



Effectiveness and optimal dosage of resistance training for chronic non-specific neck pain: a systematic review and qualitative synthesis

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Introduction

Neck pain is highly prevalent with up to 70% of individuals experiencing recurring or chronic symptoms.⁽¹⁾ Different **Resistance exercise training (RET)** packages are recommended to improve pain and disability although the optimal package and dosage (reps, frequency etc.) is unknown.⁽²⁾

Aims

- 1) To evaluate the effectiveness of different RET packages on chronic non-specific neck pain and/or disability
- 2) To investigate whether changing the dosage of RET influences its effectiveness

Methods

- A **systematic review** was conducted according to a **published protocol (PROSPERO: CRD42018096187)**⁽³⁾
- **Databases and key journals** were searched up to **28/11/18** for **RCT's** evaluating **RET** against any **comparator** in **chronic non-specific neck pain** patients, using measures of **pain** or **disability**. Two reviewers were involved throughout
- RET packages were **classified** using an **expert informed framework**⁽⁴⁾
- **Risk of bias (RoB)** and **overall strength of evidence** was evaluated with **Cochrane risk of bias tool** and **GRADE** respectively
- A **qualitative synthesis** was completed



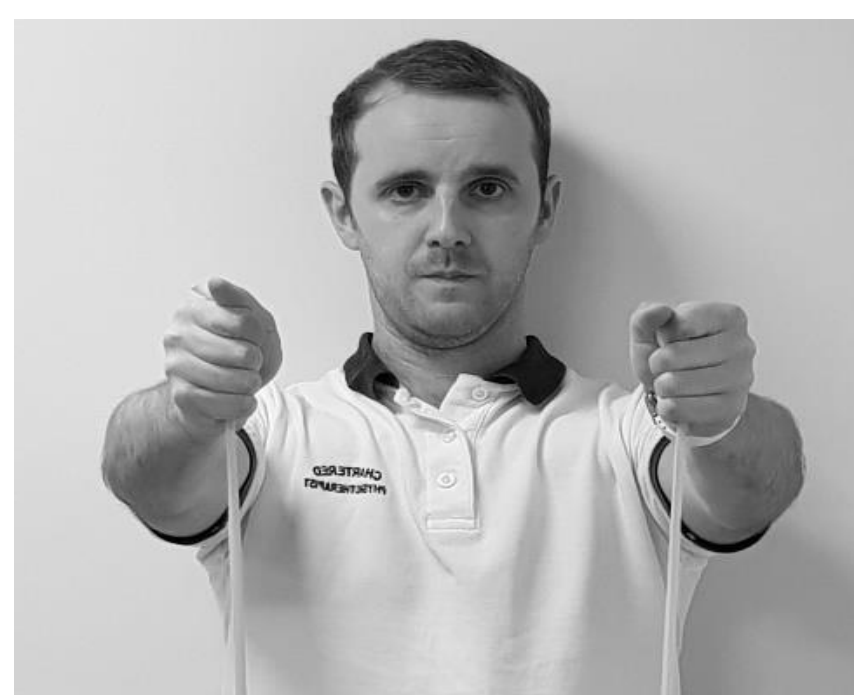
1. Motor Control (MC)



