

**Managing Nausea: A Chemotherapy Education Resource Manual for Nurses**

By © Lorie Kielley BN,RN

A report submitted to the School of Nursing

in partial fulfilment of the requirements

for the degree of

**Masters in Nursing**

**School of Nursing**

Memorial University of Newfoundland

August 2015

St. John's

Newfoundland and Labrador

## Abstract

Cancer is a significant health care concern worldwide that is often treated by using chemotherapy. Nurses working in Oncology/Hematology are not only responsible for the administration of chemotherapy agents but also play a significant role in teaching patients about their treatments. From my personal experience as an Oncology/Hematology nurse, I noted barriers to providing effective patient chemotherapy education which led to inconsistencies in the teaching being provided. From these observations, the idea of a resource manual was constructed. To substantiate the felt need for a resource manual a comprehensive literature review as well as key stake holder consultations were conducted. The management of nausea and vomiting for individuals undergoing chemotherapy was identified as a priority need. This report provides an overview of the findings of the literature review and key stake holder consultations. Findings were used in conjunction with Morrison, Ross, Kalman and Kemp's (2013) instructional design model and Knowles Principles of Adult Learning (1984) to develop this manual. In doing so, application of the advanced nursing competencies: clinical practice, research, leadership, consultation and collaboration were demonstrated.

### **Acknowledgements**

I would like to acknowledge the following people who have been instrumental in my success over the past four years while I pursued my Masters of Nursing:

A sincere thank you to Dr. April Manuel for the continuous support, motivation, guidance and patience. I cannot thank you enough for all the time and effort you have devoted to me as I finished this last step of the Master's program.

To the staff of 4NA, thank you for your input and support throughout the development of this manual.

To the patients of 4NA, you are the motivation for this project.

To my family and friends, thank you for your ongoing support, encouragement and patience with me especially over the past year.

To my husband and "fur baby", thank you for your support and understanding in my endeavours.

**List of Figures**

Figure 1	Instructional Design Model	34
----------	----------------------------	----

**List of Appendices**

Appendix A: Managing Nausea: A Chemotherapy Education Resource Manual	
For Nurses	58
Appendix B: Literature Review Summary	122
Appendix C: Consultation Report	154
Appendix D: Literature Review Tables	175

## Table of Contents

Abstract	ii
Acknowledgements	iii
List of Figures	iv
List of Appendices	v
Introduction	9
Background and Rationale for Practicum	10
Practicum Goal and Objectives	13
Overview of Methods	14
Summary of the Literature Review	14
Chemotherapy Educational Programs	16
Psychological	16
Physiological	17
Nurses Experiences with Educating Clients about Chemotherapy	17
Educational Resources	18
Time to Provide Chemotherapy Education	18
Knowledge	19
Patients Experience with Chemotherapy	19

## A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

Diagnosis and Treatment	20
Side Effects and Self-Management Strategies	20
Educational Preferences	23
Literature Gaps	24
Summary of Key Stake Holder Consultations	26
Data Collection	26
Data Analysis	27
Conclusion	29
Theoretical Framework	30
Model of Instructional Design	34
Instructional Problem	35
Learner Characteristics	37
Task Analysis	37
Instructional Objectives	38
Content Sequencing	39
Instructional Strategies	40
Designing the Instructional Message	41
Development of Instruction	42

## A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

Development of an Evaluation Tool	42
An Ongoing Process	44
Summary of Educational Resource Manual	45
Advanced Practice Nursing Competencies	47
Conclusion	51
References	52



An average of 524 Canadians are diagnosed with cancer every day, with two out of five Canadians expected to develop cancer at some point in their lifetime (Canadian Cancer Society [CCS], 2014). The most common types of cancer in Newfoundland and Labrador are prostate, colorectal, breast and lung (CCS, 2014). As the number of newly diagnosed cancer cases in Canada steadily increases, more individuals are undergoing lifesaving treatments which includes chemotherapy. There are no statistics on the number of Canadians receiving chemotherapy, however, based on the large number of people being diagnosed one may conclude that chemotherapy rates are increasing proportionally. As oncology nurses, we play an essential role in providing patients with the education about their chemotherapy treatment; specifically side effects of treatment. The goal of this practicum is develop a resource manual for nurses to facilitate patient education about chemotherapy, specifically the management of nausea and vomiting related to chemotherapy.

This report starts with a brief overview of the background and rationale of the practicum. This is followed by a summary of the methods used to inform the project including: a literature review and consultations with key stake holders. A discussion of the Knowles' Principles of Adult Learning (1984) and the application of Morrison, Ross, Kalman and Kemp's (2013) Instructional Design Model as they apply to this practicum will be presented. To conclude, a discussion on how I demonstrated the Advanced Nursing Practices competencies throughout this practicum will be presented.

*Keywords: chemotherapy education, nausea, instructional design, oncology, adult learning, nurses*

## **Background and Rationale for the Project**

Chemotherapy is the systemic treatment of illness by the use of powerful chemicals that attack rapidly dividing cells in the body (Mayo Clinic, 2014). Chemotherapy may be used independently or in combination to treat various forms of cancer. Although chemotherapy can be an effective treatment for cancer, it can also cause harmful and sometimes fatal side effects (Mayo Clinic, 2014). These side effects can sometimes be prevented or minimized, and providing education to patients can significantly impact their dealings with encountered side effects. Chemotherapy has different indications for use depending on the patient and their disease. Sometimes cure is the goal of the treatment, but other times it may be used for symptom control or palliative purposes (Mayo Clinic, 2014).

Oncology nurses can acquire the knowledge and skills to administer chemotherapy through advanced education (Dalby et al., 2013; Fredette, 1990; Lauer, Murphy, & Powers, 1982; McCaughan & Parahoo, 2000; Mueller & Glennon, 2007; Pedersen, Koktved, & Nielson, 2013) and a specialized certification process (Oncology Nursing Society [ONS], 2012). To be certified in chemotherapy administration, nurses' must demonstrate understanding of how chemotherapy agents work, management of its side effects, and have knowledge of the education needs of those receiving it (ONS, 2012).

Individuals receiving chemotherapy have voiced concerns that current teaching is not meeting their learning needs (Smith et al., 2004). Despite the availability of existing chemotherapy educational materials, research has found that nurses do not feel fully

prepared to provide chemotherapy education to patients and thus, are not meeting the needs of this cohort (McCaughan & Parahoo, 2000; Smith et al., 2004). Adding to this is the lack of literature that outlines the content of what an educational program for those receiving chemotherapy should include, how this information should be delivered, and its effectiveness on the management of chemotherapy side effects.

The General Hospital is the main acute care facility in the province of Newfoundland and Labrador that administers chemotherapy treatment to patients. The nursing staff on 4NA, the inpatient Oncology/Hematology ward at this site, complete a chemotherapy administration course offered through Eastern Health in which they learn about specific cytotoxic agents, administration techniques, side effects, assessment skills, and documentation. Nurses on 4NA are the primary educators of patients and their families about their chemotherapy treatment however, education is also provided by other members of the Oncology/Hematology team including physicians and pharmacists. Despite completing this chemotherapy course, many of the nurses on 4NA feel they do not have the time or adequate resources to provide consistent teaching to patients about the management of chemotherapy side effects. That is, although the side effects of chemotherapy are reviewed with the patient the management is not discussed in detail. As noted in the literature, depending on the experience and knowledge of the nurse, the quantity and quality of education provided may vary (Smith et al., 2004). Finally, there appears to be a lack of clarification between health care providers about who is teaching what content. This has resulted in some information being missed or being redundant in nature.

In order to address the educational needs of patients receiving chemotherapy, resources must be up to date, readily accessible to nurses (Fredette, 1990), and reflective to the needs of this population. The proposed resource manual on the management of nausea and vomiting will address these needs. A literature review helped identify the priority learning needs of this population, inform the development of the key stakeholder consultations, and the construction of the proposed manual to help nurses educate clients on the management of the side effects of chemotherapy.

### **Practicum Goals and Objectives**

The overall goal of this practicum is to develop a resource manual for nurses to facilitate patient education about nausea and vomiting related to chemotherapy (see Appendix A). The objectives of this practicum are to:

1. Update current educational materials used for patient education on 4NA.
2. Complete an integrative literature review on chemotherapy education resources for nurses, as well as the educational needs of individuals receiving chemotherapy.
3. Collaborate and consult with members of the healthcare team in the development of a chemotherapy education resource manual for nurses.
4. Use Knowles (1984) Principles of Adult Learning as a framework to development the Chemotherapy Educational Resource Manual for Nurses.
5. Use Morrison, Ross and Kemp's Instructional Design Model (2013) in the development of the Chemotherapy Education Resource Manual for Nurses.
6. Demonstrate application of the Advanced Practice Nursing Competencies throughout the practicum project.

### **Overview of Methods**

In meeting my goals and objectives for this practicum I used various methods. These methods included a review and analysis of the literature, consultations with key stake holders, application of a theoretical framework and a conceptual design model. Below are summaries of the literature review and key stake holder consultations. For full reports please see literature review (see Appendix B) and consultations (see Appendix C).

### **Summary of Literature Review**

Cancer is a leading cause of death worldwide (World Health Organization [WHO], 2014). It is estimated that in Canada there will be 191,300 new cases of cancer diagnosed and 76,600 deaths from cancer in 2014 alone (Canadian Cancer Society [CCS]), 2014). Cancer is responsible for 30% of all Canadian deaths, with the most common forms of cancer being lung, breast, colorectal and prostate (CCS, 2014). In 2014, it is estimated that 3,400 new cases of cancer will be diagnosed and that 1,500 people will die of cancer in Newfoundland and Labrador (CCS, 2014). For men in this province, the most commonly diagnosed cancer is prostate cancer (with 510 estimated to be diagnosed in 2014) and for women; breast cancer (330 estimated to be diagnosed in 2014) (CCS, 2014). The leading cause of cancer mortality in both men and women in Newfoundland and Labrador is lung cancer with 240 men and 170 women estimated to die in 2014 (CCS, 2014).

Chemotherapy is one of the primary treatments for cancer disorders. Although chemotherapy is considered an effective treatment for cancer it does have side effects that

can be physically and psychologically challenging for the recipient (Aranda et al., 2012; Dodd, 1988; Kinnane, Stuart, Thompson, Evans, & Schneider-Kolsky, 2008; Lauer et al., 1982; Lee, Francis, Walker, & Lee, 2004; Pederson et al., 2013; Piredda et al., 2008; Schofield et al., 2008; Skalla, Bakitas, Furstenberg, Ahles, & Henderson, 2004; Smith et al., 2004; Tamburini et al., 2003; Williams & Schreier, 2004; Van der Molen, 2000). In order to manage their everyday lives these individuals need education on how to cope with the side effects of chemotherapy (Lauer et al., 1982; Mann, 2011; Mills & Sullivan, 1999; Pederson et al., 2013; Van der Molen, 2000). Also, given that oncology nurses are responsible for the education and administration of chemotherapy they must have the prerequisite skills to address the needs of this group, including the management of chemotherapy side effects.

A literature review was completed in order to examine the needs of individuals receiving chemotherapy from the perspective of the patient and the nurse. To conduct the literature review, the search engines CINAHL and PubMed were used with the keywords such as: *chemotherapy education, chemotherapy teaching and cancer education*. Search results were initially limited to 2004-2014 however, results were extended to include significant studies from earlier dates. The two critical appraisal tools used to critique the literature were the Public Health Agency of Canada (PHAC, 2015) Critical Appraisal Tool Kit and the Quality Assessment Review Instrument (QARI) (Joanna Briggs Institute, 2014) critical appraisal tool. The findings are summarized in a literature review table (see Appendix D). Four bodies of literature that were identified are: chemotherapy educational programs: psychological and physiological impact, nurses' experiences with educating

clients about chemotherapy, patients' experience with chemotherapy and educational preferences. To conclude, gaps in the literature are identified.

### **Chemotherapy Educational Programs: Psychological and Physiological Impact**

There is a growing awareness about the importance of providing patient education on chemotherapy (Aranda et al., 2012; Dalby et al., 2013; Dodd, 1988; Kinnane et al., 2008; Lee et al., 2004; Mills & Sullivan, 1999; Schofield et al., 2008; Smith et al., 2004). Although most literature supports positive patient outcomes (Aranda et al., 2012; Friedman, Cosby, Boyko, Hutton-Bauer, & Turbull, 2011; Harris, 1998; Mann, 2011; Mills & Sullivan, 1999; Pederson et al., 2013; Van der Molen, 1999; Williams & Schreiner, 2004) one study noted that that educating patients about chemotherapy does not affect the frequency or severity of experienced side effects (Dodd, 1988). Both psychological and physiological outcomes of providing chemotherapy education have been discussed within the literature.

**Psychological outcomes.** Educating patients about chemotherapy has been found to promote autonomy (Harris, 1998; Mills & Sullivan, 1999), reduce anxiety (Harris, 1998; Mann, 2011; Mills & Sullivan, 1999; Van Der Molen, 1999), develop coping skills, enhance recovery (Harris, 2011; Mills & Sullivan, 1999), and assist patients and families in creating realistic goals and expectations (Harris, 1998; Mann, 2011). Educating patients on their treatment has been suggested as an effective means to reduce their fear of the unknown and retain a sense of control (American Cancer Society, 2007; Pederson et al., 2013; Skalla et al., 2004; Williams & Schreier, 2004). Pederson et al.'s (2013) phenomenological study found that as the severity of side effects related to chemotherapy



escalated, patients' described an increasing sense of loss of control over the management of the disease; education on the management of side effects of chemotherapy was offered as a potential strategy to help patients' reinstate some sense of control over the disease.

**Physiological outcomes.** Although providing chemotherapy education to patients has been shown to have positive physical health care outcomes such reducing the severity of side effects (Aranda et al., 2012; Williams & Schreier, 2004) this is not always the case (Aranda et al., 2012; Dodd, 1988). Aranda et al.'s (2012) randomized control trial (RCT) of cancer patients (n=192) examined the impact of a pre-chemotherapy educational intervention (DVD, question prompt list, drug information and procedural information) on prevalence and severity of chemotherapy side effects and found that patient distress was not significantly reduced ( $p=0.47$ ). There was, however, a noted reduction in information ( $p=0.027$ ) and support needs ( $p=0.03$ ) surrounding preparation for treatment. A decrease was also noted in the prevalence and severity as well as impact of nausea and vomiting ( $p=0.001$ ) in those who received pre-chemotherapy education.

### **Nurse's Experiences with Educating Clients about Chemotherapy**

Nurses have pivotal role in cancer care, especially when it comes to the provision of information to patients (Cowan & Hoskins, 2007; Friedman et al., 2011; McCaughan & Parahoo, 2000; Mills & Sullivan, 1999; Mueller & Glennon, 2007; Rigdon, 2010; Rutten, Arora, Bakos, Aziz, & Rowland, 2005). Patient education is an essential part of patient care and is an integral part of the nursing process (Mills & Sullivan, 1999). Nurses face many challenges in the workplace that impede their ability to achieve these goals

including adequate educational resources, time to provide education, and a lack of knowledge about chemotherapy.

**Educational resources.** In order to meet the educational needs of individuals living with cancer nurses need resources that are evidence based and readily accessible (Mann, 2011). Research has shown that digital video disc's (DVD's) (Aranda et al., 2012; Freidman et al., 2011; Kinnane et al., 2008; Schofield et al., 2007), internet websites (Cowan & Hoskins, 2006; Friedman et al., 2011), pamphlets and written materials (Cowan & Hoskins, 2006; Freidman et al., 2011; Skalla et al., 2004; Smith et al., 2004), interactive multimedia (Freidman et al., 2011.; Skalla et al., 2001) and audiotapes (Freidman et al., 2011; Williams & Schreier, 2004) are effective teaching methods commonly used in chemotherapy education. Despite the abundance of chemotherapy educational tools nurses find it difficult to avail of these resources for a variety of reasons such as limited financial resources (Dalby et al., 2013) and physical time to access the tools (Mills & Sullivan, 1999; Pederson et al., 2013; Skalla et al., 2001).

**Time to provide chemotherapy education.** Nurses identified lack of time to participate in patient education as one of the most significant barriers in providing chemotherapy teaching (Dalby et al., 2013; McCaughan & Parahoo, 2000; Mills & Sullivan, 1999; Pedersen et al., 2013; Russell, 2006; Skalla et al., 2004). Finding time for patient education on an acute care ward, where nurses are caring for multiple patients with complex health care needs can be a challenge.

One cross-sectional survey of nurses (n=72) found that they perceived lack of time to be a barrier to providing psychosocial care (McCaughan & Parahoo, 2000). This lack

of time limited their ability to help patients balance the uncertainty of living with cancer and accepting their diagnosis. These findings were also noted in an earlier study of nurses (n=310) (Frost, Brueggen, & Mangan, 1997) that identified lack of time to be the number one barrier to providing psychosocial care to patients. Two qualitative studies found that patient's perceived that a nurses lack of time to provide education negatively impacted the quality of information provided (Pederson et al., 2013; Skalla et al., 2004).

**Knowledge.** Nurse's lack of knowledge about chemotherapy education has been noted to contribute to their lack of confidence in providing chemotherapy teaching (McCaughan & Parahoo, 2000; Russell, 2006). One study (McCaughan & Parahoo, 2000) specifically examined nurse's perceptions of their ability to provide effective chemotherapy education. McCaughan and Parahoo (2000) used a self- reported survey to assess nurse's level of competence in activities relating to their work with patients living with cancer. This study reported that 88% felt competent with providing physical care to patients receiving chemotherapy, 74.2% in communicating with patients, 60% felt comfortable in helping patients come to terms with diagnosis and treatment, but only 55.8% felt competent in educating patients in dealing with side effects from treatment. This study also found that nurses may be uncomfortable communicating with patients who are experiencing high emotions (McCaughan & Parahoo, 2000), and this may pose as a barrier to providing effective chemotherapy education to this population.

### **Patients Experience with Chemotherapy**

There is a large body of literature that has examined the educational needs of patients who are receiving chemotherapy. The priority educational needs identified in the

literature are diagnosis and treatment, side effects of chemotherapy, and self-management strategies (Skalla et al., 2004; Mills & Sullivan, 1999)

**Diagnosis and treatment.** There is a consensus in the literature that individuals living with cancer need a clear understanding of their diagnosis and available treatment options such as chemotherapy agents (Fredette, 1990; Lauer et al., 1982; Lee et al., 2004; Mills & Sullivan, 1999; Mueller and Glennon, 2007; Piredda et al., 2008; Smith et al., 2004; Tamburini et al., 2003) in order to make informed choices about their care and manage their daily lives.

Piredda et al.'s, (2008) survey of cancer patients (n=108) needs during hospitalization found that information about illness (65.7%) and treatments, including chemotherapy (26.9%), were identified as the most important learning need. Similarly, Lee et al. (2004) (n=51) reported that the priority learning need of breast cancer patients was knowledge about medication treatment regimes. Although Lauer et al.'s (1982) study (n=33 patients; n=27 nurses ) did report that knowing the purpose of chemotherapy drugs was deemed to be significant to the patients, nurses, did not rank this as a priority learning needs for them. This discrepancy highlights the importance of collaborative care between health care providers and the patient to ensure that the patients' unique health care needs are being met.

**Side effects and self-management strategies.** For patients undergoing chemotherapy, dealing with the side effects can be challenging. Threaded throughout the literature is the fact that knowledge of chemotherapy side effects and their management is a high priority learning need for this population (Dodd, 1988; Fredette, 1990; Kinnane et

al., 2008; Lauer et al., 1982; Lee et al., 2004; Pedersen et al., 2013; Piredda et al., 2008; Rigdon, 2010; Skalla et al., 2004; Smith et al., 2004; van Weert, Bolle, van Dulmen, & Jansen, 2013; Williams & Schriener, 2004). Although Skalla et al's (2004) study found that patients' primary learning need was information about specific side effects and how these would impact their daily life this was not the case in another study (Piredda et al., 2008). Piredda et al. (2008) (n=111) study of patients living with cancer found that only 22.4% ranked side effects as their highest priority learning need.

Noteworthy is the fact that although nurses and patients have both identified management of side effects as a priority learning need there is a discrepancy as to the where this need ranks in comparison to other needs. For example, in Lauer et al.(1982) (n=33 nurses; n=27 patients) nurses ranked management of side effects as a high priority learning needs whereas, patients ranked knowledge of medications, treatment schedules and length of treatment as priorities. In order to develop a plan of care that takes into consideration the top learning needs of this population it is important that nurses engage in dialogue with these individuals in order to tailor educational resources reflective of their learning needs and style.

Chemotherapy can have a wide range of physiological side effects that can impact one's everyday life. The most common cited side effects in the literature are nausea and fatigue (Dodd, 1988; Kinanne et al., 2008; Williams & Schriener, 2004). Dodd's (1988) RCT (n=60) listed the most common side effects of chemotherapy as being nausea (50%), fatigue (38.3%), hair loss (19%), sore mouth and throat (16%), bleeding (10%), and decreased appetite (10%). Similarly, fatigue (81%), nausea and vomiting (74%), taste

change (63%), and difficulty sleeping (50%) were found as the most common side effects reported by patients in a second RCT (n= 70) (Williams & Schriener, 2004). In a third, RCT (Kinanne et al., 2008), ( n=64) patients identified mouth care (83.3%), diet and fluids (73.3%), signs of infection (70.0%), nausea and vomiting (66.6%) and anemia (20%) as the most useful educational topics.

In order to manage living with a diagnosis of cancer and coping with the side effects of chemotherapy agent's patients have identified the need to learn effective self-management strategies (Dodd, 1988; Mills & Sullivan, 1999; Skalla et al., 2004; Smith et al., 2004; Williams & Schreier, 2004). Self-care management is one way patient's can gain control over side effects and minimize their impact on daily life. In fact, one study found that participants who received education on side effects pre chemotherapy performed significantly higher in self-care behaviour activities and preventative activities ( $t[58]=2.5$ ,  $p=.012$ ) (Dodd, 1988).

Some key self-management strategies were highlighted in the literature and can be used to assist patients in dealing with side effects of their treatment. Dodd (1988) found that using prescribed medications and eating preferred foods in small amounts can assist in managing chemo-induced nausea. For sore mouths, rinsing, using prescribed pain medications and cold drinks can reduce severity of this side effect. Fatigue can be reduced by increasing sleep, incorporating small amounts of exercise into their daily routines and decreasing work hours. A decreased appetite can be improved by offering preferred foods and eating small frequent meals (Dodd, 1988). Hair loss is a side effect from chemo that cannot be prevented or minimized. In helping patients to deal with this

side effect wigs and supportive programs to improve this population's self-perception can be discussed with the patient.

The most frequently used self-care behaviours for fatigue and nausea were also reported by Williams & Scherier (2004). At one month taking naps (78%), getting up later (48%), getting more exercise (26%), and caffeine (19%) were the most frequently used self-care behaviors used in managing fatigue. In coping with nausea taking prescription medications (96%), eating less (78%), keeping busy (78%), resting in a quiet place (74%), drinking clear fluids (68%), eating small frequent meals (65%), resting after meals (61%), cleaning mouth often (61%) and avoiding sight and smells of food (61%) were most frequently used (Williams & Scherier, 2004). Educating patients on using self-care behaviours like those mentioned above, can improve their overall well-being in dealing with the side effects they experience from chemotherapy.

**Education preferences.** Chemotherapy education can be offered to patients by various methods of learning. Since there is variability in the preferred learning styles of individuals (Kinnane et al., 2008), nurses need to be aware of which methods are most effective while considering individual preferences of this population. A balance of standardized chemotherapy education (Dalby et al., 2013; Mueller & Glennon, 2007) coupled with individualized assessment of learning needs is essential (Harris, 1998; Kinnane et al., 2008; Pederson et al., 2013; Skalla et al., 2004) in order to select appropriate methods of instruction (e.g. verbal explanations, written materials, audiovisual materials, and internet sources).

There is a body of literature that supports patient's preference for verbal explanations of their chemotherapy treatment (Mueller & Glennon, 2007; Piredda et al., 2008; Skalla et al., 2004; Smith et al., 2004; Van der Molen, 2000). Piredda et al. (2008) determined that 99.1% of patient's wanted oral information above written pamphlets (61.1%) and internet information (23.1%). Although Smith et al. (2004) found that patient's learn well through one-on-one conversation, it is noted that a combination of various teaching methods is most effective (Freidman et al., 2009; Kinnane et al., 2008). That is, verbal teaching should only be used when combined with other forms of learning (e.g. written pamphlets, audiovisual materials).

