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Clearing the Pathway to Chemotherapy Certification for Inpatient Nurses

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Nursing 653-01, Internship: Clinical Nurse Leader

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Clearing the Pathway to Chemotherapy Certification for Inpatient Nurses

One of the outcomes of conducting a microsystem assessment in an inpatient medical-oncology unit was that there are a decreasing number of nurses that are available to administer chemotherapy, and to manage patients that are undergoing chemotherapy treatments. The patient population that is affected in this case is made up of the oncology patients on this unit who have recently, or who are currently receiving chemotherapy to treat their cancer. A dearth of experienced oncology nurses to care for these patients can adversely affect quality of care. Conversations with the charge nurses on the unit, manager, and oncology nurses on the unit revealed that some of nurses felt that maintaining the required Oncology Nursing Society (ONS) Chemotherapy and Biotherapy certification cards, and administering chemotherapy was too challenging and too stressful. Some of the nurses on the unit had let their certification cards lapse and did not go on for the practicum training in order to be able to administer chemotherapy.

To learn more about how the nurses perceived their own competencies related to the care of those receiving chemotherapy or post-chemotherapy, and about any barriers to achieving the certification required to administer chemotherapy, a Likert survey was given to the nurses on the unit. The surveys revealed that nurses felt fearful of exposure to hazardous medications – especially reproductive toxicity, that chemotherapy assignments were too stressful, and that there was minimal chemotherapy competency amongst leadership. Further, all of the nurses expressed the need for oncology education.

It is the purpose of this clinical nurse leader (CNL) project to address these concerns and competency needs through an education program. The education will cover safe handling and proper personal protective equipment (PPE) to minimize risk of exposure, resilience exercise to mitigate the stress of caring or oncology patients, and pathways to certification. The global aim

of this project is to increase the number of nurses that can administer chemotherapy on the unit through eliminating barriers to becoming certified. It is expected that by providing this education and eliminating the barriers, nurses on this unit will be more willing to become certified and trained to administer chemotherapy.

Clinical Leadership Theme

There were several themes that emerged from the microsystem assessment that was conducted in the medical-surgical oncology inpatient unit. Themes are selected using the 5 Ps of, purpose, patients, professionals, processes, and patterns, and consideration of baseline data and the overall strategic goals of the organization (Nelson, Batalden, & Godfrey, 2007). The CNL met with stakeholders involved in these processes to establish a team to implement the project, garner support for improvement, and to decide on a theme for a process improvement. The team consisted of the nurses on the unit, oncology nurses, unit manager, unit charge nurses, oncology program director, director of pharmacy, senior director of nursing practice and education, director of medical-surgical education and staff development, assistant chief nursing officer, the chief nursing officer, and the CNL. See Appendix A for Stakeholder Analysis.

After analyzing the 5 Ps, observations made, baseline unit data, the culture on the unit, and feedback from the staff nurses, the team decided to start with the broad theme of professional development. The team selected this theme because the most pressing concern on the unit was the decreasing number of nurses willing and competent to administer chemotherapy. The goals were to enhance the quality of care for patients with cancer by making improvements in oncology nursing competencies, educational support for professional practice, and staff development. By working on this process, we expect an increase in efficiency and productivity of chemotherapy admissions, more flexibility in staffing assignments, increased nurse perception

of chemotherapy competency, and increased recruitment of inpatient oncology nurses. It is important to work on this now as the team identified the need to improve (1) nursing competency in the care the of those with cancer, (2) the number of available nurses that are qualified to administer chemotherapy, (3) productivity (4) retention and recruitment of oncology nurses.

The leadership theme that is most relevant for this project is the CNL as an educator and team leader. As a team leader, the CNL will collaborate and communicate with the strategic team in order to improve the efficiency, safety, and quality of this project. As an educator, the CNL will use evidenced-based education and teaching principles to facilitate learning. The essential elements of CNL practice on which this project is based are, *Essential 2: Organizational and Systems Leadership*, *Essential 3: Quality Improvement and Safety*, and *Essential 9: Master's- Level Nursing Practice* (American Association of Colleges of Nursing (AACN), 2013).

Statement of the Problem

Competent oncology nurses are needed to care for the complex needs of those with cancer. According to the United States Department of Health and Human Resources (HHS), cancer is the most common disease in the United States and approximately 1.6 million new cases will be diagnosed this year (HHS, 2016). Cancer can be physically, emotionally, and spiritually devastating to patients and their loved ones. In a report by the Institute of Medicine (IOM) (2013), cancer is further explained as becoming more complex, as people are living longer and have co-morbidities. There have also been technological advances in the treatment of cancer (IOM, 2013). The Oncology Nursing Society (ONS) put forth a report to address the current issues that oncology nurses are facing such as, the increasing number of people living with cancer, the increased number of novice oncology nurses compared to experienced oncology

nurses in the workforce, and the vast amount of advancement in treatment, which makes maintaining competency a challenge. The problem that this CNL project is attempting to address coincides with national issues related to cancer care.

The problem identified on this unit is the decreasing number of nurses available to administer chemotherapy, resulting in overtime and inadequate staffing flexibility. The total number of certified nurses able to administer chemotherapy on the unit at the time of this project was eight of sixty nurses. Furthermore, two of the eight nurses are moving on to different areas of nursing in the near future. Another impetus for this project was the increased volume of chemotherapy given on the unit, as the result of a recent collaboration between this organization and a local academic institution. The goal of this collaboration is to expand the cancer program, and to advance the care of those with cancer in this community. As mentioned previously, the nurses' Likert survey identified barriers in knowledge, competency, and fear related to chemotherapy administration. The nurses surveyed expressed that they did not understand the pathway for chemotherapy certification, and they all expressed that oncology education would be a benefit to their practice. See Appendix B and C for examples of the Likert surveys.

Finally, in addition to this feedback, there was a recent medication incident where a nurse crushed an oral chemotherapy tablet, and administered the medication through a gastrointestinal tube, which caused an inhalation exposure to the nurse and others nearby. This demonstrated a lack of knowledge regarding safe handling of hazardous medication. Based on this incident, as well as the declining number of chemotherapy certified nurses, the cancer care collaboration with the academic institution, and feedback from the learning needs assessment, the team decided to plan an education program for the nurses on the unit.

Project Overview

This Clinical Nurse Leader (CNL) project will implement evidenced-based education for the inpatient nurses in a medical surgical oncology unit. The one-hour education course will be instructed by the CNL. The following teaching points will include:

- Evidenced-based practices on safe handling of antineoplastic drugs, and other hazardous drug (HD) administration.
- Potential routes of exposure to HDs.
- How to minimize the risk of worker exposure through proper use of PPE and closed system transfer devices.
- Evidence from research studies that concluded positive risks for reproductive and fertility abnormalities in nurses that work with HDs versus those that do not. Other research studies that demonstrated HDs in urine of oncology nurses that administer chemotherapy, and contamination of surfaces in areas where chemotherapy.
- Limitations of the studies such as same sample size, variation in nursing adherence to proper PPE, and that most studies were conducted more than 17 years ago, which is prior to closed system transfer devices.
- Instruction on how closed system transfer devices work to minimize risk.
- Practicing emotional resilience can lead to decreased stress in caring or those with cancer.
- Discussion on ONS Chemotherapy and Biotherapy certification course and the American Nurses Credentialing Center (ANCC) oncology certified nurse (OCN), the differences between these two certifications, and the pathways to becoming certified in either of

these or both. Benefits of certification will be explored, and reimbursement from the hospital as specified in the union contract will be discussed.

- Informational handouts will be provided that list the steps in becoming certified, what classes are available, and how to access them on the ONS website. A pamphlet will be provided on how, when, and what type of PPE to use when administering and handling patients' body fluids 48 hours post chemotherapy administration.

