

Deze powerpoint is gepresenteerd op het 3^e WCN-Verenso
symposium

Got to Move

Bewegen en multimorbiditeit na een beroerte

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Deze presentatie is eigendom Vivian Weerdesteyn, hoofd
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gebruiken van (delen van) deze presentatie mag alleen in
overleg met de auteur.

Falls after stroke: From fall mechanisms towards prevention

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A fall can happen to anyone.....



The story of a repeated faller



2002: Balkenende I



His personal trainers



Balkenende II, III and IV fallen as well

Epidemiology: Fall rates

General population > 65 years

- 30% at least one fall / year
- 0.5 – 0.65 falls / year

Stroke

- In hospital 4-22%
In rehab 11-47%
Chronic phase 40-73% / year
- In hospital 2.2 – 4.9
In rehab 1.3 – 6.5
Chronic phase 1.4 – 5.0
falls / year

Epidemiology: Fall consequences

Physically

- Injuries: 8 – 69% of all falls
- Fractures: 0.5 – 8.5%
- 45 – 59% of fractures involve the hip, due to
 - Frontal plane instability
 - Hemi-osteoporosis

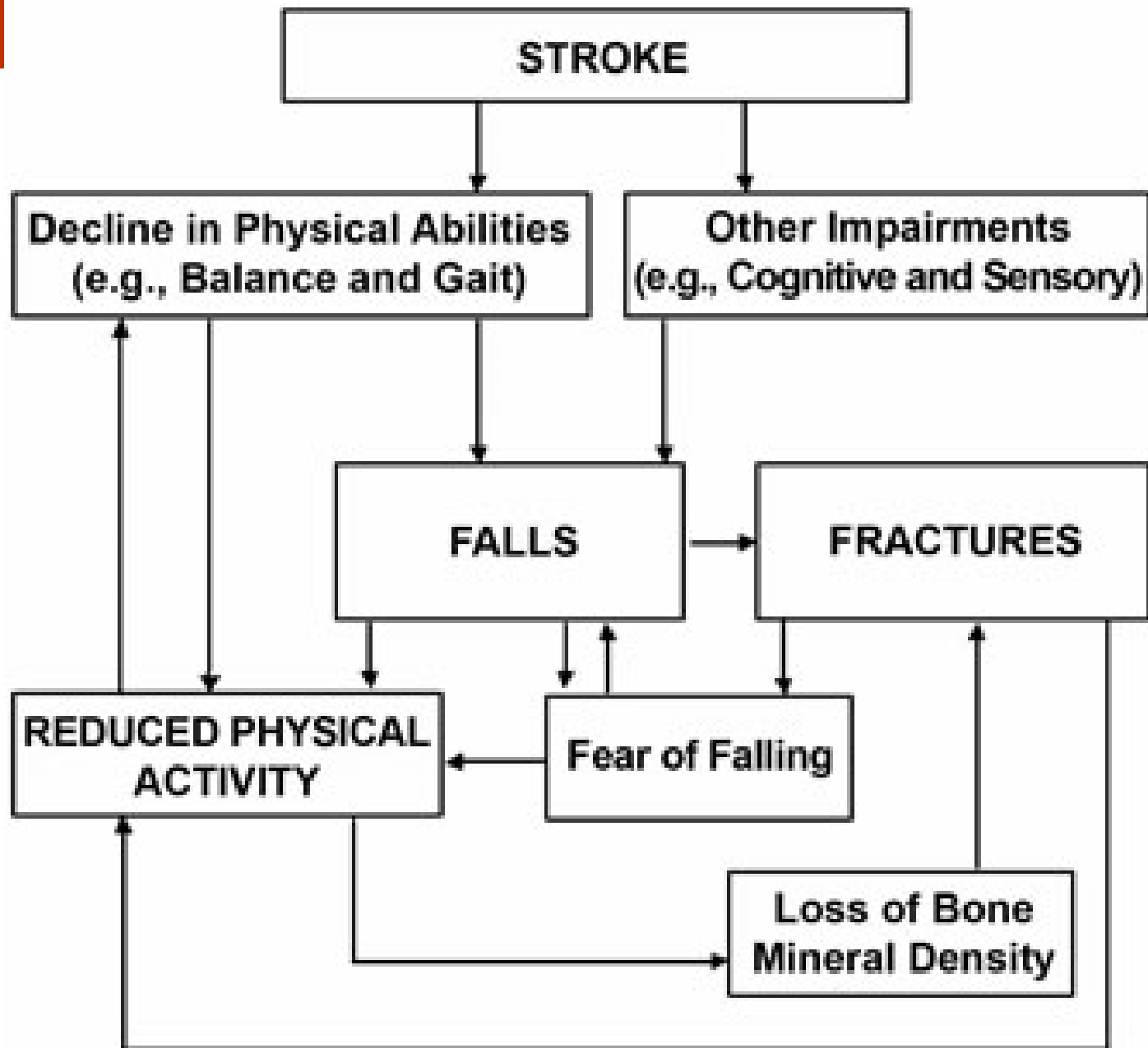
Psychosocially

- Fear of falling
- Activity restriction
- Social deprivation
- Depression
- Care giver stress

Risk factors

- ADL dependency
- Balance impairments
- Gait impairments
- Poor transfer ability (during rehab only)
- Depression
- Cognitive deficits
- Sensory impairments

- Inconclusive: quads strength, spasticity, neglect
- Not: age, hemianopia, and type, side, or location of stroke