### **Literature Gaps**

The above literature provides evidence of the benefits of providing effective chemotherapy education to patient's living with cancer. An evident gap in the literature is the lack of current research on chemotherapy education for patients. Most literature identified on the topic was completed prior to 2005. Of the small body of literature that does exist, the majority of studies focus on educational needs from the patient's perspective, rather than the nurses. Only one study that delved into the nurse's perspective on their level of competence and comfort in providing effective chemotherapy education (McCaughan & Parahoo, 2000). In order to create a comprehensive educational tool both the perspectives of the nurse and patient should be examined.

A paucity of Canadian studies and statistics that focus on educational needs of chemotherapy patients was noted. Learning needs of individuals are unique and having



Canadian research could solidify current approaches to treatment education. There is also a need to further examine current approaches to chemotherapy education that are being implemented in the workplace and their effectiveness for this population.

Although positive outcomes of pre chemotherapy education are discussed in the literature, the effectiveness on reducing side effects is not clear, warranting more exploration. There also needs to be further research into the most common side effects experienced by patients so that nurses can focus their teaching in this area. In addition to identifying common side effects, ways to prevent and cope with these outcomes need to be further addressed. Barriers to providing effective chemotherapy education are discussed in the literature however, there is a dearth of research on ways to overcome these barriers in practice. In particular, various forms of educational methods to facilitate learning (e.g. DVD's, audiotapes, internet) and their effectiveness must be further investigated. To ensure that the educational needs of this cohort are being met, nurses need to receive education and have access to the resources that they need in order to provide effective education. More research needs to occur investigating the nurse's perception of current patient education practices in order to improve upon their approach to patient education.

### **Summary of Key Stake Holder Consultations**

Consultations with key stake holders were conducted to further elaborate on information gathered from the literature review. A total of seven staff nurses, two physicians and one pharmacist were included in the consultation process. A questionnaire (see Appendix A of consultation report) was used to gather information on the learning needs of the patients with regards to chemotherapy treatment. Individualized consultations were conducted with the pharmacist, physicians and two nurses to investigate these learning needs in greater detail. Participants were randomly approached and all had agreed to participate in the interviews. Objectives of the consultations were:

1. To identify the educational needs of patients during chemotherapy treatment.
2. To identify existing chemotherapy resources for patients and nurses.
3. To obtain suggestions in how to improve chemotherapy education to patients.
4. To obtain suggestions as to key content and layout of the resource manual.
5. To identify barriers to the delivery of chemotherapy education to patients.

### **Data Collection**

Prior to any data collection, permission was obtained from the manager of 4NA to conduct a questionnaire and face to face interviews. Participants were informed about the purpose of the questionnaire and consultations and took part on a voluntary basis. This agreement to participate was considered informed consent. Confidentiality was discussed prior to data collection. The questionnaire was developed based on the literature review

and my experience as an Oncology nurse. Questionnaires were distributed and collected within working hours. Questionnaires took approximately 5-10 minutes to complete. To further investigate findings from the questionnaires, face to face consultations occurred. These consultations were guided by the results of the questionnaires and information obtained from the literature review. Interview lengths were approximately 20 minutes. Results from both the questionnaires and consultations were transcribed to Microsoft Word on a password protected computer in my home. The Health Research Ethics Authority assessment tool was used and it was determined that this project does not require ethical approval, as it is not a research project (see Appendix B of consultation report).

### **Data Analysis**

Information gathered from the questionnaires and face to face consultations were analyzed for common themes and descriptive statistics. The three main themes identified from the consultations were (1) current resources, (2) priority learning needs and (3) barriers to education.

**Current resources.** Questionnaire results indicated that staff felt their current approaches to chemotherapy education were acceptable. Despite this, less than half of respondents felt they had appropriate resources to facilitate effective teaching. Currently nurses are using printed information for the Canadian Cancer Society, drug pamphlets, and an education checklist developed by Eastern Health. Staff indicated that there was a need for more detailed information on the management of side effects of chemotherapy. Suggestions on how to further improve effectiveness of teaching as a whole included

having a designated chemotherapy educator, allotting uninterrupted time to provide teaching, and having resources for the nurse to guide chemotherapy education.

**Priority learning needs.** Participants ranked side effects as the most important learning need for patients followed by the prevention of side effects. Nausea and vomiting, fatigue, decreased appetite, and neutropenia were ranked as most common side effects.

Staff were asked to identify what an educational resource manual should contain in order to facilitate chemotherapy education. Suggestions included a simple description of how chemotherapy works, effects on blood values (platelets, red blood cells, white blood cells etc.), infection prevention, a brief description of individual types of cancer, detailed information on side effects and side effect management, how to monitor for infections at home, and an updated education checklist. Staff also voiced the need for the manual to be easy to read and understand.

**Barriers to education.** Participants were asked to identify barriers to education that exist on 4NA. Time (100%), limited resources (50%), lack of privacy (40%), and lack of knowledge/comfort in providing education (30%) were the main barriers identified by staff. To manage providing education on a busy unit nurses found “handing off” the call bell beeper (86%), developing an education plan (71%), and selecting a time when the unit is least busy (71%) to be effective. Participants also stated that easy access to educational resources would help ensure timely chemotherapy education. Although resources are available on the unit, nurses have to go looking for some of the information. That is, not all information is readily accessible.

## **Conclusion**

The information gathered from my consultations further supported the findings obtained in my review of the literature and my experience as an Oncology nurse. These findings were used to guide the development and content of my resource manual. The focus of the manual will be based upon a key learning need identified in the literature and through the consultation process: management of nausea and vomiting related to chemotherapy. The manual will also include a description of how chemotherapy works which is the basis for all further learning.

## **Theoretical Framework**

Knowles' Theory of Andragogy (1984) provided the framework for the development of this resource manual. Knowles (1984) adult learning theory is based upon the concept of self-directed learning. Adults are more likely to learn when they feel the information is personally relevant and important (Billings & Halstead, 2012). They learn best when they can combine previously acquired knowledge and experience with new knowledge to solve real life problems (Billings & Halstead, 2012). For these reasons, this theory is appropriate for adult learners working in an acute care environment.

Knowles identified six principles of adult learning. The first principle is based on the concept that adult learners need to have an understanding of why they need to learn. They want to have an understanding of how the content is going to benefit them (Knowles, 1984; Russell, 2006). An adult's desire to learn may often arise from life experiences and personal situations (Russell, 2006). The nurses on 4NA see patients struggle with managing the side effects from chemotherapy on a daily basis. Being witness to the negative physical impacts of chemotherapy on this populations' health motivates nurses to want to provide more comprehensive teaching in an effort to assist patients in preventing and coping with side effects.

The next principle discusses how adult learners are independent (Knowles, 1984). By using a self-directed learning approach learners can decide if the information provided by the manual is beneficial to their practice. They can also choose to read what they feel is useful to their practice while bypassing the material that they are already

knowledgeable in. This manual will also contain resources to augment their learning even after learners are finished reading its contents.

The adult learner's previous experiences and education can affect how they learn and the third principle of adult learning incorporates this idea. Adults have a wealth of life experience and their past education and experiences can be used to facilitate the learning of new material (Russell, 2006). Most nurses on 4NA have some degree of experience with chemotherapy education and many have decades of experience in providing this education to patients. Nurses providing chemotherapy education have all been successful in completing the chemotherapy administration course. Building on past experience can make the learning process more meaningful (Russell, 2006). It is important to acknowledge that previous experience and education can also hinder the learning process (Russell, 2006). For example, some nurses may feel that they do not have a need for further learning because they have been providing chemotherapy education for so long that they feel they are experts in the field. To address this I will recommend they take the post-test quizzes to assess their current knowledge.

The fourth principle purposed by Knowles is directed towards the adult's readiness to learn (Knowles, 1984; Russell, 2006). Adult's want control over the nature, timing and direction of the learning process (Russell, 2006). In order to engage nurses in the learning process I need to make the benefits to the patient transparent. From working directly with Oncology nurses, I have heard them voice their readiness to learn more about managing side effects patients experience from chemotherapy. This need was further established in the results of the questionnaire and through the completion of

consultations. To support a readiness to learn within this population, I will discuss real life experiences from 4NA demonstrating how further understanding of chemotherapy side effects could have improved patient outcomes. The Registered Nurse should acknowledge and discuss with the patient that in an effort to reduce nausea it is better to eat smaller more frequent meals.

Adults have a desire to learn material that will directly assist them in dealing with their individual lives. This is what Knowles's (1984) refers to as orientating to learning and is the fifth principle of learning. Nurses need to feel that the educational material being provided is relevant and practical in their line of work (Russell, 2006). Since 4NA is primarily a haematological/oncological floor, chemotherapy administration and education occurs daily on the unit. Furthermore, an expectation of the nurses employed on the unit is that they are skilled in providing education about the management of chemotherapy side effects. Thus, gaining more knowledge about chemotherapy holds immediate relevancy and will help nurses assist this population in managing their health. The majority of literature has reported a positive correlation between educating patients about chemotherapy and improving physical and psychological health outcomes (Aranda et al., 2012; Friedman et al., 2011; Harris, 1998; Mann, 2011; Mills & Sullivan; Pederson et al., 2013; Van der Molen, 1999; Williams & Schreiner, 2004). This further supports the immediate need for expanding nurse's knowledge on this topic.

The final principle of adult learning is the responsiveness to both external and internal motivators. External motivators (e.g. pay raise) can certainly encourage the adult learner to seek new learning opportunities however, it is the internal motivators that are



most effective. Improving the quality of patient care and increased job satisfaction are two internal motivators that motivate nurses on 4NA to gain a deeper understanding of chemotherapy side effects for patients. When nurses begin to see the positive outcomes that their patient education is having they will be more motivated to continue to advance their knowledge and skills on chemotherapy education.

## Model of Instructional Design

The chemotherapy educational resource material for this project was developed using Morrison, Ross, Kalman & Kemp's (2013) instructional design (ID) model. This model focuses on how to facilitate learning from the learner's perspective rather than that of the instructor. The model is oval in structure and is composed of three layers. The outer layer consists of planning, implementation, summative evaluation, project management support services and confirmative evaluation. This outer layer supports the middle which is made up of formative evaluation and revision. The main concepts of this model are contained within its inner core and include instructional problems, learner characteristics, task analysis, instructional objectives, content sequencing, instructional strategies, designing the message, development of instruction and evaluation instruments. The oval structure of this model allows for flexibility and adaptability in that you may enter and/or exit the model at any step of the process.

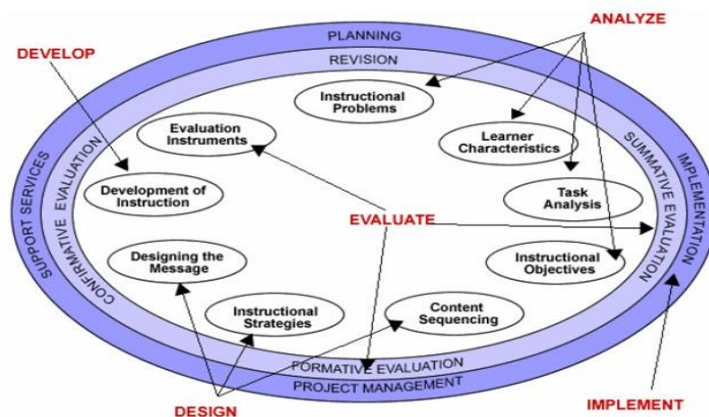


Figure 1. Ross, Morrison, Kalman & Kemp's Model of Instructional Design. Morrison, G.R., Ross, S.M., Howard, K.K., & Kemp, J.E. (2013). *Designing Effective Instruction* (7th ed.). John Wiley & Sons, Inc.

### **Instructional Problem**

The first step in Morrison, Ross, Kalman & Kemp's (2013) instructional design model is identifying the instructional problem. In this case the identified problem is a lack of knowledge and limited resources to assist nurses in providing comprehensive chemotherapy education to patients. Since this need can effectively be addressed by written instruction, the concept of a resource manual was developed. To fully understand the problem a needs assessment was completed.

There are six categories of needs considered when completing a needs assessment: normative needs, comparative needs, felt needs, expressed needs, anticipated needs, and critical incident needs (Morrison et al., 2013). A comparative and felt need were identified over the course of this practicum.

A comparative need "compares the status of the target audience to a peer group" (Morrison et al., 2013, p.34). To demonstrate a comparative need, I compared patient education practices from the outpatient Ambulatory Treatment Clinic at the Health Science Center to that of the inpatient 4NA unit. This was completed via informal conversation with two nurses who work in this outpatient clinic. This clinic treats haematology patients with similar diagnosis and treatments plans to that of 4NA except that they do not require hospitalization for their treatment. These nurses have very comparable knowledge and skill set to that of 4NA and therefore are an appropriate audience for establishing a comparative need. It was found that these nurses also voiced concerns about not having access to a comprehensive resource for patient education. In

retrospect, these informal conversations should have been included as part of the formal consultation.

A felt need is a “desire to improve his or her performance or that of the target audience” (Morrison et al., 2013, p.35). A felt need captures the gap between one’s existing level of performance and desired level. The initial idea for a resource manual to assist nurses with chemotherapy education originated from my own personal experience as an Oncology/Haematology nurse. On 4NA, I observed inconsistencies in chemotherapy education and also noted that nurses had difficulty finding comprehensive resources to assist them with teaching. I also noted that less experienced nurses were often not comfortable or confident in providing education. These observations were confirmed via consultations with key stakeholders (e.g., nurses, physicians and a pharmacist), working on the oncology unit and through a comprehensive review of the literature. Consultations revealed that a key concern was a lack of time and comprehensive resources to provide effective patient chemotherapy education. Nurses identified that there was a need for more comprehensive information on the side effects of chemotherapy treatment. Specifically, they ranked side effects and side effect management as the top two most crucial patient learning needs. In particular, nausea and vomiting was identified as the most commonly experienced side effect of treatment and a topic that nurses would like to see contained in a resource manual. Findings from a review of the literature supported the expressed needs of this population and allowed me to have a comprehensive understanding of the educational needs of patients undergoing chemotherapy treatment

## **Learner Characteristics**

Once the needs assessment is completed it is important to establish the target audiences' characteristics. That is, establishing prior background knowledge, learning preferences, learning environment, age, social characteristics and work experience (Morrison et al., 2013). The target population for this resource manual is Registered Nurses. 4NA is comprised of nurses with various levels of experience, ages and background knowledge. In saying this, all have similar education, are adult learners, are registered nurses, have experience with diverse cultures, and are familiar with caring for Oncology patients. Additionally, all nurses who will be providing chemotherapy education have completed the Chemotherapy Administration Course offered through the provincial Cancer Care Program.

## **Task Analysis**

Task analysis is a crucial step in the instructional design process and involves the identification of instructional content to be included in the project (Morrison, Ross, Kalman & Kemp, 2013). In completing the task analysis I used topic analysis. Facts, concepts, and rules to guide the instruction were based upon information obtained from a literature review, questionnaires, consultations with key stake holders, and my own experience as an oncology/hematology nurse.

One component of task analysis is the identification of the content to be contained in the instructional material (Morrison et al., 2013). From my experience as an oncology/hematology nurse and a chemotherapy education provider, I recognized the

need to improve access to resources to enhance the quality of chemotherapy education. Specifically, the prevention and management of side effects was an area where thorough teaching was lacking. This observation lead me to perform a literature review which also identified side effects as a key learning need for chemotherapy patients. This finding was also supported by information obtained in the questionnaires and consultations completed with key stakeholders. Since the topic of side effects and their management is broad I turned to the literature and consultations to narrow down the priority side effect learning needs of patients. The most common cited side effects in the literature are nausea and fatigue (Dodd, 1988; Kinanne et al., 2008; Williams & Schriener, 2004). Consultations concluded that the most common side effect witnessed on 4NA was nausea and vomiting. This was also a topic identified by staff as essential to be included in a resource manual.

The second component of task analysis identifies the structure of the learning materials (Morrison et al., 2013). Considering the learner characteristics, the fast paced work environment and financial constraints, a resource manual was identified as an appropriate learning aid for nurses. All educational information would be contained within this manual and would be easily accessible to all staff. The manual would be broken down into the following sections: Chemotherapy: A Closer Look, Nausea & Vomiting, Case Scenarios, Program post test, Program Questionnaire, Answer Keys and Additional References.

### **Instructional Objectives**

Instructional objectives identify the main learning goals of the educational material (Morrison et al., 2013). Objectives guide the content of the learning material and

also serves as a way to evaluate learning. In order to be effective, objectives must be clearly defined and measurable (Morrison et al. 2013). Morrison et al. (2013) identified three major categories of objectives: cognitive, affective and psychomotor. Cognitive objectives are created to increase an individual's knowledge (e.g. naming, solving, predicting) (Morrison et al., 2013). Affective objectives aim to change the learner's attitude and focus on such things as appreciations, values and emotions (Morrison et al., 2013). The third and final domain of objectives is psychomotor. These objectives aim to develop or improve upon a physical skill such as coordination, performing, manipulating and constructing (Morrison et al., 2013).

The instructional objectives created for my resource manual were developed from the cognitive domain. Objectives were built around the acquisition of knowledge and information (Morrison et al., 2013). The manual aims to further build upon the basic knowledge that all oncology nurses have to develop a comprehensive understanding of managing nausea and vomiting related to chemotherapy. Application, analysis, and synthesis of both old and new knowledge are incorporated into the manual's content and objectives. Finally, evaluation of learned material is contained throughout the manual and at the end of the manual through post module tests, a case scenario, and a post manual test.

### **Content Sequencing**

The order in which information is presented to learners impacts their understanding of the material (Morrison et al., 2013). Morrison et al. (2013) discusses three sequencing schemes: learning-related, world-related and concept-related. Learning-

related sequencing was used in the construction of this manual. This type of sequencing is based upon the learner characteristics and takes into consideration the difficulty of the material, its appeal to the learner, previous knowledge needed, and the learner's cognitive development (Morrison et al., 2013). The beginning of the manual will review basic material that should be familiar to the nurses such as the definition of chemotherapy, its method of action and goals of treatment. The manual will continue into more comprehensive materials (e.g. medications used to treat nausea and vomiting) that build upon basic knowledge. The manual will contain overall goals at the beginning while each individual module will have specific objectives. Each module begins with a reflective question to engage learners. Again, each module begins with the most basic information and builds on that information throughout the module. To facilitate the flow of information, an outline of the content will be located at the front of the manual. A case scenario, program post-test and program evaluation are contained in the appendices to conclude the manual. This was done so that learners can apply all of their knowledge learned throughout the manual to these forms of evaluation.

### **Instructional Strategies**

An instructional strategy encourages and motivates the learner to link new knowledge to their past knowledge and experience (Morrison et al., 2013). The design of the manual will allow for several instructional strategies to be incorporated into its development. Recall will be enforced by having specific material repeated throughout the manual. Critical thinking will be promoted by offering a case scenario where learners can apply previous knowledge and incorporate new knowledge. The case scenario will be a



real life situation that has occurred on 4NA. The manual will also contain a post-test so that nurses can evaluate what they have learned from the manual in order to identify any areas they may require further exploration. The manual will include links to more detailed information related to the content of the manual. For example, if nurses want more detailed information on how chemotherapy works within the cell cycle they can individually seek this information on their own time.

### **Designing the Instructional Message**

Designing the instructional message involves presenting materials in a way so that the learner is engaged and so that they can identify key learning points (Morrison et al., 2013). This includes pre instructional strategy, strategies for signaling the structure of text and the use of pictures and graphics (Morrison et al., 2013). A similar layout was used for each module of the manual to allow for organization and ease of use. Important concepts and ideas were bolded to bring attention to them. Each module was clearly outlined and contained specific objectives to guide learners. A reflective question was presented at the beginning of each module to engage learners and these questions were highlighted in green. Each main heading contained within the modules was bolded in blue to draw attention. When information was listed, point form was used to facilitate learning and reduce the amount of reading required. The use of graphics was used as appropriate to facilitate written content but overuse was avoided so that learners were not distracted from the content.

### **Development of Instruction**

The development of instruction is the process of applying the design plan to the development of the manual (Morrison et al., 2013). A resource manual was the chosen method of learning after taking into consideration the learner's characteristics and the barriers to chemotherapy education that exist on 4NA. A resource manual is easily accessible to all nurses and is a feasible project. Another benefit to this learning method is that it can continuously be built upon to cover additional related topics. This manual will be in a binder so that it can easily be adapted and added to. It will also contain quick reference tabs so that nurses can refer to their topic of interest quickly without having to read through information they may already be familiar with. Although this is a printed resource there will be a reference page at the back of the manual with information regarding other learning references (e.g. videos, internet sources, books, courses) so that if a nurse requires more in depth information they will have access to reliable sources. To ensure the content of the manual is accurate and applicable it was reviewed by the 4NA patient care coordinator and another senior nurse working in the Oncology setting.

### **Development of an Evaluation Tool**

Evaluation is a crucial step in the instructive design process. Evaluation instruments are used as a means to assess how well the learner has met the outlined objectives (Morrison et al., 2013). It is also an effective way to identify any revisions that may need to be made to the manual. Throughout the development on this resource manual both formative and summative evaluation methods were used.

Formative evaluation is the testing of learning materials with select learners during the development phase, where results are used to make revisions (Morrison et al., 2013). To complete a formative evaluation on this manual its contents were reviewed by key stake holders. Feedback on content, visual appeal and ease of use was obtained and revisions were made accordingly.

Summative evaluation is used to evaluate how well the overall objectives of the program are attained at the end (Morrison et al., 2013). Several approaches to summative evaluation were used to evaluate this reference manual. First of all, there are module post-tests to assess learning that has occurred during each module. There is also a final post-test at the end manual to assess overall learning. A case scenario was used to reflect on the main objectives presented in the manual to allow learners to apply their critical thinking skills to solve real life problems. To conclude, a final questionnaire will be provided to obtain feedback on the manual to assess what changes or additions need to be made to the manual.

Confirmative evaluation is the ongoing assessment of the effectiveness of the program (Morrison et al., 2013). As an oncology nurse I will be working with the nurses who will be accessing this manual and therefore ongoing evaluation can occur. During our yearly education day I will administer a questionnaire to identify what learning has occurred and what learning needs to occur. The results will be used to make ongoing changes and additions to the manual.

Evaluation is an ongoing process, and this is represented by the oval shape of the ID model. Evaluation of the learning material is essential in order to allow the

instructional designer to assess what learning has occurred and what changes need to be made to make the manual more effective. It is also a way for learners to assess how much they have learned and what areas they require further education in. Evaluation must begin during the development of the manual and continue for as long as the manual is implemented in practice.

### **An Ongoing Process**

This, practicum discusses the development and initial evaluation of the resource manual, however, this project will be ongoing. This manual was designed so that it could be built upon by adding new modules which will reflect the needs of the learners. As updated research, information and policies change; the information in the manual will need to be adjusted. The self-learning nature of this practicum means that project management and support services are not necessary at this time.

### **Summary of Educational Resource Manual**

In response to educational needs identified from my personal experience, a review of literature and via consultations with front line staff on 4NA, an educational resource manual entitled Managing Nausea: A Chemotherapy Education Resource Manual for Nurses was developed (see Appendix A). The goal of this manual is to enhance nurse's knowledge about the management of nausea and vomiting of patients receiving chemotherapy. This manual is meant to be an easily accessible resource for nurses that can be continuously built upon.

The manual begins with an outline of the goals and objectives followed by a description of how to use this resource. It is comprised of two modules: 1. Chemotherapy: a closer look and 2) Management of Nausea and Vomiting. Each module begins by introducing the objectives for that specific module. A reflective question is posed to get users thinking about what they already know about the topic. The module concludes with a post test to allow learners to assess how much they have learned and what areas they may need further education in. Included in the appendices are a manual post test, evaluation form, case scenario and a list of additional resources.

This manual is designed for independent learning and use. Each nurse is an adult learner and has unique learning needs and therefore this method of learning is appropriate. Permission to use this manual on 4NA was obtained from the unit manager Christina Walsh.

## A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

This resource was designed for nurses who provide chemotherapy teaching to inpatients, although most of its content is applicable to outpatients as well. The content of the manual was designed at an education level appropriate for that of an Oncology nurse. The manual was designed to be read from beginning to end however easy access tabs allow nurse to quickly access specific information as desired. The content of the manual was guided by a literature review and consultations with key stakeholders. The design of the manual was aided by using Knowles's Six Principle of Adult Learning (1984) and Morrison, Ross, Kalman & Kemp's (2013) Instructional Design Model.

