

# Podium Abstracts

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## Podium abstracts are indexed by first author and page number.

Adrian, R. ....	30	Holt, C. ....	6	Olsen, J. ....	22
Allen, S. ....	23	Hooker, M.B. ....	44	Olsen, M. ....	47
Armstrong, S. ....	48	Hsu, H.-T. ....	28	O'Neill, C.M. ....	38
Barrow, C. ....	30	Inumerables, F. ....	20	Owusu-Mensah, V. ....	9
Bartholomay, M. ....	19	Kechedjian, F. ....	21	Pandey, P. ....	3
Bartley, J. ....	54	Keener, K. ....	16	Penaranda, M. ....	10
Beauchemin, M. ....	53	Kelly, K. ....	39	Perez, R. ....	28
Beers, E. ....	31	Kinsey, K. ....	44	Peterson, M.E. ....	10
Begue, A. ....	2	Kormanik, P. ....	7	Phillips, C. ....	61
Belcher, S. ....	55	Kotobalavu, C. ....	35	Pike, P. ....	39
Bell, A. ....	18	Kraska, B. ....	17	Robertson, D. ....	48
Bellury, L.M. ....	60	Laffan, A. ....	20	Rubenfeld, E. ....	40
Bloom, R. ....	31	Lamoreaux, A. ....	33	Sanders, S. ....	24
Boni, R. ....	53	Lanahan, S. ....	32	Santacruz, N. ....	49
Brens, J. ....	2	Laurans, M. ....	8	Seo, J.Y. ....	62
Brogren, J. ....	26	Leary, M. ....	2	Shah, D. ....	7
Bryte, K. ....	41	Lee, H. ....	58	Sheikh, S. ....	12
Burge, J. ....	42	Lee, L. ....	56, 57	Streeter, L. ....	42
Charles, M. ....	16	Legor, K. ....	33	Sullivan, D. ....	25
Cherwin, C. ....	54	Lehto, R.H. ....	34	Taets, G. ....	29
Chu, K. ....	6, 55	Leonard, F. ....	13	Vo, J.B. ....	12
Colabroy, D. ....	11	Li, C.-C. ....	59	Wagner, A. ....	25
Corso, M. ....	4	Lubejko, B. ....	35	Wallace, C. ....	49
Creedle, C. ....	43	Marshall, V. ....	61	Walsh, A. ....	13
Dean, S. ....	17	Mathey, K. ....	8	Wargo, K. ....	46
de Deus, M. ....	28	Mausisa, G. ....	60	Wenger, B. ....	50
DeFeo, H. ....	32	Medina, S. ....	45	Wilaon, D. ....	41
Dest, V. ....	4, 5	Miller, E. ....	36	Wilson, L. ....	14
Dolim, M. ....	18	Mitchell, J. ....	36	Wohlgezogen, K. ....	52
Donovan, H. ....	58	Mkparu, O. ....	14	Worrell, J. ....	52
Edmondson-Martin, K. ....	50	Molloy, M. ....	37	Wright, D. ....	26
Franek, O. ....	43	Mooney, K. ....	24	Wyatt, G. ....	62, 63
Froggatt, N. ....	22	Musial, A. ....	21	Youssefi, F. ....	27
Guidi, K. ....	45	Myhren-Bennett, A.R. ....	57	Zeichner, K. ....	15
Harrison, E. ....	19	Nair, K. ....	47	Zhang, Y. ....	63
Hjelm, R. ....	51	Ollom, C. ....	39	Zinck, L. ....	37

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## ADVANCED PRACTICE

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### DEFINING, TRACKING, AND UTILIZING QUALITY METRICS TO ASSESS ADVANCED PRACTICE PROVIDER CLINICAL PRACTICE IN CANCER CENTER

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The number of Advanced Practice Providers (APPs) continues to grow throughout every specialty area of oncology. These providers are providing high quality care to medically complex patients. In order to prove that high quality care is being delivered, quality outcomes need to be monitored for each and every APP that is practicing. The Joint Commission states that the organized medical staff must create a process for evaluation of a practitioners professional practice. This should be specialty-specific, evidence based and must meet the standard for ongoing professional practice evaluation with a clearly defined process that includes data collection. Our goal is to create a process inline with the joint commission regulations that fosters education, promotes a culture that encompasses high standards in practice, and ultimately improve the quality of care rendered by APPs. The APP Division has created a Partnership with the Department of Quality and Patient Safety to develop a single data repository to track outcomes of APP practice related to clinical privileging. By creating unit and practice specific quality metrics we can establish benchmarks to determine what is acceptable practice. This will allow us to easily and quickly identify outlier data which prompts peer review of the records for further evaluation. The innovation of an electronic dashboard that allows for quick and easy access to personal metrics allows the APP to quickly review their own quality metrics which in turn will lead to changes in behavior, increased knowledge and improved patient care. Framework based on six domains of health care quality defined by the Institute of Medicine. Safe: Avoiding harm to patients from the care that is intended to help them. Effective: Providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and misuse, respectively). Patient-centered: Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions. Timely:

Reducing waits and sometimes harmful delays for both those who receive and those who give care. Efficient: Avoiding waste, including waste of equipment, supplies, ideas, and energy. Equitable: Providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

### MEDICAL MARIJUANA FOR ACUTE POST-OPERATIVE PHASE OF ONCOLOGIC SPINAL SURGERY: EXAMINING THE EVIDENCE

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Pharmacological therapy is the primary pain management approach after spinal surgeries. Adequate pain control is correlated with improvement in ambulation, function, length of stay and prevents development of chronic pain. Diverse pharmacological options, such as parenteral or oral narcotic analgesics, have risks and benefits. The presentation will use a case study to review evidence supporting the use of medical marijuana to manage postoperative pain. Medical marijuana use in oncology is emerging. Reviews about efficacy in pain management are of “moderate quality”. There are studies that report improvement in pain management and patient outcomes. Two recent publications, a retrospective cross-sectional study and a systematic review with meta-analysis support the use of cannabinoids for the treatment of chronic pain. The presentation will highlight how a 68-year-old female, diagnosed with spinal anaplastic astrocytoma, with a history of multiple surgical interventions associated with complex post-operative complications and chronic pain was successfully managed with medical marijuana. She developed a recurrence three years after diagnosis requiring a laminectomy with instrumentation. The case presentation will describe the process used to facilitate continued use of medical marijuana during immediate post-operative period and the outcomes achieved. Because marijuana is classified as a schedule I drug, it is difficult to conduct rigorous nursing research studies to determine its impact on the hospitalized patient. Case study analysis can contribute to an understanding of how to leverage use of medical marijuana in subsets of hospitalized patients, propel research and inform policy decisions.

### CENTRAL VENOUS CATHETER PATIENT EDUCATION

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Central line associated blood stream infections (CLABSIs) cost billions of dollars to the United States Healthcare system and result in thousands of deaths annually. CLABSIs prolong length of stay and increase mortality. While a central venous catheter (CVC) provides IV access, proper is essential. It is vital that patients are educated on CVC use, especially at home, and the importance of appropriate care to help reduce risk of infection. In a multi-site NCI-designated cancer center spanning two states, patients are discharged home with a CVC for continued outpatient treatment. While institutional patient education materials contained instructions for patients on how to care for a CVC at home, it was found that the in-depth education provided to patients varied. Insight into the most appropriate content to teach patients was evaluated. Hematology oncology Clinical Nurse Specialists (CNSs) completed a comprehensive literature review and found no evidence supporting the safety of patients/caregivers to change their dressings at home. Five comprehensive cancer centers were consulted. Only one reported they provided in depth education to patients on home dressing changes. Internal volume of dressing changes performed at the institution found that most patients could receive dressing changes during outpatient visits at a site near home. Therefore, patient education materials were modified into an easy guide, eliminating in-depth instructions on how to perform dressing changes. Scheduled dressing changes upon discharge with the outpatient visit, local oncologist's office, or Visiting Nurse Service (VNS) were made standard across all areas. Finally, discharge supply kits were amended to comply with updated practice. Education provided to patients/caregivers upon discharge has reported to be more consistent. The amended discharge kit is predicted to reduce costs by 38%, with an estimated annual cost savings of \$33,480. The rate of CLABSIs will be evaluated six and twelve months post-implementation. Reduction of CLABSI rates is a nationwide mission. Providing up-to-date evidence-based patient education materials supports efforts to decrease these infections, improve patient safety and decrease costs. As a result of supplying patients with the appropriate

education, tools and resources for a healthcare professional to change their dressing, their risk of infection will likely decrease.

### **ROLE OF A RADIATION ONCOLOGY ADVANCED PRACTICE PROVIDER IMPROVES ACCESS TO CARE FOR COMPLICATED BONE METASTASIS PATIENTS**

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Radiation therapy (RT) is a highly effective treatment modality for palliation of pain due to bone metastases. RT can reduce opioid use, improve patients' quality of life (QOL), and decrease skeletal related events (SREs). MD Anderson Cancer Center is a large cancer center with 44,000 new patients per year with approximately 1500 patients receiving palliative bone RT annually. Historically, the interval between radiation oncology (RO) referral to treatment can range from days to weeks, leading to decreased patient satisfaction, increased hospitalizations for pain and significant out-of-pocket costs for the patients. The purpose of advanced practice provider (APP) led triage and coordination of care in Rapid Access Bone Metastases Clinic (RABC) was to improve access by decreasing time from referral to consult scheduling as well as provide rapid access to RT following the consult visit. RABC is a new twice-weekly clinic, which was started in April 2018. RABC was limited to uncomplicated cases until the implementation of the APP role. The role of the APP is to triage consults that meet criteria for RABC, discuss the case with RO physician, coordinate necessary imaging studies and multidisciplinary work-up with orthopedic surgery as indicated, obtain financial clearance, determine consult date, schedule simulation, and coordinate team care including nursing, dosimetrists and physicists. The APP triaged 133 patients between May and August 2019; 23% (30) patients were scheduled in the RABC in that interval, 10 of which had complicated bone metastases. T-test and chi-square test were used to compare pre-APP and post-APP clinic consult to radiation start times for complicated bone metastases. The implementation of an APP triage significantly decreased mean time from consult to treatment for complicated bone metastasis patients from 4.6 days

to 1.6 days (t-test;  $p=0.017$ ); and increased the percentage of patients with complicated bone metastases receiving same day treatment from 16% to 50% (t-test;  $p=0.036$ ). For palliative bone RT, an APP led care coordination decreased time from consult to treatment, and increased the number of patients receiving same day treatment. This model may also aid in improving patient-centric, multi-disciplinary care, along with potential for higher patient satisfaction and lower financial burden. Radiation treatment centers should consider incorporating APP role to improve palliative RT access for patients with bone metastases.

### **BREAST MEDICAL ONCOLOGY COMPETENCY-BASED ORIENTATIONS (CBO) FOR THE ONCOLOGY ADVANCED PRACTICE PROVIDER (APP)**

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CBO plans are a vital component in the onboarding and mentorship of new/seasoned APP hires. A CBO is an orientation program that focuses on a new APP's ability to actually perform the expectations of his/her role in a disease team/setting. In 2013, a generic APP CBO plan was developed by the Advanced Practice Nurse (APN) Council at Yale, which focused on the onboarding components and the five pillars of competency, which included professionalism, systems-based practice, patient care/procedures, medical knowledge, and practice based learning and improvement. In 2018, Smilow Cancer Hospital at Yale developed disease specific CBO plans. The purpose was to develop a tool to outline the essential competencies of a Breast Medical Oncology APP. This includes the specific skill sets, education foundation, and abilities that are required for these APPs to be successful. Breast Oncology competencies were developed and included proficiency at breast exams, understanding the pathological and molecular features, and evidence based guidelines for disease management using a multimodality approach. An essential proficiency for breast oncology includes prescribing of breast specific chemotherapy, immunotherapy, targeted therapy, endocrine therapy and supportive therapy, with a focus on clinic trial participation. Assessment and management of toxicities, patient and caregiver education and adherence related to these treatments is crucial. The APP should exhibit competency in symptom management and the ability to assess patients for acute, chronic and long-term sequelae of therapy. She/

he should be able to refer to appropriate specialties in a multidisciplinary approach including fertility/sexuality, genetics, physical rehabilitation, social work, cardiology oncology, palliative care and survivorship. The Breast Oncology CBO is utilized to evaluate baseline skill set and determines the APP's progress and helps identify areas requiring further training in a structured framework. The CBO will provide a framework for both the new hire and mentor APP to provide an onboarding experience that is specific, measurable and actionable while identifying baseline knowledge and areas of improvement. The breast oncology CBO has enhanced the disease specific orientation for the APP mentors and hires at Smilow. It provides detailed guidelines regarding competencies and expectations promoting professional growth and development that occur throughout the course of the APP's career.

### **THE ABCS OF ONCOLOGY ADVANCED PRACTICE PROVIDER (APP) EDUCATION IN URGENT CARE: WHAT EVERY ONCOLOGY APP NEEDS TO KNOW ABOUT ONCOLOGY URGENT CARE**

**Vanna Dest, MSN, APRN, BC, AOCN®, Smilow Cancer Hospital at Yale New Haven Health, New Haven, CT**

Our Oncology Extended Care Center (ECC) opened in April 2017. It is an APP driven unit with four budgeted full-time positions. The APPs have a mix of oncology and emergency medicine experience. The unit is open 16 hours per day, 7 days per week. Patients are by appointment only. Referrals to ECC are made by the disease team/care centers and/or oncology fellows. The purpose was to develop an educational program that assists in the orientation and competency of APPs working in oncology urgent care. Interventions included development of an educational curriculum for oncology urgent care, which included didactic and shadowing/orientation in the Oncology ECC. The curriculum focused on telephone triage of patients, ECC workflow, referral process to other disciplines, documentation, and billing. In addition, the assessment and management of common presenting symptoms/problems such as neutropenic fever/sepsis, fever, nausea/vomiting, diarrhea, dehydration, uncontrolled pain, dyspnea, cardiac issues, immunotherapy related toxicities, electrolyte imbalances such as hyperkalemia, hypokalemia, acute kidney injury, and oncologic emergencies such as hypercalcemia, spinal cord compression, SIADH, and tumor lysis syndrome. The didactic program was 4 hours in length and orientation to ECC for seasoned APPs is a minimum of 12 hours. The combination of

didactic content and “hands-on” approach has been shown to be beneficial and effective in the orientation/training of new skills. The didactic program covers all the key components required to care for patients seen in the Oncology Extended Care Clinic. The didactic education program will be transformed into evidence based treatment/management algorithms. Oncology specific urgent care education provides the necessary education and competencies to care for oncology patients in the urgent setting. Oncology urgent care is a value added service within our organization as it has reduced the number of hospital admissions and ED visits as well as huge patient satisfaction as reported by Press Ganey. Sixty-eight percent of patients seen in the ECC are discharged to home and there has been an approximate 13.9% reduction in ED visits.

### **ONCOLOGY APP-DRIVEN EXTENDED CARE CLINIC: WHAT'S THE URGENCY?**

**Vanna Dest, MSN, APRN, BC, AOCN®, Smilow Cancer Hospital at Yale New Haven Health, New Haven, CT**

Oncology care has shifted to a predominately ambulatory setting, which has increased the volume of urgent same day visits. This has led to high utilization of the emergency department and subsequent admissions. In 2014, we analyzed ED utilization and hospital admissions in a 5 month period of time and found that the majority of patients were seen during the daytime and estimated that 50% could have been treated in ambulatory urgent setting. An APP same-day visits pilot program showed that urgent visits can reduce ED utilization and subsequent hospital admission with reduction in health care costs, increased patient satisfaction and improved quality of life. Constraints of the program were APP staffing and operation hours. A business plan was approved for an oncology urgent care center. The purpose was the evolution of urgent oncology care to an established APP driven Oncology Extended Care Clinic (OECC). OECC opened on 4/3/2017. The clinic is open 7 days from 7AM–11PM and staffed with 4 full time APPs and the support of a supervising physician. The complement of APP experience includes oncology and emergency care. The unit capacity is 6 patients. The providers make referrals to OECC and triaged for appropriateness. Appropriate orientation and training was developed for staff. Patients are treated as priority patients, similar to ED patients, with radiology, laboratory, pharmacy, rapid response team, and specialty consult services. Over the past 28 months (4/3/2017–8/31/2019), there have been 6901 patient visits. Sixty eight (68%) percent were discharged to

home and the remaining patients were admitted. The volume has been consistent based upon the hours and days of the week. The highest referrals come from GI, Thoracic, and Hematology. The most common presenting complaints are categorized under symptom management, both disease and treatment related. Patient satisfaction has been very high as analyzed by Press Ganey. ED utilization has decreased by 13.9%. The OECC has been pivotal in the care of our patients with the opportunity to access urgent care outside of the ED, leading to reduction in hospital admissions. After 28 months of operations, we have been able to evaluate and modify operational issues and continue to develop triage guidelines and oncology urgent care treatment algorithms. Further data analysis with ED utilization, cost effectiveness, and patient satisfaction will continue.

