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Final DNP Practice Report

Evaluating the Effectiveness of Norton Cancer Institute's Prompt Care Clinics

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Spring 2018

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Dedication

My DNP project is dedicated to the patients and families of Norton Cancer Institute and Norton Cancer Institute's Prompt Care Clinics. The Norton Cancer Institute Prompt Care Clinics have motivated me to continue to look for ways to improve patient care and outcomes. This is for my husband, who has always been a constant source of support and encouragement. This is for my children, who constantly remind me that I can do anything I set my mind too and has supported me through this journey. This is to my mother, who never fails to tell me how proud she is of me and "I knew you could do it." This is to my granddaughter, Olivia who always brings a smile to my face and reminds me to set an example for her and others who want to further their education and pursue their dreams.

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Abstract

Purpose: The purpose of this project was to evaluate outcomes of implementation of the Norton Cancer Institute (NCI) Prompt Care Clinics (PCCs), to include number of emergency room (ER) visits and number of inpatient admissions. A second purpose of the study was to identify presenting symptoms for patients seen in the NCI PCCs and compare the average charge per case for patients seen in the ER or NCI PCCs with the same diagnosis.

Methods: This study employed a pre-post implementation retrospective review of NCI patient electronic medical records (EPIC) to examine the effectiveness of the NCI PCCs on ER visits, inpatient admissions, and average charge per case for patients seen in the ER and NCI PCC.

Results: Prior to implementation of the PCCs, 5.2% of patients went to the ER, 16.6% were admitted, and 78.2% were seen at one of the NCI facilities. Post implementation, 3.6% of patients went to the ER, 17.5% were admitted, 21.8% were seen at NCI Offices, and 57.1% went to the NCI PCCs. Of the 280 encounters seen at NCI Offices or the NCI PCC's, the most frequent symptoms were nausea (13%), followed by emesis (13%), fever (11%), dehydration (9%), diarrhea (8%), anemia (3%), and pneumonia (<1%). There was a significant difference in charges for the NCI PCCs versus the ER visits for patients seen with dehydration ($p=.047$), diarrhea ($p=.013$), and fever ($p=.014$).

Conclusion: During the six-month study period, there was no significant difference in number of ER visits or inpatient admissions over time but cost savings were noted for patients presenting with specific symptoms.

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Evaluating the Effectiveness of Norton Cancer Institute's Prompt Care Clinics

Introduction

According to the Centers for Medicare and Medicaid Services (CMS, 2016), as of 2020 Medicare payments will be impacted by a measure known as OP-35. According to Miller (2016), OP-35 will focus on oncology patients who received chemotherapy within the last 30 days and were seen in the Emergency Room (ER) or admitted for anemia, nausea, dehydration, neutropenia, diarrhea, pain, emesis, pneumonia, fever, and sepsis. The new OP-35 measure is claim-based and focuses on outcomes and not process. As a result of OP-35, oncology symptom-based clinics are beginning to develop. According to Meisenberg et al. (2014), some clinics focus exclusively on palliative care and hospice transition while others focus on urgent care issues. Despite several examples of such clinics reported in the literature, data referencing the operational metrics and results are sparse (Meisenberg et al. 2014).

To reduce avoidable ER visits and hospital admissions among oncology patients receiving chemotherapy, Norton Cancer Institute (NCI) developed the NCI Prompt Care Clinics (PCCs). Under the supervision of an oncologist, nurse practitioners provide same day appointments to manage patients' symptoms associated with their disease or treatment. Decreasing avoidable ER visits and inpatient admissions will reduce over-utilization of services and help NCI avoid payment penalties. The goal of the NCI PCCs was to limit the use of Norton Healthcare ERs and inpatient admissions to those without one of the 10 diagnoses included in OP-35.

Background

Side effects are a common occurrence for people undergoing cancer treatment. Nausea, vomiting, fatigue, and other physical discomforts are notorious symptoms of chemotherapy and

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other cancer therapies (National Comprehensive Cancer Network, 2018). A fever may not send most people to the doctor's office. However, for a cancer patient, fever, along with weakness and pain, could signal an infection – and may prompt a visit to the ER (Cleveland Clinic, 2018).