### **Advanced Practice Nursing Competencies**

The application of advanced practice nursing competencies were used throughout the development of this resource manual. Advanced nursing describes the application of an advanced level of clinical practice that maximizes the use of graduate level education to positively affect the health and well-being of individuals or populations (Canadian Nurses Association [CNA], 2014). The role of the advance practice nurse is complex and based on an extensive understanding of nursing knowledge, theory, research and clinical practice (CNA, 2014). Throughout the development and implementation of my practicum project I have demonstrated each of the five APN competencies: clinical, research, leadership, consultation and collaboration

#### **Clinical Competencies**

A major focus of advanced nursing practice is having proficiency in a specialized area of nursing (CNA, 2014). In particular, the advanced practice nurse incorporates extensive clinical experience with theory, research and in depth nursing knowledge to improve patient's health care outcomes (CNA, 2014). In the development of this manual I completed an extensive literature review to determine the learning needs of my identified population. I reflected on my own practice as an Oncology nurse and used critical thinking in determining the style and content of my resource manual. I used both quantitative and qualitative data (i.e. literature, interviews) to inform the construction of the manual. In addition, I engaged members of the interdisciplinary team to provide insights into and feedback about the contents of the manual. As a result, this manual is

based on the needs of individuals undergoing chemotherapy and the nurses delivering the care.

### **Research Competencies**

Research development and application is an essential competency of the advanced practice nurse. Reviewing and analyzing research was fundamental in gaining an understanding of the key learning needs of patients undergoing chemotherapy treatment and the learning need of the nurses who care for them. I have demonstrated this competency by completing a comprehensive literature review of both qualitative and quantitative studies. Each of these research articles were critically analyzed using the PHAC (2015) Critical Appraisal Tool Kit and the QARI (Joanna Briggs Institute, 2014). In addition to research studies, non-research articles were reviewed and were crucial in informing me of current thinking and practice in Oncology nursing. Based on the literature review an interview guide and survey were constructed and administered to interdisciplinary members of the Oncology/Hematology team. Evidence from the literature review and the interviews informed the focus of my resource manual and its contents.

### **Leadership**

A key role of the advanced practice nurse is to play a leadership role within the nursing profession. Advanced practice nurses are continuously seeking ways to improve nursing practice and patient care by facilitating change (CNA, 2014). The main goal of my resource manual is to improve chemotherapy education practices for both patients and



nurses. The motivation for this practicum came from acknowledging that nurses were having difficulty accessing educational resources and from observing inconsistencies in the chemotherapy education being provided. This practicum has allowed me to demonstrate leadership through the initiation of change and the development of a resource manual to assist nurses in providing comprehensive competent chemotherapy teaching to patients. As a leader, I have identified a workplace issue, worked with stake holders to develop an appropriate intervention and applied my in depth knowledge to develop and evaluate an effective education tool to facilitate nurses in providing chemotherapy education to patients. As the plan is to implement this project, I will be contributing to a, organizational culture that support professional growth, continuous learning and collaborative practice (CNA, 2014).

### **Consultation and Collaboration**

Effective consultation and collaboration are fundamental competencies of nursing practice. The advanced practice nurse consults and collaborates with colleagues from various sectors from an organizational, provincial, national and international level (CNA, 2014). Collaboration and consultation were essential elements of this practicum and were demonstrated throughout the process. Consultations with key stake holders as well as collaboration with front line nurses allowed me to recognize the key areas that my manual needed to focus on. Through continual interaction with these key stake holders and front line staff, content of the manual was adapted and objectives of the manual were refined. Including the learners in the development of the manual was essential to ensure that the content covered was appropriate and that the approach to learning was accepted by those

who would be using it. A final collaboration allowed the patient care coordinator and another senior nurse on the floor to review the manual prior to its publication to provide feedback on content, visual appeal and functionality.

## **Conclusion**

Nurses need to be supported in their efforts to provide comprehensive chemotherapy education to their patients. Both the literature and consultations completed support the need for a more in depth resource to assist nurses in educating patients about chemotherapy side effects: specifically the management of nausea and vomiting. With the increasing number of patients requiring chemotherapy treatment nurses are playing a pivotal role in preparing patients for their treatment. The development of this manual is a step towards advancing nursing knowledge and skills in providing patient chemotherapy education and therefore in improving the overall health outcomes of this population.

## References

American Cancer Society. (2007). Retrieved from:

<http://www.cancer.org/cancer/cancerbasics/index>

Aranda, S., Jefford, M., Yates, P., Gough, K., Seymour, J., Francis, P...Schofield, P.

(2012). Impact of a novel nurse-led prechemotherapy education intervention

(ChemoEd) on patient distress, symptom burden, and treatment-related

information and support needs: results from a randomized controlled trial. *Annals*

*of Oncology*, 23, 222-231. doi: 10.1093/annonc/mdr042

Billings, D. & Halstead, J. (2012). *Teaching in Nursing: A Guide for Faculty* (4<sup>th</sup> ed.).

Saunders/Elsevier

Canadian Cancer Society. (2014). *Cancer statistics at a glance*. Retrieved from:

<http://www.cancer.ca/en/cancer-information/cancer-101/cancer-statistics-at-a-glance/?region=nl>

Canadian Nurses Association. (2012). *Advanced nursing practice: a national framework*.

Retrieved from: [https://www.cna-aiic.ca/~media/cna/page-content/pdf-en/anp\\_national\\_framework\\_e.pdf](https://www.cna-aiic.ca/~media/cna/page-content/pdf-en/anp_national_framework_e.pdf)

Cowan, C. & Hoskins, R. (2007). Information preferences of women receiving

chemotherapy for breast cancer. *European Journal of Cancer Care*, 16(6), 543-

550

Dalby, C. K., Nesbitt, M., Frechette, C. A., Kennerley, K., Lacoursiere, L. H., & Buswell,

L. (2013). Standardization of Initial Chemotherapy Teaching to Improve

Care. *Clinical Journal Of Oncology Nursing*, 17(5), 472-475.

doi:10.1188/13.CJON.472-475

Dodd, M. (1988). Efficacy of proactive information on self-care in chemotherapy patients. *Patient Education and Counselling*, 11, 215-225

Fredette, S. (1990). A model for improving cancer patient education. *Cancer Nursing*, 13(4), 207-215

Friedman, A., Cosby, R., Boyko, S., Hatton-Bauer, J., & Turnbull, G. (2011). Effective teaching strategies and methods of delivery for patient education: a systematic review and practice guideline recommendations. *Journal of Cancer Education*, 26(1), 12-21. doi:10.1007/s13187-010-0183-x

Frost, M., Brueggen, C., & Mangan, M. (1997). Intervening with the psychosocial needs of patients and families: perceived importance and skill level. *Cancer Nursing*, 20(5), 350-358

Harris, K. (1998). The informational needs of patients with cancer and their families. *Cancer Practice*, 6(1), 39-46

Joanna Briggs Institute. (2014). Retrieved from: <http://www.joannabriggs.org/jbi-approach.html#tabbed-nab=JBI-approach>

Kinnane, N., Stuart, E., Thompson, L., Evans, K., & Schneider-Kolsky, M. (2008).

Evaluation of the addition of video-based education for patients receiving standard pre-chemotherapy education. *European Journal of Cancer Care*, 17(4), 328-339

- Knowles, M. (1984). *The modern practice of adult education: From pedagogy to andragogy*. Chicago, IL: Associated Press, Follett Publishing Co
- Lauer, P., Murphy, S., & Powers, M. (1982). Learning needs of cancer patients: a comparison of nurse and patient perceptions. *Nursing Research*, 31, 11-16
- Lee, Y., Francis, K., Walker, J., & Lee, S. (2004). What are the information needs of Chinese breast cancer patients receiving chemotherapy? *European Journal of Oncology Nursing*, 8(3), 224-233
- Mann, K. (2011). Education and health promotion for new patients with cancer. *Clinical Journal of Oncology Nursing*, 15(1), 55-61. doi:10.1188/11.CJON.55-61
- Mayo Clinic (2014). *Tests and procedures: chemotherapy*. Retrieved from:  
<http://www.mayoclinic.org/tests-procedures/chemotherapy/basics/definition/prc-20023578>
- McCaughan, E., & Parahoo, K. (2000). Medical and surgical nurses' perceptions of their level of competence and educational needs in caring for patients with cancer. *Journal of Clinical Nursing*, 9(3), 420-428. doi:10.1046/j.1365-2702.2000.00403.x
- McCaughan, E., & Thompson, K. (2000). Information needs of cancer patients receiving chemotherapy at a day-case unit in Northern Ireland. *Journal of Clinical Nursing*, 9(6), 851-858. doi:10.1046/j.1365-2702.2000.00434.x

Mills, M., & Sullivan, K. (1999). The importance of information giving for patients newly diagnosed with cancer: a review of the literature. *Journal of Clinical Nursing*, 8, 631-642

Morrison, G.R., Ross, S.M., Howard, K.K., & Kemp, J.E. (2013). *Designing Effective Instruction* (7th ed.). John Wiley & Sons, Inc

Mueller, P., & Glennon, C. (2007). A nurse-developed prechemotherapy education checklist. *Clinical Journal of Oncology Nursing*, 11(5), 715-719.  
doi:10.1188/07.CJON.715-719

Oncology Nursing Society. (2012). Oncology nursing society position on the education of the nurse who administers chemotherapy and biotherapy. Retrieved from:  
<http://www2.ons.org/Publications/Positions/RNed>

Pedersen, B., Koktved, D. P., & Nielsen, L. L. (2013). Living with side effects from cancer treatment - a challenge to target information. *Scandinavian Journal of Caring Sciences*, 27(3), 715-723. doi:10.1111/j.1471-6712.2012.01085.x

Piredda, M., Rocci, L., Gualandi, R., Petitti, T., Vincenzi, B., & De Marinis, M. (2008). Survey on learning needs and preferred sources of information to meet these needs in Italian oncology patients receiving chemotherapy. *European Journal of Oncology Nursing*, 12(2), 120-126

Public Health Agency of Canada (2015). Critical Appraisal Took Kit. Retrieved from:  
<http://www.phac-aspc.gc.ca/nois-sinp/guide/catk-toec-eng.php>

- Rigdon, A. (2010). Development of patient education for older adults receiving chemotherapy. *Clinical Journal of Oncology Nursing*, 14(4), 433-441
- Russell, S. (2006). An overview of adult-learning processes. *Urologic Nursing*, 26(5), 349
- Rutten, L., Arora, N., Bakos, A., Aziz, N., & Rowland, J. (2005). Information needs and sources of information among cancer patients: a systematic review of research (1980-2003). *Patient Education & Counseling*, 57(3), 250-261
- Schofield, P., Jefford, M., Carey, M., Thomson, K., Evans, M., Baravelli, C., & Aranda, S. (2008). Preparing patients for threatening medical treatments: effects of a chemotherapy educational DVD on anxiety, unmet needs, and self-efficacy. *Supportive Care In Cancer*, 16(1), 37-45
- Skalla, K., Bakitas, M., Furstenberg, C., Ahles, T., & Henderson, J. (2004). Patients' need for information about cancer therapy. *Oncology Nursing Forum*, 31(2), 313-319. doi:10.1188/04.ONF.313-319
- Smith, J.A., Kindo, C.C., Kurian, S., Whitaker, L.M., Burke, C., & Wachel, B. (2004). Evaluation of patient chemotherapy education in a gynecology oncology center. *Supportive Care in Cancer*, 12, 577-583
- Tamburini, M., Gangeri, L., Brunelli, C., Boeri, P., Borreani, C., Bosisio, M... Trimigno, P. (2003). Cancer patients' needs during hospitalisation: a quantitative and qualitative study. *BMC Cancer*, 3(12), 1-11. doi:10.1186/1471-2407-3-12



- van Weert, J. M., Bolle, S., van Dulmen, S., & Jansen, J. (2013). Older cancer patients' information and communication needs: What they want is what they get? *Patient Education & Counseling*, 92(3), 388-397. doi:10.1016/j.pec.2013.03.011
- Van der Molen, B. (1999). Relating information needs to the cancer experience: . Information as a key coping strategy. *European Journal of Cancer Care*, 8(4), 238-244
- Van der Molen, B. (2000). Relating information needs to the cancer experience. . Themes from six cancer narratives. *European Journal of Cancer Care*, 9(1), 48-54
- Williams, S. & Schreier, A. (2004). The effect of education in managing side effects in women receiving chemotherapy for treatment of breast cancer. *Oncology Nursing Forum*, 31(1), 16-23
- World Health Organization. (2014). *Key Fact Sheet*. Retrieved from: <http://www.who.int/mediacentre/factsheets/fs297/en/>

## **Appendix A**

### **Managing Nausea: A Chemotherapy Education Resource Manual for Nurses**



# Managing Nausea: A Chemotherapy Education Resource Manual for Nurses

Developed by: Lorie Kielley BNRN

## Introduction

Chemotherapy is the systemic treatment of illness by the use of powerful chemicals that attack rapidly dividing cells in the body (Mayo Clinic, 2014). Chemotherapy may be used independently or in combination to treat various forms of cancer. Although chemotherapy can be an effective treatment for cancer, it can also cause harmful and potentially fatal side effects (Mayo Clinic, 2014). These side effects can sometimes be prevented or minimized; providing education to patients can significantly reduce the amount side effects experienced.

As an Oncology/Hematology nurse who is certified in chemotherapy administration you play a significant role in providing patient education. Research has shown that educating patients about chemotherapy side effects, such as nausea, results in positive health care outcomes (Aranda et al., 2012; Friedman, Cosby, Boyko, Hutton-Bauer, & Turnbull, 2011; Harris, 1998; Mann, 2011; Mills & Sullivan, 1999; Pederson, Kottved & Nielson, 2013; Van der Molen, 1999; Williams & Schreiner, 2004). Although there are many side effects associated with chemotherapy, a review of the

literature and consults with experts in the field of Oncology identified the management of nausea and vomiting as a primary concern for chemotherapy patients. Hence, the focus of this manual is on the management of nausea and vomiting.

The manual begins with an outline of the goals and objectives followed by a description of how to use this manual. This self-directed resource manual is comprised of two modules: 1) Chemotherapy: A Closer Look; and 2) Management of Nausea and Vomiting. Each module begins by introducing the objectives for that specific module. A reflective question is posed to get users thinking about what they already know about the topic. The content of the module concludes with a posttest to assess what has been learned from the module. The manual concludes with an Appendix which is comprised of a manual post-test, evaluation form, a case scenario, and a list of additional resources. It is anticipated that after reviewing this manual nurses will feel more knowledgeable and experience increased confidence in providing patient education.

## Goal and Objectives

**Goal:** To enhance nurse's knowledge about the management of nausea and vomiting of patients receiving chemotherapy.

**Objectives:** After completing the chemotherapy education resource manual for nurses you will be able to:

1. Articulate an overview of chemotherapy as a treatment for individuals living with cancer.
2. Identify key strategies in the management of nausea and vomiting.
3. Access additional educational resources for the management of nausea and vomiting.

## Using this Manual

- ❑ Each module should be completed in sequence
- ❑ Easy access tabs are provided if you wish to focus on a particular section
- ❑ Each module starts off with a reflective question. This question will help you identify your learning needs and reflect upon what you already know about the topic.
- ❑ Each module concludes with a self-test
- ❑ If you receive a score below 80% on the self-test you have the option to review the material and redo the test
- ❑ Case scenarios are provided at the end of the manual to help you apply your knowledge to real life situations you may encounter on an Oncology unit (see Appendix A)
- ❑ The manual concludes with a post test (see Appendix B). This will assess your overall learning. If you receive a score below 80% on this test you have the option to review the material and redo the test or to contact [lorie\\_churchill@yahoo.com](mailto:lorie_churchill@yahoo.com)
- ❑ All answers to tests and case scenarios can be located in Appendix C
- ❑ The manual provides a list of additional educational resources about chemotherapy side effects management (see Appendix D)
- ❑ Please complete the evaluation questionnaire at the end of the manual (see Appendix E). You are asked to provide feedback on what you found useful and suggestions for improvement. Please indicate any additional learning modules you would like to see added to this manual. This information will be used to revise the manual. Please email feedback to [lorie\\_churchill@yahoo.com](mailto:lorie_churchill@yahoo.com)

## Table of Contents

Introduction	60
Goals and Objectives	62
Preface	63
Module 1: Chemotherapy: A Closer Look	65
Module 2: Management of Nausea & Vomiting	82
References	101
Appendix A: Case Scenarios	104
Appendix B: Program Post Test	107
Appendix C: Answer Keys	112
Appendix D: Additional Resources	116
Appendix E: Program Evaluation	119



# Module 1:

# Chemotherapy:

# A Closer Look



## Learning Objectives

After completing this module, you should be able to:

1. Provide a definition of chemotherapy.
2. Explain how chemotherapy acts on cancer cells.
3. Identify the potential goals of chemotherapy.
4. List the common side effects of chemotherapy.



*What are some of the common side effects of chemotherapy that you have seen on the unit?*

## Definition

Chemotherapy is a drug used to treat cancer. It works by destroying cancer cells and preventing them from replicating or dividing (Cancer Net, 2015).

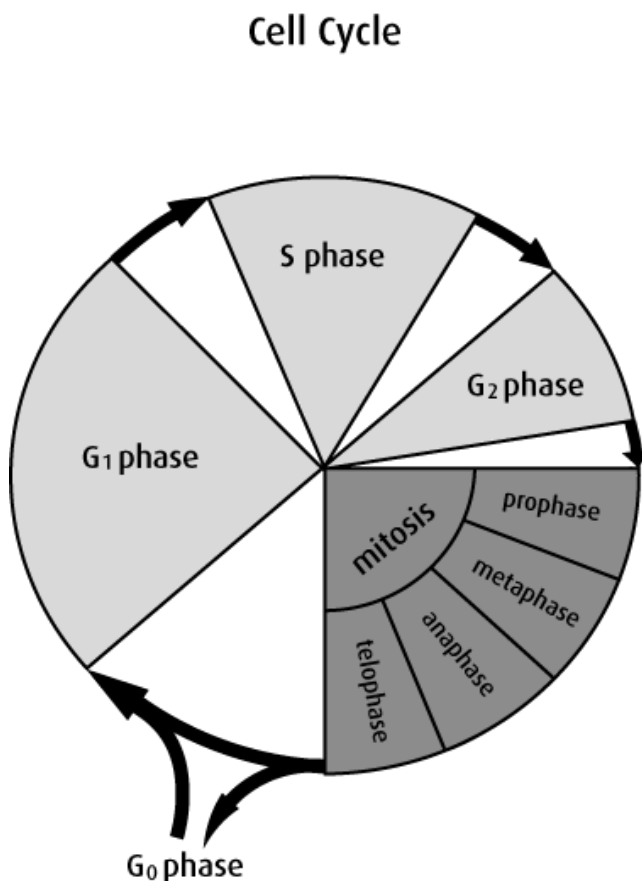
Chemotherapy acts on rapidly dividing cells and therefore in addition to attacking cancerous cells it also damages healthy cells (e.g. bone marrow, hair follicles, mucosal lining). Chemotherapy may be given as a single dose or repeated in cycles depending on the indication for treatment. On 4NA chemotherapy is administered intravenously, orally, or subcutaneously.

## Method of Action

Chemotherapy directly or indirectly disrupts the reproduction of cells by altering essential biochemical processes. It destroys cancer cells or slows down how fast they grow (Black & Hawks, 2001). In order to appreciate how chemotherapy works within the cell cycle you should first learn how the normal cell cycle works.

## The Cell Cycle

Every cell in the body goes through a life cycle. Cells grow and die at different rates. Both normal and cancerous cells go through phases of replication, which is referred to as the cell cycle. Below is a diagram as well as a description of each phase of the cell cycle (Canadian Cancer Society, 2014)



*Figure 1.1* Phases of the cell cycle. Canadian Cancer Society. (2014). Retrieved from: [www.cancer.ca](http://www.cancer.ca)

## A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

Phase	Description
Interphase	<b>G<sub>0</sub></b> Resting phase (also called the quiescent or dormant phase) <ul style="list-style-type: none"><li>• The cell performs all of its normal functions but is not preparing to divide.</li><li>• Some cells divide often and either are in G<sub>0</sub> for a short amount of time or skip G<sub>0</sub>. Other cells do not divide very often and are in the G<sub>0</sub> phase for many years.</li><li>• When the cell receives the signal to divide, it moves into G<sub>1</sub> phase of the cell cycle.</li></ul>
	<b>G<sub>1</sub></b> Gap 1 – first growth phase <ul style="list-style-type: none"><li>• The cell prepares to undergo cell division.</li><li>• The cell still performs all of its normal functions, but starts to get bigger.</li><li>• The cell begins to make a copy of the cell parts (organelles). It also begins to make more protein to get ready to divide.</li><li>• The time for this phase varies from about 8 hours to several days, weeks or months.</li></ul>
	<b>S</b> Synthesis phase <ul style="list-style-type: none"><li>• The cell copies its deoxyribonucleic acid (DNA) (DNA synthesis) to make 2 sets of chromosomes – one set for each new cell.</li><li>• This phase lasts about 6–8 hours.</li></ul>
	<b>G<sub>2</sub></b> Gap 2 – second growth phase <ul style="list-style-type: none"><li>• The cell makes more proteins in preparation for cell division.</li><li>• This phase lasts about 2–5 hours.</li></ul>
	<b>M</b> Mitosis
Prophase	<ul style="list-style-type: none"><li>• The cell divides into 2 new cells, which occurs in 4 stages (prophase, metaphase, anaphase and telophase).</li><li>• The mitosis phase lasts about 1–3 hours.</li></ul>
Metaphase	
Anaphase	
Telophase	
After mitosis, a cell either re-enters the G <sub>1</sub> phase or goes into the resting phase (G <sub>0</sub> ) where it may later re-enter the cell cycle.	

**Figure 1.2** Description of the phases of the cell cycle. Canadian Cancer Society. (2014). Retrieved from: [www.cancer.ca](http://www.cancer.ca)

## The Cell Cycle and Cancer

Normal tissue is made of cells that are in the resting phase of the cell cycle ( $G_0$ ) and cells that are going through replication or cell death. There is a balance between the number of replicating and dying cells. When there is no longer a balance in cell replication and cell death, cancer can occur. Cancer occurs when there is abnormally growing or dividing cells. Cancer cells usually cannot enter the resting phase ( $G_0$ ) and therefore begin to divide uncontrollably (CCS, 2014).

## Cell Cycle and Cancer Treatment

Since each individual drug works at different phases of the cell cycle, chemotherapy is often given in combination with other drugs. When combined, chemotherapeutic agents destroy more malignant cells and produce fewer side effects because each drug acts on cancer cells at a different part of the cell cycle. Treatment regimens are complex, cyclic and individualized based on the individual and their type of cancer (CCS, 2014)

## Cell Kill Theory (Otto, 2001)

A single cell is capable of multiplying and eventually killing the host. With each dose of chemotherapy only a fraction of the cancer cells are killed:

- Repeated doses of chemotherapy are needed to reduce the total number of cells enough for the body's immune system to destroy any remaining cells (Otto, 2001)

- Each dose of chemotherapy kills a percentage of cancer cells.

Therefore, **the tumor burden never reaches zero** (Otto, 2001)

- We cannot predict a person's response to chemotherapy. Cells may mutate over time and become resistant to chemotherapy. Patients with similar diseases can respond to the same treatment quite differently (Otto, 2001). Therefore, the success of treatment and use of alternative treatments (e.g. surgery, radiation) vary from patient to patient.

## Major Differences Between Normal Cells and Cancer Cells

Cancerous cells replicate in the cell cycle as do normal cells, however there are major differences noted between normal cells and cancer cells (Black & Hawks, 2001; Otto, 2001).