### **COMPETENCY-BASED ORIENTATION (CBO) FOR THE ONCOLOGY ADVANCED PRACTICE PROVIDER (APP)**

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CBO plans are a vital component in the onboarding and mentorship of newly hired and seasoned APPs. A CBO program focuses on the APP's ability to actually perform the expectations of his/her role in a disease team/setting. In 2013, a generic APP CBO plan was developed by the Advanced Practice Nurse (APN) Council at Yale New Haven. In 2018, Smilow Cancer Hospital @ Yale New Haven developed disease specific CBO plans. A key purpose of the CBO initiative was to provide nursing leadership with a standardized framework to assess the essential knowledge and skills set required for APPs to be successful to attain initial competencies as well as assessing ongoing competencies. The generic APP CBO focused on generic onboarding components and five pillars of competency, which included professionalism, systems based practice, patient care/procedures, medical knowledge, and practice based learning and improvement. Oncology nursing leadership team supported the creation of disease specific CBOs by mentoring APPs in the development process. Each disease specific CBO highlights the unique components of the role. Through this process, a standardized policy was implemented to ensure a structured and equitable process to guide APPs from novice to expert. After each disease team completed their CBO, it was peer



reviewed for accuracy and completeness. As new hires start, the CBO is reviewed and implemented. The evaluation of the CBO process will assist in possible restructuring and modification of the current orientation plan. In addition, this process will help the APP manager during the APP's orientation, 6 month performance review, and ongoing annual performance reviews. The CBO will assist in providing positive APP experiences that are specific, measurable, and actionable. Disease team specific CBOs will assist new APPs, their mentors, and APP manager in adapting to new practice settings, verifying initial competencies and skills to perform their role, and shape their orientation and onboarding experience. Knowledge gaps will be identified early for modification of plan. CBOs offer numerous advantages for the APP mentors and hires. They provide clear guidelines regarding disease specific competency expectations which are ongoing and evolution of novice to APP expert. This can serve as a model for other oncology organizations and disciplines.

### **CAN SELF-REPORTED ARM-SWELLING AND LYMPHEDEMA SYMPTOMS PREDICT OBJECTIVELY MEASURABLE LYMPHEDEMA?**

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There is no established method to diagnose lymphedema in breast cancer. Patient-reported arm-swelling and lymphedema symptoms are often the indication of lymphedema in breast cancer survivors. However, objective measures of the lymph volume change (LVC) have been considered in assessing and detecting lymphedema and little is known about the relationship between self-report of arm swelling and lymphedema symptoms, and objectively measured LVC. This study aimed to find if self-reported arm swelling and lymphedema symptoms can predict objective, measurable LVC. The data collected prospectively from 140 women between December 2011 and April 2014 were analyzed. The inclusion criteria were women aged 21 years and over who were diagnosed with a first-time diagnosis of stage I-III breast cancer and were scheduled for surgical treatment. LVC  $\geq 5\%$  by perometer were compared with self-report of arm swelling and 22 lymphedema symptoms collected on Breast Cancer & Lymphedema Symptom Experience (BCLE-SEI) at pre surgery, four to

eight weeks and one-year post surgery. There were significant associations between self-reported arm swelling and the perometer measurement of LVC at four to eight weeks post-surgery ( $r=.202$ ,  $p=.017$ ) at one-year post-surgery ( $r=.422$ ,  $p=.000$ ). The mean lymphedema symptom score for LVC  $\geq 5\%$  was 16.3 (SD=11.2,  $p=.005$ ) and 10.0 (SD= 12.8,  $p=.013$ ) at four to eight and one-year post surgery, respectively. Participants who reported swelling (No vs. Yes) were five and eight times more likely to have LVC  $\geq 5\%$  at four to eight weeks (OR=5.852,  $p=.002$ , 95% CI; 1.867-18.339) and one-year (OR=8.784,  $p=.000$ , 95% CI; 3.285-23.487) post-surgery, respectively. Patients who reported having arm swelling somewhat, quite a bit or severe were 24 times and 36 times more likely to have LVC  $\geq 5\%$  at four to eight (OR=24,  $p=.006$ , 95% CI=2.544-226.453) and one-year (OR=36.174,  $p=.001$ , 95% CI=4.310-308.592) post-surgery, respectively. Participants who reported total Lymphedema symptom score  $\geq 5$  are 2.9 times more likely to have LVC  $\geq 5\%$  at one-year post-surgery (OR=2.90,  $p=.011$ , 95%CI; 1.274-6.648). Early detection is crucial for clinical management of lymphedema. Self-report of arm swelling and lymphedema symptoms is pragmatic and cost-effective, and can be used for screen tool for lymphedema.

### **PALLIATIVE CARE COMPETENCY BASED ORIENTATIONS (CBO) FOR THE PALLIATIVE ADVANCED PRACTICE PROVIDER (APP)**

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CBO plans are a vital component in the onboarding and mentorship of new/seasoned APP hires. A CBO is an orientation program that focuses on a new APP's ability to actually perform the expectations of his/her role in across multiple disease teams and setting. In 2013, a generic APP CBO plan was developed by the Advanced Practice Nurse (APN) Council at Yale, which focused on the onboarding components and the five pillars of competency, which included professionalism, systems-based practice, patient care/procedures, medical knowledge, and practice based learning and improvement. In 2018, Smilow Cancer Hospital at Yale developed disease specific CBO plans. The purpose was to develop a tool to outline the essential competencies of the Palliative Care APP. This includes the specific skill sets, education foundation, and abilities that are required for these APPs to be successful. Palliative Care competencies focus mainly on the consultant role for the

inpatient and outpatient APP providers. This APP works with patients and caregivers longitudinally or episodically, depending on the need. Communication and relationship building skills are vital for this partnership as many times conflict may be present. A proficient knowledge base is necessary for treating pain, disease/ treatment related affects, as well as end of life issues. The assessment of psychosocial support and spiritual /cultural aware is crucial. The APP plays a role in education to providers as well as patients/caregivers about symptoms/management and their disease. It is necessary for the APP to be aware of the ethical and legal issues. Of importance, the APP focuses on the need for self-care as the role can be emotionally challenging, with communication to other providers. The Palliative Care CBO is utilized to evaluate baseline skill set and determines the APP's progress and helps identify areas requiring further training in a structured framework. The CBO will provide a framework for both the new hire and APP mentor to provide an onboarding experience that is specific, measurable and actionable while identifying baseline knowledge and areas of improvement. The Palliative Care CBO has enhanced the disease specific orientation for the APP mentors and hires. It provides detailed guidelines regarding competencies and expectations promoting professional growth and development that occur throughout the course of the APP's career.

### ADVANCED PRACTICE PROVIDERS' ATTITUDES AND KNOWLEDGE REGARDING FINANCIAL TOXICITY AT AN NCI COMPREHENSIVE CANCER CENTER

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Advancements in oncology care are occurring rapidly and at a high cost. Cancer is the second most expensive disease in the United States with an estimated cost of \$124 billion in 2010 with a projected 27% rise in cost to \$157 billion by 2020. Consequences of financial toxicity (FT) to patients include: bankruptcy, poor quality of life and poor clinical outcomes. The purpose was to determine Advanced Practice Providers' (APPs') financial toxicity knowledge base. UC San Diego Oncology Service line APPs completed a nine-item QualtricsR questionnaire about cost consciousness when providing cancer care, perceptions about patient and family awareness of financial burdens (FBs), awareness of financial resources for health care and willingness to speak with patients

and families about FBs of care. 21 APPs responded to the survey (43%): 9 (43%) Medical Oncology; 4 (19%) Surgical Oncology; 2 (9%) Infusion Center; 1 (5%) Palliative Care; 3 (14%) BMT; 2 (9%) Hematology. 60%: extremely important to choose treatments (tx) that were financially responsible for patients. 5% choose tx responsible to society. 20% choose tx responsible to health system. 5% choose tx responsible to insurer. 33% somewhat aware of costs to patients for recommended tests and treatments. 33% not at all or a little aware of costs. 42% discussed FB sometimes with patients. 14% always advised patients about FB of treatment. 90% requested information about healthcare financial counseling, counseling resources, financial support resources. Results from this survey suggest that APPs are better equipped to address FT when they have access to FT resources, know how to refer patients to navigation/counseling and support programs and have strategies to discuss financial hardships with patients and families.

### DEVELOPING THE ADVANCED PRACTICE ROLE IN INFUSION TREATMENT AREA

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The purpose was to better understand the role of APP specifically in Stanford Infusion treatment area and improve APP integration, retention and satisfaction by providing role clarity. The number of APPs at Stanford health care has quadrupled over the last 10 years. The rate of APP turnover at Stanford health care is 14 percent, which is higher than the turnover in the state of California. We identified APP wellness as an area of concern through the APP shared governance Council. Based on those findings and APP wellness survey was launched in June 2017 with a response rate of 62%. This survey was modeled after the physician wellness survey to allow for comparison. The survey showed that 38% of APPs report a moderate or higher likelihood of leaving the institution within two years with key areas of opportunity being top of licensure practice and role clarity. Cancer Center has also been impacted with APP growth in which there was a lack of role clarity and expectations. In the last 5 years infusion treatment center went from one site and no APP's to 3 sites across bay area and 6 APP's. The methodology included baseline survey of the APP's and physician regarding APP utilization and role clarity. We engaged Stanford health care staff in focus groups

to discuss views regarding APP role. We also created and implemented educational sessions to educate stakeholders regarding APP national trends, leading practices and common regulatory compliance issues. Models of care workshops were developed using a multidisciplinary approach inclusive of the full team including nurse, ITA scheduler, all ITA APP's, Clinic operational managers, ITA director and physician. APP's were able to guide their practice while meeting operational needs. This has resulted in increased APP satisfaction and retention. We have increased capacity by 100% by incorporating prescheduled on-treatment visits and sick calls. We have also had increased APP participation in professional development. APP's have become an important resource for value-based care. It is imperative that we recognize them as independent providers and optimize their role leading to improvement in APP integration in patient care teams and APP retention and satisfaction.

### **NEURO-ONCOLOGY COMPETENCY-BASED ORIENTATION (CBO) FOR THE ONCOLOGY ADVANCED PRACTICE PROVIDER (APP)**

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CBO plans are a vital component in the onboarding and mentorship of newly hired APPs. A CBO is an orientation program that focuses on an APP's ability to perform the expectations of his/her role in a disease team/setting. It differs from a traditional model in which the focus is on the cognitive knowledge necessary for the role. In 2013, a generic APP CBO plan was developed by the Advanced Practice Nurse Council at Yale, which focused on the onboarding components and the five pillars of competency, which included: professionalism, systems based practice, patient care/procedures, medical knowledge, and practice based learning and improvement. In 2018, Smilow Cancer Hospital developed disease specific CBO plans to determine the essential functions of the job and what knowledge, skills, and abilities are required for APPs to be successful, assess their current skill set, and determine required skills in order to meet their new roles. Neuro-oncology competencies were developed and included assessment and management of neurological presenting symptoms and complications related to diagnosis and treatment in this specific patient population. This included chemotherapy prescribing and proficiency in treatment algorithms, radiography review, and assessment of

treatment and disease. Competencies were developed for performing procedures such as lumbar punctures, administration of intrathecal chemotherapy as well as management of neurologic complications related to diagnosis and treatment in oncology. Due to rapid decline, longitudinal follow-up with ongoing cognitive/psychosocial assessment and home care challenges/caregiver support was emphasized. As new Neuro-oncology APPs are hired, the CBO is implemented to assist in determining the APP's mastery of skill set and competencies in Neuro-oncology. Methods will assist in providing positive APP experiences that are specific, measurable, actionable, and realistic. The CBO will assist new APPs in adapting to the practice settings, verify APPs' initial competencies/skills, and possible reduction in the amount of time to bring new APPs to full productivity in their roles. APPs who have difficulty completing their initial competencies are quickly identified with the ability to remediate/restructure their clinical experiences to address those deficits or problem areas. CBOs offer numerous advantages for APP mentors and hires. They provide clear guidelines regarding competency expectations which are ongoing and can decrease the amount of time spent in orientation for more experienced/skilled APPs.

### **THE JOURNEY FROM A NOVICE ONCOLOGY NURSE PRACTITIONER TO ADVANCED ONCOLOGY CERTIFIED NURSE PRACTITIONER (AOCNP®) THROUGH A YEAR-LONG NATIONALLY ACCREDITED ONCOLOGY TRANSITION TO PRACTICE FELLOWSHIP PROGRAM**

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The objective is to describe the yearlong transition to practice fellowship. The end result being the expectation of sitting for the AOCNP® exam. As more people are being diagnosed with cancer, the demands on oncologists continue to increase. The changing health care landscape and access to care issues have created an opportunity for increased utilization of the Advanced Practice Provider (APP). The Transition to Practice Fellowship was created to provide specialty onboarding for the complex care needs of oncology patients. The care of oncology patients goes beyond introductory primary care taught in school. Over approximately 52 weeks, 2,080 hours, the novice nurse practitioner transitions to a competent



oncology provider. The purpose is to detail how the Oncology Nurse Practitioner (NP) transitions from primary nurse practitioner to advanced oncology certified nurse practitioner. The Transition to Practice Fellowship was created to provide specialty onboarding for the complex care needs of oncology patients. The fellowship covers the continuum of cancer care; prevention, early detection, active treatment, survivorship, and end-of-life care. Participants develop core knowledge that enables them to practice independently in any oncology setting with the opportunity to pursue disease-specific areas of focus. All participants rotate through three major rotations; surgical oncology, medical oncology, and hematology, with shorter rotations in survivorship, radiation oncology, oncologic emergencies, infection, pain, and palliative care. The APP fellows also complete the online ONS course *Post-Master's Foundation in Cancer Care*. This course, with their didactic and clinical work, gives them the specialized knowledge and skills of an advanced oncology certified nurse practitioner. Participants are expected to sit for the AOCNP® certification exam to prove their specialized knowledge and expertise. As oncology care is becoming more complex, increased quality at less cost can be achieved through the use of the nurse practitioner. The APP Oncology Fellowship provides specialty onboarding for the complex needs of oncology patients. At the end of this year-long fellowship, participants have developed specialized knowledge important to the advanced practice role in oncology nursing. By passing the AOCNP® exam, the nurse practitioner assures not only their employers of their oncology care skill set, but also their fellow providers, patients and families.

### **GROWTH OF A COMMUNITY HOSPITAL THORACIC PROGRAM**

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Lung cancer is the leading cause of cancer death among men and women ages 50 and above in the United States surpassing breast, colon and prostate cancer. Early detection is the key. Enrollment to the lung program has been encumbered due to various factors. This led to minimal enrollment causing providers to refer patients to larger institutions with comprehensive lung/thoracic programs. The purpose is to increase number of patients referred to RWJ

Hamilton's Thoracic Program, including lung screenings, medical oncology treatment, and thoracic/pulmonary procedures. The oversight of the lung screening program was expanded to include thoracic telemedicine, thoracic tumor board conference, and tobacco cessation services. An Oncology nurse practitioner who was experienced in lung and thoracic program coordination and was a certified tobacco treatment specialist was hired to oversee the Hamilton lung/thoracic program. Collaboration between the nurse practitioner, the community primary care physicians, and the various specialty physicians made the expansion and transition process possible. Lung screenings increased from 91 in 2015, 23 in 2016, and 66 in 2017 to 202 by 2018. The screenings initially were free in 2015, but changed over to insurance-covered in 2016. Screenings are usually covered by all insurance plans in 2018/2019. Starting in 2018, RWJ Hamilton started a Telemedicine Consultation Program, as well as referring possible lung surgery patients to the thoracic surgeon in New Brunswick. A total of 31 patients were referred/reviewed. A mutual Thoracic Tumor Board was begun between New Brunswick and Hamilton utilizing videoconferencing with participation from surgeons, oncologists, pulmonologists, radiologists, pathology, radiation oncology, nursing, and others on a weekly basis. In 2018, 101 cases were reviewed, with some of these patients moving on to the Telemedicine Consultation Program or referred directly to New Brunswick. Tobacco Cessation consultations have been steady in 2019. In 2019, the above programs have been continuing and increasing in numbers. The Telemedicine Program is an example of institutions cooperating to provide excellent care to patients who are initially seen in a community hospital setting but need the services of an academic medical center.

### **IMPROVING LUNG CANCER REFERRAL RATE: EDUCATIONAL INTERVENTION FOR PRIMARY CARE AND INTERNAL MEDICINE PROVIDERS**

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Late detection of lung cancer is largely responsible for the high rates of lung cancer death. Only 15% of lung cancers are diagnosed at a localized stage, which results in poor survival rates. Recognizing that lung cancer is a deadly disease and early detection is the key to decreasing mortality rate among high risk patients and that providers lack of knowledge of the low-dose computed tomography (LDCT)

screening guidelines is contributing to the problem was a step towards finding a resolution. The purpose is to determine if exposing the primary care and internal medicine providers to educational intervention via PowerPoint presentation to enhance primary care and internal providers' knowledge about the screening will strengthen the referral rate to (LDCT) screening program at a community hospital in four weeks. The intervention was an educational component via PowerPoint presentation about lung cancer screening guidelines, which ran about ten to fifteen minutes. The level of knowledge on the lung screening guidelines increased from pre-educational intervention to post educational intervention. Majority of the providers were able to correctly identify the high-risk patients and order the appropriate screening test. The post educational chart review also showed significant increase in referral rate among both the primary care and internal medicine providers from 8 to 18. The educational intervention created awareness of LDCT screening to the providers. Although the sample size was suboptimal and the education delivery was challenging, the study supported the idea that educational program for primary care and internal medicine providers was effective in improving lung cancer screening rate and also to be cost effective. Future studies should include larger sample size and to include at risk patients for lung cancer and all providers who provide patient care in the study community. Providers were e-mailed Survey Monkey link to complete a confidential online survey along with educational PowerPoint presentation. The survey utilized 24 questions from the National Cancer Institute (NCI) Colorectal and Lung Cancer Screening Questionnaire to assess providers' lung screening practices, knowledge of the screening guideline and their cancer screening beliefs. The second sampling involved reviewing 8 pre-intervention education charts, and reviewing 18 post-intervention education charts over the four weeks that followed the session.