The education will be developed by the CNL, and presented via power point and demonstration in a classroom setting. The goal is to have at least 50% of nurses attend the program on either July 27 or August 1st of this year. After three months, the remaining staff on the unit will attend a second series of classes. Additionally, another aim is to have three nurses take the chemotherapy certification class, train at the outpatient infusion center, and start administering chemotherapy by the end of the year. The program will be assessed for effectiveness by a post-test to measure competency, with a pass rate goal of greater than 90%. This specific aim statement coincides with the global aim of this project because it is focused on professional development.

Rationale

The Cause and Effect Fishbone analysis revealed that the shortage of chemotherapy certified nurses resulted from a number of reasons. See Appendix E. These reasons include a high ratio of novice to experienced nurses on the day shift when most chemotherapy is given, a knowledge deficit regarding the chemotherapy certification process, a lack of education on safe handling, and nursing fears surrounding chemotherapy administration. As mentioned previously, the number of nurses that are available to administer chemotherapy on this inpatient unit is eight out of sixty nurses, which makes it challenging to staff appropriately

on days that chemotherapy is ordered. This organization participates in the National Database of Nursing Quality Indicators (NDNQI) to evaluate nursing satisfaction throughout the organization. For this microsystem, nursing satisfaction outcomes related to opportunity for professional development demonstrated a score below the magnet and national benchmark.

There were two different Likert scales given to the nurses on the unit. One was given to the nurses that were not administering chemotherapy, and one to the nurses that administer chemotherapy. See Appendix B and Appendix C. Of the nurses on the unit, 70% participated in the survey and 100% of the nurses who administer chemotherapy participated. All of the nurses felt that there needed to be more education related to oncology care in this unit, and many of the concerns related to administering chemotherapy had to do with fear of being exposed to toxic chemicals, especially during childbearing years. Some nurses said that they thought it was emotionally stressful to care for those with cancer.

The recent medication exposure error of crushing the oral chemotherapy and administering it via the gastrointestinal tube demonstrated a need for education. It is also important to mention that the patient satisfaction scores for this unit demonstrated an overall below the magnet mean score, in particular related to discharge instructions and in the area of nursing explanations of care. In analyzing and discussing this aforementioned data and the current evidence in the literature with the strategic team, it was decided that this CNL project should focus on education in safe handling of hazardous drugs and how to manage stress in caring for those with cancer. The goal of the class will be to improve competency and alleviate fears related to working with hazardous drugs. The overarching goal is to have more nurses willing to administer chemotherapy on this unit.

The costs of this CNL project will be associated with paying for the educational classes for the nurses. The unit manager has agreed to pay the nurses their regular salary for attending the class. There will be three classes to cover each shift on one day in July, and then three classes on another day in August. We are expecting approximately 35 nurses (50%), which will cost approximately \$2,450.00, at an average nursing salary of \$70.00 per hour. Other costs may include color copies of handouts, estimated at approximately \$80.00 (Staples, 2016). Total cost for the initial project would then be \$2530.00. Other costs as a result of the educational classes may include the cost of the nurses becoming certified in administering chemotherapy, and practicum training. The cost of the initial Chemotherapy and Biotherapy Class certification from Oncology Nursing Society (ONS) is \$200.00 and the practicum training in the infusion center is a one-week nurses salary, which is approximately \$2800.00. Therefore the cost for one nurse to be certified and trained in administering chemotherapy would be approximately \$3000.00. The unit manager has set a goal of a total of three additional nurses becoming certified and trained in administering chemotherapy this year, and three more nurses the following year. So first year cost of this project is projected at \$11,530. The potential costs of the second year will be \$9000.00, as this would include the ONS certification class and the practicum training costs only.

This project has the potential to decrease overtime cost on this unit. In analyzing the overtime with the manager, overtime is related to not having a nurse available on the next shift to administer chemotherapy. Therefore, the previous shift's nurse stays hours into the next shift to finish the chemotherapy, resulting in overtime. At this time the average overtime related to not having an available nurse to administer chemotherapy is approximately 12 hours per two-week pay period. This is approximately \$30,000/year in cost associated with overtime. If this project

influences nurses in their decision to administer chemotherapy by providing adequate education, and if the goal of having three nurses certified and trained this year is met, this would remove overtime hours related to inadequate staffing for chemotherapy administration. Thus, if you subtract the total cost of the project from the cost of the overtime on this unit, the unit will be saving \$18,500 per year. See Appendix D for the cost analysis projection.

There are other potential savings related to having adequate and competent staff that can provide oncology care and administer chemotherapy. For example, a patient who was admitted to this organization recently for chemotherapy related to lymphoma, brought in revenue of \$96,000. This patient will receive this treatment every 2 weeks for an approximate total of six cycles. If this patient had to go to another institution for their complete regimen, the potential loss of revenue to this organization would be \$288,000.

Although it is difficult to quantify patient satisfaction in terms of money saved, the Centers for Medicaid and Medicare (CMS) does reimburse the hospital based on outcomes. So, improved patient satisfaction scores can make a difference in savings. If more nurses are certified, patients may report improved scores on things like “nurses gave me explanations and education and answered all my questions” on the surveys. Word of mouth spreads, and if patients are satisfied, they will tell their family and friends where to go for excellence in care.

Finally, the nursing satisfaction scores on this unit demonstrated that nurses are below the magnet and national benchmarks in professional growth opportunities, and this can lead to a high nursing turnover (Mazurenko, Gupte, & Shan, 2014). Within the last two years, several nurses have moved to different areas of the organization. In a report by Nursing Solutions Inc. (2016), the average cost of turnover for a bedside nurse averages \$37,000 to \$58,400. Therefore, if this project decreases nursing turnover, there is the potential for thousands of dollars of savings.

Mazurenko, et al (2014), found that providing nurses with career and professional development programs would improve nursing retention. This is especially important on this unit, as many of the nurses currently on the floor are new to the profession and are interested in career growth.

Methodology

After conducting a microsystem assessment, collaborating with the strategic team involved with this CNL project, brainstorming for global theme ideas and settling on an aim statement, the next part of this CNL project is implementation. As explained by the Institute for Healthcare Improvement (IHI) (2017), testing the change or implementing the proposed change for testing, is part of the “Do” phase of the PDSA cycle of quality improvement process (IHI, 2017). To implement this project, the CNL will develop a power point presentation that includes a demonstration on when and how to use personal protective equipment (PPE). Through lateral integration, the CNL will communicate and collaborate with the strategic team by sharing the educational plan to garner feedback. Through the learning needs assessment and obtaining feedback from the staff nurses, the CNL was able to garner support and buy-in from the nurses in this unit. The nurses on this unit gave feedback for scheduling the classes. These will be at three different times, and on two different days, so that each shift is able to attend. The manager is supporting the class by paying the hourly wage for each nurse. The CNL is working with the Senior Director of Education to provide a free continuing education unit (CEU) for the class. The goal is to have 50% of the nurses on the unit attend the class. The metrics that will be utilized to ascertain whether the project was successful will be a post-test with a pass-rate goal of 90%. On this unit nursing satisfaction was decreased in the area of professional development, and because this project is also geared towards professional development, this can be measured as well.

Long-term measurement of this project will include a monitoring tool to evaluate whether nurses are utilizing PPE during administration of chemotherapy and hazardous drugs with a goal of 100% of PPE usage. This project is part of a larger strategic plan to increase the number and competencies of oncology nurses, and other PSDA cycles for process improvement will be conducted to work towards those goals. Therefore, other measurement will include whether or not the number of oncology nurses increases in this unit after interventions through PSDA cycles are implemented. It will be important to evaluate trends in patient satisfaction to assess whether or not improving the competencies of nurses in oncology has any effect on these metrics.