**Growth** – normal cells stop growing when enough are produced. **Cancer cells lack signals to tell them to stop reproducing and therefore continue to grow indefinitely.**

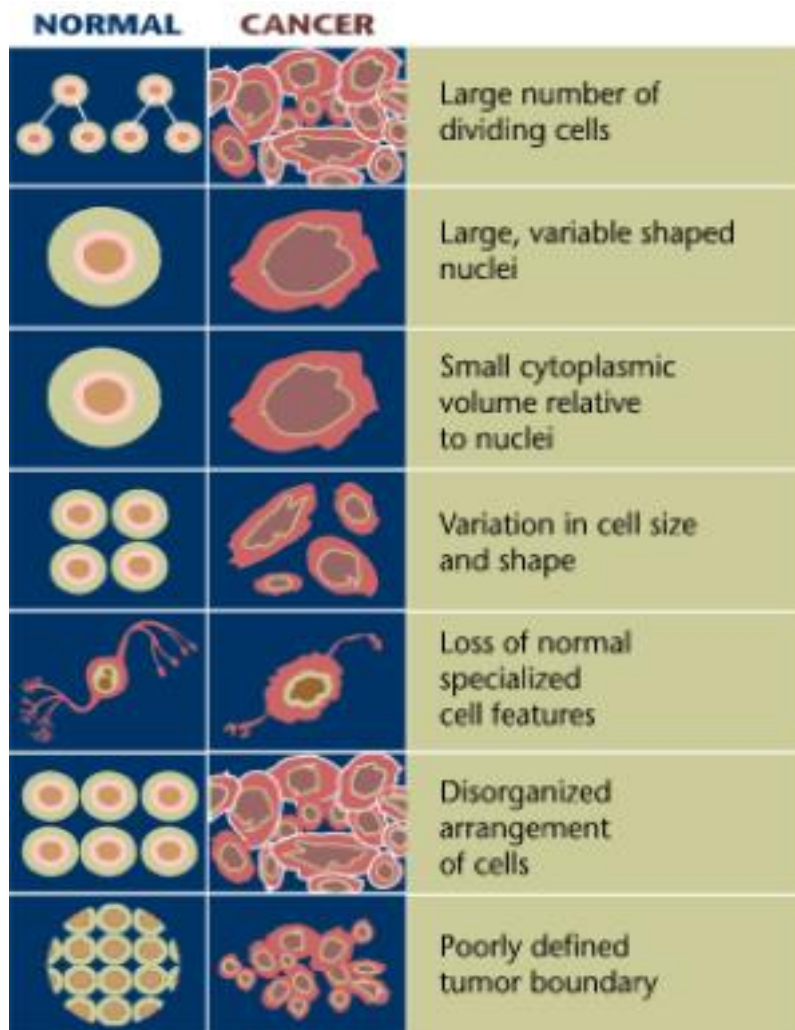
**Communication** – normal cells communicate to know when they have reached their boundaries for growth. Cancer cells lack these signals.

**Cell Repair and Death** – when normal cells are damaged or old they wither, repair, or die. Cancer cells are neither repaired nor do they die.

**Stickiness** – normal cells produce a substance that helps them stick together, whereas cancer cells float around.



**Appearance** – under a microscope normal versus cancer cells appear quite different (See Figure 1.3)



*Figure 1.3* Normal versus Cancer cells. Retrieved from:

<http://lungcancer.about.com/od/Biology-of-Cancer/a/Cancer-Cells-Normal-Cells.htm>

**Rate of Growth/Maturation** – normal cells mature. Cancer cells grow rapidly without maturing.

**Evading Immune System** – normal cells when damaged get picked up and removed by our immune system. Cancer cells evade our immune system.

**Function** – normal cells have a function (e.g. red blood cells carry hemoglobin). Cancer cells do not have a function.

### Goals of Treatment:

Treatment goals of chemotherapy are dependent on the diagnosis, disease progression and the patient's wishes (Black & Hawks, 2001; CCS, 2014).

Goals of chemotherapy treatment may include:

1. **Cure** - *eliminate cancer cells and prevent reoccurrence*
2. **Control** - *eliminate cells from growing and spreading*
3. **Prevent** – *prevent growth and spread of new cancer cells*
4. **Relieve** – *shrink or control cancer to relieve symptoms*

As a nurse it is important to be aware of the goal of treatment in order to facilitate the development of an individualized treatment plan.

## Treatment Plan

An individual's diagnosis, underlying health and age will dictate the chemotherapy protocol to be used (Black & Hawks, 2001; Otto, 2001).

Although there are often standing protocols for specific diseases, individual factors need to be considered when selecting which type of chemotherapy a patient receives. For example, a patient with underlying kidney disease may not tolerate a highly nephrotoxic treatment.

Patients may be admitted to your floor for various reasons. Some may be receiving their first chemotherapy treatment while others may be in for treatment of a relapsed disease. The following are a list of indications for chemotherapy treatment:

**Induction** – the first treatment given for a disease. Accepted as the best treatment option.

**Neoadjuvant Therapy** – used to attack cancer cells and shrink the tumor before primary treatment begins. For example, a patient has a large tumor to be operated on. Chemotherapy may be given to shrink the size of the tumor to make surgery more successful.

**Adjuvant Therapy** –chemotherapy is given in addition to primary treatment (surgery, radiation) to attack any remaining cancer cells. For example, a patient has a brain tumor resected. Chemotherapy is given afterward to attack any remaining cells.

**Concurrent Therapy** – when chemotherapy is used concurrently with another form of treatment (i.e. radiation) to maximize cell kill.



**Consolidation** – treatment given once patient has obtained remission to prolong their remission.

**Salvage** – involves 2<sup>nd</sup>, 3<sup>rd</sup> (etc.) line chemotherapy when others (induction) have failed.

**Central Nervous System (CNS) Prophylaxis** – intrathecal administration of chemotherapy in order to prevent CNS relapse

## Side Effects of Chemotherapy Treatment

In addition to destroying cancerous cells, chemotherapy also damages healthy cells such as bone marrow, hair follicles, lining of the mouth and the digestive system. The following are potential side effects experienced by chemotherapy: (most common bolded)

- Anxiety
- Altered taste changes
- Stress
- Headaches
- Disturbed sleep patterns
- Constipation
- **Fatigue**



- **Diarrhea**

- **Nausea/Vomiting**



- Depression
- **Leukopenia (neutropenia)**
- **Hair Loss**
- **Sore mouth**
- Fertility Issues
- Decreased Appetite
- Hand and foot syndrome
- Infections
- Skin and nail changes
- Memory changes

You can see that chemotherapy can have detrimental side effects for patients. Although there are a number of potential side effects that may be experienced from treatment, some are more common than others (see bolded side effects above). After reviewing the literature it was determined that nausea and vomiting was one of the most common side effects from chemotherapy (Dodd, 1988; Kinanne, Stuart, Thompson, Evans, & Schneider-Kolsky, 2008; Williams & Schriener, 2004). This finding was supported by formal consultations with experts in the field who agreed that nausea and vomiting was one of the most common side effect of treatment that warranted further education

**Congratulations! You have finished module 1. Please turn to the next page to complete a self-test on the content you have learned within this module. Proceed to module 2 for a further discussion on the management of nausea and vomiting as a side effect.**

## Self-Test

Instructions: Please answer the following questions using a separate sheet of paper. Try to answer each question without referring back to the manual content. After answering all questions please refer to the appendix for answers. If you obtain a score of 80% (8 out of 10) please proceed to the next module. If you score less than 80% please review the content of Module 1 until a score of 80% is obtained.

1. Chemotherapy acts by destroying cancer cells and preventing them from replicating or dividing.

TRUE

FALSE

2. In addition to destroying cancerous cells, chemotherapy also attacks other slowly dividing cells.

TRUE

FALSE

3. What are two potential goals of chemotherapy?

\_\_\_\_\_

\_\_\_\_\_

4. The rationale for using combination chemotherapy is:

- a) Decreased side effects
- b) Maximum cell kill
- c) Faster response (remission)
- d) A & B

5. List 3 most common side effects of chemotherapy

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



6. The amount of cancer cells will eventually reach zero.  
TRUE FALSE
7. A major difference between normal and cancer cells is that normal cells do not have “stop lights”.  
TRUE FALSE
8. The two most common side effects of chemotherapy cited in the literature are nausea and vomiting and diarrhea.  
TRUE FALSE
9. When you are receiving multiple modalities of treatment (surgery, chemotherapy, radiation) at the same time this is referred to as:  
a) Adjuvant Therapy c) Neoadjuvant Therapy  
b) Concurrent Therapy d) Salvage Therapy
10. Patient’s receiving the same treatment for the same disease should have the same clinical outcome.  
TRUE FALSE

# **Module 2:**

## **The Management of Nausea and Vomiting**



## Learning Objectives

After completing this module, you should be able to:

1. Understand the pathophysiology of nausea and vomiting.
2. Identify the four types of nausea associated with chemotherapy.
3. Recognize the common symptoms of nausea and vomiting.
4. Identify prevention and management of nausea and vomiting.



**In your practice what strategies have you used to help patients receiving chemotherapy cope with nausea and vomiting? Were these strategies successful or not?**

## Overview of Nausea and Vomiting

“Nausea is a subjective phenomenon of an unpleasant, wavelike sensation experienced in the back of the throat and/or the epigastrium that may culminate in vomiting (emesis). Vomiting is the forceful expulsion of the contents of the stomach, duodenum, or jejunum through the oral cavity.” (National Cancer Institute, 2015)

Nausea and vomiting are both controlled within the central nervous system but controlled by different mechanisms. Nausea is mediated by the autonomic nervous system while vomiting results from triggering of the vomiting center located in the medulla. The vomiting center may be triggered by:

1. **A chemoreceptor trigger zone**
2. **Cerebral cortex and the limbic system** which is activated by sensory stimulation
3. **Vestibular Labyrinthine** located in the inner ear and affected by movement

4. **Peripheral stimuli from visceral organs** from accumulation of chemicals or endogenous substances

(National Cancer Institute, 2015)

Some of the main causes of nausea and vomiting related to chemotherapy include: **gastric stasis, blood toxins, movement or other related factors**

(Black & Hawks, 2012)

**Gastric Stasis** – The slowing down of the digestive system which may be related to taking opioids.

**Toxins in Blood** – May be caused by high levels of cancer cells in the blood, the breakdown of cancer cells, and medications that can release chemicals into the blood.

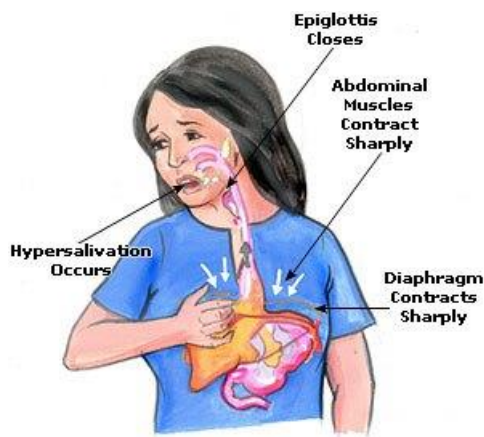
**Movement** – Some patients experience nausea similar to sea sickness (occurs upon movement).

**Other** - increased intracranial pressure, hypersensitivity to smells and sights.

## Symptoms of Nausea and Vomiting

Symptoms of nausea and vomiting can vary depending the origin of the nausea, emetic potential of chemotherapy treatment and patient characteristics (e.g. threshold for nausea) (British Columbia Cancer Agency, 2014; CCS, 2014). Symptoms of nausea include:

- dizziness
- upset stomach
- pallor
- sweating
- increased heart rate
- restlessness
- lack of appetite
- irritability
- increased saliva production



## Types of Nausea

Various classifications used to describe nausea and vomiting related to chemotherapy patient's and include: **acute, delayed, chronic and anticipatory.**

**Acute** – Occurs several minutes to a few hours after treatment is given. Often resolves within the first 24 hours.

**Delayed** – develops more than 24 hours after treatment is given. It can last for up to 6-7 days.

**Chronic** – not caused by the treatment itself. Caused by the effect that cancer waste products has on the body or by the location of the tumor in the body. Chronic nausea and vomiting may be caused by:

- metastatic cancer (especially brain and colon metastases)
- pain medications (gastric stasis)
- metabolic abnormalities ( e.g. low magnesium, high potassium)
- constipation

- stomach ulcers

**Anticipatory** – may occur before chemotherapy treatment. Patients are often anxious and expect to feel nauseated with their treatment. They connect certain sights, sounds and smells with their treatment and therefore trigger anticipatory nausea.

(Black & Hawks, 2012; CCS, 2014; National Cancer Institute, 2015)

### Prevention of Nausea and Vomiting

The best way to control nausea and vomiting is to **PREVENT** it before it **occurs**. This means taking prescribed anti-nauseas before, during, and after treatment as needed.





## Management of Nausea and Vomiting

The management of nausea and vomiting for patient's undergoing chemotherapy is an essential nursing skill for Oncology nurses.

Management of this side effects includes effective assessment, providing prescribed medications, teaching self-management techniques and providing appropriate nursing interventions.

### Assessment

Assessing patients for nausea and vomiting can help to prevent this side effect from becoming severe. It is essential to understand the patient's perception of their nausea in order to effectively treat it. As with pain, each individual experiences nausea differently. Therefore, patient communication is key when managing chemotherapy induced nausea and vomiting. Using a simple visual scale may assist patients in describing their nausea. Figure 1.4 provides a good reference for patient's to use to describe their discomfort level.

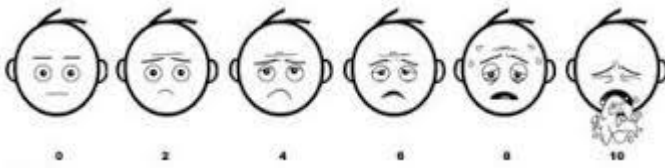


Figure 1.4 Baxter Animated Retching Faces Scale. Retrieved from:

<http://pediatrics.aappublications.org/content/127/6/e1542.full.pdf>

In order to further explore potential causes and implications of the patient's nausea and vomiting you could ask the following questions

([www.cancer.gov](http://www.cancer.gov)):

- 1. When did the nausea begin? (which classification of nausea is this, what could be the trigger)**
- 2. What makes your nausea worse? (remove triggers when possible)**
- 3. What have you tried in the past to relieve your nausea? Was it effective? (can help to identify effective treatment more promptly)**
- 4. When did you move your bowels last? (could gastric stasis be the cause, bowel obstruction)**
- 5. Do you feel bloated? (could gastric stasis be the cause, bowel obstruction)**

**6. Are you passing gas? (could gastric stasis be the cause, bowel obstruction)**

**7. Can you relate your nausea to anything? (e.g. meal times, after taking a certain medication, headaches) (again identifying triggers)**

It is important for nurses to assess the cause of nausea, level of nausea and existing patient coping strategies in order to select the most appropriate management strategies. To further help nurses grade the level of nausea a patient is having a Common Terminology Criteria for Adverse Events:

Nausea and Vomiting was created by the National Institute of Cancer. For access to this resource using the following link:

[http://www.cancer.gov/about-cancer/treatment/side-effects/nausea/nausea-hp-pdq#link/\\_3\\_to](http://www.cancer.gov/about-cancer/treatment/side-effects/nausea/nausea-hp-pdq#link/_3_to)

## **Medications**

There are many different types of anti-nauseas available to patients and which have varying levels of effectiveness for each individual. As their health care professional it is important that you monitor the effectiveness of the patient's anti-nauseas. Often there will need to be changes made to

the anti-emetic schedule in order to effectively manage one's nausea.

**Remember, the use of prescription medications are the most effective way to treat chemotherapy induced nausea and vomiting!**

Below is a list of the most common medications used for the treatment of nausea on an Oncology floor.

**Ondansetron (Zofran)** – Indicated for acute nausea caused by chemo which usually lasts 2-3 days.

**Metoclopramide (Maxeran)** – Used mostly for chronic nausea caused by chemotherapy or for nausea related to gastric stasis.

**Haloperidol (Haladol)** – Indicated for nausea caused by chemical toxins in the blood.

**Prochlorperazine (Stemitil)** - Indicated for nausea caused by chemical toxins in the blood.

**Diphenhydramine (Gravol)** - Indicated for nausea caused by movement. May be helpful in nausea caused by toxins in the blood.

**Nabilone** – Derivative of marijuana. Used to modify the brains response to the vomiting signal.

**Fosaprepitant (Emend)** - A preventive medicine that helps block nausea and vomiting signals from the brain.

**Lorazepam (Ativan)** - can help reduce nausea and vomiting by reducing anxiety.



## Self-Care Management

In order to manage living with a diagnosis of cancer and coping with the side effects of chemotherapy agent's patients need to learn effective self-management strategies (Dodd, 1988; Mills & Sullivan, 1999; Skalla et al., 2004; Smith et al., 2004; Williams & Schreier, 2004). Self-care management is one way patient's can gain control over side effects and minimize their impact on daily life.

**Although self-care management strategies can be helpful in dealing with chemotherapy induced nausea they should not replace the use of prescription medications.**

## Possible Self-Care Management Strategies

- do not eat your favorite foods when nauseated
- do not eat fatty, fried or spicy foods
- eat your meals at room temperature or cold. Smell of hot foods can induce nausea
- perform good oral hygiene especially pre and post meals

- participate in relaxation exercise such as listening to calming music
- eat small, frequent meals instead of 3 large meals
- eat slowly and chew foods well
- if nauseated try dry toast or crackers
- drink plenty of fluids outside of meal times
- avoid meals with strong odors
- avoid alcohol and excessive caffeine
- stay in the upright position after eating to aid digestions
- avoid acidic foods and drinks
- eat before getting hungry as hunger can increase nausea
- avoid gas producing foods (cabbage, broccoli, cauliflower, green pepper)

(Dodd, 1988; Mills & Sullivan, 1999; Skalla et al., 2004; Smith et al., 2004; Williams & Schreier, 2004)

## Nursing Interventions

Despite many efforts to prevent the occurrence of nausea and vomiting patients often still experience this sometimes debilitating side effect.



**Can you identify possible nursing interventions that are essential when caring for patient's experiencing chemotherapy induced nausea and vomiting?**

Below are a list of some nursing interventions that are important to consider for these patients:

- have physicians re-evaluate patient





- monitor need for intravenous fluids (is the patient dehydrated, monitor bloodwork)



- have physicians change oral medications to intravenous as required (if patients cannot stop vomiting they are not absorbing their oral medications)
- ensure patient has had proper education on nausea and vomiting  
(this is an essential nursing task!)



- monitor nutritional intake (consider dietician consult if appropriate)

**Congratulations! You have finished module 2. Please turn to the next page to complete a self-test on the content you have learned within this module.**

## Self-Test

Instructions: Please answer the following questions using a separate sheet of paper. Try to answer each question without referring back to the manual content. After answering all questions please refer to the appendix for answers. If you obtain a score of 80% (8 out of 10) please proceed to the next module. If you score less than 80% please review the content of Module 2 until a score of 80% is obtained.

1. The vomiting center of the brain is located in the cerebellum  
TRUE FALSE
2. Vomiting can be caused by a buildup of toxins in the blood  
TRUE FALSE
3. List 4 symptoms of nausea and vomiting  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Acute nausea can develop 24 hours after treatment and last 6-7 days  
TRUE FALSE
5. Pain medication (opioids) can cause anticipatory nausea  
TRUE FALSE
6. Prescription anti-nauseas are the best way to treat nausea and vomiting  
TRUE FALSE

7. The following would be the best anti-nausea to use for a patient with gastro stasis
- a) Zofran
  - b) Maxeran
  - c) Gravol
  - d) Haladol
8. Self-management strategies can replace the use of anti-nauseas
- TRUE FALSE
9. About \_\_\_\_\_ percent of people undergoing chemotherapy will experience nausea and vomiting?
- a) 25%
  - b) 40%
  - c) 50%
  - d) 75%
10. List 3 self-management strategies that can be used by patients dealing with chemotherapy induced nausea and vomiting. Please use examples discussed in the manual

---

---

---

## References

American Cancer Society. (2007). Retrieved from:

<http://www.cancer.org/cancer/cancerbasics/index>

Aranda, S., Jefford, M., Yates, P., Gough, K., Seymour, J., Francis, P...Schofield, P. 2012).

Impact of a novel nurse-led prechemotherapy education intervention (ChemoEd) on patient distress, symptom burden, and treatment-related information and support needs: results from a randomized controlled trial. *Annals of Oncology*, 23, 222-231. doi: 10.1093/annonc/mdr042

B C Cancer Agency (2014). Retrieved from: [http://www.bccancer.bc.ca/health-](http://www.bccancer.bc.ca/health-info/coping-with-cancer/managing-symptoms/nausea)

[info/coping-with-cancer/managing-symptoms/nausea](http://www.bccancer.bc.ca/health-info/coping-with-cancer/managing-symptoms/nausea)

Black, J.M. & Hawks, J.H. (2001). *Medical-Surgical Nursing: Clinical Management for Positive Outcomes* (7th ed.). Philadelphia: Elsevier/Saunders

Canadian Cancer Society. (2014). *Cancer statistics at a glance*. Retrieved from:

<https://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/managing-side-effects/?region=nl>

Cancer.Net (2015). Cancer Basics. Retrieved from: <http://www.cancer.net/navigating-cancer-care/cancer-basics/what-cancer>

Dodd, M. (1988). Efficacy of proactive information on self-care in chemotherapy patients. *Patient Education and Counselling*, 11, 215-225

- Friedman, A., Cosby, R., Boyko, S., Hatton-Bauer, J., & Turnbull, G. (2011). Effective teaching strategies and methods of delivery for patient education: a systematic review and practice guideline recommendations. *Journal of Cancer Education*, 26(1), 12-21. doi:10.1007/s13187-010-0183-x
- Harris, K. (1998). The informational needs of patients with cancer and their families. *Cancer Practice*, 6(1), 39-46
- Kinnane, N., Stuart, E., Thompson, L., Evans, K., & Schneider-Kolsky, M. (2008). Evaluation of the addition of video-based education for patients receiving standard pre-chemotherapy education. *European Journal Of Cancer Care*, 17(4), 328-339
- Mann, K. (2011). Education and health promotion for new patients with cancer. *Clinical Journal of Oncology Nursing*, 15(1), 55-61. doi: 10.1188/11.CJON.55-61
- Mayo Clinic (2014). *Tests and procedures: chemotherapy* .Retrieved from :  
<http://www.mayoclinic.org/tests-procedures/chemotherapy/basics/definition/prc-20023578>
- Mills, M., & Sullivan, K. (1999). The importance of information giving for patients newly diagnosed with cancer: a review of the literature. *Journal of Clinical Nursing*, 8, 631-642
- National Cancer Institute (2015). *Chemotherapy*. Retrieved from [www.cancer.gov](http://www.cancer.gov)
- Otto, S.E. (2001). *Oncology nursing (4<sup>th</sup> ed.)*. Mosby: Missouri

- Pedersen, B., Koktved, D. P., & Nielsen, L. L. (2013). Living with side effects from cancer treatment - a challenge to target information. *Scandinavian Journal of Caring Sciences*, 27(3), 715-723. doi:10.1111/j.1471-6712.2012.01085.x
- Smith, J.A., Kindo, C.C., Kurian, S., Whitaker, L.M., Burke, C., & Wachel, B. (2004). Evaluation of patient chemotherapy education in a gynecology oncology center. *Supportive Care in Cancer*, 12, 577-583
- Van der Molen, B. (1999). Relating information needs to the cancer experience: Information as a key coping strategy. *European Journal of Cancer Care*, 8(4), 238-244
- Williams, S., & Schreier, A. (2004). The effect of education in managing side effects in women receiving chemotherapy for treatment of breast cancer. *Oncology Nursing Forum*, 31(1), 16-23

## **Appendix A**

### **Case Scenario**



## Case Scenario

Complete the following case scenario. Record your answers on a separate sheet of paper. Feel free to discuss and complete case sceneries with co-workers. When completed refer to appendix C for answers.



A 28 year old female has been diagnosed with relapsed lymphoma. Other than severe nausea with previous chemotherapy treatments she has no other history. You are sitting down with the patient to discuss the current treatment she is about to receive.

1. How can you help to prevent severe nausea with this treatment?
2. How can the patient help with preventing severe nausea?

3. What medications can assist this patient throughout her treatment?
4. Her mother offers to make her favorite meal to have on hand for when she is nauseated. How should you respond?
5. The patient tells the nurse not to worry she drinks about a liter of water at each meal? How should you respond?
6. After receiving education on chemotherapy the patient states that she will not bother the nurses unless the nausea becomes severe. What education should you enforce?



## **Appendix B**

### **Program Post Test**

## Program Post Test



Instructions: Please answer the following questions using a separate sheet of paper. Try to answer each question without referring back to the manual content. After answering all questions please refer to the appendix for answers. If you score less than 80% please review the content of both modules until a score of 80% is obtained.