### **ROADMAP TO ESTABLISHING A FIREFIGHTER CANCER PREVENTION AND WELLNESS CLINIC**

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Firefighters have chronic exposure to carcinogenic materials and chemicals. Carcinogens such as benzene and polycyclic aromatic hydrocarbons (PAHs) are present in active burning fires. This exposure over time has raised concerns about possible occupational associated cancer risks. According to a retrospective cohort study, which focused solely on firefighters in the state of Florida, increased findings for cancer included bladder, thyroid, testicular, and cervical. The Firefighter Cancer Initiative (FCI) launched in 2015, with the purpose of understanding cancer in the firefighter population. As part of ongoing research, the Cancer Prevention and Wellness Clinic was created to provide prevention, screening and early detection of cancer to active and retired firefighters. The objective was to describe one institution's roadmap to establishing a Cancer Prevention and Wellness Clinic. Steps to launch the clinic involved: (a) hiring clinic personnel, (b) collaboration with various departments such as marketing, IT, and other key stakeholders, (c) meeting with local fire departments to advertise the clinic in the community, (d) establishing clinic guidelines and intake processes, and (e) developing in-services for clinic nurses. Firefighters in the community have yearly physicals as a job requirement. If results from their yearly physical are suspicious for cancer, firefighters have no designated specialists for follow up. The purpose of this clinic is to provide an all-inclusive service to include comprehensive exams, diagnostic tests when applicable, referral to specialists and follow up as indicated all within one established comprehensive cancer center. As the clinic grows, the goal is to help further our understanding of screening practices, as well as, create a national standard of care for cancer screening among firefighters. The added benefit for the firefighter population is the availability of clinic trials offered by the center with ongoing collaboration with the FCI research team.

### **BUILDING A MODEL OF PATIENT-CENTERED CANCER CARE WITH APPS ON THE FRONTLINES**

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Historically, cancer care has focused on the medical management of cancer, sometimes to the detriment of patient goals and quality of life. Through advances in research, cancer has become a chronic disease for many, yet the current cancer care delivery system is unprepared to comprehensively address and support the cancer survivors' practical, physical, financial and emotional needs. Within the cancer space successful implementation of a comprehensive model of patient-centered cancer care is lacking due to the fact that no universal set of quality standards exists and the shift away from fee for service towards value-based models has yet to demonstrate financial sustainability. In 2017–2018, we developed and operationalized a new model of patient-centered care called CaLM (Cancer Life ReIMagined), based on the IOM's six key recommendations. The CaLM Model was launched in 2018 at the LIVESTRONG Cancer Institutes at Dell Medical School/University of Texas at Austin. We designed a “flipped” model of care, whereby a subset of team members, called the SWAT TEAM spearheads coordination and management of cancer care while the disease-specific oncology team provides initial treatment planning and episodic decision making. The SWAT Team includes advanced practice providers (APPs), a clinical social worker and a patient navigator. The SWAT team delivers real time symptom management, education, and whole-person assessment, proactively managing the day to day care of the patient, then pulling in other members of the patient support team (psychiatrists, dietitians, nurses, pain management specialists, genetic counselors, fertility specialists, pharmacists, pathologists and radiologists) or the multidisciplinary disease team as needed. Early data demonstrates that the CaLM Model reduces patient symptom burden while improving quality of life. PRO scores for our GI, GYN, and Heme patients in the last 6 months from baseline show that symptom severity has decreased from “severe” to “mild-moderate”; (MDSAI 18–13%). Additionally, physical well-being scores as assessed with the GAD-7 and PHQ have also improved (GAD-7

10–8% and PHQ 6–5%). The CaLM Model is an efficient use of resources, compared to the traditional high acuity oncologist-focused care model. While the model remains in its infancy, we are producing preliminary results supporting the concept that novel care delivery models may yield patients that are better supported and equipped to be long term cancer survivors.

## THEY WILL SURVIVE! DEVELOPMENT OF AN ADOLESCENT YOUNG ADULT SURVIVORSHIP PROGRAM

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Cancer in the adolescent or young adult (AYA) is often more aggressive and advanced at diagnosis than in children or older adults. In remission, AYA survivors face life-long risk of adverse treatment complications and disease effects. These unique physical, mental, emotional and financial challenges can profoundly affect their quality of life. Support of a multidisciplinary team of oncology professionals in the outpatient survivorship setting ensures access, education and guidance for survivor-focused care. The purpose was the development of a young adult survivorship clinic for cancer patients, ages 18–39, ready to transition from pediatric or adult medical oncology care into long-term survivorship care. The Adolescent and Young Adult (AYA) Team at Lehigh Valley Cancer Institute identified a gap in the provision of age-appropriate AYA survivorship care. There was concern that AYA survivors could be lost to follow-up. A focus group including oncology clinical nurses, nurse practitioner, nurse navigator, social worker and clinical nurse specialists met to consider whether an AYA survivorship program could be created, utilizing a CRNP-provider model, in an existing multi-disciplinary clinic (MDC) space. The group reviewed guidelines and literature regarding AYA survivorship care needs and determined that with some modifications and education, age-appropriate survivorship care could be realized. An algorithm for Young Adult Survivorship at Survivor PLACE was created. It outlined patient criteria,

initial visit process, treatment-related physical assessment, and screening recommendations based upon pediatric and adolescent/young adult guidelines. An educational offering detailing the unique needs of this population including long term effects, reproductive implications, and psychosocial needs was provided via grand rounds presentation to MD/APN providers, nurses, social workers and support staff. At the Survivor PLACE visit, the patient is seen by multiple disciplines in coordinated sequential visits including: nurse practitioner, social worker/counselor, physical therapist, dietitian and nurse navigator. The patient's needs/concerns are identified and discussed; referrals and appointments made, a survivorship care plan developed, and patient education provided. To date six young adult cancer survivors have been referred to Young Adult Survivor PLACE. AYA's pursuing survivorship care at Young Adult Survivor PLACE express satisfaction with a program tailored to their long term cancer care needs, in a familiar location. Innovation: Expansion of Young Adult Survivor PLACE to additional LVHN campuses.

### **A SYSTEMATIC REVIEW ON INTERVENTIONS FOR MANAGING A SYMPTOM CLUSTER (PAIN, FATIGUE, AND SLEEP DISTURBANCES) DURING CANCER SURVIVORSHIP**

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More than 40% of cancer survivors experience the bothersome symptom cluster of pain, fatigue, and sleep disturbances. Effective self-management interventions are needed to assist in alleviating distress from the symptom cluster and improve quality of life. The purpose of this systematic review was to examine the current state of the science of randomized control trials (RCT) of interventions aimed at self-management for the symptom cluster during cancer survivorship. A systematic review of literature was conducted using CINAHL, Google Scholar, PubMed, PsycINFO, and Web of Science for RCTs. The search terms included pain AND fatigue AND sleep disturbance AND cancer (2001 through June 12th, 2019). 1025 studies were found, but only 10 met inclusion criteria for oncology patients over the age of 18, RCTs (e.g., non-pharmacological or pharmacological intervention), and measurement of all three symptoms (pain, fatigue, and sleep disturbances). A total of 1176 cancer survivor participants were included in the 10 studies. Interventions consisted of exercise

movement (n=3), behavioral (n=3), pharmacological (n=2), and other therapies (n=2). Forty percent of interventions were effective in managing the symptom cluster while 50% were effective with 1 or 2 symptoms, and 10% did not manage any symptom. RCTs to address self-management of the symptom cluster of pain, fatigue and sleep disturbances are needed, especially related to treatment efficacy for the cluster. Only a few interventions have demonstrated preliminary effectiveness in managing the symptom cluster. However, the long-term effectiveness of these interventions is unclear, and more research is needed to develop, test, and implement effective interventions to manage the symptom cluster of pain, fatigue and sleep disturbances in cancer survivors. At the start of cancer survivorship, oncology nurses should remain attuned to symptoms and symptom cluster patterns, distress, frequency, and severity to identify opportunities for intervention development and appropriate timing to decrease symptom burden. Therefore, oncology healthcare providers can encourage prevention and self-management of symptoms to provide appropriate resources that will improve the cancer survivors' overall quality of life.

### **REVIEWING CLINICAL CARDIOVASCULAR GUIDELINES FOR ADULT CANCER SURVIVORS: IMPLICATIONS FOR ONCOLOGY NURSING PRACTICE**

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There are 15.5 million cancer survivors living in the US, which is projected to increase to >20 million by 2026. Cancer treatments, such as anthracyclines, trastuzumab, immunotherapy, and/or radiation to the chest, are associated with toxicity to the heart and vascular systems leading to premature cardiovascular disease (CVD) in survivors. Breast, lung, multiple myeloma, lymphoma, and leukemia cancer survivors are particularly at increased treatment-related CVD risk. Because cancer survivors are living longer, monitoring for late effects of treatment including premature CVD is an important component of survivorship care. Our purpose is to review current clinical guidelines addressing cardiovascular screening and management in adult cancer survivors and provide implications for advanced nursing practice. We identified five survivorship guidelines that address cardiovascular care of cancer survivors; four were cancer organizations



(American Society for Clinical Oncology [ASCO], ASCO/American Cancer Society [ACS], European Society for Medical Oncology [ESMO], National Comprehensive Cancer Network [NCCN]); one was a cardiac organization (American Heart Association [AHA]). Of the guidelines, three explicitly recommend baseline echocardiograms of left ventricular ejection fraction (AHA, ASCO, ESMO) for patients receiving anthracyclines and/or trastuzumab, and the NCCN deems low (<55%) baseline ejection fraction as a risk factor for cardiotoxicity. AHA, ASCO, and ESMO recommend regular screening while receiving cardiotoxic treatment (e.g., every 3 months), and AHA, ASCO, ESMO, NCCN recommend screening one year after completion of cancer treatment. Only ESMO recommends long-term monitoring for potential cardiac dysfunction (4 and 10-years after completion of anthracyclines treatment). The ASCO/ACS survivorship guidelines references NCCN cardiotoxicity guidelines; however, its education focus included recommendations to monitor lipid levels, provide cardiovascular monitoring, and educate patients on health lifestyle modification. There is a paucity of data to support long-term guidelines. Based on current recommendations, implications for advanced nursing practice include: 1) facilitating echocardiograms before, during, and at minimum 1-year after treatment completion for high-risk patients; and 2) providing comprehensive, tailored survivorship care to lower risk of cardiotoxicity via modifying behavioral risk factors. Current clinical guidelines describe the need for cardiovascular monitoring of cancer survivors and highlight the importance of patient education. Advanced practice nurses can facilitate implementation of clinical guidelines and provide appropriate patient education for improved cardiac health.

#### **NURSE-DRIVEN PRACTICES FOR REDUCING UNNECESSARY ONCOLOGY ADMISSIONS AND IMPROVING PATIENT CARE ACROSS THE CONTINUUM: CHANGES TO REFLECT THE CHANGING HEALTHCARE ENVIRONMENT**

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Nurse leaders at all levels of an 800-bed academic medical center recognized the need to develop a partnership between an outpatient Oncology Evaluation Center (OEC) and an Emergency Department

Observation Unit (EDOU). Oncology patients are a high-risk patient population with specialized care needs that often require immediate assessment and intervention for disease and treatment related complications. Inefficiencies in care transitions jeopardize patient safety and the delivery of timely, quality care. Lack of self-reported confidence and knowledge on oncology-specific care by ED providers also yields preventable inpatient oncology admissions from the ED. Establishing a nurse-driven partnership between OEC and EDOU stakeholders with shared-decision making is needed to improve clinical practice and care across the continuum, enhance knowledge of oncology care in an ED environment, prevent delays in care delivery, and reduce unnecessary admissions for oncology patients. Nurse leaders supported Clinical Nurse Greenbelts to use Lean Six Sigma Methodology including statistical analysis and Quality Improvement tools to improve care transitions through innovative nurse and APRN driven practices, that aim to eliminate waste and maximize care quality, workflow, and cost. A pathway was implemented for patients requiring care beyond the OEC, but not necessarily an admission, to transition from the OEC to the EDOU where they can remain in observation status for up to 48 hours. This alliance included the development of evidence-based treatment pathways and education for oncology specific issues for ED providers; implementation of standardized EMR documentation and a communication pathway between departments ensuring efficient transfer of patient information; and utilization of the oncology fellow consult service for progressive care recommendations. The impact of these efforts resulted in: an increase in OEC patients from 1.74 patients daily (August 2017) to 6.26 patients daily (September 2018); 94% patient satisfaction with OEC care, 81% of OEC patients with a disposition to home, and 87% of OEC patients requiring care in EDOU avoiding inpatient admissions. Acuity of oncology patients continues to increase and expand to ambulatory settings, emphasizing the need to prioritize interventions for effectively addressing common care complications to: maximize patient outcomes, streamline transitions in care to prevent delays, minimize costs, enhance stakeholder satisfaction, and reduce preventable hospital admissions. This RN-driven partnership offers other a translatable care model for other forward thinking ambulatory care practices and emergency departments.

#### **BEST PRACTICE FOR UTILIZING A NURSE PRACTITIONER AND PHYSICIAN ASSISTANT**



## IN AN INTERPROFESSIONAL NCI SATELLITE COMMUNITY PRACTICE

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Patient focused oncology care continues to grow in complexity and expand geographically. Interprofessional collaboration is essential to comprehensive, quality care delivery. High performing teams effect positive outcomes from both the professionals' and patients' perspectives. Reduction of errors and improved patient satisfaction are among the outcomes shown in studies. A Satellite clinic of a large NCI designated cancer center developed a strategy for improving the quality of patient care by incorporating the nurse practitioner and physician assistant into the team and developing several strategies for promoting interprofessional collaboration. Team collaboration and care coordination were important attributes identified in this process improvement project. Our Satellite physician base expanded from four full-time physicians to a practice of ten. Attendings were on site fewer days, creating gaps in continuity of care. We instituted a new advanced practice role, utilizing a nurse practitioner and physician assistant to provide a comprehensive, cohesive, safe model of patient care. The purpose of this project was to implement a new interdisciplinary model of care in our Satellite to improve quality and continuity of care, as well as patient satisfaction with team collaboration. An interprofessional team designed a process map for new treatment patients and a Priority/Pay-Off Matrix. These tools created interventions allowing us to address our purpose. We expanded the workroom space, instituted a provider communication board where Attendings listed upcoming new treatment starts. We conducted an interdisciplinary "Daily Morning Safety Huddle" in this space, to review treatment plans for accuracy and completeness, for each patient. We instituted introductions of the NP/PA by the Attending to the patient, during the planning visit. Data demonstrated an increase from 12% to 82% of chemotherapy patients being introduced to the NP/PA, from baseline to post care team model implementation. The voice of the patient was also measured. Ninety-seven percent of patients strongly agreed that the NP/PA played an important role in their care, including being informed and kept up-to-date about their treatment plans. A defined process for introducing new treatment patients to the NP/PA established trusting relationships with patients, families and team

members. Based on interactions with the NP/PA, patients reported receiving high quality continuity of care. Establishing interdisciplinary partnerships and collaboration is essential in caring for patients across the oncology continuum.

## IMPROVEMENT IN PATIENT SATISFACTION THROUGH IMPLEMENTATION OF AN ADVANCED PRACTICE PROVIDER LED CANCER SURVIVORSHIP CLINIC

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Cancer survivorship is broadly referred to as living with and beyond the diagnosis of cancer. The Institute of Medicine (IOM) published *From Cancer Patient to Cancer Survivor: Lost in Transition* in 2005 which defines the standard of care across the country for cancer survivorship. A recommendation from this document is for all cancer survivors to be presented with a survivorship care plan (SCP) that includes a summary of their treatment and the recommended follow up care including long-term effects of cancer and its treatment. This evidence-based practice (EBP) project utilized a pre-test, intervention, post-test design to evaluate patient satisfaction with information received during an advanced practice provider (APP) led survivorship clinic visit. Adult patients diagnosed with Stage I, II, or III cancer participated in an oncology nurse practitioner led survivorship clinic. Patients were asked to complete a survey tool prior to the clinic visit, and then again within thirty days after completing the clinic visit. The measurement tool was the European Organization for Research and Treatment Center (EORTC) Quality of Life information module, QLQ-INFO25. Responses to the tool were evaluated for a change in score and were measured for statistical significance with a repeat measures t-test and McNemar's test. A statistically significant score was evident in 8 of the 13 measurement scales. Challenges with the delivery of survivorship information to patients can be burdensome to oncology practices. This innovative project evaluates an alternative method for delivery of survivorship care. An APP led cancer survivorship clinic is a meaningful method of delivery of cancer survivorship care that improves patient satisfaction.

