IMPROVING EDUCATION FOR NEWLY DIAGNOSED PEDIATRIC ONCOLOGY PATIENTS USING A STANDARDIZED EDUCATION CHECKLIST

Doctor of Nursing Practice Project
Presented to the Faculty of Sinclair School of Nursing
Graduate Studies
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In Partial Fulfillment
of the Requirements for the Degree
Doctor of Nursing Practice
by
AMANDA M. CARTEE, RN, BSN, CPHON

Tammy Rood, DNP, CPNP-PC, AE-C Committee Chair
Ellen Chiocca, Ph.D., CPNP, APRN Committee Member
Jenny Marsh, RN, MSN, CPON Committee Member
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Improving Education for Newly Diagnosed Pediatric Oncology Patients Using a Standardized Education Checklist

Every year, 400,000 children worldwide are diagnosed with cancer (World Health Organization, 2021). Quickly addressing the complications from harsh immunosuppressive treatments is essential to providing the best outcome for the child. Parents and caregivers may take their child home soon after diagnosis; however, a great deal of education must be done to prepare them to care for their child and avoid possible treatment complications. Education concerning medical emergencies and complications for children with a pediatric oncology diagnosis is essential. It should be presented to the parent or caregiver at the time of diagnosis in a standardized approach. One proven recommended way to ensure that this critical education is given to all newly diagnosed pediatric oncology patients would be to use a standardized new diagnosis education checklist (Duffy et al., 2021).

The nursing staff at an oncology unit at an urban children's hospital have noted that the parents of newly diagnosed pediatric oncology patients discharged home for the first time lack education on febrile neutropenia. To address this issue, the unit uses an evidence-based standardized education checklist provided by the Children's Oncology Group (Rodgers et al., 2018). This checklist, named *Know to Go* (*KTG*), guides the multidisciplinary team in educating patients and their families before they leave the hospital for the first time. This checklist covers essential information such as when to contact a healthcare provider or seek emergency care, guidelines for dealing with fever and febrile neutropenia, and the warning signs and symptoms of infections.

Project PICOT/Purpose Statement & Objectives

The purpose of this project is to develop an evidence-based education intervention to increase bedside nurses' knowledge about the febrile neutropenia guideline detailed within the *Know to Go* portion of the new diagnosis checklist. Project objectives relate to the following PICOT question: In pediatric oncology bedside nurses (P), how does an education intervention on the "*Know to Go*" portion of the standardized education checklist for newly diagnosed patients (I), compared to current practice (C), affect staff knowledge of these guidelines and the documented rate of patient/caregiver education given by bedside nurses (O) between two timepoints from June 2023 to August 2023 (T1) and September 2023 to November 2023 (T2)? The primary objectives of this project are:

1. A 20% increase in bedside nurse knowledge of the *Know to Go* education guidelines in the new diagnosis education checklist based upon the pre and post-test education survey results.
2. A 20% increase in patient education documented within the Electronic Health Record (EHR) on the *Know to Go* guidelines detailing when to call the provider, fever guidelines, and signs and symptoms of infection from T1 to T2.

Review of the Literature

An extensive review of the literature revealed two recurrent themes: specific pediatric oncology education programs and barriers to parent education and methods to overcome barriers.

Pediatric oncology education programs.

Seven studies in this review examined the impact of specific educational programs for parents and caregivers of pediatric oncology patients. One such article (Di Giuseppe et al., 2020) studied the effect of videotaped education on parents' experience with children with acute lymphoblastic leukemia and the specific decrease in anxiety after viewing ($p = 0.03$). An experimental study by De la Maza et al. (2020) assessed the impact of a structured education

program group (EPG) in comparison to the standard care group (SCG) on the patient's clinical outcome, with the rate of central venous catheter infections being significantly lower in the EPG versus SCG (7% versus 26%; $p = .01$). Landier et al., (2016) developed the five broad principles that the Children's Oncology Group (COG) determined were essential for parental education as follows: (1) pediatric oncology education must be family-centered; (2) a diagnosis of childhood cancer is overwhelming; (3) education should be interprofessional; (4) education should occur across the continuum; (5) the need for a supportive learning environment. A multidisciplinary team from COG agreed that diagnosis, treatment plan, and fever are the most important topics for education (Haugen et al., 2016). Rodgers et al. (2018) developed a standardized education checklist for parents of children diagnosed with cancer for use by the pediatric oncology nurse at the time of diagnosis, highlighting the primary, secondary, and tertiary education topics.