1. Chemotherapy works by:

- |                            |                   |
|----------------------------|-------------------|
| a) Destroying cells        | c) Slowing growth |
| b) Changing genetic makeup | d) A & B          |

2. The goal of chemotherapy may be:

- |               |                     |
|---------------|---------------------|
| a) Cure       | c) Symptom Control  |
| b) Palliation | d) All of the above |

3. Nausea and vomiting in chemotherapy can be induced by:  
a) The disease itself  
b) All of the above  
c) Buildup of toxins in the blood  
d) Gastro stasis
4. The best way to treat nausea is by using self-management strategies  
True  
False
5. Which medication is most effective for acute onset of chemotherapy related nausea?  
a) Gravol  
b) Haladol  
c) Maxeran  
d) Zofran
6. It is easiest to treat nausea:  
a) Before it begins  
b) After treatment  
c) B & D  
d) At initial onset
7. Chemotherapy acts by destroying cancer cells and preventing them from replicating or dividing.  
TRUE  
FALSE
8. The amount of cancer cells will eventually reach zero.  
TRUE  
FALSE
9. Self-management strategies can replace the use of anti-nauseas  
TRUE  
FALSE

10. This drug is used when nausea is caused by movement (similar to sea sickness)

a) Maxeran

c) Zofran

b) Gravol

d) Nabilone

11. Cancer cells are stickier than normal cells

TRUE

FALSE

12. When first line (induction) treatment fails a patient will move on to salvage chemotherapy

TRUE

FALSE

13. Patients should try to eat more quickly to reduce nausea

TRUE

FALSE

14. Metabolic abnormalities can cause nausea.

TRUE

FALSE

15. Patient's receiving the same treatment for the same disease should have the same clinical outcome.

TRUE

FALSE

16. Which is a highly common side effect of chemotherapy?

a) Fatigue

c) Nausea

b) Headache

d) A & C

17. This classification of nausea occurs usually within the first 24 hour of initiating chemotherapy

a) Acute

c) Chronic

b) Delayed

d) Anticipatory

18. Hunger can increase the level of nausea a patient has

TRUE

FALSE

19. Chronic nausea can be caused by:

- |                                 |                 |
|---------------------------------|-----------------|
| a) Constipation                 | c) A & B        |
| b) Thinking about getting chemo | d) Chemotherapy |

20. Who is responsible for ensuring nausea related to chemotherapy is managed properly?

- |              |                     |
|--------------|---------------------|
| a) Nurse     | c) Patient          |
| b) Physician | d) All of the above |

## **Appendix C**

### **Answer Keys**



## **Module 1**

1. True
2. False
3. Cure, Palliation, Symptom control
4. D
5. Refer to pg. 8-9 for a list possible symptoms
6. False
7. False
8. False
9. B
10. False

## **Module 2**

1. False
2. True
3. Refer to page 14-15 for a list of symptoms
4. False
5. False
6. True
7. B
8. False
9. C
10. Refer to Module

## **Case Scenario**

1. Provide effective education

Assess what has been effective for patient in the past

Ensure she receives appropriate pre medications to prevent nausea

2. Use Self-Care behavior

Create a diary of nausea triggers etc.

Request anti-nauseas before nausea becomes severe

3. You should not eat your favorite meals when nauseated (it may turn you from them)
4. Although drinking plenty of fluids is important you should not drink a large amount of fluids with your meals as it may increase nausea
5. Patients should request anti-nauseas BEFORE nausea becomes severe. Nausea is much harder to treat once it becomes severe.

### **Program Post Test**

1. D
2. D
3. B
4. False
5. D
6. A
7. True
8. False
9. False

10. B

11. False

12. False

13. False

14. True

15. False

16. D

17. A

18. True

19. A

20. D

## **Appendix D**

### **Additional Resources**

## **Chemotherapy**

<http://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/chemotherapy-and-other-drug-therapies/?region=on>

<http://www.cancer.gov/about-cancer/treatment/types/chemotherapy>

<http://www.mayoclinic.org/tests-procedures/chemotherapy/basics/definition/prc-20023578>

## **Nausea and Vomiting**

[http://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/chemotherapy-and-other-drug-therapies/chemotherapy/side-effects-of-chemotherapy/?region=on#Nausea\\_vomiting](http://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/chemotherapy-and-other-drug-therapies/chemotherapy/side-effects-of-chemotherapy/?region=on#Nausea_vomiting)

<http://www.cancer.gov/about-cancer/treatment/side-effects/nausea/nausea-hp-pdq>

## **Management of Nausea and Vomiting**

<http://www.cancer.ca/en/cancer-information/diagnosis-and-treatment/managing-side-effects/nausea-and-vomiting/?region=on>

<http://www.cancer.gov/about-cancer/treatment/side-effects/nausea>

<http://www.cancer.gov/publications/patient-education/nausea.pdf> (Print out for patients)

<http://www.bccancer.bc.ca/health-info/coping-with-cancer/managing-symptoms/nausea>

<http://www.cancer.net/navigating-cancer-care/side-effects/nausea-and-vomiting>

## **Anti-Emetic Treatment Information**

<http://www.cancer.gov/about-cancer/treatment/drugs>

<http://www.bccancer.bc.ca/health-professionals/professional-resources/cancer-drug-manual>

**Nutritional Information for Pre and Post Treatment**

<http://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/diet-and-nutrition/nutrition-recommendations-during-and-after-treatment>

**Differences between normal cells and cancer cells**

<http://lungcancer.about.com/od/Biology-of-Cancer/a/Cancer-Cells-Normal-Cells.htm>

## **Appendix E**

### **Program Evaluation**

## Program Evaluation Form

Please read each statement below. To what degree do you agree with each statement. Please put an X in the box that correlates with your answer. These answers will be used to modify and make addition to the current manual. Please do not leave any identifying information on the program evaluation form. Please e mail [lorie\\_churchill@yahoo.com](mailto:lorie_churchill@yahoo.com) for a copy of this form. Completed forms may be e mailed to the address above. For those without computer access, please call 777-700 to request a copy.

	Strongly Disagree	Disagree	Agree	Strongly Agree	Unsure
This manual meets my expectations					
Material was presented in a clear and logical manner					
The manual was visually appealing					
I was satisfied with the content of the manual					
Posttests asked relevant questions					
Case scenarios were appropriate for the content and promoted critical thinking					
This manual has expanded my knowledge on chemotherapy and nausea and vomiting during treatment					
This manual is easy to read and access information					

What topics were most helpful to you?



What topics were least helpful?

What would you change about the manual?

What additions would you like to see to this manual?

# **Appendix B**

## Literature Review

The Development of a Self-Directed Learning and Reference Module for Registered

Nurses: Educating

Patients on Chemotherapy

Lorie Kielley

Memorial University of Newfoundland

Table of Contents

Introduction	125
Background and Rationale	126
Chemotherapy Educational Programs: Psychological and Physiological Impact	129
Psychological Outcomes	130
Physiological Outcomes	131
Nurse's Experiences with Educating Clients about Chemotherapy	132
Educational Resources	133
Time to Provide Chemotherapy Education	134
Knowledge	136
Patients Experience with Chemotherapy	137
Diagnosis and Treatment	138
Side Effects and Self-Management Strategies	139
Education Preferences	143
Literature Gaps	145
Conclusion	147
References	148

Cancer is a leading cause of death worldwide (World Health Organization [WHO], 2014). It is estimated that there will be 191,300 new cases of cancer diagnosed and 76,600 deaths from cancer in 2014 alone (Canadian Cancer Society [CCS]), 2014). Cancer is responsible for 30% of all Canadian deaths, with the most common forms of cancer being lung, breast, colorectal and prostate (CCS, 2014). In 2014, it is estimated that 3,400 new cases of cancer will be diagnosed and that 1,500 people will die of cancer in Newfoundland and Labrador (CCS, 2014). For men in this province, the most commonly diagnosed cancer is prostate cancer (with 510 estimated to be diagnosed in 2014) and for women; breast cancer (330 estimated to be diagnosed in 2014). The leading cause of cancer mortality in both men and women in Newfoundland and Labrador is lung cancer with 240 men and 170 women estimated to die in 2014.

Chemotherapy is one of the primary treatments for cancer disorders. Although chemotherapy is considered an effective treatment for cancer it does have side effects that can be physically and psychologically challenging for the recipient (Aranda et al., 2012; Dodd, 1988; Kinnane, Stuart, Thompson, Evans, & Schneider-Kolsky, 2008; Lauer, Murphy, & Powers, 1982; Lee, Francis, Walker, & Lee, 2004; Pederson, Koktved, & Nielson, 2013; Piedda et al., 2008; Schofield et al., 2008; Skalla, Bakitas, Furstenberg, Ahles, & Henderson, 2004; Smith et al., 2004; Tamburini et al., 2003; Williams & Schreier, 2004; Van der Molen, 2000). In order to manage their everyday lives these individuals need education on how to cope with the side effects of chemotherapy (Lauer et al., 1982; Mann, 2011; Mills & Sullivan, 1999; Pederson et al., 2013; Van der Molen, 2000). Also, given that oncology nurses are responsible for the education and

administration of chemotherapy they must have the prerequisite skills to address the needs of this group, including the management of chemotherapy side effects.

A literature review was completed in order to examine the needs of individuals receiving chemotherapy from the perspective of the patient and the nurse. To conduct the literature review, the search engines CINAHL and PubMed were used with the keywords: *chemotherapy education, chemotherapy teaching and cancer education*. Search results were initially limited to 2004-2014 however, results were extended to include significant studies from earlier dates. Pertinent websites were also accessed to gather cancer and chemotherapy related information. Two critical appraisal tools that were used to critique the literature were the PHAC (2015) Critical Appraisal Tool Kit and the QARI (Joanna Briggs Institute, 2014).

A background into the issue will be presented along with rationale for the proposed project. Four bodies of literature that were identified and that will be further discussed are: chemotherapy educational programs: psychological and physiological impact, nurse's experiences with educating clients about chemotherapy, patients experience with chemotherapy and educational preferences. To conclude, gaps in the literature will be identified.

### **Background and Rationale**

An average of 524 Canadians are diagnosed with cancer every day, with two out of five Canadians expected to develop cancer at some point in their lifetime (CCS, 2014). The most common types of cancer in Newfoundland and Labrador are prostate,

colorectal, breast and lung (CCS, 2014). As the number of newly diagnosed cancer cases in Canada steadily increases, more individuals are undergoing lifesaving treatments which includes chemotherapy. There are no statistics on the number of Canadians receiving chemotherapy, however, based on the large number of people being diagnosed with cancer one may conclude that chemotherapy rates are increasing proportionally.

Chemotherapy is the systemic treatment of illness by the use of powerful chemicals that attack rapidly dividing cells in the body (Mayo Clinic, 2014). Chemotherapy may be used independently or in combination to treat various forms of cancer. Although chemotherapy can be an effective treatment for cancer, it can also cause harmful and sometimes fatal side effects (Mayo Clinic, 2014). These side effects can sometimes be prevented or minimized, and providing education to patients can significantly impact their dealings with encountered side effects. Chemotherapy has different indications for use depending on the patient and their disease. Sometimes cure is the goal of the treatment, but other times it may be used for symptom control or palliative purposes (Mayo Clinic, 2014).

Oncology nurses, can acquire the knowledge and skills to administer chemotherapy through advanced education (Dalby et al., 2013; Fredette, 1990; Lauer et al., 1982; McCaughan & Parahoo, 2000; Mueller & Glennon, 2007; Pedersen et al., 2013) and a specialized certification process (Oncology Nursing Society [ONS], 2012). To be certified in chemotherapy administration nurses' must demonstrate understanding of how chemotherapy agents work, management of its side effects, and have knowledge of the education needs of those receiving it (ONS, 2012).

Individuals receiving chemotherapy have voiced concerns that current teaching is not meeting their learning needs (Smith et al., 2004). Despite the availability of existing chemotherapy educational materials, research has found that nurses do not feel fully prepared to provide chemotherapy education to patients thus, are not meeting the needs of this cohort (McCaughan & Parahoo, 2000; Smith et al., 2004). Adding to this is the lack of literature that outlines the content of what an educational program for those receiving chemotherapy should include, how this information should be delivered, and its effectiveness on the management of chemotherapy side effects.

The General Hospital is the main acute care facility in the province of Newfoundland and Labrador that administers chemotherapy treatment to patients. The nursing staff on 4NA, the inpatient Oncology/Hematology ward at this site, complete a chemotherapy administration course offered by Eastern Health in which they learn about specific cytotoxic agents, administration techniques, side effects, assessment skills, and documentation. Nurses on 4NA are the primary educators of patients and their families about their chemotherapy treatment however, education is also provided by other members of the Oncology/Hematology team including physicians and pharmacists. Despite completing this chemotherapy course, many of the nurses on 4NA feel they do not have the time or adequate resources to provide consistent teaching to patients about the management of chemotherapy side effects. That is, although the side effects of chemotherapy are reviewed with the patient the management is not discussed in detail. As noted in the literature (Smith et al., 2004), depending on the experience and knowledge of the nurse the quantity and quality of education provided may vary. Finally, there appears



to be a lack of clarification between health care providers about who is teaching what content. This has resulted in some information being missed or to be redundant in nature.

In order to address the educational needs of patients receiving chemotherapy, resources must be up to date, readily accessible to nurses (Fredette, 1990), and reflective to the needs of this population. The proposed resource manual on the management of chemotherapy side effects will address these needs. This literature review will help identify the priority learning needs of this population, inform the development of the key stakeholder consultations, and the construction of the proposed manual to help nurses educate clients on the management of the side effects of chemotherapy.

### **Chemotherapy Educational Programs: Psychological and Physiological Impact**

There is a growing awareness about the importance of providing patient education on chemotherapy (Aranda et al., 2012; Dalby et al., 2013; Dodd, 1988; Kinnane et al., 2008; Lee et al., 2004; Mills & Sullivan, 1999; Schofield et al., 2008; Smith et al., 2004). Although the majority of literature has reported a positive correlation between educating patients about chemotherapy and physical and psychological health outcomes (Aranda et al.; Friedman et al., 2011; Harris, 1998; Mann, 2011; Mills & Sullivan, 1999; Pederson et al., 2013; Van der Molen, 1999; Williams & Schreiner, 2004) this is not always the case. One study noted that that educating patients about chemotherapy does not affect the frequency or severity of experienced side effects (Dodd, 1988).

## **Psychological Outcomes**

Educating patients about chemotherapy has been found to promote autonomy (Harris, 1998 ; Mills & Sullivan, 1999), reduce anxiety (Harris, 1998; Mann, 2011; Mills & Sullivan; Van Der Molen, 1999), develop coping skills, enhance recovery (Harris, 1998; Mills & Sullivan, 1999), and facilitate patients and families to create realistic goals and expectations (Harris, 1998; Mann, 2011). Mills and Sullivan's (1999) literature review reported that the most significant causes of anxiety and stress in patients living with cancer are a lack of information about their care, a lack of clear explanation about treatments regimes, and a lack of support. Van der Molen's (1999) phenomenological study, identified information seeking as an effective coping strategy that reduced stress. The significance of providing comprehensive education was reinforced in another study that found as treatment regimens advance and become more complex, patients required more tailored information to meet their learning needs (Lauer et al., 1982) and to ensure their well-being. Part of this plan should include timely and accurate divulgence of clear information (Van der Molen, 2000). Suggestions to address these concerns offered in the literature include the use of educational digital video disk (DVD)'s (Aranda et al., 2012; Freidman, Cosby, Boyko, Hutton-Bauer, & Turnbull, 2011; Kinnane et al., 2008; Schofield et al., 2008), internet resources (Cowan & Hoskins, 2007; Friedman et al., 2011), pamphlets and written materials (Cowan & Hoskins, 2007; Skalla et al., 2004; Freidman et al., 2011; Smith et al., 2004), verbal explanations (Piredda et al., 2008; Smith et al., 2004; Van der Molen, 2000), interactive multimedia (Freidman et al., 2011; Skalla et al., 2004) and audiotapes (Freidman et al., 2011; Williams & Schreier, 2004).

Educating patients on their treatment has been suggested as an effective means to reduce their fear of the unknown and retain a sense of control (American Cancer Society, 2006; Pederson et al., 2013; Skalla et al., 2004; Williams & Schreier, 2004). Pederson et al.'s (2013) phenomenological study found that as the severity of side effects related to chemotherapy escalated patients' described an increasing sense of loss of control over the management of the disease; education on the management of side effects of chemotherapy was offered as a potential strategy to help patients' reinstate some sense of control over the disease. Psychoeducational interventions such as the provision of information, exercise, and psychosocial support have also been shown to improve clinical outcomes in adult patients (Friedman et al., 2011).

### **Physiological Outcomes**

Although providing chemotherapy education to patients has been shown to have positive physical health care outcomes such reducing the side effects (Aranda et al., 2012; Williams & Schreier, 2004) this is not always the case (Aranda et al., 2012; Dodd, 1988). Aranda et al.'s (2012) randomized control trial (RCT) of cancer patients (n=192) examined the impact of a pre-chemotherapy educational intervention (DVD, question prompt list, drug information and procedural information) on prevalence and severity of chemotherapy side effects found that patient distress was not significantly reduced ( $p=0.47$ ). There was however a noted reduction in information ( $p=0.027$ ) and support needs ( $p=0.03$ ) surrounding preparation for treatment. A decrease was also noted in the prevalence and severity as well as bother from nausea and vomiting ( $p=0.001$ ) in those who received pre-chemotherapy education (Aranda et al., 2012). Similar to Aranda et al.

(2012) another RCT (Williams & Schreier, 2004) found that woman with breast cancer (n=70) who had received an audiotape on chemotherapy side effect management (e.g., nutrition, exercise, relaxation, sleep) reported a reduction in the number of side effects they experienced. For example, nausea and vomiting was reduced by nearly 50%, fatigue decreased by 8.5%, alterations in taste improved 5.7% and difficulty sleeping improved by 3.1% between one and three month post chemotherapy.

In contrast to the above two studies, Dodd's (1988) RCT found that those living with cancer (n=60) who participated in a side effect management pre-chemotherapy program did not report any significant reduction in chemotherapy side effects by three months. Noteworthy is that despite the fact that the severity of side effects did not decrease participants did engage in more self-care behaviours (e.g., smaller frequent meals) in an effort to reduce fatigue, nausea, hair loss, sore mouth, and decrease appetite.

This small body of literature suggests that the effectiveness of chemotherapy educational programs on reducing side effects is not clear, warranting more exploration. Resources such as audiotapes, DVD's etc., however, have been shown to have some impact on the reduction of side effects.

### **Nurse's Experiences with Educating Clients about Chemotherapy**

Nurses have pivotal role in cancer care, especially when it comes to the provision of information to patients (Cowan & Hoskins, 2007; Friedman et al., 2011; McCaughan & Parahoo, 2000; Mills & Sullivan, 1999; Mueller & Glennon, 2007; Rigdon, 2010; Rutten, Arora, Bakos, Aziz, & Rowland, 2005). Patient education is an essential part of

patient care and is an integral part of the nursing process (Mills & Sullivan, 1999). Health care professionals, including nurses, are the most frequently cited source of information about cancer care and treatment, therefore, must ensure their patients are getting accurate and up-to-date education (Cowan & Hoskins, 2007; Friedman et al., 2011; Piredda et al., 2008; Skalla et al., 2004). Nurses face many challenges in the workplace that impedes their ability to achieve these goals including adequate educational resources, time to provide education, and a lack of knowledge about chemotherapy.

### **Educational Resources**

In order to meet the educational needs of individuals living with cancer nurses need resources that are evidence based and readily accessible (Mann, 2011). Research has shown that digital video disc's (DVD's) (Aranda et al., 2012; Freidman et al., 2011; Kinnane et al., 2008; Schofield et al., 2007), internet websites (Cowan & Hoskins, 2007; Friedman et al., 2011), pamphlets and written materials (Cowan & Hoskins, 2007; Freidman et al., 2011; Skalla et al., 2004; Smith et al., 2004), interactive multimedia (Freidman et al., 2011; Skalla et al., 2004) and audiotapes (Freidman et al., 2011; Williams & Schreier, 2004) are effective teaching methods commonly used in chemotherapy education. Despite the abundance of chemotherapy educational tools nurses find it difficult to avail of these resources for a variety of reasons such as limited financial resources (Dalby et al., 2013) and physical time to access the tools (Mills & Sullivan, 1999; Pederson et al., 2013; Skalla et al., 2004). Furthermore, there is a lack of literature that has examined, from the nurses' perspective, which education resources are

the most “user –friendly”. That is, which tools can be efficiently used in practice on a busy oncology unit while ensuring that the educational needs of patients are being met.

Mueller and Glennon (2007) suggest the use of a checklist as a guide to assist nurses in the delivery of education to oncology patients. The tool is offered as a means to identify gaps in education, provide a standardized approach to education, promote nursing confidence in delivery of education, and to act as a means to document what teaching has been done, and what needs to be done. Similar to Mueller and Glennon (2007), Dalby (2013) reported that nurses who used a checklist to guide their chemotherapy education had higher levels of satisfaction with the educational process.

### **Time to Provide Chemotherapy Education**

Nurses identified lack of time to participate in patient education as one of the most significant barriers in providing chemotherapy teaching (Dalby et al., 2013; McCaughan & Parahoo, 2000; Mills & Sullivan, 1999; Pedersen et al., 2013; Russell, 2006; Skalla et al., 2004). Finding time for patient education on an acute care ward, where nurses are caring for multiple patients, with complex health care needs, can be a challenge.

One cross-sectional survey of nurses (n=72) found that they perceived lack of time to be a barrier to providing psychosocial care (McCaughan & Parahoo, 2000). This lack of time limited their ability to help patients balance the uncertainty of living with cancer and accepting their diagnosis. These findings were also noted in an earlier study of nurses (n=310) (Frost, Brueggen, & Mangan, 1997) that identified lack of time to be the number one barrier to providing psychosocial care to patients. Although from the patient’s

perspective, two qualitative studies also found that nurses lack of time to provide education negatively impacted the quality of information provided (Pederson et al., 2013; Skalla et al., 2004).

Participants in Pederson et al. (2013) stated that nurses were too busy to provide them with face-to-face chemotherapy teaching resulting in fragmentation of the information. As well, participants felt that they needed the guidance of the nurse to tease out relevant information being that many of the written materials were not specific enough to address their needs. Time and continuity of care was deemed essential to ensure that patients feel safe enough to express their concerns. Similar findings were reported by Skalla et al. (2004). In that study patient's described getting access to health care providers as an obstacle to receiving the information they needed about their treatment. Furthermore, when the health care provider did have a moment to speak with them they felt overwhelmed with the amount of information and had difficulty absorbing it.

It is evident from this small body of literature that in order to provide in depth education to patient's, nurses need to be able to spend uninterrupted time with their patient's. However, there is a dearth of evidence to support which educational approaches are superior. That is, which educational tools can provide patients with the proper chemotherapy education, in the most efficient manner in effort to improve the health outcomes of this population.

## **Knowledge**

Nurse's lack of knowledge about chemotherapy education has been noted to contribute to their lack of confidence in providing chemotherapy teaching (McCaughan & Parahoo, 2000; Russell, 2006). There was only one study found (McCaughan & Parahoo, 2000) that specifically examined nurse's perceptions of their ability to provide effective chemotherapy education. McCaughan and Parahoo (2000) used a self-reported survey to assess nurse's level of competence in activities relating to their work with patients living with cancer. This study reported that 88% felt competent with providing physical care to patients receiving chemotherapy, 74.2% in communicating with patients, 60% felt comfortable in helping patients come to terms with diagnosis and treatment, but only 55.8% felt competent in educating patients in dealing with side effects from treatment. This study also found that nurses may be uncomfortable communicating with patients who are experiencing high emotions (McCaughan & Parahoo, 2000), and this may pose as a barrier to providing effective chemotherapy education to this population. Given that lower competence scores were noted in the psychosocial care of patients rather than the physical it is evident that nurses need more resources and education to assist them in this area of their practice.

One suggestion to improve health care providers' sense of mastery over chemotherapy education is interdisciplinary collaboration (Fredette, 1990). Collaboration ensures that each health care provider has up to date information on the patient's cancer diagnosis, past medical history, social history, and other important information. When all health care providers have the same information it ensures the patient is getting consistent



and accurate information, reduces overlap of materials, and can ensure that gaps in knowledge are addressed by the appropriate expert in the field (Fredette, 1990). An important aspect of interdisciplinary collaboration is effective communication (Mitchell, Porter, & Manias, 2014; Rask, Jensen, Anderson, & Zachariaie, 2009; Thorne, Bultz, & Baile, 2005). Strong communication between the health care team and the patient will not only facilitate the teaching process but will ensure that adequate interdisciplinary planning occurs.

Part of interdisciplinary care is ensuring that all members of the team are well trained in principles of adult education (Harris, 1998; Ludlow, Gaudine, & Jacobs, 2007; Russell, 2006). This includes being knowledgeable about how to access resources to meet not only their educational needs but that of their patients. Harris (1998) proposes that including patient education in health provider's job descriptions and offering continuing education on teaching-learning skills may improve the quality of education provided to patients. In addition, it may increase the overall knowledge, skills, and confidence of nurses related to chemotherapy education. The knowledge and use of adult learning principles will guide nurses to develop more effective teaching techniques (Russell, 2006).

