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Guideline Summary NGC-6654

Guideline Title

Practice parameter: therapies for benign paroxysmal positional vertigo (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology.

Bibliographic Source(s)

Fife TD, Iverson DJ, Lempert T, Furman JM, Baloh RW, Tusa RJ, Hain TC, Herdman S, Morrow MJ, Gronseth GS, Quality Standards Subcommittee, American Academy of Neurology. Practice parameter: therapies for benign paroxysmal positional vertigo (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology 2008 May 27;70(22):2067-74. [38 references] PubMed

Guideline Status

This is the current release of the guideline.

Guidelines are updated or affirmed every three years or earlier, based upon the availability of new evidence.

Scope

Disease/Condition(s)

Benign paroxysmal positional vertigo (BPPV)

Guideline Category

Assessment of Therapeutic Effectiveness

Evaluation

Treatment

Clinical Specialty

Family Practice

Neurological Surgery

Neurology

Otolaryngology

Pharmacology

Intended Users

Physicians

Guideline Objective(s)

To perform an evidence-based review to answer the following questions concerning the treatment of benign paroxysmal positional vertigo (BPPV):

- What maneuvers effectively treat posterior canal BPPV?
- Which maneuvers are the most effective treatments for horizontal canal and anterior canal BPPV?
- Are postmaneuver activity restrictions necessary after canalith repositioning procedure?
- Is it necessary to include mastoid vibration with repositioning maneuvers?
- What is the efficacy of Brandt–Daroff exercises, habituation exercises, or patient self-administered treatments for BPPV?
- What is the efficacy of medication treatments for BPPV?
- What are the safety and efficacy of surgical treatments for posterior canal BPPV?

Target Population

Patients with benign paroxysmal positional vertigo (BPPV)

Interventions and Practices Considered

1. Maneuvers that effectively treat posterior canal benign paroxysmal positional vertigo (BPPV):
   - Canalith repositioning procedure (CRP)
   - Semont maneuver
2. Self-administered Brandt-Daroff or habituation exercises (insufficient evidence to recommend or refute)

The following interventions were considered but not recommended (see the original guideline for specific context)

1. Self-administered Semont maneuver or CRP for posterior canal BPPV
2. Maneuvers that treat horizontal canal BPPV:
   - Lempert supine roll maneuver (barbecue roll)
   - Gufoni maneuver
   - Vanucchi–Asprella liberatory maneuver
   - Forced prolonged positioning
3. Maneuvers that treat anterior canal BPPV
4. Post-treatment activity restriction
5. Addition of mastoid vibration to maneuvers
6. Medications
7. Surgical treatment of posterior canal BPPV
   - Posterior semicircular canal occlusion
   - Singular neurectomy

Major Outcomes Considered

Effectiveness of treatments for resolution or improvement of symptoms of benign paroxysmal positional vertigo (BPPV)

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

For the literature review, the following databases were searched for relevant, fully published, peer-reviewed articles published form 1966 to June 2006: Medline, EMBASE and Current Contents. The search terms were as follows:" benign paroxysmal positional vertigo," "Semont liberatory maneuver" "canalith repositioning maneuver," "particle repositioning maneuver," "Epley maneuver," "modified Epley maneuver." In addition, the search was supplemented through manual searches by panel members. At least two panelists reviewed each article for inclusion. The literature was limited to human subjects, randomized controlled trials, case-control or cohort studies, cases series involving more than 6 subjects, and meta-analyses. Abstracts, reviews, and articles with undocumented or unstated mention of improvement were excluded.

Articles included in this analysis met all of these criteria:

1) Benign paroxysmal positional vertigo (BPPV) was diagnosed by both symptoms of positional vertigo lasting less than 60 seconds, and paroxysmal positional nystagmus in response to the Dix–Hallpike maneuver or other appropriate provocative maneuver; 2) for all forms of BPPV, the nystagmus was characterized by a brief latency before the onset of nystagmus or a reduction of nystagmus with repeat Dix–Hallpike maneuvers (fatigability); 3) for posterior canal BPPV, a positive Dix–Hallpike maneuver was defined by the presence of upbeating and torsional nystagmus with the top pole of rotation beating toward the affected (downside) ear; and 4) for horizontal canal BPPV, the Dix–Hallpike or supine roll maneuver produced horizontal geotropic (toward the ground) or apogeotropic (away from the ground) direction-changing paroxysmal positional nystagmus. Geotropic direction-changing positional nystagmus refers to paroxysmal right beating nystagmus when the supine head is turned to the right and paroxysmal left beating nystagmus with the supine head turned to the left. Conversely, apogeotropic indicates the nystagmus is right beating with the head turned to the left and left beating with head turned to the right.

