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An Implementation of Combined Fecal/Gastric Occult Blood Testing in the Emergency Department

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An Implementation of Combined Fecal/Gastric Occult Blood Testing in the Emergency

Department

N670- Internship

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July 30, 2023

An Implementation of Combined Fecal/Gastric Occult Blood Testing in the Emergency Department

Abstract

Problem: The gastrointestinal occult blood test is a point-of-care (POC) test used to detect the presence of occult (hidden) gastrointestinal bleeding via stool or gastric contents. Existing fecal and gastric occult blood point-of-care (POC) testing requires separate and unique sampling cards and developer, respectively. Separate fecal/gastric tests are less definitive and take longer than a combined test. Fecal/gastric testing can be improved and more effective using a combined testing mechanism.

Context: This project includes the microsystem of the emergency department, which involves groups of medical professionals, such as groups of clinicians and staff working together with a shared clinical goal to provide the best care for the population of patients.

Intervention: The CNL worked with an emergency department third-year resident and an emergency department attending to compare a commercially available combined fecal/gastric occult blood point of care (POC) testing platform in place of separate fecal and gastric occult blood POC testing platforms currently used. Methods to obtain combined samples were the same procedure as currently done with separate tests.

Measures: Clarity and definitiveness of both combined and separate cards were reviewed through photographs. A before and after survey was presented to staff for their input on preference when it comes to the quality of the different POC cards used in clinical practice.

Result: The combined fecal/gastric POC testing cards were 100% in quality and effectiveness tested against current practice of separate cards. This was established in chart review and photographs for clarity. 100% of registered nurses and providers that participated in the survey

find the combined fecal/gastric POC testing more effective in practice. Twenty samples were obtained from fecal specimen, and twenty samples were obtained from gastric specimen. In total, forty samples were obtained (n = 40, 20 fecal, 20 gastric).

Conclusion: Combined fecal/gastric POC testing is superior and more effective than separate testing cards. Combined fecal/gastric POC tests are valuable to patients and staff in the emergency department.

Keywords: Emergency department, point-of-care testing, gastrointestinal bleed, fecal, gastric

Personal Leadership Statement

The term “leader” is an inclusive and complex definition. Leadership involves the ability to act or lead others. Qualities of a leader include being supportive of others, honest, caring, and compassionate. Nurse leaders look for opportunities for improvement in nursing, and influential nursing leaders deliver high-quality care and ensure patient safety (King et al., 2019).

I take pride in being a nurse. I joined this profession originally to help educate others and provide high-quality patient-centered care. Those values that I hold close to me correlate with natural leadership. Healthcare is constantly changing. Having the ability to adapt to change, adjust, and lead in nursing is essential. As a nurse leader, I have become more self-aware in my practice, recognized my strengths and weaknesses, and devised self-improvement plans.

My strengths as a nurse leader align with my organization's values, mission, and vision. I value compassion, courage, integrity, and providing extraordinary love in every situation. With guidance from other nurse leaders and instructors, my mission as a leader is to provide science-based, technologically precise, compassionately delivered

patient care. My vision as a nurse leader is to provide the highest quality patient care through education and advancing nursing practice (UC Davis Health, 2023).

Nursing is forever evolving, and leaders need to be able to work with change and further educate themselves to adapt accordingly. As a leader working through this project, I have dealt with change and had to adapt swiftly. The theme of my project has changed multiple times, showing my ability to adapt to change, be flexible, and accept the challenge I face. My values of courage and integrity showed were demonstrated in this project and my organization.

I am very proud of this project and excited to see the changes from a quality improvement perspective within my department. Nursing leaders must work closely with other interprofessional team members in the constantly evolving healthcare landscape to ensure quality patient care (Brunt & Bogdan, 2023). My project reflects collaborating with other interprofessional team members for the common goal of quality improvement to provide high-quality patient care. I have worked closely with a third-year resident physician with data collection and will educate and obtain feedback from other nurses and physicians. Teamwork and trust are both essential, and as a leader, I work with other members of the interdisciplinary team together to provide quality patient care.