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## CLINICAL PRACTICE

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## A MULTIDISCIPLINARY EFFORT TO IMPROVE COMPLIANCE WITH RECOMMENDED

## ADMINISTRATION GUIDELINES FOR AZACITIDINE (VIDAZA®) IN A COMMUNITY HOSPITAL SETTING

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Azacitidine (Vidaza®) is used for the treatment of all subtypes of myelodysplastic syndromes (MDS), Chronic myelomonocytic leukemia (CMML) & Acute myeloid leukemia (AML). This medication has a very narrow administration timeline; for Intravenous (IV) formulations, administration must be completed within one hour of reconstitution, otherwise, the manufacturer's data shows that the medication loses its potency. During a multidisciplinary inpatient audit process, a community hospital found that its nurses were not able to consistently meet this one hour reconstitution to completion of administration goal; this had implications for the quality of care patients received, patient satisfaction and the potential cost of wasted medications. The purpose was to improve compliance of administration completion of Azacitidine within one hour from pharmacy reconstitution. Interventions: (a) A multidisciplinary team convened to review to workflow and identify potential areas for improvement. (b) Improved pharmacy labels to ensure expiration date and time were visible and legible. (c) Improved audit process to accurately capture reconstitution timeline within the pharmacy. (d) Improved premedication delivery times and utilized intravenous to oral conversion of Zofran to facilitate early administration. (e) Required pharmacy technician to deliver Azacitidine directly to primary RN. (f) Educated frontline nurses and pharmacy staff regarding changes to process and workflow. Prior to the interventions, 33% of patients reviewed were within the recommended administration guidelines; after intervention, compliance was 100%. Frontline nursing & pharmacy, have a heightened awareness of the steps and the need to administer this medication within the recommended timeline. As large health systems grow and integrate with smaller community hospitals, complex patient care problems arise and it is imperative to have a vibrant group comprised of

physicians, pharmacists, hospital executives, nursing leaders, admissions, pharmacy, and frontline representatives to address these issues. The existence of this multidisciplinary team helped to identify barriers and gaps resulting in timely, innovative and effective solutions. This has; translated to greater education among frontline nurses and impacted the quality of nursing care delivered.

## COOKING WITH CHEMOTHERAPY: RECIPES FOR KEEPING YOUR PATIENTS SAFE

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With cancer as the second leading cause of death that affects older patients more commonly and the current trend in staffing shortages, the combined result can create many challenges. In a large NCI-designated Comprehensive Cancer Center, a vast mix of experience levels comprise our outpatient infusion center staff where nurses encounter many different specialty providers and are tasked with providing treatment to many different tumor groups via a variety of modalities. If the nurse is well experienced, this may not be an atypical environment to work in. However, for a newer nurse to work with this population and these providers, all the various treatment regimens can be overwhelming. In order to treat patients safely and to improve the confidence of the nurses administering therapy in an environment where management of oncology patients is becoming more complex, chemotherapy/tumor group reference sheets have been developed by a multidisciplinary team to help organize treatment regimens by tumor groups and provide the latest symptom management. Additionally, the reference sheets will provide appropriate teaching points for the patients to follow upon discharge to optimize self-care. Reference chemotherapy sheets were developed for the 8 most common tumor groups that exist within our practice. These sheets include both common chemotherapy regimens encountered for each group and side effects that are normally attributed to those treatments. Each sheet was reviewed within each tumor group in addition to members of the pharmacy team. Once review of each tumor group reference sheet has been completed, education will be rolled out regarding the new resource. The reference sheet is not intended for use by nurses on orientation under preceptor supervision.

Instead, the intent is to provide supplemental resources to nurses who have completed orientation and are beginning to function more autonomously. While the reference sheets are completing the review process, prior to implementing and rolling out education, a survey was developed to establish baseline comfort levels of nurses in reference to managing multiple chemotherapy regimens ordered by multiple providers. The survey will be re-distributed to the same staff after the reference sheets have been fully implemented to determine whether the intervention was helpful in improving their comfort level and the impact on their nursing practice.

### **EARLY RECOGNITION OF SEPSIS IN THE OUTPATIENT CANCER CENTER INFUSION CLINIC**

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Sepsis is a life threatening response to an infection. Mortality rates are as high as 25%. Sepsis is the leading cause of death among hospitalized patients and the most expensive disease to treat. It is well documented that early recognition of sepsis saves lives. Despite various campaigns and the availability of good evidence for treatment, death rates remain high mainly due to poor identification and delayed interventions. Sepsis in cancer patients is an oncology emergency. Infectious complications in oncology patients are the most common cause of death not directly related to malignancy. Sepsis screening tools and bundles have been utilized for years, but are not commonly used in outpatient settings. Oncology nurses in the Cancer Center Infusion Clinic are in a crucial position to recognize early symptoms of sepsis in immunosuppressed cancer patients. A clear need was identified to be able to screen, identify and refer possible sepsis patients for treatment. In the last quarter of 2017, 33 Oncology patients went to our Emergency Care Center (ECC), 25 had sepsis and 7 had septic shock. A quality improvement plan was developed to include: sepsis education for RNs, an education program for chemo patients, and qSOFA sepsis screening for all cancer patients on every visit. A standard work flow was developed. A 4-month retrospective chart review identified 21 oncology patients went to the ECC, 15 had sepsis, 6 septic shock. All patients were admitted to the ECC directly from home. No patients were admitted from the MD offices or Infusion clinic. The majority (57%) were currently being treated in the Infusion Clinic. Preliminary results indicate patient

education was effective. Oncology sepsis patients decreased during the 4-month period. Also, patients went to the ECC when symptoms presented instead of the Infusion clinic. Further investigation needs to be done on sepsis screening in outpatient oncology settings. Sepsis screening can be implemented in other departments within the Cancer Center. Sepsis patient education needs to expand to Oncologist offices as well. Limitations include small sample size. Also no patients in the Infusion Clinic were directly admitted to the ECC, so it is impossible to determine the efficacy of RN education.

### **AROMATHERAPY: IMPROVING SYMPTOM MANAGEMENT WHILE RECEIVING ONCOLOGY TREATMENTS AND IMPLICATIONS FOR CLINICAL PRACTICE**

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Although the term aromatherapy is relatively new, the use of essential oils for healing and symptom management dates back to ancient Greece, China, and Egypt. Oncology patients often report symptoms of anxiety and nausea prior to or during infusion treatments. Creating a healing environment and providing patients with a sense of control is of benefit to overall care of this population. Literature supports using aromatherapy to help control symptoms and healing. No adverse effects or drug interactions were found in articles reviewed. Also, aromatherapy is widely used in modern healthcare throughout the world; however, not extensively in the United States. An evidence-based practice project was designed to explore the effects of aromatherapy packets on self-reported symptoms of anxiety and/or nausea in patients receiving infusion therapy. Three outpatient infusion centers at a comprehensive cancer center collected data over a six-month period. Patients who expressed feeling anxiety and/or nausea were asked to rate the level of intensity both before and after inhaling a reusable aromatherapy blend packet during their infusion treatment. Results demonstrated an improvement of both anxiety and nausea after using the aromatherapy packets. Patient reports of nausea were reduced by 57% between pre- and post-treatment, while patient reports of anxiety were reduced by 53%. Patients also reported that aromatherapy helped relieve their nausea as 3.1 out of 5 on 5-point scale, while patients reported that aromatherapy helped relieve their anxiety as 3.2 out of 5 on a 5-point scale. Implications for

clinical nursing practice are substantial. Since the project was completed, the electronic health record was modified to include specific nursing assessment questions for anxiety and nausea. The aromatherapy packets are ordered and stocked on each unit and offered to patients as needed. Although patients are not charged for the packets their use is indicated on the charge ticket for tracking purposes. Receiving oncology treatments can trigger many symptoms and feelings for patients, including lack of control in their care. Empowering patients to play an active role in symptom management through use of aromatherapy may actually enhance feelings of control, thereby increasing patient satisfaction.

### **A PROACTIVE NURSING CARE APPROACH TO REDUCE UNPLANNED HOSPITAL ADMISSIONS FOR PATIENTS RECEIVING CHEMORADIATION FOR GASTROINTESTINAL CANCER**

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Concurrent radiation and chemotherapy (CCRT) for gastrointestinal (GI) cancer can cause numerous, acute side effects including malnutrition and dehydration that subsequently can lead to unplanned hospital admissions. In 2017, the Seidman Cancer Center embarked on a quality initiative to reduce the admission rate of patients with GI cancer receiving CCRT from 42% to a target goal of below 27%. Baseline symptom management, preventative intravenous (IV) hydration, and nutrition counseling are evidence-based interventions that can be initiated and managed by the radiation oncology nurse. The purpose of this project was to plan, implement, and evaluate a proactive approach during radiation therapy to reduce unplanned admissions in this vulnerable population. Interventions were initiated by an interdisciplinary committee in 2018. At consultation, all patients were screened by the radiation oncology nurse using an institutional scoring tool to identify nutritional deficits. Following screening, the dietician met with all patients regardless of score. Patients were informed at consultation that they would be evaluated by the infusion center by week three of treatment for weekly IV hydration. On a weekly or biweekly basis, the radiation oncology nurse

performed focused assessments, took orthostatic vital signs, and evaluated the patient's weight, skin, and bowel function. Dieticians performed calorie counts and discussed hydration and oral nutritional needs. Patients with feeding tubes received ongoing evaluation for functionality, skin breakdown, and the need for supplemental IV hydration. Pain issues, which can interfere with patient's ability and desire to eat, were monitored closely by the nurse. Referrals to pain management were made promptly, if needed. Data were collected during radiation treatment and thirty days after. The average rate for unplanned admissions demonstrated a significant reduction from the preintervention rate of 28% to 7% postintervention. The radiation oncology nurse can make a positive impact on patients with GI cancers receiving CCRT through the process of early targeting, focused symptom management and utilizing interventions that optimize hydration and nutrition. Because radiation therapy is given on a daily basis, the radiation oncology nurse has the unique opportunity for frequent patient interactions allowing for frequent assessments and close monitoring. By adopting a proactive approach to symptom management, the radiation oncology nurse plays a pivotal role in reducing the rates of unplanned interruptions of treatment and unplanned hospital admissions.

### **FEBRILE NEUTROPENIA: A JOURNEY TO IMPROVED TIME TO TREAT**

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Febrile Neutropenia (FN) is an oncologic emergency with high morbidity and potential mortality if not treated quickly and appropriately. There was a lack of standardization for febrile neutropenia management at Wentworth-Douglass Hospital (WDH) and the Seacoast Cancer Center (SCC). The process was not optimal for timely recognition, evaluation and treatment of patients presenting with suspected febrile neutropenia as recommended by the American Society of Clinical Oncologists and the Infectious Diseases Society of America. The recommendation of administration of antibiotics within 60 minutes of recognition was not being met. In June of 2017 an RN attending the Oncology Nursing Society Congress learned about oncology centers that had improved processes through clinical pathways. This

RN strongly advocated for improvement in the time from triage to antibiotic administration by creating a nursing pathway. A multi-disciplinary team of an SCC RN and medical oncologist, infectious disease MD, the oncology pharmacist and quality staff met over 15 months to create an Adult Febrile Neutropenia policy which includes a nursing pathway and an order set. These were designed to best support the work flow of the SCC. Education of providers, nursing, and support staff took place over several weeks in October of 2018. Once implemented a smaller team consisting of nurses from the SCC has continued to work on improving the process. Further improvements have been made including creating a label to alert the lab that the absolute neutrophil count results should be prioritized over other STAT labs from the SCC. Work is ongoing to improve the coordination of care across WDH for at risk oncology patients. In the year since implementing the policy, nursing pathway and order set there has been a steady improvement in the number of patients receiving antibiotics within 60 minutes of triage. In order to deliver the highest quality care it takes a team approach and willingness to make continual improvements.

### 3 WISHES: MAKING A DIFFERENCE AT END OF LIFE

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The overall goal of 3 Wishes Project (3WP) is to improve the quality of the dying experience. Eligible patients are those who are imminently dying (patients who are on end-of-life symptom management protocol or who are being discharged on home hospice). Family members are approached and offered ways to celebrate the patient's life. The dying process in the hospital environment is often in the medical realm: titration of medications, questions of treatments to continue or discontinue, and discussions about code status. However, for patients and families this sacred time ought to be devoted to the human aspects of dying: celebrating the life of the individual, expressing love and gratitude, and engaging in the emotional processes that allow for healing in a time of grief. Two nurses will discuss the goal of compassionate care, and how meaningful deaths are being fulfilled by 3 Wishes. We will present our data on health care provider's burnout and resiliency pre and post initiation of the 3WP on the inpatient

oncology unit at a large academic medical center. Also, we will share examples of wishes granted and the process to fulfill the wishes. This project seeks to redefine the dying process by refocusing patients' and family members' attention towards honoring one's life and celebrating what remains. We will discuss successes, barriers and the effects on the healthcare team. The 3WP on the oncology ward is important as it aims to help families engage in celebration, remembrance, and healing through the fulfillment of 'wishes' that are cooperatively constructed from the unique characteristics of the patient and family. Wishes, such as performing a wedding, decorating a patient's room to humanize the environment, or creating physical mementos, help families to shift the focus away from the medical aspects and back to their emotional processing. Moreover, for many of our providers, this is a way to remain engaged and express compassion even when "there is nothing left to be done." In the spirit of compassionate care we believe that humanizing the dying process benefits all of us, leading to healing families and more caring, loving providers.

### THE POWER OF AN ORDER SET: A STANDARDIZED APPROACH TO END OF LIFE CARE

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Managing end of life care requires a finesse that oncology nurses have the unique capability to provide to those that are in the process of dying. Nurses take ownership of this process to allow for a smooth transition from this life on (ie. comfort care). A barrier was discovered to this process for nurses and providers in the inpatient oncology setting. Within Epic, a variety of comfort care order sets existed that lacked clarity and totality. As a result, providers strayed away from using the comfort care order sets putting in orders unsystematically resulting in confusion for the nurses as well as medication errors. Additionally, comfort care orders often required considerable modifications resulting in a frequent need for order clarification and revision. Ultimately, the



lack of a standardized process for placing orders on comfort care patients affected the entire care team including the patient. To address these gaps in care, a standardized comfort care order set was developed resulting in only one comfort care order set available system wide for providers to use. Removing the variety of order sets streamlined the process, allowing patients across the hospital to receive the same high level care no matter their location. Creating the standardized comfort care order set was not enough on its own. Education to providers, pharmacy, and nursing staff was required to get the word out about the new process. Support from the Supportive Oncology and Survivorship team as well as pharmacy was key for educating nurses on the order set. Although nurses do not place these orders, they are highly influential in encouraging providers to use this order set instead of placing their own ad-hoc orders. To measure the impact of this standardized order set, provider utilization of the comfort care order set for patients at the end of life was the primary measurement. A secondary measurement was to assess a decrease in comfort care medication error rates. This initiative shed light on the importance of a standardized process for caring for patients at the end of life. A clear process gives way for oncology nurses to care for these patients at their highest level of skill and knowledge.

### **CHALLENGES IN IMPLEMENTING A SCALP CRYOTHERAPY PROGRAM FOR CHEMOTHERAPY-INDUCED ALOPECIA**

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Chemotherapy-induced alopecia (CIA) is a common and distressing side effect of cancer chemotherapy and can influence a patient's decision to accept or decline treatment. CIA has been associated with lower self-esteem, poorer body image, and altered quality of life (QOL). It is one of the most traumatic side effects patients can experience, and it is a visible reminder to patients and those around them that they are undergoing cancer treatment. With the emergence of newer FDA-approved technologies and mounting evidence regarding efficacy of Scalp Cryotherapy (SC), it became imperative that SC Program be instituted in the Cancer Center. What seemingly was going to be a simple implementation of a new technology became a complex, challenging program to implement. A

multi-disciplinary group was organized with representation from the Cancer Center, the Infusion Unit, and Dermatology to oversee implementation of the new SC Program. The CIA Prevention, Education, and Treatment Team (CHIAPET) was formed with a mission "To serve the needs of our patients with cancer undergoing chemotherapy by providing convenient and equitable access to scalp cryotherapy to prevent chemotherapy induced alopecia." The CHIAPET team reviewed all available technologies and developed the general workflows. A Clinical Research Coordinator was funded to assist with implementation and data collection regarding efficacy, QOL and decision-making considerations. An equity program was developed so all patients had equal access to SC technology. The scheduling system was updated to include scheduling both patients and SC machines together, which a Patient Service Coordinator managed through use of a dedicated email box. Extensive education was provided to the physicians and nursing staff; super-users were identified. After successful implementation, there proved to be many unforeseen challenges, including but not limited to: RN resistance to SC; disruption of RN workflow; managing realistic patient expectations; increased chair time; need for dedicated, private post-SC area; managing provider requests for off-label use; modifying Oxaliplatin-based chemotherapy orders to accommodate SC; need for prioritization of machines given limited resources; and need for patient altering prior to first treatment. Although SC can be challenging to implement, the hurdles are not insurmountable. It has the potential to impact positively on a patient's cancer experience and can give the patient a sense of control during a distressful time.

