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An effective utilization management strategy by dual approach of influencing physician ordering and gate keeping

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ABSTRACT

Objectives: There is increasing recognition of the importance of appropriate laboratory test utilization. We investigate the effect of a multifaceted educational approach that includes physician feedback on individual test ordering, in conjunction with targeted restriction, on the utilization of selected laboratory tests.

Design and methods: Scientific evidence was compiled on the usefulness and limitations of tests suspected of being over utilized in our laboratories. A variety of approaches were used to deliver education on each of the targeted tests, with greater focus on primary care physicians (PCPs). Feedback on requesting behavior of these tests was also communicated to the latter group which included an educational component. Laboratory based restriction of testing was also exercised, including the unbundling of our electrolyte panel.

Results: PCP requesting patterns for the selected tests were found to be markedly skewed. The interventions implemented over the study period resulted in a substantial 51% reduction in overall ordering of five of the targeted tests equating to an annual marginal cost saving of $60,124. Unbundling of the electrolyte panel resulted in marginal cost savings that equated annually to $42,500 on chloride and $48,000 on total CO_2.

Conclusions: A multifaceted educational approach combined with feedback on utilization and laboratory driven gate-keeping significantly reduced the number of laboratory tests suspected of being redundant or unjustifiably requested. Laboratory professionals are well positioned to manage demand on laboratory tests by utilizing evidence base in developing specific test ordering directives and gate-keeping rules.

1. Introduction

Appropriate selection of a test repertoire, guided by scientific evidence and tailored to the clinical needs of a patient with appropriate interpretation of results, is the cornerstone of sound laboratory medicine. Since the early 1990s investigators have underscored the importance of evidenced based medicine (EBM) as a driver for improving quality of patient care (1,2). While EBM embraces the diagnostic modalities, Evidence-Based Laboratory Medicine (EBLM) focuses on the appropriate utilization of diagnostic tests to improve actual patient outcomes (2,3,4).

Despite substantial technologic advancements in laboratory testing over the past two decades, neither the accuracy of a test nor its correlation with a disease state defines its true usefulness. This is determined rather by its downstream impact on quality of care. Inappropriate ordering of tests that are devoid of any utility to diagnosis or disease management, generate unnecessary waste thus affecting laboratory budgets and healthcare systems worldwide (5,6). The problem however is far more complex and the effects resonate beyond the economic repercussions on one hospital department. Background 'noise' generated by unwarranted testing not only consumes valuable physician time but may sometimes divert attention away from clinically important results. This may sometimes lead to further unnecessary diagnostic pathways and clinically invalid procedures. Such waste in time and resources is a relatively benign outcome compared to that of a missed or delayed diagnosis which may ensue (7,8,9). With these considerations and that the scale of unnecessary testing in clinical chemistry has been found in some studies to be over 90%, a sizable threat to both quality and efficiency in healthcare can be perceived (9,10). Efficiency savings synchronous with improvement in the quality of patient care can hence be envisioned in the context of demand management i.e. manipulating the use of health resources to maximize their utility.

The economic impact of superfluous testing is compounded by the annual increase in workload of about 5–8% seen by most clinical laboratories and which are unparalleled by an increase in budget (6). Many

Abbreviations: PCPs, primary care physicians; EBM, evidenced based medicine; EBLM, evidenced based laboratory medicine; MRI, minimal retesting intervals; CEA, carcinoembryonic antigen; S.folate, serum folate; FOB, fecal occult blood; SPE, serum protein electrophoresis.

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drivers have been proposed to be behind this increase in demand; an aging and expanding population, physician insecurity from fear of litigation, lack of clear clinical guidelines and patient driven testing are just some of these (11,12,13). Hence a number of strategies have been proposed and investigated over the years to tackle this growing problem; physician education and introduction of laboratory rules for restriction of testing appear to be at the heart of many of these proposals. Feedback to individual physicians on their requesting behavior in comparison to their peers has also been a relatively recent stratagem introduced (14,15). However feedback on numbers tested unaccompanied by an explanation of the clinical and analytic limitations of the individual test, does little to change physician behavior in the long term. Physicians' testing habits are often driven by the notion that they are doing what is right for their patient; laboratory clinicians need to demonstrate that this is a common goal by being at the forefront of examining the best available evidence on the clinical utility of tests including their limitations from both a diagnostic and analytic point of view. Communication on general test overuse and the subsequent drawbacks of this has been shown to be somewhat effectual (15). On the other hand sound practice of EBLM for individual tests, coupled with effective long term communication with users and subsequent implementation of various laboratory restrictions, is a more promising but challenging approach to demand management (3).

