Understanding and managing chronic low back pain - Myths-busting facts and figures

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PAIN-ED

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PVMT

Flexchair® RBT evaluation in patients with LBP versus healthy controls: discriminative validity of PAR-test

KATHOLIEKE UNIVERSITEIT LEUVEN

Door Lien Tahon
en Laura Van Lommel

o.l.v. prof. dr. W. Dankaerts, promotor

Effect of exercises performed on the Flexchair on trunk muscle activation and low back posture

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UNIVERSITY of LIMERICK

Methods

- ethical approval & written informed consent
- 10 young painfree participants (6M/4F)
  - age = 22 (1) years
  - height = 174(9)cm
  - mass = 70(11)kg
  - BMI= 23(4) kg/m^2
  - excluded: previous LBP, aged < 18, were on any current pain medications, previous postural control training

Methods: Spinal Motion
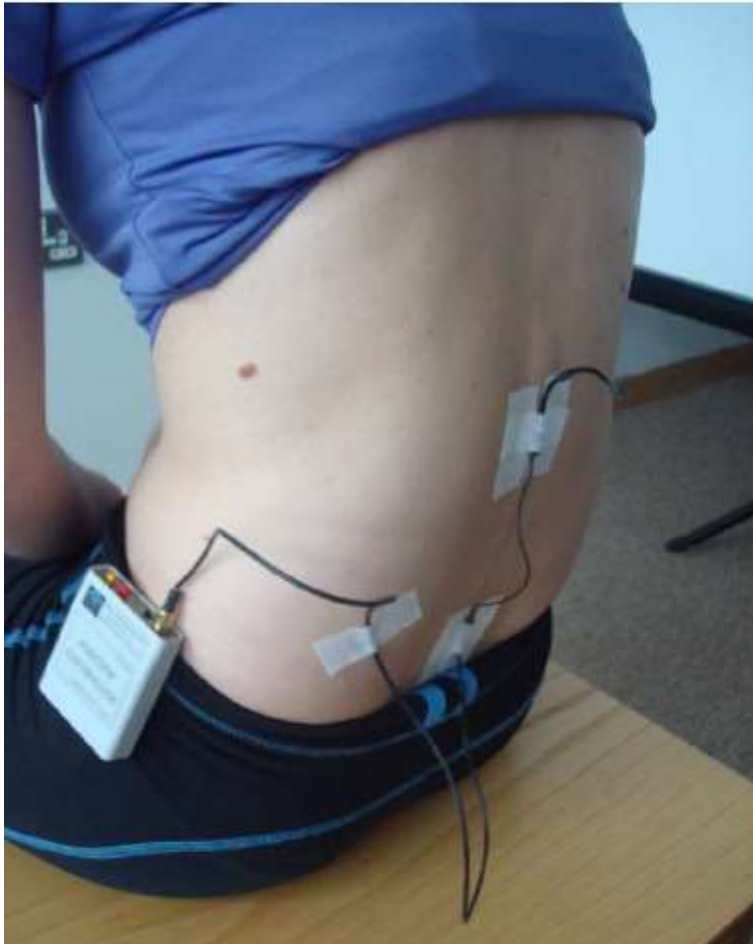
- BodyGuard^{TM}
- www.sels-instruments.be
- strain gauge
- reliable (O'Sullivan et al 2010)
- valid (O'Sullivan et al 2010)
- applied in slumped sitting position
- lower Lx (L3 → S2)
- secured with tape
- 20Hz

Posture: calibration
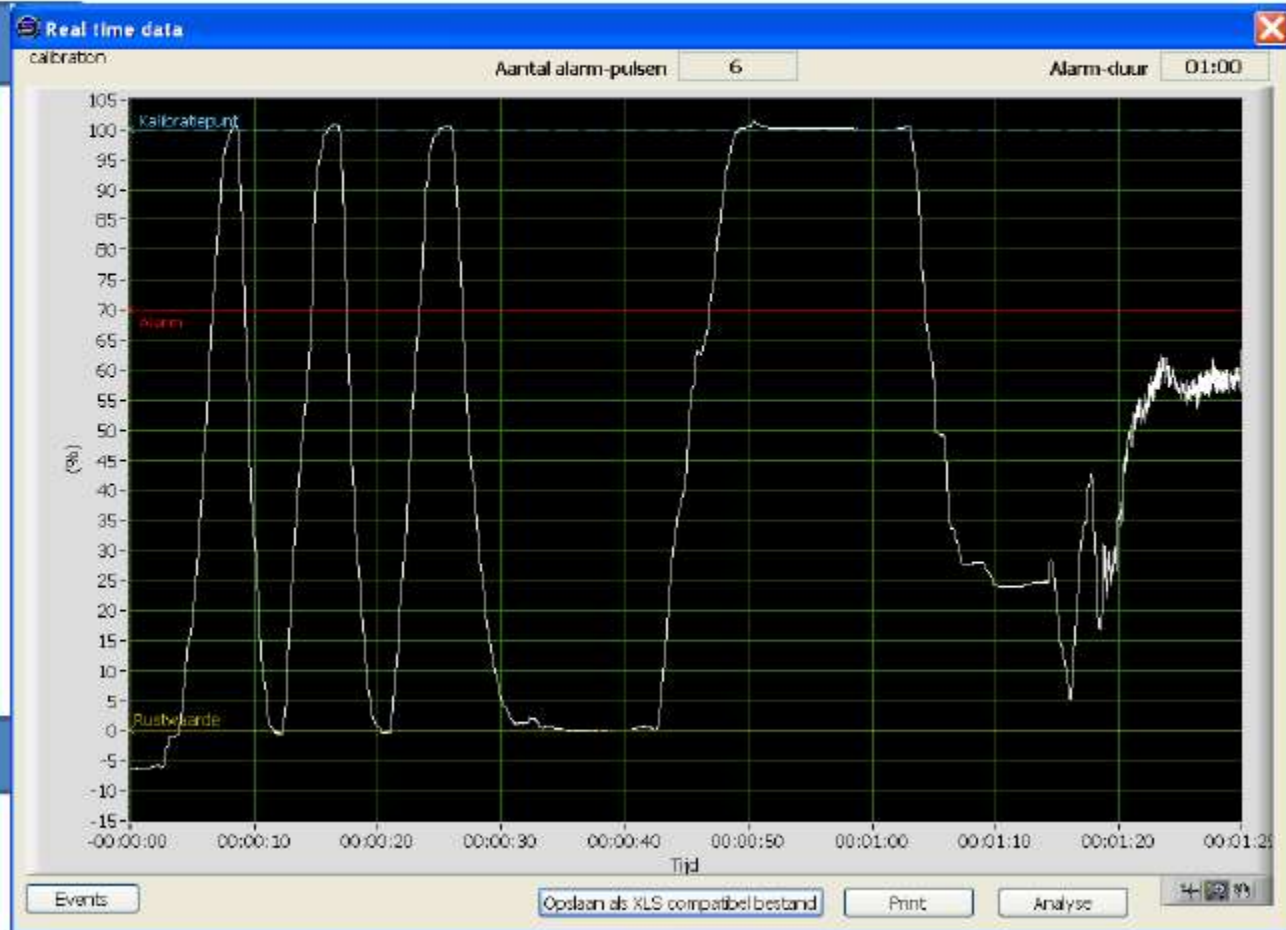
posture expressed % relative to ROM

max
posterior
pelvic tilt

100%

0%

max
anterior
pelvic tilt

Trunk Muscle Activity

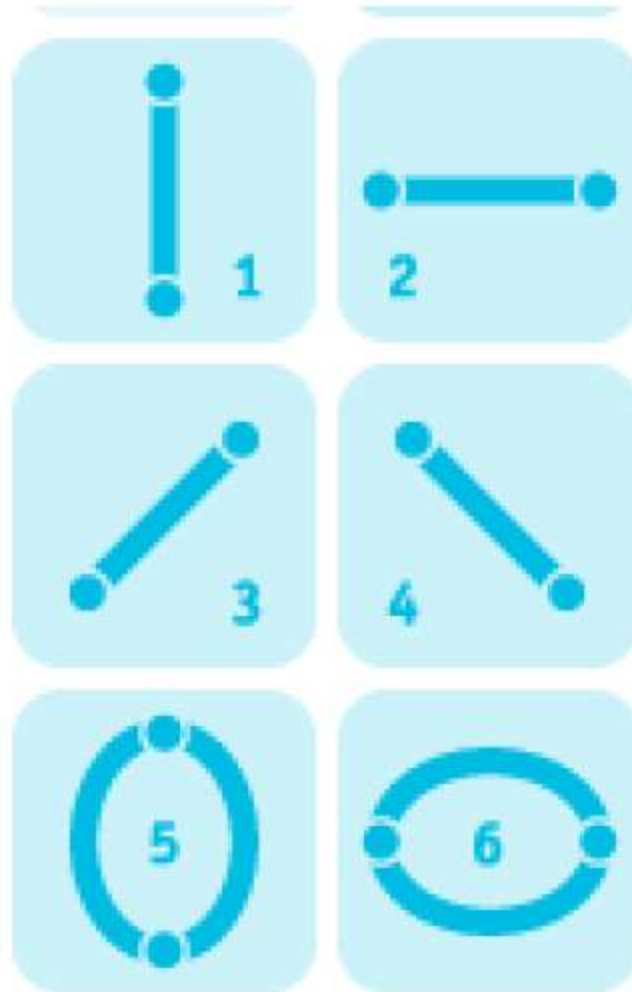- Non-invasive surface electromyography (EMG)
- %MVIC

