Improving Compliance with NCCN Anemia Evaluation Guidelines Among Gynecologic Oncology Patients Demetra H. Hufnagel¹, Kendall Shultes², Colleen Morton³, Sarah Osmundson³, Alicia Beeghly-Fadiel³, Alaina J. Brown³, Lauren S. Prescott³

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BACKGROUND

- Anemia is very common among patients with cancer, and is associated with worse mortality and decreased quality of life [1].
- The National Comprehensive Cancer Network (NCCN) clinical practice guidelines recommend patients with hemoglobin (hgb) ≤11 g/dL should undergo workup for possible causes, including iron, vitamin B12, and folate studies [2].
- There is a potential opportunity to improve quality of life in gynecologic cancer patients with optimal workup and treatment of anemia.
- We undertook this project to improve compliance with the NCCN recommendations to evaluate and treat anemia among gynecologic oncology patients at Vanderbilt University Medical Center (VUMC).
- We conducted a prospective healthcare improvement initiative to align our practice with NCCN recommendations. Baseline data was collected from 1/1/19-12/31/19.



Vanderbilt University Medical Center is an academic medical center based in Nashville, TN. The division of gynecologic oncology includes 4 gynecologic oncologists and 2 nurse practitioners who are members of the Vanderbilt-Ingram Cancer Center, an NCI-designated comprehensive cancer center in Tennessee.

VUMC gynecologic oncology treats patients with gynecologic cancers and is responsible for all aspects of patients' gynecologic oncology care including chemotherapy, surgery, and surveillance.

PROJECT TEAM

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- Alicia Beeghly-Fadiel, PhD, MPH, Assistant Professor of Medicine, Division of Epidemiology
- Sarah Osmundson, MD, MS, Assistant Professor of Obstetrics and Gynecology, Division of Maternal Fetal Medicine
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- Kendall Shultes, PharmD, Assistant Professor of Pharmacy Practice
- Demetra Hufnagel, BS

The primary aim of our health care improvement initiative was to increase VUMC gynecologic oncology compliance with NCCN guidelines (specifically ordering of iron, vitamin B12, and folate studies for hgb ≤ 11 g/dL) by 15% by 7/31/20 for new patients diagnosed with gynecologic cancer and patients undergoing chemotherapy for gynecologic cancer.

MEASURES

- Outcome Measure (impact of intervention): percentage of new VUMC gynecologic oncology patients with hgb $\leq 11g/dL$ who had anemia studies ordered during the intervention period on a monthly basis.
- Process Outcome (how the process is performing): percentage of patients with anemia labs ordered that have labs completed.
- Data was collected by manual chart review of new patient appointments and patients with active chemotherapy plans.

INTERVENTIONS

- Our pre-intervention flow chart suggested that intervention at the ordering step may provide an important opportunity to improve compliance.
- Following an educational presentation in the Division of Gynecologic Oncology presenting our project and the NCCN guidelines, we launched a manual ordering process (PDSA 1) in February 2020. Providers were notified if their patient had hemoglobin ≤ 11 g/dL and a clinical pharmacist pended iron studies, B12, and folate labs for the provider to review and accept if appropriate.
- Our initial plan was for these interventions to focus on the new patient population, however given the COVID-19 pandemic starting in March 2020, volume of new patients with confirmed cancer diagnoses was lower than we had expected during our project planning phase. Accordingly, we implemented our intervention among patients undergoing chemotherapy clearance in April 2020 (PDSA 1.1).

CONCLUSIONS, LESSONS LEARNED, **AND FUTURE WORK**

- Anemia is common among gynecologic cancer patients. Implementation of a healthcare improvement program was associated with significant increases in compliance with NCCN guidelines for evaluation of anemia among gynecologic oncology patients.
- Future PDSA cycles should seek to optimize sustainability of these interventions by reflexing relevant anemia labs for patients with anemic hemoglobin values who have not had prior evaluation. Frequent project updates should continue to be given to the Division of Gynecology Oncology to refine and optimize future work.

REFERENCES

[1] Knight K, Wade S, Balducci L. Prevalence and outcomes of anemia in cancer: a systematic review of the literature. Am. J. Med. 2004;116(7):11–26. [2] Becker PS, Griffiths EA, Alwan, L, et al. NCCN Clinical Practice Guidelines in Oncology: Hematopoietic Growth Factors. Version 2.2020. Available at: NCCN.org.

AIM STATEMENT

- analysis.
- chemotherapy patients.

Run Chart for Patients Undergoing Chemotherapy



- engagement of relevant stakeholders.

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RESULTS

• Data for the post-intervention periods from 2/2/2020-7/31/20 were captured prospectively. The primary outcome was prevalence of anemia and the secondary outcome was compliance with anemia evaluation, including iron, b12, or folate studies. Unadjusted odds ratios (OR) were obtained from logistic regression

• We identified 422 patients, 270 in the baseline (69 new patients, 201 chemotherapy patients), and 152 in the post-implementation cohort (55 new patients, 97 chemotherapy patients). Prevalence of anemia in the entire study population was N=33/124 (27%) among new patients and N=202/298 (68%) among



• Among new patients presenting with anemia, 92% of patients with any anemia order placed had any anemia order completed. Compliance with recommendations for evaluation of anemia increased from **37%** to 93%, OR 22.3 (95% CI 3.4-451.2; p=0.007). In the post-implementation new patient cohort, N=13/14 (93%) underwent any anemia evaluation. Of those with iron evaluation, N=2/13 (15%) had absolute iron deficiency and N=1/13 (8%) had possible functional iron deficiency. Of those with nutritional evaluation, N=0/9 (0%) had B12 deficiency, and N=1/9 (11%) had folate deficiency.

• Among anemic patients undergoing chemotherapy, 93% of patients with any anemia order placed had any anemia order completed. Compliance with recommendations for evaluation of anemia increased from **46%** to 91%, OR 12.2 (95% CI 5.29-33.2; p<0.001). In the post-implementation chemotherapy cohort, N=61/67 (91%) underwent any anemia evaluation. Of those with iron evaluation, N=0/58 (0%) had absolute iron deficiency and N=2/58 (3%) had possible functional iron deficiency. Of those with nutritional evaluation, N=3/53 (6%) had B12 deficiency, and N=9/53 (17%) had folate deficiency.

• To help guide management in the case of abnormal labs, the project team developed a treatment of nutritional deficiency sheet, and frequent updates given to the Division of Gynecology Oncology facilitated