Developing relationships with the strategic stakeholders is essential to the project work of the CNL, in order to amass support and facilitation of process improvement within the microsystem (Kaack, et al., 2017). By including all of the stakeholders and members of the project team, the CNL can successfully design and implement process improvement to provide high-quality safe care (King & Gerald, 2016).

The change theory that guides this project is Kotter's eight-step change process of 1) Creating an urgency 2) Build a coalition 3) Form strategic initiatives and a vision 4) Enlist other volunteers to keep the movement going 5) Remove barriers to enable action 6) Generate and share short-term wins 7) Sustain the acceleration and 8) Institute the change (Kotter International 2016). See Appendix F for the Kotter's Eight-Change Process. By the aforementioned actions of the student CNL, this project has already created a sense of urgency, formed a coalition and strategic team with a shared vision, has removed barriers, and finally has shared short-term wins. The unit manager assisted with removing financial barriers by providing support for the classes through paying the nurses one-hour salary for attending the class. Also, the student presented a

proposal to the chief nursing officer (CNO), who supports the educational program and gave approval, as per the union contract, for the nurses on this unit to be reimbursed for their certification in chemotherapy, should they go on for certification. This is a short-term win that was shared with the nursing staff, helped to generate interest in the program, and keep momentum going. Celebrating milestones as you go, and communicating that to others promotes enthusiasm and honors the efforts made by those involved (Calegari et al., 2015).

Data Source/ Literature Review

The microsystem assessment was completed on an inpatient medical-surgical-oncology 39-bed unit. The macrosystem to which this unit is situated is a 341-bed community based acute care hospital in Fremont, CA. The hospital was recently re-designated by the American Nurses Credentialing Center (ANCC) as a Magnet hospital. Magnet recognizes excellence in nursing and outstanding quality of care. The microsystem assessment was conducted using the 5P's – purpose, patients, professionals, processes and patterns. Generally speaking, the purpose of this unit is to provide excellence and high-quality care to improve the lives of the patients that are admitted to this unit. This purpose is embedded throughout the culture on the unit. The average age of the patients is late 60's to early 70's and they are admitted to this unit for medical and/or oncology-related illness. There are 65 registered nurses on the unit, and the staff is diverse in age and ethnicity. The majority of the novice nurses (those with less than 1-year experience) are working on day shift and evening shift. Charge nurses mentioned that this is a challenge for the unit, as newer nurses need an increased amount of support and resources. The ratio of patient-to-nurse is 5-to-1 unless the patients are receiving chemotherapy, and then it is 3 to 1. If the patients have a particularly high acuity, then the ratio can be 4 to 1. The unit also employs certified nurse assistants (CNA) and when there are over 32 patients, they are staffed with three

CNAs on the unit. The nursing staff has 5% masters prepared nurses, and 80% of nurses hold a baccalaureate degree. The remaining nurses have an associates degree in nursing.

The processes that were assessed during this microsystem assessment focused on oncology, and included how the chemotherapy is ordered, how the nurses get notified of the chemotherapy of orders, and what the processes are by which nurses on the unit become chemotherapy certified. Finally, the patterns that emerged on this unit were excellence in teamwork and support for one another, and unit leadership that is empowering and supportive. These discoveries were also outlined in a strengths, weaknesses, opportunities, and threats analysis (SWOT). See Appendix H for SWOT analysis.

In order to research best practice as it relates to nursing competency in administering chemotherapy with safe handling practices, the following PICO search strategy was used:

- P – Problem: Inpatient medical-oncology nurses fear of exposure to chemotherapy and decreased knowledge about safe handling of hazardous drugs.
- I – Intervention: Evidenced-based education given via power point presentation in interactive setting
- C- Comparison: Not having ongoing education
- O- Outcome: Increased knowledge by inpatient medical-oncology nurses in safe handling practices to prevent risk of exposure to chemotherapy and other hazardous drugs.

Google, CINAHL, and the Gleeson Library were used as search engines with key words such as “safe handling of hazardous drugs,” “risk of exposure in administering chemotherapy,” “competency in adhering to safe practices in administering chemotherapy,” and “evidenced-based teaching strategies.” These searches provided a multitude of current evidenced-based

standards and practices on safe handling from the Centers for Disease Control and Prevention (CDC), Oncology Nursing Society (ONS), United States Pharmacopeia (USP), and National Institute of Occupational Safety and Health (NIOSH).

There is a current evidenced-based NIOSH/CDC/USP hazardous drug list that describes these medications based on their specific hazardous capability, and risk to those involved in the safe handling of these drugs. The list includes how to minimize risk. There are certain medications that were once considered hazardous, that are not any longer, and vice versa (NIOSH, 2016). There are two evidenced-based references related to standards of nursing care during the administration of chemotherapy, and after the administration of chemotherapy (Polovich, M. Olsen, M., & LeFebvre, K, 2014; Eisenberg, 2017). The first reference is a book called *Chemotherapy and Biotherapy Guidelines and Recommendations for Practice* by Polovich et al (2014), which informs the reader regarding best practice on all aspects of chemotherapy. Polovich et al (2014), discussed studies that found surfaces where chemotherapy is administered were contaminated with HDs, studies that demonstrated HDs in oncology nurses' urine, and epidemiological studies that found a 2-fold increase in the risk of fertility and reproductive abnormalities for nurses that administer HDs compared to those who do not. Also discussed was the limitations of the studies conducted, such as the small sample size, variation in nursing practice regarding PPE use, and that the studies were conducted before 2004 and before closed system transfer devices (CSTDs) were in use (Polovich et al., 2014). This reference book is given to students who are taking the chemotherapy certification courses on the ONS website.

The article by Eisenberg (2017), describes nursing implications regarding current evidenced-based changes to the USP and NIOSH list of HDs, how nurses can minimize their exposure risk, when to use PPE, and which components of PPE are to be used for specific

aspects of chemotherapy administration (Eisenberg, 2017). These articles will be utilized in the development of the power point presentation, and will provide current best practice information to the nurses.

In addition, the American Society of Clinical Oncology (ASCO) and ONS collaborated on best practices and standards related to safe chemotherapy administration. This article gives detailed information about what information organizations need to include in policies, competencies, and procedures as it relates to safe chemotherapy administration (Nuess, et al., 2016). There was an epidemiology study conducted that found that nurses who were chronically exposed to hazardous drugs (HDs) experienced more reproductive abnormalities than those who hadn't worked with HDs. The study emphasized the importance of strict adherence to safe handling practices to reduce the risk of exposure (Conner, Lawson, Polovich, & McDiarmid, 2014). This will inform this project because nurses on this unit expressed concerns regarding toxicity and the effects on reproduction. Other studies conducted by Crickman, (2017) & Levine, J. & Johnson, J. (2014), discuss implementation of an educational program using pre-and post-testing to measure competency, and developing competency programs to improve knowledge and patient outcomes. There are several ONS books on safe handling, competencies, and best practice for effective teaching strategies that were published within the last 5 years that will also be used to guide this education project.

Timeline

The timeline of this project started in May of this year and will end in December of this year. In May, the microsystem assessment was accomplished using the 5 P's of analyzing the purpose, patients, professionals, processes and patterns of this unit. In June, using Kotter's change theory as a guide, a strategic team was formed, the microsystem assessment data was

synthesized and analyzed, and a Likert survey was completed to garner input from the nursing staff. Also in June, the project was presented to the CNO and members of the strategic team. The plan for July is to complete required documents to request for a continuing education unit (CEU) for nurses who attend the class, develop the power point presentation education and post-test, and hold the class on July 27th. For August, the plan is for the second class to be held on August 1st, evaluation of the post-test data, and complete a poster presentation of the entire project. For September, the plan is to have two days of classes to ensure all the nurses on the unit have the opportunity to have education, give the presentation of the project to the nursing staff in their staff meetings and unit-based council meetings. For the remaining months of the year, the goal is for three nurses to become certified and then trained to administer chemotherapy. See Appendix I for the Gantt Chart Timeline.