### **OSTOMY 101 CLASS: MEETING THE NEEDS OF THE ONCOLOGY OSTOMY PATIENT**

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More than 700,000 Americans have had ostomy surgical diversions. Every year about 40,000 individuals receive an ostomy diversion due to an oncology diagnosis. Surgical techniques, such as laparoscopic and robotic surgery, have decreased the length of hospital stays. Therefore, the earlier discharge of the new ostomate (individual with an ostomy) has decreased the available time for ostomy education. Moreover, access to education from a Certified Wound, Ostomy and Continence Nurse (CWOCN) through a Home Health Agency or outpatient clinic is rare due to few WOCNs in the community. By establishing a monthly

Ostomy 101 Class that provides outpatient ostomy education for new ostomates in the community, class attendees gain knowledge about ostomy care, build their confidence about ostomy care and make adjustments to a “new normal” living with their ostomies and maintaining their quality of life. The two-hour Ostomy 101 Class, scheduled monthly during the past year, covers the surgical procedure, stoma site marking, post-operative ostomy care-management of common pouching issues, prevention and treatment of common skin irritation and how to obtain supplies. It also provides resources needed for ostomates to be confident about life after surgery, including tips for wardrobe, going back to work, swimming, travel, exercise, and intimacy. At an Ostomy 101 Class, attendees (n=31) completed two Likert scale surveys (0=low; 5=high), Pre- and Post-class. Attendee responses Pre-class, scoring 0: No Knowledge about ostomy care (26%), No confidence (42%), No adjustment after surgery (45%). Attendee responses Post-class, scoring 5: Knowledgeable about ostomy care (35%), Confident (36%), Able to adjust after surgery (48%). Ostomy 101 Class attendees confirmed that the Class provided valuable education to new ostomates about their ostomy care, built their confidence about functioning with their ostomies and increased their ability to adjust to their ostomies. As a method of collaborative patient education designed and presented by a Certified WOCN and an experienced ostomate, the Ostomy 101 Class is an innovative forum, providing patient education and support to new ostomates. Post class surveys from Class attendees confirmed that the Ostomy 101 Class can serve as a template for outpatient ostomy education, relaying information about ostomy care, boosting confidence about ostomy care and supporting quality of life for ostomates.

### IMPROVING ANTIBIOTIC STEWARDSHIP THROUGH NURSE-DRIVEN PENICILLIN ALLERGY TESTING

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The Center of Disease Control and Prevention estimates 10% of patients in the United States report allergy to penicillin, however <1% are truly allergic. Approximately 80% lose their sensitivity to penicillin after 10 years. Penicillin allergic patients are at higher risk for VRE, MRSA, Clostridium Difficile, and prolonged hospital stays. There is also an increase in financial toxicity when more expensive antibiotics are

utilized. Correctly identifying patients who are not truly allergic can decrease use of unnecessary antibiotics and potential resistance. At one NCI-designated Cancer Center, a Penicillin Allergy Testing program, was developed to reduce inappropriate utilization of antibiotics in the inpatient and outpatient settings. An interdisciplinary group of nursing, Infectious Disease (ID), administration, pharmacy, and clinical nurse specialists (CNS), met to establish workflows, policies, and electronic documentation. The program started in the inpatient setting but transitioned outpatient to more proactively identify patients without active infections. The program was initiated in Bone Marrow Transplant patients due to their high likelihood of needing antibiotics during their treatment course and the need for triplicate treatment if unable to receive penicillin. It was expanded to include all hematology patients. The workflow initiates with the clinic nurse screening all new patients with reported penicillin allergies for eligibility. Once verified by ID, the patient is scheduled for testing in the infusion unit where they are educated, consented and tested using a 3-step process (scratch test, intradermal injection and IV challenge dose). Since inception, 98 patients were eligible (50% outpatient; 50% inpatient) and 94% of tested patients were negative and their allergy was removed; 3% tested positive and the allergy was maintained; 3% had delayed reactions of localized rash. No cases of anaphylaxis were noted. Penicillin Allergy Screening and Testing is important to be part of the nursing assessment specially for new oncology patients. Knowing and proving that a patient is not truly allergic to penicillin can potentially impact management of infectious disease and could lead to better patient outcome.

### SURVIVORSHIP CARE MODEL FOR PATIENTS WITH METASTATIC NEUROENDOCRINE TUMORS

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Neuroendocrine tumors are rare often indolent tumors. Approximately 22% of patients present with metastatic disease at diagnosis and can live with metastatic disease for years. These patient's often don't identify as cancer survivors and don't meet the criteria for care in traditional survivorship clinics. The purpose of this project was to develop, implement and evaluate a multidisciplinary neuroendocrine wellness clinic which addresses the unique survivorship/holistic needs of patients living with metastatic neuroendocrine tumors. Patients from the Norcalcarcinets/UCSF neuroendocrine tumor support group were recruited

to participate in a focus group assessing the need for and interest in attending a neuroendocrine wellness clinic. Based on feedback, a multidisciplinary neuroendocrine wellness clinic was established. It comprised of a dietician, nurse practitioner, social worker, cancer resource specialist and exercise counsellor. Patients are seen in the consult clinic in 30 minute increments by each provider. Patients are given the opportunity to have individual follow up appointments with the different providers as needed. Upon completion of each clinic visit, patients are asked to complete a post-clinic survey to assess satisfaction and helpfulness of the experience. Patients in the support group overwhelmingly agreed with the need for holistic care. Patients identified with the term “wellness” rather than survivorship. Patients were supportive of meeting with multidisciplinary providers on one day to decrease the financial burden of transportation and time off work. A referral was developed in the electronic medical record and patients were referred to the wellness clinic from neuroendocrine oncology clinic. Over the course of 16 months, 48 patients were referred to the neuroendocrine wellness clinic and 83% of patients complied with the referral. 60% of patients completed a post-visit survey, 84% of patients said that they were extremely satisfied with the overall clinic experience, 100% of patients were very satisfied/extremely satisfied with the information received. 100% of patients said the clinic meet their expectations and 100% of patients would recommend the clinic to other patients. The multidisciplinary neuroendocrine wellness clinic achieved its goal of meeting the holistic needs of this unique patient population. The implementation of the wellness clinic demonstrated that the project was feasible and it was met with high levels of patient satisfaction.

### **INITIATING A PRIMING PRACTICE CHANGE TO REDUCE HYPERSENSITIVITY REACTION IN PATIENTS RECEIVING RITUXIMAB INFUSIONS**

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On an academic Hematology and Oncology unit, patients may be developing higher incidences of hypersensitivity reaction to Rituximab compared to

industry standards with a lack of standard operating procedures that are supported by evidence. After reviewing a ONS publication, a staff nurse addressed the lack of standards with Rituximab priming as proponent to hypersensitivity rate reactions. The purpose of this process change was to lower the incidence of hypersensitivity reaction by educating and developing a standard workflow for Rituximab priming and infusing. Prior to this project, there was no standardized workflow or guideline for nursing staff to follow. There were multiple different methods of Rituximab set ups. Team also discovered variation in practice on restarting infusion after a reaction as well as communication on subsequent cycles. Approximately over half of the patient with first time Rituximab administration experienced a reaction. Literature review was performed which supported the premise of this project. Process team members consulted with the manufacturers nurse educator to verify medication guidelines. Manufacturers administration and priming guidelines were reviewed. Government and professional practice criteria for hazardous drug administration was reviewed to ensure Rituximab priming would not pose any exposure risk for nursing staff. Standard work was created to help streamline the workflow by use of Tip Sheets. Nursing staff was educated and taught one-on-one with new Rituximab priming methods and standard work. Restarting of infusions after a reaction and communication of subsequent cycles is currently being addressed. Staff was open to standard work development and changes with Rituximab infusions. There has been less documented use of hypersensitivity rescue medications given since this implementation. Staffing ratios with first time rituximab has improved with less reactions and standard workflow. The development of standard work based on current evidence can improve the nurses' workflow, as well as decrease the use of rescue medication and improve patient experience.

### **DECREASING EMERGENCY DEPARTMENT VISITS AND INPATIENT ADMISSIONS 30 DAYS POST-CHEMOTHERAPY**

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Chemotherapy side effects experienced by cancer patients can be severe, resulting in emergency department (ED) visits and inpatient admissions. Nurses can predict these manageable side effects, and if proactively assessed and addressed can increase the

patient's quality of life and decrease healthcare costs. To decrease the number of ED visits and inpatient admissions by 30% through side-effect management 30-days post chemotherapy. This will be accomplished through the use of a screening tool and follow-up monitoring plan. There are ten diagnoses included as manageable chemotherapy side-effects by the Centers for Medicare & Medicaid Services (CMS). An assessment tool was developed utilizing unit data from the CMS dry run in 2016, multidisciplinary team feedback, and current literature. Contributing factors were defined for what may increase a patients' risk of an ED visit and/or inpatient admission. This tool was utilized by the nurse navigator upon patient referral and at the first visit to the cancer center. When a patient is identified as high-risk for experiencing one of these side effects, the patient was put on a follow-up call schedule after each chemotherapy treatment. A nurse calls these patients 5-7 days following every chemotherapy treatment and completes a comprehensive phone assessment. From this assessment a number of outcomes may be implemented. The patient may only need education on signs and symptoms to report or symptom control measures they can implement at home, such as a new home medication. Patients could require a call back in 24-48 hours for further assessment, and/or asked to come in for a physical assessment and supportive care measures within the infusion center. Of the high risk patients identified, 32.7% required an intervention resulting from the assessment call. There was a 54% decrease in ED and inpatient admissions for qualifying encounters within a 12-month period. Oncology nurses are integral to patient education, a vital component in ambulatory setting to assure adherence to the follow-up care plan. Patients require care when outside the clinic space, a nurse-driven approach to assuring safe care within the home can prevent poor outcomes. CMS intends to reduce ED visits and inpatient admissions for predictable conditions that are treatable in the ambulatory setting. The overall goal is to assess the outpatient care and inform on quality improvement efforts.

### **BEYOND THE BIRDS AND THE BEES: A STANDARDIZED PROCESS FOR FERTILITY PRESERVATION WITHIN THE HEMATOLOGY/ONCOLOGY SERVICE LINE**

**Julia Olsen, MN, RN, CNL, Froedtert & Medical College of WI, Milwaukee, WI; Nancy Froggatt, MN, RN, CNL, Froedtert & Medical College of WI, Milwaukee, WI**

A diagnosis of cancer can be devastating and overwhelming for any patient. For those of child bearing

age, learning that the cancer treatments can negatively impact their fertility can cause more stress to an already stressful situation. There are nearly 500,000 cancer survivors of reproductive age in the United States; it is important to discuss fertility preservation prior to treatment so that patients understand all options available to them. Previously, one nurse coordinator within a large academic medical center was responsible for providing fertility preservation education to all hematology/oncology patients identified by physicians as candidates. This created a heavy workload burden on a single employee and our team identified gaps in access to this information for patients. The purpose of this project is to standardize the process of providing inpatient hematology/oncology patients with the proper information regarding fertility preservation options and offering sperm cryopreservation to male patients prior to undergoing treatment. Clinical nurse leaders at a large academic medical center created a standardized method of fertility preservation education and services for inpatient hematology/oncology patients. This new method includes specific handouts/educational resources, structured consultations by designated staff members with standardized documentation, coordination with the andrology lab and courier services, and collaboration with the interdisciplinary team. All handouts and educational resources have been vetted through the health system's Reproductive Medicine Center and the hematology/oncology leadership team. The entire process has been organized into an easy-to-follow flowchart diagram so that coordinators follow the appropriate process and do not miss any pertinent steps. The goal of this project is to have a standardized method for providing fertility preservation education and services to inpatient hematology/oncology patients. Since the implementation of this new method, we have ensured that all patients receive current and accurate information, and have the necessary resources available to make an educated decision related to their future fertility needs. Providing fertility preservation information and services to hematology/oncology patients ensures that they are knowledgeable about their fertility risks associated with cancer treatment and are provided with all options available to minimize or mitigate these risks for life after cancer. Other institutions may wish to adopt this method to ensure patients receive timely and necessary fertility preservation information prior to starting treatment.

### **DON'T PUT OFF UNTIL TOMORROW WHAT YOU CAN DO TODAY: A PROCESS IMPROVE-**

## MENT PROJECT FOR EARLIER DISCHARGE TIME FOR ONCOLOGY PATIENTS

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The majority of discharges from three HemOnc units at this academic medical center occurred after 1500. The delay in discharging patients caused an overlap with peak admission times, putting undue pressure on both staff and patients due to boarding patients in outpatient spaces and Intensive Care Units. While nursing staff ratios remain steady between shifts, Provider staffing reduces in the late afternoon during this peak discharge/admission time overlap. After several safety events were attributed in part to this overlap, a multidisciplinary team of Registered Nurses, Providers, Pharmacists, Case Managers, Social Workers, and a Process Improvement Specialist assembled to identify opportunities for earlier discharges. For one month, Charge Nurses gathered information on activities that were being performed for patients on the day of discharge. This effort identified opportunities around transportation arrangements, blood product transfusions, prescription delivery, scheduling of outpatient appointments, and Attending Physician rounding. Nursing, Provider, and Pharmacy staff created lists of tasks their respective discipline performs 24- and 48-hours prior to discharge. Conflicting tasks were identified and workflows were adjusted accordingly. Laminated checklists of the improved workflows were provided to staff and poster-sized checklists were hung in shared spaces and work areas. The project team met every two weeks to monitor progress and identify barriers. In the first quarter after implementation, the distribution of discharges shifted with an increased number of discharges in every hour between 1000 and 1400, the largest increase occurring between 1200 and 1300. The improvements continued across all three units in the second quarter but the most significant improvement occurred on the transplant and cellular therapy unit. This unit achieved a nearly one hour improvement in peak discharge time and a 1.5 hour improvement in average discharge time. Lessons learned for this patient population are being applied to the other oncology populations. This process improvement project has highlighted the importance of coordinated efforts among the multidisciplinary team. Small tests of change with close monitoring and frequent adjustments throughout the project have resulted in positive changes that affect both patients and staff, and this approach easily translates into almost any

problem scenario. The successes of this project are forming the foundation for another project to reduce average inpatient length of stay.

## UTILIZATION OF EVIDENCE-BASED PRACTICE (EBP) COMPETENCIES IN THE DEVELOPMENT OF AN ONCOLOGY NURSE NAVIGATOR (ONN) ORIENTATION MODEL

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A long-established ONN program existed in a National Cancer Institute designated Comprehensive Cancer Center (NCICCC) but lacked structure and defined outcomes as a navigation program. Practice depended on the setting, local needs, and physician demands. A common set of core competencies and baseline performance was needed for all ONNs regardless of specialty. This multi-phase project was designed to evaluate the application of the 2017 ONN core competencies to build an evidence-based orientation model for novice ONNs in an NCICCC. Phase 1 involved assessing current-state role and job functions, reviewing the job description, developing competency measurement requirements, identifying learning opportunities from self-assessment, and developing ONN education. Incumbent ONNs were evaluated to ensure minimum qualifications were met. They provided input into operationalizing competencies for role delineation. Pre- and post-education self-assessments were utilized to identify learning opportunities and led to the development of learning plans and schema for an emerging ONN program. A two day multi-modal education course was developed to address competency areas collectively ranked weakly. Criteria for each competency were identified as a method of measurement. Prior to intervention, ONNs scored themselves as Level Zero or One (limited experience and knowledge) for 19 of 40 competencies. Post education, only five competencies were rated Level One or less and the number of ONNs indicating an acceptable level of proficiency for each competency increased by 50% to 100%. All of the ONNs reported appreciation of the education course along with improved confidence and knowledge. While, utilizing nursing competencies is not new practice. However, developing an orientation program framework that allows ONNs to measure improved performance of required knowledge in



their roles will have far reaching implications. Operationalizing the 2017 ONN competencies established baseline measurement requirements for ONN education. This framework will be utilized moving forward for novice ONN onboarding and professional development. The ONN core competencies guided the development of an evidence-based practice orientation framework and allowed standardization across disease specialty nursing practice. This orientation model prepares nurses with a variety of oncology experience and applies nursing competencies across the broad continuum of oncology care. This abstract will add to the literature relevant to the application of the ONS ONN competencies in development of an orientation program model.

### **COORDINATION OF CARE FOR PATIENT RECEIVING RADIATION THERAPY FOR HEAD AND NECK CANCERS**

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The radiation oncology nurse plays a key role in coordination of care with patients receiving head and neck (H&N) radiation therapy. Through the nursing process and evidence-based practice, the goal is to insure there are minimal delays in care, implement measures to decrease the severity of toxicities and manage toxicities earlier to prevent missed treatments and hospitalizations. It is important for the nurse to understand the anticipated toxicities based on treatment field, early intervention to manage toxicities, collaborate with members of the multidisciplinary team, and begin patient education at the time of consult. The project purpose was to determine if a nurse led multidisciplinary team would improve the process and coordination of care for patients receiving radiation therapy for H&N, and thus lead to minimizing delays in care, implementation of measures to decrease and manage toxicities earlier, and prevention of missed treatments/hospitalizations. Features put into place: an educational program by the radiation oncologist detailing the unique needs of these patients; implementation of biweekly/PRN OTVs with an RN; establishment of collaboration with the gastroenterologists for PEG placement; assuming responsibility for patient education and care of PEG by the radiation RN in partnership with the dietitian; early collaboration with the social worker; implementation of new skin care and additional oral care measures. A 2018 review of our "Missed Treatments Report" and "Morbidity and Mortality Report", was conducted to identify patients who received treatment to the

H&N, the number and reason for missed treatments, and interventions taken to address these issues. A more in depth review was performed to determine if outcomes could have improved with a nurse lead, multidisciplinary team. The results of the 2018 review: four patients, missed a combined 11 days, two admissions and one incomplete course of treatment. After implementing these changes, results from Jan-June 2019 showed nine H&N cancer patients treated, toxicities were grade <2, one patient with weight loss of >10%, a combined total of 5 missed treatments, zero hospitalizations. The addition of the new features have improved outcomes by decreasing the number missed treatments, no hospitalizations, and 100% completion rate. Ongoing research to assess the severity and timing of toxicities, addition of speech therapy and implementation of technologies, ie. low level laser therapy, to improve patient outcomes.