EMG

- Rectus abdominis (RA)
- External oblique (EO)
- Internal oblique (IO)
- Lumbar multifidus (sLM)
- Iliocostalis lumborum pars thoracis (ICLT)
- Thoracic erector spinae (TES)

- Right side of trunk
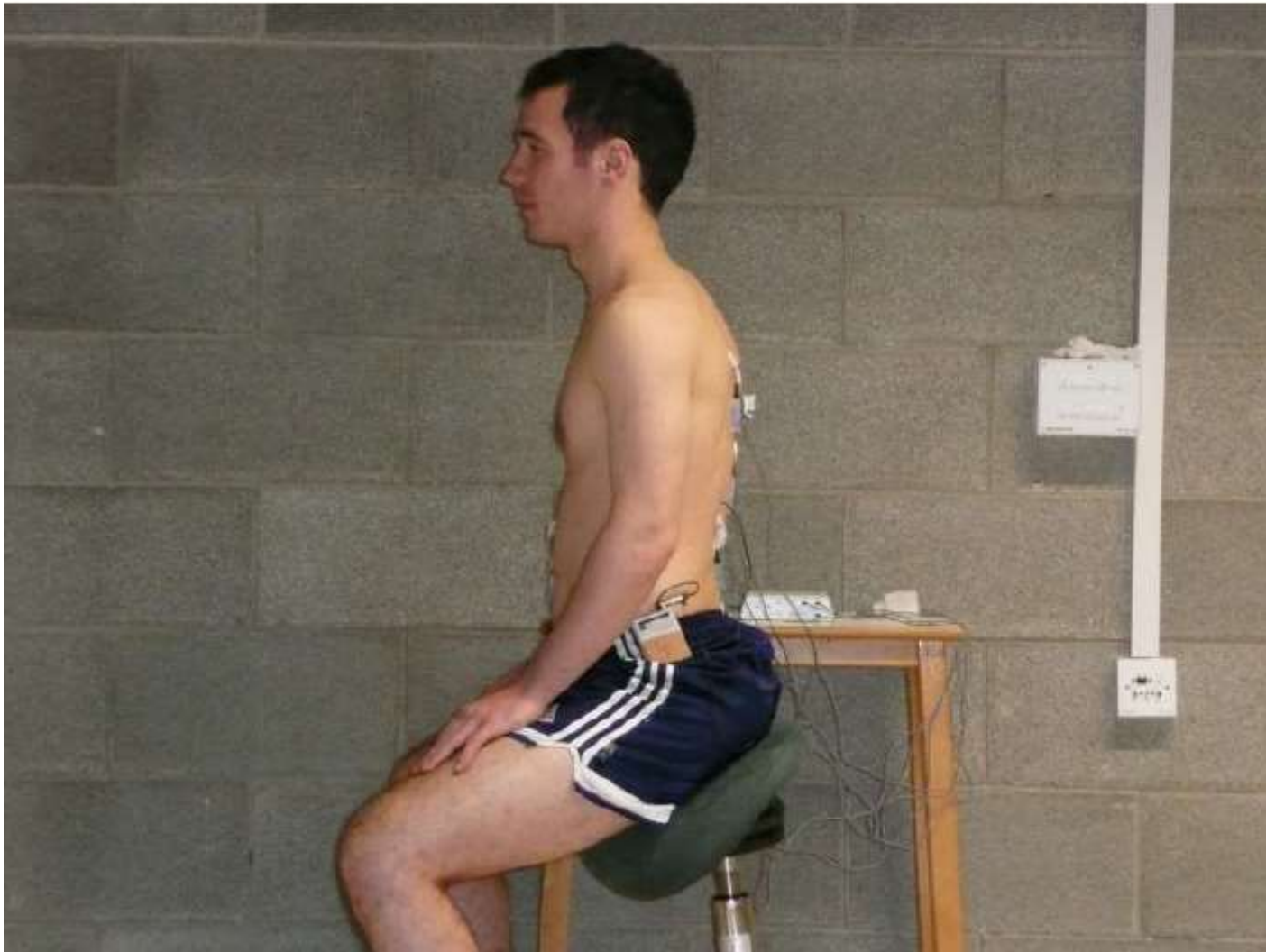
Methods: Flexchair

Methods: 6 exercises

Protocol

- Each exercise performed for 1 minute
- 2 minute break between each exercise
- EMG recording for 15 secs during exercise
- Quality of mvt: >90% accuracy for test
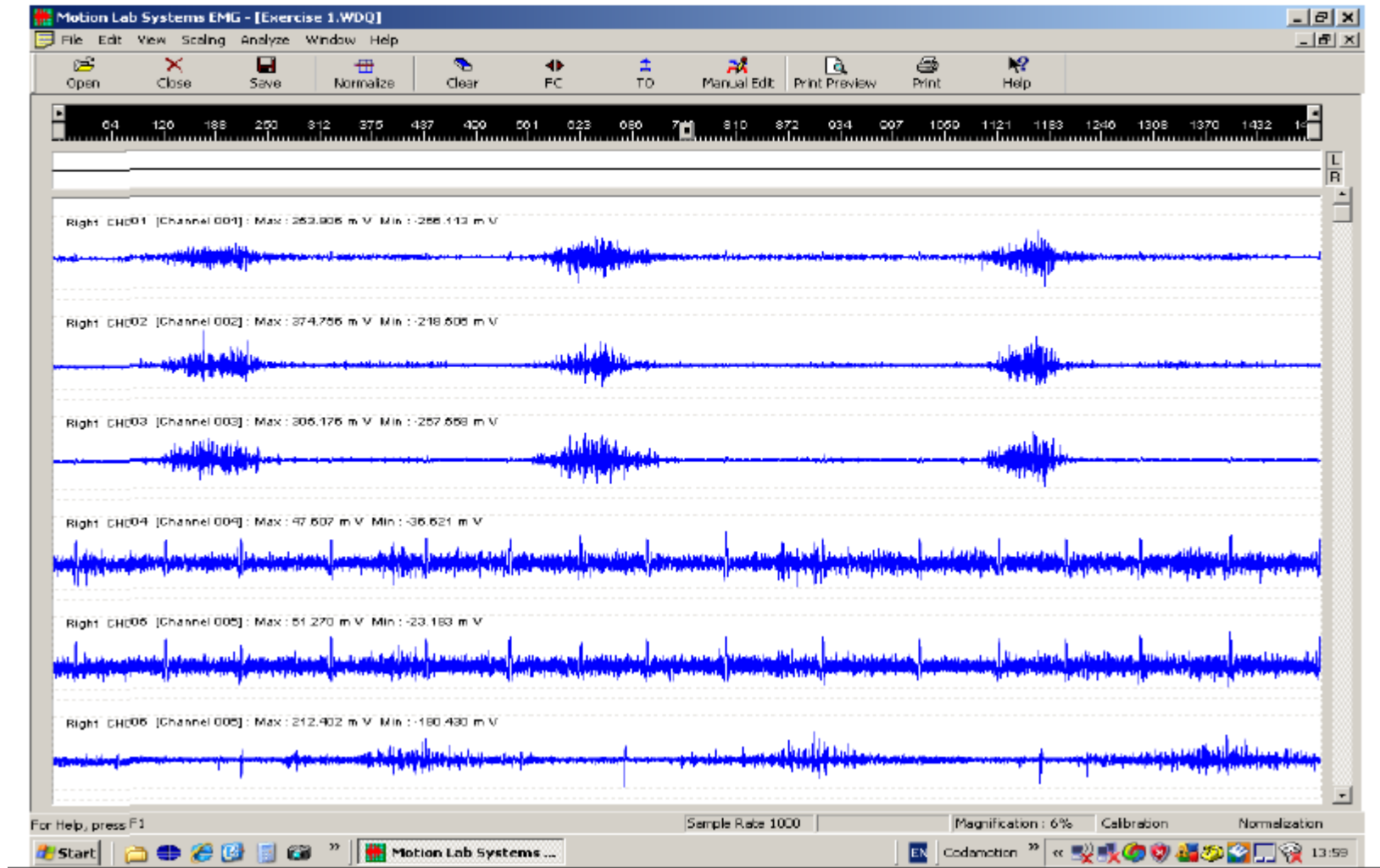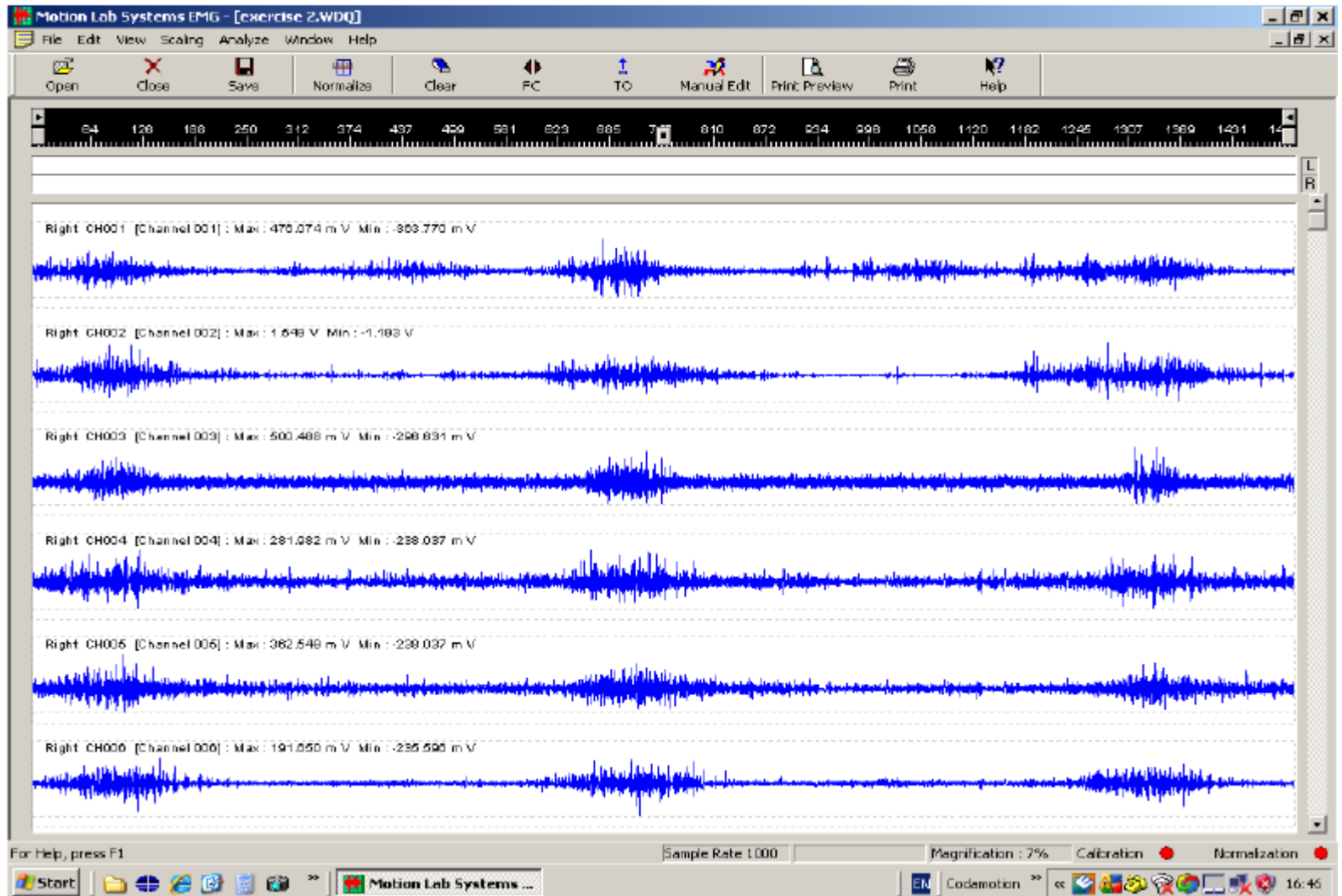- EMG: RMS analysis

