

Question: What is the rate of repeated laboratory tests within a ninety (90) day period?

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Introduction

Laboratory tests are quick, low risk, and generally well-accepted procedures. Because of this, patients often do not question the need for these tests, even if they are repeated within a relatively short time period.

These repeat tests may be appropriate if they are necessary to follow-up on an abnormal result, or reassess a patient whose clinical condition has changed. However, there is also most likely unnecessary duplication of laboratory tests in practise. The frequency and timing of repeat laboratory testing in practice is not clear, but represents an important area of study because there may be certain tests that have frequent and unnecessary duplication. Identifying this would allow policy makers to target this area for potential financial savings for the health care system. Regardless of indication for a repeated test, there is increasing evidence of inappropriate laboratory testing in clinical practice.¹⁻⁴ Thus, the aim of this analysis was to (1) identify the overall rate of repeat tests, (2) identify the top five repeated tests in 2014; and (3) assess the rate of repetition for both for common laboratory tests where follow-up testing within 90 days would be reasonable and for a test that should generally not be repeated.

Describing the Data and Analysis

- *Data Custodian Organization(s) and data sources:* Data sources were analysed through the Institute for Clinical Evaluative Sciences (ICES) Western (London, Ontario). Data sources included: 1) Ontario Health Insurance Plan (OHIP) database, which contains all physician billing claims for the province; and 2) the Registered Persons Database (RPDB) which contains demographic and vital statistics for all people in the province.
- *List of Datasets Used (e.g. names of database and/or data origins):* OHIP and RPDB
- *Exclusions:* We excluded people who had invalid unique identifier, missing sex, or date of birth in the RPDB, or those who died prior to the initial laboratory test date.
- *Nature and Size of Cohort (e.g. geographic area covered, number of patients included):* Our cohort included all people in the province of Ontario who had any **outpatient** laboratory tests in our accrual period (those done in hospital were not included). Ontario's population in 2014 was 13.6 million, which accounts for over a 1/3 of Canada's overall population.
- *Data timeframe:* Laboratory tests conducted between February 1, 2014 and January 31, 2015 were included in our study. The maximum follow-up was until April 30, 2015.

Please provide a brief summary of the analysis methodology

People undergoing any outpatient laboratory test during our accrual period were identified using specific OHIP fee codes, which are billed by public laboratories. The date of the first laboratory test for an individual was identified, and any repeated tests (defined as the same specific laboratory test within 90 days) were identified. Patients were eligible to be included multiple times for different lab tests. We also examined the rate of repeated tests among laboratory tests, which are often repeated within 90 days if results are abnormal (hemoglobin A1c testing for diabetes, thyroid-stimulating hormone (TSH), total cholesterol level, and high-density lipoprotein test), and a test that generally does not need to be repeated (ABO blood type).

Describing the Findings

- We found 6,693,579 unique patients that had 113,909,976 laboratory tests conducted.

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- Of the tests identified in our cohort, 1,988,433 / 6,693,579 (29.7%) unique individuals had a repeat test and 19,895,455 / 113,909,976 (17.5%) tests were repeated for the same person within 90 days.
- The top five most commonly repeated tests were:
 - 1) Complete blood count (CBC) -- 1,922,010 / 7,812,659 (24.6%)
 - 2) Creatinine -- 1,757,161 / 7,366,638 (23.9%)
 - 3) Serum Glucose -- 957,953 / 6,376,529 (15.0%)
 - 4) Alanine Aminotransferase -- 1,065,515 / 5,710,813 (18.7%)
 - 5) Serum Potassium -- 1,009,356 / 5,251,775 (20.9%).
- For laboratory tests of interest that are often repeated within 90 days to follow-up on an abnormal result, the following rates of repeat testing within 90 days were identified:
 - 1) Hemoglobin A1c -- 564,717 / 4,035,841 (14.0%)
 - 2) Thyroid-stimulating hormone (TSH) -- 650,961 / 5,164,362 (12.6%);
 - 3) Total cholesterol level -- 401,027 / 4,824,839 (8.3%)
 - 4) High-density lipoprotein test -- 390,306 / 4,799,972 (8.1%)
- A persons ABO blood type generally does not require reassessment within 90 days, however we found that 17,112 / 248,543 (6.9%) of tests were repeated within 90 days.

Strengths & Limitations

- Our strengths include the use of a large, contemporary sample of lab tests carried out in the largest Canadian province. Accuracy of billing records is high. In addition to answering the challenge question, we identified the most common repeated tests, and the rate of repeat testing among laboratory tests which are often repeated within 90 days, and one that should not be repeated within 90 days.
- Our limitations include the lack of clinical details surrounding each patient's laboratory test: some repeat tests may have been indicated or clinically necessary. The results of the initial test probably influence the likelihood of a repeat test, and these details are not available in administrative data records. For example, Salvagno et al.¹ found that inappropriate repeat tests were more frequently repeated when glycated hemoglobin was lower among outpatients with a previous value of <7% than in outpatients with a previous value of >7% (64.8% vs. 35.2% repeat tests within 90 days).

Conclusion

Among individuals that had a laboratory test, almost a third had the same lab test conducted within 90 days. A measurable rate of repeat testing was found even among a laboratory test which would generally not need to be repeated within 90 days. This is an important area for further research to maximise fiscal efficiency for our health care system.

References

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