Neutropenia is often associated with fever. Chemotherapy often leads to a reduced white blood cell count, called neutropenia. This condition causes the patient's body to be less effective at fighting off infection. For patients with a weakened immune system, infections need to be treated before they cause greater complications (Cleveland Clinic, 2018). Patients frequently go to the ER for symptom management, where they are seen by a non-oncology provider and have a 50% chance of being admitted to the hospital (Vandyk, Harrison, MacCartney, Ross-White, & Stacey, 2012). Unplanned ER visits place oncology patients at risk for adverse outcomes due to the ER providers' unfamiliarity with chemotherapy agents and their specific toxicities or the patients' treatment regimens (Considine, Livingston, Bucknall, & Botti, 2008).

Oncology patients should have a clear understanding of what to do when they experience chemotherapy related symptoms. According to the National Comprehensive Cancer Network (2018), symptoms are often expected complications of cancer therapy. Symptoms can develop over time or quickly. There are times when a patient will need to be seen in the clinic, in the ER, or admitted to the hospital to manage their symptoms. It is important for patients to know when to contact their provider or to seek emergency help. Initial and ongoing education about the side effects of cancer treatment should be provided to patients and their families, to help patients determine when to call their providers and when to go to the ER. Often symptoms are easier to treat and manage more effectively earlier than later (National Comprehensive Cancer Network, 2018).

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Normally, the oncology nurse or oncologist can make a determination as to the best course of action for the patient via the telephone. For some patients simply increasing, decreasing, or changing medications can resolve the symptom. However, if the oncology nurse or oncologist believes a symptom may lead to a life-threatening event, the patient will be referred to the ER. Not all events are life threatening that warrant a visit to the ER (National Comprehensive Cancer Network, 2018). Patients who are unable to keep fluids down or have symptoms of dehydration such as dizziness, dry mouth, or who feel light-headed especially when changing positions may require intravenous fluids and need to go to the ER (National Comprehensive Cancer Network (2018). In addition, if the oncology clinic is not open during the evenings or weekends when symptoms begin, patients will seek help in an ER. Once, in the ER it is important the patient or family member has a detailed medical history, including what chemotherapy, radiation, and/or surgeries patients have received (National Comprehensive Cancer Network, 2018).

In November 2016, NCI opened the first NCI PCC on the Norton Medical Pavilion campus. In March 2017, the second NCI PCC opened on the Norton Women's and Children's campus. Both NCI PCCs are located within NCI offices. The NCI PCCs were staffed with a nurse practitioner, nurses, medical assistants, and registrars. The clinics were open Monday through Friday from 12:00 pm to 8:00 p.m. Patients seen within NCI's PCCs were those who developed a medical need outside of their scheduled physician appointment or treatment. The NCI PCCs utilized oncology nurses to triage symptom management calls. The nurse would either address the symptom via the telephone or notify the oncologist to see if the patient was appropriate for the NCI PCCs. If appropriate, the patient was brought in the same day and evaluated and treated by the NCI PCCs nurse practitioner. The NCI PCCs allowed for

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reasonable co-localization between surgery, medical oncology, radiation, and ancillary service sites within each medical campus.

Purpose

The purpose of this project was to evaluate the effectiveness of the NCI PCCs in reducing ER visits and inpatient admissions due to symptoms defined by the OP-35, within 30 days of chemotherapy. Specifically, this study aimed to 1) compare the percentage of patients seen in the ER or admitted to the hospital within 30 days of chemotherapy prior to, and following the implementation of the NCI PCCs, 2) identify presenting symptoms for patients seen in the NCI PCCs and 3) and compare the average charge per case for patients seen in the ER or NCI PCCs with the same diagnosis.

Methods

Study Design

This study employed a pre-post implementation retrospective review of NCI patient electronic medical records (EPIC) to examine the effectiveness of the NCI PCCs on ER visits, inpatient admissions, presenting symptoms, and average charge per case for patients seen in the ER and NCI PCC. Patient data were extracted from EPIC pre-implementation of the NCI PCCs (January 2016 through June 2016) and post-implementation of NCI PCCs (January 2017 through June 2017).