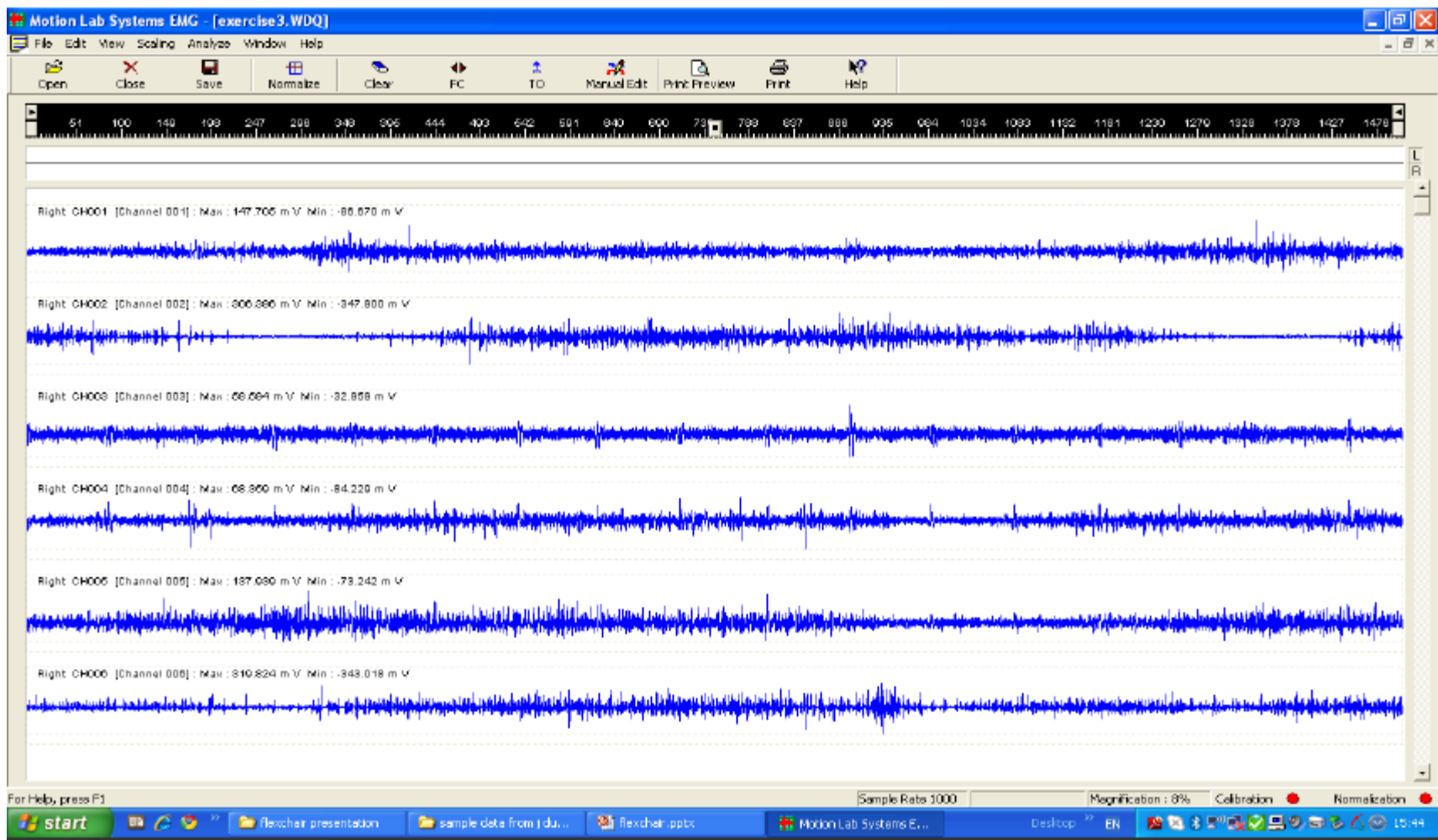# Methods

Methods

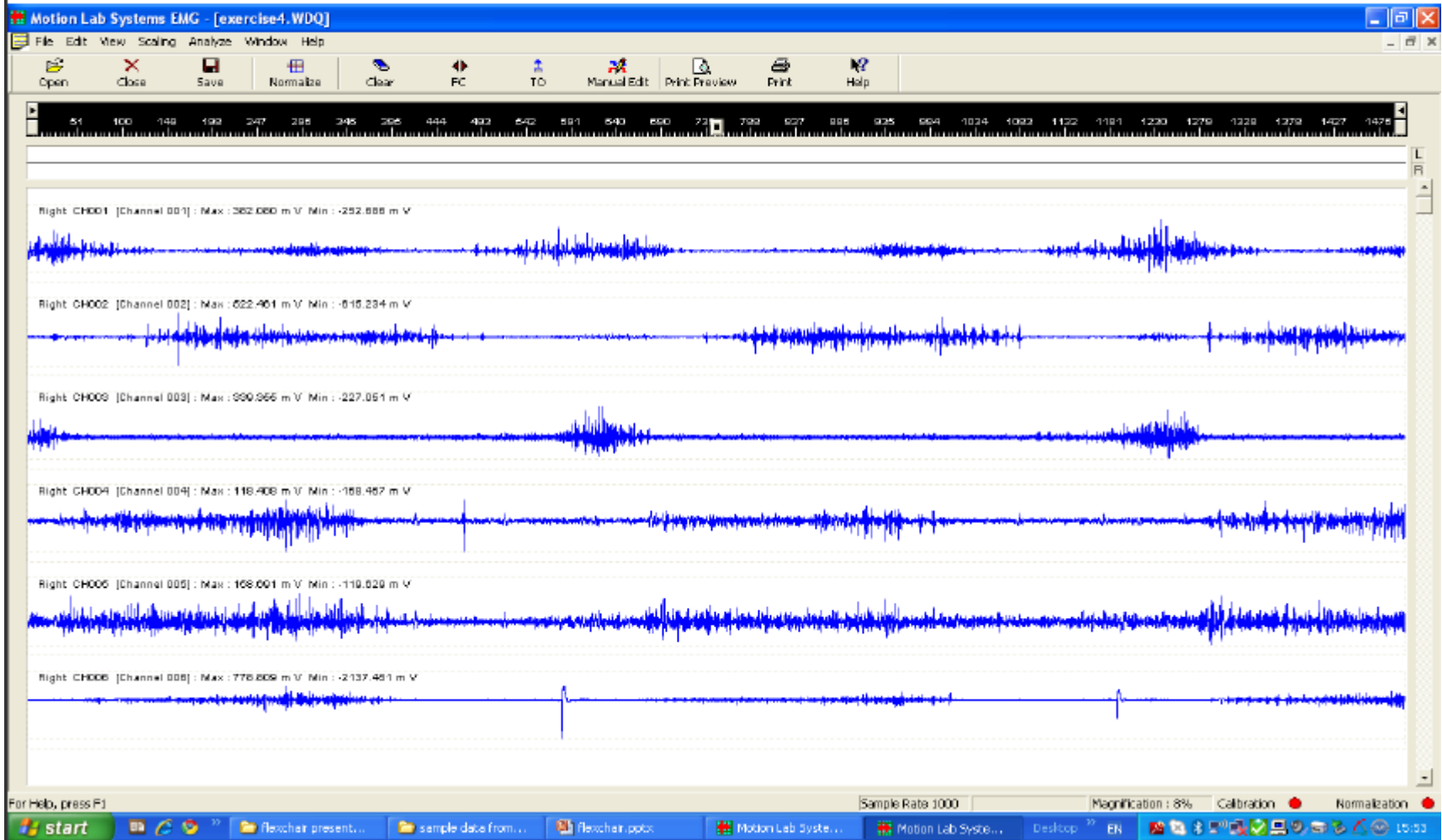# Methods

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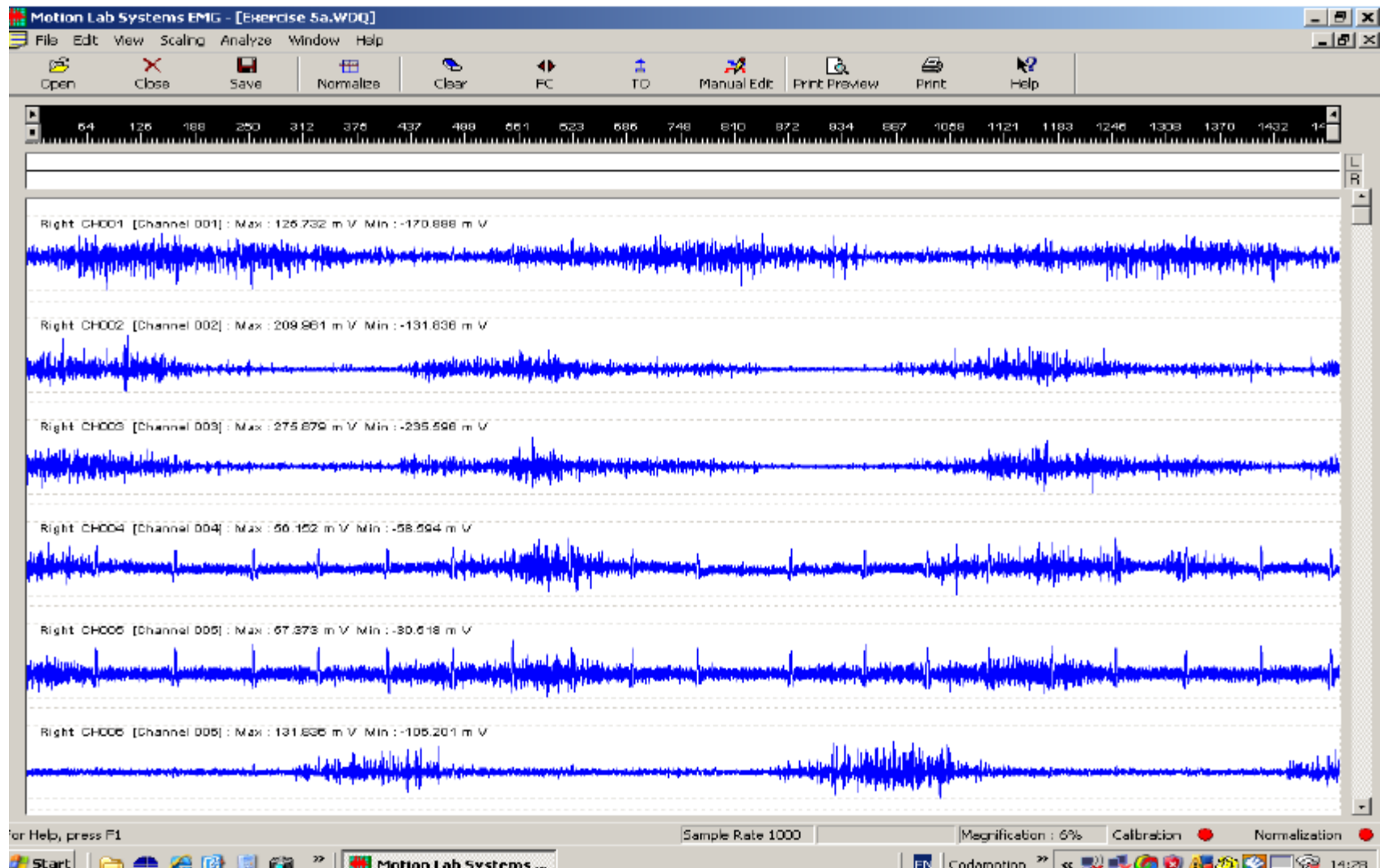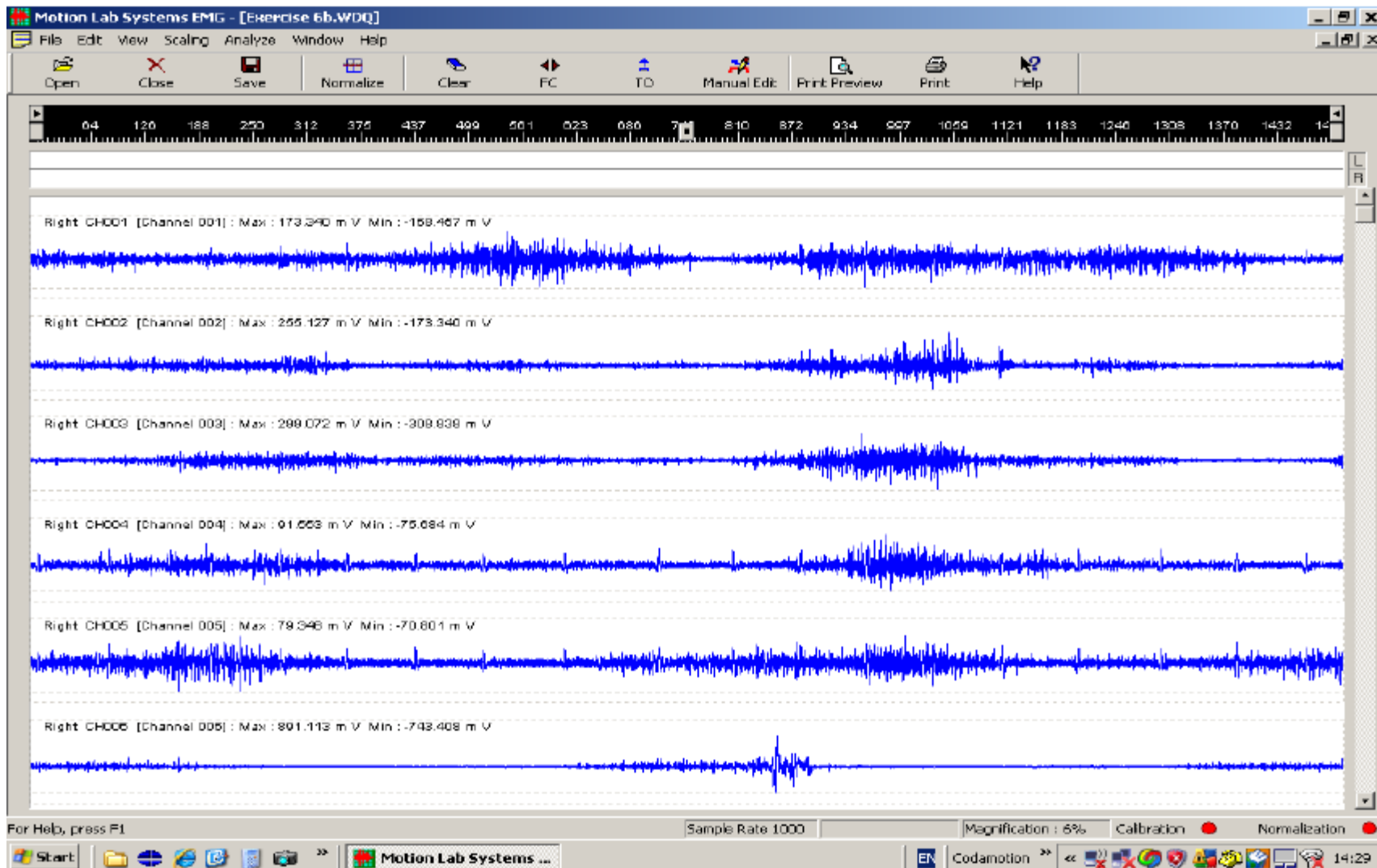# Methods

Ex 1

Ex 2

Ex 3

Ex 4

Ex 5

Ex 6

# Methods: Data analysis

SPSS 16.0.

