TITLE: Channels for the Diagnosis of Obstructive Sleep Apnea: Validity, Diagnostic Accuracy, and Guidelines

DATE: 26 August 2015

RESEARCH QUESTIONS

1. What is the comparative validity and diagnostic accuracy of portable testing devices that use three channels versus devices that use four channels for the diagnosis of sleep apnea?

2. What is the validity and diagnostic accuracy of any combination of oxygenation, nasal pressure, heart rate, pulmonary effort, or body position as measured by portable three channel or four channel testing devices for the diagnosis of sleep apnea?

3. What are the evidence-based guidelines regarding the appropriate channels and appropriate number of channels for the diagnosis of sleep apnea?

KEY FINDINGS

One evidence-based guideline was identified regarding the appropriate channels and appropriate number of channels for the diagnosis of sleep apnea. No literature was identified regarding the validity and diagnostic accuracy of portable testing devices that use three channels versus four channels for the diagnosis of sleep apnea.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. Methodological filters were applied to limit retrieval to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, randomized controlled trials, non-randomized studies, guidelines and diagnostic accuracy studies. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2005 and August 12, 2015. Internet links were provided, where available.

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The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

**SELECTION CRITERIA**

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

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<th>Table 1: Selection Criteria</th>
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<td><strong>Population</strong></td>
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| **Intervention** | Q1: Portable testing devices that use three channels (type IV devices) to diagnose sleep apnea  
Q2: Any combination of oxygenation, nasal pressure, heart rate, pulmonary effort, or body position as measured by portable three channel or four channel testing devices for the diagnosis of sleep apnea  
Q3: Portable testing devices for the diagnosis of sleep apnea |
| **Comparator** | Q1: Portable testing devices that use four channels (type III devices) to diagnose sleep apnea  
Q2: Any alternate portable type III or type IV testing device for the diagnosis of sleep apnea  
Q3: No comparator |
| **Outcomes** | Q1: Validity and diagnostic accuracy (e.g., positive predictive values, negative predictive values, specificity, sensitivity) of three channels compared to four channels  
Q2: Validity and diagnostic accuracy outcomes  
Q3: Guidelines and recommendations regarding the appropriate channels for diagnosis of obstructive sleep apnea, including the number of channels upon which a diagnosis should be made |
| **Study Designs** | Health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, non-randomized studies, evidence-based guidelines |

**RESULTS**

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials, non-randomized studies, and evidence-based guidelines.

One evidence-based guideline was identified regarding the appropriate channels and appropriate number of channels for the diagnosis of sleep apnea. No relevant health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, or non-randomized studies were identified regarding the validity and diagnostic accuracy of portable testing devices that use three channels versus four channels for the diagnosis of sleep apnea, or specific channels used within three or four channel devices.

Additional references of potential interest are provided in the appendix.
OVERALL SUMMARY OF FINDINGS

The Portable Monitoring Task Force of the American Academy of Sleep Medicine published a guideline in 2007 regarding the use of unattended portable monitors for the diagnosis of obstructive sleep apnea (OSA) in adults.\(^1\) The guideline recommends that portable monitoring devices must record three channels (airflow, respiratory effort, and blood oxygenation), at a minimum, for the diagnosis of OSA.

No relevant evidence was identified regarding the validity and diagnostic accuracy of portable testing devices that use three channels versus four channels, or any combination of oxygenation, nasal pressure, heart rate, pulmonary effort, or body position as measured by portable three channel or four channel devices for the diagnosis of sleep apnea; therefore, no summary can be provided.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses
No literature identified.

Randomized Controlled Trials
No literature identified.

Non-Randomized Studies
No literature identified.

Guidelines and Recommendations

   See: 2 Technology for Portable Monitors, pages 740 to 741

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APPENDIX – FURTHER INFORMATION:

Previous CADTH Reports


Systematic Reviews – Alternate Comparator


Validation and Diagnostic Accuracy – Alternate Comparator

Three Channel (Type IV)


Four Channel (Type II)


Clinical Practice Guidelines and Position Statements

   See: Policy – Diagnosis, pages 3 and 4

   See: 5.0 Technical Considerations, page 231

Coverage Policies


Review Articles


Additional References