Expected Results

The expected outcome of this project is for 50% of the nurses on the unit to attend and for the nurses to pass the post-test after the education at 90% or greater. It is also expected that nurses will feel more comfortable and competent in the safe handling aspects of administering chemotherapy. Therefore, they may be more willing to take the certification class by ONS, and then be trained to administer chemotherapy. As mentioned previously, the other goal of this project is to have three nurses this year, and three more next year become competent in administering chemotherapy. By providing classes, structural support, and an avenue for professional development, nurses may be more satisfied with their job. Other themes that might emerge from this project are that nurses may need ongoing education, support, and mentorship in caring for these patients in the inpatient setting. Because the nurses will be considered novice nurses in oncology, these nurses will likely need to have coaches and/or mentors for support and

guidance. If this class is successful in meeting the goals of the project, the conclusion might be to continue these education sessions periodically and/or have an oncology skills day.

Nursing Relevance

This project is relevant to nursing because other community hospitals are challenged in keeping nurses competent in administering chemotherapy, and caring for those with oncological issues. One reason is because chemotherapy has moved to the outpatient setting, making it difficult for nurses in the inpatient setting to keep their skills current. By surveying the nurses, they are able to have their voices heard and give their input. This creates a shared vision by taking what they have given as feedback, and creating opportunities to improve work-related processes, or provide educational programs to facilitate quality of care on the unit. In addition this unit's manager is supporting the time and providing the nurses salary for the one-hour class. By investing in the nurses on this unit, the nurses will be empowered and encouraged to grow professionally and this will have a positive impact on patient care outcomes. The most significant contribution this project may make is demonstrating transformational leadership through empowering nurses to engage in professional development to improve outcomes on their unit.

Summary Report and Conclusions

One of the goals of this CNL internship project was to have 50% of the nurses on this inpatient unit attend the education program, and to pass the post-test with a score of 90% or greater. Another goal was to have three nurses take the chemotherapy certification class, train at the Infusion Center, and start administering chemotherapy by the end of the year. The project was conducted in the acute care setting of a 39-bed medical-surgical oncology unit. The majority of the population of patients is aged over 65 years old.

The organization has collaborated with a local academic institution, and since then, chemotherapy administration in the inpatient setting has risen by 50%, as compared to December of 2016. This volume is expected to continue to rise. Baseline data collected through the Fishbone Cause and Effect Diagram, the SWOT analysis, and through conversations with the unit manager revealed that the number of chemotherapy certified nurses on the unit was inadequate to support chemotherapy administration without resulting in overtime. There are eight nurses on the unit who can administer chemotherapy, and this has resulted in nurses working long hours and costing the unit overtime. The eight nurses that are able to provide chemotherapy have expressed concern over not having enough staffing flexibility, and feeling isolated because they are sometimes the only nurse on the unit competent in chemotherapy. The Likert survey responses from the non-oncology nurses on the unit revealed that they are fearful of being exposed to chemotherapy, that they feel that working with the cancer population is too stressful, and that there is a lack of chemotherapy administration skills amongst management and charge nurses. All of the nurses who were surveyed felt they needed oncology education. This baseline data gave rise to developing education to address the barriers for nurses in becoming chemotherapy certified.

Plan, Do, Study, and Act (PDSA) cycles were conducted to implement the project. See Appendix J. The first PDSA cycle consisted of assessing the barriers, surveying the nurses for feedback, analyzing the data from the nurses, and the developing the evidenced-based education that addressed the barriers. The next PDSA consisted of conducting a post survey of nursing interest in chemotherapy administration after they had attended the class, assessing whether they intend to pursue chemotherapy certification, evaluating the results of the survey, displaying this data on the unit, and encouraging mentorship for novice oncology nurses from the experienced

nurses on the unit. The materials used in the educational class consisted of a PPE used for a demonstration on proper donning, handouts detailing the pathway to becoming chemotherapy certified, and a pamphlet on safe handling from ONS. See Appendices L, M and N.

The results of the educational project were positive. A total of 44 nurses attended the one-hour class. That amounted to 73%, and the original goal was 50%. All 44 of the nurses scored above 90% on the post-test, and this was our original goal. In the post survey of the class, there were four charge nurses, the unit manager, and four direct-care nurses who declared intent to become certified in chemotherapy. In addition, one direct-care nurse took the chemotherapy certification class, was trained at the infusion center, and is now competent to administer chemotherapy. See Appendix S.

Another positive outcome that is not easy to quantify is that the project sought to involve the staff by creating a shared vision. Feedback from the nurses was used to conduct research and develop the education program. The unit manager demonstrated transformational leadership in supporting the classes financially, attending the class, and asserting that he will become certified in chemotherapy administration. Although the manager and charge nurses will not be giving the chemotherapy, they can independently check off chemotherapy for medication safety with the oncology nurse at the bedside, because they have taken the class. This will improve the patient flow and timeliness of chemotherapy administration, and provide support for the oncology nurses. Some of the nurses have expressed wanting more education, and that they would like to have the oncology nurses become engaged in mentoring novice nurses on the unit.

The project progressed fairly consistently and as projected. Developing a shared vision with the team of nurses and the strategic team was imperative for adoption of the program, and for removing any barriers that could have impeded the project. Initially the project was going to

focus solely on safe handling, however, after assessing the Likert surveys and listening the nurses concerns, the team agreed that it was best to include all of the barriers brought forth in the survey. Barriers such as financial reimbursement for the classes, knowledge deficit related to becoming chemotherapy certified, and ways to mitigate stress were also included. This was the only change made during the course of the project. See Appendices K-R for examples of all the educational materials given and used for the class.

The sustainability plan for this project will include continued mentoring of the nurses that become chemotherapy certified, and presenting and updating the data on the unit's quality board, as more nurses become certified in chemotherapy. Other data that will be analyzed will include nursing satisfaction in the professional development arena, and patient satisfaction to see if there is a correlation between increasing the number of certified nurses on the unit and these values. Also, celebrating nurses that become certified by displaying their name on the quality board, and verbally acknowledging them for their hard work will aid in increasing the momentum of this project. There are several processes the team is looking to standardize as the result of outcomes of this project. In particular, all charge nurses and managers will be required to take the chemotherapy certification class from the Oncology Nursing Society, so that they will be able to support the nurses on the unit with independent double medication verification for safety. This will support the oncology nurses on the unit, and improve the flow of patient care. Other process improvements will center around providing regular ongoing education sessions that relate to caring for those with cancer, improving our policies and procedures to reflect current best practices on safe handling, creating a chemotherapy administration checklist, and putting together an annual oncology skills day. Finally, there are nurse champions on the unit that are mentoring newer nurses and providing support for professional development. To further

maintain momentum, the CNL will continue to make rounds in this unit, and be a resource for ongoing improvement work.

In conclusion, this educational project yielded positive results for professional development for inpatient oncology nurses. By empowering nurses to invest in education and chemotherapy certification, the quality of care for those undergoing chemotherapy and battling cancer will improve. Also, by investing in the front-line nurses and providing them education and resource support, nurses become more engaged. Finally, this unit will save in costs related to overtime, because more nurses will be become certified and available to administer chemotherapy.

There are many people to acknowledge that were engaged and supportive of the project from the beginning. First and foremost were the inpatient nurses. Their teamwork, dedication, compassion, and level of professionalism are outstanding. It was a joy to work with them on this project. Each member of the strategic team provided valuable expertise and input throughout the project. The unit manager, who is also the CNLs preceptor provided support, resources, and guidance for this project, and for the nurses on the unit. He has exceptional transformational leadership qualities. Lastly, the professors at the University of San Francisco provided guidance, expertise, and wisdom throughout the entire CNL program, and for this project in particular.