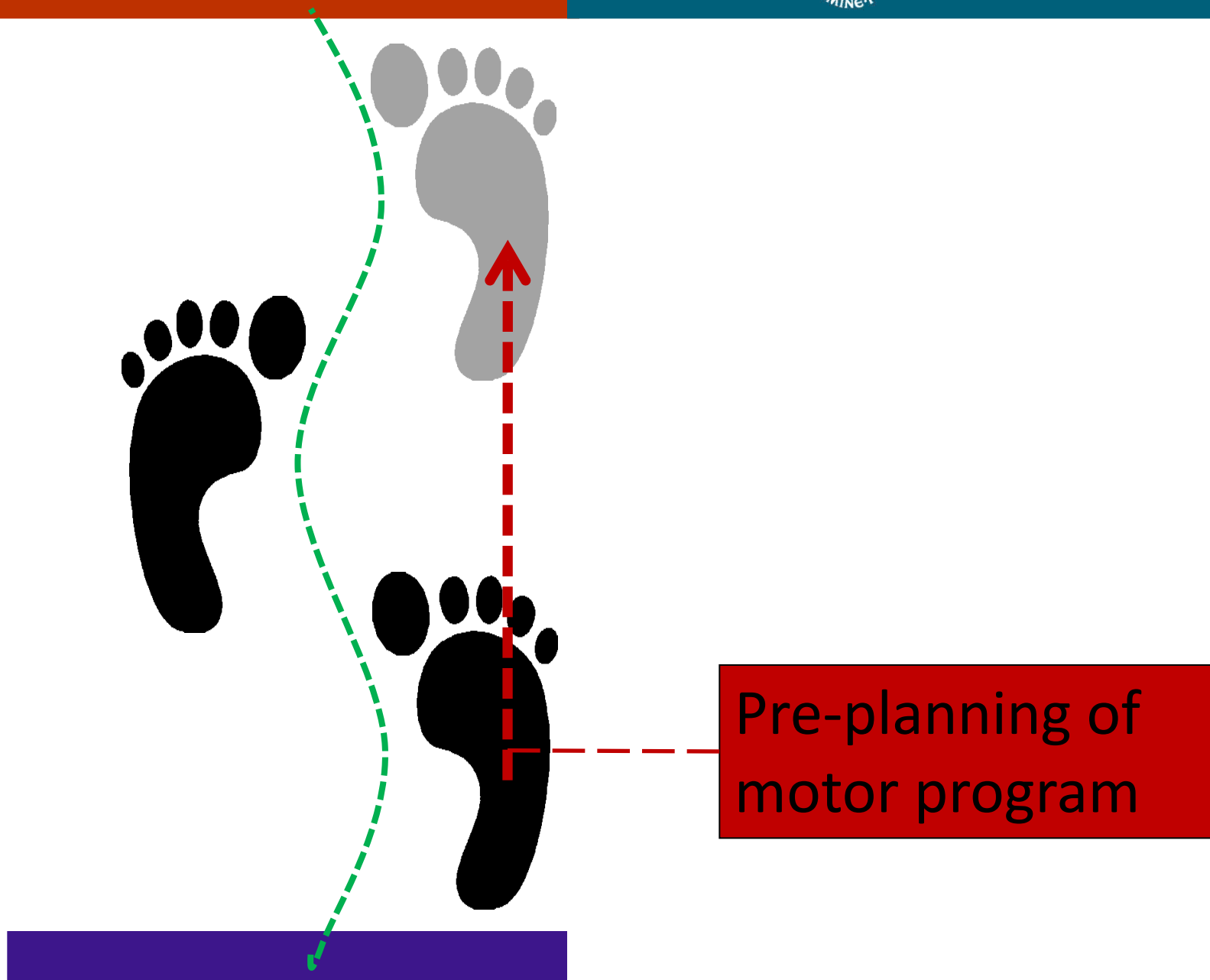
Fall circumstances

In rehab: most falls during transfers

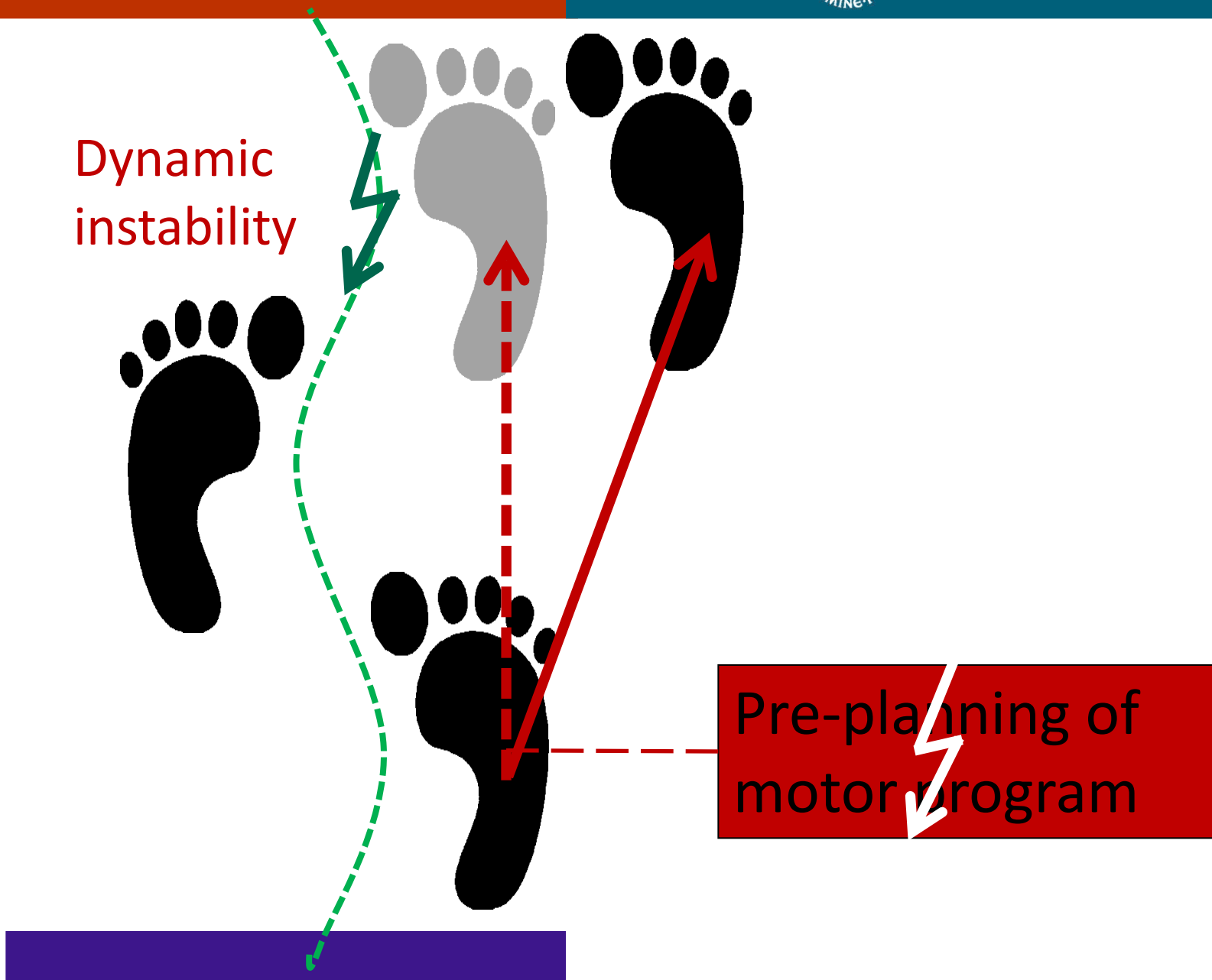
Chronic phase: most falls during walking (39 – 90% of all falls)

What makes walking so difficult?

