Utilization Management Reduces Unnecessary Testing in the Coronary Care Unit

Wang TJ, Mort EA, Nordberg P, et al. A utilization management intervention to reduce unnecessary testing in the coronary care unit. Arch Intern Med 2002;162:1885–90.

Study Overview

Objective. To determine whether a multifaceted utilization management intervention in a coronary care unit (CCU) could reduce the ordering of unnecessary tests without affecting clinical outcomes.

Design. Nonrandomized controlled interventional trial.

Setting and participants. House staff and nurses working in the CCU of a large urban major teaching hospital.

Intervention. Practice guidelines for routine laboratory and chest radiographic testing were developed by a multidisciplinary team, which included the director of the CCU. Evidence-based recommendations and expert opinion were used to develop the guidelines, which covered the indications and recommended frequency for ordering various chemistry tests, complete blood count (CBC), arterial blood gases (ABG), and portable chest radiograph. The guidelines were reviewed with the house staff team and nurses every month during the 3 months of intervention and were incorporated into the computer admission orders for the CCU.

Main outcome measurements. Test utilization rates and costs per ICU patient-day. Utilization rates during the 3-month intervention period were compared with those during the same 3 months in the prior year. Utilization rates in the medical intensive care unit (ICU) served as a secondary control. Length of stay, ICU readmission rate, hospital mortality, and ventilator days also were measured.

Main results. There were statistically significant reductions in all chemistry tests, ranging from 7% to 40%, during the intervention period as compared with the historical control period in the CCU. After controlling for trends in the medical ICU, statistically significant reductions in ABG ($P = 0.04$) and chest radiographs ($P < 0.001$) were noted in the CCU. This reduction translated into a $14.22 savings per patient-day (in 1998 dollars). There were no significant changes in the ICU length of stay, readmission to the ICU, hospital mortality, or ventilator days in the intervention group.

Conclusion. A multifaceted utilization management program was associated with significant reductions in test ordering without any detectable change in clinical outcomes.

Commentary

The rising cost of health care, particularly in ICUs, has put the utilization of routine diagnostic testing under scrutiny. Fortunately, previous research has shown that interventions targeting multiple behavioral factors can be successful at producing a change in physician test ordering behavior [1]. In the innovative study presented by Wang et al, we learn that test ordering behavior in the ICU can indeed be brought in line with practice guidelines with the help of a multifaceted utilization management program.

Performing a utilization management intervention in a large, complex teaching hospital poses no small challenge. First, consensus must be reached regarding the details of the intervention, which this study was able to accomplish with the help evidence-based recommendations and support of local experts. Second, valid control groups must be identified. Without the benefit of randomization, however, patients in the control groups can be expected to differ systematically from those in the intervention group. It was unfortunate that this study did not measure and account for differences in the house staff and nurses in the CCU versus the medical ICU. It is also not clear if clinical factors, such as patient comorbidity, have been controlled for in comparing outcomes in the CCU and medical ICU. These differences serve as potential sources of confounders, and they should be accounted for in the analysis.

In spite of this study's minor limitations, its results offer much face validity and are supported by results from previous studies. Our major concern with the study, however, should lie in its generalizability. This intervention targeted physicians in training, whose behavior can be expected to be more malleable than that of trained physicians in the community. Furthermore, the intervention also relied in part on the presence of a computerized physician order entry system, which has been adopted by only 15% of U.S. hospitals [2]. It is also unclear if the effects of this intervention would persist over time, an issue that is logistically difficult to study in a teaching hospital, where house staff turnover in the CCU occurs rapidly.

The results offered by Wang et al are indeed thought provoking, and they generate further questions that may merit further investigation. For example, it is important to understand how physicians and nurses felt about these new guidelines, an issue that could be addressed through a survey during the intervention period. This survey also would allow physicians and nurses to report any adverse events that may have occurred as a result of adopting these new guidelines. Finally, a cost-benefit analysis would be helpful in justifying the widespread adoption of the proposed intervention.

Applications for Clinical Practice

A multifaceted approach focusing on education of house staff and nurses in the coronary care unit and the use of computerized order entry can reduce the utilization of unnecessary tests. Whether this effect can be generalized to ICUs in nonteaching hospitals, however, remains an unanswered question.

–Review by Eric G. Poon, MD

References

1. Solomon DH, Hashimoto H, Liang MH. Techniques to improve physicians' use of diagnostic tests: a new conceptual framework. JAMA 1998;280:2020–7.
2. Ash JS, Gorman PN, Hersch WR. Physician order entry in U.S. Hospitals. Proc AMIA Symp 1998;235–9.