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Retrospective Chart Review of Abnormal Lab Results in the Primary Care Setting

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The document mentioned above has been reviewed and accepted by the student's advisor, on behalf of the advisory committee, and by the Assistant Dean for MSN and DNP Studies, on behalf of the program; we verify that this is the final, approved version of the student's DNP Project including all changes required by the advisory committee. The undersigned agree to abide by the statements above.

Derek Summers, Student

Dr. Sharon Lock, Advisor

DNP Final Project Report

Retrospective Chart Review of Abnormal Lab Results in the Primary Care Setting

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Dedication

My work and DNP project are dedicated to my son Kellen, who sacrificed time, so I could finish graduate school. He was very understanding, and I can't wait to spend much more time with him. This is for my parents and grandparents, who supported me and helped me when times got tough. I am forever grateful for these wonderful people in my life.

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Abstract

PURPOSE: The purpose of this project was to perform a needs assessment to determine if there was a delay in addressing abnormal lab results. The objectives were: 1) to determine the amount of time it takes for providers to address abnormal lab results in the ambulatory setting at an ambulatory setting within a Southeast Health Care System and 2) evaluate the alert and order set system for abnormal lab results of thyroid stimulating hormone, lipid panels, and hemoglobin A1C.

METHODS: A retrospective chart review was performed to determine the time it takes for primary care providers to address or follow up on abnormal lab results in the primary care setting. The timeframe was from February 1, 2017 to July 1, 2017. The Healthcare System IT department randomly selected 100 charts from all ambulatory care visits for review from February 1, 2017 to July 1, 2017 who met the inclusion criteria. Inclusion criteria were patients 18 years of age and older with an ICD-10 code for hypothyroidism- E03.9, hyperlipidemia- E78.5, or type 2 diabetes - E11.65 with correlating lab results. Charts were reviewed for date and time lab was obtained, the lab results, the date and time lab results were documented in the chart, the date and time the provider acknowledged the results and what the provider did to address the results.

RESULTS: The median time it took providers to follow-up with abnormal lab results was thirty-two hours. The seventy-fifth interquartile range was 110 hours and the twenty-fifth interquartile range was fifteen hours. This means that seventy-five percent of patients were notified between fifteen and 110 hours. The goal time for the organization's abnormal lab follow-up in the primary care setting is forty-eight hours.

CONCLUSION: There was no delay in abnormal lab follow-up in the ambulatory care setting. The abnormal labs reviewed were under the time the organization requires for follow-up.

Introduction

Primary care providers are responsible for a magnitude of lab results (Elder et al., 2010). Abnormal test results are defined as lab results that are not within a specific reference range (Shulkin, 2015). Failing to follow-up with a test result is when a care provider neglects to document follow- up actions (Calen et al., 2011). The purpose of this project was to perform a needs assessment to determine if there was a delay in addressing abnormal lab results in the primary care setting. Without addressing delayed lab results in the ambulatory setting patient safety is at risk and legal action from patients.

Background

There is currently a delay with primary care providers following up and addressing abnormal lab results. Around 7% of abnormal labs or imaging results are missed in the primary care setting (Malone, 2012). A delay in the follow-up of abnormal lab results is associated with poor patient outcomes (Shulkin, 2015). If abnormal lab results are not addressed, the primary care provider is risking patient safety and legal action.

The primary care provider is responsible for the well- being of patients and may order lab tests in the primary care office. Abnormal test results are defined as lab results that are not within a specific reference range (Shulkin, 2015). Failing to follow-up with a test result is when a care provider neglects to document follow- up actions (Calen et al., 2011). Singh et al. (2010) reported that 10.2 % of lab results were not acknowledged by the primary provider and that 6.8% of the lab results were lacking a timely communication. A delay in the follow-up of abnormal lab results is associated with poor patient outcomes (Shulkin, 2015) and can threaten patient safety and satisfaction (Poon et al., 2004). Diagnostic errors contribute to most patient harm and have

cost 38.8 billion dollars between 1986 to 2010 (John Hopkins Medicine, 2013). Without addressing delayed lab results in the ambulatory setting patient safety is at risk and legal action from patients is possible.

There is currently limited research available on the best practice to address delayed lab results in the primary care setting. There is no universal method of addressing abnormal lab results and most offices have different protocols on responding to results. Automated notifications of abnormal results do not guarantee a timely action.

In many ambulatory or primary care offices within the study healthcare system, the current practice is for lab results and abnormal labs to be sent via inbox to the provider in the electronic health record. The ordering provider must acknowledge the results. However, this process is inadequate because the provider has many labs to address and some labs may get overlooked.

It is essential to perform a needs assessment to determine if there is a delay in addressing abnormal lab results in primary care offices. The overall goal is to eventually help speed up the process of acting on and notifying patients of abnormal lab results.

