

# MUSCLE ACTIVITY DURING THE PACK HIKE TEST AND A SIMULATED RAKEHOE TASK

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## Research Aim:

Compare and contrast the muscle activity of six major muscles during the Pack Hike Test and a simulated rakehoe task.

## Methodology:

Eight male firefighters completed the Pack Hike Test (PHT), a 4.83 km hike over level terrain carrying a 20.4 kg pack within a 45 minute time period. After 30 minutes rest, participants completed a rakehoe task and were instructed to clear a mineral earth line over a period of three minutes at normal operational pace using a rakehoe. Muscle activity was recorded from six major muscle areas on the right side of each participant including the rectus femorus, gluteus maximus, erector spinae, latissimus dorsi, posterior deltoid and biceps brachii. Muscle activity was expressed relative to the maximum muscle activity of each muscle group.

## Results:

- Peak muscle activity during the PHT ranged from 6% to 66% and 29% to 93% during the rakehoe task.
- Significantly different peak muscle activation levels were recorded in four of the six muscles tested when the PHT was compared to the rakehoe task (Figure 1).

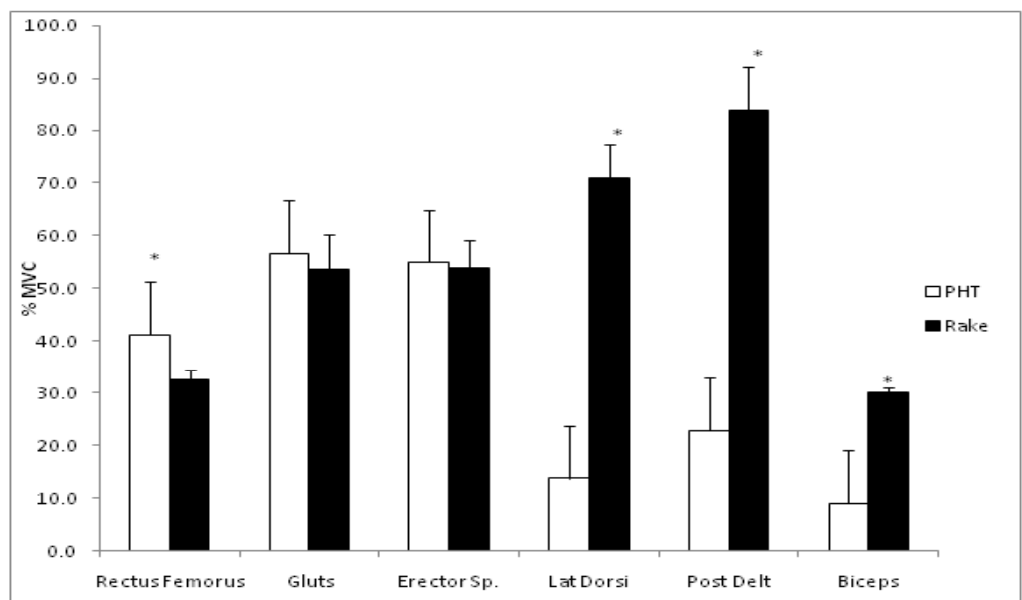


Figure 1. Comparison of mean peak muscle activity in the six muscles analyzed during the PHT and Rakehoe task

## Outcomes:

- The findings cast doubt on the validity of the PHT to accurately replicate the musculoskeletal demands of rakehoe - a core bushfire suppression task.
- PHT is predominantly cardiorespiratory-focused physical employment test.
- Fire agencies may wish to combine the PHT with other tests that are able to more appropriately assess fire fighter's muscular endurance levels.