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## The Effectiveness of Root Cause Analysis: What Does the Literature Tell Us?

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**Background:** Root cause analysis (RCA) is an analysis framework used in health care to determine the systemic causes and prevent recurrences of adverse events. It is required by The Joint Commission for reported events and by the Department of Veterans Affairs (VA) National Center for Patient Safety for qualifying events in VA medical centers. The evidence on RCA effectiveness in improving patient safety was reviewed.

**Methods:** MEDLINE®, Academic Search™ Premier, and the Cochrane Database were searched from database inception to September 2007. RCA case studies and articles that directly addressed the RCA framework were reviewed.

**Results:** Discussion of RCA did not emerge in the literature until the late 1990s, and there have been no controlled trials that test the RCA framework. Twenty-three articles describe the RCA process, 38 articles present RCA case studies, and 12 articles analyze weaknesses of the RCA framework. Eleven of the case studies measure RCA effectiveness, 3 using clinical outcome measures and 8 using process measures. All 11 articles report improvement of safety following RCA. RCA participants report the difficulty in forming causal statements and in developing/implementing corrective actions. Criticisms of RCA include the uncontrolled study design and participant biases.

**Discussion:** Overall, the limited literature on RCA effectiveness provides anecdotal evidence that RCA improves safety. At the same time, it highlights the numerous theoretical problems with the analytical framework. Formal studies at the system level and cost-benefit analysis are needed to determine the effectiveness of RCA. Structured publication of case studies will support shared knowledge and will provide benchmarks for improvement. Enrichment of the RCA literature body will enable reproducibility of improvement work, optimization of analysis, and validation of the framework itself.