### **NURSE-LED MEDICATION RECONCILIATION SAFETY INITIATIVE**

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Medication reconciliation errors during inpatient care transitions place patients at risk for adverse drug-related events. In the fall of 2017, the blood and marrow transplant (BMT) unit nurses at this NCI-designated Comprehensive Cancer Center identified a trend in medication errors, specifically omission of medication orders, through the hospitals event-reporting system and feedback from the staff that was placing patients at risk. Nursing and physician leadership agreed that daily medication review during rounds might help prevent this type of error. In November 2017, daily medication review during rounds was implemented using the orders tab in the electronic health record. New physician staff were provided with educational materials that reviewed BMT specific medications requiring special consideration when completing medication reconciliation and common issues seen while admitting patients. For eight

months, the teams were verbally reminded to complete medication review, however full adoption by the team did not occur and medication omission errors continued. During this time, six omission events were reported with 50% discovered during medication review on rounds. The units Safety Committee determined that a paper audit tool to track compliance of physician-initiated medication review should be used to further increase adoption and decrease omission errors. The audit tool was completed by the charge nurses on rounds for four months, resulting in an increase in medication reviews completed on rounds from 57% at baseline to 86.5%. In the eight months post auditing, three omission events were reported with 100% identified during daily medication review on rounds. This patient safety initiative demonstrated that daily medication review on rounds is an effective and simple way to improve medication safety on inpatient units that led to a 50% decrease in medication omission events, and a 50% increase in omission events that were discovered during daily medication review. With persistence from the nursing staff, and continued communication between nursing and physician leadership to share audit data and reported errors, the provider teams now initiate medication review without prompting and have more meaningful conversations about patients' medications. Physician leadership has seen the positive effect of this practice and as a result are educating the new providers about the importance of multidisciplinary medication reconciliation during rounds.

### **THE ROLE OF THE NURSE IN AN EMBEDDED PALLIATIVE CLINIC**

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Thoracic oncology patients have significant and complex pain. Nurses in the ambulatory oncology setting may be the first clinician that the patient can confide in when talking about their pain. The patients have a large pain burden and may be undertreated due to the current climate of the opioid epidemic. Due to the patients' specific needs, many have to make multiple trips to different providers to receive holistic treatment. To best meet the needs of the patient population, a palliative team was embedded into the operations of a high volume thoracic oncology clinic. This model allows the medical oncologists to focus on cancer treatment while palliative team addresses symptom management. Nurses connect

with the patient on a personal level, creating a setting for healing. The thoracic oncology clinic integrated a palliative team into the clinic twice a week. This team includes a palliative physician and nurse who performs an assessment focused on pain, symptoms and medication use. Additionally, the nurse performs urine-drug toxicity screenings, counseling, alternative pain management and specialized comfort and support in times of transition to hospice. A survey was administered to evaluate the knowledge base of the thoracic team pre and post integration of the palliative team into the outpatient clinic. After implementation, patient satisfaction score positively increased, pain scores decreased as well as phone calls related to pain. Oncologists endorse overall satisfaction with the support of a palliative team to manage the patient's complex symptoms. Patients voice appreciation that they are able to have their holistic needs met in one multidisciplinary visit. Nursing staff knowledge increased related to their knowledge of palliative care. Data to be shared upon selection. Nurses are essential in collaborating with members of the team that provide specialized care to patients. This model allows nurses to collaborate with physicians to provide better outcomes in an efficient manner. As a nurse working in a clinic with this new embedded clinic within a multidisciplinary system, it is my intent to show how the RN is an integral part of the team and an advocate for the oncology patient. As described, we have the data to show the effectiveness of this clinic concept for the patient and the health-care team.

### **DISCHARGE IN CONFIDENCE: IMPLEMENTING AN INTERDISCIPLINARY, STANDARDIZED DISCHARGE CHECKLIST**

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Healthcare standardization is a concept which provides a guided framework ensuring patients receive the same quality of care. On average, Hematopoietic Stem Cell Transplant (HSCT) patients have a 51% readmission rate due to transplant complications. As a result, discharge education is important for this population because it effects care post discharge. Our nursing team recognized that discharge education was not consistent and the need to standardized the discharge education. The purpose of this study was to see how an interdisciplinary patient discharge checklist effected standardization of the discharge process on a 16-bed in-patient academic medical center HSCT unit. From January-March 2019, an

interdisciplinary HSCT discharge checklist was implemented. In-services were conducted the month prior to implementation. Staff educated included all HSCT nurses, physician assistants, pharmacists, and social work. The checklist addressed discharge education topics including emergencies, do's and don'ts post transplant, readmission reasons, medications, home services, caregiver support, central line care, and a patient specific education area. The checklist was introduced on admission and lived in the discharge folder. Throughout the hospitalization and upon discharge, interdisciplinary teams initialed checklist topics for which they educated. Nurses were the last to educate patients. If a section was not signed, nursing reached out to the appropriate team for education. A total of 22 HSCT nurses completed a 7 question pre (December 2018) and post (March 2019) intervention survey. The survey, based on the Likert scale, helped to assess nursing discharge standardization through questioning process, consistency, interdisciplinary education, and patient education. Post intervention, the largest survey increase was 29% in the discharge standardization domain. There was a 28% improvement in the domains education consistency and interdisciplinary education. Nurses expressed this study promoted self-reflection about patient education and ensured all patients were educated equally. Limitations of this study included checklist utilization compliance. An interdisciplinary discharge checklist helps to increase discharge standardization and education. Oncology nurses play a pivotal role in discharge ensuring all patients receive the same information. To effectively educate patients, all nurses and members of the interdisciplinary team should be proactive and work together. In the future, we plan to audit discharge checklist usage to increase compliance and explore other areas that could benefit from standardization.

### **NURSES BRIDGE THE MULTI-DISCIPLINARY COMMUNICATION GAP TO IMPROVE CONCURRENT CHEMORADIOTHERAPY PATIENT CARE**

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When a concurrent oncology treatment plan is prescribed, it is imperative that patients start chemotherapy as close as possible to the initiation of radiation

therapy to maximize radio sensitivity of their tumor. Historically at our institution, medical oncology and radiation oncology worked as separate entities, and patient care was not coordinated between disciplines. Without a standardized process for early identification and collaboration of concurrent modalities, patients may be scheduled inappropriately resulting in decreased benefit of treatment. The purpose of this project was to utilize nurse navigators and radiation nurses to bridge multidisciplinary communication to improve the coordination of care for patients with a concurrent oncology treatment plan. Manual chart reviews were performed for patients who underwent treatment for Head and Neck and Thoracic cancers to measure the interval between the start date of new chemotherapy and the start date of new radiation treatment. Nurse navigators and radiation nurses shadowed each other to gain better understanding of each other's roles and to facilitate team work. Nurse Navigators and radiation nurses attended weekly huddles to facilitate multi-disciplinary care. Additionally, nurse navigator workflow was redesigned to assist in multi-disciplinary care plan coordination with newly consulted patients. Analysis included using a Pareto chart. Preintervention data indicated that 9% of patients in the head and neck and thoracic clinics were started on chemotherapy or radiation therapy more than 7 days from the start dates of the initial therapy administered. Postintervention data showed that after the nursing interventions were initiated in Head and Neck and Thoracic cancers, only 2% of patients were started on chemotherapy or radiation therapy more than 7 days from the start dates of the initial therapy administered. Building a multi-disciplinary team of radiation nurses and oncology nurse navigators improved communication and care coordination amongst multidisciplinary team members. The nursing intervention demonstrated a positive impact on clinical patient care and outcomes. The implementation of oncology nurse navigation in the multidisciplinary care plan optimized care coordination in conjunction with weekly huddles with radiation nurses. Identification of concurrent patients has become systematically identified resulting in zero patients being scheduled to start chemotherapy outside of a 7-day window.

### **UTILIZING THE ELECTRONIC HEALTH RECORD TO IMPROVE SAFETY OF NEPHROTOXIC CHEMOTHERAPY ADMINISTRATION**

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At an ambulatory Cancer Center, labs were drawn and couriered to a main processing site prior to the administration of chemotherapy. A serious safety event related to the administration of chemotherapy prior to reviewing the labs, led to an evaluation of nursing practice and safety standards. A change in policy was implemented to state creatinine must be resulted within two calendar days prior to administration of nephrotoxic chemotherapy. Additionally, point of care creatinine testing was made available and scheduling practices changed to decouple lab draws and treatment appointments. The utilization of the electronic health record (EHR) and workflows were then evaluated to improve compliance. The purpose of this patient safety project was to utilize functions within the EHR to improve compliance and workflow sustainability of reviewing lab results prior to the administration of nephrotoxic chemotherapy. The project team, consisting of the Education Specialist, Quality Coordinator, and Nursing Leadership collaborated with the Clinical Informatics team to assess capabilities within the EHR. A Best Practice Advisory (BPA) was developed within the EHR to activate during the release of the chemotherapy order if there was not a documented creatinine result in the patient's chart within the last 2 calendar days. This BPA could not be bypassed until an action was taken. Prior to implementing the BPA, a silent test was performed in September 2018 resulting in 125 potential BPA activations. The BPA was officially implemented in October 2018 resulting in 90 BPA activations. The BPA utilization decreased in the months following with an average activation of 45.7 times per month between November 2018–August 2019, and a record low recorded in February 2019 at 31 activations. Post-implementation, there were no safety events reported due to nephrotoxic chemotherapy administration prior to lab results review. The implementation of a BPA provided an electronic automated safety check prior to the administration of chemotherapy. As nurses and providers became more attentive to the updated policy and practice changes, the necessity of the activation of the BPA significantly decreased, signifying a change in safe practice standards and increased compliance with the policy. Collaborating with the Informatics team and utilizing IT improvements made this patient safety

project sustainable and helped to reduce the chance for human error.

## IMMUNOTHERAPY: ARE WE ON THE SAME PAGE?

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Integration of immunotherapy in cancer treatment provides significant improvement in patient outcomes. Immunotherapy may be given as monotherapy, in combination with other immunotherapy, or in combination with chemotherapy. However, these agents may compose side-effects and immune-related adverse reactions (irAEs). Thus, educating oncology nurses in identifying side-effects and providing intervention guidance appropriately is imperative to safe patient outcome. Organizations including Oncology Nursing Society (ONS) and National Comprehensive Cancer Network (NCCN) provided resources and pathways to identify and manage side-effects of irAEs. Utilizing resources will ensure oncology nurses are well informed of irAEs and can provide consistency in patient education. A survey was developed to assess baseline knowledge of both oncology nurses and non-nurse research coordinators practicing in an academic ambulatory cancer center to identify educational gaps for improvement. The 10-question digital survey consisted of two demographic questions and eight knowledge-based questions. The assessment focused on recognizing categories of immunotherapy, mechanisms of action, checkpoint inhibitor side-effects, and interventions for skin toxicity. An example question included, "Your patient asked how checkpoint inhibitors attack cancer cells. Please select the most appropriate response". Four answer choices were provided: "It affects the cell cycles of the cancerous cells"; "They remove the brake on T-Cells of the immune system"; "By preventing the blood supply to the cancerous cells"; and, "By attacking their disguise protein". Survey analytics allowed for proper data to see shortfalls in understanding. A total of 50 participants responded to survey. Impressively, over 60% responded accurately to questions regarding understanding of checkpoint inhibitors. However, less than 50% responded accurately to questions identifying and managing irAEs. The overall data revealed the need for further education and periodic educational in-service. While immunotherapy has a tremendous impact on patients' survival rate, unique properties of these agents, especially checkpoint inhibitors, can cause serious side-effects. Nurses have a key role in providing treatment information, managing side-effects, and offering emotional support to patients

receiving immunotherapy. Thus, it's clear educational sessions would be beneficial to staff. Presently, ONS and NCCN provide many educational guidelines to identify and manage side-effects. Adherence to these guidelines and consistency of care for patients receiving immunotherapy continues to be challenging. By assessing knowledge and providing in-services, oncology nurses can retain and receive reinforcement of the information.

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## INTERNATIONAL

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### A SINGLE-CENTER EXPERIENCE OF NORMAL SALINE SOLUTION IN PATENCY OF CENTRAL VENOUS CATHETER: A RETROSPECTIVE STUDY

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Central venous catheters (CVC's) are widely utilized in clinical practice, especially in intensive care units. Heparin solution (HS) was commonly chosen since 1970's to maintain the patency of CVC's. However, the comparative efficacy between heparin saline and normal saline (NS) solution remains controversial. The use of heparinised saline is associated with potential risks, as coagulation disorders. Recent studies have shown no statistical difference in catheter patency when comparing NS to HS solution. This study is aiming to show the results of 1-year follow-up with cancer patients only using normal saline as the solution to lock CVC's. Use of 20ml with pulsatile technique of normal saline (sodium chloride 0.9%) and positive pressure to lock CVC's. In 1-year follow-up we use NS 165 times in patients to lock CVC's. From July 2018 to July 2019 we did not have any case of catheter occlusion by using 20ml with NS to lock CVC's. On the other hand, we had 4 events of infection, which was not related to the use of NS. More studies to compare efficacy between HS and NS are needed due to the inconclusive evidence available. Our experience have shown until now that NS could be a safe and effective solution to lock CVC's. In our ambulatory we believe that NS could be a safe choice to lock CVC's and we use only this solution since the ambulatory was opened. Furthermore, using NS decreases adverse events and the costs. By doing this,

we reinforce the necessity of more studies to standardize in global scale which solution is better for the patient.

### DETERMINANTS OF RESILIENCE IN BREAST CANCER PATIENTS RECEIVING TREATMENT

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Although these treatments have improved the survival rate, breast cancer patients face many challenges during the recovery process. The first year is also a period of recovery and adaptation to living with cancer. Promoting resilience is an essential component of psychological and social care for cancer patients. The aim of this study was to investigate relationships among body image, stress, hope, social support, coping, and resilience in breast cancer patients during treatment. This cross-sectional descriptive correlation study used a structured questionnaire to collect data for a convenience sample of 160 breast cancer patients undergoing treatment at cancer centers or outpatient clinics at two regional hospitals and a medical center in southern Taiwan. Pearson correlation coefficient and a stepwise multiple regression analysis were used to identify predictors of resilience. The data showed that resilience was significantly associated with body image, stress, hope, support from family members and medical staff, and coping (confrontation and acceptance-resignation). In stepwise multiple regression analysis, the explained variance in resilience was highest for hope (44%) followed by stress (7%) and body image (2%). The model accounted for 53% of the total variance in resilience. The standardized equation was  $\text{resilience} = .48 \times \text{hope} - .22 \times \text{stress} - .18 \times \text{body image}$ . The data collected in this study provide a useful reference for designing interventions for increasing resilience in breast cancer patients undergoing treatment.

### CONVERSION TO AN INPATIENT ONCOLOGY UNIT IN A CANADIAN COMMUNITY HOSPITAL: UNIQUE CHALLENGES AND PERSPECTIVES LEARNED

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Cancer is the leading cause of mortality and the number of new cancer diagnoses is expected to increase over the next decade. In 2013, cancer has accounted for over 27,600 deaths in Ontario. Consistent with this trend, Markham Stouffville Hospital (MSH) has observed a significant increase with patients requiring cancer care. Without an inpatient unit dedicated to care for oncology patients, this specific patient population were admitted to any available medical beds. Thus, to consolidate care provided to the oncology patient population and to ensure smooth transition in patient care, a medicine unit was converted to an inpatient oncology unit. The purpose was to translate experiential knowledge gained from the process of converting a medicine unit into an inpatient oncology unit related to planning phases, implementation strategies, and resource management. Objectives were to: (1) Discuss the planning phases and implementation strategies used for conversions, stakeholder engagement, funding allocation, and resource management. (2) Identify challenges, barriers, and obstacles found throughout implementation phases. (3) Recognize successes in process enhancement and sustainability planning to meet the needs of inpatient chemotherapy administration. Through stakeholder engagement, the need to provide specialized oncology care throughout the entire disease trajectory was recognized. A multiphase approach was used for the conversion process from a stroke unit to an oncology unit. Phase 1, which was a 6 month process, consisted of the planning phase including staff and fiscal resources. Phase 2, which was a 1 year process, consisted of providing frontline staff with the training appropriate to manage oncology patients using the D'Souza Institute Education Program. Phase 3, which was a concurrent 6 month process, involved the cross training of staff to the Chemotherapy Clinic. Phase 4, is the ability to administer chemotherapy on the inpatient unit. Throughout the phases, staff recruitment for oncology is a recognized challenge due to the required skills and training. Further discussions amongst internal stakeholders continue regarding patient ratios and models of care while taking into consideration fiscal responsibilities. Consolidation of patients onto one unit provides Oncologists the ability to provide timely and efficient care to their patients. Streamlined care and communication between outpatient clinic and inpatient

unit is enhanced therefore contributing to a positive patient experience. Additionally, staff are provided the opportunity for growth and professional development.

