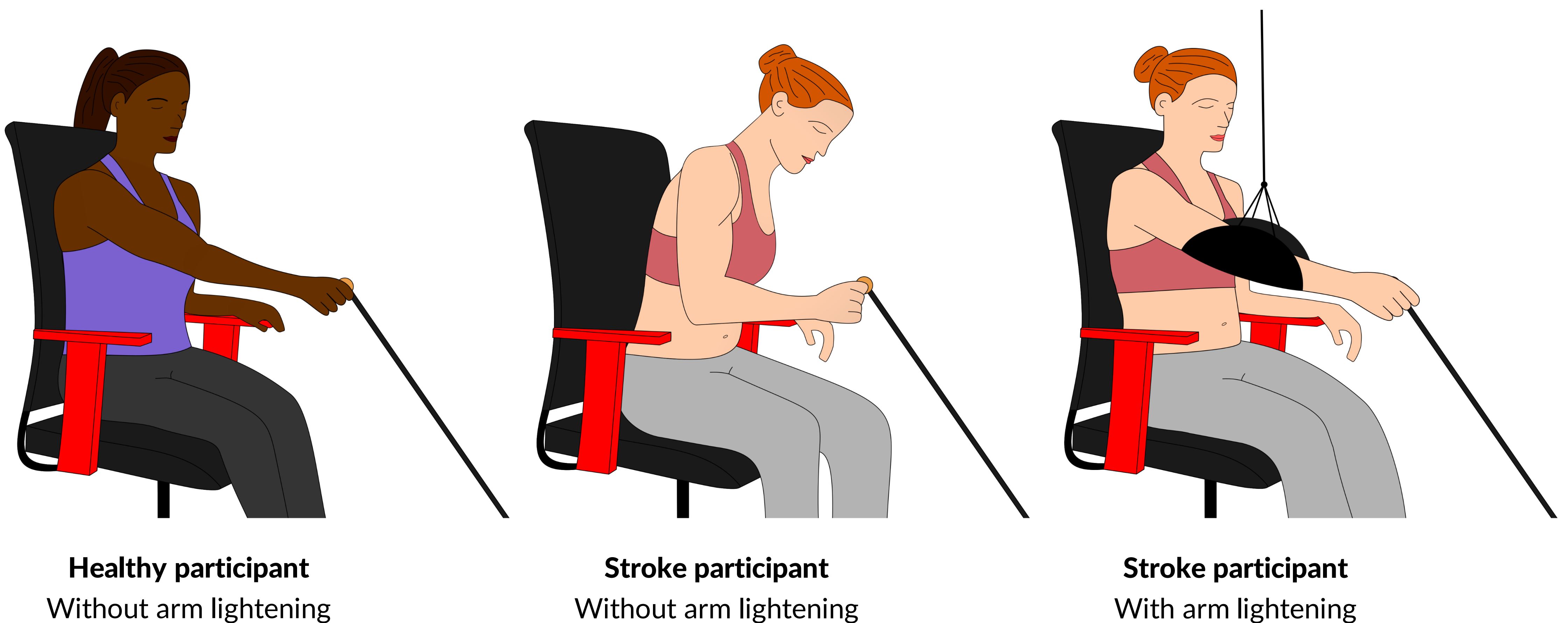
## INTRO

- Most stroke patients do not use their paretic limb even when they are able to do so, often resulting in secondary loss of function.
- Healthy people adapt their elbow-shoulder-trunk coordination to minimize the torque at the shoulder.
- The aim of this study is to evaluate how shoulder weakness after stroke impacts elbow-shoulder-trunk coordination.

