

# Surface electromyographic biofeedback to optimize performance in daily life

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by Erik Peper, Annette Booiman, Marie Tallard, and Naoki Takebayashi

Surface electromyographic biofeedback to optimize performance in daily life: Improving physical fitness and health at the worksite

## ABSTRACT

Muscle pain is the primary cause of discomfort for more than 30% of patients who visit their primary physicians with severe pain. These pains are often caused by dysponesis which is unaware misdirected muscle efforts not necessary for task performances. It can consist of 1) excessively tightening muscles that are used for the task performance, 2) tightening muscles not necessary for the task performance (inappropriate co-contractions), 3) not relaxing muscles after the task has been completed, or 4) not relaxing muscles momentarily during task performance to allow for ongoing regeneration (surface electromyographic gaps/micro-breaks). These chronic covert muscle tensions are a significant co-factor in the etiology, maintenance and progression of many disorders such as headaches, backaches, joint pain, repetitive strain injuries, myalgias, etc. Dysponesis can be identified with surface electromyographic (SEMG) feedback. The benefits of using SEMG to reduce dysponesis through awareness and training are illustrated by two clinical case examples: 1) to improve health at work when packing apples and 2) to enhance performance while working out in the gym on an elliptical exercise machine. As documented by the SEMG recorded from the upper trapezius and/or forearm flexors, the reduction of misdirected muscle efforts decreased the neck and shoulder pains at work and at home and enhanced performance on an elliptical exercise machine. SEMG is a useful clinical tool to assess, monitor, provide feedback to the therapist and client, document muscle dysponesis, and teach clients awareness and voluntary control to reduce their dysponesis and improve health.

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