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)

Pullman SL, Goodin DS, Marquinez AI, Tabbal S, Rubin M. Clinical utility of surface EMG: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. Neurology 2000 Jul 25;55(2):171-7. [81 references]

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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 Electrodiagnostic 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

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").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate clinical use of surface electromyelography

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

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.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Jul

GUIDELINE DEVELOPER(S)

American Academy of Neurology - Medical Specialty Society

SOURCE(S) OF FUNDING

American Academy of Neurology (AAN)

GUIDELINE COMMITTEE

Therapeutics and Technology Assessment Subcommittee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Subcommittee Members: Douglas S. Goodin, MD (Chair); Elliot Mark Frohman, MD, PhD; Robert Goldman, MD; John Ferguson, MD; Philip B. Gorelick, MD, MPH; Chung Hsu, MD, PhD; Andres Kanner, MD; Ann Marini, MD, PhD; Carmel Armon, MD; David Hammond, MD; David Lefkowitz, MD; and Edward Westbrook, MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline broadens the scope of a previous assessment of surface EMG published by the American Association of Electrodiagnostic Medicine (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).

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

- Practice statement definitions. St. Paul (MN): American Academy of Neurology.
- Practice statement development. St. Paul (MN): American Academy of Neurology.

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.

COPYRIGHT STATEMENT

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