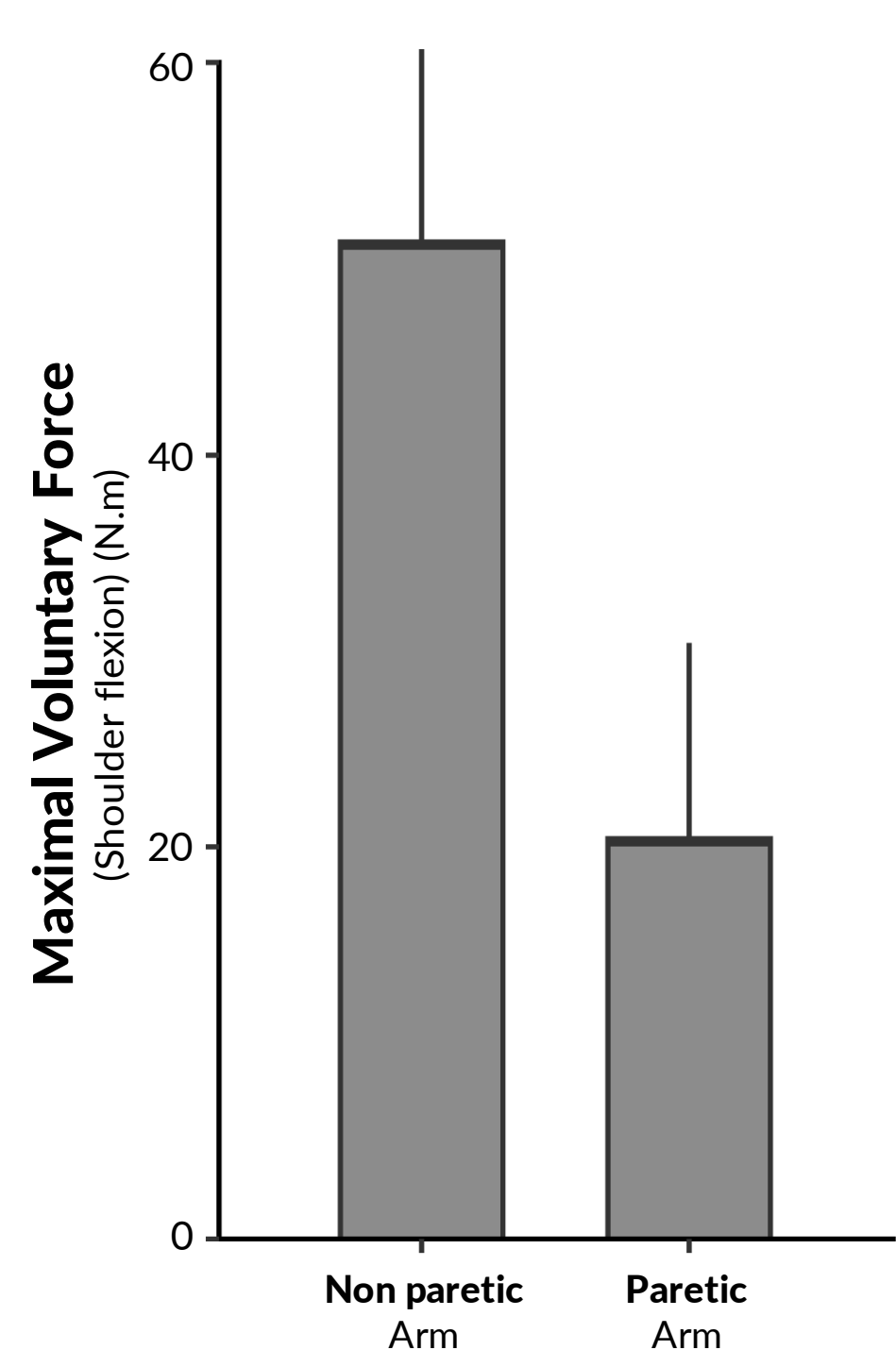
## METHODS

- 17 out of 22 patients recruited
- Supratentorial stroke (> 1 month)
- EMG + Motion Capture (Kinect v2)
- Reaching: Spontaneous VS Self-limited trunk