## EFFECT OF MUSIC ON STRESS IN CANCER PATIENTS

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In nursing, the use of music is applied as a complementary form for pain relief, well-being promotion as well as for the relief of other nursing diagnoses, namely: spiritual anguish, sleep disorders, hopelessness, risk of loneliness, social isolation and stress. This is because the use of music promotes positive physiological effects, such as changes in blood pressure, heart and respiratory rate and reduction of pain sensory stimuli. In response to cancer and / or its treatment, a large number of patients present, in addition to physical symptoms, decreased functionality, loss or departure from work, social isolation, fear, sadness, anger, anxiety, depression and uncertainties, which cause Emotional suffering. The purpose was to evaluate the effect of music on the physiological and emotional stress of cancer patients undergoing treatment. This is a quasi-experimental study conducted between January and July 2018 in a Public Hospital located in Macaé, Brazil. The study design followed the recommendations for interventional studies from the Standard Protocol Items: Recommendations for Interventional Trials (SPIRIT). The study was approved by the Research Ethics Committee of the Federal University of Rio de Janeiro. The single intervention with 26 patients occurred individually using headphones, and lasted 15 minutes with 3 songs chosen by the patients themselves. The present study showed statistical evidence that the use of music with cancer patients was able to reduce physiological and emotional stress. This study brings two contributions not only to nursing, but to all health professionals who care for cancer patients. The first concerns the choice of the method not commonly used in nursing studies, especially when it is intended to confer scientificity to an intervention, in this case, the musical intervention by attributing the possibility of measuring biological changes. The second has to do with the

fact that we have found a small number of studies that comprehend this research object, so it is very important to study the effects of the use of music in cancer patients, expanding the possibilities of attending this type of patient and promoting a non-invasive and non-pharmacological therapeutic form, but which may still be able to act upon the physical and emotional needs of these patients.

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## LEADERSHIP/MANAGEMENT/EDUCATION

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### PHARM TO BEDSIDE NURSING: AN INPATIENT ONCOLOGY UNIT'S INTERDISCIPLINARY EFFORT TO IMPROVE RN ONCOLOGICAL PHARMACEUTICAL KNOWLEDGE

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Inpatient oncology patient care is increasingly complex due to scientific treatment advances and the expansion of outpatient services. Hospitalized patients receive intense pharmacological interventions in both antineoplastic treatment and supportive care. As a result, the bedside oncology nurse is responsible for staying up to date and well versed in oncologic pharmacology. This is particularly important in a teaching hospital with highly specialized drug regimens and rotating medical staff with variable experience levels. At one urban, NCI designated cancer center, a Hematology/Oncology/BMT unit initiated an interdisciplinary lecture series to address self-identified gaps in staff nurses' pharmaceutical knowledge. Two OCN staff RN's, Nurse Manager, Oncology Nurse Educator, and Oncology Pharmacy Director collaborated to determine the goals, structure, and content of the lecture series. Project goals were to increase staff knowledge, measured with pretest-posttest questions, and to deliver topics that nurses would rate highly as applicable to their practice, using a 5 item Likert scale. Monthly lectures take place on the unit at a time when staff from both day and night shifts can attend. Unit RNs share topic suggestions on a board posted in a conference room frequented by staff throughout the day. Lecture dates and topics are distributed via broadcast email and flyers posted on the unit. Topics are chosen based on staff suggestions, as well as new medications/protocols and clinical issues.

Pharmacology residents present pathophysiology on different drug classes, side effects and adverse reactions, dosages and administration, and provide time for questions and answers. Topic examples include "Antiemetic Management for Chemotherapy-Induced Nausea and Vomiting", "A Review of Blinatumomab and Daratumumab", and "Alkalization Management with High-dose Methotrexate". The informal, on-unit setting promotes attendance and discussion between nurses and pharmacists. Reviews of pre/posttest knowledge questions and ratings of topic applicability have shown increased nursing knowledge about oncological pharmacy and high ratings for applicability to practice. The program fosters communication and collaboration between pharmacists and nursing staff in reviewing best practices and promoting excellence in care delivery. Future plans include preparing education materials for use in orientation and expanding the program to other oncology units.

### USING SIMULATION TO ASSESS COMPETENCE IN MANAGING TOXICITIES OF CHIMERIC ANTIGEN RECEPTOR (CAR) T CELL THERAPY

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CAR T therapy is a new line of immunotherapy that utilizes genetically engineered T cells to target cancer cells for destruction by the patient's immune system. These therapies are available commercially and through multiple ongoing clinical trials in hematologic malignancies and solid tumors. Specific guidelines for the management of these patients are mandated by either Institutional Review Board (IRB) protocols or the Food and Drug Administration (FDA). CAR T therapy toxicity management was identified as an annual competency for nurses in the inpatient oncology units at Baylor University Medical Center, since it is a lower frequency treatment that carries a higher risk due to the prevalence and severity of cytokine release syndrome (CRS) and neurotoxicities. Simulation exercises involving CRS and neurotoxicity post CAR T cell infusion were developed as one of the methods to demonstrate competence. The scenarios were programmed into a high fidelity manikin, and the simulation exercises took place in one of the oncology patient rooms. Car T therapy resources (CAR T Side effect management order set and CARTOX 10 neuro-assessment form) were made available during the exercise. The simulation exercise centered on assessment, recognition of side effects related to

CRS and neurotoxicity, appropriately notification of the physician, and initiating appropriate interventions required per the order set. In a post exercise survey, nursing staff reported the exercise to be very helpful. Staff enjoyed the hands-on opportunity to utilize the order sets and gain additional experience in utilizing the CARTOX assessment. Nursing staff and leadership requested more CAR T simulation opportunities in the next fiscal year. Staff from three inpatient oncology units with varying degrees of CAR T therapy management experience participated in the exercise. This provided a valuable unexpected benefit of allowing the more inexperienced staff to learn from the more experienced staff during the exercises and the debriefing. Simulation is an effective method to provide hands-on opportunities to demonstrate competence in managing CRS and neurotoxicity related to CAR T therapy and can be utilized in inpatient oncology settings. It also allows the staff to gain experience and increased confidence in managing higher risk situations that occur infrequently and need to be managed effectively and in a timely fashion to prevent harm.

### **A LARGE, MAGNET, HEALTH NETWORK INTEGRATES A CLINICAL LADDER SYSTEM INTO THE CANCER INSTITUTE**

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In 2018 Lehigh Valley Health Network (LVHN) developed a clinical ladder system entitled “Program for Recognition of Individual Merit and Excellence” (PRIME) to reduce nurse turnover in the inpatient setting. In 2019, two direct patient care nurses from the Cancer Institute were involved in planning and implementing PRIME within the outpatient setting. Implementing a clinical ladder system has been linked to increased staff satisfaction, increased employee engagement, and decreased turnover rate. Bimonthly meetings with the clinical ladder committee were held to create the PRIME policy and eight professional and developmental categories. These categories include: Service, Profession, Leadership, Recognition, Engagement, Education, Teaching and Research. Points for each category are acquired based on the nurse’s expertise and contributions. Educational drop in sessions were held during the PRIME application window. Each nurse that chose to apply completed an online application that included supporting evidence of their accomplishments with manager sign off. After the application period closed, the committee reviewed and scored each application to determine PRIME status.

Each nurse applicant fell into a numerical category, levels 1–4. (Level 1 novice–Level 4 expert). All nurses who applied were notified of their PRIME status in writing. Those nurses with higher levels (3 & 4) received a monetary one-time bonus. Nurses with lower levels (1&2) did not receive a bonus but were encouraged to pursue opportunities for advancement and reapply for PRIME next year. Within the Cancer Institute 55% of eligible colleagues submitted for PRIME status; of those 31% achieved PRIME level 3 or level 4. Employee surveys conducted at LVHN have shown an increase in overall satisfaction related to career development and professional growth. Since inception of PRIME at LVHN, the network has seen a 37% reduction in nurse turnover. LVHN requires that applicants reapply on an annual basis. This encourages nurses to remain actively engaged and empowered to grow and pursue their professional goals. Increase opportunities for staff to develop professionally. Continue to evaluate staff satisfaction and turnover rate; this will be critical in fine tuning the clinical ladder system.

### **INCORPORATING ONCOLOGY SIMULATION IN A BACHELOR OF SCIENCE IN NURSING PROGRAM**

**Rosaleen Bloom, PhD, APRN, ACNS-BC, AOCNS®, Texas State University, Round Rock, TX; Regina Jillipalli, MSN, RN, Texas State University, Round Rock, TX**

Patients with cancer are some of the most complex patients a new graduate nurse may encounter. New nurses are often hired directly onto oncology units without any experience. However, many Bachelor of Science in Nursing (BSN) programs only briefly address oncology patients in didactic pharmacology and medical-surgical courses. Few programs have implemented simulations focused on oncology patients. In the literature, nursing student simulations related to oncology patient care included: pediatric patient receiving chemotherapy, skin cancer screening, palliative care and end-of-life communication, and mock-codes. Some hospitals have successfully created and implemented oncology simulations for new graduate nurses and experienced nurses new to oncology in order to aid the transition to the oncology specialty. However, most new nurses do not have these simulations available to them. The purpose was to introduce BSN students to the complexity of caring for an oncology patient. In the Spring of 2019 we created an oncology focused simulation using high-fidelity mannequins for our Nursing Care Across the Life Span course. The simulation scenario focused on a multiple myeloma patient experiencing multiple

lab abnormalities, an active infection and pain. The simulation took place late in the semester due to the complexity of care required. Over two days, 104 Junior BSN students participated in the simulation. During de-briefing students verbalized they appreciated the challenges the scenario provided specifically: caring for a patient with cancer experiencing pain who required complex and evolving pain management; identifying infection risk and active infection; and interpreting abnormal diagnostic test results and intervening when necessary. During a follow-up meeting with clinical faculty, faculty verbalized the value of this type of scenario and how the scenario challenged the students. Further integration of complex oncology patients earlier in BSN preparation is essential to ensure new graduate nurses are prepared for the patients they will encounter. Oncology simulations can increase confidence with the oncology population and highlight the oncology specialty as a possible career path. Further evaluation of this simulation will continue as we work to refine and add to the scenario. Innovation: Applying clinical judgement to a complex oncology patient scenario in a BSN program.

### **CREATING STANDARD WORK AND A TEAM-BASED COMPETENCY SIMULATION FOR THE MANAGEMENT OF ONCOLOGY INFUSION HYPERSENSITIVITY REACTIONS ACROSS A MULTI-SITE HEALTHCARE SYSTEM**

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Patients must be educated and monitored during infusions with a risk of hypersensitivity reactions. Chemotherapy infusion related reactions can be reduced by checking for prior history of allergies, ensuring appropriate premedication, and monitoring for signs and symptoms of a hypersensitivity reaction. Simulation is strongly correlated to improved patient outcomes and increased learner confidence. Team-based simulation best represents real world clinical scenarios. At HHC Cancer Institute clinical sites, gaps in EHR protocol implementation and documented safety events identified a need for education and assessment of content application. The purpose was to create best practice standard work and test content application utilizing an inter-professional team-based competency simulation. Standard work and a pre-simulation Health stream module were created for staff to follow when educating about the risk of a hypersensitivity reaction, responding to the grade of reaction being experienced, and documenting the event. An

inter-professional simulation based team competency for all chemotherapy trained nurses (9 infusion centers and 5 acute care hospitals) was developed. 118 inpatient and outpatient chemotherapy nurses, Advanced Practice Providers and pharmacists within the health system participated in a session. Qualitative feedback from participants at the end of each session was overwhelmingly positive. The sessions led to identification of multiple opportunities to improve patient safety and implement evidence-based practice changes utilizing the LEAN PDSA cycle. These include changes in the preparation of CD-20 and desensitization medications by the pharmacy, epinephrine dosage and route in the hypersensitivity order protocol, and access to rescue medications in department Pyxis machines. There were significant changes in adverse event EHR documentation implemented and an increase in compliance with online institution safety event reporting. Nursing leadership has partnered with nursing informatics to create enhanced communication of these safety events through standardized documentation. An inter-professional, team-based simulation competency is a meaningful, effective, fiscally responsible approach to validating staff competency and improving the management of an oncology patient experiencing an infusion related hypersensitivity reaction across a multi-site healthcare system. Innovation: The development of standard work, implementing evidence based practice changes using LEAN PDSA methodology and validating competency of the inter-professional team using team-based simulation to impact patient outcomes from hypersensitivity reactions.

### **ONCOLOGY NURSING ORIENTATION AND PRECEPTOR SURVEY**

**Sarah Lanahan, RN, BSN, Brigham and Women's Hospital, Boston, MA; Christina Hale, RN, Brigham and Women's Hospital, Boston, MA; Cathleen Rowland, RN, MPH, MSN, OCN®, BMTCN®, Brigham and Women's Hospital, Boston, MA; Caitlin Guerrero, BSN, RN, OCN®, Brigham and Women's Hospital, Boston, MA** Nurses hired at Brigham and Women's Hospital complete a comprehensive orientation within their specialty. In 2018 the oncology service expanded to include an additional 34 inpatient beds. In 2018 over a hundred new nurses have been hired. The oncology divisional committee recognized this as a unique opportunity to collect data to evaluate and improve our orientation process. We surveyed nurses who had precepted within the last five years, and nurses who had completed orientation within the last five years.

The oncology division committee compiled questions for a survey that were emailed to the oncology service for completion. For preceptors, 104 nurses responded. For orientees, 114 nurses responded. Staff was encouraged to complete this survey by their nurse directors, professional development managers, and fellow oncology division committee members. The results of the survey were broken down by themes. There were themes that both the preceptor and orientee survey responses included. Communication was the number one theme that both preceptors and orientees identified. There was a gap in the communication between the preceptors for an individual. That is, when asked how preceptors communicate an individual's progress to the next preceptor 65% responded that there was no communication at all. When orientees were asked what could be improved, communication was a strong concern. They responded that they would have appreciated more communication with the nursing leadership throughout their orientation. They also responded that they appreciated communication in the form of feedback from the preceptors. The results of the survey prompted short and long-term goals. In an immediate effort to improve communication between preceptors, we are implementing that the primary preceptor is responsible for printing the orientees calendar schedule and updating it each shift to denote the orientees patient load, as well as experiences completed and those needed. To address the orientee concern regarding last of communication with leadership staff, the PDM/ND meetings have been re-invigorated. Our long-term goals include the development of a task force that uses the survey results as a guide to re-vamp and improve the orientation process based on the feedback. Another long-term goal will focus on improving the communication and relationship between the entire staff, from charge nurses to patient care assistants.

#### **DEVELOPMENT OF A PATIENT EDUCATION PROGRAM TO IMPROVE SYMPTOM MANAGEMENT OPPORTUNITIES, DECREASE EMERGENCY DEPARTMENT VISITS AND UNPLANNED ADMISSIONS WHILE INCREASING URGENT CARE UTILIZATION AT A FREE-STANDING CANCER CENTER**

Amber Lamoreaux, BSN, RN, MSN, OCN®, CCCTM, Moffitt Cancer Center, Tampa, FL; Susan Vallan, MSN, OCN®, CBCN®, Moffitt Cancer Center, Tampa, FL  
Patients undergoing chemotherapy are at risk for adverse events (AEs) and may seek treatment at an Emergency Department (ED) which can lead to an unplanned admission. As many as 56% of ED visits

that do not require admission could have been avoided with greater availability of outpatient services. Avoidable healthcare utilization contributes to \$38 billion in wasteful spending annually. The most common cancers associated with ED visits are breast, prostate and lung cancers. In 2020, the Centers for Medicare & Medicaid Services (CMS) will be adding an oncology measure to its Hospital Outpatient Quality Reporting (OQE) Program. Measure OP-35 is "designed to assess the quality of care for chemotherapy patients and encourage improvement" and may impact reimbursement of claims. OP-35 focuses on unplanned readmissions for 10 specific conditions within 30 days of outpatient chemotherapy: anemia, nausea, dehydration, neutropenia, diarrhea, pain, emesis, pneumonia, fever and sepsis. In an attempt to better serve our patients and proactively prepare for CMS OP-35, we employed measures to decrease ED utilization and unplanned readmissions while increasing the use of the center's Urgent Care (UC) services. Clinic nurses began having meaningful conversations with patients about the center's UC and services available. A handout was developed to educate patients about UC, when to seek care at our UC and what medical conditions may warrant an ED visit instead. Because of recent changes to our UC and to decrease team member confusion, we also developed nurse education that helped review the changes and how UC can be utilized by our patients. Knowledge was assessed with pre/post surveys. In order to evaluate the impact of the changes, we collected data for three outcome measures: Patients' cost of care by utilizing our UC vs. an outside ED, utilization of ED services by cancer patients, and unplanned admissions of cancer patients. Data is currently being collected and interventions will be reevaluated based on the results. We are continuing to work on improving outcomes for our patients and more interventions may be necessary; this will be evaluated as the program continues.