Purpose and Objectives

The purpose of this project is to perform a needs assessment to determine if there is a delay in addressing abnormal lab results. The objectives are: 1) to determine the amount of time it takes for providers to address abnormal lab results in the ambulatory setting at a Southeastern Healthcare System and 2) evaluate the alert and order set system for abnormal lab results of thyroid stimulating hormone, lipid panels, and hemoglobin A1C.

Methods

A retrospective chart review was performed to determine the time it takes for primary care providers to address or follow up with abnormal lab results. Each ambulatory clinic was utilized in capturing each abnormal lab result. The organization's information technology (IT) department randomly selected 100 charts from all ambulatory care visits for review from February 1, 2017 to July 1, 2017 who met the inclusion criteria. Inclusion criteria were patients 18 years of age and older with a recent ICD-10 code for hypothyroidism- E03.9, hyperlipidemia- E78.5, or type 2 diabetes - E11.65 with correlating lab results. Charts were reviewed for date and time lab was obtained, the lab results, the date and time lab results were documented in the chart, the date and time the provider acknowledged the results and what the provider did to address the results. At the time of the lab draw, the organization's policy was to follow-up with abnormal labs in the primary care setting within 48 hours.

Sample

For this study, the sample consisted of 100 randomly selected charts of patients who were seen in an ambulatory setting between February 1, 2017 to July 1, 2017. Charts were reviewed to determine the amount of time it took for providers to address the abnormal lab results of ICD 10 codes of hypothyroidism, hyperlipidemia, and type 2 diabetes. Each clinic was captured for each abnormal lab result. Eligible records were from individuals that were: a) 18 years of age or older b) had a recent ICD code of hypothyroidism, hyperlipidemia, or type 2 diabetes with correlating labs. Exclusion criteria included: a) patients that were admitted to the hospital after the office visit b) patients under 18 years of age and c) pregnant women. Patients under the age of 18 and pregnant women were excluded because treatment protocol is different and more conservative.

Informed consent

Since this study was a retrospective chart review informed consent was not practical. A waiver for informed consent was requested and granted by the UK Institutional Review Board and the Healthcare System's Office of Research.

Procedures

Data was obtained from primary care offices. After approval was obtained 100 randomly selected charts with ICD 10 codes of hypothyroidism, diabetes type II, and hyperlipidemia were reviewed. The data was extracted from patient electronic health records (EHR) and included the date and time the lab was obtained, the lab results and the date and time the lab results were documented in the patients record, the date and time the provider acknowledged the results, and what the provider did to address the lab results. The electronic data was stored on a secured drive that is firewall protected.

Data Analysis

Descriptive statistics were used to summarize the length of time it took providers to follow-up with abnormal lab results. Because the distribution of time was right skewed, the median and interquartile range were provided. Percentages of the type of labs drawn were taken and what the provider did for follow-up of the abnormal lab results were also recorded in Table 1.

Results

Nineteen percent of labs were hemoglobin A1C, 46% were lipid panels, and 35 % were thyroid stimulating hormones (see Table 1). Time was measured in hours. The median time it

took providers to follow-up with abnormal lab results was 32 hours. The 75th interquartile range was 110 hours and the 25th interquartile range was fifteen hours. This means that 75 percent of patients were notified between fifteen and 110 hours. The highest time recorded for follow-up was 3,456 hours. The lowest time recorded was 7 minutes and it was recorded twice (See Figure 1). The average of lab follow-up on the 100 labs was 164 hours.

There were four different ways for providers to follow-up with the patients. They could call the patient via telephone, mail a letter, notify during an office visit, or send a Mychart note to the patient via electronic medical record. Twenty percent of patients were called via telephone, 22 % had a letter mailed to them, 35% had a Mychart note sent via electronic medical record, and 23 % were given results in the office (see Table 1).

Discussion

The purpose of this study was to perform a needs assessment to determine if ambulatory providers are following up with abnormal lab results in the primary care setting in a timely manner. At the time of the lab draw, the organization's policy was to follow-up with abnormal labs in the primary care setting within 48 hours. Because the distribution of time was right skewed, the median and interquartile range were provided. The median time was 32 hours, and this is better than the 48 hours that was expected for follow-up. Overall, most providers followed-up in a timely manner. Even though the data was right skewed there were still some patients who waited much longer than forty-eight hours for abnormal lab results. The average time on the 100 random labs was 164 hours.

An important solution for lab follow-up may be using orders sets that will present on a separate window of the computer and offer the provider orders sets or action buttons that

acknowledges the labs or offers an action button that no action is needed (Singh et al., 2010). This is known as an Epic "pop-up" window. Using order sets in pop-up windows may be the best way to handle abnormal lab results because it allows the provider to address all lab results in an organized way and document on the patient results to promote patient safety and avoid legal action.

Limitations

Not all the labs reviewed were abnormal lab results. Some lab results were within normal ranges. This could have caused a delayed follow-up on lab results since they were within normal ranges and no action was needed.

