

Reducing Inappropriate Laboratory Testing Through Provider Education and Feedback

Thomas RE, Croal BL, Ramsay C, et al. Effect of enhanced feedback and brief educational reminder messages on laboratory test requesting in primary care: a cluster randomised trial. *Lancet* 2006;367:1990–6.

Study Overview

Objective. To determine the impact of enhanced feedback and/or reminder messages on the number of laboratory tests ordered in primary care practices.

Design. Cluster, randomized controlled trial with a 2 × 2 factorial design.

Setting and participants. The laboratory test ordering patterns of 85 primary care practices that included approximately 370 general practitioners in northeast Scotland were analyzed. All laboratory tests were performed at a single regional center.

Intervention. Primary care practices were allocated to 1 of 4 groups: control, reminder messages alone, enhanced feedback alone, or a combination of reminder messages and enhanced feedback. Targeted tests included autoantibody screening (AAS) panel, carbohydrate antigen (CA)-125, carcinoembryonic antigen (CEA), ferritin, follicle-stimulating hormone (FSH), *Helicobacter pylori* serology (HPS), IgE, thyroid-stimulating hormone (TSH), and vitamin B₁₂. For each of the 9 targeted tests, an educational message describing inappropriate uses of the test was created. Reminders consisted of educational messages attached to test result reports sent to the requesting practice. Enhanced feedback consisted of a booklet that graphically presented the rates of laboratory test ordering over the preceding 3 years for each practice compared with regional rates as well as educational messages regarding the 9 targeted tests. Feedback booklets were distributed every 3 months for the duration of the trial.

Main outcome measure. The number of orders requested for the 9 targeted laboratory tests over 12 months.

Main results. Baseline practice characteristics were similar among the 4 groups. Compared with the control group, the enhanced feedback group had a 13% reduction in the number of tests ordered (odds ratio [OR], 0.87 [95% confidence interval {CI}, 0.81–0.94]), the reminder group had an 11% reduction (OR, 0.89 [95% CI, 0.83–0.93]), and the combined

intervention group had a 22% reduction (OR, 0.78 [95% CI, 0.71–0.85]). For the individual tests, the number of tests ordered was reduced for all 9 targeted tests in the enhanced feedback group, with AAS, FSH, TSH, and vitamin B₁₂ reaching statistical significance. In the reminder group, the number of tests ordered was reduced for all targeted tests except ferritin (OR, 1.04 [95% CI, 0.81–1.34]), with CEA, TSH, and vitamin B₁₂ reaching statistical significance.

Conclusion. Enhanced feedback and/or brief educational reminders reduce laboratory test requests in primary care practices.

Commentary

Several studies have documented that laboratory tests are often ordered inappropriately [1,2]. Unnecessary or inappropriate ordering of tests wastes valuable health care resources and puts healthy patients at risk for harm from unneeded interventions. Electronic reminders have been shown to reduce unnecessary laboratory testing for both inpatients and outpatients [3,4]. While these strategies appear promising, the majority of primary care practices do not use electronic medical records. Thomas et al demonstrated that simple interventions, such as brief educational reminders regarding the indications for certain tests and feedback regarding laboratory test utilization rates, can help reduce the rates of inappropriate laboratory test ordering. Both interventions appeared equally effective.

The unit of randomization in this study was the practice, not the individual provider, which was appropriate to avoid contamination (ie, individuals allocated to the control group being aware of the educational intervention). This design, however, limits overall power, making it harder to interpret the results for individual tests. Furthermore, it does not allow the investigators to determine if certain provider factors might be associated with a greater response to the intervention. The authors did not attempt to discern whether tests were ordered appropriately or inappropriately, but it seems unlikely that the messages would have persuaded a provider against ordering a test that was appropriately indicated. No economic analysis was performed, so it is unknown whether the reminder or

feedback system might be cost-effective. A strength of this study is the relative ease at which other practices could likely implement the interventions.

Applications for Clinical Practice

Inappropriate laboratory testing can place a substantial burden on finite health care resources. Simple interventions, such as provider feedback and educational reminders, could potentially reduce inappropriate laboratory testing in primary care.

—*Review by Harvey J. Murff, MD, MPH*

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