- Data were normally distributed
- Rep Measures ANOVA (LSD post-hoc)
- $p < 0.05$.
- Posture data (simply ensuring full ROM)

Results

- Clear activn (& relaxn) of trunk muscles
- Intensity of activation low-moderate → suitable for MC rehab > strength training
- Evidence that exercise requiring cognitive training improve motor control
- Considerable variation between exercises
- Potential to match exercises to clinical situation
- Rehab tool √ (user skill, esp clinical skill)

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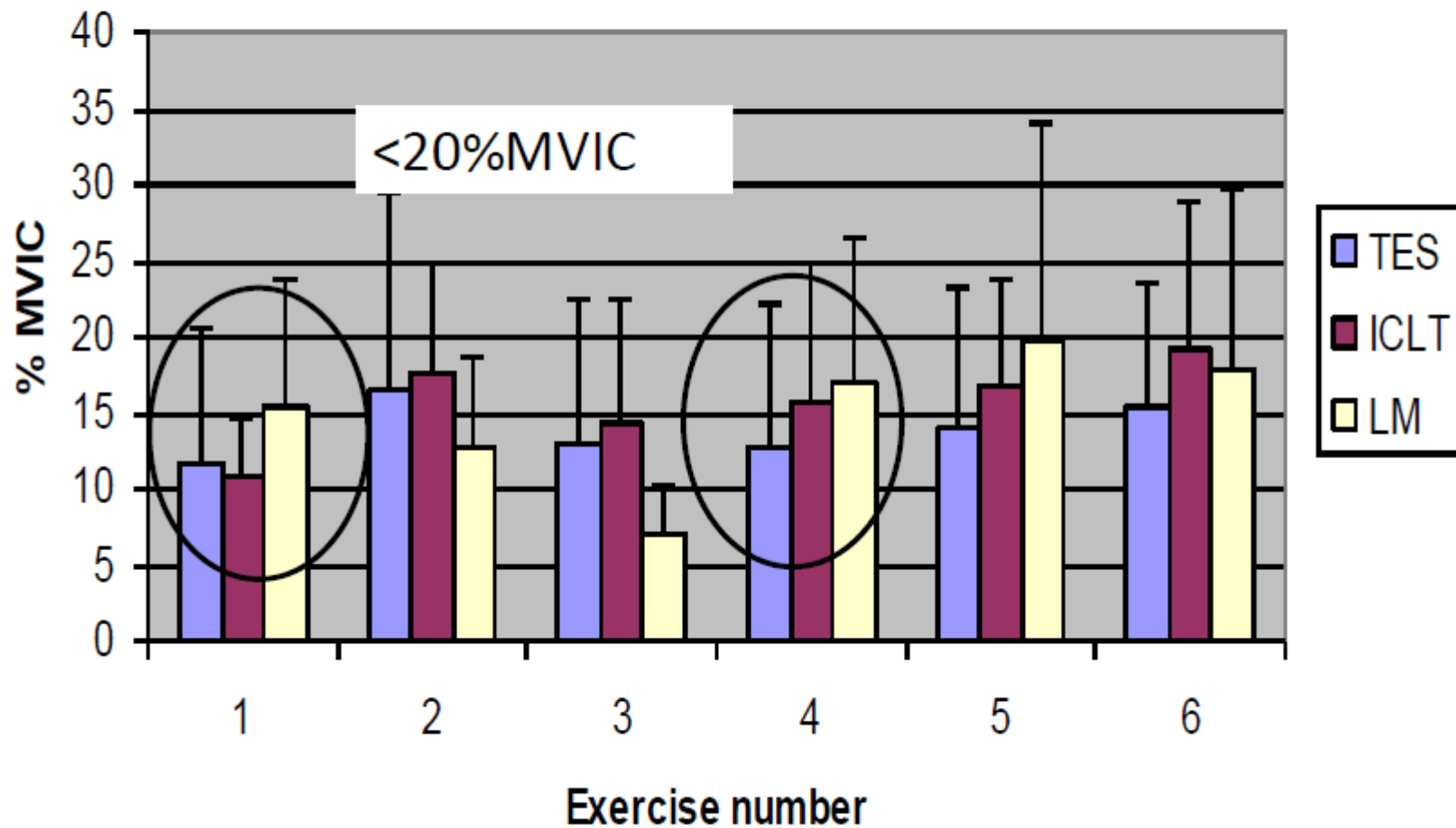
Back muscles

Back muscles

Abdominal muscles

Less variation (apart from ex 6)

