correspondence

Another Laboratory Test Utilization Program: Our Approach to Reducing Unnecessary 1,25-Dihydroxyvitamin D Orders With a Simple Intervention

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To the Editor

We were very interested in the report by Jeffrey Warren[1] outlining a comprehensive laboratory test utilization program in a large academic medical center. The report highlighted the implementation of an interdisciplinary committee to review utilization patterns, appropriateness, and new test requests in combination with significant information technology (IT) resources dedicated to computerized provider order entry decision tools. Over 5 years, they decreased send-out testing expenses normalized to clinical laboratory expenses.

We implemented a similar laboratory test utilization program in a 250-bed pediatric hospital that processes approximately 1,000 requisitions daily. Send-out expenses are a proportionally large burden on clinical laboratory and hospital budgets.[2] We developed a strategy to manage "flagged" test requests with minimal IT resources. Our utilization committee operates similarly to the committee described by Warren and selects tests to manage, remove from the formulary, or add to the formulary. Tests chosen for management by the committee are flagged in the laboratory information system with a "UM," for utilization management, preceding the test name.

In 1 example, the committee reviewed 1,25-dihydroxyvitamin D orders. At our institution, we sent close to three hundred 1,25-dihydroxyvitamin D tests to our major reference laboratory in 2011. We performed a retrospective medical record review for all orders during a 6-month period and found that 66% of the 1,25-dihydroxyvitamin D tests were ordered in error, and in these cases, 25-hydroxyvitamin D [25(OH)D] was the intended test. We created an e-mail template **Figure 1** describing the utility of both vitamin D tests and asked the provider if he or she wanted to modify the order to 25(OH)D. This template was managed by the frontline send-out staff, consisting of 3 dedicated staff. Faculty was involved when the provider did not respond within 2 days, which was rare. The response from providers was positive, often expressing appreciation for the education. As a result, many of the providers corrected order sets that had erroneously been built with 1,25-dihydroxyvitamin D. Two months after the intervention started, we instituted privileging to endocrinologists, meaning we did not manage their 1,25-dihydroxyvitamin D test requests since nearly all were ordered correctly.

Dear (Provider),

The lab received a request for 1,25-dihydroxy vitamin D for your patient, (NAME, MRN). This requires review before it will be sent to the performing lab because recent studies found that more than 50% of orders were ordered by accident, where 25-hydroxy vitamin D was the intended test to assess nutritional status.

25-hydroxy vitamin D is most useful in nutritional assessment, primarily due to its longer half–life of approximately 3 weeks. 25-hydroxyvitamin D is elevated with vitamin D intoxication, and decreased with malabsorption, nutritional deficiency, and in liver disease. This test is performed daily in Seattle Children's Laboratory.

The circulating half–life of 1,25-dihydroxy vitamin D is relatively short; 4-6 hours, which limits utility for overall Vitamin D assessment. Testing can be useful in the diagnosis of renal dysfunction in conjunction with parathyroid hormone. 1,25-dihydroxy vitamin D is elevated in sarcoidosis and primary hyperparathyroidism, and decreased in renal failure and hypoparathyroidism.

There are two options for how you can proceed with this test:

1) We can cancel the order for 1,25 dihydroxy vitamin D and you can write an add-on communication for 25, hydroxy vitamin D in CIS – we do not need a new order or specimen.

2) Proceed with the test as you have ordered it.

Please let me know if I can be helpful and how you want to proceed. I apologize for any inconvenience if this was the test you intended.

Figure 1 Template sent to providers.

After 7 months of the intervention, we found that 58% (n = 134) of the 1,25-dihydroxyvitamin D test orders were cancelled and modified to 25(OH)D, reducing our monthly orders from 25 to less than 10 **Figure 2**. This intervention required minimal IT resources and was reasonably managed by the send-out staff in their daily work flow. Our simple intervention was able to increase the value of vitamin D testing to patients by eliminating wasteful, unnecessary tests that were ordered in error. This type of intervention can be used as a model for other commonly misordered tests.

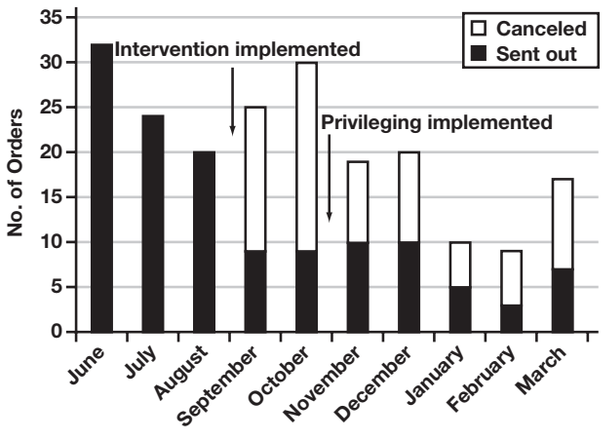

Figure 2 Change in test orders after intervention.

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1. Warren JS. Laboratory test utilization program: structure and impact in a large academic medical center. *Am J Clin Pathol*. 2013;139:289-297.
2. Dickerson JA, Cole B, Conta JH, et al. Improving the value of costly genetic reference laboratory testing with active utilization management. *Arch Pathol Lab Med*. In press.

The Author's Reply

Correspondence from Dickerson et al[1] highlights the laboratory test utilization program at the Seattle Children's Hospital (University of Washington). This effective program includes features that differ from the University of Michigan Health System program, which I recently described.[2] Their ability to substantially affect test utilization despite the deployment of less extensive information technology (IT) resources is particularly important because it mitigates a major barrier to implementation (IT costs) and allows the relatively rapid deployment of utilization management actions. Early in our University of Michigan experience, there was a significant time lag between Formulary Committee decisions and implementation of the IT component of our computerized provider order entry system. Another appealing aspect of the program instituted by Dickerson et al is the use of standardized information templates that include clearly articulated test order options. This feature has doubtlessly contributed to user buy-in and satisfaction. Direct comparison of 1,25-dihydroxyvitamin D ordering patterns—before and after implementation of a utilization control measure—is a particularly effective and impactful example. Optimal resource utilization will continue to be a important facet of laboratory medicine practice.

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1. Dickerson JA, Cole B, Conta JH, et al. Improving the value of costly genetic reference laboratory testing with active utilization management. *Arch Pathol Lab Med*. In press.
2. Warren JS. Laboratory test utilization program: structure and impact in a large academic medical center. *Am J Clin Pathol*. 2013;139:289-297.

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