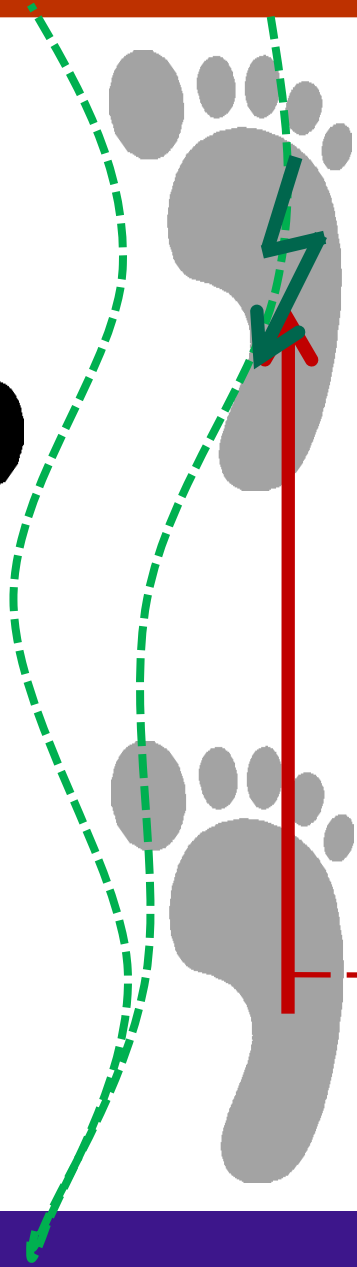




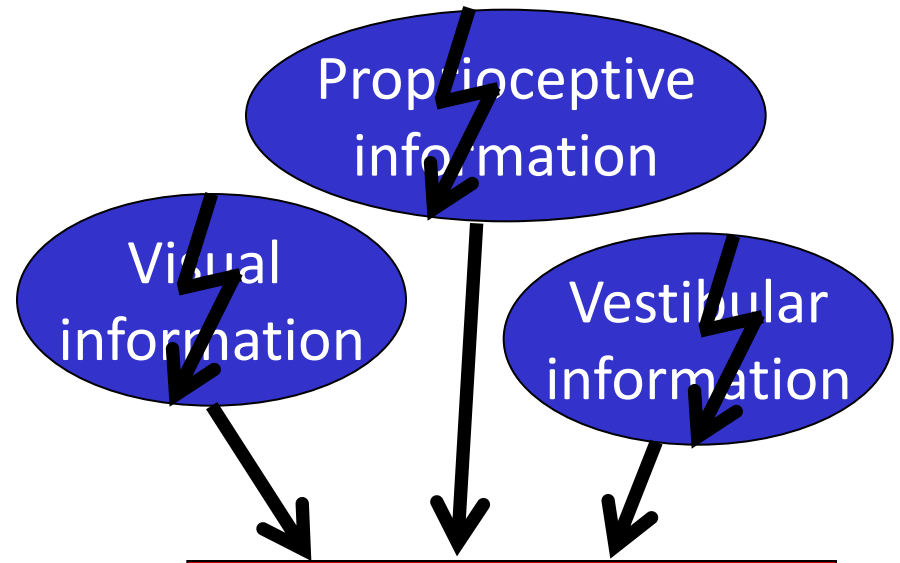
Dynamic instability



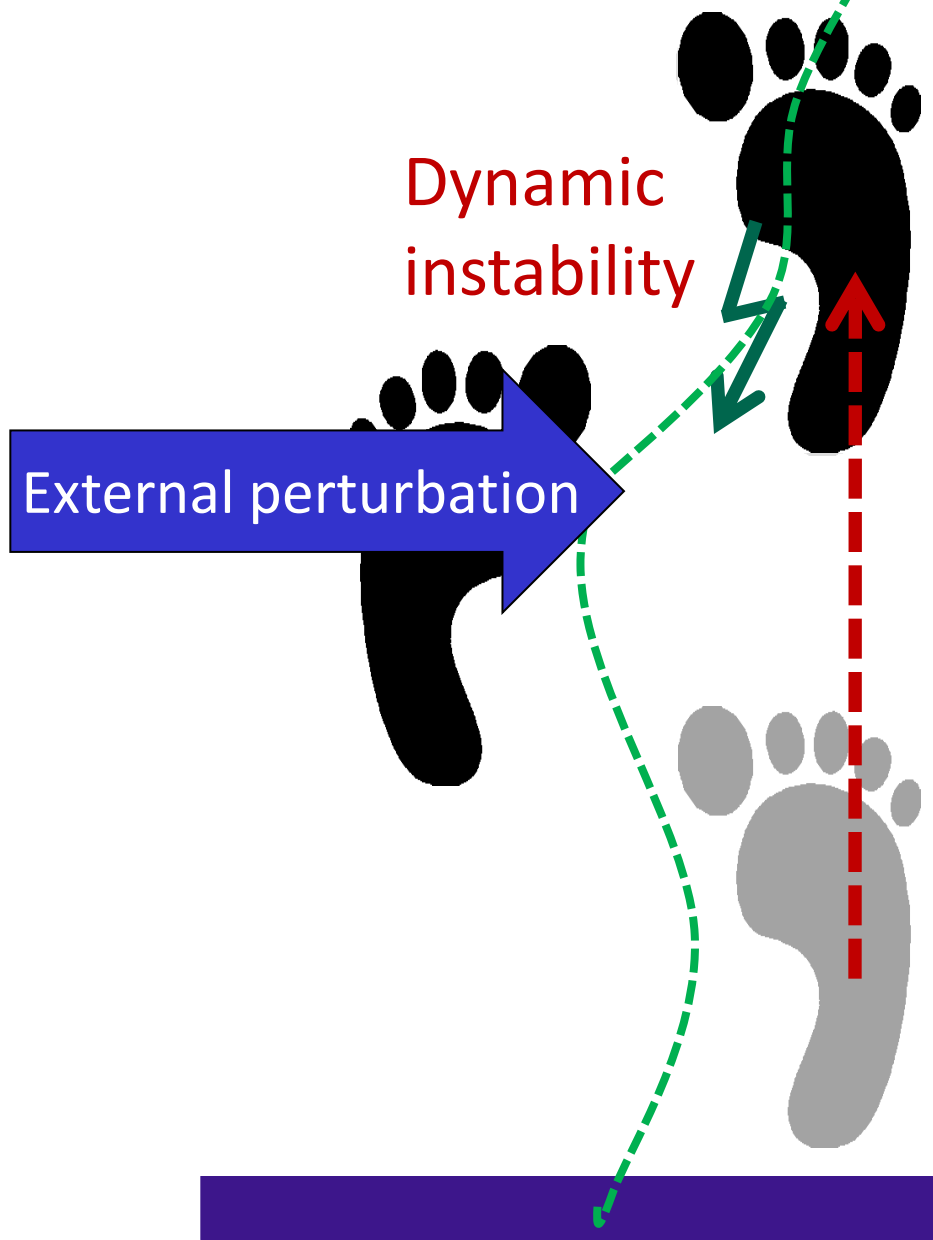
Poor stance stability

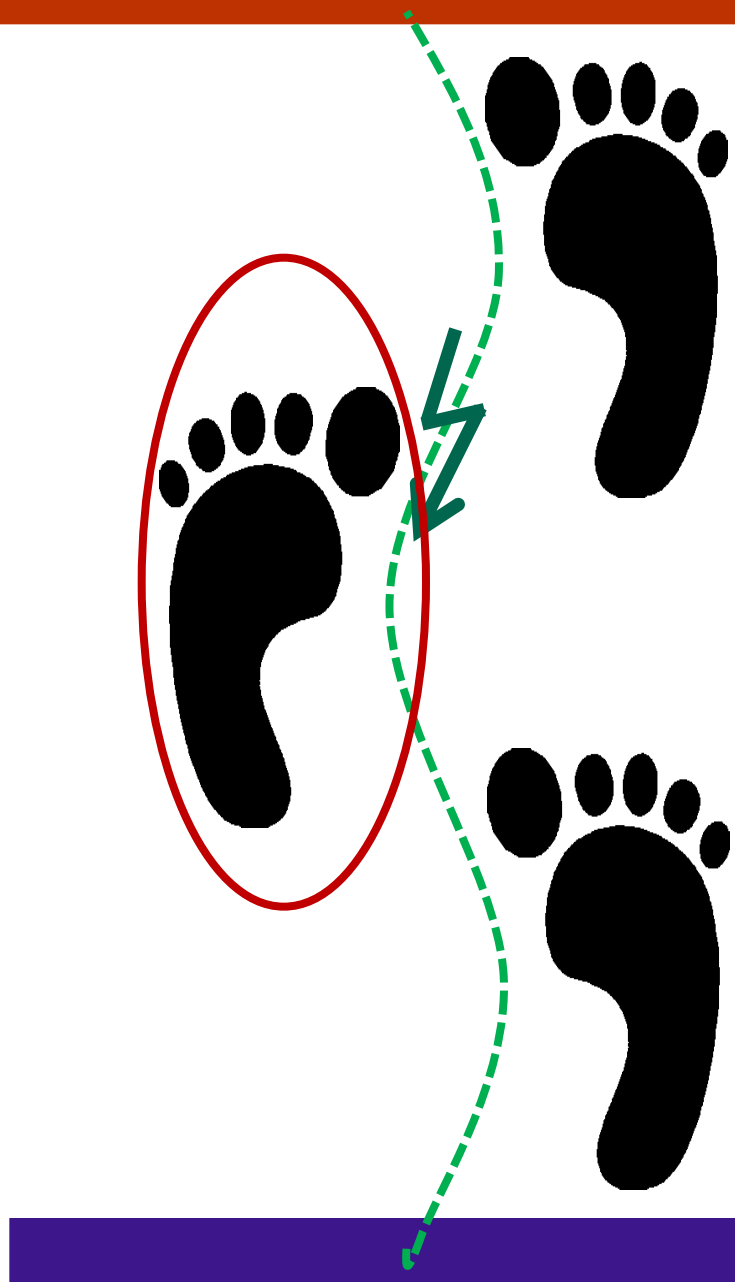


Dynamic instability



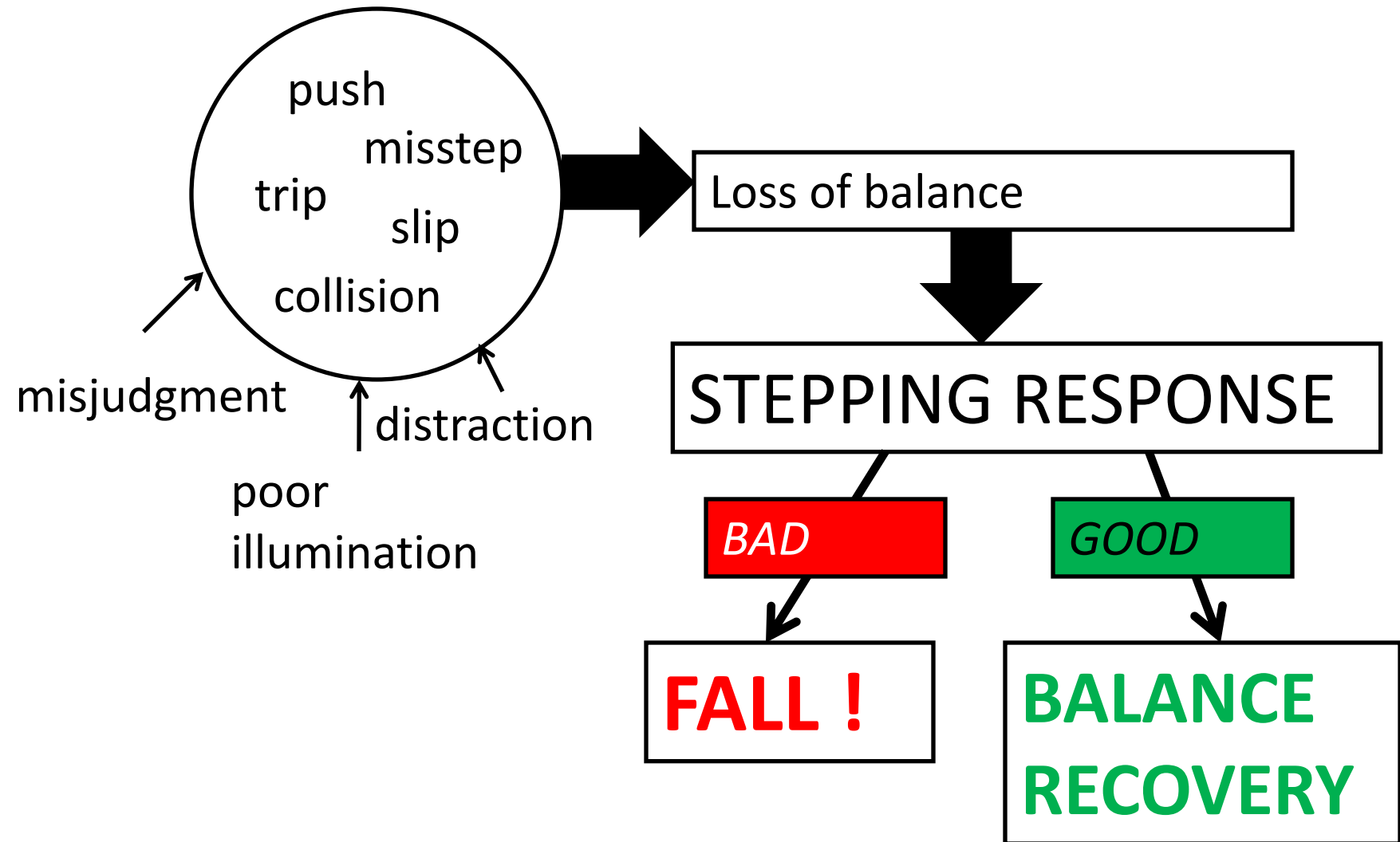