Problem Description

The gastrointestinal occult blood test is a point-of-care (POC) test used to detect the presence of occult (hidden) gastrointestinal bleeding via stool or gastric contents. In the Emergency Department (ED) setting, fecal or gastric occult blood testing is performed to detect clinically significant occult gastrointestinal bleeding in evaluating patients presenting because of

trauma, anemia, syncope, hypotension, and before the administration of anticoagulants or thrombolytics (Drescher et al., 2020).

Current practice in this emergency department for fecal and gastric occult blood POC testing requires separate and unique sampling cards and developers. Separate fecal/gastric testing are not as definitive and take longer than a combined test. Gastrointestinal occult blood POC testing can be improved and more efficient using a combined testing mechanism.

The desired state is to validate the need for combined fecal/gastric occult blood point of care (POC) testing and utilize those testing kits in the emergency department (See Appendix A, Gap Analysis). A combined fecal and gastric blood occult POC cards do not involve a guaiac developer bottle and only require reading one test versus two, saving time in the emergency department. Therefore, fecal and gastric blood occult POC testing can be improved and more efficient using a combined testing mechanism. The combined cards will develop a result within 60 seconds, faster than the current separate fecal and gastric blood occult POC cards. For the separate cards, it is recommended to wait three to five minutes before adding the developer of the fresh specimen so the stool can penetrate the paper (Pullen, 2005).

Specific Project Aim

The aim is to implement a combined fecal/gastric point of care (POC) testing 100% of the time in the emergency department, replacing the current separate fecal and gastric tests, to improve timing and definitive results by July 2023. (See Appendix B, Project Charter).

Available Knowledge

PICOT

For staff working in the emergency department, how would implementing a combined fecal and gastric blood occult POC testing mechanism compared to the current practice of

utilizing separate fecal and gastric blood occult POC cards affect the quality and definitiveness of tests and staff preference over two months?

Search Strategy

A comprehensive electronic search was completed in April 2023, reviewing and researching different blood occult testing products, instructions and guides for testing, and implementation of fecal and gastric blood occult POC testing in the emergency department. The following databases were utilized: evidence-based journals (*Journal of Emergency Nursing*), CINAHL, DynaMed, PubMed, and Joanna Briggs. To help narrow the search correlating to the PICOT question, the electronic databases were searched using various combinations of keywords and phrases: *emergency department, fecal blood, gastric blood, POC testing, quality of POC testing, quality improvement, POC testing guidelines*. Limitations were set to include a specific date range to emphasize studies (2018-2023), English-only articles, and quality improvement. A total of 2,427 articles came back between 2018-2023 publication and in English, and five articles were evaluated using the Johns Hopkins Nursing Evidence-Based Practice Appraisal Tool (Dang & Dearholt, 2017). (see Appendix C, Evaluation Table).

Synthesis of Literature

Gastrointestinal bleeding is a common presentation in the emergency department and is considered a medical emergency with a mortality rate of up to 14% (Haigh, 2022). Low hemoglobin levels in the complete blood count laboratory specimen may indicate internal blood loss. In acute gastrointestinal bleeding, hemoglobin levels may appear at baseline values (<11.0 g/dL). Hemoglobin can take several hours to be reflected in laboratory specimens and should not be used as a sole predictor of bleeding severity (Salisbury et al., 2021).

A fecal and/or gastric occult blood test in the emergency department would need to be done for further investigation of gastrointestinal bleeding. A digital rectal examination can support the diagnosis of gastrointestinal bleeding as the presence of fecal occult blood and its color can determine if the bleed is active or if the blood is residual (Haigh, 2022). Digital rectal examinations for fecal occult blood tests are an easy and time-saving method for patients with suspected gastrointestinal bleeding (Gurmen et al., 2018). A positive fecal occult blood test can indicate further testing to locate the source of the bleed with a colonoscopy or an endoscopy (Cuthbert & Hashim, 2018).

Summary of Review

As far as comparing the two different cards of fecal and gastric blood occult POC testing, there is not much evidence-based research within the databases to compare. An electronic search engine discovered opinions and reviews for each test, combined vs. separate POC. Evidence-based research involving fecal and gastric blood occult POC testing in the emergency department within the academic databases included research supporting POC testing and its importance of POC testing altogether.