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Appendix A

STAKEHOLDER ANALYSIS

Stakeholder Name	How much does the project <u>impact</u> them?	How much <u>influence</u> do they have over the project?	What is important to the stakeholder?	How could the stakeholder contribute to the project?	How could the stakeholder block the project	Strategy for engaging the stakeholder
Staff nurses	High	High	Structural support for resources and education for oncology nursing and chemotherapy	Participate in the teaching sessions, willingness to take chemotherapy certification class	Lack of interest and willingness to learn	Survey and interview nurses. Develop a rapport and relationships with the nursing staff.
Unit manager	High	High	Provide support for nursing staff to learn chemotherapy, optimize staffing flexibility, and improve quality of care for those with cancer.	Support the education classes, encourage staff to join classes, take the chemotherapy certification class. Provide resources as needed	Not provide support for the project and or education classes	Involve unit manager from the start to get by in and to work within the unit's budget.
Charge nurse	High	High	Have more nurses on the unit that are available to administer chemotherapy	Take the chemotherapy certification class; encourage nurses to come to class, and mentor/coach nurses.	Not be interested and willing to learn. May not think the project is worthwhile or see importance.	Involve from the beginning to get feedback and input.
Chief Nursing Officer	High	High	Optimize staffing, improve patient flow, decrease overtime, and improve quality	Give approval for project, meet with student CNL about	May not see the importance of the project	Involve CNO from the start to get approval and support. Present project.
Senior Director of Education	High	High	Would like to bring best practice and evidence into what is being taught to nursing staff	Give approval of education classes and CEUs.	May not see the importance of the education	Involve earlier on and provide teaching material for approval.
Director of Oncology Program	High	High	Would like to continue to expand oncology program and have <u>component</u> nursing staff.	Support project by giving <u>feedback</u> , resources, and guidance.	May not see the project as something that will improve patient access to high-quality care.	Involve earlier as part of strategic team for support and guidance.

Appendix B

SURVEY FOR 4W THOSE WITHOUT CHEMOTHERAPY CERTIFICATION

What certifications do you have? Specialty training? Please circle

- OCN (Oncology ANCC)
- ONS/chemotherapy/biotherapy certification
- Medical-surgical ANCC
- Other _____

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I feel competent caring for patients who have a cancer diagnosis with symptoms from that disease.					
I feel competent caring for patients who are receiving chemotherapy (already infusing or on oral chemotherapy).					
I feel competent caring for patients with prior history of chemotherapy					
I feel competent to care for patients who are experiencing side effects from chemotherapy.					
It would benefit my nursing practice to have education in caring for those with cancer.					
I am interested in becoming chemotherapy certified					
Do you know the pathway in becoming chemotherapy/biotherapy certified					
If you are not interested in chemotherapy certification and or oncology, can you give feedback about that? Or any other comments – they are helpful to guide improvement process change. Thanks so much. 😊					

Appendix C

SURVEY FOR CHEMOTHERAPY CERTIFIED NURSES

What certifications do you have? Specialty training? Please circle

- OCN (Oncology ANCC)
- ONS/chemotherapy/biotherapy certification
- Medical-surgical ANCC
- Other _____

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5
I feel competent caring for patients who have a cancer diagnosis with symptoms from that disease.					
I feel competent and prepared to care for those patient with orders for chemotherapy.					
I feel competent caring for patients who have had chemotherapy in the past.					
I feel competent to care for patients who are experiencing side effects from chemotherapy.					
It would benefit my nursing practice to have education in caring for those with cancer.					
There are educational opportunities to maintain chemotherapy competency at this organization					
<p>A few questions:</p> <p>What are the barriers in giving chemotherapy?</p> <p>What about the process could be better?</p> <p>What do you enjoy about oncology nursing?</p> <p>What do you feel could enhance oncology nurse recruitment in this unit?</p>					