Pre-planning of motor program





Next step is crucial
for balance
recovery

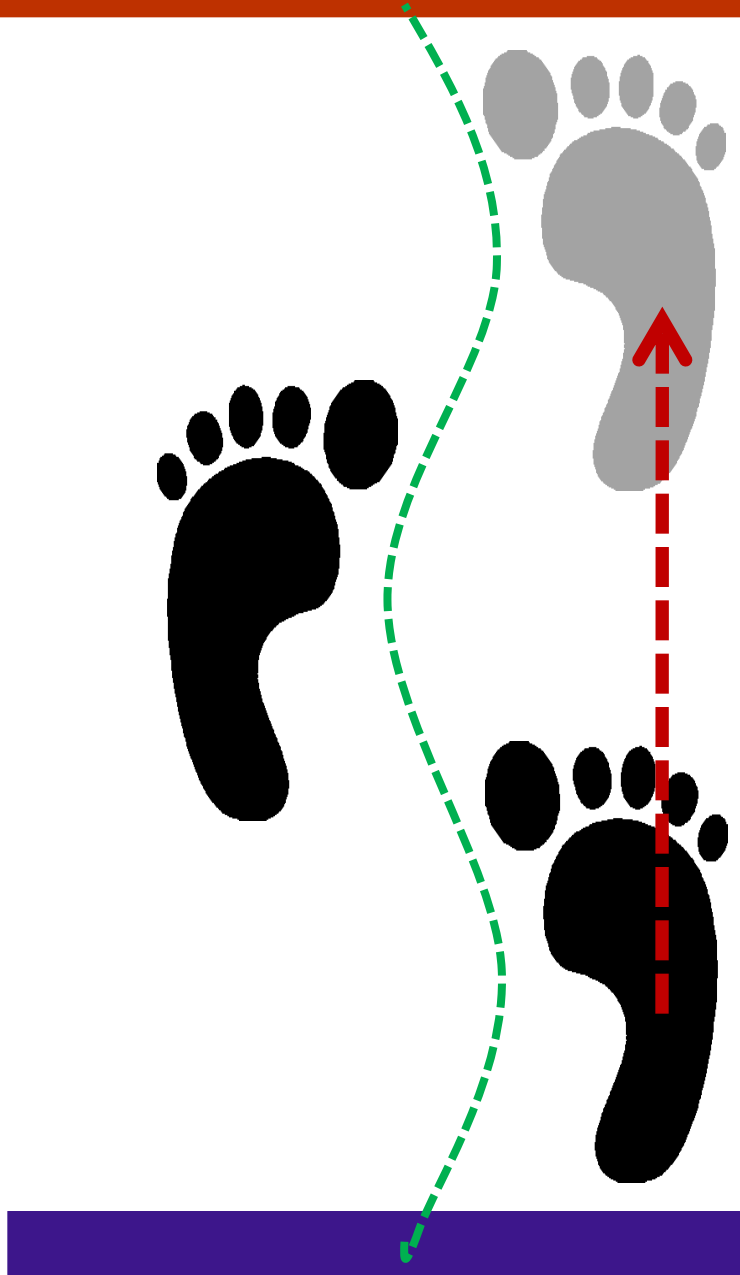
Stepping to recover balance



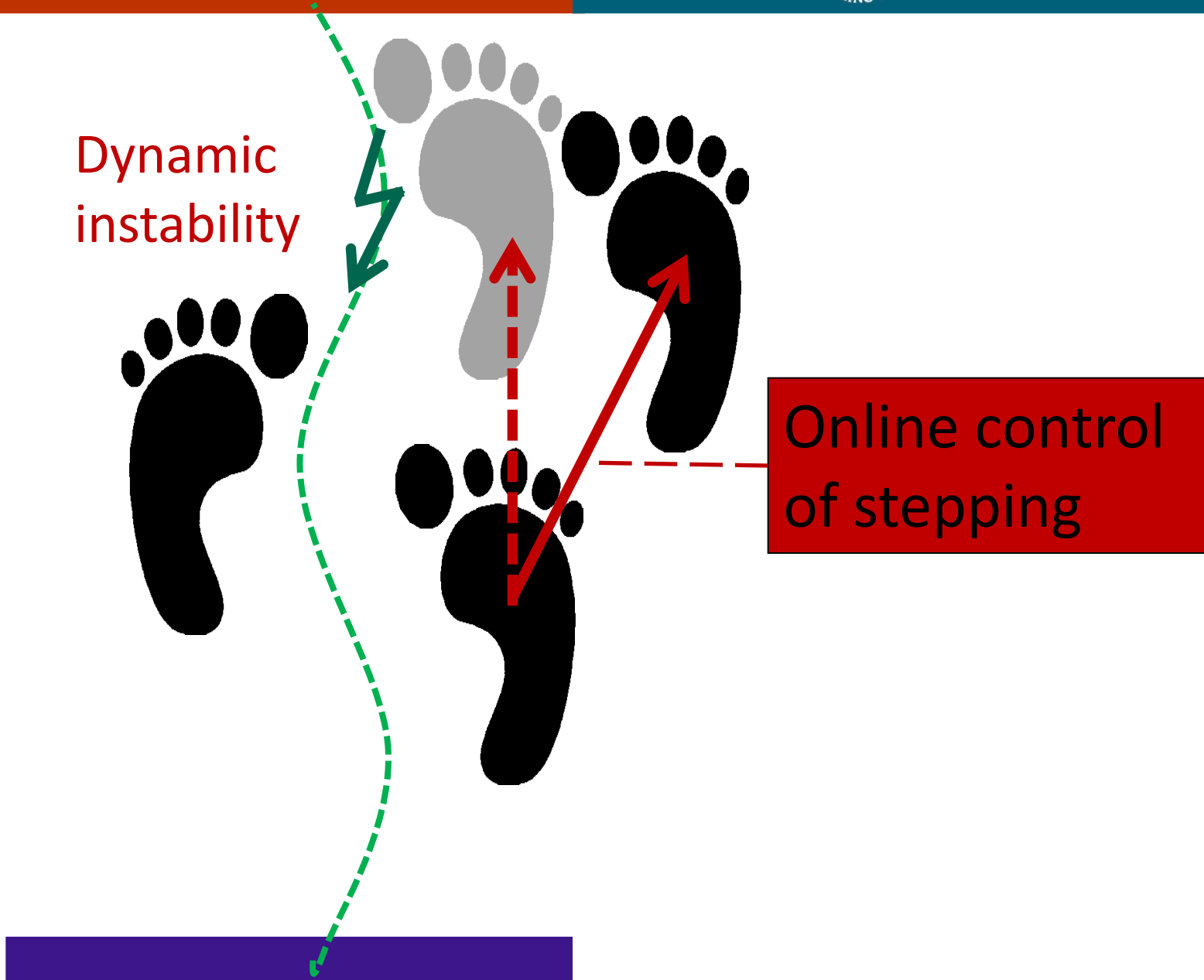
Radboud Falls Simulator



Gait adaptability



Dynamic instability

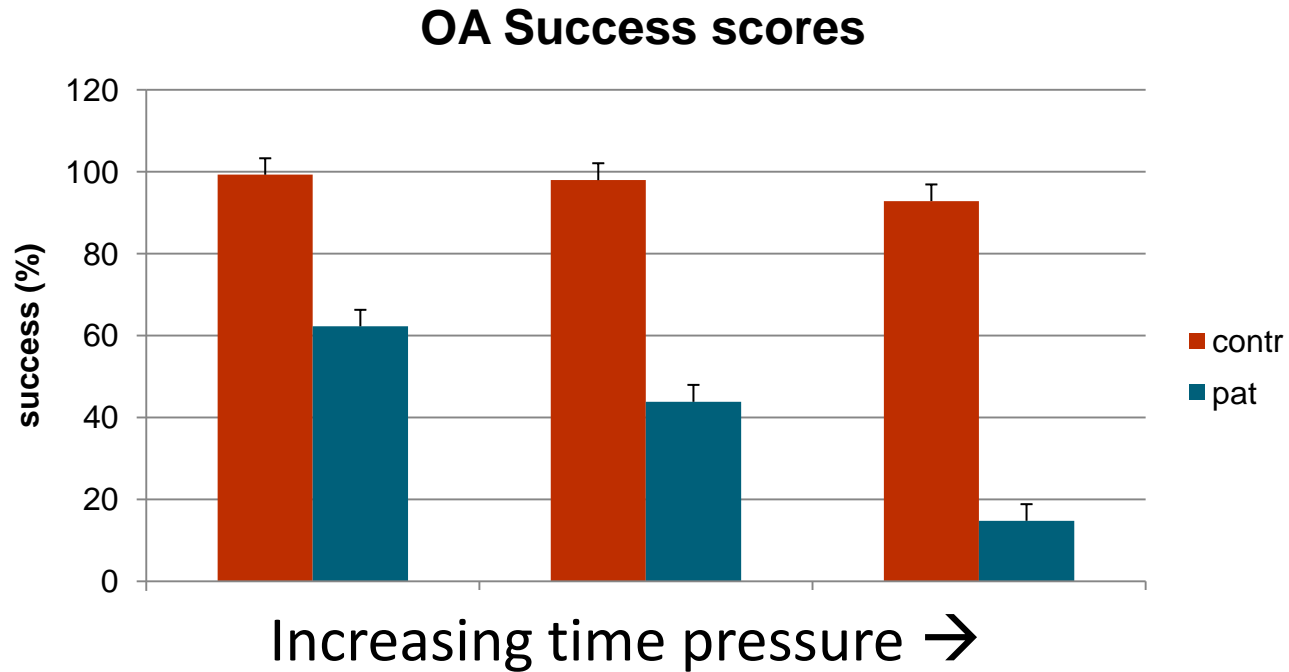


