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SYSTEMATIC REVIEW/META ANALYSIS

A SYSTEMATIC REVIEW AND META-ANALYSIS OF COMMON THERAPEUTIC EXERCISES THAT GENERATE HIGHEST MUSCLE ACTIVITY IN THE GLUTEUS MEDIUS AND GLUTEUS MINIMUS SEGMENTS

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ABSTRACT

Background: The gluteus medius (GMed) and gluteus minimus (GMin) muscle segments demonstrate different responses to pathology and ageing, hence it is important in rehabilitation that prescribed therapeutic exercises can effectively target the individual segments with adequate exercise intensity for strengthening.

Purpose: The purpose of this systematic review was to evaluate whether common therapeutic exercises generate at least high (> 40% maximum voluntary isometric contraction (MVIC) electromyographic (EMG) activity in the GMed (anterior, middle and posterior) and GMin (anterior and posterior) segments.

Methods: Seven databases (MEDLINE, EMBASE, CINAHL, AusSPORT, PEDro, SPORTdiscus and Cochrane Library) were searched from inception to May 2018 for terms relating to gluteal muscle, exercise, and EMG. The search yielded 6918 records with 56 suitable for inclusion. Quality assessment, data extraction and data analysis were then undertaken with exercise data pooled into a meta-analysis where two or more studies were available for an exercise and muscle segment.

Results: For the GMed, different variations of the hip hitch/ pelvic drop exercise generated at least high activity in all segments. The dip test, and isometric standing hip abduction are other options to target the anterior GMed segment, while isometric standing hip abduction can be used for the posterior GMed segment. For the middle GMed segment, the single leg bridge; side-lying hip abduction with hip internal rotation; lateral step-up; standing hip abduction on stance or swing leg with added resistance; and resisted side-step were the best options for generating at least high activity. Standing isometric hip abduction and different variations of the hip hitch/ pelvic drop exercise generated at least high activity in all GMin segments, while side-lying hip abduction, the dip test, single leg bridge and single leg squat can also be used for targeting the posterior GMin segment.

Conclusion: The findings from this review provide the clinician with confidence in exercise prescription for targeting individual GMed and GMin segments for potential strengthening following injury or ageing.

Level of Evidence: Level 1.

What is known about the subject: Previous reviews on GMed exercises have been based on single electrode, surface EMG measures at middle GMed segment. It is not known whether these exercises effectively target the other segments of GMed or the GMin at a sufficient intensity for strengthening.

What this study adds to existing knowledge: This review provides the clinician with confidence in exercise prescription of common therapeutic exercises to effectively target individual GMed and GMin segments for potential strengthening.

Keywords: EMG, gluteal muscle, hip, exercise therapy, movement system

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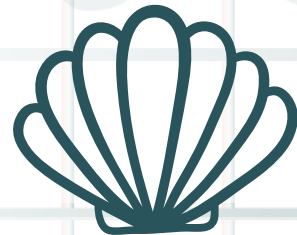
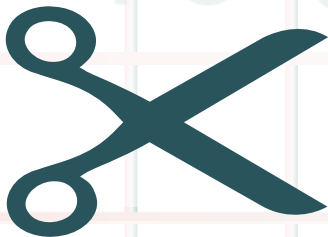
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THE Article

- a systematic review and meta-analysis of common therapeutic exercises that generate highest muscle activity in the gluteus medius and gluteus minimus segments
- published in 2020 by the International Journal of Sports Physical Therapy

THE Takeaways

- **Clams Vs. Side Lying Abduction**
 - Side Lying Abduction has better gluteus medius activity than a clam
 - Side Lying Abduction was best w/ resistance or internal rotation (hip)



- altering hip flexion angle or trunk position has minimal effect on activity of gluteus medius

THE Takeaways

- Squats

- Single leg squat better than double
- If doing double leg, consider adding resistance like a resistance loop, just above your knees



- Steps

- Side step ups have more gluteus medius activity than front step ups
- If doing front step ups try adding resistance or stepping up AND

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THE Takeaways

- Lunges
 - better activity of gluteus medius and minimus was found during rear foot elevated lunge (aka dip test) versus a classic lunge



- Hip Hike/Pelvis Drop
 - high activity for both gluteus medius and minimus

THE Takeaways

- **Glute Bridges**
 - much higher activity found with single leg glute bridge for both gluteus medius and minimus compared to double leg



- **Standing Abduction**
 - high activity for both gluteus medius and minimus

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