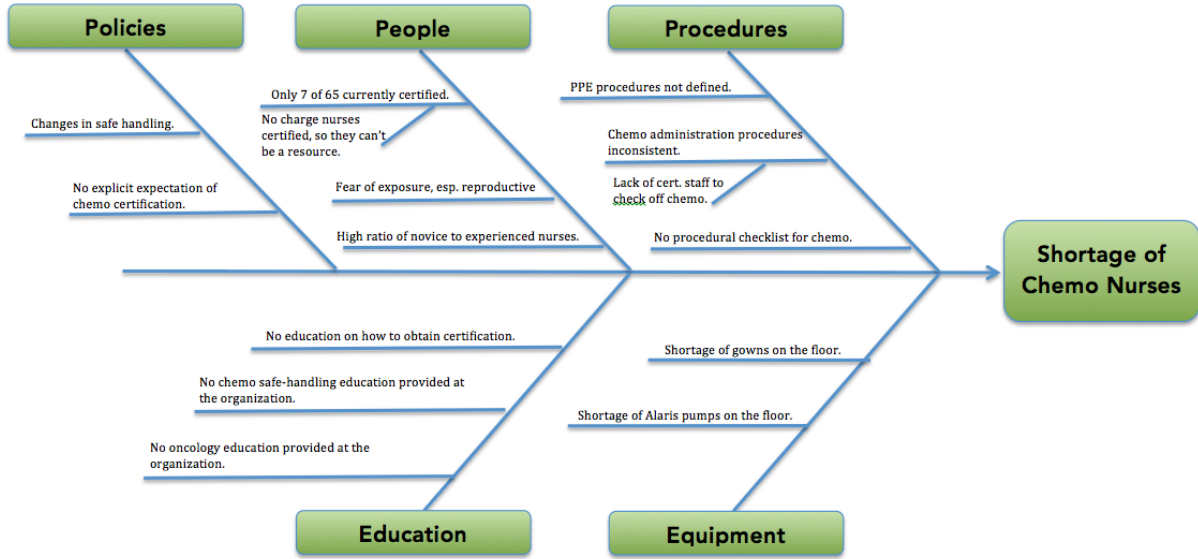
Appendix D

COST ANALYSIS

Cost Analysis

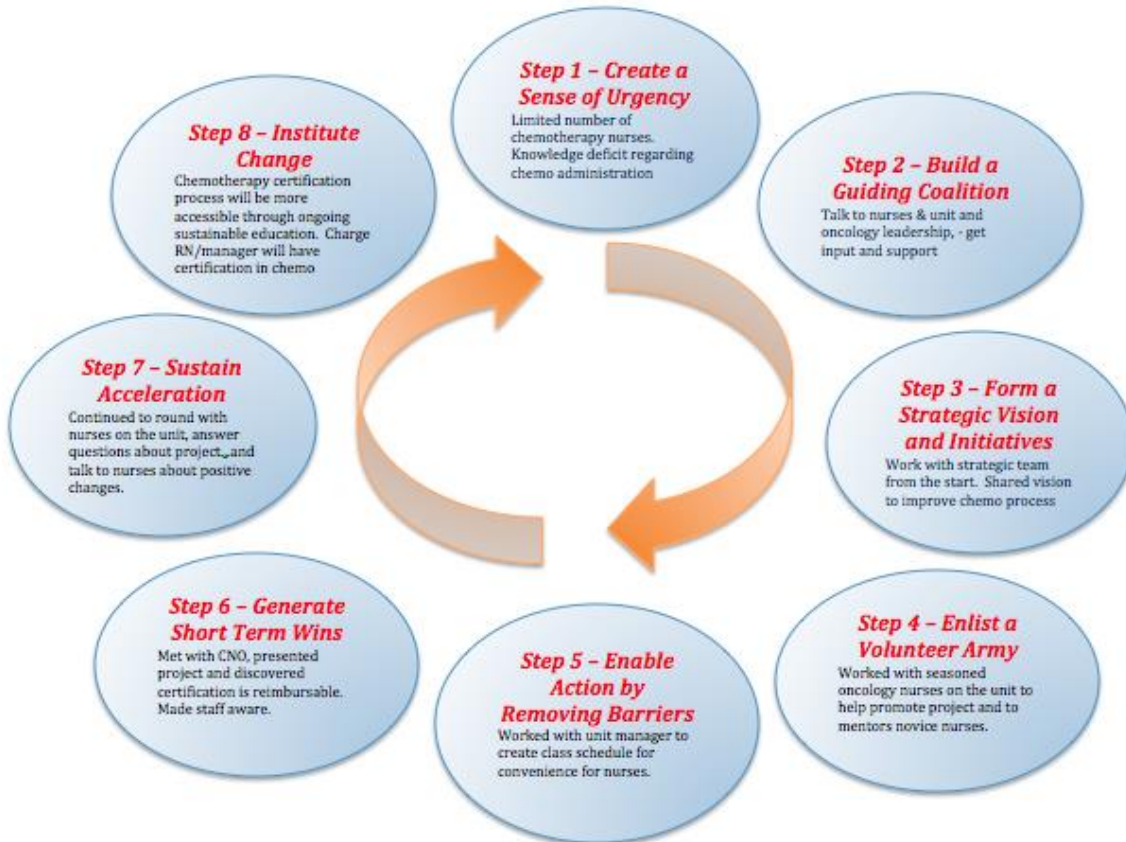
POTENTIAL SAVINGS		
	Estimated	Actual
Decreased Overtime	30,000	
COSTS		
	Estimated	Actual
Wages paid during classes	2,450.00	
Class materials	80	
Cost of certification for 3 nureses	9000	
Total Fixed Costs	11,530	
SURPLUS/(DEFICIT)		18,470