Abdominal muscles

EMG Difference: Back
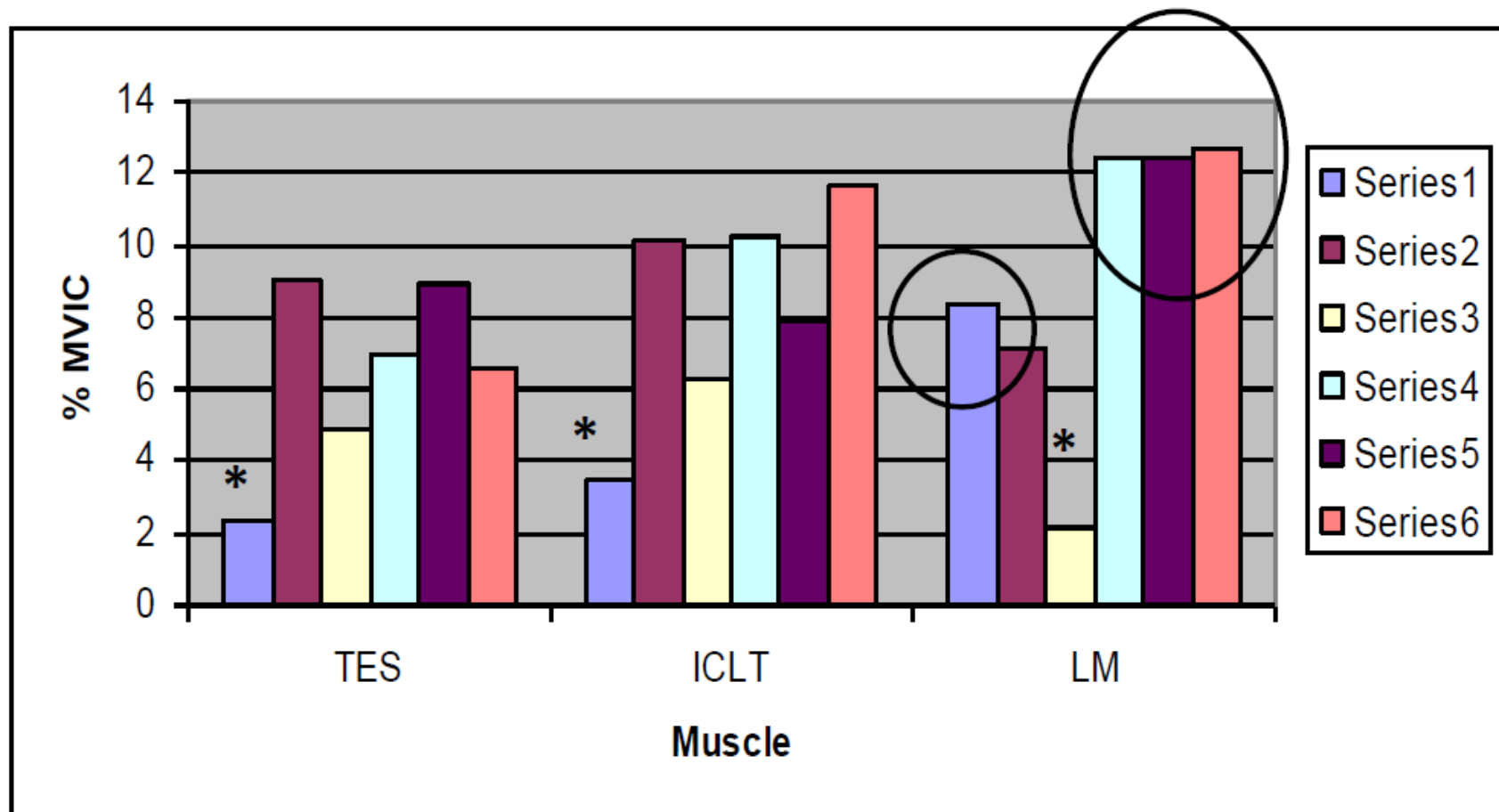
EMG Difference: Abdominals
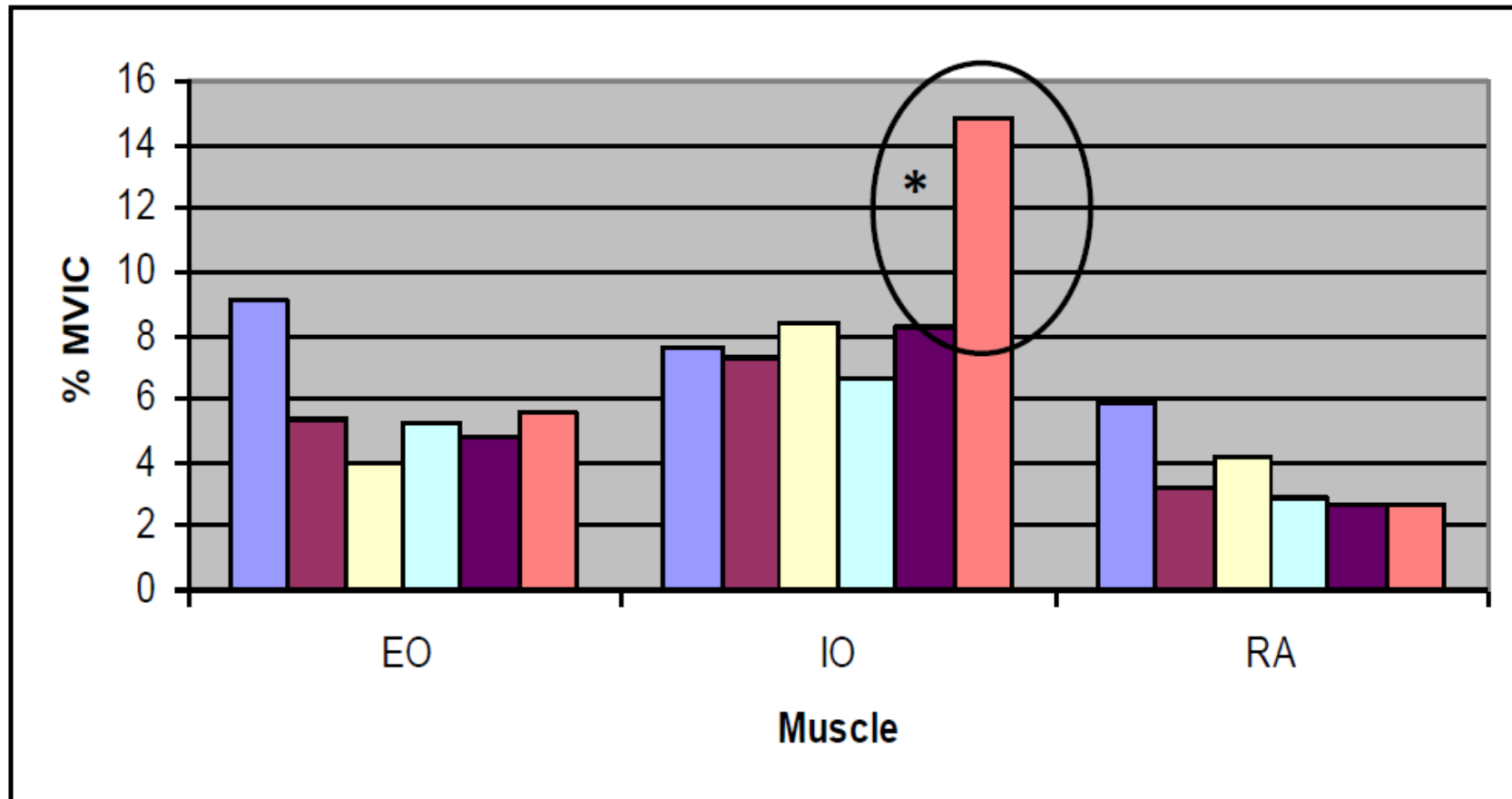
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