Rationale

Lewin's Change Model

Kurt Lewin displayed a model of organizational change in 1951 consisting of three stage change process reflecting momentous stages in change implementation (Hussain et al., 2018). Lewin suggests that it is imperative to balance motivation and driving forces through effective communication and employee engagement. Stage One of Lewin's Change Model is called "Unfreeze," which prepares for what needs to be changed and ensures strong leadership support.

Stage Two is “Change,” which is implementing the desired change, and Stage Three, “Refreeze,” is solidifying the desired change (Malik, 2022).

This project involves the process of change: from one product used in current practice to another superior product; therefore, Lewin’s Change Model will be used as a framework tool. Lewin’s Change Model gives a framework to help implement a combined fecal and gastric blood occult POC testing mechanism compared to the current practice of utilizing separate fecal and gastric blood occult POC cards. The model encourages emergency nurses to actively control their learning, gain new knowledge, and update existing knowledge. Lewin’s Change Model and the implementation of change involve the encouragement of the current state within a microsystem having to be changed into a desired state (Hussain et al., 2018).

Lewin’s Change Theory has the capability to locate outcome measures/tools to measure how the emergency department can provide high-quality patient care to patients with a suspected gastrointestinal bleed with the help of education and instructions on the change process and implementing the combined fecal and gastric occult POC testing cards into current practice.

Context

Five P’s Assessment

This project includes the microsystem of the emergency department, which involves groups of medical professionals, such as groups of clinicians and staff working together with a shared clinical goal to provide the best care for the population of patients. Understanding the “5 Ps” of the microsystem – purpose, professionals, patients, process, and patterns- is essential in knowing that they are vital elements of a well-functioning microsystem (Barach & Johnson, 2006). The “5 Ps” are woven and interrelated in meeting the patient’s needs.

Purpose/Patients

The setting is an emergency department, a Level 1 Trauma Center in Sacramento, California. The purpose of this emergency department is to be ready to deal with life-threatening situations and serve as the first point of contact for patients of all ages seeking emergent medical care (OSF Healthcare, 2022). The emergency department is open 24 hours a day, seven days a week, prepared to operate when an emergency occurs.

Professionals

Full staffing at the emergency department includes a Charge Nurse, Flow Coordinator Nurse (MICN certified), CNL, Registered Nurses, unit secretaries, mental healthcare workers, emergency department technicians, social workers, respiratory therapists, transport team, front desk registration team, radiology technicians, and phlebotomists. Medical providers include emergency attendings, emergency residents (years 1, 2, and 3), medical students, trauma attendings, trauma residents (years 1, 2, and 3), nurse practitioners, and physician assistants. There are many specialties (cardiology, ICU, pediatrics, burn, neurology, etc.) within the health system and can be called upon to evaluate the patient in the emergency department for further evaluation.

Process/Patterns

A patient will come to the emergency department via ambulance or come to the front entrance for a triage assessment. At triage, based on emergent symptoms and necessity, a patient may be seen and treated right away (most emergent) or may wait for a

bit in the waiting area to be seen (less emergent). Delays can occur if the census within the emergency department is extremely high or the acuity is high. Most people in non-emergent cases may wait for hours in the waiting room. The most critical and emergent cases need to be seen immediately because time is key to preventing trauma and/or death. There are many “between” hand-offs between microsystems. Some patients from the emergency department will be admitted to other units for further care and treatment. These units include: medical-surgical, ICU (intensive care unit), burn unit ICU, Pediatric, and PICU (pediatric intensive care unit). A report of the patient will be made to the nurse assigned in the admitting unit.

Patterns include specific protocols for common emergencies such as trauma codes medical codes, stroke, sepsis, gastrointestinal bleeds, and STEMI alerts. There are blood culture, blood bank, homeless discharge, and medication protocols. The emergency department consists of different pods for the flow of organization. Each pod has a “team lead” nurse used as an extra resource for assistance. If an RN needs assistance or a policy question, they will ask the team lead, then CNL, then the Charge RN. Shift report and treatment is discussed at the bedside for patient and family involvement.