Appendix E



Appendix F

KOTTER'S EIGHT-STEP CHANGE PROCESS



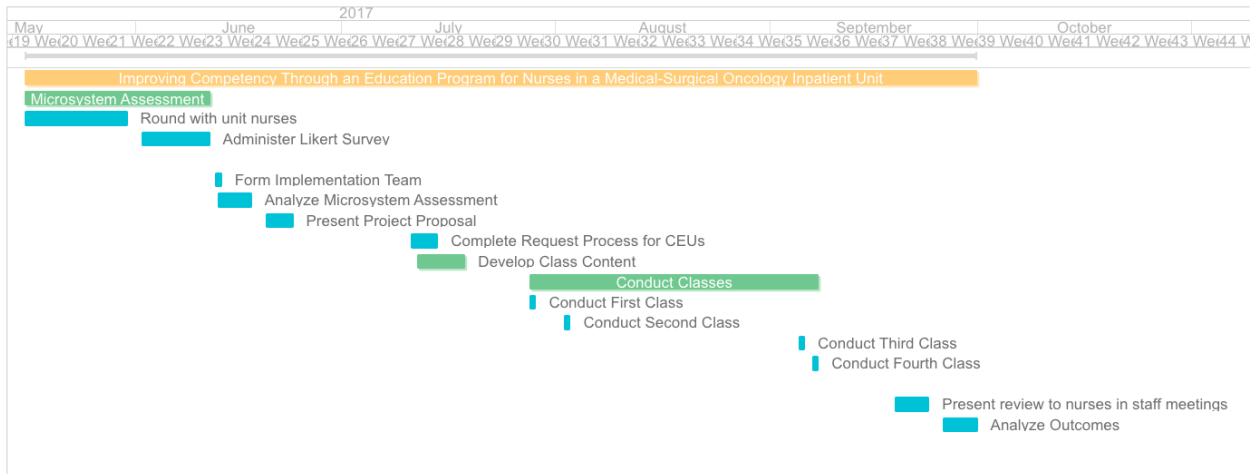
Appendix G

SWOT ANALYSIS



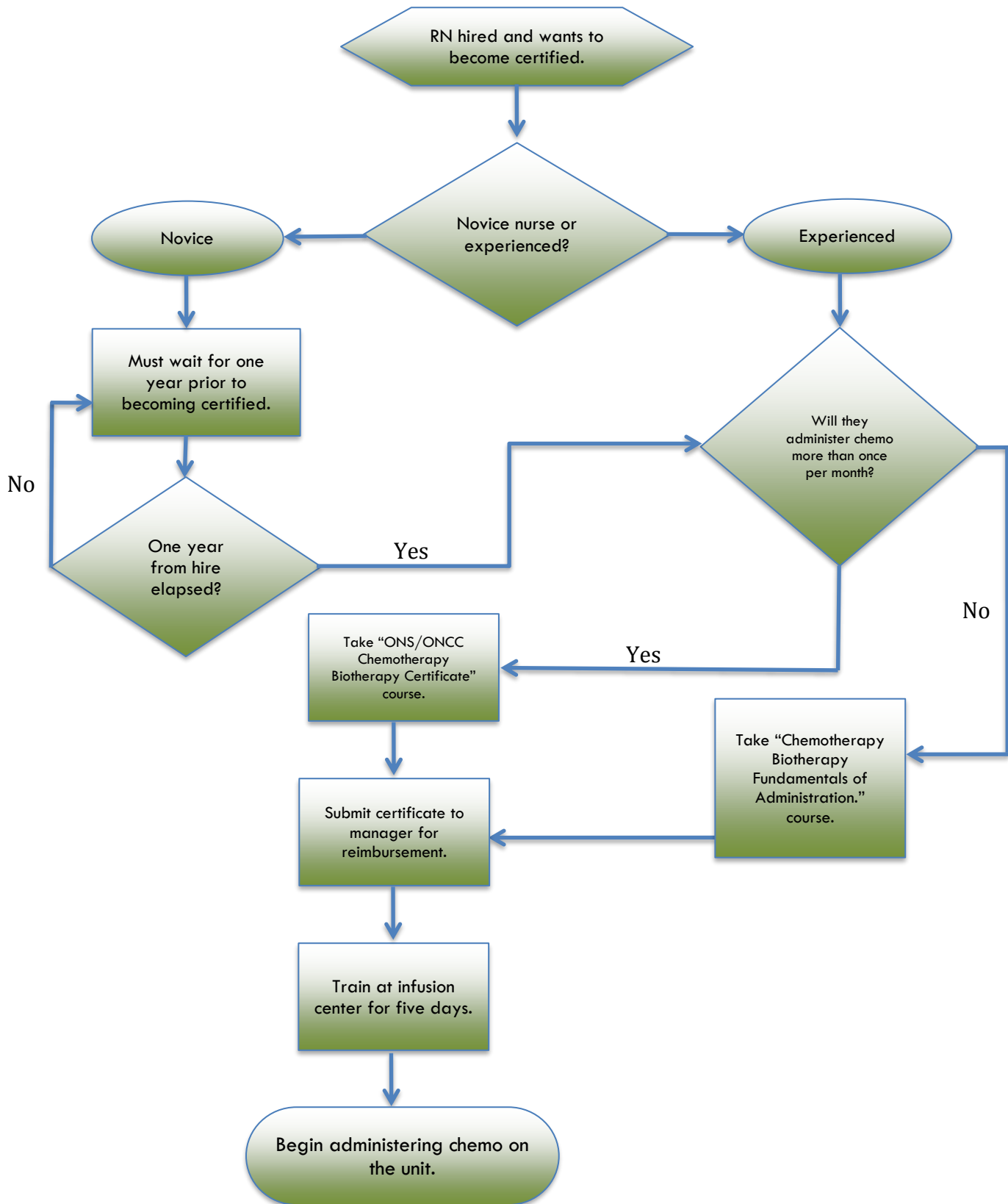
Appendix H

GANTT CHART FOR TIMELINE



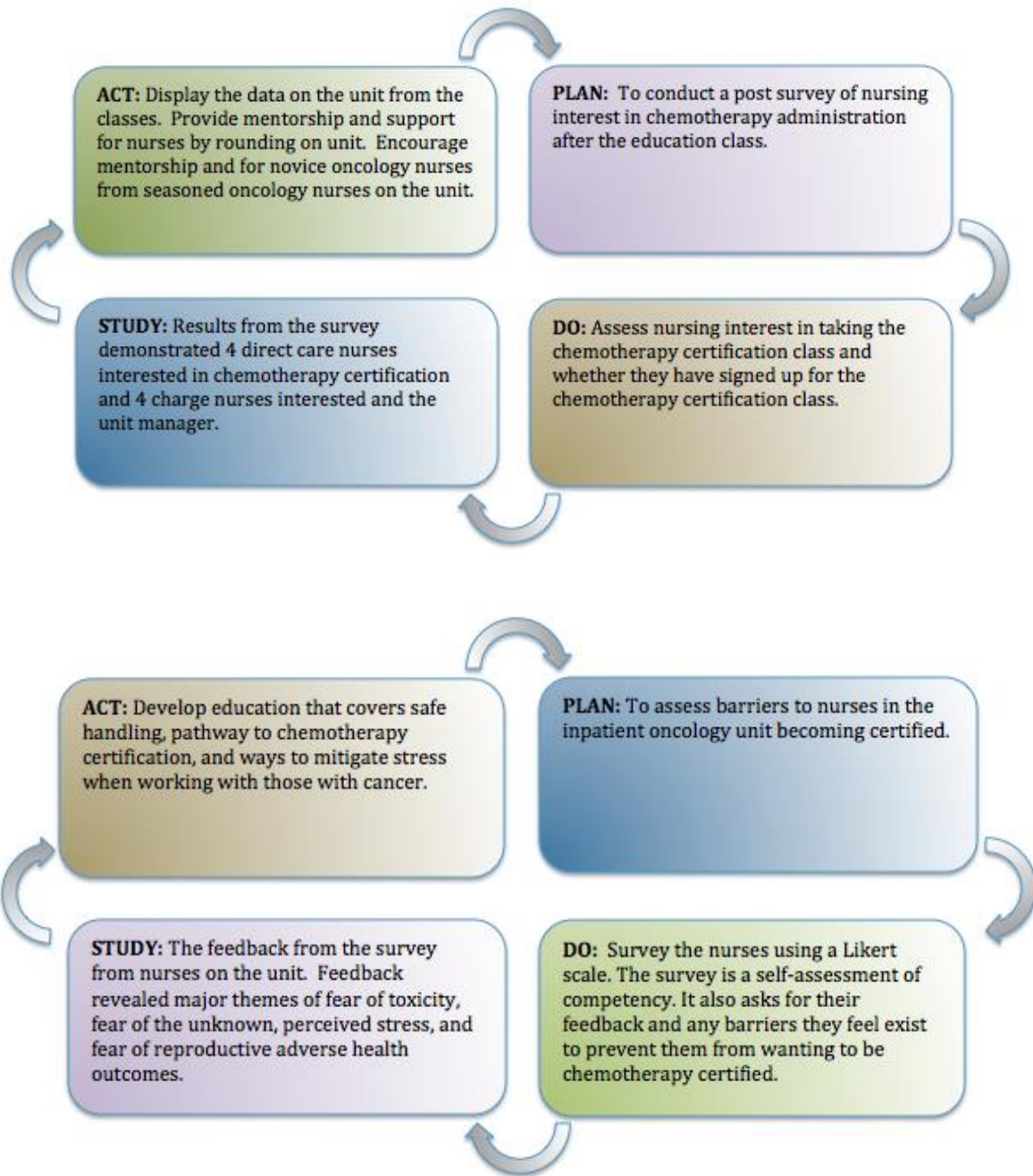
Appendix I

CHEMOTHERAPY CERTIFICATION PROCESS



Appendix J

PLAN, DO, STUDY, ACT (PDSA) CYCLES



Appendix K

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS


Personal Protective Equipment for Use With Hazardous Drugs

Two pairs of chemotherapy-tested gloves should be worn for all HD-handling activities. Change gloves every 30 minutes or immediately if damaged or knowingly contaminated. Gloves must be disposable and powder-free; made from nitrile, neoprene, or latex, and have a cuff long enough to cover the sleeves of the gown. Thickness will vary according to glove material. With chemotherapy preparation, use sterile gloves as the outer glove. *(ASHP, 2006; Connor, 1999; Gonzalo-Garjo et al., 2012; NIOSH, 2008; Wallemacq, 2006)*

Chemotherapy-tested gloves

The most recent standard for HD glove testing from the ASTM is D6978-05, which replaced the older (1999) standard of ASTM F739. The following are examples of products that meet the most recent ASTM D6978 standards. Glove testing results are available from the manufacturer and printed on the box. Gloves are tested for permeability by specific chemotherapy drugs. Ensure that the selected gloves have been tested against the types of chemotherapy used in practice. *(Polovich, Power, Massoomi, & Connor, 2015)*

The following list includes examples of gloves meeting ASTM D6978 standards, according to testing results and information from the manufacturer. The list is limited by space considerations and is not all-inclusive. Inclusion of a product or manufacturer does not imply endorsement by ONS or any other party.



Ansel, n.d.
Micro-Touch[®] Nitra-Tex[®]
Product Code:
6034010/6034014



Covidien, n.d.a
ChemoPlus[™] Latex Gloves
Product Code:
CT0191–CT0194



Kimberly-Clark Professional, 2014
Purple Nitrile[®]
Product Code:
KC500

GLOVES

Developed through a collaboration of the American Society of Clinical Oncology, American Society of Health System Pharmacists, Association of Community Cancer Centers, Association of Pediatric Hematology/Oncology Nurses, Hematology/Oncology Pharmacy Association, and the Oncology Nursing Society

Appendix L

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS

Pathway for Nurses to Advance their Practice in Caring for Oncology Patients

Certification classes offered through the Oncology Nursing Society (ONS).

These classes can be reimbursed upon proof of passing. Provide manager with chemotherapy certification (ONS Chemo-bio card), ANCC oncology certification (OCN) and/or renewal of ONS chemo-biotherapy card. These are reimbursed at \$200.00 for the initial certification and \$100.00 for the renewal.

All of the classes are **On Demand**, making sure there is ample time to finish in the comfort of your home. ☺. It is better to become an ONS member because the pricing discount on classes, free CEUs, and current best-practice information is outstanding. ONS membership is \$125.00/year or \$235.00/2 years. If you have had your license for less than five years, the membership is 95.00/year.

1. **Chemotherapy Biotherapy: Fundamentals of Administration**

- Contact hours 9.10
- Cost is \$99.00 for member, \$139.00 non-member
- ONS chemotherapy/biotherapy certificate card provided
- Great class for:
 - Nurses who are new to oncology that care for those who have had chemotherapy or
 - For nurses to prepare to administer chemotherapy and
 - For charge nurses.

Course Topics

- Types of Chemotherapy
- Types of Biotherapy and Targeted Therapy
- Drug Administration
- Safe Handling
- Complications of Chemotherapy Infusion
- Caring for Patients

Appendix M

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS**2. ONS/ONCC Chemotherapy Biotherapy Certificate Course**

- Contact hours 15
- Cost is \$199.00 for member, \$279.00 non-member
- ONS chemotherapy/biotherapy certificate card provided
- ONCC certificate of added qualification that indicates attainment of knowledge
- Online Chemotherapy and Biotherapy Book will be provided
- Great class for:
 - Nurses who will be administering chemotherapy more than once a month and have cancer basics knowledge.
 - This class is a more comprehensive chemotherapy class

The primary purpose of this certificate course is to best prepare and reinforce critical information for safe administration and use evidence to manage acute side effects and adverse events related to chemotherapy and biotherapy administration.

