Tools for the Early Identification of Adult Inpatients at Risk for Deterioration: Clinical Effectiveness and Guidelines
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Acknowledgments:

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About CADTH: CADTH is an independent, not-for-profit organization responsible for providing Canada’s health care decision-makers with objective evidence to help make informed decisions about the optimal use of drugs, medical devices, diagnostics, and procedures in our health care system.
Research Questions

1. What is the clinical effectiveness regarding tools or indicators for early identification of deteriorating or worsening condition among adult hospitalized patients?

2. What are the evidence-based guidelines and best practice regarding tools or indicators for early identification of deteriorating or worsening condition among adult hospitalized patients?

Key Findings

One health technology assessment, six systematic reviews, one randomized controlled trial, and one evidence-based guideline were identified regarding tools or indicators for early identification of deteriorating or worsening conditions among adult hospitalized patients.

Methods

This report makes use of a literature search developed for a previous CADTH report. The original literature search was conducted in November 2011 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. No filters were applied to limit retrieval by study type. Where possible, retrieval was limited to the human population. The initial search was also limited to English-language documents published between January 1, 2008 and November 7, 2011. For the current report, database searches were rerun on September 19, 2017 to capture any articles published since the initial search date. The search of major health technology agencies was also updated to include documents published since November 2011.

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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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 and evidence-based guidelines. Due to the volume of relevant literature, non-randomized studies have been included in the appendix.

One health technology assessment, six systematic reviews, one randomized controlled trial, and one evidence-based guideline were identified regarding tools or indicators for early identification of deteriorating or worsening conditions among adult hospitalized patients.

Non-randomized studies and additional references of potential interest are provided in the appendix.

Overall Summary of Findings

One health technology assessment\(^1\) was identified that examined the implementation of electronic early warning score systems in hospitals. Some evidence was identified that suggested that the use of these systems resulted in reduced mortality rates. Length of stay was reduced in both intensive care units (ICUs) and general hospital wards and the accuracy of vital sign measurement was improved.\(^1\)

One systematic review (SR)\(^4\) examined the impact of the use of the Early Warning Score (EWS) on patient outcomes. The studies included in the review found a range of differences on in-hospital mortality rates from significantly improved to no significant difference.\(^4\) There was no significant difference reported in serious adverse events; however, there was a reduction in events following the use of the EWS. Two SRs identified 11\(^5\) and 13\(^6\) different early warning systems that were based on a combination of clinical evaluation and vital signs. The authors determined that the systems were able to predict cardiac arrest and death within 48 hours; however, the methods of the included studies were too varied to allow them to make a conclusion about their overall effectiveness.\(^5\)-\(^6\) One SR\(^7\) identified studies that examined single parameter and aggregate weighted scoring systems and the authors determined that aggregate scoring systems appeared to be the most effective. One randomized controlled trial\(^8\) compared the measurement of EWS at eight or 12 hour intervals. The authors found no significant differences between groups in 30 day mortality, cardiac arrests, ICU admissions, length of stay, or elevated EWS at 48 hours.\(^8\)

Two SRs\(^2\)-\(^3\) examined the role of patients and their families in escalating patient deterioration to response teams in hospital. Both reviews found patient and family escalation was used appropriately and did not result in an overuse of hospital resources.\(^2\)-\(^3\) Feedback provided by participants was generally positive\(^3\) but the process seemed to increase staff stress.\(^3\) Response teams were sometimes called for non-urgent reasons.\(^2\)

One guideline from the National Guideline Centre was identified that recommends that hospitals "consider using an early warning score to assess people with suspected sepsis in acute hospital settings."\(^9\)
References Summarized

Health Technology Assessments


Systematic Reviews and Meta-analyses


Randomized Controlled Trials

Guidelines and Recommendations

Appendix — Further Information

Previous CADTH Reports


Non-Randomized Studies


Economic Evaluations


Clinical Practice Guidelines – Methodology Not Specified


See: 2.2 NATIONAL EARLY WARNING SCORE, page 2
Review Articles

PubMed: PM27863876

PubMed: PM28727184


PubMed: PM27031791

PubMed: PM26780181

PubMed: PM24100432

Additional References

PubMed: PM28296456