SWOT Analysis

To help examine the strengths and weaknesses of the microsystem that may impact this project, a strength, weakness, opportunities, and threats (SWOT) analysis was conducted. The project’s strengths include the desire of both nurses and physicians for a better and improved clarity, and definitiveness and efficiency of changing out the current separate fecal occult blood POC cards for a better product. A weakness of the

microsystem can involve a busy and overwhelming emergency department and certain staff on-leave not being able to catch up to an updated system once they return to work. Opportunities for the microsystem include updating the education set for annual modules regarding POC testing and having better time efficiency with shorter lengths of stays for the patients utilizing combined fecal occult blood POC cards. Threats can include staff resistance to change and resistance to more education. (See Appendix D, SWOT Analysis).

Stakeholder Analysis

RNs, management, emergency department physicians, clinical educators, and the quality improvement team within the department have the most significant impact on this project. These stakeholders were excellent resources and have a wide range of experience and knowledge from implementing protocols in the emergency department before and still widely used. The head of the department and the Unit-Based Practice Council have been kept in the loop continuously with communication and updates about the project and kept satisfied. Other knowledgeable staff, including emergency department technicians and other physicians, have been adequately informed to ensure no significant issues or snags in change of practice. Patients as stakeholders were monitored through chart review. (See Appendix E, Power Interest Grid Communication Plan)

Interventions

The first action step for implementation was researching and emphasizing the need for combined POC testing with physicians, unit-based practice council, and nurses in the emergency department. Once validation occurred, combined fecal and gastric occult blood POC cards were

ordered for clinical use. Registered nurses and physicians were educated on using the combined testing cards. The combined fecal and gastric blood POC cards and the current state of the separate fecal and gastric occult blood POC cards were tested simultaneously. Eighty testing cards were tested: 20 for combined fecal, 20 for combined gastric, 20 for separate fecal, and 20 for separate gastric. The MD resident took photographs of the results of the combined tests and the current state of separate cards to compare quality and definitiveness. A survey was sent to nurses and MDs to collect data on their personal preferences regarding convenience and quality. A financial budget was built to show the cost savings and how cost-effective it will be to implement combined fecal and gastric occult blood POC testing in the emergency department. (See Appendix F, Gantt Chart Project Timeline).

Cost-Benefit Analysis

Financial analysis, as seen in Appendix G, carefully calculated time in hours, months, resident and nurse hourly rates, and costs of separate and combined fecal occult blood POC testing cards per their respective manufacturer selling rate. The CNL worked 100 hours implementing this project at a one-cost rate of \$9026.10. This was calculated with the base hourly rate of \$66.86 times 1.35% for benefits totaling \$90.26/hour. The third-year resident spent ten hours of a one-cost rate of \$469.67, calculated based on an hourly rate of \$46.87/hour after including 1.35% to reflect benefits is \$34.79. This project's one-time cost for the MD and CNL's time is \$9,495.67.

Reading time is considered, as seen in the legend in Appendix G (financial analysis). Eighty tests were done during this implementation to assess and compare combined and separate POC testing: 20 combined fecal, 20 combined gastric, 20 separate fecal, and 20 separate gastric.

This was done in one month. It took an average of five minutes to read each test. Five minutes multiplied by 80 equals 400 minutes. Four minutes multiplied by 12 months equals 4,800 minutes a year. 4,800 divided by 60 minutes equals 80 hours a year of reading time. Eighty hours a year multiplied by MD resident wage of \$46.97 an hour equals \$3,757.60. Eighty hours a year multiplied by CNL wage of \$90.26 an hour equals \$7,220.80. The total current cost of reading time a year for the MD and CNL is \$10,978.40.

The cost of one box of the separate POC testing cards (consisting of 100 tests) costs \$93.86. Since 40 separate POC cards are being tested for this project to be compared to the combined cards, one box of 100 separate tests multiplied by six to cover the year will equal \$563.16. One box of combined cards (40 tests) costs \$124.74. One box of 40 combined POC cards multiplied by 12 months to cover the year equals \$1,496.88. The total for separate fecal and gastric occult blood POC testing equals \$2,060.04.