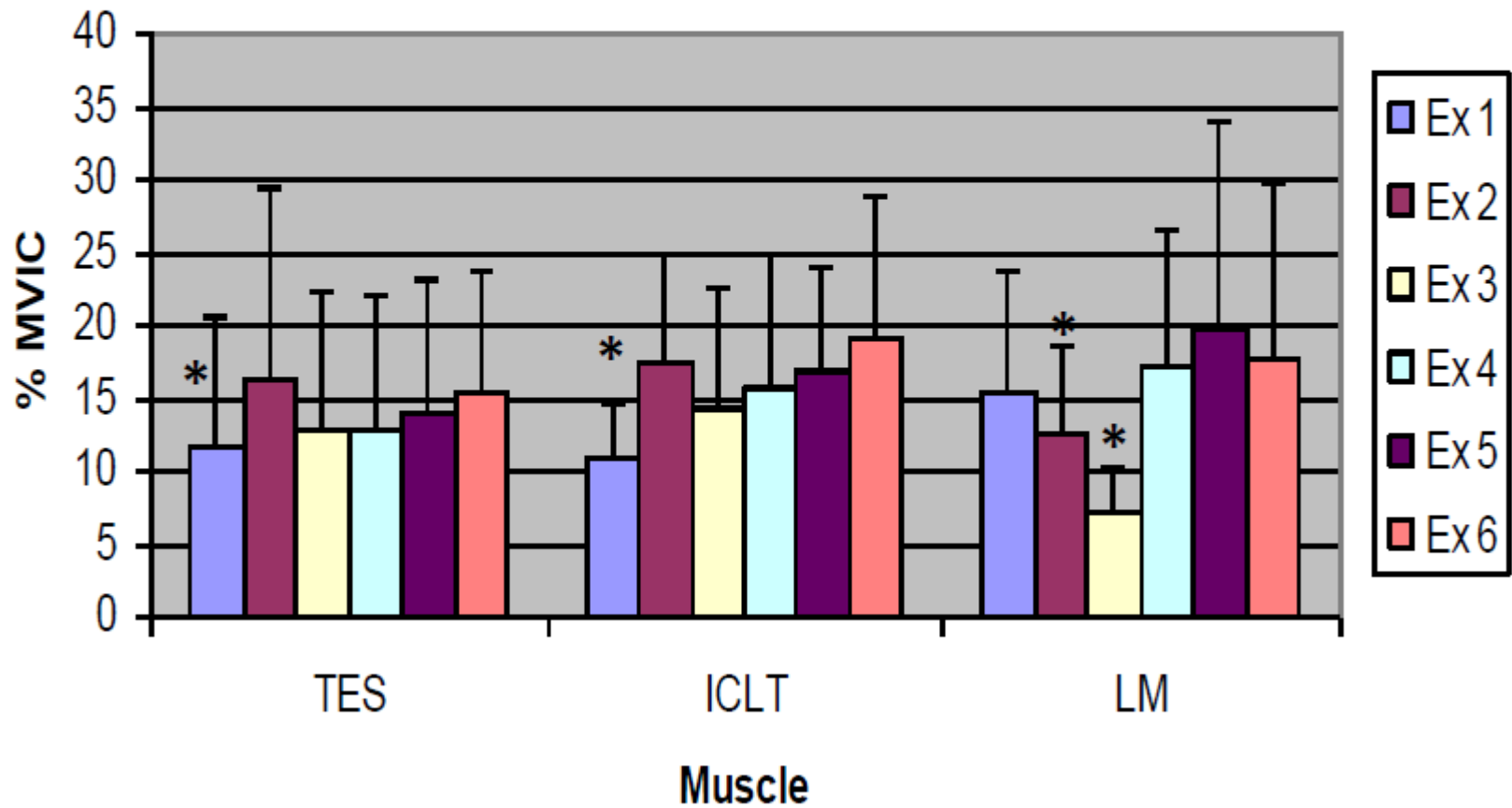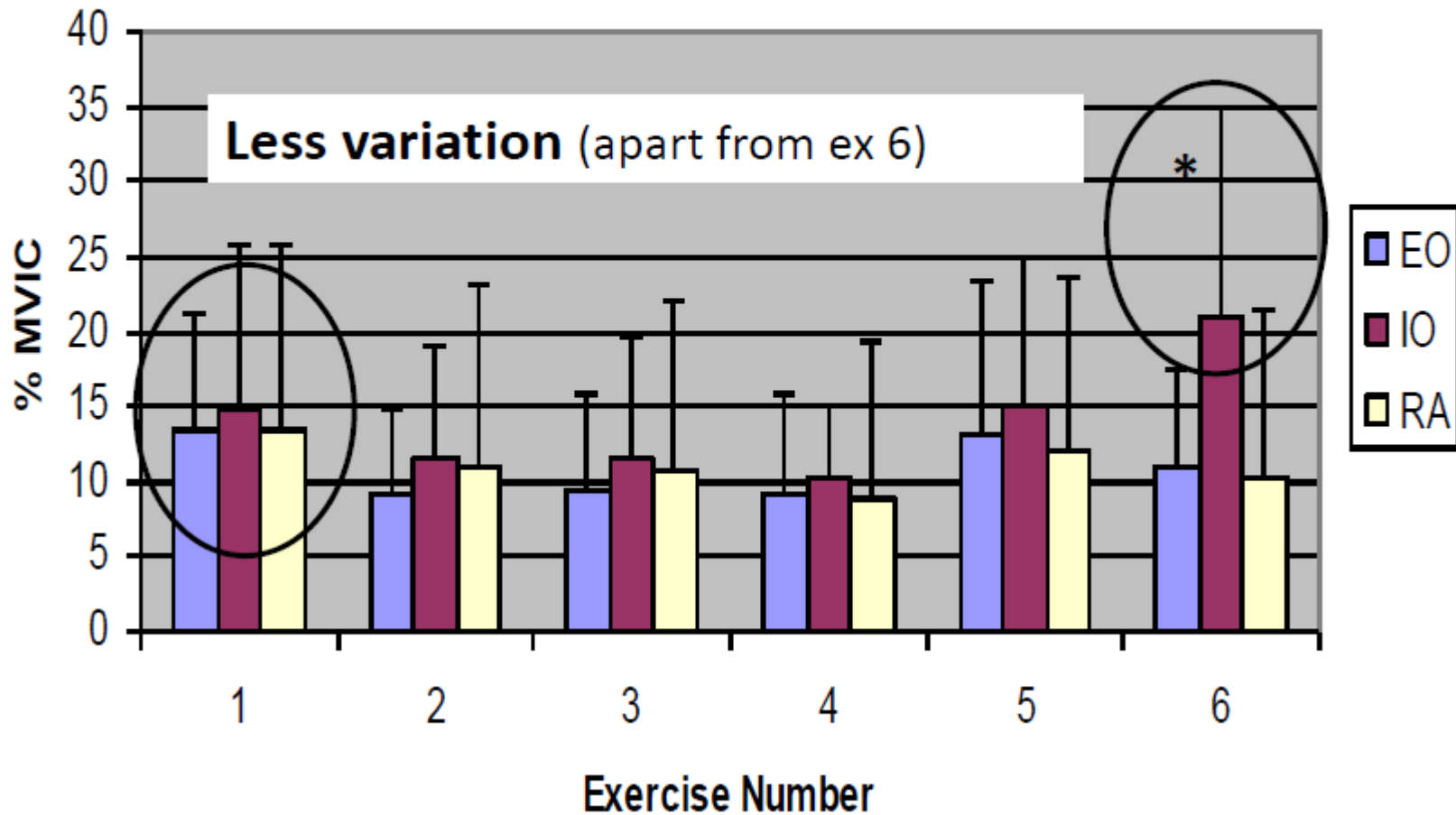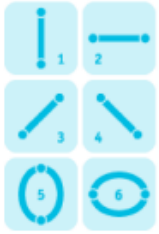- Rehab tool √ (user skill, esp clinical skill)

