UNIVERSITI TEKNOLOGI MARA

EVALUATION OF CONFORMITY TO MINIMUM RETESTING INTERVAL RECOMMENDATIONS IN CHEMICAL PATHOLOGY TESTS

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Dissertation submitted in partial fulfillment
of the requirements for the degree of
Master of Pathology
(Chemical Pathology)

Faculty of Medicine

May 2022

ABSTRACT

Introduction: There is evidence that a sizable proportion of repeated laboratory tests are inappropriate or unnecessary, which could potentially contribute to cost burden and affect the efficiency of lean economics within a laboratory. Data on unnecessary retesting (UR) in the local setting have not been established and the applicability of the international established guideline on minimum retesting intervals in our local practice has not been studied. Our objective was to evaluate the prevalence of UR, its cost impact, and its association with ordering location and clinical significance of change in repeated test results at an academic medical facility.

Methodology: This was a retrospective analysis. Data of five target analytes (Total Cholesterol, TSH, Ferritin, Iron, and CRP) from July to December 2019 were extracted from the laboratory information system. The time interval of repeated tests was compared to the minimum retesting interval guidelines. A repeated test was considered as UR if the time interval was less than those stated in the guidelines. Clinical significance of change in repeated test results was assessed by comparing the Delta% with reference change value (RCV). If the delta% was less than the RCV, the change was considered as not clinically significant. The frequency and cost of UR were analysed using descriptive statistics and the association of UR with ordering location and clinical significance of change in repeated test results were analysed using Chi-square tests.

Results: The total volume for the five target analytes was 7,999, with 1,542 (or 19%) of those tests being repeated. From these repeated tests, 103(10.6%) were classified as UR, with TSH as the analyte most frequently repeated unnecessarily. The cost impact of UR amounted to RM 1865.00. Conformity to the minimum retesting interval guidelines was significantly associated with the ordering location and clinical significance of change in repeated results ($p<0.001$ and $p<0.05$, respectively). Majority of the UR comes from the inpatient setting and most of the changes in UR were not clinically significant.

Conclusion: More than 10% of the total repeated tests were considered unnecessary and contribute to laboratory and healthcare costs which could potentially be saved. Most of the unnecessarily repeated tests did not show a clinically significant change in test results and did not add value to patient care. Therefore, it is important to formulate strategies to reduce unnecessary repeat testing.

Keywords: Unnecessary Retesting; Minimum Retesting Interval;

ACKNOWLEDGEMENT

Firstly, I want to express my gratitude to God for allowing me to persevere in the face of adversity. Day by day, I've benefited from your advice.

I want to acknowledge and give my warmest thanks to my principal supervisor, Dr. Nadzimah Mohd Nasir (Department of Pathology, Faculty of Medicine, Universiti Teknologi MARA), who made this work possible. Her guidance and advice carried me through all the stages of writing my project.

I would also like to extend my appreciation to A/P Dr. Thuhairah Hasrah Abdul Rahman (Department of Pathology, Faculty of Medicine, Universiti Teknologi MARA) and Dr. Tengku Norita Tengku Yazid (Department of Pathology, Hospital Selayang), my co-supervisors, whose continual guidance and help were crucial to the success of this project.

A word of thanks to (Department of Public Health Medicine, Faculty of Medicine, Universiti Teknologi MARA) for her guidance and technical expertise in statistical data analysis.

I would also like to give special thanks to my wife, my son and my family as a whole for their continuous support and understanding when undertaking my research and writing my project. Your prayer for me was what sustained me this far.

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1. Introduction

1.1 Research Background

Laboratory testing plays a significant role in patient care. 60-70% of clinical decisions are influenced by laboratory test results.[1] Healthcare costs are rising at a rate that is not likely to be sustainable.[2] A major contributing factor to rising healthcare costs is the increasing number and range of laboratory tests used.[3] Laboratory tests utilization has increased drastically beyond what can be attributed to inflation and population ageing.[4,5]

Inappropriate test ordering is a primary cause for laboratory tests overutilization,[6-8] which includes unnecessary retesting (UR), which is defined as tests that are repeated too frequently or too soon. Van Walraven and Raymond reported that repeat testing within one month comprises 30% of test volumes for eight common tests and 63% within one year,[10] making it a suitable target for potential reduction.

There is evidence that a sizable proportion of repeated laboratory tests are inappropriate or unnecessary, which could potentially contribute to cost burden and affect the efficiency of lean economics within a laboratory.

Hueth *et al.* reported that 44% of the repeated inpatient tests included in their study [lipid panel, thyroid stimulating hormone (TSH), hemoglobin A1c (HbA1c), C-reactive protein (CRP), iron, ferritin, folate, 25-hydroxyvitamin D, 1,25-dihydroxyvitamin D and procalcitonin] were UR with an estimated cost-savings opportunity of US$ 37,376 per year. They also found that a small percentage of providers (10%) accounted for most (69%) of the repeats. This has important implications for intervention because it is generally easier to address the order behavior associated with a small group of providers. [7]

In their study on outpatient laboratory requests, Chami *et al.* found that the percentage of UR ranged from 6-20% depending on analytes (lipid profile, TSH, HbA1c, vitamin D, vitamin B12, folate, serum protein electrophoresis, immunofixation, and quantitative immunoglobulins). Between 60-85% of the time, the ordering physician was the same one who ordered the previous test.[9]

Morgen and Naugler evaluated all laboratory tests performed over a 2-year period for six tests (total cholesterol, HbA1c, TSH, vitamin D, vitamin B12, and ferritin) and found that 16% of these tests were UR, representing an annual cost of $0.6 to 2.2