Complete Summary

GUIDELINE TITLE

Clinical utility of surface EMG: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology.

BIBLIOGRAPHIC SOURCE(S)


GUIDELINE STATUS

This is the current release of the guideline.


COMPLETE SUMMARY CONTENT

SCOPE

METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
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INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

Neurologic disorders, including neuromuscular diseases, low back pain, and disorders of motor control

GUIDELINE CATEGORY
Diagnosis
Technology Assessment

CLINICAL SPECIALTY

Neurology

INTENDED USERS

Physicians

GUIDELINE OBJECTIVE(S)

- To review the clinical uses of surface electromyography as a diagnostic tool for neurologic disorders

TARGET POPULATION

Patients with neurologic disorders, including neuromuscular diseases, low back pain, and disorders of motor control

INTERVENTIONS AND PRACTICES CONSIDERED

Use of surface electromyography (SEMG) in comparison with needle electromyography (NEMG) and fine-wire electromyography (FWEMG)

MAJOR OUTCOMES CONSIDERED

Sensitivity, specificity, and positive predictive value of diagnostic tests and evaluations performed

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

- Hand-searches of Published Literature (Primary Sources)
- Hand-searches of Published Literature (Secondary Sources)
- Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Manual and computerized literature searches from the National Library of Medicine were used to obtain the articles. Key words used included SEMG, spontaneous activity, fasciculation, myopathy, muscle fiber conduction, motor unit estimation, fatigue, low-back pain, tremor, movement disorders, reaction time, and psychophysics. Other key words relating to neuromuscular diseases (other than when cross-referenced with SEMG) were not searched for specifically because this topic was the focus of the earlier American Association of Electrodagnostic Medicine assessment (Haig AJ, Gelblum JB, Rechtien JJ, Gitter AJ. Technology assessment: the use of surface EMG in the diagnosis and treatment of nerve and...
muscle disorders. Muscle Nerve 1996 Mar;19[3]:392-5) and was not the main focus of the current paper.

**NUMBER OF SOURCE DOCUMENTS**

More than 2,500 source documents

**METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Weighting According to a Rating Scheme (Scheme Given)

**RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

**Quality of Evidence Ratings:**

**Class I.** Evidence provided by one or more well-designed clinical studies of a diverse population using a "gold standard" reference test in a blinded evaluation appropriate for the proposed diagnostic application.

**Class II.** Evidence provided by one or more clinical studies of a restricted population using a reference test in a blinded evaluation of diagnostic accuracy.

**Class III.** Evidence provided by expert opinion, nonrandomized historical controls, or observation(s) from case series.

**METHODS USED TO ANALYZE THE EVIDENCE**

Systematic Review

**DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

More than 2,500 original articles, reviews, and books were examined to determine the scope of surface electromyography utility, its benefits and risks, and the extent to which surface electromyography techniques vary, and to assess surface myography’s strengths and weaknesses for specific clinical applications.

**METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Not stated

**RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

**Suggested Strength of Recommendations:**

**Type A.** Strong positive recommendations, based on Class I evidence, or overwhelming Class II evidence when circumstances preclude randomized clinical trials.

**Type B.** Positive recommendation, based on Class II evidence.
**Type C.** Positive recommendation, based on strong consensus of Class III evidence.

**Type D.** Negative recommendation, based on inconclusive or conflicting Class II evidence.

**Type E.** Negative recommendation, based on evidence of ineffectiveness or lack of efficacy, based on Class II or Class I evidence.

**Type O.** Insufficient data to make a recommendation.

**COST ANALYSIS**

A formal cost analysis was not performed and published cost analyses were not reviewed.

**METHOD OF GUIDELINE VALIDATION**

External Peer Review
Internal Peer Review

**DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

This guideline was reviewed by numerous individuals within the American Academy of Neurology and its various sections, including the Child Neurology Section, Clinical Neurophysiology Section, Geriatrics Neurology Section, Government Service Section, Neurogenetics Section, Neuromuscular Section, Pain Medicine Section, and the Section on Women's Issues, as well as the American Association of Electrodiagnostic Medicine.

