

Supplementary File I: EMG Methodological Quality Assessment Checklist

EMG Detection of signal	Yes	No	Comments
Electrode type: Was the selection of electrode (surface or indwelling) appropriate?			
Was the hardware equipment used fully described or available from the manufacturer so that the following can be confirmed: <ul style="list-style-type: none"> • signal to noise ratio (no minimum but the higher the better) • common mode rejection ratio > 95dB • input impedance 1-10 Mega Ohm • differential amplifiers used as per <ul style="list-style-type: none"> - hardware filters should be bandpass with <10 Hz as low cut off and a maximum of 1/2 sample rate for the high cut off - amplification ranges from 100-5000 x 			
Was the sample rate used appropriate? A minimum sample rate for surface electrodes should be 1000 Hz and for indwelling 2000 Hz			
If using surface electrode, was skin preparation appropriate to ensure inter-electrode impedance < 10 kilo Ohm? This typically involves the use of abrasive/shaving (if necessary) and alcohol.			
Was the placement of the electrodes appropriate? Placement of surface electrodes should be on the muscle belly and parallel to the muscle fibres or referenced. For indwelling electrodes, the description should be clear or referenced. The use of ultrasound to confirm placement in layered muscles should be used. The placement of the electrodes should be tested to ensure activity is recorded when the muscle is contracted and no or minimal activity recorded when the muscle is relaxed.			

Processing Signals	Yes	No	Comments
Was there an inspection of the raw signal or was a sample of the raw data provided to determine: <ul style="list-style-type: none"> • whether signals are EMG signals and not noise? • whether a high-pass filter was needed to reduce movement artefact? 			
Is there a statement reporting proportion of lost data?			

For studies evaluating EMG Levels/Patterns	Yes	No	Comments
Was appropriate smoothing conducted: RMS or rectified and low pass filtered or integrate EMG (area under curve)			
Were appropriate normalisation methods used?			
Comparison within a muscle:			

<ul style="list-style-type: none"> • normalization not required if electrodes not removed between performance of tasks • normalisation to validated MVC/standard task required if electrodes replaced <p>Comparison between muscles within a subject or between subjects, tasks, experiments:</p> <ul style="list-style-type: none"> • normalization to validated MVC required 			
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For studies evaluating EMG timing	Yes	No	Comments
<p>Was a validated method used for evaluating the timing of the EMG?</p> <ul style="list-style-type: none"> • ≥ 2 SD from resting activity levels • rectify and low pass filter then identify inflection point • or described fully and reliability checked 			

Procedures	Yes	No	Comments
Were test procedures standardized? e.g. quality of exercise/task execution, speed of execution, relative load			
Were potential effects of fatigue accounted for? E.g. tasks randomized, adequate rest periods			

Analysis	Yes	No	Comments
Were appropriate statistical analyses undertaken?			