Online control of stepping

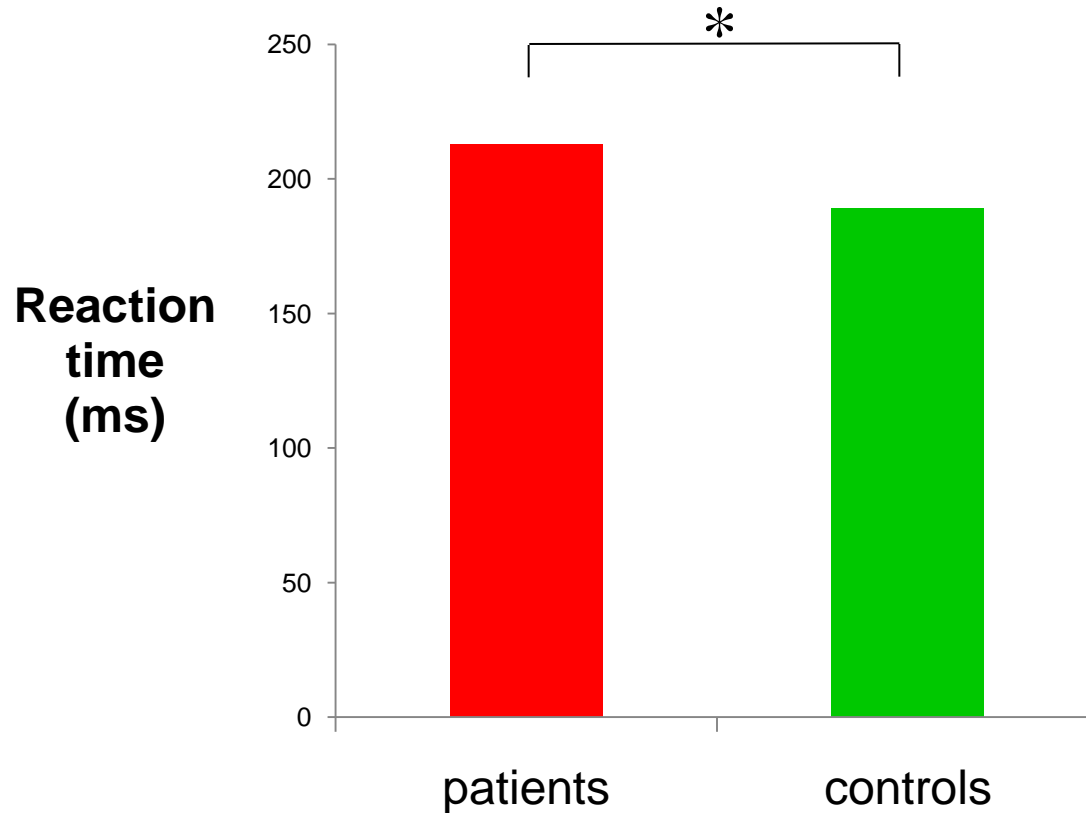
Obstacle avoidance task



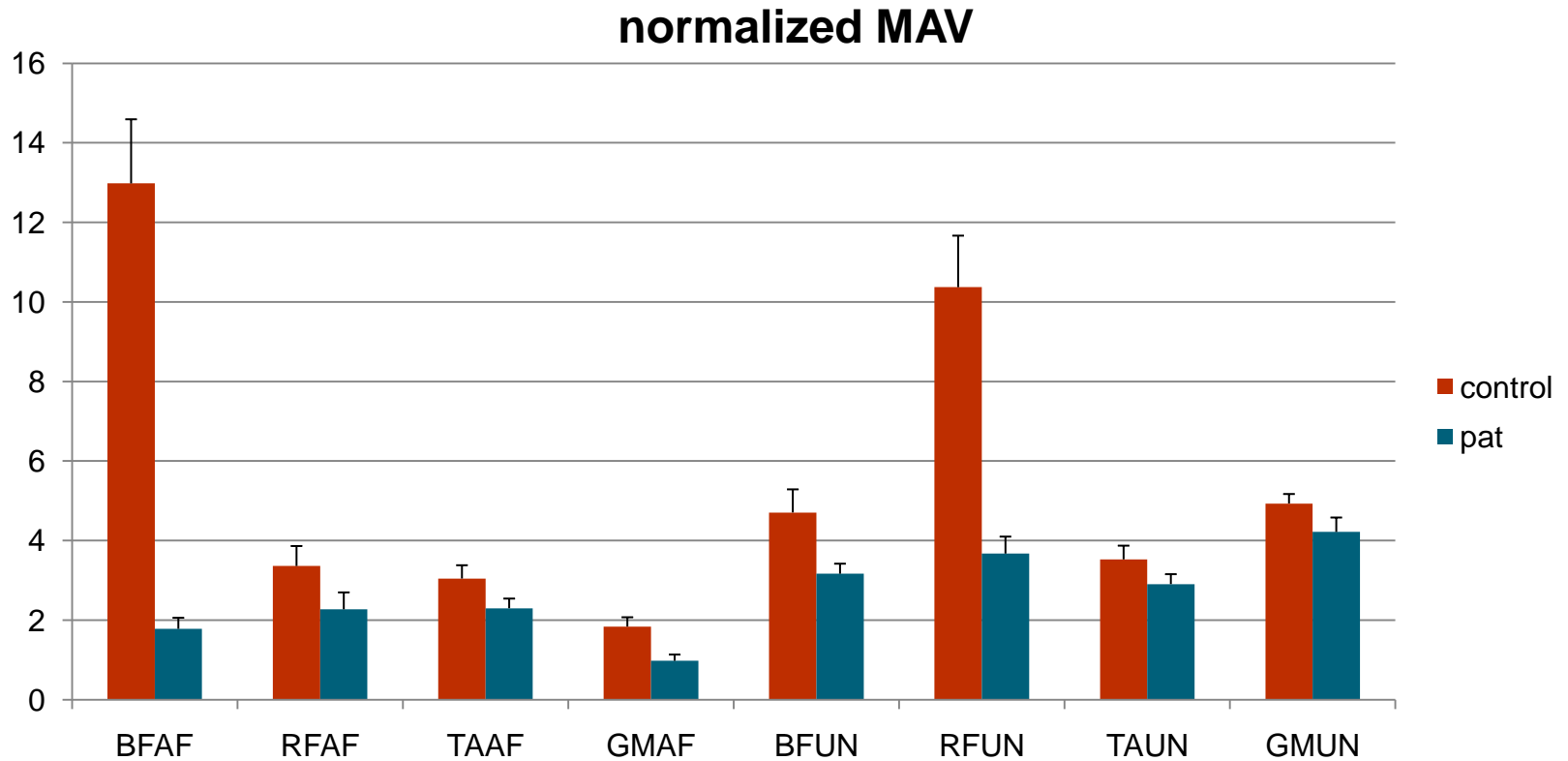
When under time pressure, stroke patients become increasingly more impaired in obstacle avoidance



Due to substantial delay in response times...