### **Patients Experience with Chemotherapy**

There is a large body of literature that has examined the educational needs of patients who are receiving chemotherapy. The priority educational needs identified in the literature are diagnosis and treatment, side effects of chemotherapy, and self-management strategies (Skalla et al., 2004; Mills & Sullivan, 1999)

## **Diagnosis and Treatment**

There is a consensus in the literature that individuals living with cancer need a clear understanding of their diagnosis and available treatment options such as chemotherapy agents (Fredette, 1990; Lauer et al., 1982; Lee et al., 2004; Mills & Sullivan, 1999; Mueller & Glennon, 2007; Piredda et al., 2008; Smith et al., 2004; Tamburini et al., 2003) in order to make informed choices about their care and manage their daily lives. There were three cross sectional studies that examined the learning needs of this population. Piredda et al., (2008) survey of cancer patients (n=108) needs during hospitalization found that information about illness (65.7%) and treatments, including chemotherapy (26.9%), were identified as the most important learning need. Similarly, Lee et al. (2004) (n=51) reported that the priority learning need of breast cancer patients was knowledge about medication treatment regimes. Although Lauer et al.'s (1982) study (n=33 patients; n=27 nurses ) did report that knowing the purpose of chemotherapy drugs was deemed to be significant to the patients, nurses, did not rank this as a priority learning needs for them. This discrepancy highlights the importance of collaborative care between health care providers and the patient to ensure that the patients' unique health care needs are being met.

Although the literature alludes to the fact that another concern of this population is chemotherapy treatment schedules (e.g., blood work, chemotherapy administration times, diagnostic tests) (Mueller & Glennon, 2007; Rigdon, 2010; Van Der Molen, 2000; Van der Molen, 1999) there was only one article that specifically addressed this concern (Mueller & Glennon, 2007). This literature points to the fact that providing patients with a

tentative schedule of expected treatment regimens can help them gain a sense of control over their daily lives (Mueller & Glennon, 2007; Rigdon, 2010; Van Der Molen, 1999). Hence, it is important that nurses take time to explain prescribed treatment regimens and follow up appointments to patients (Lee et al., 2004; Mueller & Glennon, 2007; Piredda et al., 2008; Rigdon, 2010).

### **Side Effects and Self-Management Strategies**

For patients undergoing chemotherapy, dealing with the side effects can be challenging. Threaded through out the literature is the fact that knowledge of chemotherapy side effects and their management is a high priority learning need for this population (Dodd, 1988; Fredette, 1990; Kinnane et al., 2008; Lauer et al., 1982; Lee et al., 2004; Pedersen et al., 2013; Piredda et al., 2008; Rigdon, 2010; Skalla et al., 2004; Smith et al., 2004; van Weert, Bolle, van Dulmen, & Jansen, 2013; Williams & Schriener, 2004). Although Skalla et al's (2004) study found that patients' primary learning need was information about specific side effects and how these would impact their daily life this was not the case in another study (Piredda et al., 2008). Piredda et al. (2008) ( n=111) study of patients living with cancer stated that only 22.4% ranked side effects as their highest priority learning need. However, of those who ranked knowledge of side effects as being a lower need 58.9% requested side effect information as soon as they found out the type of treatment they would receive, while the other 25.2% preferred information immediately prior to their initial treatment (Piredda et al., 2008). These findings are inconsistent with a survey on information needs of patients receiving chemotherapy in a day-unit in Ireland (McCaughan & Thompson, 2000). In that study 80% of participants

indicated that they wanted information about side effects at their first treatment while 20% preferred information prior to their first treatment. The difference in these findings could be associated to the variance in study settings and changing health care needs. That is, the needs of this population can be transient and change over time (Van der Molen, 2000), depending on the disease trajectory and prescribed chemotherapy agents. Thus, nurses need to be cognizant of the evolving health care needs of this population and adapt educational resources accordingly.

Noteworthy is the fact that although nurses and patients have both identified management of side effects as a priority learning need there is a discrepancy as to the where this need ranks in comparison to other needs. For example, in Lauer et al. (1982) (n=33 nurses; n=27 patients) nurses ranked management of side effects as a high priority learning needs whereas, patients ranked knowledge of medications, treatment schedules and length of treatment as priorities. In order to develop a plan of care that takes into consideration the top learning needs of this population it is important that nurses engage in dialogue with these individuals in order to tailor educational resources reflective of their learning needs and style.

Chemotherapy can have a wide range of physiological side effects that can impact one's everyday life. The most common cited side effects in the literature are nausea and fatigue (Dodd, 1988; Williams & Schriener, 2004; Kinanne et al., 2008). Dodd's (1988) RCT (n=60) listed the most common side effects of chemotherapy as being nausea (50%), fatigue (38.3%), hair loss (19%), sore mouth and throat (16%), bleeding (10%), and decreased appetite (10%). Similarly, fatigue (81%), nausea and vomiting (74%), taste

change (63%), and difficulty sleeping (50%) were found as the most common side effects reported by patients in a second RCT (n= 70) (Williams & Schriener, 2004). In a third, RCT (Kinanne et al., 2008) ( n=64) patients identified mouth care (83.3%), diet and fluids (73.3%), signs of infection (70.0%), nausea and vomiting (66.6%) and anemia (20%) as the most useful educational topics.

One common side effect of chemotherapy is neutropenia. Neutropenia is experienced when the level of the neutrophils in the blood become less than  $1.9 \times 10^9$  (CCS, 2014). When this occurs, patients are more susceptible to febrile neutropenia which may result in a fatal infection. A longitudinal study of 115 United States hospital discharge data bases determined that between 1995 and 2000 there was 55,276 hospitalizations in 41,779 patients living with cancer who were experiencing febrile neutropenia (Kuderer, Dale, Crawford, Cosler, & Lyman, 2006). Of these admissions a 9.5% in hospital mortality rate was noted (Kuderer et al., 2006). Although there is a large body of literature that address the medical treatment of febrile neutropenia and its prevention there is a lack of literature documenting this as a priority learning need from the perspective of chemotherapy patients or nurses. There was one RCT (Kinanne et al., 2008), however that found that less than 30% of participants were aware of how often to monitor their temperature post chemotherapy. Given the high incidence of febrile neutropenia in this population coupled with its potential fatal outcome further investigation may be warranted into why this is not deemed high priority learning need for this population.

In order to manage living with a diagnosis of cancer and coping with the side effects of chemotherapy agent's patients have identified the need to learn effective self-management strategies (Dodd, 1988; Mills & Sullivan, 1999; Skalla et al., 2004; Smith et al., 2004; Williams & Schreier, 2004). Self-care management is one way patient's can gain control over side effects and minimize their impact on daily life. In fact, one study found that participants who received education on side effects pre chemotherapy performed significantly higher in self-care behaviour activities and preventative activities ( $t[58]=2.5, p=.012$ ) (Dodd, 1988). Similar findings were noted in Williams & Schreier (2004) study in which participants who used informational audiotapes (nutritional management of side effects and coping with fatigue, anxiety and difficulty sleeping) increased their use of self-care behaviours over time.

Some key self-management strategies were highlighted in the literature and can be used to assist patients in dealing with side effects of their treatment. Dodd (1988) found that using prescribed medications, eating preferred foods and eating small amounts can assist in managing chemo-induced nausea. For sore mouths, rinsing, using prescribed pain medications and cold drinks can reduce severity of this side effect. Fatigue can be reduced by increasing sleep, incorporating small amounts of exercise into their daily routines and decreasing work hours. A decreased appetite can be improved by offering preferred foods and eating small frequent meals (Dodd, 1988). Hair loss is a side effect from chemo that cannot be prevented or minimized. In helping patient's to deal with this side effect wigs and supportive programs to improve this population's self-perception can be discussed with the patient.

The most frequently used self-care behaviours for fatigue and nausea were also reported by Williams & Scherier (2004). At one month taking naps (78%), getting up later (48%), getting more exercise (26%), and caffeine (19%) were the most frequently used self-care behaviors used in managing fatigue. In coping with nausea taking prescription medications (96%), eating less (78%), keeping busy (78%), resting in a quiet place (74%), drinking clear fluids (68%), eating small frequent meals (65%), resting after meals (61%), cleaning mouth often (61%) and avoiding sight and smells of food (61%) were most frequently used (Williams & Scherier, 2004). Educating patients on using self-care behaviours like those mentioned above, can improve their overall well-being in dealing with the side effects they experience from chemotherapy.

### **Education Preferences**

Although the use of standardized chemotherapy education is recommended in the literature (Dalby et al., 2013; Mueller & Glennon, 2007), in order to meet the diverse needs of adult learners nurses must be cognizant of effective chemotherapy education methods (e.g. verbal explanations, written materials, audiovisual materials, and internet sources) (Harris, 1998; Kinnane et al., 2008; Pederson et al., 2013; Skalla et al., 2004). This includes attention to one's preferential learning modalities.

Literature has shown that patient's prefer verbal explanations about their chemotherapy treatment (Mueller & Glennon, 2007; Piredda et al., 2008; Skalla et al., 2004; Smith et al., 2004; Van der Molen, 2000). For example, in Piredda et al.'s (2008) study 99.1% of patient's wanted oral information over written pamphlets (61.1%) and internet information (23.1%). Smith et al. (2004) also found that face to face dialogue

was an effective teaching approach how others have noted that a combination of various teaching methods are most effective (e.g. written pamphlets, audiovisual materials). (Cowan & Hoskins, 2006; Freidman et al., 2011; Kinnane et al., 2008).

Kinnane et al.'s (2008) RCT (n=67) found that 66.7% of participants were satisfied with an chemotherapy educational video while 83.3% preferred a combination of written, verbal and video materials. Likewise, Smith et al. (2004) (n=190) noted 86.6% of patient's preferred to receive chemotherapy education via written materials or verbally. The use of written materials was reinforced by Cowan & Hoskins (2007) (n=36) study which found that 89% of participants used pamphlets and 50% used internet sources as a means of accessing information on their treatment. This use of technology as a means to provide education can supplement the use of audiovisual materials.

Audiovisual materials such as DVD's and audiotapes can assist patients in learning about their chemotherapy treatment (Kinnane et al., 2008; Schofield et al., 2008; Williams & Schriener, 2004). Schofield et al. (2008) quasi-experimental study (n=100) reported that no significant difference was on levels of anxiety and depression pre and post an educational DVD on chemotherapy management. Furthermore, the DVD did not significantly influence self-efficacy and satisfaction with the information they were provided. Authors recommended that the use of DVD should be paired with other educational material. The use of audiotapes as an educational tool to manage chemotherapy side effects was measured by Williams & Schriener (2004) at one month and three months post chemotherapy. Those who used audiotapes experienced a decrease



in side effects, decreased anxiety, decreased nausea and vomiting by 50%, decreased difficulty sleeping by 50% and an increase in attempted self-care behaviors..

Based on these studies it is evident that when developing an educational plan for individuals receiving chemotherapy it is important that nurses take the time to tailor educational approaches to suit the learning needs and style of the patient.

### **Literature Gaps**

The above literature provides evidence of the benefits of providing effective chemotherapy education to patient's living with cancer. An evident gap in the literature is the lack of current research on chemotherapy education for patients. Most literature identified on the topic was completed prior to 2005. Of the small body of literature that does exist, the majority of studies focus on educational needs from the patient's perspective, rather than the nurses. In order to create a comprehensive educational tool both the perspectives of the nurse and patient should be examined.

A paucity of Canadian studies and statistics that focus on educational needs of chemotherapy patients was noted. Learning needs of individuals are unique and having Canadian research could solidify current approaches to treatment education. There is also a need to further examine current approaches to chemotherapy education that are being implemented in the workplace and their effectiveness for this population. Given the fact that in Newfoundland access to timely, chemotherapy education can be challenging more research into innovative teaching approaches (e.g., telemedicine) as a probable teaching approach should be investigated.

Although positive outcomes of pre chemotherapy education are discussed in the literature, the effectiveness on reducing side effects is not clear, warranting more exploration. There also needs to be further research into the most common side effects experienced by patients so that nurses can focus their teaching in this area. In addition to identifying common side effects, ways to prevent and cope with these outcomes need to be further addressed. Noteworthy is the fact that although there is an abundance of medical research on febrile neutropenia there is a dearth of research that examines if this is a priority learning need that warrants attention for both nurses and patients. Given the potential fatal outcome of this condition and based on my knowledge of working with this cohort more exploration is needed.

Barriers to providing effective chemotherapy education are discussed in the literature however, there is a lack of research on ways to overcome these barriers in practice. What is clear however is that diverse educational approaches (e.g., DVD's) when providing education to this population however, the effectiveness of specific educational approaches is limited in the literature.

Finally, there was only one study that delved into the nurse's perspective on their level of competence and comfort in providing effective chemotherapy education (McCaughan & Parahoo, 2000). To ensure that the educational needs of this cohort are being met, nurses need to receive education and have access to the resources that they need in order to provide effective education. More research needs to occur investigating the nurse's perception of current patient education practices in order to improve upon their approach to patient education.

## **Conclusion**

Effective and comprehensive chemotherapy education is essential to assist those living with cancer in coping with their disease and treatment. The literature has identified some priority learning needs as well as educational preferences that can assist nurses in developing an educational plan for this population. It also offers self-management strategies to assist patients in coping with their side effects. Despite this, further investigation into the most common side effects as well as more detailed information on self-management strategies must be further explored.

Nurse's need to be properly trained in providing patient education. They need to have access to appropriate and up to date resources in order to gain knowledge and confidence in providing this education. The development of this manual is a step towards addressing the lack of easily accessible resources for nurses and towards improving patient chemotherapy education.

## References

American Cancer Society. (2007). Retrieved from:

<http://www.cancer.org/cancer/cancerbasics/index>

Aranda, S., Jefford, M., Yates, P., Gough, K., Seymour, J., Francis, P...Schofield, P.

(2012). Impact of a novel nurse-led prechemotherapy education intervention (ChemoEd) on patient distress, symptom burden, and treatment-related information and support needs: results from a randomized controlled trial. *Annals of Oncology*, 23, 222-231. doi: 10.1093/annonc/mdr042

Canadian Cancer Society. (2014). *Cancer statistics at a glance*. Retrieved from:

<http://www.cancer.ca/en/cancer-information/cancer-101/cancer-statistics-at-a-glance/?region=nl>

Cowan, C. & Hoskins, R. (2007). Information preferences of women receiving chemotherapy for breast cancer. *European Journal of Cancer Care*, 16(6), 543-550

Dalby, C. K., Nesbitt, M., Frechette, C. A., Kennerley, K., Lacoursiere, L. H., & Buswell,

L. (2013). Standardization of Initial Chemotherapy Teaching to Improve Care. *Clinical Journal Of Oncology Nursing*, 17(5), 472-475.  
doi:10.1188/13.CJON.472-475

Dodd, M. (1988). Efficacy of proactive information on self-care in chemotherapy patients. *Patient Education and Counselling*, 11, 215-225

- Fredette, S. (1990). A model for improving cancer patient education. *Cancer Nursing, 13*(4), 207-215
- Friedman, A., Cosby, R., Boyko, S., Hatton-Bauer, J., & Turnbull, G. (2011). Effective teaching strategies and methods of delivery for patient education: a systematic review and practice guideline recommendations. *Journal of Cancer Education, 26*(1), 12-21. doi:10.1007/s13187-010-0183-x
- Frost, M., Brueggen, C., & Mangan, M. (1997). Intervening with the psychosocial needs of patients and families: perceived importance and skill level. *Cancer Nursing, 20*(5), 350-358
- Harris, K. (1998). The informational needs of patients with cancer and their families. *Cancer Practice, 6*(1), 39-46
- Joanna Briggs Institute. (2014). Retrieved from: <http://www.joannabriggs.org/jbi-approach.html#tabbed-nab=JBI-approach>
- Kinnane, N., Stuart, E., Thompson, L., Evans, K., & Schneider-Kolsky, M. (2008). Evaluation of the addition of video-based education for patients receiving standard pre-chemotherapy education. *European Journal Of Cancer Care, 17*(4), 328-339
- Kuderer, N., Dale, D., Crawford, J., Cosler, L., & Lyman, G. (2006). Mortality, morbidity, and cost associated with febrile neutropenia in adult cancer patients. *Cancer, 106*(10), 2258-2266. doi: 10.1002/cncr.21847
- Lauer, P., Murphy, S., & Powers, M. (1982). Learning needs of cancer patients: a comparison of nurse and patient perceptions. *Nursing Research, 31*, 11-16

- Lee, Y., Francis, K., Walker, J., & Lee, S. (2004). What are the information needs of Chinese breast cancer patients receiving chemotherapy?. *European Journal of Oncology Nursing*, 8(3), 224-233
- Ludlow, V., Gaudine, A., & Jacobs, M. (2007). The design of a hemodialysis nursing orientation program. *CANNT Journal*, 17(12), 44-47
- Mann, K. (2011). Education and health promotion for new patients with cancer. *Clinical Journal of Oncology Nursing*, 15(1), 55-61. doi:10.1188/11.CJON.55-61
- Mayo Clinic (2014). *Tests and procedures: chemotherapy* .Retrieved from:  
<http://www.mayoclinic.org/tests-procedures/chemotherapy/basics/definition/prc-20023578>
- McCaughan, E. & Parahoo, K. (2000). Medical and surgical nurses' perceptions of their level of competence and educational needs in caring for patients with cancer. *Journal of Clinical Nursing*, 9(3), 420-428. doi:10.1046/j.1365-2702.2000.00403.x
- McCaughan, E., & Thompson, K. (2000). Information needs of cancer patients receiving chemotherapy at a day-case unit in Northern Ireland. *Journal of Clinical Nursing*, 9(6), 851-858. doi:10.1046/j.1365-2702.2000.00434.x
- Mills, M. & Sullivan, K. (1999). The importance of information giving for patients newly diagnosed with cancer: a review of the literature. *Journal of Clinical Nursing*, 8, 631-642

Mitchell, G., Porter, S., & Manias, E. (2014). A critical ethnography of communication processes involving the management of oral chemotherapeutic agents by patients with a primary diagnosis of colorectal cancer: study protocol. *Journal of Advanced Nursing*, 00(0), 1-11. doi: 10.1111/jan.12565

Mueller, P. & Glennon, C. (2007). A nurse-developed pre chemotherapy education checklist. *Clinical Journal Of Oncology Nursing*, 11(5), 715-719.  
doi:10.1188/07.CJON.715-719

Oncology Nursing Society. (2012). Oncology nursing society position on the education of the nurse who administers chemotherapy and biotherapy. Retrieved from:  
<http://www2.ons.org/Publications/Positions/RNed>

Pedersen, B., Koktved, D. P., & Nielsen, L. L. (2013). Living with side effects from cancer treatment - a challenge to target information. *Scandinavian Journal of Caring Sciences*, 27(3), 715-723. doi:10.1111/j.1471-6712.2012.01085.x

Piredda, M., Rocci, L., Gualandi, R., Petitti, T., Vincenzi, B., & De Marinis, M. (2008). Survey on learning needs and preferred sources of information to meet these needs in Italian oncology patients receiving chemotherapy. *European Journal of Oncology Nursing*, 12(2), 120-126

Public Health Agency of Canada (2015). Critical Appraisal Took Kit. Retrieved from:  
<http://www.phac-aspc.gc.ca/nois-sinp/guide/catk-toec-eng.php>

- Rask, M., Jensen, M., Andersen, J., & Zachariae, R. (2009). Effects of an intervention aimed at improving nurse-patient communication in an oncology outpatient clinic. *Cancer Nursing, 32*(1), 1-11
- Rigdon, A. (2010). Development of patient education for older adults receiving chemotherapy. *Clinical Journal of Oncology Nursing, 14*(4), 433-441
- Russell, S. (2006). An overview of adult-learning processes. *Urologic Nursing, 26*(5), 349
- Rutten, L., Arora, N., Bakos, A., Aziz, N., & Rowland, J. (2005). Information needs and sources of information among cancer patients: a systematic review of research (1980-2003). *Patient Education & Counseling, 57*(3), 250-261
- Schofield, P., Jefford, M., Carey, M., Thomson, K., Evans, M., Baravelli, C., & Aranda, S. (2008). Preparing patients for threatening medical treatments: effects of a chemotherapy educational DVD on anxiety, unmet needs, and self-efficacy. *Supportive Care in Cancer, 16*(1), 37-45
- Skalla, K., Bakitas, M., Furstenberg, C., Ahles, T., & Henderson, J. (2004). Patients' need for information about cancer therapy. *Oncology Nursing Forum, 31*(2), 313-319. doi:10.1188/04.ONF.313-319
- Smith, J.A., Kindo, C.C., Kurian, S., Whitaker, L.M., Burke, C., & Wachel, B. (2004). Evaluation of patient chemotherapy education in a gynecology oncology center. *Supportive Care in Cancer, 12*, 577-583



Tamburini, M. Gangeri, L., Brunelli, C., Boeri, P., Borreani, C., Bosisio, M... Trimigno,

P. (2003). Cancer patients' needs during hospitalisation: a quantitative and qualitative study. *BMC Cancer*, 3(12), 1-11. doi:10.1186/1471-2407-3-12

Thorne, S., Bultz, B., & Baile, W. (2005). Is there a cost to poor communication in cancer care? a critical review of the literature. *Psychooncology*, 14(10), 875-884

van Weert, J. M., Bolle, S., van Dulmen, S., & Jansen, J. (2013). Older cancer patients' information and communication needs: What they want is what they get? *Patient Education & Counseling*, 92(3), 388-397. doi:10.1016/j.pec.2013.03.011

Van der Molen, B. (1999). Relating information needs to the cancer experience: Information as a key coping strategy. *European Journal of Cancer Care*, 8(4), 238-244

Van der Molen, B. (2000). Relating information needs to the cancer experience. . Themes from six cancer narratives. *European Journal of Cancer Care*, 9(1), 48-54

Williams, S. & Schreier, A. (2004). The effect of education in managing side effects in women receiving chemotherapy for treatment of breast cancer. *Oncology Nursing Forum*, 31(1), 16-23

World Health Organization. (2014). *Key Fact Sheet*. Retrieved from:  
<http://www.who.int/mediacentre/factsheets/fs297/en/>

## **Appendix C**

### Consultation Report

Final Consultation Report

Chemotherapy Education Manual for Nurses

Memorial University of Newfoundland

Lorie Kielley

Cancer is a leading cause of death worldwide (World Health Organization, 2014). An average of 524 Canadians are diagnosed with cancer every day, with two out of five Canadians expected to develop cancer at some point in their lifetime (Canadian Cancer Society, 2014). As the number of newly diagnosed cancer cases in Canada steadily increases, more individuals are undergoing lifesaving treatments which includes chemotherapy. There are no statistics on the number of Canadians receiving chemotherapy, however, based on the large number of people being diagnosed with cancer one may conclude that chemotherapy rates are increasing proportionally.

Chemotherapy is the systemic treatment of illness by the use of powerful chemicals that attack rapidly dividing cells in the body (Mayo Clinic, 2014). Chemotherapy may be used independently or in combination to treat various forms of cancer. Although chemotherapy can be an effective treatment, it can also cause harmful and sometimes fatal side effects (Mayo Clinic, 2014). These side effects can sometimes be prevented or minimized, and providing education to patients can significantly impact their dealings with encountered side effects.

Oncology nurses, can acquire the knowledge and skills to administer chemotherapy through advanced education (Dalby et al., 2013; Fredette, 1990; Lauer, Murphy, & Powers, 1982; McCaughan & Parahoo, 2000; Mueller & Glennon, 2007; Pedersen, Koktved, & Nielsen, 2013) and a specialized certification process (Oncology Nursing Society [ONS], 2012). To be certified in chemotherapy administration nurses' must demonstrate understanding of how chemotherapy agents work, management of its

side effects, and have knowledge of the education needs of those receiving it (ONS, 2012).

Individuals receiving chemotherapy have voiced concerns that current teaching is not meeting their learning needs (Smith et al., 2004). Despite the availability of existing chemotherapy educational materials, research has found that nurses do not feel fully prepared to provide chemotherapy education to patients thus, are not meeting the needs of this cohort (McCaughan & Parahoo, 2000; Smith et al., 2004). Adding to this is the lack of literature that outlines the content of what an educational program for those receiving chemotherapy should include, how this information should be delivered, and its effectiveness on the management of chemotherapy side effects.

The General Hospital is the main acute care facility in the province of Newfoundland and Labrador that administers chemotherapy treatment to patients. The nursing staff on 4NA, the inpatient Oncology/Hematology ward at this site, complete a chemotherapy administration course offered via Eastern Health in which they learn about specific cytotoxic agents, administration techniques, side effects, assessment skills, and documentation. Nurses on 4NA are the primary educators of patients and their families about their chemotherapy treatment however, education is also provided by other members of the Oncology/Hematology team including physicians and pharmacists. Despite completing this chemotherapy course, many of the nurses on 4NA feel they do not have the time or adequate resources to provide consistent teaching to patients about the management of chemotherapy side effects. That is, although the side effects of chemotherapy are reviewed with the patient the management is not discussed in detail.

