The Function of the Teres Major Muscle:
An Electromyographic Study

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ABSTRACT
Electromyographic activity of the teres major and latissimus dorsi muscles using indwelling bipolar fine-wire electrodes was recorded during motion of the arm and shoulder without resistance, against resistance, and during static resisted activity. The teres major is active during static motion and during motion against resistance with medial rotation, adduction, and extension of the arm. It is not active during motion without resistance, although latissimus dorsi usually is.

The classic article in the literature on the kinesiology of the shoulder region is that of Inman, Saunders and Abbott ('44). Their findings have in general withstood the test of time and few of their conclusions have been contradicted by subsequent investigators.

One point of controversy has been the function of the teres major muscle which Inman et al. ('44) reported never showed activity during motion, having a purely static function. But Hermann ('60), Kamon ('65), and DeSousa et al. ('69), all using surface electrodes, denied this, reporting that teres major was indeed active during active motion of the arm. The present study was undertaken to clarify the disagreement because of the obvious importance of this large muscle. The closely related latissimus dorsi was studied simultaneously as a reference.

MATERIAL AND METHODS
The teres major muscle of ten normal adult subjects, using their dominant arm could usually be easily visualized and palpated by having the subject adduct and internally rotate his arm against a static resistance. In the majority of subjects, the latissimus dorsi muscle was also easily palpable. Bipolar fine-wire (75 μ) Karma electrodes were inserted into the mass of the teres major 3 cm lateral and 3 cm superior to the inferior angle of the scapula; and into the latissimus dorsi muscle 4 cm inferior to the inferior angle of the scapula. Construction and insertion of these electrodes have been described elsewhere (Basmajian and Stecko, '62).

Recordings were made on a four-channel Thermionic FM tape recorder and viewed on a four-channel Tektronix storage oscilloscope.

Subjects were directed through a series of motions of the shoulder and arm: (a) standing at rest with the arms hanging at the side, (b) medial rotation, (c) lateral rotation, (d) abduction, (e) adduction, (f) flexion, and (g) extension. These were first done without resistance and then against a resistance force that either allowed or prevented completion of the arc of the motion.

One channel recorded teres major activity while the second channel recorded latissimus dorsi activity. Good recordings were obtained from all ten teres majors and in seven latissimus dorsi muscles.

RESULTS
The teres major had no electrical activity in motions without resistance. But against active resistance, it consistently showed electrical activity during medial rotation, adduction, and extension in both

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the static and the dynamic exercises. The latissimus dorsi had similar activity during both static tension and resisted motion; without resistance, in five of the seven acceptable subjects, latissimus dorsi had activity during medial rotation, adduction, and extension.

DISCUSSION

The more precise and sensitive techniques used in this study appear to resolve the controversy over the functions of teres major. The key to the solution seems to be whether a movement or an attempted movement is resisted. If it is resisted, teres major is always active. If added resistance is lacking, free movement of the shoulder joint in all its directions does not recruit the teres major although it usually recruits its close relation, latissimus dorsi.

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LITERATURE CITED