Number of Source Documents

70 articles were identified and reviewed for preparation

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

Classification of Evidence for Therapeutic Intervention

Class I: Prospective, randomized, controlled clinical trial with masked outcome assessment, in a representative population. The following are required: (a) primary outcome(s) clearly defined; (b) exclusion/inclusion criteria clearly defined; (c) adequate accounting for drop-outs and cross-overs with numbers sufficiently low to have minimal potential for bias; and (d) relevant baseline characteristics are presented and substantially equivalent among treatment groups or there is appropriate statistical adjustment for differences.

Class II: Prospective matched group cohort study in a representative population with masked outcome assessment that meets a-d above OR a randomized controlled trial in a representative population that lacks one criteria a-d.

Class III: All other controlled trials (including well-defined natural history controls or patients serving as own controls) in a representative population, where outcome is independently assessed, or independently derived by objective outcome measurement.*

Class IV: Evidence from uncontrolled studies, case series, case reports, or expert opinion.

* Objective outcome measurement: an outcome measure that is unlikely to be affected by an observer's (patient, treating physician, investigator) expectation or bias (e.g., blood tests, administrative outcome data).

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Otoneurologists with experience in benign paroxysmal positional vertigo and general neurologists with methodologic expertise were invited by the Quality Standards Subcommittee to perform the evidence review. At least two panelists reviewed each article for inclusion. The risk of bias was determined using the classification of evidence for each study (see "Rating Scheme for the Strength of the Evidence").

Methods Used to Formulate the Recommendations

Other

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Classification of Recommendations

The strength of practice recommendations is linked directly to the level of evidence:

Level A = Established as effective, ineffective, or harmful for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.)

Level B = Probably effective, ineffective, or harmful for the given condition in the specified population. (Level B rating requires at least one Class I study or at least two consistent Class II studies.)

Level C = Possibly effective, ineffective, or harmful for the given condition in the specified population. (Level C rating requires at least one Class II study or at least two consistent Class III studies.)

Level U = Data inadequate or conflicting; given current knowledge, treatment is unproven.

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

Draft guidelines were reviewed for accuracy, quality, and thoroughness by the American Academy of Neurology members, topic experts, and pertinent physician organizations.

The practice parameter was approved by the Quality Standards Subcommittee on May 1, 2007; by the Practice Committee on June 21, 2007; and by the American Academy of Neurology Board of Directors in July 2007.

Recommendations

Major Recommendations

Definitions of the levels of the recommendations (A, B, C, U) and classification of the evidence (Class I through Class IV) are provided at the end of the "Major Recommendations" field.

1. **What maneuvers effectively treat posterior canal benign paroxysmal positional vertigo (BPPV)?**

Conclusion

Two Class I studies and three Class II studies have demonstrated a short-term (1 day to 4 weeks) resolution of symptoms in patients treated with the canalith repositioning procedure (CRP), with number needed to treat (NNT) ranging from 1.43 to 3.7. The Semont maneuver is possibly more effective than no treatment (Class III), a sham treatment (Class II), or Brandt–Daroff exercises (Class IV) as treatment for posterior canal BPPV. Two Class IV studies comparing CRP with Semont maneuver have produced conflicting results; one showed no difference between groups, and the other showed a lower recurrence rate in patients undergoing CRP.

Recommendation

CRP is established as an effective and safe therapy that should be offered to patients of all ages with posterior semicircular canal BPPV (**Level A recommendation**). The Semont maneuver is possibly effective for BPPV but receives only a **Level C** recommendation based on a single Class II study. Although many experts believe that the Semont maneuver is as effective as canalith repositioning maneuver, based on currently published articles the

Semont maneuver can only be classified as "possibly effective." There is insufficient evidence to establish the relative efficacy of the Semont maneuver to CRP (**Level U**).

