



Title **Accuracy and Reliability of Using Computerized Interpretation of Electrocardiograms for Routine Examinations**

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Aim

To determine the available published evidence on the diagnostic accuracy and reliability of computerized interpretation of electrocardiograms (ECGs). Computerized interpretation of ECGs is an automated laboratory test for screening ECGs in asymptomatic adults. The intent was to inform health policy makers, medical practitioners, and other interested parties about the current status concerning the use of computerized ECG interpretation for detecting normal heart activity. This review is confined to the use of computerized ECG interpretation during routine examinations of resting ECG performed in ambulatory settings.

Conclusions and results

No primary research studies were found that addressed the question of whether computerized interpretation of resting ECG can be considered an accurate and reliable automated laboratory test for screening heart conditions in asymptomatic adults as part of their routine clinical examination.

The available evidence (weak and limited) suggested that computer programs with best diagnostic performance may be as accurate as the human reader. Results showed that these programs confirm normality (in terms of heart condition) as established by non-ECG clinical evidence (the gold standard for type A diagnosis) in more than 90% of cases.

The available evidence did not permit conclusive answers on the diagnostic accuracy and reliability of computerized interpretation of resting ECG in asymptomatic adults. The question whether it can replace interpretation by a skilled professional in an ambulatory clinical environment for this application has yet to be answered.

Recommendations

Computerized interpretation of ECGs should be used with an awareness of the potential risk of false positive and false negative findings. Complete reliance on computerized ECG interpretation may result in incorrect diagnoses and could lead to inappropriate management decisions. Computerized interpretation of resting ECG in primary care has future potential. The immediate availability of computerized ECG interpretation has been viewed as a significant improvement for practicing clinicians. Those considering the use of computerized ECG interpretation for this indication should be aware that:

- The ECG test is only one of the tests used to detect/exclude possible heart conditions and is of limited value as a stand-alone screening tool in an apparently healthy population.
- It remains to be determined whether the use of computerized ECG interpretation actually increases physician's accuracy in ECG interpretation, saves physician time, improves quality of patient care, and leads to a reduction in the costs.
- There are different applications of computerized ECG interpretation. The computer programs available on the market apply different approaches to diagnostic classification of ECGs and use different terminology.

Methods

Systematic review of the research published from 1994 to April 2001. The following databases were searched: PubMed MEDLINE, HealthSTAR, EMBASE, ECRI database, The Cochrane database of Systematic Reviews, Best Evidence database and the NHS (UK) Centre for Reviews and Dissemination databases (HTA, EED, and DARE), National Guideline Clearinghouse, CCOHTA publications, and the WWW. Two well renowned experts externally reviewed this report.

Written by Paula Corabian