With all this considered, the total cost for MD one-time cost, CNL one-time cost, respective reading times, and cost of separate fecal and gastric occult POC testing cards equal \$13,038.24. The cards implemented will be cut in half for future expenses since the tests will now be combined fecal and gastric. Forty multiplied by the MD resident hourly rate of \$46.97 will total \$1,878.66. 40 multiplied by the CNL hourly rate of \$90.26 will total \$3,610.44. Altogether, future expenses for reading combined tests for the MD and CNL will equal \$5,489.10. This future expense is different than the current MD and CNL reading time because the reading time is cut in half – instead of 80, the MD and CNL will read 40 tests.

Combined fecal and gastric blood occult POC cards cost \$122.99 for a box of 50 tests. One box multiplied by 12 to cover the year will cost \$1,475.88. The total reading time of the MD and CNL plus the cost of combined cards will total \$6,964.98 for future expense costs.

The total project expense for year one will be \$2,530.69, which includes the reading time for the separate tests and the one-time cost of the MD and CNL's time. After year two and years moving onward, the total project savings will eliminate the time of reading the separate cards and replace those with the combined reading times. The total project savings for year two and onward is \$6,073.26 each year. This project will save the unit money over time.

Study of the Intervention

The CNL checked in with the emergency resident and evaluate the progress of the combined tests compared to separate fecal and gastric blood occult POC cards. The CNL will listen and collect feedback for quality, definitiveness, and preference. Photographs of combined fecal and gastric blood occult POC cards were compared against the separate POC cards used, and were reviewed for clarity and definitiveness. The CNL continued to measure and educate staff on current testing and informed them of a survey after the completion of the study to collect their feedback on preference and accuracy. Electronic health records provided information to analyze and detect failures in the diagnostic process.

Ethical Considerations

This evidence-based project has been approved by the University of San Francisco and has met the criteria of the Non-Research Determination Form (See Appendix H). The project is also research-based; therefore, the Institutional Review Board (IRB) did not need approval. This project aligns with the University of San Francisco Jesuit Core Values by practicing *cura personalis*, or care for the whole person, for quality improvement and to improve patient

outcomes and provide high-quality patient-centered care. (University of San Francisco, 2023). This project lies securely within Provision 4 (interpretive statement) of the American Nurses Association Code of Ethics, “the nurse has authority, accountability, and responsibility for nursing practice; makes decisions; and takes action consistent with the obligation to promote health and to provide optimal care” (ANA, 2015).

Outcome Measure Results

The combined fecal/gastric POC testing cards were 100% in quality and effectiveness tested against current practice of separate cards. This was established in chart review and photographs for clarity and definitiveness. 100% of registered nurses and providers that participated in the survey found the combined fecal/gastric POC testing more effective in practice.

Summary

Combined fecal/gastric POC testing is superior and more effective than separate testing cards. The combined fecal/gastric POC test cards developed faster than the separate counterpoint. Nurses and providers discovered that the combined fecal/gastric POC test cards and education of clinical use were easy to navigate in practice. This project is expected to continue, with nursing staff to perform all fecal/gastric POC testing with the combined POC testing platform.

Conclusion

In the Emergency Department setting, fecal or gastric occult blood testing is performed to detect clinically significant occult gastrointestinal bleeding. Occult blood testing is highly used in the unit to help confirm or rule out gastrointestinal bleeding to help determine an appropriate patient disposition. This project confirmed that combined fecal/gastric occult blood testing cards

are superior than the separate testing cards used in past practice. Education of combine cards test use, along with active communication with providers and nurses, helped vindicate this project successful.

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Appendix A

Gap Analysis

Gap Analysis		
Area under consideration: Implementing a combined fecal/gastric occult blood qualitative testing in the emergency department		
Desired State	Current State	Action Steps
Validate the need of combined fecal/gastric occult blood point of care (POC) qualitative testing and utilize those testing kits into the emergency department	The emergency department currently uses separate fecal and gastric occult blood POC testing	Emphasize need of combine POC testing with physicians, unit-base practice council, and nurses.
		Order combined fecal/gastric blood POC testing for clinical use.
		Educate staff on how to use combined testing in practice.
		Test combined fecal/gastric blood POC with current state of separate fecal and gastric occult blood POC.
		Compare results of tests and results through utilization survey with nurses and MDs.
		Develop financial budget for implementing combined fecal/gastric occult blood POC qualitative testing.