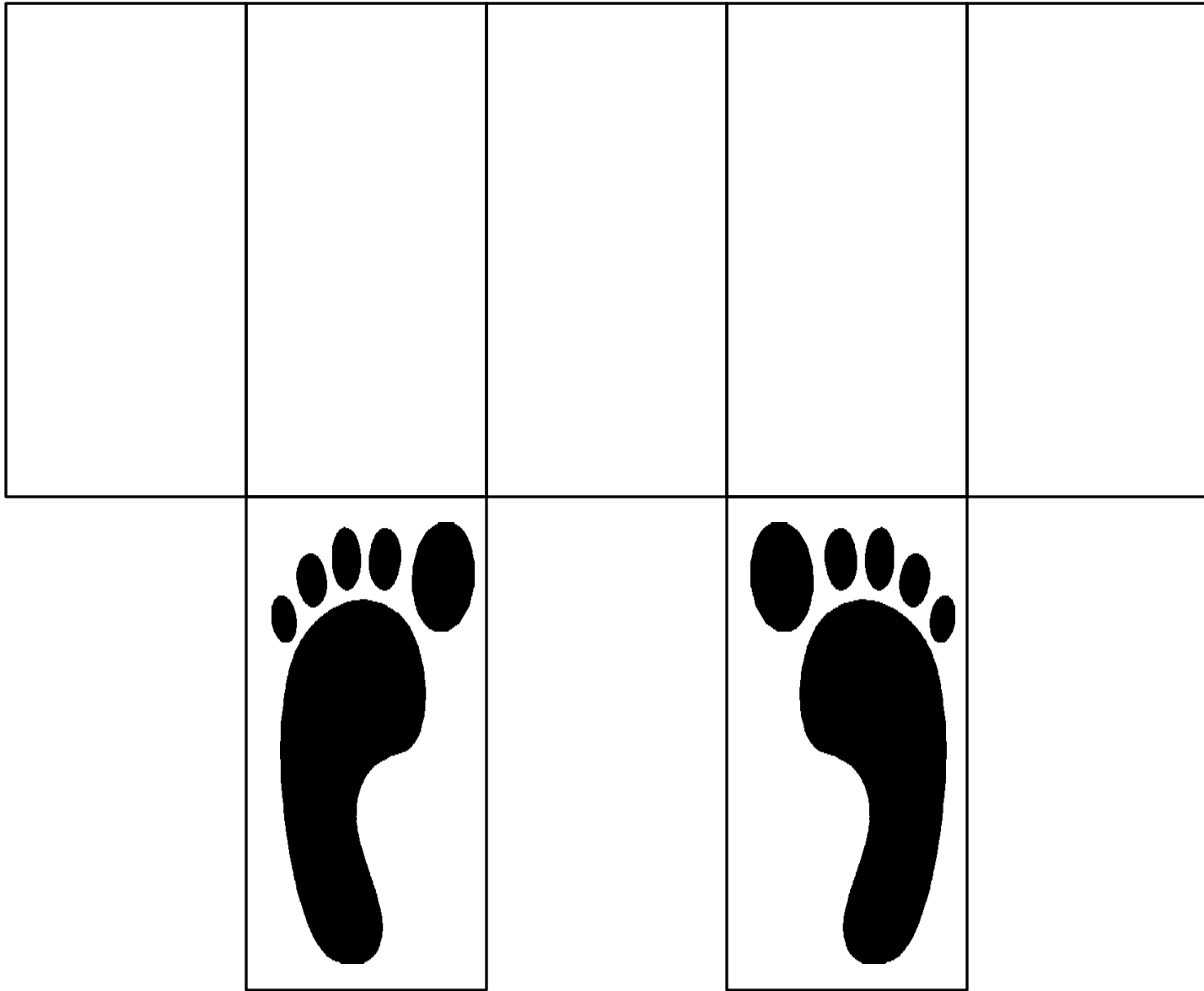
...and also because of reduced response amplitudes

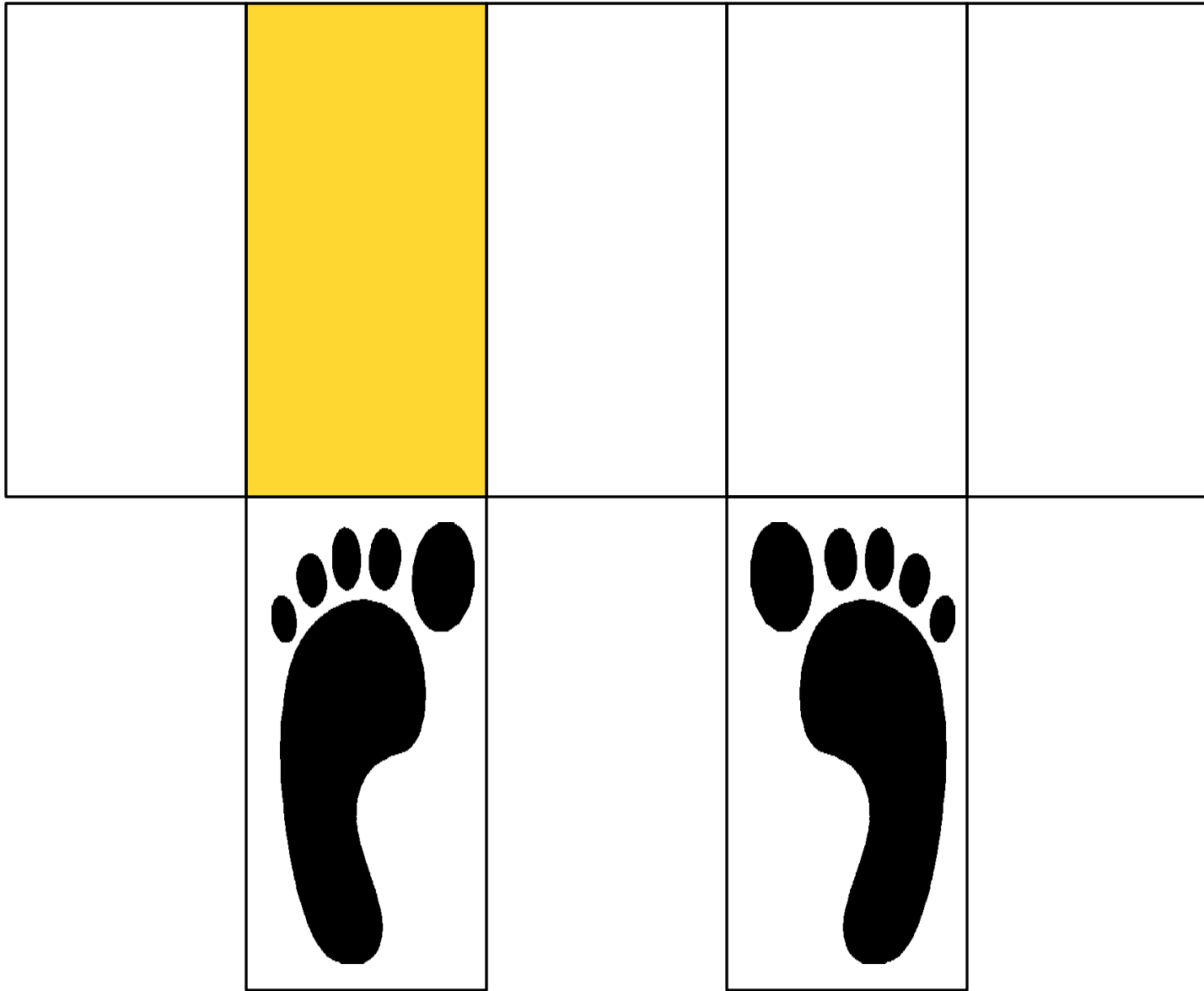


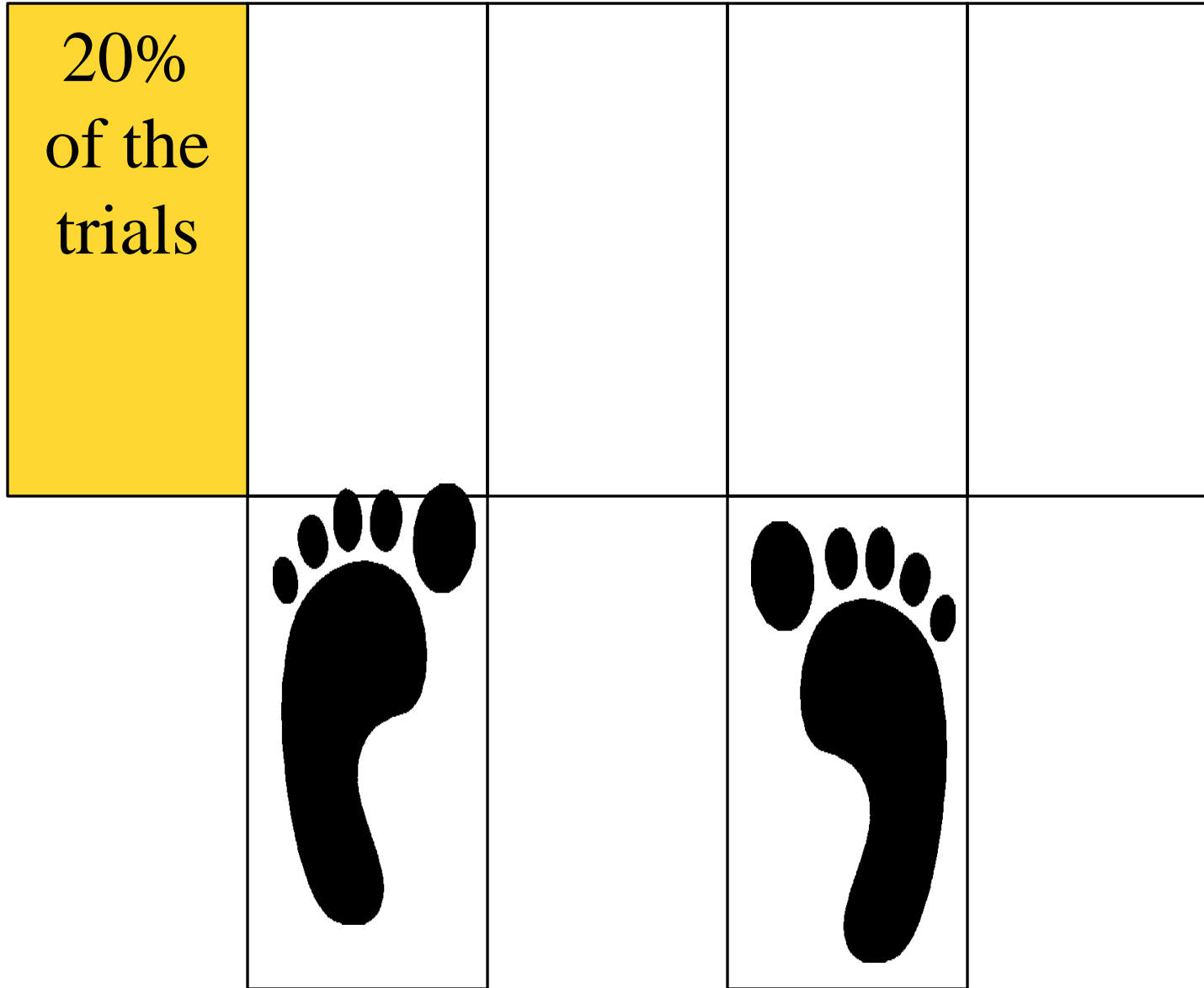
Are deficits in gait adaptability only due to impaired leg motor control?