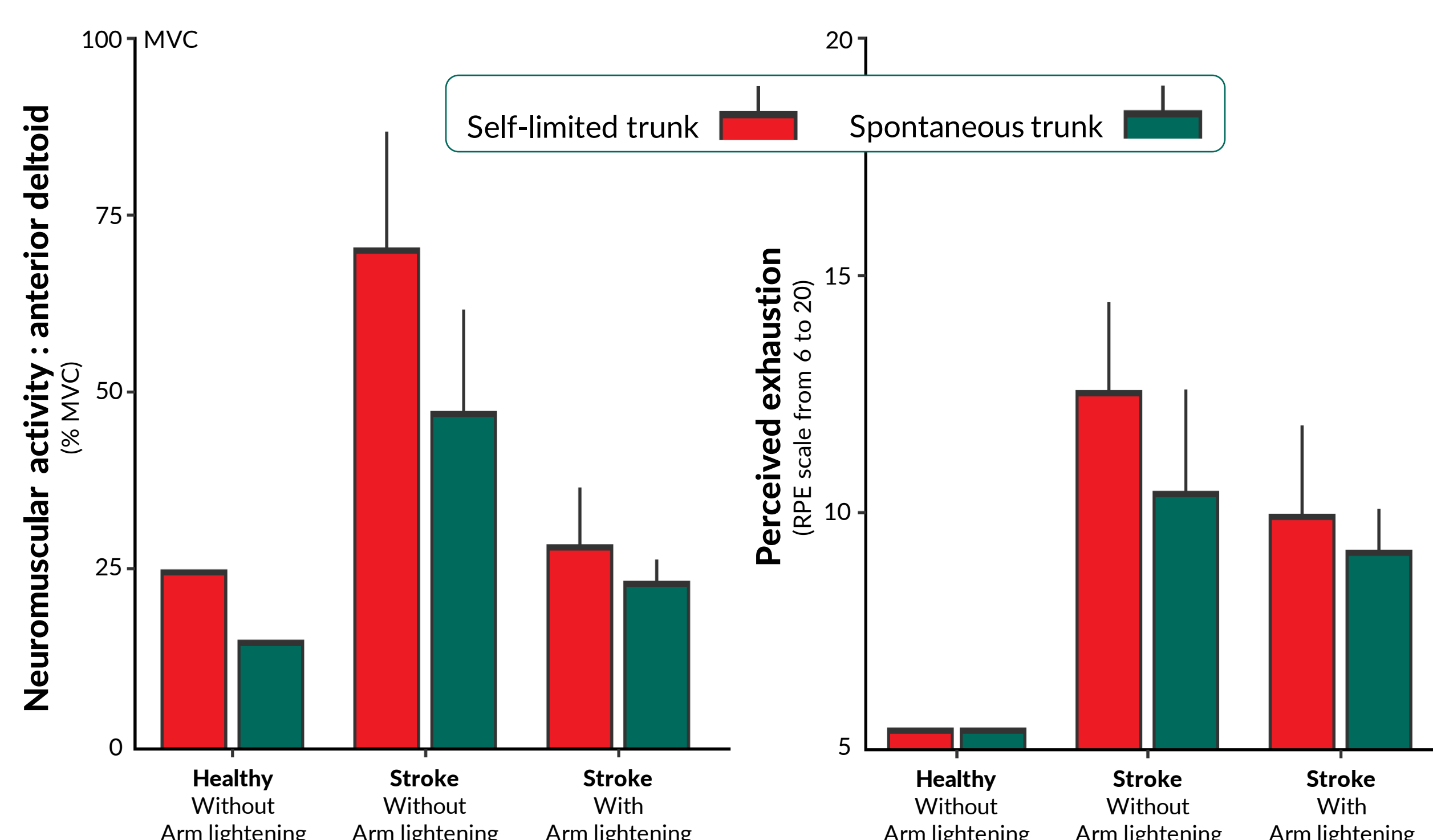
# After a **stroke**, shoulder **weakness** leads to **changes** in arm-trunk **coordination**.