Setting

The setting for the study was the NCI PCCs at Norton Pavilion and Norton Women's and Children's campus at Norton Healthcare. The NCI PCCs were staffed with a nurse practitioner, nurses, medical assistant, and a registrar. Both locations served patients who were in active treatment and suffered an acute issue in one of the seven facilities operated by NCI.

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Sample

The sample consisted of 150 patients who were randomly selected from pre and post implementation, yielding a sample size of 300 patients. Active chemotherapy patients were eligible for inclusion in the study if they sought medical care within 30 days of chemotherapy treatment for one or more of the 10 avoidable conditions stated by OP-35 (anemia: D64.9, nausea: R11.0, dehydration: E86.0, neutropenia: D70.9, diarrhea: R19.7, pain: G89.4, emesis: R11.10, pneumonia: J18.9, fever: R50.9, and sepsis: A41.9). Patients were excluded if they were not receiving active chemotherapy, were hematology patients, or were not seen by an NCI provider. A separate file of all NCI PCCs visits was extracted. These data were linked with the 2017 data by medical record number, visit type and date of service to obtain presenting diagnosis (ICD-10) and determine disposition following the NCI PCCs visit.

Measures

Data fields extracted for eligible patients included: medical record number, hospital account record, check-in date, discharge date, patient type, diagnosis code (ICD-10), diagnosis name, entity (Norton Audubon Hospital, Norton Brownsboro Hospital, Norton Hospital, Norton Women's and Children's Hospital, NCI Audubon, NCI Brownsboro, NCI Jeffersonville, NCI Pavilion, and NCI St. Matthews), nursing station, total charge, medical record match, and difference in days from chemotherapy. Patient data were provided at the encounter level, as some patients sought care multiple times (perhaps at multiple facilities) throughout the study periods.

Data Analysis

Frequency distributions were used to summarize visit type and diagnosis. Costs per diagnosis were summarized using medians and interquartile ranges and compared between ER and practice visits via the Mann-Whitney U test. The chi-square test of association was used to

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evaluate differences in primary visit type, location, symptoms, and disposition. All analyses were conducted using SPSS version 22; an [alpha] level of .05 was used for statistical significance throughout.

Results

Comparison of Patients Pre and Post Implementation of NCI PCCs

Between January 2016 and June 2016, the pre-NCI PCC period, 229 encounters were recorded from 150 randomly selected unique NCI patients seeking help for symptom management (see Table 1). For the 229 encounters, 12 (5.2%) went to the ER, 38 (16.6%) were admitted, and 179 (78.2%) were seen at one of the NCI facilities. Between January 2017 and June 2017, the post-NCI PCC period, 280 encounters were recorded for 150 randomly selected unique NCI patients seeking help for symptom management. For the 280 encounters, 10 (3.6%) went to the ER, 49 (17.5%) were admitted, 61 (21.8%) were seen in NCI Offices, and 160 (57.1%) went to the NCI PCCs.

In 2016 a total of 12 (5.2%) patients were seen in the ER and in 2017 a total of 10 (3.6%) patients went to the ER. Four out of the 10 diagnosis codes CMS reports as avoidable were documented with these visits. Two patients were seen for dehydration, three for diarrhea, five for fever, and one for nausea. There was no significant difference in ER visits or inpatient admissions over time ($p=.64$).

Summary of Characteristics for NCI PCCs

There were a total of 160 encounters from 150 unique patients seen in the PCCs between January 2017 and June 2017 at NCI Pavilion and NCI St. Matthews (see Table 2). Over one-third (39%) of encounters at the PCCs were due to symptom management using the 10 avoidable diagnosis codes listed from CMS. The most commonly reported symptom was nausea (13%),

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followed by emesis (13%), fever (11%), dehydration (9%), diarrhea (8%), anemia (3%), and pneumonia (<1%). A total of 98% of patients were sent home from the NCI PCC; 3% were admitted to the hospital; and (0%) were sent to the ER.