Barriers to parent education and methods to overcome barriers.

Six studies examined parental educational needs and health disparities and their effect on pediatric patient outcomes of treatment (Hentea et al., 2019; Isaevska et al., 2019; McCann et al., 2019). Similar themes were found in the type of education parents needed, with McCann et al. (2019) finding that emphasis placed on low socioeconomic status was linked to decreased treatment adherence. Socioeconomic factors, as well as maternal education, play a considerable role in patient outcomes, with Isaevska et al. (2019) observing a disadvantage in the overall survival for children of less educated mothers, with the effect of maternal education on survival being particularly strong for central nervous system tumors (hazard ratios [HR], 2.9; 95% CI, 1.1-8.0). Education retention and the impact of socioeconomic markers were measured by Hentea et al. (2019) using a vignette-based survey instrument, finding a mean score of four (range 0-6, SD = 1.6) for parents with high school education only. Disparities in parental education also exist between healthcare institutions of differing sizes; oncologists at large research institutions reported increased availability of an established patient education protocol compared to small non-academic institutions (50.8% vs. 38.1%, $p < 0.001$) (Slone et al., 2014).

Methods

This quality improvement project is a needs assessment with a longitudinal design that evaluated the effectiveness of evidence-based education interventions on nurses' knowledge of febrile neutropenia guidelines and nurses' documentation of febrile neutropenia patient education within the Electronic Health Record. The project was conducted in a pediatric Hematology/Oncology/Bone Marrow Transplantation unit at an urban Midwestern children's hospital. The project used a purposive convenience sampling of Hematology/Oncology/Bone Marrow Transplant nurses for the febrile neutropenia knowledge survey. The same nurses *(N =* 98) were surveyed before and after the education intervention. Furthermore, a systematic purposive convenience sample of retrospective electronic medical records (charts) of newly diagnosed oncology patients admitted from June 2023 to August 2023 ($n = 19$) and post-intervention charts from September 2023 to November 2023 ($n = 19$) were reviewed for documentation of febrile neutropenia patient education.

Intervention

The first component of the intervention was two education sessions presented at the unit's quarterly update that reviewed the *Know to Go* febrile neutropenia guidelines. This 10-minute PowerPoint presentation reviewed the guidelines, the reasoning behind the guidelines, and reminders on how to document patient education of the *Know to Go* guidelines. Nurses were surveyed before and after the education session to assess their knowledge of the guidelines. The intervention's second component was the creation of a job-aid for bedside nurses to remind them

when to complete *Know to Go* education, in addition to screen prints showing how to document education. The intervention's final component was the relocation of the *Know to Go* guidelines to a main area on the unit for easy access for bedside nurses to review and distribute to patients when providing education.

Tools and Measures

Using a significance level of $p = .05$, an effect size of 0.5, and a power of 0.8, at least 17 pairs of pre- and post-intervention surveys were required to be completed (GPower, n.d.). With a confidence interval of 95%, a maximum margin of error of 5%, an estimated two-month patient population size of 19, and a response distribution of 50%, a minimum of 19 patient charts needed to be reviewed retrospectively and post-intervention (Raosoft, 2004).

Primary outcome variables were the nurse's knowledge of *Know to Go* febrile neutropenia guideline surveys. Secondary outcome variables were the rates of documented patient education on febrile neutropenia. The pre-intervention Qualtrics survey was disseminated before the nurses were educated, with the post-survey being available after the educational intervention presented at the unit's quarterly meeting. Both update presentations and pre/post education surveys were delivered and collected at two timepoints in August 2023. Demographics collected included age, gender, race, highest education level, total years of nursing experience, years of nursing experience on the Hem/Onc/BMT floor, and if the nurse was a Certified Pediatric Hematology Oncology Nurse (CPHON). Retrospective rates of documented patient education of febrile neutropenia guidelines were collected from June 2023 to August 2023. To determine if there was an increase in documented febrile neutropenia education, frequencies from September 2023 to November 2023 post-intervention were also collected.

All data from the surveys and medical records were entered into the Statistical Package for Social Sciences (SPSS) database. Descriptive statistics were used to summarize demographic data. Ordinal level data from nurse knowledge surveys pre-and-post intervention was analyzed using the Wilcoxon signed-rank test. The Vargha and Delaney (*A*) effect size measures were utilized to determine the clinical significance of the educational intervention, using values of small (.10), medium (.30), and large (.50). Nominal level data collected from chart reviews were analyzed using the Chi-square Test of Independence and the *phi* coefficient was used as an index to describe the magnitude of the effect from the intervention with values of small (.10), medium (.30), and large (.50). Statistical significance is defined as $p \leq .05$.