Limitations

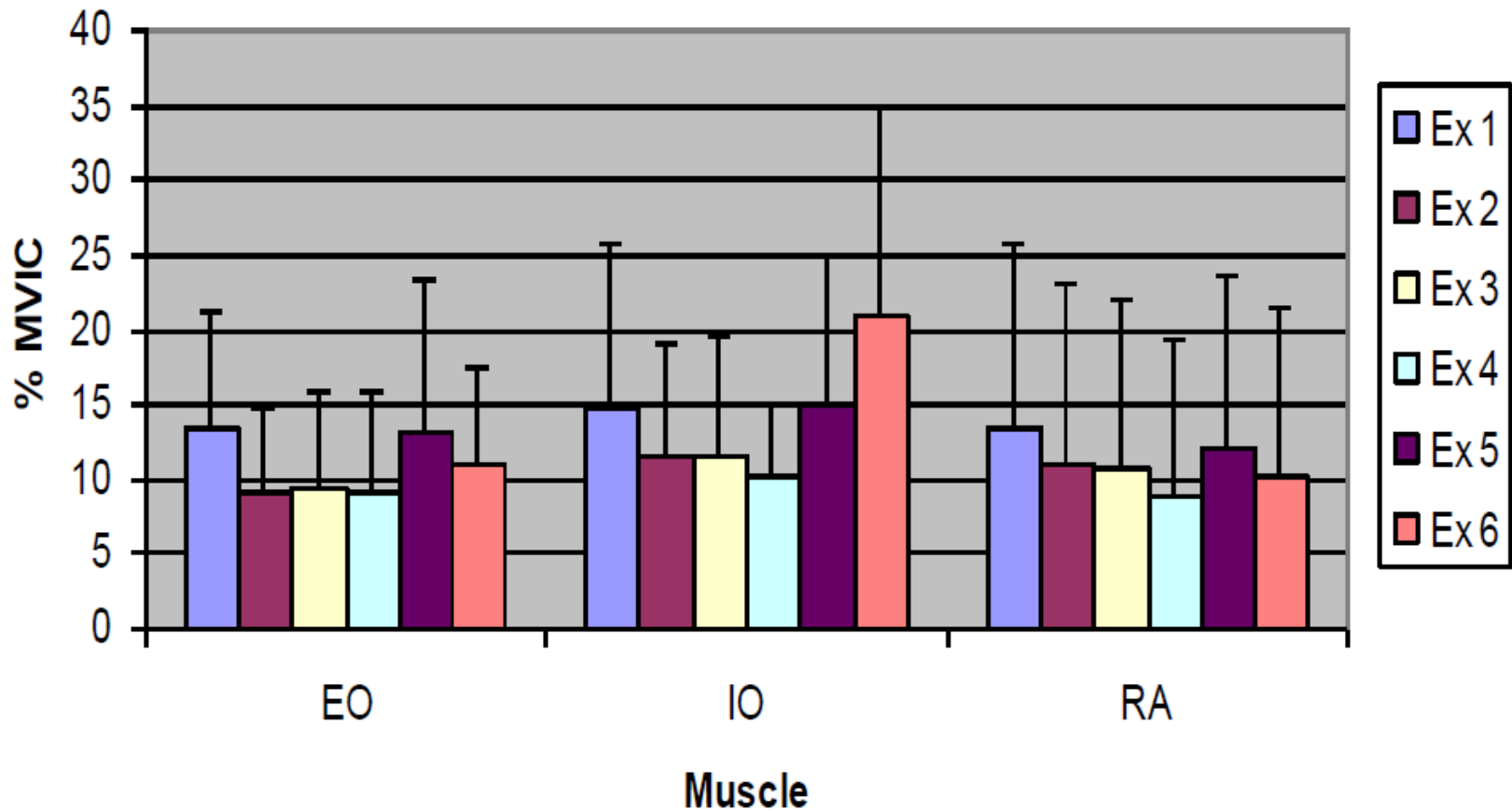- Young, painfree participants

- Closely supervised (<u>no cheating!</u>)

- Sagital posture monitoring only

- NSCLBP: multifactorial / biopsychosocial
  (McCarthy et al 2004; Linton et al 2007)

Discussion

- Transfer to usual sitting - "real-world"?

- Transfer to other postures and tasks

- Apply within BPS framework…..not just for the sake of novelty

- Language we use with patients?

Flexchair® RBT evaluation in patients with LBP versus healthy controls: discriminative validity of PAR-test

Door Lien Tahon
en Laura Van Lommel

o.l.v. prof. dr. W. Dankaerts, promotor

Flexchair® RBT evaluation in patients with sitting related LBP & healthy controls: discriminative validity of the PAR-test

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en Laura Van Lommel

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Research Questions (RQs)

RQ1: Is there a difference in PAR-score between patients with LBP versus healthy controls?

RQ2: Does a change in PAR-score is associated with a change in primary (pain and disability) and secondary outcome (physical activity and kinesiophobia) measurements?
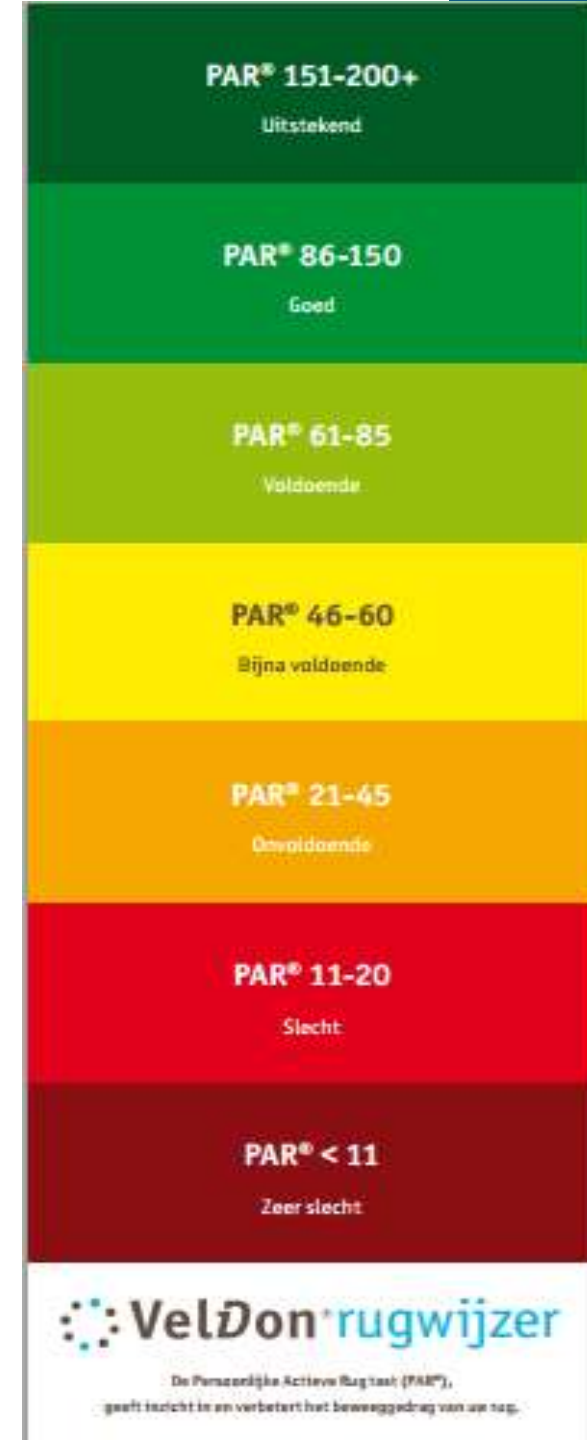
Methods: materials

▶ 6 coordination exercises

▶ > difficulty

▶ before every exercise 15" to prepare

▶ 2' to complete figure
  ◦ as much as possible
  ◦ 20 cycles = maximum score

▶ online registration Veldon database

Methods: materials

PAR $^{®}$-test

▶ total PAR$^{®}$ -score
  ◦ rates lumbar motor control in sitting
  ◦ based on quality and quantity of movement
  ◦ 6 subscores

PAR$^{®}$ 151-200+
Uitstekend

PAR$^{®}$ 86-150
Goed

PAR$^{®}$ 61-85
Voldoende

PAR$^{®}$ 46-60
Bijna voldoende

PAR$^{®}$ 21-45
Onvoldoende

PAR$^{®}$ 11-20
Slecht

PAR$^{®}$ < 11
Zeer slecht

VelDon rugwijzer

De Persoonlijke Actieve Rug test (PAR®),
geeft inzicht in en verbetert het beweeggedrag van uw rug.