Analysis Variable: Charges

Utilizing the 2017 data, there were 146 randomly selected patients who were seen in the ER or the NCI PCCs (see Table 3). The Mann Whitney U test was used to compare the medians rather than the means. Of these patients, 11 were seen in the ER and 135 were seen in the NCI PCC with a diagnosis of dehydration, diarrhea, fever, or nausea. The sample size for the ER group was small. There was a significant decrease in charges for patients seen at NCI PCCs versus charges for the ER visits for patients seen with dehydration ($p=.047$), diarrhea ($p=.013$), and fever ($p=.014$). There was no significant difference for patients seen with nausea ($p=.09$).

Discussion

This study aimed to evaluate the effectiveness of the NCI PCCs on avoidable ER visits, inpatient admissions, and average cost for an ER or NCI PCCs visit with patients experiencing one of the ten avoidable diagnoses per CMS. No significant difference in ER visits and inpatient admissions to the hospital after the implementation of NCI PCCs was demonstrated. The clinic saw a mixture of patients in the NCI PCCs; however, only 39% of those patients were seen for one of the 10 avoidable diagnoses. A significant difference in average cost per case was noted for a patients who were seen in the NCI PCCs with dehydration, diarrhea, and fever. However, there was no significant difference for nausea as only one patient was seen in the ER during this study period. The researcher was unable to provide a comparison for anemia, neutropenia, pneumonia, and sepsis with the randomly selected sample. The NCI PCCs provided same day appointments for patients not only for the ten avoidable diagnoses but also for other symptoms

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that prevented patients from going to the ER. After the clinics were open for a continued time period, patients and providers became more familiar with what the NCI PCCs could provide.

The NCI PCC program is similar to the Oncology Acute Toxicity Unit (OATU) at Bellvitge University Hospital (Majem et al. 2007) and the Supportive Care Clinic (SCC) located on the campus of the Anne Arundel Medical Center (Meisenberg, Graze, Brady and Copertino (2014). According to Majem et al. (2007), the OATU was implemented to improve the management of toxicity due to chemotherapy. The clinic utilizes oncology nurses to triage calls which filtered out inappropriate non-toxicity-related events (Majem et al. 2007). Depending on the symptoms, the issue is resolved via telephone, or a consultation visit at the OATU is arranged. The OATU enables prompt and efficient access of patients to medical oncology facilities in the event of toxicity due to chemotherapy. Unnecessary ER use was avoided while oncology outpatient and hospitalization facilities were optimized (Majem et al. 2007). The Supportive Care Clinic (SCC) has an embedded clinic in a physician practice in which nurse practitioners deliver most of the care for symptom management (Meisenberg, Graze, Brady and Copertino (2014). This study measured disposition of patients from the SCC to the ER and the effect on the ER visits and admissions for symptom management. An estimated 66 ER visits were avoided by patients accessing the SCC. Same-day and next-day appointments with the nurse practitioner were arranged for patients. The most common complaints were related to pain and gastrointestinal issues. According to, Meisenberg, Graze, Brady and Copertino (2014), most patients were discharged home with a few of them needing ER level care or admission to the hospital.

The outcomes from the OATU (Majem et al. 2007) and the SCC (Meisenberg, Graze, Brady and Copertino (2014) indicate that the NCI PCCs will become more effective over time.

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All three studies utilized the telephone as the first point of contact for patients. This allows for patients to voice their concerns to a trained oncology nurse. Nurses trained in oncology symptom management will help decrease avoidable ER visits through effective triage management. The OATU and SCC demonstrated a decrease in ER visits after their implementation indicating NCI PCCs will become more effective over time. All three clinics indicated a large number of patients were evaluated, treated, and dispositioned home after being seen by the nurse practitioner.

Limitations

Several limitations were identified in the design of this study. The data collected for the NCI PCCs were limited to the 10-specific diagnoses. Other presenting diagnoses to the NCI PCCs were excluded, although they may have prevented an ER visit or admission. The sample size was randomized and consisted of 150 patients seen pre and post implementation of the NCI PCCs. This study only focused on NCI PCCs pre and post data, therefore not allowing for a comparison of variables from another organization. If information was entered into the electronic medical record incorrectly, results could be inaccurate, distorting the outcomes of the objectives.