Appendix B

Project Charter

Project Charter: Implementation of Combined Fecal/Gastric Occult Blood Testing in the Emergency Department.

Global Aim: Implement the need of combined fecal/gastric occult blood point of care (POC) testing and utilize those testing kits into the emergency department.

Specific Aim: Implement combined fecal/gastric point of care (POC) testing 100% of the time, to replace the current separate fecal and gastric tests, to improve timing and definitive results by July 2023.

Background: Fecal/gastric testing can be improved and be more efficient using a combined testing mechanism. Current separate fecal/gastric testing are not as definitive and take longer than a combined test. The clinical nurse leader (CNL) will work with an emergency department third year resident and an emergency department attending to compare a commercially available combined fecal/gastric occult blood point of care (POC) qualitative testing platform in place of separate fecal and gastric occult blood POC testing platforms used in current practice. Methods to obtain combined samples is the same procedure as currently done with separate tests. Fecal samples will be obtained via digital rectal exams or stool, and gastric samples will be obtained from emesis or naso-/oro-gastric. Samples will be applied to the respective combined POC card.

Sponsors:

Unit-Based Practice Counsel.
Quality Improvement Team.
Nurse Manager.

Interventions:

- 1) Emphasize the need of combine POC testing with emergency department physicians, unit-base practice council, and nurses.
- 2) Order combined fecal/gastric blood occult POC testing for clinical use.
- 3) Educate staff on how to use combined testing for clinical practice.
- 4) Test combined fecal/gastric blood POC with current state of separate fecal and gastric occult blood POC.
- 5) Compare results of tests and results through utilization survey with nurses and MDs.
- 6) Develop financial budget for implementing combined fecal/gastric occult blood POC qualitative testing.

Measures:

Measure	Data Source	Target
Outcome		
# of tests using combined POC	Chart Review	100%
Process		
% of results that are definitive	Chart review	100%
% of results that are readable in a certain amount of time	Chart Review	50%
Balancing		
RN and MD preference to utilize/update new POC	Survey	100%

Team:

Clinical Educators

RNs
ED Resident Year 3
ED Attending

Measurement Strategy

Data Collection Method:

- 1) Photographs: comparing photographs of combined fecal and gastric blood occult POC cards against the separate POC cards used. Clarity and definitiveness of both combined and separate cards will be reviewed through the photographs.
- 2) Survey: A before and after survey will be presented to staff for their input on preference when it comes to quality of the different POC cards used in clinical practice.
- 3) Chart Review: using the data from electronic health records provides information to analyze and detect failures in the diagnostic process.

Data Definitions

Data Element	Definition
Photographs	Qualitative data. Uses a series of still photographs taken over a period of time to discern changes taking place and to compare.
Survey	Lists a set of structured questions to which respondents provide answers based on their experience and preference. Allows to access

	information from a predefined group of respondents during research.
Chart Review	Conducting chart reviews using the data from electronic health records provides information to analyze and detect failures in the diagnostic process.

Measure Description

Measure	Measure Definition	Data Collection source	Goal
% of patients with combined POC	N= 20 fecal; 20 gastric D=# patients admitted	Chart review	100%
% RNs and MDs preference	N= # RNs and MDs participating in survey	Survey	100%
% effective of combined tests	N = # combined tests	Photographs	100%

Appendix C

Evaluation Table

Citation	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied and their Definition	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Cuthbert & Hashim, 2018.	None Identified.	Design: Retrospective Analysis. Methods: Chart review of fecal occult blood tests obtained during a three-year period (2010-2013).	Sample: 5,028 fecal occult blood tests. Setting: Emergency Department.	IV: Reason for EGD (esophagogastroduodenoscopy) and colonoscopy. DV: fecal occult blood testing result.	Comparisons and review of findings from chart review.	More negative results than positive ones: 3571 negative (71.0%) vs 1457 positive (29.0%); 2582 subjects had only negative results (68.2%), whereas 1205 had at least 1 positive result.	The results of fecal occult blood tests are rarely used for patient management. Eliminating the routine diagnostic use of fecal occult blood tests in those settings would not compromise patient care.	JHNEBP Critical Appraisal Tool Rating: Level III B. Strengths: largest inpatient and ED review in the literature, with more than 5000 FOBT results and more than 12,000 endoscopy procedures scheduled during the study period. Limitations: Not indicated by authors.
Drescher et al., 2020.	None Identified.	Design: Scoping Review Method: Review and	Sample: 25 articles were researched.	IV: 5 clinical workups mentioned (trauma, anemia, syncope, hypotension,	Not described.	Not described.	Fecal occult blood testing in the ED is margin	JHNEBP Critical Appraisal Tool Rating: Level V C.