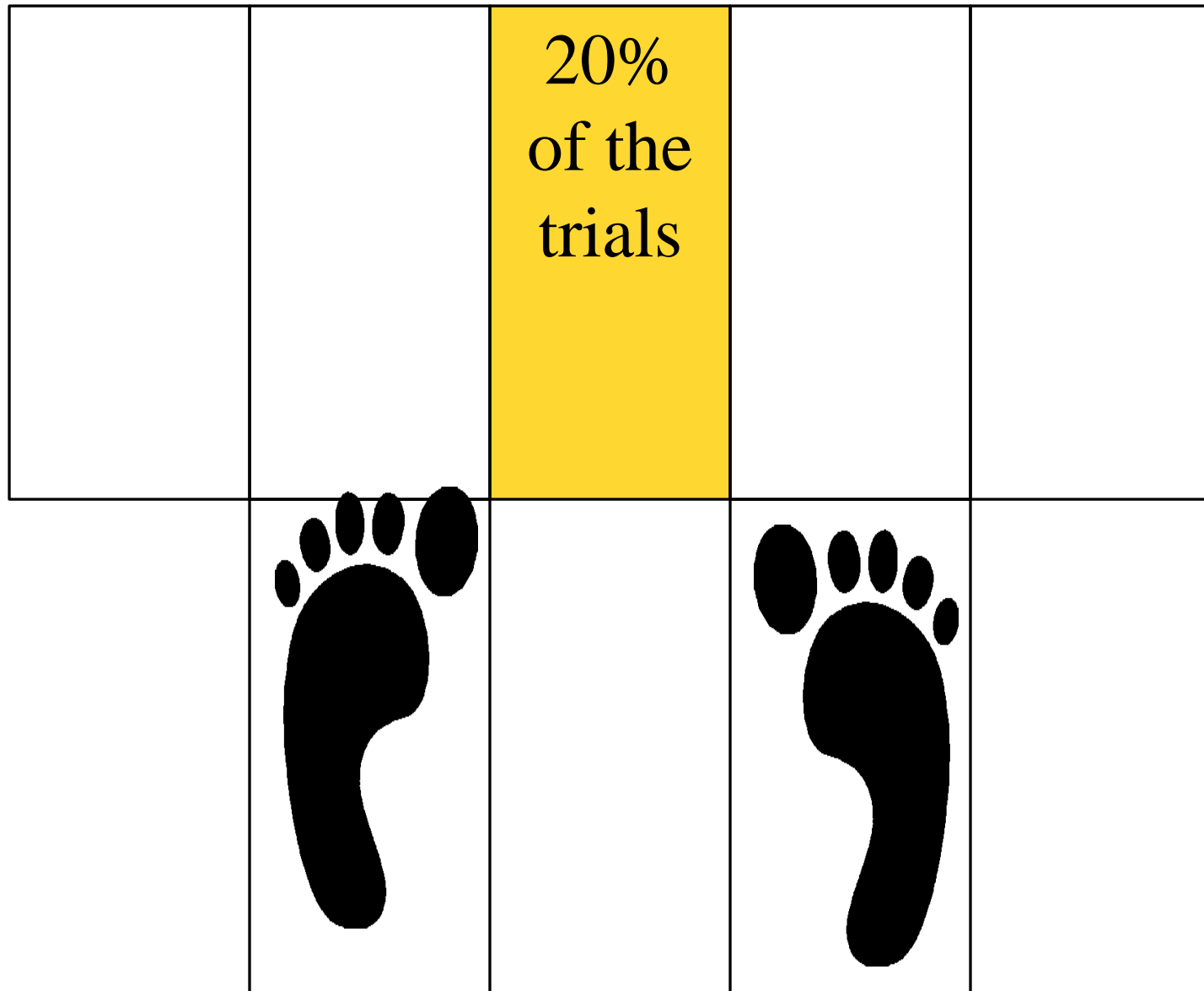
Step adjustments with and without body support