Results

Survey Demographics

Fifty-four nurses completed the pre- and post-surveys. Nurses were primarily ages 22-27 (46.2%, $n = 23$), female (94.4%, $n = 51$), and white (98.1%, $n = 53$). Most nurses had zero to three years of total nursing experience (37.0%, $n = 20$) and zero to three years of experience on the Hem/Onc/BMT unit (44%, $n = 24$). Most nurses' highest education level was a bachelor's degree (92.6%, $n = 50$), and only 22.2% ($n = 12$) were CPHON certified.

Chart Review Demographics

There were 19 patient charts reviewed at both T1 and T2. All thirty-eight charts were included in the analysis. The predominant race was White/Caucasian (78.9%, $n = 30$), with others including Hispanic (10.5%, $n = 4$), Black/African American (5.3%, $n = 2$), and Multiple ethnicity/Other (5.3%, $n = 2$). The mean age of patients was 7.7 years ($SD = 6$). The sample was 50% female ($n = 19$) and 50% male ($n = 19$). The primary oncologic diagnosis was Acute Lymphoblastic Leukemia (28.9%, $n = 11$) with others including Non-Hodgkin's Lymphoma (10.5% $n = 4$); Acute Myeloid Leukemia (7.9%, $n = 3$); Osteosarcoma (7.9%, $n = 3$);

Neuroblastoma (7.9%, n = 3); Wilms Tumor (7.9%, n = 3); Rhabdomyosarcoma (7.9%, n = 3); Brain Tumor (7.9%, n = 3); Ewing's Sarcoma (5.3%, n = 2); Other (5.3%, n = 2); and Severe Aplastic Anemia (2.6%, n =1). The primary sample payer was Private Insurance (50%, n = 19). There were no statistically significant differences found between groups in oncologic diagnosis (p = .26), insurance type (p = .15), or race (p = .7).

Survey Results

The nurse knowledge survey revealed a 12.1% increase in overall nurse knowledge. The pretest mean was 9.1 (SD = 2.33), with a posttest mean of 10.2 (SD = 2.03). The questions from the knowledge survey that were statistically significant were as follows: "fever threshold for oncology patient" (p = .04), "fever threshold if patient receiving steroids" (p = .03), "medication to combat febrile neutropenia" (p < .001), "who to call if the child has a fever" (p = .05), "where to document *KTG* education" (p < .001). When comparing survey results at the two timepoints, the Wilcoxon signed-rank test revealed a very large statistically significant increase in participants whose knowledge survey score changed to a higher value (p < .001, A = 12.9).

Chart Review Results

A comparison of retrospective and post-intervention chart reviews revealed a 66.7% increase in documentation by bedside nurses of *KTG* febrile neutropenia education. While not statistically significant, there was a small to moderate increase in *KTG* documentation by the bedside nurse from T1 (15.8%, n = 3) to T2 (26.3%, n = 5), p = .61, Φ = .2. There was also a small to moderate decrease in patients with no documentation of *KTG* education from n = 5 (26.1%) in T1 to n = 3 (15.8%) at T2, p = .61, Φ = .2.

Conclusions

The purpose of the QI project was to increase Hem/Onc/BMT nurses' knowledge of the *KTG* febrile neutropenia guidelines by implementing an educational intervention. The primary objective to demonstrate a 20% increase in bedside nurse knowledge of the *KTG* education guidelines was not met, as nurse knowledge only increased by 12% post-intervention. The second objective to increase documentation of *KTG* patient education by 20% was met with a 66.7% increase in documentation.

Recommendations

While the primary objective was not met, the large statistically significant increase in participants who had their knowledge survey score increase after the educational intervention does indicate a noteworthy increase in nurses' knowledge of the *KTG* febrile neutropenia guidelines. Moreover, the 66.7% increase in documentation of patient education displays that the nurses adjusted their practice to emphasize providing newly diagnosed patients and families with adequate education before discharge.