Methods: research design

Study 1
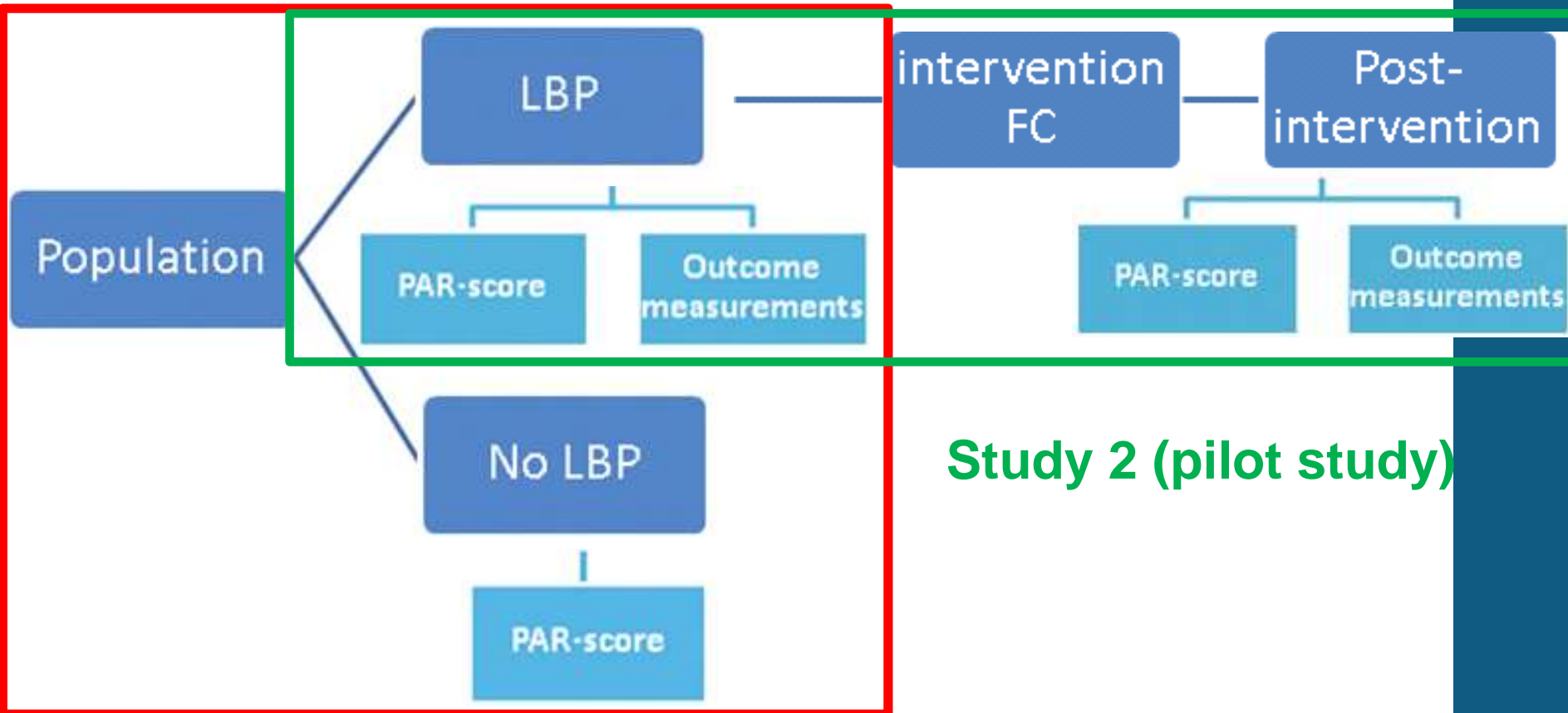
Study 2 (pilot study)

Experimental group: LBP

Inclusion criteria	Exclusion criteria
Non-specific LBP >3m	Specific diagnosis (Spondylolisthesis, Bechterew,…)
Mechanical pain	LBP and/or radiation during PAR-test
	Previous testing and/or intervention with FC– RBT because of LBP
	Non-mechanical pain
	Previous spine surgery, pelvic surgery or abdominal surgery
	Red flags or dominant yellow flags
	BMI > 35
	Pregnancy or 6m postpartum
	Vision or hearing problems

Control group: no LBP

Exclusion criteria
LBP in previous 2 years • No medication • No consultation with a health professional • No intervention • No days off work for LBP
BMI > 35
Vision or hearing problems
Previous spine surgery, pelvic surgery or abdominal surgery
Previous testing and/or intervention with FC-RBT because of LBP

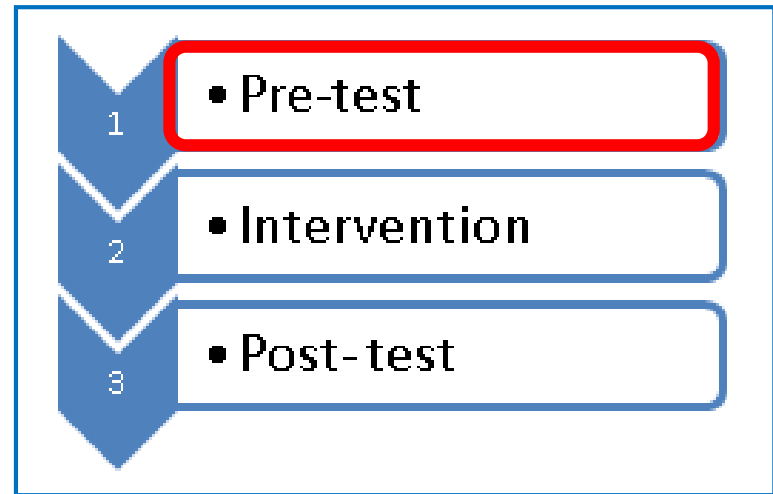age and gender matched control group ~ experimental group)

Pre-test

PAR-test

Personal data:

▸ Age – gender – height/weight

▸ LBP data: location? aggravating/easing factors? time course? …

Outcome measurements:

▸ Pain
  • VAS (0-10)

▸ Disability
  • ODI (%)
  • PSFS (0-30/50)
  • SBST (low/medium/high risk)

▸ Physical activity (PA)
  • Baecke (16-80)

▸ Kinesiophobia
  • TSK (17-68)

1 • Pre-test
2 • Intervention
3 • Post-test

Intervention

Pilot Study

▶ LBP group :   Flexchair®RBT intervention and usual care

▶ Choice therapist:
  ◦ Usual care (content)
  ◦ Flexchair® training program
  ◦ # treatment sessions / stop treatment
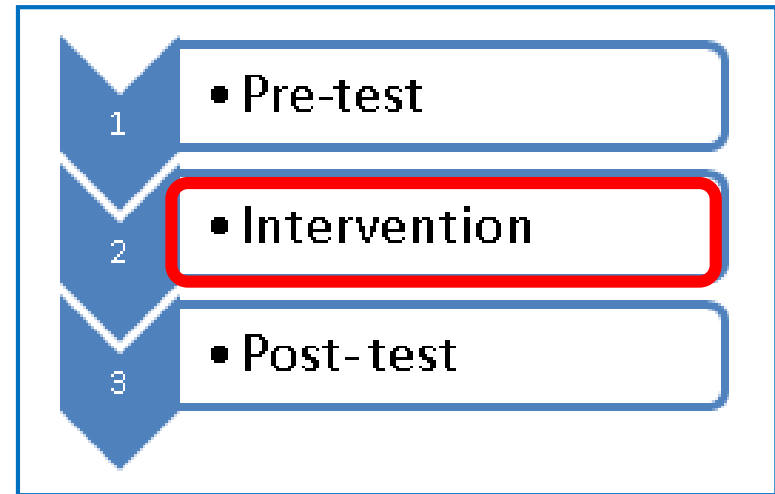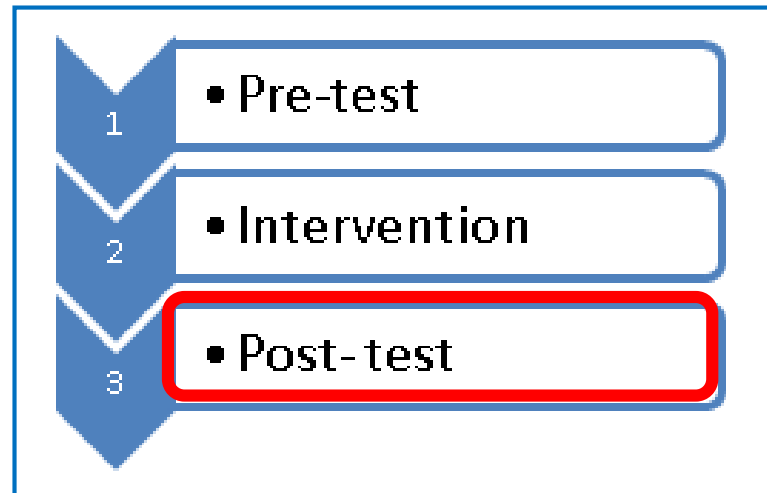
Post-test

PAR-test

Outcome measurements:

▶ Pain
- VAS (0-10)

▶ Disability
- ODI (%)
- PSFS (0-30/50)
- SBST (low/medium/high risk)

▶ Physical activity (PA)
- Baecke (16-80)

▶ Kinesiophobia
- TSK (17-68)

Questions?

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