In order to address the educational needs of patients receiving chemotherapy, resources must be up to date, readily accessible to nurses (Fredette, 1990), and reflective to the needs of this population. The proposed resource manual on the management of chemotherapy side effects will address these needs. A review of the literature was completed which informed the key stakeholder consultations. These consultations helped to identify the priority learning needs of this population and guide the construction of the proposed manual.

To find what is currently known on this topic I have examined the impact of chemotherapy educational programs on patient's physiological and psychological health, nurses' experience with educating clients about chemotherapy, patient's experience with chemotherapy, and educational resources. Barriers to providing effective chemotherapy education from both the patients and the nurse's perspectives were explored. The content and layout of the resource manual will be based on the literature review as well as discussions with key stakeholders. Key stakeholders will be invited to review the manual for content and presentation and revisions made accordingly.

### **Objectives**

1. To identify the priority educational needs of patients during chemotherapy treatment.
2. To identify existing chemotherapy resources for patients.
3. To obtain suggestions in how to improve chemotherapy education to patients.
4. To obtain suggestions as to key content and layout of the resource manual.

5. To identify barriers in to the delivery of chemotherapy education to patients.

### **Setting and Sample**

Consultations occurred with ten staff members of Eastern Health employed at the Health Sciences Center including. Seven front line registered nurses, one pharmacist, and two haematologists were consulted.

Front line nurses – this resource manual is being developed for nurses and therefore including nurses in consultation is crucial. Nurses who deliver chemotherapy on the unit were able to identify gaps in current resources, identify learning needs of their patients, and discuss barriers to providing education to this population. From a nursing perspective they provided input on what is important to include in a resource manual. Upon completion of this manual, nurses will be asked to review the draft of the manual.

Pharmacy – consulting with pharmacy is particularly important as they have in depth knowledge of chemotherapeutic agents and their side effects. In consulting with pharmacy I discussed their role in patient education and gained a deeper understanding of their perceived learning needs of this population. The pharmacist was provided with a questionnaire in addition to the face to face consultation that occurred.

Physicians – physicians play an essential role in chemotherapy education. Often they hear the concerns voiced by patients and therefore are valuable in identifying patient learning needs. Physicians completed the questionnaire during a face to face consultation.

## **Data Collection**

Data will be collected by using a questionnaire with both open and closed ended questions (see Appendix A of consultation report). This questionnaire was developed based on my literature review and my experience as an Oncology nurse. Although this self-designed questionnaire allowed for quick, effective, and inexpensive data collection it is not valid or reliable.

On a fast paced acute care floor many colleagues do not have the time to sit down, uninterrupted to be interviewed. Using a questionnaire allowed colleges to complete the information at their convenience and enabled more time to reflect on their answers. Questionnaires were distributed to Registered Nurses my me during morning report and collected during evening handover before the end of the shift. I was available to participants throughout the duration of the questionnaire to provide explanations or clarifications as needed. The pharmacists, both physicians, and two nurses were met with individually .The two nurses were randomly selected for a face to face consultation. Face to face consultations occurred in the privacy of a classroom located on 4NA. The pharmacists, both physicians and two nurses were met with individually. Each participant was provided the questionnaire to guide the consultation. I used a blank questionnaire to make jot notes as the consultation was in process. Each consultations took between 20-30 minutes.



### **Data Management and Analysis**

Closed ended questions and those answered using a Likert scale will be summarized using percentages and lists. Open ended questions will be summarized by content analysis and organized in themes. For example, for questions such as “Can you identify resources/information that would assist you in providing effective chemotherapy education (i.e. updated drug information and, updated education checklist), answers will be listed and common themes identified.

### **Ethical Considerations**

Consent to participation in the questionnaire will be obtained through implied consent. I will approach members of the Oncology Team for their participation. This questionnaire does not require review by the Health Research Ethics Review Board and does not involve the participation of patients and/or family members (see Appendix B of consultation report). Permission to conduct both the questionnaires and the face to face consultations were obtained from the floor manager, Christine Walsh. Questionnaires will be collected at the end of the work day were, taken home to analyze and then destroyed to ensure security of data. Only Dr. Manuel and I would review the data. All information will be kept in a locked cupboard in a filing cabinet at my house. Once analyzed the data will be included in my practicum report.

Participants were made aware that their participation is voluntary and they participants can withdraw from the questionnaire at any time. In this event all data will be shredded or deleted immediately. Any data contained on a computer will be password

protected. Since there is only one pharmacist participating in both the questionnaire and consultations their information will be easily identifiable. This was discussed with the pharmacist prior to their participation.

As previously mentioned, interviews will take place in a classroom on 4NA where privacy can be ensured. If the participants are not comfortable participating on their unit we can arrange a setting that is agreeable by the participant.

### **Key Findings**

A total of ten participants took part in the questionnaire and five in the face to face consultations. Seven participants were front line nurses, one pharmacist and two physicians. The pharmacist, both physicians and two front line nurses were individually consulted with. The three main Major themes identified from the consultations were (1) current resources, (2) priority learning needs and (3) barriers to education. Offered throughout these common themes are suggestions of how to improve upon current approaches to chemotherapy education.

### **Current Resources**

The questionnaire results showed that 80% of participants felt that current patient education on 4NA was either effective or moderately effective. Despite the fact that most staff found current approached to teaching effective, only 40% agreed that there are adequate resources to facilitate patient chemotherapy education. Although all participants agreed that teaching information on 4NA is up to date it was noted that the drug pamphlets available were dated from 2005.

Nurses stated that they currently use a “Chemotherapy and You” booklet provided by the Canadian Cancer Society (2014), drug pamphlets, and the units available chemotherapy education checklist. They also access information via the British Columbia Cancer Agency and the Canadian Cancer Society (2014) online. Several nurses as well as the pharmacist thought that more detailed information on side effects would facilitate chemotherapy education while both physicians felt that using scholarly research articles on chemotherapy education could help nurses to incorporate evidenced based practice into their teaching. Suggestions on how to further improve effectiveness of teaching as a whole included having a designated chemotherapy educator, allotting uninterrupted time to provide teaching, and having resources for the nurse to guide chemotherapy education.

### **Priority Learning Needs**

Participants ranked side effects as the most important learning need for patients. The second priority learning need identified was how to prevent side effects. These learning needs were followed by how chemotherapy works, a description of the specific illness, psychosocial effects of being diagnosed with a cancer disorder, diagnostic testing and plan of care.

Participants were also asked to rank given side effects from most common to least common according to their experiences in dealing with this population. Nausea and vomiting, fatigue, decreased appetite, and neutropenia were ranked as most common. Hair loss, sore mouth and taste changes were ranked least common. Other side effects identified by staff were leukopenia (febrile neutropenia), thrombocytopenia, difficulty sleeping, constipation and diarrhea. In dealing with some of these common side effects

staff noted that patients use medications, eating small meals, normal saline rinses, and resting to cope.

Staff were asked to identify what an educational resource manual should contain in order to facilitate chemotherapy education. Suggestions included a simple description of how chemotherapy works, effects on blood values (platelets, red blood cells, white blood cells etc.), infection prevention, brief description of individual types of cancer, detailed information on side effects and side effect management, how to monitor for infections at home, and an updated education checklist. The manual should be easy to read, easily

### **Barriers to Education**

Participants were asked to identify barriers to education that exist on 4NA. Time (100%), limited resources (50%), lack of privacy (40%), lack of knowledge/comfort in providing education (30%) were the main barriers identified by staff. To manage providing education on a busy unit nurses found “handing off” the call bell beeper (86%), developing an education plan (71%), and selecting a time when the unit is least busy (71%) to be effective. Participants also stated that easy access to educational resources would help ensure timely assist in time management with chemotherapy education. Although resources are available on the unit, nurses have to go looking for some of the information. That is, not all information is readily accessible.

Staff were asked to identify what an educational resource manual should contain in order to facilitate chemotherapy education. Suggestions included: a simple description

of how chemotherapy works, effects on blood values (platelets, red blood cells, white blood cells etc.), infection prevention, brief description of individual types of cancer, detailed information on side effects and side effect management, how to monitor for infections at home and an updated education checklist. The manual should be easy to read, easily accessible, organized, and contain links to more detailed information.

### **Summary**

The staff of 4NA feel that current approaches to chemotherapy education are satisfactory, however they identified several areas in which teaching could be improved upon. They also expressed a need for easily accessible, up to date educational resources. Keeping in alignment with findings in the literature. The information obtained from these consultations coupled with the literature review revealed that side effects and their management are a priority learning need for patients. In particular, nausea and vomiting, fatigue, and febrile neutropenia were identified as essential learning needs of patients.

Nurses require easy access to comprehensive educational resources in order to facilitate chemotherapy education for patients. Currently nurses are accessing pamphlets and booklets available on 4NA and although these resources discuss most educational topics they are very limited in content. The proposed manual will select one or two of the top priority learning needs identified in the consultations and literature review to cover extensively in the proposed educational manual. This manual can then be built upon to address more extensive educational needs of chemotherapy patients.

## References

B C Cancer Agency (2014). Retrieved from: <http://www.bccancer.bc.ca/health-info/coping-with-cancer/managing-symptoms/nausea>

Canadian Cancer Society. (2014). *Cancer statistics at a glance*. Retrieved from: <http://www.cancer.ca/en/cancer-information/cancer-101/cancer-statistics-at-a-glance/?region=nl>

Dalby, C. K., Nesbitt, M., Frechette, C. A., Kennerley, K., Lacoursiere, L. H., & Buswell, L. (2013). Standardization of Initial Chemotherapy Teaching to Improve Care. *Clinical Journal Of Oncology Nursing*, 17(5), 472-475.  
doi:10.1188/13.CJON.472-475

Fredette, S. (1990). A model for improving cancer patient education. *Cancer Nursing*, 13(4), 207-215

Lauer, P., Murphy, S., & Powers, M. (1982). Learning needs of cancer patients: a comparison of nurse and patient perceptions. *Nursing Research*, 31, 11-16

Mayo Clinic (2014). *Tests and procedures: chemotherapy*. Retrieved from : <http://www.mayoclinic.org/tests-procedures/chemotherapy/basics/definition/prc-20023578>

McCaughan, E., & Parahoo, K. (2000). Medical and surgical nurses' perceptions of their level of competence and educational needs in caring for patients with cancer. *Journal of Clinical Nursing*, 9(3), 420-428. doi:10.1046/j.1365-2702.2000.00403.x

Mueller, P., & Glennon, C. (2007). A nurse-developed prechemotherapy education checklist. *Clinical Journal Of Oncology Nursing*, 11(5), 715-719.

doi:10.1188/07.CJON.715-719

Oncology Nursing Society. (2012). Oncology nursing society position on the education of the nurse who administers chemotherapy and biotherapy. Retrieved from:

<http://www2.ons.org/Publications/Positions/RNed>

Pedersen, B., Koktved, D. P., & Nielsen, L. L. (2013). Living with side effects from cancer treatment - a challenge to target information. *Scandinavian Journal Of Caring Sciences*, 27(3), 715-723. doi:10.1111/j.1471-6712.2012.01085.x

Smith, J.A., Kindo, C.C., Kurian, S., Whitaker, L.M., Burke, C., & Wachel, B.(2004). Evaluation of patient chemotherapy education in a gynecology oncology center. *Supportive Care in Cancer*, 12, 577-583

World Health Organization. (2014). *Key Fact Sheet*. Retrieved from:

<http://www.who.int/mediacentre/factsheets/fs297/en/>

## Appendix A

### Questionnaire

1. What is your position with the Oncology/Hematology Unit?

- a. Nurse
- b. Physician
- c. Pharmacy

2. How effective do you feel current patient chemotherapy education is on 4NA?

1                      2                      3                      4                      5

Not Effective

Very Effective

Can you please elaborate on why you selected the above? Do you have any suggestions of how to improve effectiveness of patient chemotherapy education?

3. Currently, are there adequate resources (e.g. pamphlets, DVD's, audiotapes) available to nurses to facilitate patient chemotherapy education

1                      2                      3                      4                      5

Strongly Disagree

Strongly Agree

What resources are currently available? What additional resources would you find helpful?



4. Current chemotherapy teaching resources are up to date

1

2

3

4

5

Strongly Disagree

Strongly Agree

Where do you go to access info? What info is useful?

5. Rank from most important (1) to least important (7) the following patient learning needs about chemotherapy

Side Effects \_\_\_\_

How to Prevent Side Effects \_\_\_\_

How Chemotherapy Works \_\_\_\_

Description of Illness \_\_\_\_

Diagnostic Testing \_\_\_\_

Psychosocial Effects \_\_\_\_

Plan of Care \_\_\_\_

6. Rank the following side effects as most common (1) experienced side effects to least common (5) side effects experienced by patients undergoing chemotherapy

Nausea and vomiting \_\_\_\_\_

Hair loss \_\_\_\_\_

Fatigue \_\_\_\_\_

Sore Mouth \_\_\_\_\_

Decreased Appetite \_\_\_\_\_

Taste Changes \_\_\_\_\_

Neutropenia \_\_\_\_\_

7. What are other common side effects patient's in 4NA experience? What are some interventions available to deal with side effects?
8. Tell me about what barriers to effective chemotherapy education exist on 4NA?
9. Tell me what you envision a chemo education manual containing? What should it look like?
10. How do you deal with providing education on a busy unit?

11. The literature has identified nausea as a top priority learning need for patient's undergoing chemotherapy? Do you agree? What are other top learning needs?

12. If an education manual had to focus on one side effect of chemotherapy what do you think it should be?

## Appendix B

### Health Research Ethics Authority Screening Tool

	Question	Yes	No
1	Is the project funded by, or being submitted to, a research funding agency for a research grant or award that requires research ethics review		N
2	Are there any local policies which require this project to undergo review by a Research Ethics Board?		N
	IF YES to either of the above, the project should be submitted to a Research Ethics Board.  IF NO to both questions, continue to complete the checklist.		
3	Is the primary purpose of the project to contribute to the growing body of knowledge regarding health and/or health systems that are generally accessible through academic literature?	Y	
4	Is the project designed to answer a specific research question or to test an explicit hypothesis?		N
5	Does the project involve a comparison of multiple sites, control sites, and/or control groups?		N

A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

6	Is the project design and methodology adequate to support generalizations that go beyond the particular population the sample is being drawn from?		N
7	Does the project impose any additional burdens on participants beyond what would be expected through a typically expected course of care or role expectations?		N
	LINE A: SUBTOTAL Questions 3 through 7 = (Count the # of Yes responses)	1	
8	Are many of the participants in the project also likely to be among those who might potentially benefit from the result of the project as it proceeds?	Y	
9	Is the project intended to define a best practice within your organization or practice?	Y	
10	Would the project still be done at your site, even if there were no opportunity to publish the results or if the results might not be applicable anywhere else?	Y	
11	Does the statement of purpose of the project refer explicitly to the features of a particular program,	Y	

A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

	Organization, or region, rather than using more general terminology such as rural vs. urban populations?		
12	Is the current project part of a continuous process of gathering or monitoring data within an organization?		N
	LINE B: SUBTOTAL Questions 8 through 12 = (Count the # of Yes responses)	4	

## **Appendix D**

### Literature Review Tables

**Quantitative Studies – Chemotherapy: Educational Needs of Patients and Professionals**

Article	Sample/Setting	Measurements	Results	Comments/Limitations
<p>Aranda et al. (2011)</p> <p>Type of Study/Tool: Parallel Group- Prospective Randomized Control Trial</p> <p>Objective: To assess impact of ChemoEd on pt. distress, treatment- related concerns and the prevalence and severity of six chemo side effects</p>	<p>n=192 breast, GI and Heme cancer pt's</p> <p>Cancer Hospital in Australia</p> <p>Pt's who planned to have their 1<sup>st</sup> treatment and to have at least 3 treatments</p>	<p>Independent Variable: ChemoEd (DVD, question prompt list, drug info and procedural info) given 1-7 days pre chemo</p> <p>Dependent Variable: level of distress, treatment related concerns and severity and prevalence of side effects</p> <p>Self-Administered questionnaires at in outpatient clinics at T1 (pre-education), T2 (1<sup>st</sup> cycle) and T3 (3<sup>rd</sup> cycle)</p> <p>Clinical data obtained from pt. records</p> <p>Demographic info from pt. record and at T1 from questionnaire</p> <p>HADS at T1-T3</p>	<p>ChemoEd did not significantly reduce pt. distress</p> <p>Decrease in sensory/psychological (p=.027) and procedural (p=.03) as well as prevalence and severity of vomiting (p=0.001) noted at T3.</p> <p>Those who had increased distress at T1 indicated significant decrease (p=.035) at T2 but not at T3 (p=.055) in ChemoEd pt's</p>	<p>ChemoEd can improve patient treatment related concerns and some physical/psychosocial outcomes</p> <p>Access to appropriate info and support materials can reduce treatment info and support needs.</p> <p>Despite the availability of the educational DVD in routine care, few patients watched it</p> <p>Further research needed on more diverse pop. To improve generalizability</p> <p>Limitations: No control over self- care info in the home environment</p> <p>Findings may be limited by sample size</p>



		CaTS at T1 and T3  C-SAS at T1 and T3		Study limited by pt. population  Did not assess all chemo types or those who previously received chemo  HADS measurement tool may not be best tool for treatment related distress  Strength of Study Design: Strong Quality of Study: Strong
Cowan & Hoskins (2006)  Type of Study/Tool: Cross Sectional Survey  Objectives: To determine: 1. Info seeking behaviours by pt.'s receiving chemo for BCA influences the sources of info, amt. of info and	Medical Oncology Service in a city teaching hospital  N=36 (88 initially asked to participate) 56% < 50, 72% married, all white, 72% had no higher education, 31% had chemo before  BCA pt's who have received at least one cycle of chemo	Self-report questionnaire completed during visit  Miller Behavioural Style Scale	Sources of info: Nurse Specialist n=36 Hospital Consultant n=33 GP n=24 Leaflets n=32 Medical Books/Journals n=6 Family and Friends n=21 Internet n=18  Majority used 4-6 sources.	Internet sources can be a valuable source of chemo ed.  Hospital staff top source of chemo ed.  Leaflets/written materials are important resource for pt.'s Limitations: Low response rate (42%) could mean selection bias

<p>satisfaction with info accessed</p> <p>2. Preferred sources of info for this pt. group</p> <p>3. Patient satisfaction with information sources used by this group</p>			<p>No significant relationship between monitoring score and (age <math>p=.547</math>, marital status <math>p=.737</math>, education <math>p=.20</math> and deprivation <math>p=.83</math>)</p> <p>Younger pt's (&lt;50) more likely to use internet (<math>p=.032</math>)</p>	<p>Data collected over short period of time</p> <p>Characteristics from respondents could differ from non-respondents</p> <p>Convenience sample may limit generalizability</p> <p>Strength of Study Design: Weak Quality of Study: Strong</p>
<p>Dalby et al. (2013)</p> <p>Type of Study/Tool: Cohort</p> <p>Objective: To determine patients understanding of what to expect during treatment and assess their knowledge of side effects</p>	<p>Dana-Faber Cancer Institute satellite facilities. Patients were about to receive first treatments. N=53 patients N=23 staff</p>	<p>Independent Variables: standardized treatment (checklist, treatment-specific calendar and patient education assessment survey)</p> <p>Dependent Variables: patient satisfaction scores re: knowledge of management of SE and what to expect during treatment</p> <p>Tools:</p>	<p>Patients report average satisfaction score of 4.86 (on a 0-5 scale with higher score indicating greater satisfaction) re: knowledge of management of SE</p> <p>Knowledge of what to expect of treatment increased from 91% to 97%</p> <p>Knowledge of management of SE</p>	<p>Standardized chemo ed. can improve patient understanding and increases satisfaction in chemo ed. for both patients and staff</p> <p>Limitations: Timing of the sessions may impact outcomes. Timing was not standardized</p> <p>Number of patients who received the patient education assessment</p>

		<p>Press Ganey (2013) Survey for adult Oncology used to obtain baseline measures of patients perception of chemo teaching process</p> <p>Patient Education Assessment Survey at 1 month and continued for 9 months. Collected weekly.</p> <p>Staff satisfaction data collected by post intervention survey. Online survey.</p>	<p>increased from 87%-97%</p> <p>Greater satisfaction (4.5) in knowledge re: how and when to contact health care professionals and what to expect during treatment</p> <p>Nurses reported high satisfaction with new process. 88% found checklist helpful, 100% felt materials were comprehensive and 80% felt follow up materials were appropriate</p>	<p>survey was not all of sample</p> <p>Cannot guarantee that increased satisfaction scores is casual of the intervention (many factors not controlled)</p> <p>Small sample size</p> <p>Extraneous variables: knowledge obtained from other sources</p> <p>Strength of Study Design: Moderate Quality of Study: Strong</p>
<p>Dodd (1988)</p> <p>Type of Study/Tool: RCT</p> <p>Objective: Test the efficacy of giving Side Effect Management (SEM) info. proactively for chemo pt's</p>	<p>Outpatient Clinic N=60 cancer pt's to begin chemo 21 male, 39 female SD age =55 Performance status using Karnofsky scale = 79.6 Social position using Hollingshead's Scale =2.9</p>	<p>Independent Variable: SEM information provided</p> <p>Dependent Variable: Self-care behaviours</p> <p>Intruments: SCB log MHLC scale</p>	<p>Intervention group scored higher on all SCB</p> <p>More preventative self-care activities (t[58] = 2.6, P=.012)</p> <p>Most common SE: nausea (30), fatigue (23), hair loss (19), sore</p>	<p>SEM information failed to decrease severity and distress of experienced SE</p> <p>3 Common SE: nausea, fatigue, hair loss</p> <p>Limitations: Disproportionate male:female</p>

		<p>Self-care behaviour log STAI</p> <p>STAI and LOC at start and 6 weeks</p>	<p>mouth and throat (16) bleeding and decreased appetite (10)</p> <p>No sig. diff between groups in delay in initiating SCB</p> <p>No sig. difference on severity and distress of SE experienced between groups (<math>t[58] = -.42, P=0.67</math>)</p> <p>State anxiety was not sig. negatively correlated with any SBC (<math>r=-.02-.11, p=.9-.37</math>)</p> <p>1<sup>st</sup> interview experimental had more anxiety but at 2<sup>nd</sup> had decreased significantly</p> <p>Most frequently reported SCB's: Nausea – pres. Meds, preferred foods, small amts. Sore Mouth – rinse, pain med, cold drinks</p>	<p>Pt's may have obtained outside sources of info</p> <p>Pt's may have had chemo before therefore more knowledge</p> <p>Strength of Study Design: Strong Quality of Study: Strong</p>
--	--	--	---	---

			<p>Fatigue – sleep, exercise, decrease work hours</p> <p>Hair loss – gentle, wigs, ice cap</p> <p>Decreased Appetite – preferred foods, small frequent meals</p>	
<p>Kinnane &amp; Thompson (2007)</p> <p>Type of Study/Tool: Randomized Control Study</p> <p>Video “Staying well during chemotherapy” – 10 mins.</p> <p>Objectives:</p> <p>1. Compare recall of info regarding self-care and SE in pt’s who watched the video as part of pre chemo ed. compared to those with standard care</p> <p>2. Survey pt.’s and evaluate the</p>	<p>Pt’s receiving adjuvant chemo for breast and colon CA</p> <p>N=67 approached and 64 participated</p> <p>3 declined to participate due to feeling overwhelmed with their situation</p> <p>Average age = 49 (video) and 54.8 (non video), 75% female, more than 70% were educated to high school and were professionals, 60% had a loved one who had chemo, 69% had previous education,</p>	<p>Independent Variable: Video education in addition to standard ed.</p> <p>Dependent Variable: Recall of info</p> <p>Tools: Questionnaire (demos, general info to assess past chemo ed.) – Baseline</p> <p>Multiple Choice questionnaire to assess recall of video – pre 2<sup>nd</sup> cycle</p> <p>Telephone Calls – monitored for number and content between</p>	<p>At pre 2<sup>nd</sup> cycle video group had higher recall in mouth problems (87% vs. 78%, p=.45), sympt. of low red cell count (80.6% vs. 66.7%, p=.29) and prevention of constipation (74.2% vs. 51.7%, p=.07) Not statistically sig.</p> <p>Less than 30% of both groups aware of how often to check temp.</p> <p>45% called department 27 from non-video group and 25 from video</p> <p>Higher num. of general calls from non-video</p>	<p>Use of video in addition to written and verbal ed. can be beneficial to pt’s</p> <p>Need for education on monitoring for infection</p> <p>Limitations: Predominantly female population</p> <p>Females were more likely to make the phone calls</p> <p>Some pt’s completed pre cycle 2 questionnaire in the presence of others and this may affect results</p> <p>Varying levels of chemo knowledge pre study</p>

