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SPECIAL ARTICLE

Improving Molecular Genetic Test Utilization through Order Restriction, Test Review, and Guidance

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The ordering of molecular genetic tests by health providers not well trained in genetics may have a variety of untoward effects. These include the selection of inappropriate tests, the ordering of panels when the assessment of individual or fewer genes would be more appropriate, inaccurate result interpretation and inappropriate patient guidance, and significant unwarranted cost expenditure. We sought to improve the utilization of molecular genetic tests by requiring providers without specialty training in genetics to use genetic counselors and molecular genetic pathologists to assist in test selection. We used a genetic and genomic test review process wherein the laboratory-based genetic counselor performed the preanalytic assessment of test orders and test triage. Test indication and clinical findings were evaluated against the test panel composition, methods, and test limitations under the supervision of the molecular genetic pathologist. These test utilization management efforts resulted in a decrease in genetic test ordering and a gross cost savings of $1,531,913 since the inception of these programs in September 2011 through December 2013. The combination of limiting the availability of complex genetic tests and providing guidance regarding appropriate test strategies is an effective way to improve genetic tests, contributing to judicious use of limited health care resources. *(J Mol Diagn 2015, 17: 225—229; http://dx.doi.org/10.1016/j.jmoldx.2015.01.003)*

Genetic and genomic testing is clinically available for >4000 genetic conditions, a number that has tripled in the past decade (GeneTests, *https://www.genetests.org/disorders*, last accessed September 12, 2013). This category of tests, although fairly low volume relative to other laboratory tests, contributes substantial cost to laboratory medicine in our institution, in part because of the increasing availability and complexity of molecular test options. A study of United Healthcare members found that spending on molecular genetic tests increased 14% per year between 2008 and 2010.[1] Given the rarity of most genetic disorders and the growing array of testing options, it is perhaps not surprising that 8% to 30% of genetic tests are ordered incorrectly.[2,3] Indeed, many physicians report feeling unprepared to order genetic testing or perform clinical tasks related to genetics because of lack of knowledge, confidence, and

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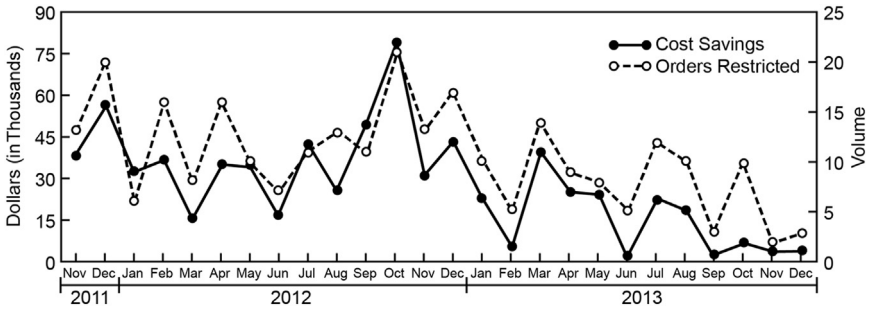

Figure 1 Volume reductions and cost savings associated with clinical decision support tools, calculated from a monthly report of restricted test order attempts and their associated institutional costs.

experience with genetic disorders.[4–6] The impact of these factors on patient care is difficult to quantify but almost certainly contributes to delayed time to diagnosis and an increase in the risk of erroneous result interpretation. Given the desire to provide appropriate testing coupled with the need to address the rapidly increasing cost of molecular genetic testing, our institution recognized an opportunity to optimize genetic test utilization among our clinicians.

Materials and Methods

Two initiatives were undertaken to improve molecular genetic test utilization at our institution.

Initiative I: Clinical Decision Support Tools

We limited the electronic ordering of molecular genetic tests. This process also required a clinical genetics consultation for any inpatient testing. This initiative, launched in November 2011, was piloted with select genetic tests that represented the highest annual cost to our institution.

Two types of electronic clinical decision support tools (CDSTs) were generated to function in the computerized provider order entry system within our electronic medical record system (Epic Systems, Verona, WI). The first CDST restricted users from filing all inpatient orders for the selected tests and required a consultation with a clinical geneticist for tests that could not reasonably be deferred to an ambulatory setting. This was designed to decrease unnecessary inpatient testing, while still preserving an avenue for testing if it was considered to be absolutely necessary. The second CDST limited outpatient genetic test orders to a self-selected group of clinicians who reported routine use of genetic testing in their clinical practice; this group was designated deemed users. All other users were prevented from filing orders for these tests and encouraged to obtain consultation with clinical genetics. After a successful pilot phase, this initiative was expanded in February 2012 to include approximately 40 complex genetic and genomic tests; additional tests were added as they became available in our system.

We reviewed the number of test orders that were prevented by the CDST and cost savings achieved by not performing these tests. There was potential revenue lost in the outpatient setting on the basis of this initiative, but the amount is not known because the reimbursement for these tests is variable based on decisions made by the individual providers (ie, some claims may have been denied, some fully reimbursed, and some partially reimbursed).

Initiative II: Genetic and Genomic Test Review and Guidance

We used a genetic counselor (J.D.R.) in daily order review and guidance for genetic and genomic testing. Although the CDST initiative targeted high-cost, high-complexity genetic tests, the engagement of a genetic counselor implemented a daily review of all genetic and genomic test orders, including those originating with the deemed users. Working with our Center for Pathology Informatics, daily pending logs were generated to capture all defined genetic and genomic test orders, as well as all miscellaneous test orders, a significant percentage of which were esoteric genetic and genomic tests.

The daily genetic and genomic test review (GGTR) began as a manual process in September 2011, with a more comprehensive and consistent review process implemented in August 2012 using electronic pending logs. The GGTR process involved the identification of molecular test orders from the daily pending list generated from the laboratory information system by the laboratory genetic counselor. The test indication and clinical findings were evaluated against the test

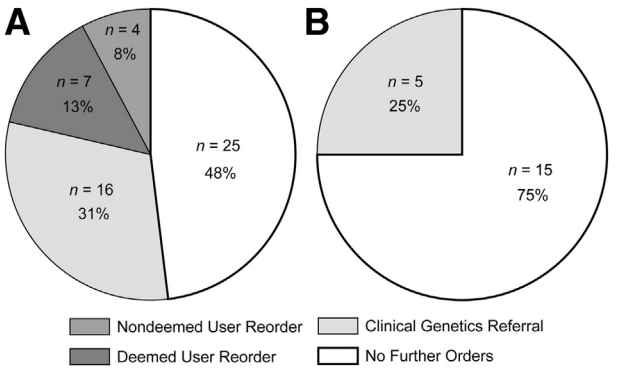

Figure 2 Impact of clinical decision support tools (CDST) initiative (July to December 2012). **A:** Ambulatory test orders ($n = 52$). **B:** Inpatient test orders ($n = 20$). Nondeemed user reorder indicates that the user ordered the test (usually as a miscellaneous order, for which a CDST cannot be used) without using the recommended strategies of either referring the patient to clinical genetics or consulting with another deemed user who could place the order. No further orders represent cases where no additional attempts to order genetic testing and no referrals to clinical genetics were identified during that episode of care.