Implications for Practice

Overall, ambulatory care providers in this study followed-up in a timely manner. There may need to be more strict policies for providers who do not follow-up in a timely manner or a better system put in place, such as a "pop-up" window for providers who are not following up in a timely manner. An important solution for lab follow-up may be using orders sets that will present on a separate window of the computer and offer the provider orders sets or action buttons that acknowledges the labs or offers an action button that no action is needed (Singh et al., 2010).

Implications for further study

In this study providers charted and acknowledged the abnormal lab results mostly in the early morning or late at night. It would be beneficial to study how much time providers spend charting after office hours. If the current process is slow and time consuming, then the Epic "pop-up" window could still save time for providers, improve provider satisfaction, and patient outcomes.

Conclusion

The overall median time for follow-up of abnormal labs in the primary care setting was 32 hours. The policy for ambulatory care follow-up of abnormal labs currently is 48 hours. Overall, the organization is exceeding goals and expectations on this policy. There is still need for improvement because some patients are still waiting much longer than 48 hours. It would be beneficial to have more strict policies, so providers are held more responsible for abnormal lab follow-up. It would also be beneficial to study how much time providers are spending charting outside of office hours. An Epic "pop-up" window may help with money and efficiency with abnormal lab follow-up. This would not only improve provider satisfaction but would also help all patients get abnormal lab results in a timely manner. As healthcare continues to become more complex, we must think of ways to become more innovative and simplified.

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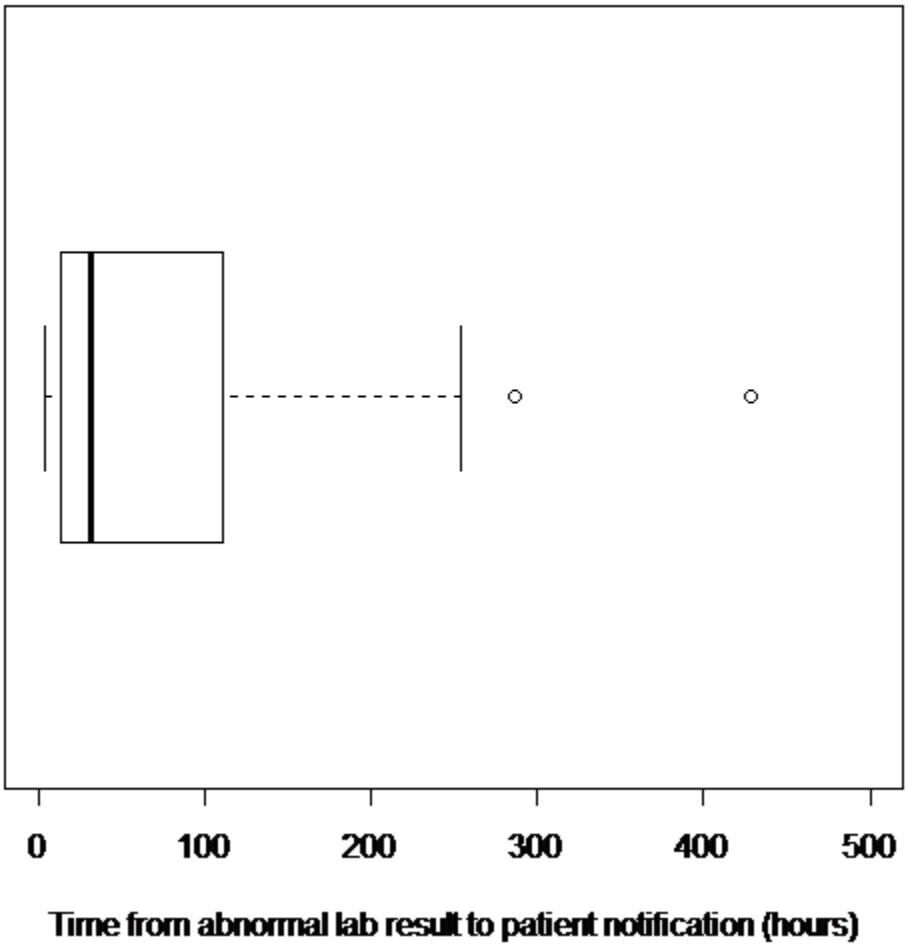
Table 1. Characteristics of patient labs (N=100)

Type of lab	**Percent**
A1C	19%
Lipid Panel	46%
TSH	35%
Provider follow-up	
Called patient	20%
Mailed letter	22%
Mychart note	35 %
Office visit	23 %

Figure 1. Boxplot of time of abnormal lab result



[1] The maximum on the axis is 500 hours for the ease of viewing. There are four data points that are not included in the boxplot that are over 500 H. The highest time recorded for follow-up was 3,456 hours and 2 minutes. The lowest time recorded was seven minutes and it was recorded twice.