2. **Which maneuvers are the most effective treatments for horizontal canal and anterior canal BPPV?**

Conclusion

Based on Class IV studies, variations of the Lempert supine roll maneuver, the Gufoni method, or forced prolonged positioning seem moderately effective for horizontal canal BPPV. Two uncontrolled Class IV studies report high response rates to maneuvers for anterior canal BPPV.

Recommendation

None (**Level U**)

3. **Are postmaneuver activity restrictions necessary after canalith repositioning procedure?**

Conclusion and Recommendation

Five Class IV studies support the omission of post-treatment activity restrictions; one study supports the use of post-treatment restrictions. There is insufficient evidence to determine the efficacy of postmaneuver restrictions in patients treated with CRP (**Level U**).

4. **Is it necessary to include mastoid vibration with repositioning maneuvers?**

Conclusion and Recommendation

One Class II, one Class III, and two Class IV studies showed no added benefit when mastoid vibration was added to a CRP as treatment for posterior canal BPPV. Mastoid oscillation is probably of no added benefit to patients treated with CRP for posterior canal BPPV (**Level C recommendation**).

5. **What is the efficacy of Brandt–Daroff exercises, habituation exercises, or patient self-administered treatments for BPPV?**

Conclusion and Recommendation

One Class II and one Class IV study suggest that Brandt–Daroff exercises or habituation exercises are less effective than CRP in the treatment of posterior canal BPPV. Self-administered Brandt–Daroff exercises or habituation exercises are less effective than CRP in the treatment of posterior canal BPPV (**Level C**). There is insufficient evidence to recommend or refute self-treatment using Semont maneuver or CRP for BPPV (**Level U**).

6. **What is the efficacy of medication treatments for BPPV?**

Conclusion and Recommendation

A single Class III study did not demonstrate that lorazepam or diazepam hastened resolution of symptoms in BPPV. A single Class III study demonstrated some benefit of flunarizine, a drug that is unavailable in the United States, in BPPV. There is no evidence to support a recommendation of any medication in the routine treatment for BPPV (**Level U**).

7. **What are the safety and efficacy of surgical treatments for posterior canal BPPV?**

Conclusion and Recommendation

Six unblinded, retrospective Class IV studies report relief from symptoms of BPPV in nearly every patient undergoing posterior semicircular canal occlusion or singular neurectomy. Because the studies are Class IV, they do not provide sufficient evidence to recommend or refute posterior semicircular canal occlusion or singular neurectomy as treatment for BPPV (**Level U**).

Definitions:

Classification of Evidence for Therapeutic Intervention

Class I: Prospective, randomized, controlled clinical trial with masked outcome assessment, in a representative population. The following are required: (a) primary outcome(s) clearly defined; (b) exclusion/inclusion criteria clearly defined; (c) adequate accounting for drop-outs and cross-overs with numbers sufficiently low to have minimal potential for bias; and (d) relevant baseline characteristics are presented and substantially equivalent among treatment groups or there is appropriate statistical adjustment for differences.

Class II: Prospective matched group cohort study in a representative population with masked outcome assessment that meets a-d above OR a randomized controlled trial in a representative population that lacks one criteria a-d.

Class III: All other controlled trials (including well-defined natural history controls or patients serving as own controls) in a representative population, where outcome is independently assessed, or independently derived by objective outcome measurement.*

Class IV: Evidence from uncontrolled studies, case series, case reports, or expert opinion.

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Classification of Recommendations

Level A = Established as effective, ineffective, or harmful for the given condition in the specified population. (Level A rating requires at least two consistent Class I studies.)

Level B = Probably effective, ineffective, or harmful for the given condition in the specified population. (Level B rating requires at least one Class I study or at least two consistent Class II studies.)

Level C = Possibly effective, ineffective, or harmful for the given condition in the specified population. (Level C rating requires at least one Class II study or at least two consistent Class III studies.)

Level U = Data inadequate or conflicting; given current knowledge, treatment is unproven.