2. Segmental



3. Pillar



4. Upper Limb

Figure 1. RET Types

Results

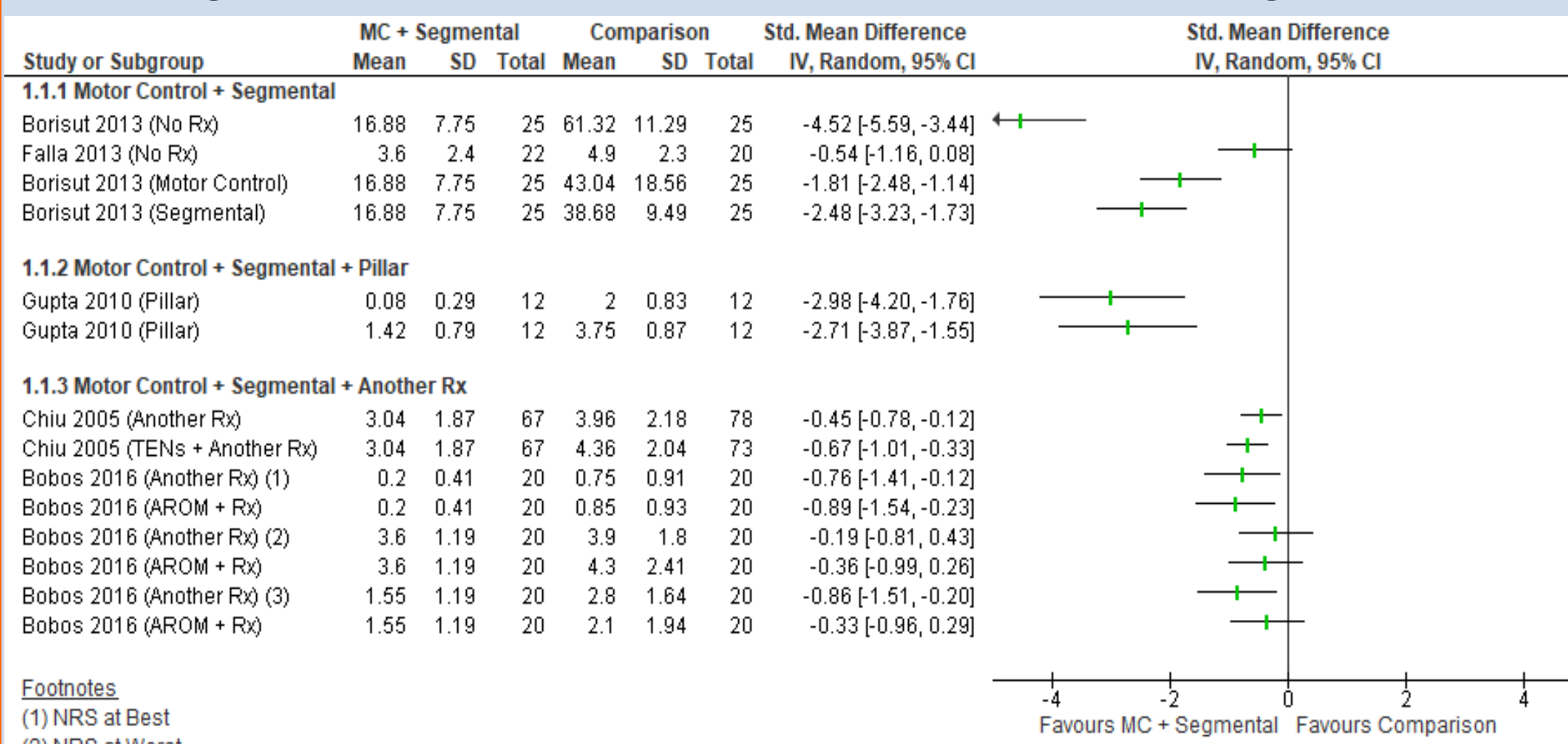
- 24 trials (n= 2126 participants) were included
- **15 different exercise packages** were identified using 4 types RET (Figure 1)
- **RoB** was **high**; **sample sizes** were **low**
- Overall quality was **very low to moderate**

Effectiveness

- ✓ **Short Term:** 1) Upper Limb; 2) MC + Pillar; 3) MC + Segmental
- ✓ **Medium Term:** 1) Pillar

MC + Segmental RET was **most effective** (small to very large effects) for pain and disability (**low to moderate** evidence) (Figure 2)

- MC + Segmental exercise parameters varied
- Long term effectiveness was not investigated



Footnotes

- (1) NRS at Best
(2) NRS at Worst
(3) NRS Now

Figure 2. Forest plot without a pooled estimate demonstrating the effectiveness of Motor Control + Segmental exercise packages reducing pain at short term follow up

Dosage

- MC + Segmental dosage was not evaluated due to clinical heterogeneity
- **Increased frequency** and **progressive loading** improves **MC** and **Pillar exercise** effectiveness respectively

Conclusions

- Evidence quality is reduced due to **bias** and **imprecision**
- MC + Segmental most effective in short term but long term outcomes have not been evaluated
- MC + Segmental exercise parameters including dosage are unclear

Implications

Clinical Practice

Consider **combinations** of MC + Segmental RET

Research

MC + Segmental **exercise parameter consensus**
Long term effectiveness and **optimal dosage**
evaluation via **adequately powered low RoB RCT**

References

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4. Spencer, S., A. Wolf and A. Rushton (2016). "Spinal-Exercise Prescription in Sport: Classifying Physical Training and Rehabilitation by Intention and Outcome." J Athl Train 51(8): 613-628.