		scrutinize the literature to assess the utility of fecal occult blood testing the emergent setting.	Setting: Emergency department.	before administering anticoagulants. DV: POC testing.			al, with indication only in select cases.	Strength: Not indicated by authors. Limitations: Not indicated by authors.
Gurmen et al., 2018.	None Identified.	Design: Retrospective analysis Method: Chart review of patients who were referred to the ED between 01/08/2012-08/08/2013 with Gastrointestinal System (GIS) bleeding symptoms and then underwent endoscopic examination were investigated.	Sample: 274 patients aged 18 years and older. Setting: Emergency Department.	IV: diagnostic testing to detect GI bleeds. V: % active bleeding detected.	Retroactive analysis of data collected through chart review in the ED from 01/08/2012 - 08/08/2013 .	In patients with positive digital rectal examination findings, endoscopy results were also highly positive for GIS bleeding.	The results of the digital rectal examination are an easy and time-consuming examination method .	JHNEBP Critical Appraisal Tool Rating: Level III B. Strength: Not indicated by authors. Limitations: Not indicated by authors.

Haigh, S., 2022.	None identified.	Design: Peer-reviewed case study. Method: Detailed medical history of patient.	Sample: A 65-year-old man who self-presented to an ED with a two-day history of abdominal pain and melena. Setting: Emergency department.	IV: treatment received in ED. DV: Effectiveness of treatment.	Not described in case study.	Not described in case study.	A prompt and effective assessment of critically unwell patients who present with upper GI bleeding is essential to identify life-threatening issues.	JHNEBP Critical Appraisal Tool Rating: Level V C. Strength: Not indicated by authors. Limitations: Not indicated by authors.
Salisbury et al., 2021.	None Identified.	Design: Case report Method: Detailed medical history of patient.	Sample: a 93-year-old female with FOBT positive melanotic stool. Setting: Emergency department.	IV: history of foods that patient ate prior to ED admission. DV: false positive POC test result.	Not described in case report.	Not described in case report.	Fecal occult blood testing has been validated for its use in emergency settings, it has limited validation as a screening tool for	JHNEBP Critical Appraisal Tool Rating: Level V C. Strength: Not indicated by authors. Limitations: Not indicated by authors.

							upper GI bleeds.	
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Appendix D

SWOT Analysis

	Favorable/Helpful	Unfavorable/Harmful
Internal (attributes of	<p>Strengths</p> <ul style="list-style-type: none"> • Nurses and MDs desire for better efficiency. • Improved clarity of tests. • Desire for better quality and definitiveness. 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Busy and overwhelming emergency department. • Staff on-leave may not be caught up to updated protocol once they return to work.
External (attributes of the organization)	<p>Opportunities</p> <ul style="list-style-type: none"> • Updated education set for annual modules. • Updated POC documentation for EHR. • Time efficiency- shorter length of stay. 	<p>Threats</p> <ul style="list-style-type: none"> • Staff resistance to change. • Staff resistance to update education.