<p>usefulness of video is assisting them in managing SE of chemo at home</p>	<p>less than 10% sourced info from internet After study began 4 dropped out. 2 exp. toxic side effects and stopped chemo, 1 recruited outside age range, 1 had disease progression – treatment change</p>	<p>end of cycle one to completion of treatment or 20 weeks Video Assessment at 20 weeks to get feedback on content and benefits in the form of a questionnaire with both quant. and qual. questions</p>	<p>group (44.4% vs. 26%, <math>p=0.06</math>). Both reported nausea and vomiting and signs of infection. Video grp. reported more often N &amp; V (40% vs. 26%) and infection (55% vs. 44%)</p> <p>66.7% extremely-very satisfied with the video</p> <p>83.3% preferred both styles of ed. combined</p> <p>Most useful topics: mouth care (83.3%) diet &amp; fluids (73.3%) signs of infect. (70.0%) n&amp;v (66.6%) anemia (20%)</p>	<p>Pt's want and need for ed. may vary</p> <p>Strength of Study Design: Strong Quality of Study: Strong</p>
<p>Lauer, Murphy &amp; Powers (1982)</p> <p>Type of Study/Tool: Cross Sectional. Questionnaire.</p> <p>Objectives:</p>	<p>3 medical/surgical units. Urban.</p> <p>N=33 nurses N=36 cancer patients</p> <p>Nurses: 32 female, 1 male, age 22-34, 16</p>	<p>Instrument: Individual structured interviews A questionnaire composed of 3 sections guided 1. Demographics</p>	<p>Most important treatment related info for nurses:</p> <ol style="list-style-type: none"> <li>1. Minimizing side effects</li> <li>2. Potential side effects</li> <li>3. Chemo Schedule</li> </ol>	<p>Addressing SE more priority for nurses rather than pt's</p> <p>Often nurses and pt's perceptions of learning needs are different</p>

Discover and compare patients' and nurses' perceptions of the learning needs of cancer patients.	<p>bachelor degree, 11 diploma, 6 associate degree, 21 had &gt;4 years' experience</p> <p>Patients: receiving or had received chemo. Readmitted for 1<sup>st</sup> time post chemo but not readmitted &gt; 3<sup>rd</sup> time. 15 female, 12 male. 14 black, 12 white &amp; 1 Hispanic. 9 married, 18 single. Age 30-81.</p>	<p>2.A questionnaire covering nutrition, SE, actions, scheduling, financial concerns and diagnostic testing. Likert scale.</p> <p>3. 3 questions concerning cancer patients learning needs.</p> <p>Reliability and validity previously established</p>	<p>Most important treatment related info for pt's:</p> <ol style="list-style-type: none"> <li>1.Purpose of meds</li> <li>2.Schedule of chemo</li> <li>3.Length of time to receive chemo</li> </ol> <p>(Potential SE ranked 4<sup>th</sup> and minimizing SE ranked 5<sup>th</sup>)</p> <p>Independent t testing noted statistically significant difference between black and white and hispanic pt's related to general info (t[25]=2.24, p&lt;.05). No statistical difference between male and female.</p> <p>Pt's identified the purpose of chemo meds as more important than nurse did.</p> <p>Treatment info ranked similarly by pts and nurses except: importance of learning</p>	<p>Limitations:</p> <p>32 female and only 1 male nurse</p> <p>Only based on one point in time</p> <p>Learning needs for each pt. could depend on confounding variables</p> <p>Learning needs could vary depending on type of cancer pt. has</p> <p>Small sample size</p> <p>Strength of Study Design: Strong</p> <p>Quality of Study: Moderate</p>
--	---	--	--	--

			<p>purpose of chemo ranked low by nurse and high by pt. SE ranked high by pt and low by nurse (in pt's only receiving chemo)</p> <p>Nurses ranked "dealing with feelings" as most problematic. Pt's ranked 5<sup>th</sup>.</p> <p>Pt's ranked SE as most problematic, and as the one they were most knowledgeable about and wanted the most information in this area.</p>	
<p>Lee et al. (2004)</p> <p>Type of Study/Tool: Cross-sectional survey</p> <p>Objectives: 1. Identify the info that Breast CA pt.'s desire at different points of treatment</p>	<p>Department of Clinical Oncology of Prince of Wales Hospital in Hong Kong</p> <p>N=51 Newly diagnosed breast ca 56% of pt.'s age 41-50</p>	<p>Self-Designed demographic questionnaire</p> <p>Informational needs questionnaire (Cronbach's alpha = 0.94)</p> <p>Used a repeated measures design Time 1 : First day of chemo</p>	<p>Patients require info on SE at both stages of chemo</p> <p>Priority Needs at Time 1 Treatments (Mean = 4.59) Disease (4.37) Investigative Tests (3.80)</p>	<p>Most important info needs: 1. cancer and it's spread 2. SE 3. management of SE</p> <p>Teaching should include families</p> <p>Individualize teaching</p> <p>Information needs stable during treatment</p>



<p>2.To prioritize the type of info needed at diff. stages of chemo</p> <p>3.Compare sig. differences in info needs of pt.'s at dif. Stages of treatment</p> <p>4.Measure the variables influencing pt.'s info needs</p>	<p>66.6% obtained secondary education or higher</p> <p>84.3% married</p>	<p>Time 2: half-way through treatment</p> <p>Pilot study completed to test feasibility &amp; reliability</p>	<p>Priority Needs at Time 2</p> <p>Treatments (Mean = 4.25)</p> <p>Disease (4.39)</p> <p>Investigative Tests (4.04)</p> <p>Priority Needs at Time 1</p> <p>Treatments (Mean = 4.59)</p> <p>Disease (4.37)</p> <p>Investigative Tests (3.80)</p> <p>Items with significant diff. between Time 1 and 2</p> <p>1.If I have SE, how to deal with them (p&lt;0.0001)</p> <p>2.Possible side effects (p&lt;0.0001)</p> <p>3.What side effects should I report (p&lt;0.0001)</p> <p>4.Am I prone to infection because of my treatment (p=0.025)</p>	<p>Limitations:</p> <p>Small sample size</p> <p>Only reflected needs during chemo treatment</p> <p>Most breast ca pt.'s require combo therapy which is not reflected in this study</p> <p>Does not assess information needs outside of treatment</p> <p>Strength of Study Design: Moderate</p> <p>Quality of Study: Moderate</p>
<p>McCaughan and Parahoo (2000)</p>	<p>(n=106)</p> <p>medical (n=42) and surgical nurses (n=30)</p>	<p>Questionnaire assessing participants level of competence</p>	<p>97% of nurses had worked with pt's with cancer</p>	<p>Limited time impedes holistic care</p>

<p>Type of Study/Tool: Cross-sectional survey</p> <p>Objectives: 1.To collect selected data on the profile of medical and surgical nurses working with cancer patients 2.To assess their self-reported level of competence in a number of activities relating to their work with cancer patients</p>	<p>Inpatient hospital in Northern Ireland</p> <p>83.6% Registered General Nurses 55.6% over 30 yrs. old</p>	<p>to care for pt's with cancer using:</p> <p>1.Competence Scale 2.Educational Checklist</p> <p>Checked for content validity by panel of nurses and researchers Piloted before use</p>	<p>Nurses concerns re: caring for cancer patients: 1.Limited time to provide holistic care 2.Staff and pt's lack of knowledge and skills 3.Pain relief 4.Ethical dilemmas</p> <p>Nurses Self-Reported Ratings of Caring for Cancer Pt's: Physical Care #1 Dealing with side effects of treatment for cancer #14</p> <p>Nurses perceptions of their priority learning needs: 1.Dealing with social and psychological problems (70.8%) 2.Communicating with pt's in different states of illness (69.4%) 3.Dealing with pain (63.5%)</p>	<p>Nurses feel they need more education in side effects and do not feel confident in teaching pt's re: side effects of treatment</p> <p>Limitations: Self-assessments may be unreliable Surveys are limited in the type of data they can collect (no ability to elaborate)</p> <p>Strength of Study Design: Moderate Quality of Study: Moderate</p>
--	---	--	---	---

			4.Nursing measures to decrease side effects of treatment (62.5%) 5.Death and Dying (61.1%)	
<p>Piredda et al. (2008)</p> <p>Type of Study/Tool: Cross-sectional survey</p> <p>Objectives: 1.The priority learning needs and amount of info desired 2.The preferred period, involvement on family, methods and sources of info re: chemo side effects</p>	<p>N=111 cancer pt.'s (108 were valid and used)</p> <p>Average age = 60 70 male, 38 female, education level varied widely</p>	<p>Questionnaire developed for this study (Cronbach's Alpha: 0,883) Coefficient of reliability completed</p> <p>Completed and returned before discharge</p>	<p>Most important info for pt.'s Info re:illness (65.7%) Chance for recovery (42.6) Treatments (26.9%) SE (22.4%) Trajectory of illness (20.4%)</p> <p>83.3% of pt.'s wanted to learn as much as possible about SE and how to deal</p> <p>0.9% of pt.'s wanted no info on SE 99.1% pt.'s wanted oral info 61.1% wanted written info 23.1 wanted internet</p> <p>Pt's preferred to receive oral info from oncologist 1<sup>st</sup> (98.1%)</p>	<p>Pt's consider info on SE to be important</p> <p>Oncology nurse plays sig. role in education</p> <p>Pt's want to know as much as possible about SE</p> <p>Oral instruction is essential in education</p> <p>Limitations: More male respondents</p> <p>Small scale survey at a single institution</p> <p>Sample not stratified</p> <p>Strength of Study Design: Moderate Quality of Study: Moderate</p>

			<p>followed by Oncology nurse (66.8%)</p> <p>Pt's wanted info on SE as soon as they knew they were getting chemo (58.9%) and pre chemo (25.2%)</p>	
<p>Rask et al. (2009)</p> <p>Type of Study/Tool: RCT: Analytical CAT</p> <p>Objective: to evaluate a standardized 2 day communication skills training program in nursing cancer care</p>	<p>Outpatient Oncology Clinic in Denmark</p> <p>24 of 26 nurses (1 maternity, 1 orientation not included)</p> <p>All female</p> <p>9 &lt;40 and 17 &gt;40</p> <p>19 married, 4 single</p> <p>4 &lt;10 years, 19 &gt;10 years</p> <p>12 &lt;5 years Onc. Exp.</p> <p>11 &gt;5 years Onc. Exp.</p> <p>413 total pt.'s (some at baseline/some follow up)</p> <p>SD age = 56.6 (27-81)</p> <p>151 male, 260 female, 2 missing</p> <p>316 married, 85 single, 12 missing</p>	<p>Independent Variable: Communications skills training program (33 hours over 8 weeks)</p> <p>Dependent Variable: Nurses assess at baseline before randomization (T1), 1 week post program (T2) and 3 months later (T3)</p> <p>Pt's 2 recruitment periods – before and after</p> <p>Baseline data after T1 and follow up between T2-T3</p> <p>Tools (pt.)</p>	<p>Intervention group had higher degree of attentiveness at T2 and T3</p> <p>Communication-related Self-Efficacy increased in both groups from T1-T2</p> <p>Confidence in prov. psychosocial support, handling conflicts and criticism, improving pt. health behaviour was only sig. increased in intervention (p&lt;.05)</p> <p>Nurses in control report sig. lower frequency of stress due to workload at T2 compared to T1</p>	<p>Results did not support the hypothesis that a training program would increase nurses' sat. with their communication, improve comm-related self-efficacy, reduced levels of stress and burnout.</p> <p>Did not benefit pt.'s with regards to increased sat., improved psychological well-being, or increased cancer related self-efficacy</p> <p>Comm. training may improve skills but clinical effectiveness of</p>

	<p>81 unskilled worker, 131 skilled worker, 14 missing, 16 other</p> <p>Pt's with psychiatric illness and poor general health not included</p>	<p>Questionnaire NPRI Brief Mood Scale CBI HADS EORTC QLQ-C30 Demographics</p> <p>Tools (nurse) Questionnaire NPRI Communication-related Self-efficacy Scale Nursing Stress Scale Maslach Burnout Inventory</p>	<p>(<math>P=.044</math>) but increased again at T3 <math>p=.03</math>)</p> <p>At T2 and T3 all nurses in both groups perceived that their pt.'s were satisfied with personal contact and professional skills</p> <p>Communication skills training did not lead to sig. change in pt.'s experience of nurse empathy and attentiveness, pt. moods or cancer related self-efficacy as <math>p&gt;.05</math></p>	<p>improved skills may be limited</p> <p>Limitations: Weakened randomization process</p> <p>Insufficient statistical power</p> <p>Potential Hawthorne effect</p> <p>Nurses could have shared training info with control group</p> <p>Pt's had high level of satisfaction in beginning ? Ceiling effects</p> <p>Social desirability bias Nurses in study were experienced – may explain less effect of training Selection bias – nurses could choose not to include pt's they felt were too emotionally burdened</p>
--	--	---	--	---

				Strength of Study Design: Moderate Quality of Study: Moderate
<p>Schofield et al. (2007)</p> <p>Type of Study: Quasi-Experimental</p> <p>Objective: Evaluate the effect of an educational DVD about chemo when given to chemotherapy naïve pt.'s</p>	<p>N=100 Group 1 recruited pre DVD n=50 Group 2 recruited post DVD n=50 (69 curative group, 31 palliative) Curative: 37 male, 32 female, average age =54, 48 married, 23 retired, 19 did not complete secondary ed. while all others had</p> <p>Palliative: 15 male, 16 female, average age=56, 14 married, 11 retired, 8 with university degrees</p> <p>Peter MacCallum Cancer Center, Melbourne Australia</p>	<p>Independent Variable: Educational DVD</p> <p>Dependent Variable: pre-treatment anxiety, informational needs and self-efficacy</p> <p>Tools: Medical records for disease variables Likert Scale on satisfaction HADS CBI – version 2 SCMS-short form</p> <p>Questionnaire Day 1</p>	<p>-no sig. difference between usual care vs. intervention on anxiety or depression subscales for curative or palliative pt.'s</p> <p>-Interventional grp. more confident re: seeking social support for curative pt.'s[t(67)=2.048, p=0.044]</p> <p>-palliative pt.'s in the intervention grp. Were more satisfied with the info they had received in SE [t(29)=2.348, p=0.026]</p> <p>-DVD did not sig. increase anxiety or depression for either grp.</p>	<p>Use of DVD may increase confidence to cope with CA and reduce their supportive care needs</p> <p>DVD is safe and does not increase anxiety</p> <p>DVD does not sig. influence self-efficacy and satisfaction with info provided</p> <p>Limitations:</p> <p>RCT would be preferred but was not possible for this study</p> <p>Current sample size had 80% power</p> <p>Due to location of study pre chemo knowledge would be high</p>

			<p>-DVD should be paired with other educational material</p> <p>-DVD can provide general info and help pt.'s and families generate questions</p> <p>-pt.'s wish to receive as much info as possible, does not always get same</p> <p>-palliative pt.'s less satisfied with info then curative</p>	<p>Intervention may have not been sufficiently intense and to general to achieve change</p> <p>Strength of Study Design: Strong Quality of Study: Strong</p>
<p>Smith et al. (2004)</p> <p>Type of Study/Tool: Cross sectional Study</p> <p>Objective: Asses the level at which patient chemotherapy education needs are being met in the GOC</p>	<p>N=190 included participants (initially 282 respondents, 92 considered chemo naive)</p> <p>GOC at UTMDACC (outpt. Clinic)</p> <p>All pt's with apt. between Jan. 2003-Feb. 2003 inc. Average age = 56.1</p>	<p>Tool: Questionnaire –peer reviewed and approved by IRB. Assessed pt.'s pref. re: the content and modality for chemo. Ed. previously received and future chemo ed.</p> <p>Privacy and anonymity maintained</p>	<p>86.6% of pt.'s preferred to receive chemo ed. via written materials or conversations with professionals</p> <p>62.6% felt they were receiving adequate info.</p> <p>42.4% wanted more info than they had received re: treatment</p>	<p>Pt's prefer one on one conversation rather than a classroom setting</p> <p>Verbal and written chemo ed. preferred</p> <p>Limitations: Chemo naïve pt. not included Only women</p> <p>Persons providing teaching may vary</p>

	90.5% English, 95% had 8 <sup>th</sup> grade or higher ed., 75% had high school/college, 50% diag. with gyne. malignancy in the past 5 years	Responses divide into 2 groups: chemo at GOC and outside	<p>Of pt.'s treated at the GOC 60% received written info and 69% verbal info pre treatment</p> <p>Pt's pt.'s outside 43.7 received written info and 56.3 via written materials</p> <p>40% might attend a chemo class: only 7.9% expressed this as a preference</p> <p>Pt's want more info on: how chemo works, why stops working and drug interactions rather than what chemo is, how it's given and SE <math>p &lt; 0.01</math></p>	<p>Pt's may have received chemo ed. info outside out the clinic</p> <p>Pt's may have had varying levels of experience with chemo therefore varying levels of previous ed.</p> <p>Tool was peer reviewed but no discussions of validity or rigor</p> <p>Strength of Study: Moderate Quality of Study: Moderate</p>
<p>Williams &amp; Schriener (2004)</p> <p>Type of Study/Tool: RCT: Analytical CAT</p> <p>Objectives: 1. To determine how the use of audiotapes</p>	<p>U.S Cancer Center. Rural outpatient. BRCA Newly diagnosed.</p> <p>n=70. Experimental n=38 and control n=33.</p>	<p>Independent Variable: Audiotapes (2 x 20 mins. each on management of SE of chemo e.g. nutrition, exercise, relaxation, sleep &amp; fatigue.</p> <p>Dependent Variable:</p>	<p>Experimental group increase use of recommended SCB; decrease in SE from 5.18 to 4.54; anxiety decreased in comparison to control; NV decreased by 50% at 1 to 3 months;</p>	<p>Audiotapes effective method to decrease anxiety and increase SCB and SE management</p> <p>Audiotapes decrease anxiety therefore, can instill confidence in</p>



<p>affects SCB and anxiety.</p> <p>2. To describe the frequency and intensity of side effects experienced by breast cancer patients.</p>	<p>Age 30-74, Education 13.23 years, 60% married, 60% &lt; 60,000</p>	<p>Self-care behaviours, anxiety &amp; intensity of SE.</p> <p>Tools:</p> <p>STAI (pre chemo, 1 and 3 months post)</p> <p>SCD (SE &amp; SCB at 1 and 3 months post)</p> <p>Telephone Interviews</p>	<p>difficulty sleeping decreased by half 1-3 months; experimental group tried more SCB.</p> <p>Incidence of fatigue increased in both groups</p> <p>More SCB were used for NV than others but prescription meds were most effective</p> <p>P values of reported data in tables statistically significant &lt; or equal to .05</p> <p>Most common SE experienced by groups are fatigue, NV, taste changes</p> <p>No significant difference between groups in number and effectiveness of SCB (exercise, caffeine, busy etc.)</p>	<p>one's self control of SE and management. On busy units can be alternative or supplemental form of patient education.</p> <p>Most common SE: fatigue, anxiety, NV, sore mouth (focus of education)</p> <p>Limitations: Loss of data</p> <p>Small sample size</p> <p>Extraneous variables: education from other sources, number of times audiotapes listened to and use of telephone calls.</p> <p>Strength of Study Design: Strong Quality of Study: Moderate</p>
--	---	---	---	---

**Qualitative Studies – Chemotherapy: Educational Needs of Patients and Professionals**

<b>Author (Year)</b>	<b>Study Design/Methods</b>	<b>Theoretical Underpinnings</b>	<b>Characteristics of the Participants/Sett ing</b>	<b>Ethical Issues</b>	<b>Outcomes</b>	<b>Limitations</b>	<b>Study Strength</b>
Pedersen , Koktved & Nielsen (2013)	Phenomenological approach Semi-structured interviews Interviews took place 1-2 months post chemo  Objective: explore pt.'s experiences of how SE from chemo and RT impact everyday life and info needs in coping with SE	Hermeneutic al approach	Danish University Hospital. A purposive sample of n=9 (5 females and 4 males participated). Age 38-74. Various types of CA 7 chemo 2 RT	Ethical issues addressed	Main Themes 1.Impacts everyday life -want to maintain control -lack of control (pt.'s with severe side effects experienced low levels of control)  2.Inexperienced patient -lacking knowledge of coping with disease at home. Felt guilt -hiding real needs caused by lack of continuity	Results not generalizable beyond these groups  Social desirability bias	Strong

					<p>3.Wish to be taken by the hand</p> <p>-impt. Of time and continuity of care</p> <p>-provide pt. specific info</p> <p>-current info on SE and coping may be insuff.</p> <p>-nurses are often too busy and pt's seek info elsewhere</p>		
Skalla et al. (2004)	Descriptive Explanatory, focus groups facilitated by APN's in Hematology/Oncology Audiotapes used	Not reported	Medical Center in New England N= 51 patients ; n=14 spouses of patients who either currently were undergoing or recently	Ethical issues not fully discussed . ?Consent ?Confident.	Information themes: 1.Information Needs 2.Being prepared 3.Sources of info received 4.Obstacles	Results not generalizable beyond these groups  Limited time for focus grps. impacted how	Moderate

A CHEMOTHERAPY EDUCATION RESOURCE MANUAL

	<p>Qual. analysis software program used</p> <p>Objective: To obtain information about the preferences of pt's with cancer; need for information about SE's of cancer treatment to design an interactive multimedia educational program.</p>		<p>completed chemo or radiation therapy</p> <p>Random sampling used</p> <p>Spouses and caregivers encouraged to attend</p> <p>Divided into groups based on treatment (chemo, RT, combo)</p> <p>Average age = 59</p> <p>Nearly even amt. of men vs. women, all Caucasian, largely protestant and married and 26% had at least high school ed.</p>		<p>-pt's wanted to know about SE, how to cope, effects on everyday life, individ. easy to understand info</p> <p>-wanted to know what to expect from treatment ahead of time, sense of control</p> <p>-written materials and healthcare providers sources of info</p> <p>-barriers to info were access to providers, provider lack</p>	<p>many questions could be asked</p> <p>Social desirability bias</p> <p>Some participants may have expected an educational/support group</p> <p>All participants Caucasian</p>	
--	---	--	--	--	--	--	--

					<p>of knowledge, info overload and retention probs.</p> <p>-traditional approached to ed. not sufficient</p> <p>-use testimonials of other pt's in ed.</p> <p>-interactive multimedia can be effective for teaching</p>		
Tamburini et al. (2003)	<p>Mixed methods</p> <p>Quant: Needs Evaluation Questionnaire (NEQ).</p> <p>Qual: Semi-structured interviews</p>	Not reported	<p>Istituto Nazionale Tumori (INT) of Milan</p> <p>Of the 224 eligible patients, 182 (81%) completed the questionnaire.</p>	Ethical issues addressed	<p>4/5 top needs concerning diagnosis (40%), about future conditions (61%), regarding a better dialogue with</p>	Sample small for quantitative study	Moderate

	<p>Objective:</p> <p>1. Evaluate the needs of cancer patients</p> <p>2. Improve our understanding of the meanings, implications of the needs directly described from the point of view of the patients.</p>				<p>clinicians (45%), and about economic-insurance information (40%), while only one regarded the need for better services at the hospital (bathrooms, meals, cleaning) (59%)</p> <p>Qualitative analysis showed that the most expressed need (to receive more information on their future conditions) has the meaning to</p>		
--	---	--	--	--	--	--	--

					<p>know how their future life will be affected more than to know his/her actual prognosis.</p> <p>Stronger physician /pt. relationships</p>		
Van Der Molen (2000)	<p>Phenomenology</p> <p>Semi structured interviews</p> <p>Tape recorded and transcribed verbatim</p> <p>Objective: To identify the information needs of people with cancer that emerged out of there cancer experience.</p>	Not reported	<p>Cancer Resource Center in the UK</p> <p>N=6</p> <p>(3 female , 3 male)</p> <p>Age (45-65)</p> <p>Completed primary treatment for breasr, brain prostate, colon and bladder CA</p>	Ethical issues addressed	<p>Themes:</p> <p>1.Self-identity</p> <p>2.Social support</p> <p>3.Processing information</p> <p>-the provision of information to patients can be an effective coping mechanism.</p> <p>-want for medical information</p>	<p>-potential for social desirability bias</p> <p>-potential of selection bias</p> <p>-possible misinterpretation of pt's interviews</p> <p>-possible confounding variables</p>	Moderate-Strong

					<p>but difficulties retaining info</p> <p>-information needs change overtime.</p> <p>-written information must be supported by verbal explanation.</p> <p>-information must be reinforced.</p>		
--	--	--	--	--	--	--	--