**RECOMMENDATIONS**

**MAJOR RECOMMENDATIONS**

Each recommendation includes a ranking for the quality of evidence supporting it, as well as a rating of the strength of the recommendation. Definitions of the levels of evidence (Class I, Class II, Class III) and strength of recommendation (A through E, O) as well as a glossary of terms are provided at the end of the Major Recommendations field.

**Recommendations**

1. Based on Class II data, surface electromyography is considered unacceptable as a clinical tool in the diagnosis of neuromuscular disease at this time (**Type E recommendation**).
2. Based on Class III data and inconclusive or inadequate Class II data, surface electromyography is considered unacceptable as a clinical tool in the diagnosis of low back pain at this time (**Type E recommendation**).
3. Based on Class III data, surface electromyography is considered an acceptable tool for kinesiologic analysis of movement disorders; for
differentiating types of tremors, myoclonus, and dystonia; for evaluating gait and posture disturbances; and for evaluating psychophysical measures of reaction and movement time (Type C recommendation).

**Quality of Evidence Ratings:**

**Class I.** Evidence provided by one or more well-designed clinical studies of a diverse population using a "gold standard" reference test in a blinded evaluation appropriate for the proposed diagnostic application.

**Class II.** Evidence provided by one or more clinical studies of a restricted population using a reference test in a blinded evaluation of diagnostic accuracy.

**Class III.** Evidence provided by expert opinion, nonrandomized historical controls, or observation(s) from case series.

**Definitions:**

**Safe.** A judgment of the acceptability of risk in a specified situation, e.g., for a given medical problem, by a provider with specified training, at a specified type of facility.

**Effective.** Producing a desired effect under conditions of actual use.

**Established.** Accepted as appropriate by the practicing medical community for the given indication in the specified patient population.

**Possibly useful.** Given current knowledge, this technology appears to be appropriate for the given indication in the specified patient population. If more experience and long-term follow-up are accumulated, this interim rating may change.

**Investigational.** Evidence insufficient to determine appropriateness, warrants further study. Use of this technology for given indication in the specified patient population should be confined largely to research protocols.

**Doubtful.** Given current knowledge, this technology appears to be inappropriate for the given indication in the specified patient population. If more experience and long-term follow-up are accumulated, this interim rating may change.

**Unacceptable.** Regarded by the practicing medical community as inappropriate for the given indication in the specified patient population.

**Suggested Strength of Recommendations:**

**Type A.** Strong positive recommendations, based on Class I evidence, or overwhelming Class II evidence when circumstances preclude randomized clinical trials.

**Type B.** Positive recommendation, based on Class II evidence.
**Type C.** Positive recommendation, based on strong consensus of Class III evidence.

**Type D.** Negative recommendation, based on inconclusive or conflicting Class II evidence.

**Type E.** Negative recommendation, based on evidence of ineffectiveness or lack of efficacy, based on Class II or Class I evidence.

**Type O.** Insufficient data to make a recommendation.

**CLINICAL ALGORITHM(S)**

None provided

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**EVIDENCE SUPPORTING THE RECOMMENDATIONS**

**TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

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**BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

**POTENTIAL BENEFITS**

Appropriate clinical use of surface electromyelography

**POTENTIAL HARMS**

Not stated

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**QUALIFYING STATEMENTS**

This statement is provided as an educational service of the American Academy of Neurology. It is based on an assessment of current scientific and clinical information. It is not intended to include all possible proper methods of care for a particular neurologic problem or all legitimate criteria for choosing to use a specific procedure. Neither is it intended to exclude any reasonable alternative methodologies. The American Academy of Neurology recognizes that specific patient care decisions are the prerogative of the patient and the physician caring for the patient, based on all of the circumstances involved.

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**IMPLEMENTATION OF THE GUIDELINE**

**DESCRIPTION OF IMPLEMENTATION STRATEGY**

6 of 10
An implementation strategy was not provided.
FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.


GUIDELINE AVAILABILITY

Electronic copies: A list of American Academy of Neurology (AAN) guidelines, along with a link to a Portable Document Format (PDF) file for this guideline, is available at the AAN Web site.

Print copies: Available from the AAN Member Services Center, (800) 879-1960, or from AAN, 1080 Montreal Avenue, St. Paul, MN 55116.

AVAILABILITY OF COMPANION DOCUMENTS


PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on November 4, 2001. The information was verified by the guideline developer as of December 20, 2001.

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