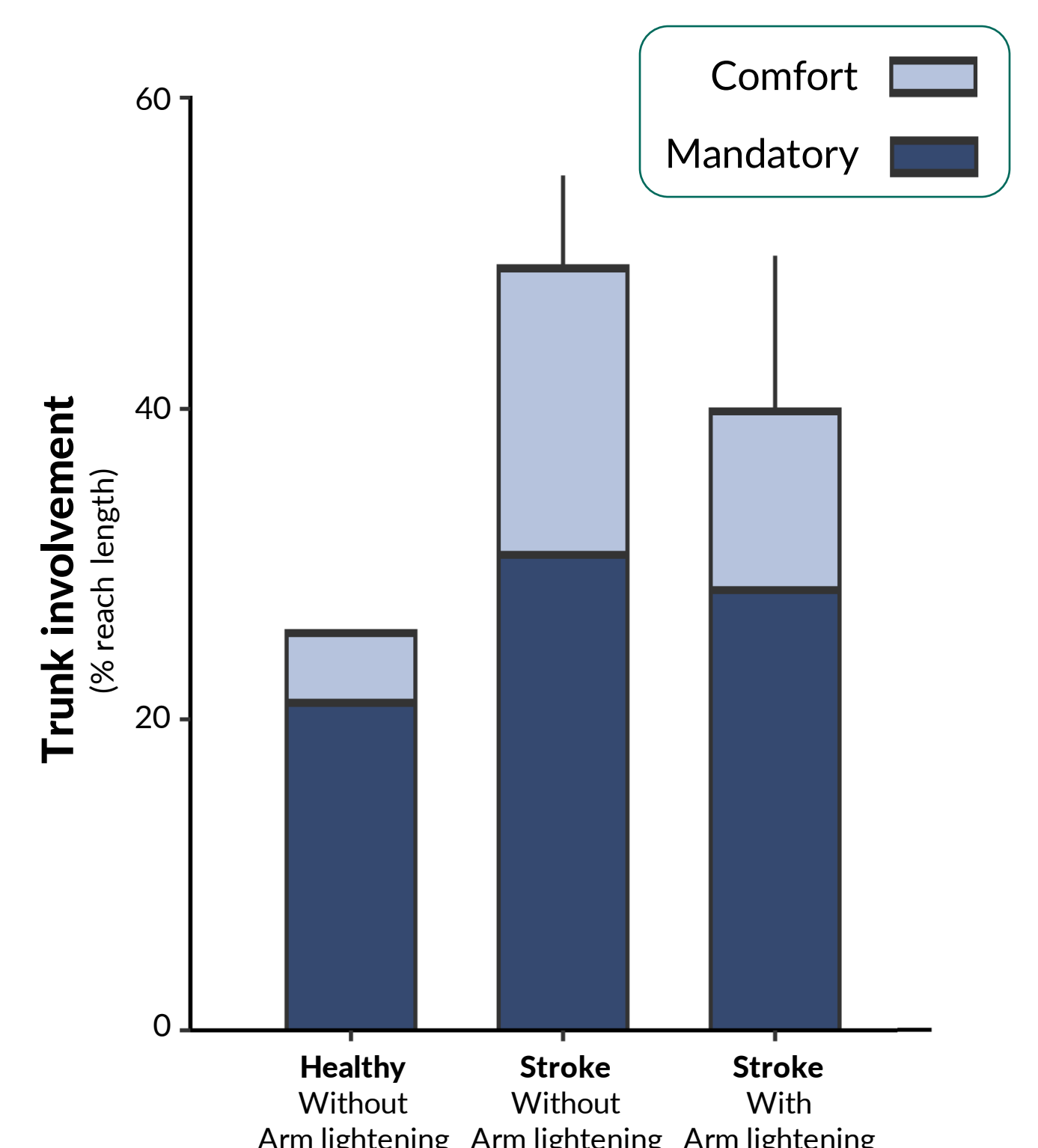
After a stroke, shoulder strength is reduced by half



Trunk compensations allow a more normal neuromuscular activity and perceived exhaustion



Lightening the arm reduces compensation



## DISCUSSION

- The observed compensation is not merely a 'poor coordination', but more likely a 'good adaptation' to the weakness of the shoulder after the stroke.
- Given the beneficial effect of the antigravity device, future work may evaluate the effect of **strength training** on reducing compensations.

Ongoing study