Course Topics

- Alkylating Agents
- Antimetabolites
- Antitumor Antibiotics
- Routes of Administration
- Dose Limiting Symptoms
- Safety Issues: Cumulative Dose
- Safety Issues: Extravasation and Vesicant Administration
- Plant Alkaloids
- Biotherapy Overview
- Occupational Exposure
- Administration of Chemotherapy and Biotherapy
- Legal and Ethical Issues Related to Cancer Treatment
- Expected Outcome

Appendix N

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS

**1. ONS/ONCC Chemotherapy Biotherapy:
Certificate Renewal Course**

- Contact hours 5.30
- Cost is \$80.00 for member, \$103.00 non-member
- Renewal of ONS chemotherapy/biotherapy certificate card provided
- Great class for:
 - Nurses who have taken the ONS/ONCC Chemotherapy Biotherapy Certificate Course already and need renewal.

Course Topics

- Breast Cancer Case Study
- Colorectal Case Study
- Lung Cancer Case Study
- Non-Hodgkin Lymphoma Case Study

Learning Objectives

- Explain what relative dose intensity is and its role in cancer treatment.
- Calculate an ANC and interpret the ANC results for next steps.
- Discuss risk factors, prevention, assessment and evidence-based interventions for common chemotherapy toxicities (ie. myelosuppression, cardiotoxicity, mucositis, peripheral neuropathy, N/V).
- Calculate routine chemotherapy dosages using appropriate dosing principles.
- List PPE required for hazardous drug administration per the guidelines.
- Breast Cancer Case Study
- Summarize important patient teaching points for their protection against exposure to hazardous drugs.
- Discuss what cumulative dose is and the nurse's role in monitoring cumulative dose

Appendix O

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS

American Nursing Credentialing Center (ANCC) Oncology Certified Nurse (OCN)**Benefits of ANCC/OCN**

- Enhances confidence in clinical abilities
- Personal satisfaction
- Professional growth
- Employers prefer to hire those with professional certifications

Eligibility Criteria for Initial Certification

- A current, active, unencumbered license as a registered nurse in the US, its territories or Canada at the time of application and examination.
- A minimum of one year (12 months) of experience as an RN within the three years (36 months) prior to application, and
- A minimum of 1,000 hours of adult oncology nursing practice within the two-and-one-half years (30 months) prior to application. Nursing practice may be in clinical practice, nursing administration, education, research or consultation. **Most nurses on 4W can qualify for this because 4W is an oncology unit. You do not have to have given chemotherapy to obtain your OCN. Chemotherapy is only one aspect of oncology nursing.**
- Completed a minimum of 10 contact hours of continuing nursing education in oncology or an academic elective in oncology nursing within the three years (36 months) prior to application. The contact hours must have been provided or formally approved by an acceptable accredited provider or approver of continuing nursing education. A maximum of five of the 10 required contact hours in oncology maybe continuing medical education (CME) in oncology.

Cost: \$286.00 -member rate. Remember you get reimbursed \$200.00.

There are many ways to study

- Form a study group
- OCN review course
- Seek mentorship
- Take sample tests at <http://www.oncc.org/resource-center/preparing-certification>

For more information go to the link below

<http://www.oncc.org/certifications/oncology-certified-nurse-ocn>

Appendix P

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS



Investing to Make a Difference

Learn how you can expand your knowledge to make a difference in the lives of your patients, progress in your career, and minimize risk.

Learning Objectives

- 1) Discover the advantages of ONS chemotherapy/biotherapy certification, and ANCC Oncology certification.
- 2) Learn about PPE & safe handling in administering hazardous drugs.
- 3) Explore ideas for self-care when working with cancer patients.

Presented by

Shari Kellen, RN, OCN, ONN, Staff Nurse IV

When & Where:

Dates: Thursday, July 27 and Tuesday, August 1

Times: 8-9am, 1:30-2:30pm, 4-5pm

Where: Infusion Center Conference Room 2500 Building Ste. 243

VOLUNTARY
1-Hour Free CE
Course Paid!

FOR 4W NURSES

Snacks & Drinks
Provided

Questions? Email shari_kellen@whhs.com
 (Provider Approved by the California Board of Registered Nurses: Provider No. CEP 3467)

Appendix Q

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS

Oncology Nursing- Making a Difference

Post-Test

1. What are some of the professional benefits of American Nursing Credentialing Center (ANCC) certification in oncology? Circle all that apply.
 - a. Greater knowledge and confidence in caring for oncology patients
 - b. Personal satisfaction
 - c. Administering chemotherapy independently
 - d. Professional growth opportunities
2. True or False: In order to test for the ANCC OCN certification, you must have been administering chemotherapy in the past 6 months?
3. What are the advantages to having a greater amount of chemotherapy/biotherapy certified nurses in the inpatient oncology unit? Circle all that apply.
 - a. Greater staffing flexibility
 - b. More competition for the nursing staff
 - c. Improved quality of care for oncology patients
 - d. Increased ability for nurses to be resource for one another
4. What are some of the ways that healthcare providers are exposed to hazardous drugs? Circle all that apply.
 - a. Completing patient assessments
 - b. Skin contact with drug residue
 - c. Inhalation through potential splashing or spills
 - d. Contaminated surfaces, including soiled linens
5. What personal protective equipment (PPE) is used in the nursing administration of chemotherapy? Circle all that apply
 - a. Chemo-tested double gloves, 2 pairs
 - b. Yellow isolation gown
 - c. Chemo-tested gown
 - d. Respirator/eye protection if inhalation or splashing potential
6. You receive an order for oral chemotherapy to be given via the patient gastrointestinal tube. What is your best course of action?
 - a. Crush the medication with all of the other patient's medication and administer via the tube.
 - b. Do nothing. Only nurses with chemotherapy experience should be handling these medications.
 - c. Call the pharmacist to have them prepare the medication in a ventilated hood in a liquid form.
7. Regarding #6, what PPE would you use to give this oral chemotherapy via the gastrointestinal tube?

8. True or False: Only chemotherapy medications are considered hazardous.
9. True or False: When handling oral chemotherapy, you should be wearing a single pair of gloves.
10. What are some of the things nurses can do to protect themselves against emotional distress of bearing witnesses to suffering? Circle all that apply.
 - a. Don't burden others by talking about how you are feeling
 - b. Develop self-awareness through reflective and mindful practices
 - c. Self-care activities such as, exercise, eating healthy, and laughter
 - d. Resilience training
11. True or False: Through the nurse-patient relationship and sharing of stress management techniques, nurses can guide their patients with nurturing of their own resilience and finding meaning in their cancer experience.

Appendix R

MATERIALS –HANDOUTS FOR THE EDUCATIONAL CLASS

Education Department Program Evaluation

Program Title: _____

Instructor: _____ Date: _____

CONTENT	Excellent	Good	Poor
Content level appropriate to call			
Content well-paced			
Provided appropriate detail			
Maintained a logical progression			

PRESENTER EFFECTIVENESS	Excellent	Good	Poor
Displayed effective delivery style			
Interacted well with participants			
Displayed knowledge of subject			

COMMENTS:

Was there anything you learned that you will put into practice on your job? Yes__ No __

Please Explain:

Was there anything you expected to learn that was not covered? Yes__ No__

Please Explain:

General Comments:

Appendix S
RESULTS FROM EDUCATION PROJECT

