Evidence-based ways to optimize test utilization.

Abstract

Efficiently optimizing laboratory test utilization requires both ensuring adequate utilization of needed tests and discouraging unnecessary tests. A wealth of interventions are available to help guide clinicians and laboratorians in making appropriate utilization choices—some more effective than others. This white paper outlines three principles of optimal test utilization and multiple proven measures to improve testing efficiency in an era of increasing financial pressure.

Introduction

Seven to 10 billion clinical laboratory tests are performed each year in the U.S.[1] However, too often the ordering physician selects an inappropriate test or a needed test is omitted that would speed the time to diagnosis. As a result, the average hospital loses $1.7 million annually to erroneous test utilization,[2] and incalculable costs when inadequate testing leads to conditions requiring imaging, surgeries, and hospital stays.

> The average U.S. hospital loses $1.7 million annually to suboptimal test utilization.

With faster access to an increasing menu of tests due to new technology and medical advances, overwhelmed clinicians are challenged to choose the most appropriate, least costly means to an accurate diagnosis. Without guidance, physicians are apt to order tests based on familiarity or custom. Some simply employ a blanket approach by ordering all tests that could be informative rather than employing a more targeted testing strategy based on clinical assessment and the patient's medical history. As a result, healthcare payers have instituted strict payment policies based on test utilization benchmarks. Thus, bottom-line profitability of the provider organization relies on optimized test utilization.

Assessing the problem & applying clinically-proven solutions

Health systems need a standardized approach to test optimization. It is not as obvious as one might think and finding root causes requires understanding of physician practice patterns and motivations that subvert optimal ordering. Several fundamental constructs of test utilization are helpful in fine-tuning test selection, frequency and breadth of testing. Three of these principles are described below.

Once opportunities to improve utilization have been identified, a number of methods that are supported by clinical literature (provided below with study citations) can be employed to change ordering behavior.[3] As in all system-wide efforts to change practice, optimizing appropriate utilization requires "buy-in" amongst the key stakeholders. A committed member of the laboratory staff must be willing to do the data analyses required to identify problem areas and provided access to adequate information technology resources. Capability to query large databases and generate customized reports is essential to assessing utilization and correlating utilization data with test results and other patient-specific data. Lastly, to succeed, medical staff must be willing to participate in utilization review and quality improvement activities.

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Principle #1 – Help physicians select the right test for each patient

Optimal test utilization begins with selecting a test. Statisticians offer us Bayes' theorem to support a common sense rule of thumb: do not order a test to "rule in" a condition when the prior probability is very low. For example, ordering a urine hCG test to assess pregnancy in an 87-year-old woman is unlikely to be a fruitful endeavor. Likewise, ordering a test when it is extremely likely that an expected diagnosis is present is equally wasteful. However, Bayes' theorem falls short when physicians are unable to assess prior probabilities due to a lack of a patient's medical history. Nonetheless, Bayesian thinking is an effective principle for assigning relative likelihood to a diagnosis, which can then guide a clinician to order sequential testing from most to least beneficial to avoid an unnecessarily costly diagnostic odyssey.

Evidence-based methods to improve test selection include:

- **Ban the test:** Eliminate the ability of clinicians to order tests for which payers no longer pay, that are not as effective as other tests, and that may be inappropriate in certain circumstances.[4, 5, 6]
- **Establish a laboratory formulary:** Establish a health system-wide policy supported by an approved list of available tests to curb suboptimal ordering—i.e., ordering an old test when a newer, better test is available. Exceptions to the formulary can be vetted through an appointed individual or committee.[7]
- **Hardwire proper ordering:** Modify the order entry system to facilitate optimal ordering and make it difficult to enter common inappropriate orders.[8, 9]

Principle #2 - Establish the optimal frequency for routine tests

Clinical studies have shown that repeat daily testing may foster fictitious diagnoses and unnecessary treatments[10] and that repeated testing costs health systems tens of millions of dollars annually.[11] Therefore, a second principle relevant to utilization optimization is the deliberate definition of the optimal frequency for routine tests. Consider hemoglobin A1c (HbA1c) testing. Since hemoglobin molecules circulate within the body for several months, assessing HbA1c on a scale of days to weeks provides no insight to treatment response. Rather, the test should be performed on a scale of 1-3 months to assess physiological changes.[12]

Evidence-based methods to optimize test frequency include:

- **Ban repetitive orders:** Specifically to address daily inpatient testing, make it difficult to enter repeated orders through computerized order entry,[13] ban standing orders,[14] and limit tests to a defined window of time.[15]
- **Utilization report cards:** Most physicians are not aware of test utilization benchmarks. Provide clinicians with data on their ordering patterns, benchmarks, and even financial impact.[16, 17, 18]
- **Follow the guidelines:** Although US guidelines have yet to be established, leaders in the United Kingdom have defined evidence-based time intervals before a test should be repeated.[19]

Principle #3 – Reduce expensive testing

Inappropriate utilization is exacerbated when a lack of clinical discretion and sequential testing leads to over-reliance on broad assay panels and esoteric testing panels, which carry high prices. Hospitals often lack the systems to flag the high-priced tests before they are performed, missing an opportunity to trigger a discussion with the ordering clinician about the test's expected clinical benefit, cost, and potential alternatives. Thus, presented with a challenging case, unaware of the cost implications and motivated to make a diagnosis, clinicians may employ a shotgun approach, ordering a full battery of tests to rule out an etiology as well as potentially vet a diagnosis. However, studies have shown that using all the available clinical data—including the findings on physical examination—combined with probabilistic reasoning leads to the diagnosis more rapidly and more efficiently than performing multiple tests to exclude possible diagnoses.[20] Ideally, testing for the single cause first with a cheaper screening methodology eliminates the need for the expensive panel and reduces the overall cost of testing.[21]

Evidence-based methods to reduce expensive testing include:

- **Offer privileged ordering for expert providers:** Limit complex, expensive and difficult-to-interpret tests by restricting their ordering to pre-qualified physicians.[22]
- **Require high-level laboratory approval:** Require the laboratory to approve the orders for certain complex, expensive and difficult-to-interpret tests.[23]
- **Reflexive testing algorithms:** Aid the clinician in defining the optimal sequential testing pathway in cases where a cheaper screening test can be used before a more costly test in an iterative approach.[24, 25]

Conclusion

While each of the above evidence-based methods has proven effective in test utilization management in clinical practice, studies suggest that the most successful interventions are those that combine various methods[26,27,28] and institute an ongoing program to monitor utilization. Understandably, clinicians may resist heavy-handed utilization management interventions that are not accompanied by educational support. In fact, by solving a pervasive challenge across the continuum of care, properly employed interventions can boost the morale of laboratory staff, clinicians, hospital administrators and patients.

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