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 use and best practices for treatment of patients with benign paroxysmal positional vertigo (BPPV)

Potential Harms

In some studies of patients with posterior canal benign paroxysmal positional vertigo (BPPV) treated with a canalith repositioning procedure, complications of nausea and vomiting, fainting, or conversion to horizontal or anterior canal BPPV occurred.

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.

Implementation Tools

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Slide Presentation

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

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Adaptation

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

Date Released

2008 May 27

Guideline Developer(s)

American Academy of Neurology - Medical Specialty Society

Source(s) of Funding

American Academy of Neurology (AAN)

Guideline Committee

Quality Standards Subcommittee

Composition of Group That Authored the Guideline

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Financial Disclosures/Conflicts of Interest

The American Academy of Neurology (AAN) is committed to producing independent, critical and truthful clinical practice guidelines (CPGs). Significant efforts are made to minimize the potential for conflicts of interest to influence the recommendations of this CPG. To the extent possible, the AAN keeps separate those who have a financial stake in the success or failure of the products appraised in the CPGs and the developers of the guidelines. Conflict of interest forms were obtained from all authors and reviewed by an oversight committee prior to project initiation. AAN limits the participation of authors with substantial conflicts of interest. The AAN forbids commercial participation in, or funding of, guideline projects. Drafts of the guidelines have been reviewed by at least three AAN committees, a network of neurologists, *Neurology* peer reviewers, and representatives from related fields. The AAN Guideline Author Conflict of Interest Policy can be viewed at www.aan.com.

The authors report the following disclosures: Dr. Fife has received research support from GlaxoSmithKline and estimates that 6% of his time is spent on canalith repositioning procedures. Dr. Iverson has nothing to disclose. Dr. Lempert estimates that <5% of his time is spent on videooculography. Dr. Furman holds stock options in Neurokinetics, has received research support from Merck, has served as an expert witness on vestibular function, and estimates that 1% of his time is spent on the Epley maneuver. Dr. Baloh estimates 5% of his time is spent on ENG. Dr. Tusa estimates that 5% of his time is spent on quantified positional testing. Dr. Hain estimates that 5% of his time is spent on ENG and 5% on VEMP. Dr. Herdman received research support from VAMC and served as an expert witness on the Hallpike–Dix maneuver. Dr. Morrow has received honoraria from BiogenIdec and has served as an expert witness and consultant on medico-legal proceedings. Dr. Gronseth has received speaker honoraria from Pfizer, GlaxoSmithKline, and Boehringer Ingelheim and served on the IDMC Committee of Ortho-McNeil.

Guideline Status

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Guidelines are updated or affirmed every three years or earlier, based upon the availability of new evidence.

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

The following are available:

- Therapies for benign paroxysmal positional vertigo. AAN summary of evidence-based guidelines for clinicians. St. Paul (MN): American Academy of Neurology. 2008. 2 p. Available in Portable Document Format (PDF) from the American Academy of Neurology Web site.
- Practice parameter: therapies for benign paroxysmal positional vertigo (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Slide presentation. St. Paul (MN): American Academy of Neurology. 2008. 71 p. Available from the AAN Web site.
- Practice parameter: therapies for benign paroxysmal positional vertigo (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Case study and coding. St. Paul (MN): American Academy of Neurology. 2008. 3 p. Available from the AAN Web site.

- Practice parameter: therapies for benign paroxysmal positional vertigo (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. Podcast. St. Paul (MN): American Academy of Neurology. 2008. Available from the AAN Web site.
- Practice parameter: therapies for benign paroxysmal positional vertigo (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. BPPV maneuvers video. St. Paul (MN): American Academy of Neurology. 2008. Available from the AAN Web site.
- AAN guideline development process [online]. St. Paul (MN): American Academy of Neurology. Available from the AAN Web site.

Patient Resources

The following is available:

- Treating benign paroxysmal positional vertigo. AAN summary of evidence-based guideline for patients and their families. St. Paul (MN): American Academy of Neurology (AAN). 2008. 2 p.

Electronic copies: Available in Portable Document Format (PDF) from the AAN Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

This summary was completed by ECRI Institute on October 31, 2008. The information was verified by the guideline developer on December 11, 2008.

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