Another limitation included consideration for patients presenting to the ER because the NCI PCCs was closed. Location of the patient may have been a consideration in relation to whether the patient presented to the ER versus the NCI PCCs. Data were not extracted to show what occurred prior to the admission. For example: was it a planned admission, or did the admission occur after the patient was triaged by the oncology nurse and directly admitted by the oncologist? Direct costs per case were not evaluated. Cost analysis was based on average charges per symptom for the ER and NCI PCCs. This study sample was small which prevented the researcher from doing a comparison for all 10 avoidable diagnosis codes. The actual cost

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savings for an NCI PCCs patient may vary depending on what services were performed during the encounter.

Recommendations for Future Studies

Recommendations for future studies include further investigation of all symptom diagnosis codes that are seen at NCI PCCs to more accurately determine how many ER visits or admissions are avoidable. Studies related to the timing and demographics of patients presenting to the ER would identify optimal hours for the NCI PCCs and need of additional clinics. This study focused on NCI PCCs. A comparison of other symptom management clinics could provide valuable information to identify evidence-based interventions that improve outcomes. This study utilized a random selection of patients seen in the ER or NCI PCCs using one of the ten ICD.10 codes. A thorough cost analysis on all active patients receiving chemotherapy who present to the NCI PCCs versus the ER would be beneficial. This would allow for a more accurate return on investment for NCI. NCI PCCs patient satisfaction surveys would give insight into patient perspectives on the ER versus the NCI PCCs setting. Finally, oncology readmission rates need to be investigated in future studies.

Conclusion

In conclusion, the goal of this project was to evaluate the effectiveness of the NCI PCCs in reducing ER visits and inpatient admissions due to symptoms defined by OP-35. During the six-month study period there was no significant difference in ER visits or inpatient admissions over time but cost savings were noted for patients presenting with specific symptoms. The NCI Offices/PCCs did enable prompt and efficient access to care for 221 encounters who presented with one of the ten avoidable diagnosis codes per CMS. Future analyses will need to focus on expanding locations, increasing hours of operation, including all symptoms to the NCI PCCs,

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direct cost per case for NCI PCCs and ERs, and patient perspectives on NCI PCCs versus ER visits.

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Table 1. Comparison of Patients Pre and Post Implementation of NCI PCCs (N=300)

Visit type	Pre-PCC (229 Encounters)	Post-PCC (280 Encounters)	
	n % Encounters	n % Encounters	
ER	12 (5.2%)	10 (3.6%)	
Inpatient	38 (16.6%)	49 (17.5%)	
Clinic	179 (78.2%)	61 (21.8%)	160 (57.1%)
	NCI Offices	NCI Offices/NCI PCCs	NCI PCCs

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Table 2. Summary of Presenting Symptoms and Disposition from the NCI PCCs (n=150 Unique Patients, 280 Encounters)

Symptom	n (%) encounters
Anemia	4 (2.5%)
Dehydration	15 (9.4%)
Diarrhea	12 (8.0%)
Emesis	20 (13.0%)
Fever	18 (11.3%)
Nausea	21 (13.1%)
Neutropenia	0 (0.0%)
Pneumonia	1 (0.0%)
Sepsis	0 (0.0%)
Disposition from NCI PCC	n (%) encounters
Home	156 (98.0%)
Hospital	4 (3.0%)
ED	0 (0.0%)

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Table 3. Analysis Variable: Charges in Dollars

Diagnosis	11 Encounters	ED Median (IQR)	135 Encounters	PCC Median (IQR)	<i>p</i>
Dehydration	2	3,757.20 (2,285.1 – 5,229.3)	15	323.0 (228.0 – 752.0)	.047
Diarrhea	3	1,545.26 (1,036.00 -2,049.26)	43	228.00 (295.00 – 323.00)	.013
Fever	5	1945.69 (1,853.74 – 3,278.01)	10	371.50 (323.00 – 1028.00)	.014
Nausea	1	2,049.26 (2,049.26 – 2,049.26)	67	228.00 (228.00 – 323.00)	.09

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