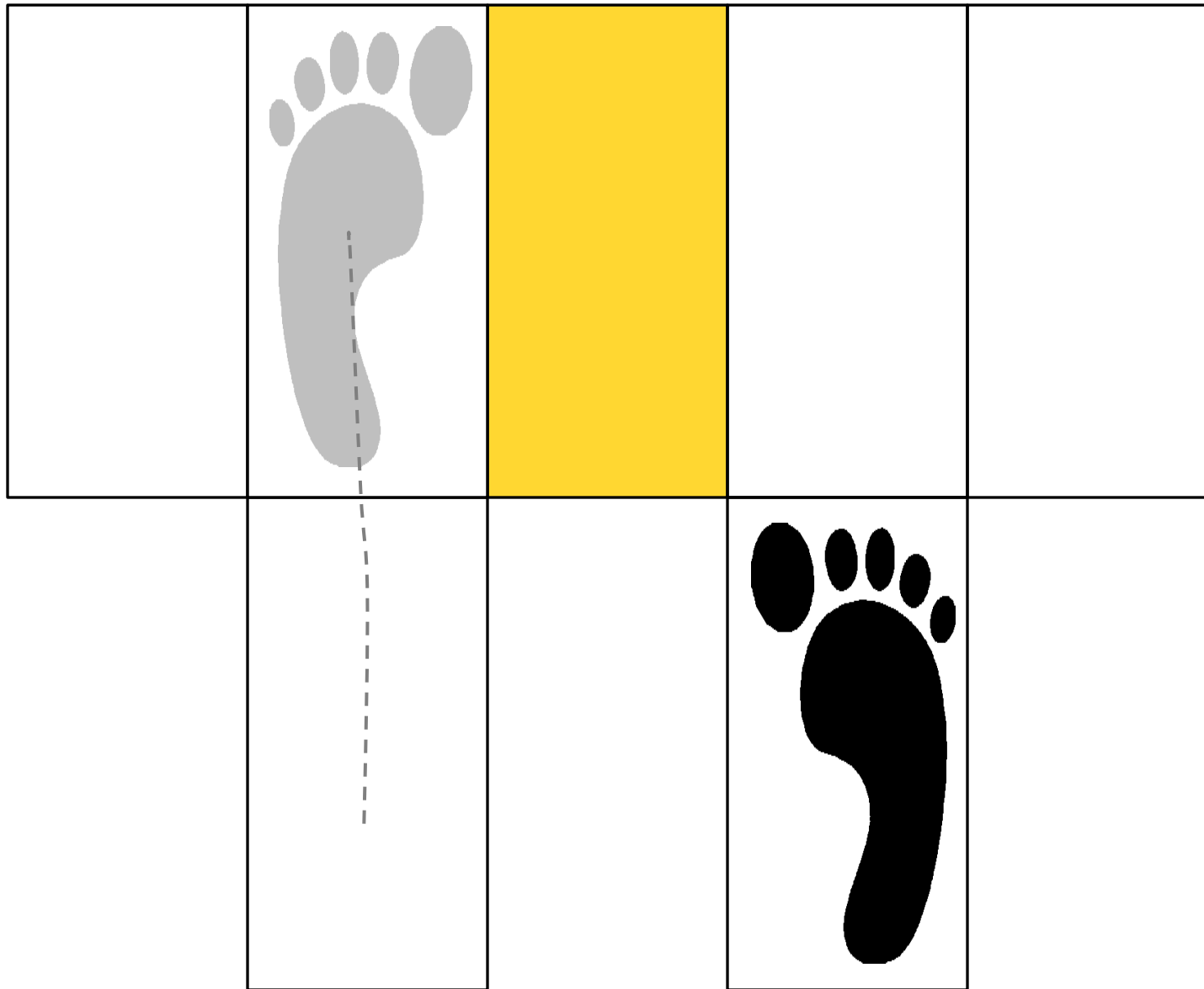


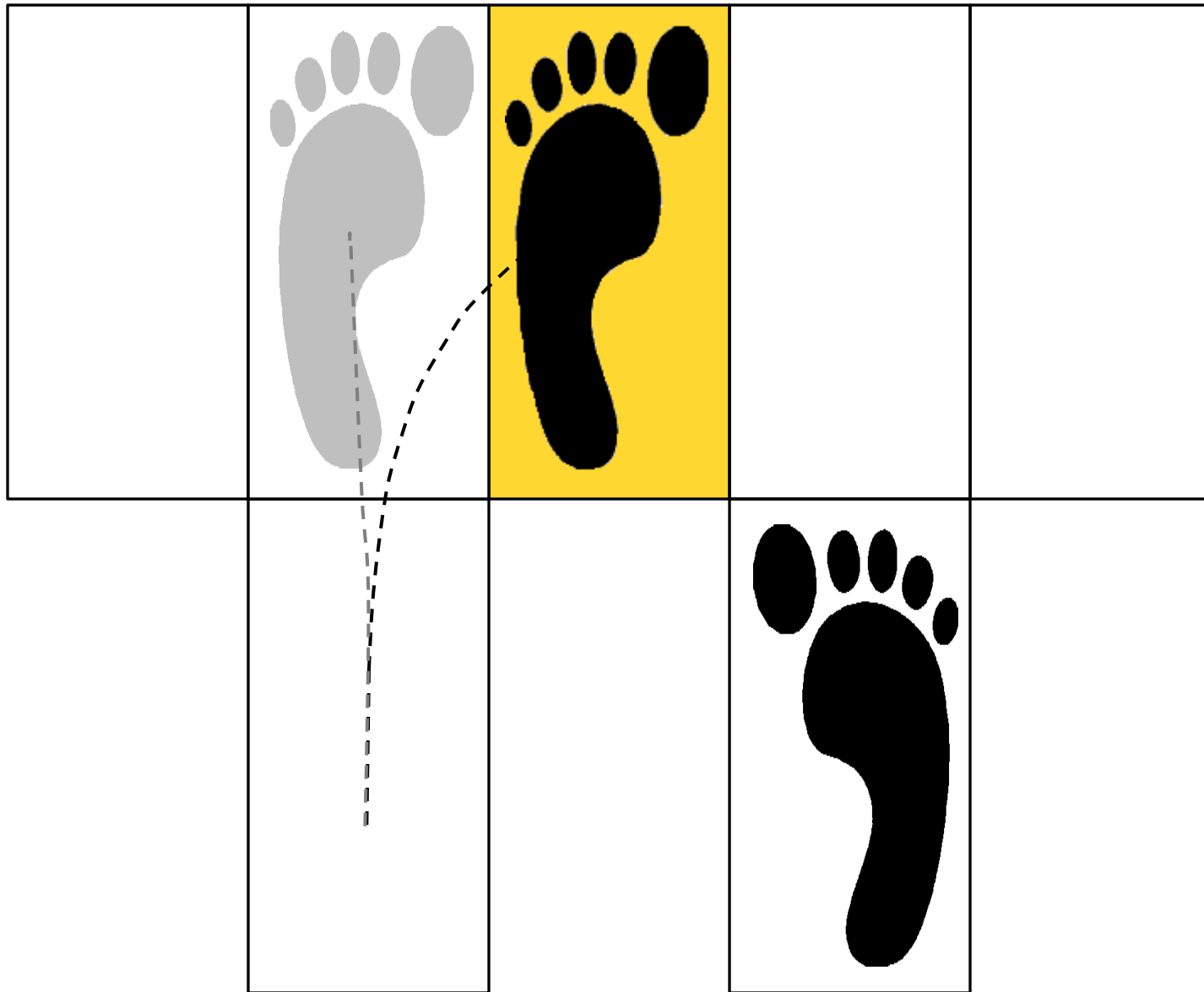


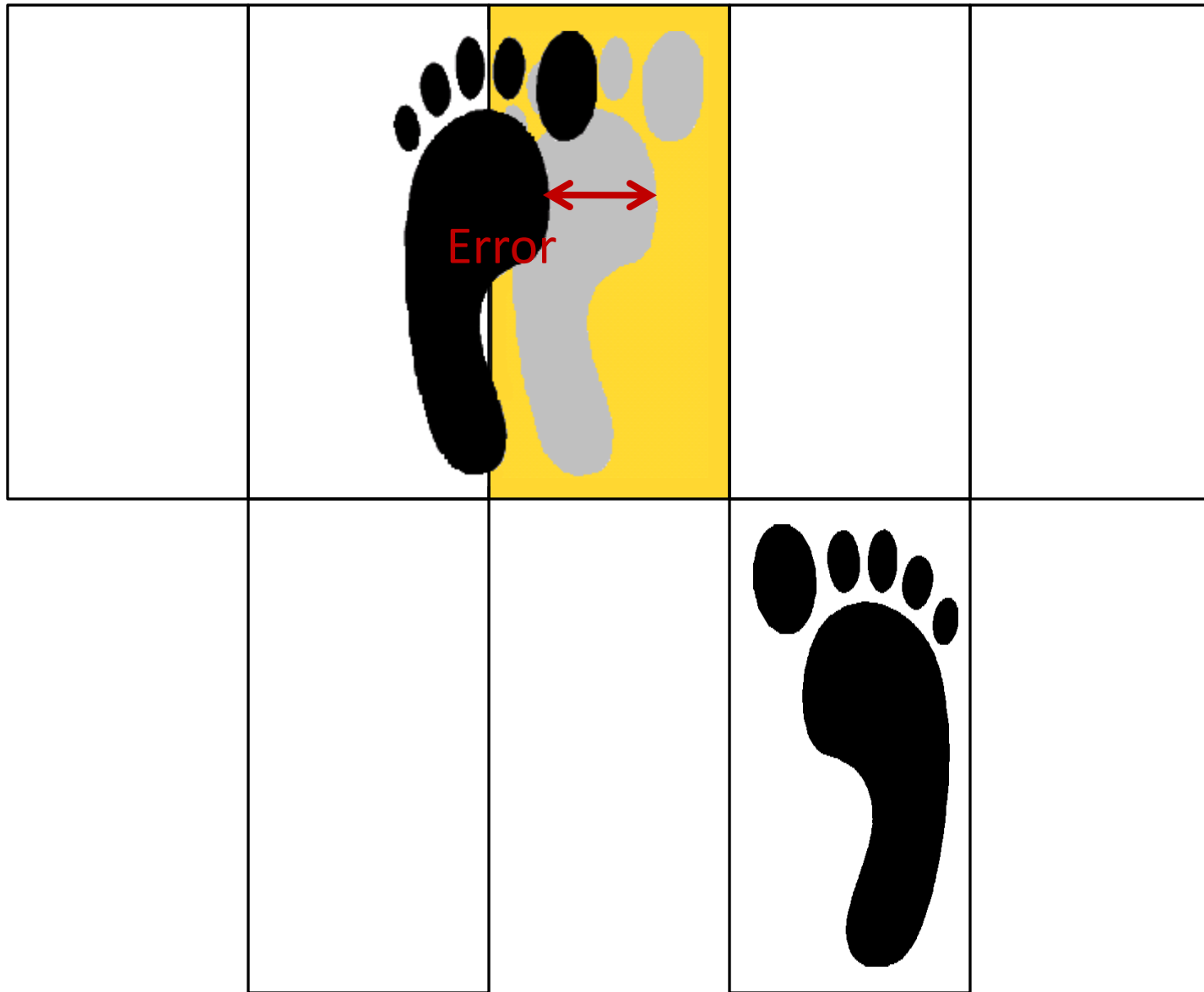




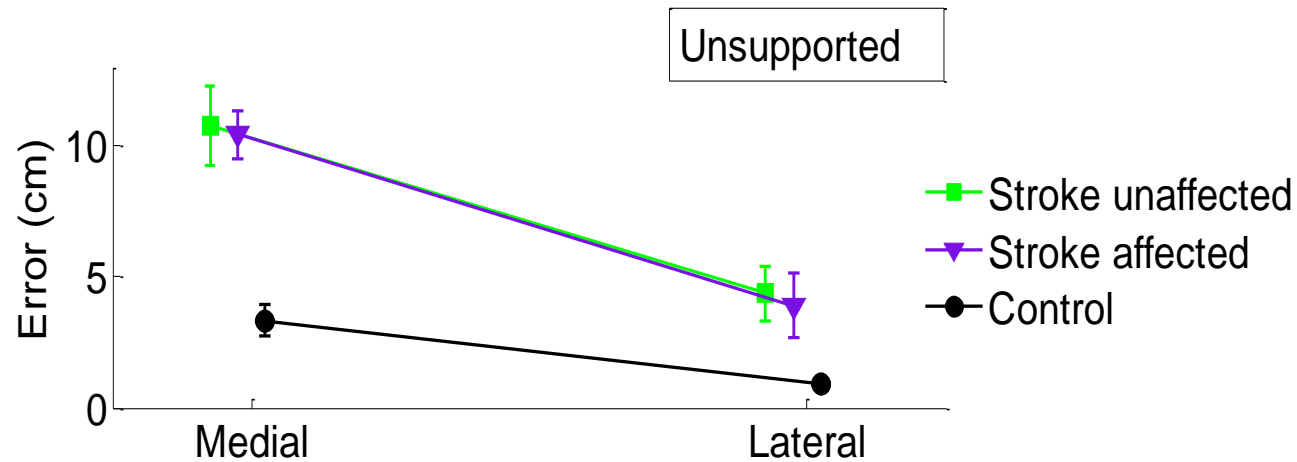









Are deficits in gait adaptability only due to impaired leg motor control?



Falls Prevention



46% reduction in
fall rates in healthy
elderly persons

Similar program
improved balance,
with tendency for
reduced fall rates in
people after stroke

Falls Prevention



Take home messages

- Falls are very frequent in people after stroke
- Almost every stroke survivor at risk
- Poor stepping responses may be crucial
- Dynamic balance training most promising in falls prevention

Thank you for your attention