Strengths and Limitations

Strengths of this project include the demonstration of statistical significance for most questions within the knowledge survey and clinical significance in the increase of patient education documentation. Limitations of the project include convenience sampling and lack of patient and family perspective. Future projects should focus on nurse barriers to providing education and families' perception of the education provided. Febrile neutropenia is a life-threatening complication for pediatric oncology patients, and thorough education on this medical emergency can improve patient outcomes. This QI project contributed to improving education for this vulnerable population, as the positive ramifications of patient and family education cannot be overstated during a time where fever can produce deadly consequences.

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Appendices

Appendix A: D1 Form

DNP D1 Form

DNP Residential Project Committee Appointment Request

Student's Name: Amanda Cartee

Student's Number: 14180049

Date Submitted: _____

I request that the faculty members listed below be appointed to serve as my Residential Project committee.

Tammy Rood	Dr. Tammy Rood Digitally signed by Dr. Tammy Rood Date: 2022.06.30 10:25:21 -05'00'
Name of Chair*	Signature, Chair of Committee
Ellen Chiocca	DocuSigned by: Ellen Chiocca
Member*	Signature, Member
Jenny Marsh	Jenny Marsh RN
Member*	Signature, Member
_____	_____
Member*	Signature, Member
Amanda Cartee Digitally signed by Amanda Cartee Date: 2022.06.26 20:53:46 -05'00'	_____
Signature of Student	Signature of Director of DNP
*Please type or print	Program, School of Nursing

To be completed during the semester enrolled in:
N9080 Section 1 DNP Residency Project

SON Approved 7/2012
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Appendix B: D3 Form

DocuSign Envelope ID: 6765A047-B656-492B-878F-CB130EC5E184

DNP D-3 Form

Approval of DNP Residency Project Proposal and the Institutional Review Board Protocol

Candidate's name: Cartee, Amanda (*Last Name, First Name*) Mizzou ID number: 14180049

Project Title: Improving Education for Newly Diagnosed Pediatric Oncology Patients Using a Standardized Education Checklist

Signatures of review members
(Please sign full names legibly)

		Acceptable	Unacceptable
Chair: Tammy Rood, DNP, CPNP-PC, AE-C (*print & sign*)	Dr. Tammy Rood Digitally signed by Dr. Tammy Rood Date: 2023.07.27 20:16:57 -05'00'	☒	☐
Member: Ellen Chiocca, PhD, CPNP, APRN (*print & sign*)	DocuSigned by: Ellen Chiocca 2CFC4A2DA6CC41D... DS EC 7/27/2023	☒	☐
Member: Jenny Marsh, RN, MSN, CPON (*print & sign*)	Jenny Marsh	☒	☐
Member: (*print & sign*)		☐	☐
The clinical project is:		☐	☐

The Program Committee has explained the decision regarding the acceptability of my project proposal.

Student Signature — Date: 7/27/23

Miriam D. Butler, DNP, NP-C, FNP-BC — Digitally signed by Miriam D. Butler, DNP, NP-C, FNP-BC Date: 2023.07.28 12:02:00 -05'00'