Over the past four years our Pathology Department has enforced cancelation rules for 31 tests based on the principles of minimal retesting intervals (MRI), which has resulted in the cancelation of about 61,000 tests per year. Several thousands of dollars in savings has thus been attained, while maintaining high quality patient care (16). Despite this, we recognize that further initiatives are still needed to guide ordering physicians away from clinically unwarranted tests.

The present study attempted to investigate the effect of combining physician education and feedback on requesting behavior, as well as some laboratory based restrictions, in reducing overutilization of selected clinical chemistry tests. The education component was driven by principals of EBLM and delivered through a number of different channels.

2. Methods

The Department of Pathology and Laboratory Medicine is part of the Nova Scotia Health Authority Central Zone which is primarily located within the Halifax Regional Municipality. There is one primary laboratory located in Halifax as well as four Rapid Response Laboratories located throughout the Zone servicing a population of approximately 450,000. Over 2500 Health Care Providers utilize these services both locally as well as a province wide referral service for specialist immunoassay tests for a total population of one million.

An analysis of laboratory test utilization patterns over the 2013 fiscal year within the Division of Clinical Chemistry against considerations in the literature and the population size, prompted clinical staff to suspect overutilization of the following tests in particular: Carcinoembryonic antigen (CEA), Fecal Occult blood (FOB), Lactate dehydrogenase (LD), Serum Folate (S.folate), serum protein electrophoresis (SPE) and vitamin D. It was also recognized that our existing 'electrolyte panel' which offered sodium, potassium, chloride and total CO_2 whenever any of these single tests were required, was wasteful and clinically unnecessary.

To determine the pattern of requesting of the six aforementioned tests, and since most of these arose from our community physicians, we looked at the number of requests, per primary care physician (PCP), per test, over 2013. As a result PCPs identified as having substantially higher requests, compared to the median of their peers, were provided with written feedback on this. Moreover, evidence based highlights on the indications as well as the clinical and analytic limitations of the test in question were also an integral part of these communications. Letters were sent to a total of 130 PCPs and confidentiality was retained throughout this process.

A number of other interventions took place mainly between January and November 2014 (Table 1) and focused on employing different educational approaches to raise awareness of appropriate use of these tests.

Evidence of the clinical usefulness of each of the tests in this study was derived from literature searches in addition to various national guidelines that were based on extensive reviews. Where relevant, the analytical limitations of a test were also cited, as for example for FOB and SPE.

It was then identified that certain laboratory restrictions were required to complement the educational element for at least some of these tests. This was based either on that the number of tests performed remained vastly incongruent with literature recommendations on test utility such as for LD, or that the use of the FOB test as a point of care procedure in some of the local clinics had been recognized as a non-conformity to recommended practice and had to be discontinued.

Finally unbundling of the electrolyte panel into separate requests for sodium and potassium, total CO_2 and chloride was implemented in February 2015, with clear direction provided to our users prior to this. Restructuring of our requisition form to reflect this change was also carried out.

The laboratory rule implemented for LD involved the cancelation of any request that was unaccompanied by clinical details or a reason as to why the test was required. Communication of this prerequisite was disseminated to all our users and since a clear educational element had also been included, we expected the number of unnecessary requests, hence cancelations, to dwindle over time.

The number of orders for each test was compared between the fiscal years of 2013 (April 2013–March 2014) and 2014 (April 2014–March 2015) to determine the impact of these interventions.

3. Results

On examining the number of tests requested per PCP over 2013 for each of CEA, FOB, serum folate, vitamin D, LD and SPE, significant skewing was observed in general, with a low median number of annual testing (Fig. 1 & Table 2). This skewing was most pronounced for CEA and FOB. Table 2 summarizes the median number of tests performed over 2013 for each analyte and the percentage of testing comprised by the highest requesting PCPs.

Table 1
Interventions performed mainly during the 2014 period for each of the targeted tests and month of implementation.

Intervention & targeted physicians	Tests	Time implemented
Organized presentations to PCP groups on appropriate test utilization.	CEA, FOB, S.Folate, Vitamin D, LD and electrolyte panel.	January 2014 May 2014 September 2014 November 2014
Feedback letters including educational component sent to highest requesting PCPs.	CEA, FOB, S.Folate, Vitamin D and LD SPE	January 2014 November 2014
Memorandum sent with educational and directional elements- to all physicians.	S.Folate FOB LD Electrolyte panel	October 2013 February 2014 March 2014 September 2014 January 2015
Information on appropriate testing published in 'Lab Corner' in the monthly Physician Newsletter - primarily accessed by PCPs	S.Folate FOB Vitamin D SPE	January 2014 February 2014 July & November 2014 May 2014
Implementation/change of laboratory rules for testing- all physicians	LD FOB Electrolyte panel	April 2014 February 2014 February 2015

CEA: carcinoembryonic antigen, FOB: fecal occult blood, LD: lactate dehydrogenase, S.folate: serum folate, SPE: serum protein electrophoresis.