Increasing the Spotlight on an Overlooked Diagnosis: A QI Initiative to Improve Anemia Evaluation

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Introduction

Second-year (PGY2) Internal Medicine (IM) residents at the Cleveland Clinic Foundation (CCF) Main Campus in Cleveland, Ohio participated in a Quality Improvement (QI) project as part of their QI requirement during their ambulatory block. Residents were encouraged to choose any topic of interest and received guidance from attending physicians and chief residents during the 2021 - 2022 academic year. IM residents met once a week, every five weeks, to discuss project methodology. IM residents' ambulatory patients were included in this project.

Anemia is a very common laboratory derangement seen in the outpatient setting. Recent data indicates that 25-54% of ambulatory patients have anemia (random references). Unfortunately, due to the complexity of the typical ambulatory patient seen at CCF, anemia is often overlooked unless severe, and may patients remain undiagnosed.

PGY2 IM residents sought to standardize the anemia work-up to increase the percentage of patients who undergo diagnostic testing for anemia. Our hypothesis was that standardizing the anemia work-up of patients in the ambulatory setting would increase the percentage of patients who were appropriately diagnosed with an anemia subtype.

Methods

Residents were asked to sample patients in their outpatient panel over 2 weeks to ascertain base rate of undiagnosed anemias based on prior lab data in the electronic medical record system.

Baseline data was collected, including: Hb, mean corpuscular volume (MCV), serum iron (Fe), total iron binding capacity (TIBC), serum ferritin, serum B12 level, reticulocyte count, history of cirrhosis, chronic kidney disease (CKD), malignancy, malabsorption disorder, autoimmune disorder, or hemoglobinopathy, If the aforementioned data was collected, patients were considered to have had an appropriate work-up conducted. The same data points were collected after the creation of the dot-phrase.

In order to diagnosis anemia, a dot phrase was developed which included multiple etiologies for anemia which was utilized for 7 weeks. A second intervention which consisted of note templating in addition to the dot phrase was created and employed for the subsequent 8 weeks. After the implementation of the above intervention, residents were surveyed regarding their perceived effectiveness of this method. Data was collected in an de-identified and secure excel spreadsheet and analyzed using R. The following work paradigm and fishbone diagram were created and followed (Figures 1 and 2).

Figure 1: Working Paradigm

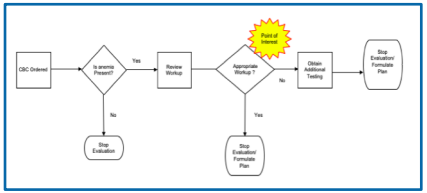
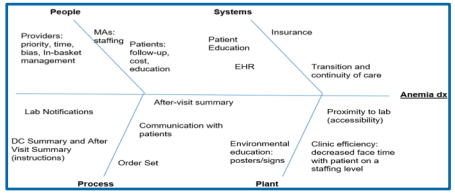


Figure 2: Fishbone Diagram

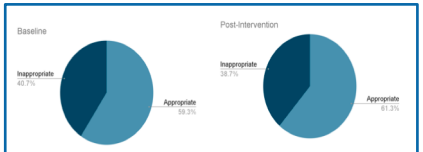


Results

A total of 59 patients were included in the pre-intervention analysis. Baseline characteristics of these patients are shown in Table 2. Among the pre-intervention cohort, 59.3% had an appropriate anemia work-up. Among the post-intervention cohort, 61.3% had an appropriate anemia work up (Figure 3). While our intervention did increase the percentage of patients with an appropriate work-up, this difference was not significantly significant (p=0.82).

The majority of residents (81%, n=9) felt that this intervention was effective in improving proper diagnosis of anemia etiology (Figure 4).

Figure 3: Pre- and Post-Intervention Work Up



	Appropriate	Inappropriate
Baseline	35	24
Post-Intervention	38	24

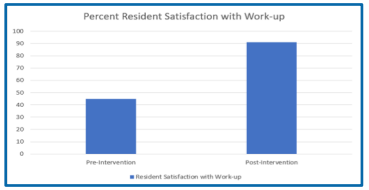
No statistically significant difference on Chi-Squared Testing (p=0.82)

Table 2: Anemia Characteristics

ANEMIA CHARACTERISTIC (N)	Baseline (n=59)	Post-intervention (n=62)
MEAN HGB (MG/DL)	11.15	10.81
MEAN MCV	88.3	88.2
INDIVIDUALS WITH FERRITIN (%)	61	77
INDIVIDUALS WITH FE/TIBC	59%	75%
INDIVIDUALS WITH B12	32%	33%
INDIVIDUALS WITH RETICULOCYTE	17%	37%
INDIVIDUALS WITH RETICULOCYTE	17%	37%
DX OF CIRRHOSIS	3.2%	1.6%
DX OF HEMATOLOGICAL PATHOLOGY	3.2%	1.6%
CHRONIC INFLAMMATORY CONDITION	11%	15%
MALABSORPTION SYNDROME	3.1%	1.5%

Conclusion

Figure 4: Resident Satisfaction



This QI project developed an efficient method for increasing the diagnosis of anemia.

Our intervention led to perceived increased resident efficiency in nine out of eleven survey residents.

This intervention has utility in complex patient presentation to assure an anemia diagnosis. While our results were not statistically significant, it is possible that including a larger sample size would lead to a more substantial difference between the pre- and post-intervention cohorts.

This QI pilot study should be expanded to more providers to ascertain its efficacy in assigning an anemia diagnosis.

Limited guidelines exist for the evaluation of anemia in the outpatient general medicine setting. This study may serve to create a standardized anemia evaluation.

References

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