Appendix E

Power Interest Grid Communication Plan

 Level of Power	Keep Satisfied High Power, Low Interest	Manage Closely High Power, High Interest
	Head of Department Unit-Based Practice Council	RNs Management Clinical Educators Quality Improvement Team MDs
	Monitor Low Power, Low Interest	Keep Informed Low Power, High Interest
	Patients	ED Technicians
Level of Interest		

Appendix F

Gantt Chart
Project Timeline

TASKS	LEAD	APRIL	MAY	JUNE	JULY	AUGUST
Build project and budget	CNL	X				
Order tests	MD	X				
Educate Staff	CNL		X			
Combined test vs separate tests	MD/CNL		X	X		
Compare Results/Send Survey	MD/CNL				X	

Financial Analysis

Implementing a Combined Fecal/Gastric Occult Blood Qualitative Testing in the Emergency Department					
Current Expenses:	Hours:	Hourly Rate:	Hourly rate with Benefits (X 1.35)	Months	Total
MD Resident Time/ Reading Tests	80	34.79	46.97	12	3757.32
Staff time /Reading Tests	80	66.86	90.26	12	7220.88
Total Current Costs					10,978
	# of Cards (1 box)	Cost of Box	Months		
Separate POC Hemoocult cards	100	93.86	6		563.16
Separate POC Gastrococult cards	40	124.74	12		1,496.88
Total Current Costs					2,060.04
Total Costs:					13,038.24
Future Expenses:	Hours	Hourly Rate:	Hourly rate with benefits (X 1.35)		Total
MD Time/Reading test	40	34.79	46.97		1,878.66
Staff reading time	40	66.86	90.26		3,610.44
Total Reading Time					5,489.10
	# of Cards (1 box)	Cost of Box	Months a Year		
Combined POC testing cards	50	122.99	12		1,475.88
Total Future Expenses Costs:					6,964.98
One Time Implementation Cost	Hours	Hourly Rate	Hourly with Benefits (X 1.35)		Total
MD Resident time/evaluation (one time costs)	10	34.79	46.9665		469.67
CNL time/evaluation (one time costs)	100	66.86	90.26		9026
Total One Time Costs					9,495.67
Project Expense After Implementation Year 1					-2,530.69
Project Savings (Year 2 and Years after)					6,073.26

Reading Time						
Average Minutes to Read Tests	# of tests	Minutes per Month (minutes x total tests)	Months a Year	Minutes a Year	Hours a Year	
	5	400	12	4,800	80	
Combined (fecal)	20					
Combined (Gastric)	20					
Separate (Fecal)	20					
Separate (Gastric)	20					
Total Test	80					

Appendix H

Statement of Non-Research Determination Form**Student Name:** DESIREE LONG

Title of Project: Implementation of Combined Fecal/Gastric Occult Blood Qualitative Testing in the Emergency Department.

Brief Description of Project: This RN will work with an ED third year resident and ED attending to validate a commercially available combined fecal/gastric occult blood point of care (POC) qualitative testing platform against separate fecal and gastric occult blood POC testing platforms used in current practice. Fecal samples will be obtained via digital rectal exams or stool, and gastric samples will be obtained from emesis or naso-/oro-gastric. Samples will be applied to the respective POC card and to the combined fecal and gastric blood occult POC card.

A) Aim Statement: Implement combined fecal/gastric point of care (POC) testing 100% of the time, to replace the current separate fecal and gastric tests, to improve timing and definitive results by July 2023.

B) Description of Intervention:

- Emphasize need of combined POC testing with physicians, unit- base practice council, and nurses.
- Order combined fecal/gastric blood POC testing for clinical use.
- Educate staff on how to use combined testing for clinical practice.
- Test combined fecal/gastric blood POC with current state of separate fecal and gastric occult blood POC.
- Compare to current practice.
- Develop financial budget for implementing combined fecal/gastric occult blood POC qualitative testing.

C) How will this intervention change practice?

- Expected improved quality of testing and timing.
- Less complicated testing for MDs and RNs.

D) Outcome measurements:

<ul style="list-style-type: none"> - Results will be recorded by the investigator as positive, negative, or indeterminate. - Samples will be labeled with a unique code and test cards will be photographed - Survey to RNs and MDs for preference, convenience and definiteness.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used:

(<http://answers.hhs.gov/ohrp/categories/1569>)

This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title:	YES	NO
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	x	
The specific aim is to improve performance on a specific service or program and is a part of usual care . ALL participants will receive standard of care.	x	
The project is NOT designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does NOT follow a protocol that overrides clinical decision-making.	x	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does NOT develop paradigms or untested methods or new untested standards.	x	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does NOT seek to test an intervention that is beyond current science and experience.	x	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	x	
The project has NO funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	x	