Director, DNP Program in Nursing — Date

SON Approved 7/2010
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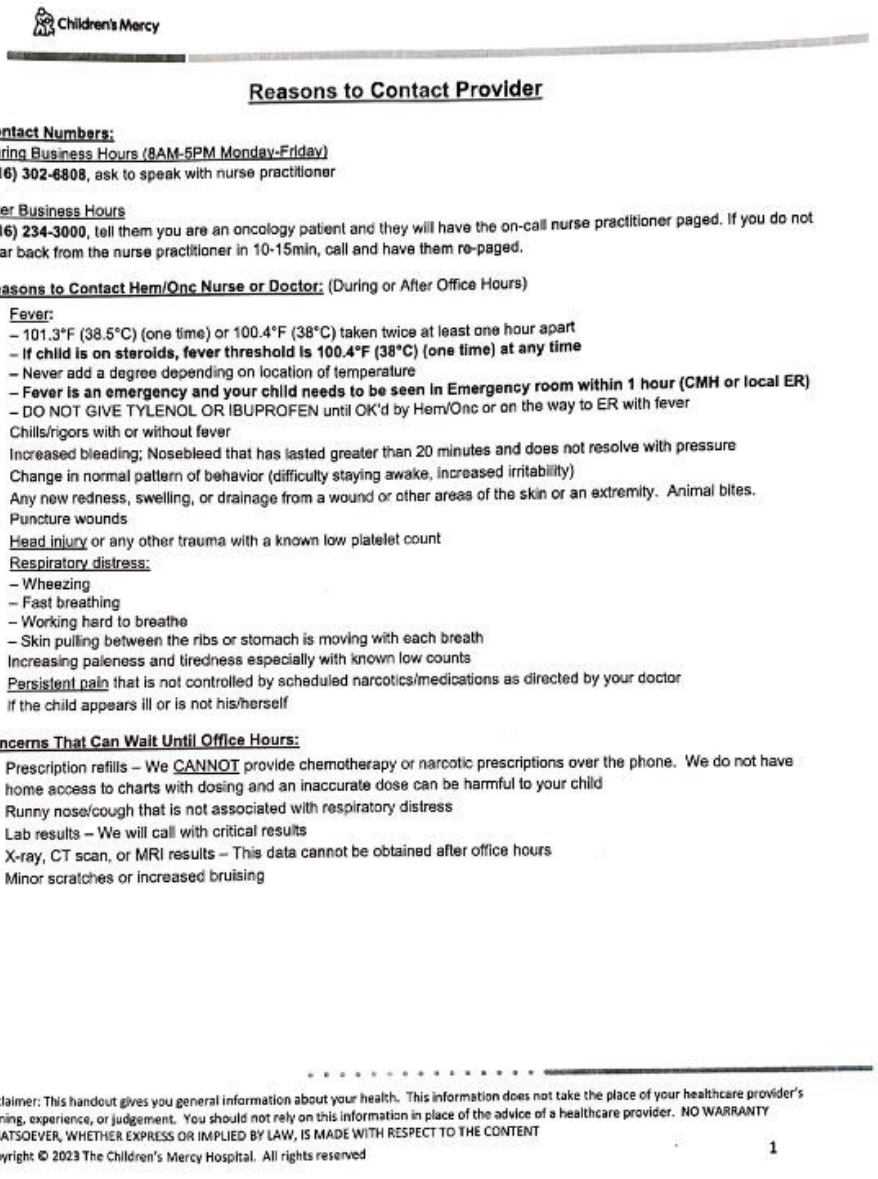
Appendix C: Know to Go Guidelines & Qualtrics Survey Link



Children's Mercy

Reasons to Contact Provider

Contact Numbers:
During Business Hours (8AM-5PM Monday-Friday)
(816) 302-6808, ask to speak with nurse practitioner

After Business Hours
(816) 234-3000, tell them you are an oncology patient and they will have the on-call nurse practitioner paged. If you do not hear back from the nurse practitioner in 10-15min, call and have them re-paged.

Reasons to Contact Hem/Onc Nurse or Doctor: (During or After Office Hours)

- Fever:
  - 101.3°F (38.5°C) (one time) or 100.4°F (38°C) taken twice at least one hour apart
  - **If child is on steroids, fever threshold is 100.4°F (38°C) (one time) at any time**
  - Never add a degree depending on location of temperature
  - **Fever is an emergency and your child needs to be seen in Emergency room within 1 hour (CMH or local ER)**
  - DO NOT GIVE TYLENOL OR IBUPROFEN until OK'd by Hem/Onc or on the way to ER with fever
- Chills/rigors with or without fever
- Increased bleeding; Nosebleed that has lasted greater than 20 minutes and does not resolve with pressure
- Change in normal pattern of behavior (difficulty staying awake, increased irritability)
- Any new redness, swelling, or drainage from a wound or other areas of the skin or an extremity. Animal bites. Puncture wounds
- Head injury or any other trauma with a known low platelet count
- Respiratory distress:
  - Wheezing
  - Fast breathing
  - Working hard to breathe
  - Skin pulling between the ribs or stomach is moving with each breath
- Increasing paleness and tiredness especially with known low counts
- Persistent pain that is not controlled by scheduled narcotics/medications as directed by your doctor
- If the child appears ill or is not his/herself

Concerns That Can Wait Until Office Hours:

- Prescription refills – We CANNOT provide chemotherapy or narcotic prescriptions over the phone. We do not have home access to charts with dosing and an inaccurate dose can be harmful to your child
- Runny nose/cough that is not associated with respiratory distress
- Lab results – We will call with critical results
- X-ray, CT scan, or MRI results – This data cannot be obtained after office hours
- Minor scratches or increased bruising

Qualtrics Survey Link:
https://qfreeaccountssjc1.az1.qualtrics.com/jfe/preview/previewId/85f672d3-0355-4190-a89c-3530fc762347/SV_9uXKjG4bD20LBOe?Q_CHL=preview&Q_SurveyVersionID=current

Appendix D: Education Documentation Job Aid