#### **EVOLUTION OF A NEWLY LICENSED NURSE ONCOLOGY RESEARCH NURSE RESIDENCY PROGRAM**

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Clinical research nursing is a specialized practice. The required skills are not taught in nursing schools.



so newly licensed nurses (NLNs) lack the clinical and research skills required for the role, limiting the availability of qualified candidates. We developed and implemented an oncology clinical research nurse residency program for NLNs. Because of sustained growth in clinical trial volume s and the need to hire research nurses to support patients on these trials, our organization funded the residency program for an initial cohort of two residents, who entered the program in September, 2016. A steering committee was formed to oversee the residency program curriculum development, monitoring and ultimately evaluation. The curriculum was developed by experienced clinical specialists, research nurses and leaders, guided by the associate chief nurse for research with the full support of our chief nursing officer. It is a comprehensive program including classroom learning for research fundamentals, online ONS classes for foundational knowledge, medication administration training in the Clinical Research Center, as well as an inpatient hospital rotation, three outpatient hospital rotations and various observation experiences with interdisciplinary colleagues and departments. To monitor progress through the one year program, the NLNs present case studies to the steering committee at the end of select rotations, submit journals for their inpatient rotations and write a final paper critiquing their overall program experience. Based on the feedback from graduates of the first cohort, the 2017–2018 program was revised to include: strategy sessions prior to each assignment; continuity for the NLNs with the same preceptors; review of expected competencies for each experience; and program restructuring for the first two months to better balance observation experiences with computer training time. For the 2018–2019 cohort, a self-assessment tool was implemented to allow the NLNs to monitor their competency milestones. As shown in the provided graph, self-assessed competency scores were collected in 12 categories. The average improvement in combined competency scores ranged from 26%–50%. The program has been successful with 100% of the six graduates working as oncology clinical research nurses and 83.3% of them are employed in our organization. The program was deemed an exemplar for Magnet in 2019. The 2019–2020 program has enrolled six NLNs and a formal evaluation and pursuit of accreditation is planned for 2020.

### **SUSTAINING THE PIPELINE OF PHD- PREPARED SCIENTISTS IN ONCOLOGY NURSING**

**Rebecca H. Lehto, PhD, RN, FAAN, Michigan State University, East Lansing, MI; Gwen Wyatt, RN, PhD,**

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It is recognized that research-intensive nursing programs nationally are struggling to maintain adequate enrollment of PhD students. Such trends are particularly ominous for oncology nursing given the aging of senior scientists and necessity for developing next generations of nurse-scientists capable of developing new science around critical emerging areas such as omics and advancing technologies in cancer care. New multi-faceted strategies are demanded to shift to a paradigm that will build and sustain a cohort of future scientists. The purpose is to present information on strategic tactics that may inform building and sustaining a pool of PhD students interested in developing oncology-nursing science for the discipline's needs. Our PhD program has developed new approaches to overcome ongoing challenges to recruit promising doctoral students. One innovative strategy was the assignment of a tenure-system faculty to the role of PhD Recruitment Pipeline Coordinator. This faculty works directly with our undergraduate program by visiting classes, visiting programs across the state, organizing recruitment luncheons, giving presentations, meeting with potential students, and hosting social events. The aim is early opportunities for exposure to research to foster interest. Given our strong focus on symptom science and cancer, we have developed an undergraduate research program that links promising students with faculty mentors who guide early research experiences, with 17 participants currently enrolled. Further, we have incorporated current PhD students in recruitment activities such as student panels, networking during conferences and presenting at recruitment programs. We have also increased outreach to promising international students, following a coordinated evaluation of academic background, English scores, faculty match and research goals. We have developed a strong list of potential students who are well matched interest-wise for whom we maintain contact as they near completion of their academic programs. Plans are also in development to ease matriculation for individuals with Doctor of Nursing Practice degrees who are interested in research careers. While our process in building the PhD program is new, results are moving in a promising direction. Our goal is to inform more students of the oncology nurse-scientist role to ensure that our college is a leader at the forefront in responding to the national crisis of declining PhD student enrollments, and ultimately to prepare oncology nurse researchers who will advance the science for our specialty.

## **CANCER-RELATED FATIGUE: TEACHING ONCOLOGY NURSES HOW TO SAFELY RECOMMEND PHYSICAL ACTIVITY**

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Despite strong evidence that physical activity (PA) can ameliorate cancer-related fatigue (CRF), people with cancer are provided PA recommendations less than 50% of time. While recommending PA falls within the scope of nursing practice, oncology nurses often do not recommend PA because of lack of knowledge, fear of causing harm, safety concerns, and perceived lack of time. The purpose of this innovative educational activity was to help oncology nurses gain the knowledge and skills required to safely provide PA recommendations to patients. An interactive online course with required patient teaching and goal setting was developed and offered to oncology nurses. The course included didactic information, a case study integrated into learning checkpoints, tips for providing PA recommendations and a PA recommendation tool. As a course requirement, a PA recommendation tool was used by each learner with 10 patients. The PA recommendation form included sections focused on current level of PA, assessment for medical clearance, patient specific PA recommendation, identified goals, and patients' commitment to increasing PA. To complete the course, learners were required to teach 10 patients and submit a copy of the PA recommendation tool for each patient. One hundred-six nurses completed the online course. The activity yielded PA recommendation data from 1,061 patients between the ages of 18 and 90 receiving treatment for cancer. Of these patients, 72% (n=763) were not physically active prior to treatment. After receiving the nurse-initiated PA recommendation, 91% reported commitment to attempt PA and 46% of these patients had no risk factors requiring medical review prior to PA. Course participants stated that required practice of assessing and making PA recommendations to patients was valuable. The use of an innovative, online platform with required application to practice was successful in educating nurses about PA recommendations and provides insight into the implementation of this evidence-based recommendation into practice not previously found in the literature. Oncology nurses caring for patients receiving cancer treatment can assess CRF and appropriately provide individualized exercise recommendations. This online course required application of evidence-based content on exercise for CRF in clinical care. This project

demonstrated that an online delivery method can be used to teach skills and support implementation of a new process into practice.

## **ONCOLOGY NURSE RESIDENCY: THE UNIQUE IMPACT ON RETENTION AND RESILIENCY FOR NEW GRADUATE NURSES**

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Nurse residency programs have been shown to be an excellent recruitment tool for new-graduate nurses. As the baby boomers retire and healthcare organizations grow, the nursing shortage is predicted to reach over 1 million nurses by 2024. In FY19, 84% of newly hired inpatient nurses at Huntsman Cancer Institute (HCI) were new-graduates. Knowing that specialty nurses are difficult to recruit, the need for oncology-based residency programs that address the potential for compassion fatigue, burnout and turnover is critical. Organizational commitment to the training and support of new-graduate nurses at HCI led to the development of the Huntsman Oncology Nurse Residency (HONR) program in 2013. The HONR program is a 12-month nurse residency for all new-graduate nurses hired at HCI. Through oncology-specific didactic, the program provides the tools to be successful in the first year of practice. In 2016, it was found that curriculum needed to adapt to proactively approach the unique challenges that oncology nurses face. Resiliency workshops and a structured mentorship program were integrated to provide extra support. Nurse residents now experience peer-to-peer support, improved networking, and workplace cohesion, which are all linked to job satisfaction and decreased perception of stress. Program evaluations demonstrate the formation of a life-long commitment to oncology nursing and a strong desire to stay in the organization. The HONR program fulfills a dual purpose of recruitment and retention of a strong core group of oncology nurses able to provide safe, quality care. Participant retention is continually measured at 1, 2, and 3 years. Prior to the implementation of

resiliency training and mentorship, retention rates were 90% at 1 year, 80% at 2 years, and 56% at 3 years (n=59 nurses). Post-implementation retention rates are now 100% at 1 year, 100% at 2 years, and 93% at 3 years (n=79 nurses). Of the 79 nurses who have gone through the program since 2016, 75 of them are still employed today (95%). The HONR program aims to improve knowledge and retention, while fortifying personal resiliency and the ability to face inevitable challenges with strength and adaptability. Nurse resident retention data will continue to be measured and analyzed. Program curriculum will continue to evolve to meet the needs of our newest oncology nursing professionals.

### **ACADEMIC NURSE NAVIGATION: UNIQUE ASPECTS AND STRATEGIES FOR SUCCESS**

**Eleanor Miller, MSN, RN, OCN®, CBCN®, Penn Medicine, Philadelphia, PA**

The type of institution where a nurse navigator is providing care is an important variable to consider when developing a navigation model. Patients seek care at an academic medical center unsure of what they need, requesting first or second opinions, subspecialty care, clinical trials or with varied expectations. This abstract will highlight the unique aspects that an academic nurse navigation team has faced and strategies used for program development, growth and success. The unique aspects of academic navigation include: high patient and staff volume and expectations, numerous referral sources, subspecialty model of care, varied system entry points and processes, and a large infrastructure of roles including nursing, supportive care, administrative and leadership. In order to be successful it was important for the team to become both clinical and operational experts. This has been achieved and is ongoing through multiple strategies: Defining and evolving the role, building relationships and a network, creating role visibility/accessibility/reliability, setting boundaries, learning processes, data collection and analysis, disease site professional development, and disease site integration at a clinical and leadership level. With this established model, our team of 8 navigators are able to facilitate multimodality access and care coordination across specialties and locations, for both new and established patients, averaging 1000 patients a year per navigator. Outcomes have demonstrated double digit increased patient retention. Additional analysis is ongoing, specifically looking at patient and provider satisfaction. Fundamentally, the trust and credibility of the role has evolved as relationships developed with patients, the

disease teams, and health system. The blend of clinical and operational expertise enables the navigator to cross through the silos that exist in this matrix health system in order to assess where patients are at in the treatment process, determine the type of clinical care needed and with whom, and actually get that accomplished. Despite the complexity and volume of an academic medical center, it is possible and essential to integrate effective navigation by building relationships, establishing reliability and credibility and demonstrating outcomes. The team is now positioned as crucial members of the health system, not just the cancer center, and of most importance, able to provide personalized care to patients in order to best meet their needs and help them access the academic care they desire.

### **EDUCATING NURSES: TORSADES DE POINTES IN THE ONCOLOGY PATIENT, INTEGRATING AND PRESENTING SPECIALTY CONCEPTS USING WEB-BASED LEARNING**

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Clinical events in which oncology patients experience Torsades de Pointes (TdP) often result in poor patient outcomes. Despite a vast amount of TdP literature available, there is a lack of direct information on its implications in the oncology patient population, and topic/population-specific educational offerings for nurses. The purpose was to evaluate the impact of an educational intervention on participant's subject knowledge and satisfaction with the methods of information delivery. RNs working in patient care roles were recruited for study participation via email. The intervention consisted of a mobile device friendly educational website, designed using the Universal Design for Learning, which focused on TdP and its relation to the oncology patient. The site included written summative information regarding key project elements, was self-paced, and included multiple modes of information delivery. Quantitative knowledge gains were assessed by evaluating pre/post-intervention scores using an independent samples t test and the Mann-Whitney U test. Qualitative gains and participant satisfaction were assessed using participant surveys. Statistically significant gains were made in testable knowledge (test scores for group 1 (M=17.35, SD 6.23) and group 2 [M=25.57, SD 2.51;  $t(99.43) = -10.26$ ,  $p = .000$ ]; (eta squared =.45). The Mann-Whitney U test compared median values for each group ( $H_0$ = distribution of test scores would equal across both test groups; significance level =.000 (<.001);  $H_0$  is rejected). Content

of participant surveys demonstrated  $\geq 96\%$  positive feedback related to content, knowledge gains, and satisfaction with methods used. Nurses need to understand the individual components of TdP, and issues that are inherently unique to the oncology patient. Witnessing nurse reactions and patient outcomes during clinical events have revealed a knowledge gap. Current learning platforms are insufficient for preparing nurses to understand, prevent, recognize, and treat TdP in the oncology patient. Today's nurse needs to be presented with information in a context specific format to reinforce how it affects patient care and medical treatment. Content analysis of participant surveys revealed a need and desire for cross over education for nurses, and that web-based, multiple media, mobile device friendly educational platforms are positively received. Integrating concepts that span multiple specialties is necessary in the comprehensive care of the oncology patient. This can be achieved through innovatively designed education and presented in web-based, mobile device friendly formats.

### **DURING THE WORST, PUT YOUR SAFETY FIRST: CREATING AN ONCOLOGY NURSE-LED CHEMOTHERAPY SPILL RESPONSE TEAM**

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In response to the United States Pharmacopeia Chapter 800 (USP800) standards for safe handling of hazardous drugs, a large urban academic hospital completed a gap analysis to identify which requirements were not currently compliant. One area of opportunity identified was related to spill control, specifically with the new respiratory personal protective equipment (PPE) requirement and reporting process. This project aimed to create and implement a chemotherapy spill emergency response team, design a formalized training program for nurses involved, implement the process to minimize risk of hazardous drug exposure, and expand USP800 compliance and preparedness. A multidisciplinary team was assembled that included Nursing, Pharmacy, Corporate Health, Performance Improvement, Environmental Services, Supply Chain and Facilities. The team reviewed current policy and practice, USP800 guidelines, ONS guidelines and similar institutions' practice. The team updated spill definitions and team members were assigned clear roles/ responsibilities for responding to a chemotherapy spill. Additionally,

the process for reporting chemotherapy spills was streamlined to accurately capture how often spills occurred, and to ensure appropriate follow-up for staff involved in a chemo spill. Nursing Education Coordinators (ECs) developed competencies and training for the spill clean-up process. Training for nurses covered a USP800 overview, updated PPE and safe handling practices, PAPR use and requirements, spill competency with PAPR, and the spill team pilot process. The emergency response spill team was implemented over six months and monitored for impact to practice and operations. Feedback was gathered and incorporated into future education and process for further expansion outside oncology. The number of nurses formally trained on chemotherapy spill clean-up and PAPR use increased from 0 to 38. Chemotherapy spill reporting increased from 10 spills reported in calendar year 2018 to 26 reported since the new process was implemented in January 2019. Through creating the chemotherapy spill response team, the appropriate team members responsible for clean-up were identified, clear responsibilities of each team member were assigned, and one clear process for reporting a spill was implemented. This process has helped to decrease occupational exposure during the clean-up process, as well provide data into the root cause of spills, to hopefully prevent future chemotherapy spills.

### **A HEALTH SYSTEM APPROACH TO TRANSFORMING INFUSION CARE AND IMPROVING PATIENT EXPERIENCE THROUGH ONGOING PROCESS IMPROVEMENT INITIATIVES**

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The vast majority of oncology care continues to migrate from inpatient to ambulatory arenas. More movement is projected as innovative solutions to site of care emerge and infusion care delivery continues to advance. As a result, oncology infusion areas nationally have faced challenges with increasing patient volumes, growing case complexity, and heightened demand

for patient satisfaction amidst a competitive market. Infusion nurses stand at the front lines of ambulatory cancer care, and are charged with maintaining patient safety while acclimating to these challenges. Infusion Nurse Leadership at an academic health system averaging 125,000 visits annually, sought to improve patient experience across a rapidly expanding network of 13 Infusion Suites through the utilization of replicable quality improvement initiatives. Interventions were completed in phases at individual infusion sites, and once proven effective, the interventions were implemented at the remaining applicable sites throughout the system. iQueue for Infusion Centers was deployed to manage patient wait times through advanced scheduling analytics. Fast Track processes were established for short duration appointments, to improve patient dissatisfaction with lengthy wait times for quick treatments. A pre-treatment patient education program was designed to enhance the patient experience, inclusive of video orientation, dedicated teaching visits, written patient materials, and a telehealth visit option for patients desiring advanced education without travel. Nurses partnered with providers in a Serious Illness Conversation Program, with a goal of improving advanced care and goal planning through coordinated nurse educational interventions. To improve patient safety related to dosing errors, a standard process was established for height and weight measurements in Infusion. Extensive improvements were noted in patient experience as a cumulative result of these rapid cycle projects. In comparing fiscal year 2018 to 2019, increases to percentile rank from combined Press Ganey patient satisfaction scores across 13 sites were noted: “overall” by 62%, “information about delays” by 165%, “skill and knowledge of the nurse” by 26%, and “nurses concern for questions and worries” by 51%. Oncology infusion nurses are uniquely positioned to improve the patient experience through involvement in quality improvement initiatives. Forward thinking Infusion Nurse Leaders looking to improve care delivery amidst growing challenges can implement similar interventions for high reward outcomes. These innovative interventions have proven success across a health system containing a diverse variety of Infusion Suites.

#### **A NURSE-DRIVEN EDUCATION PROGRAM FOR ONCOLOGY EMERGENCY MANAGEMENT AT AN OUTPATIENT INFUSION CENTER**

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With increasing care complexity in outpatient oncology, nurse leaders at an academic infusion suite averaging 60,000 infusion visits annually recognized the need for a standardized educational program regarding management of acute infusion reactions and clinical emergencies. Oncology patients are a specialized population receiving high-alert medications in an ambulatory setting; many carry increased risk of anaphylaxis, leading to cardiopulmonary arrest. Infusion nurses must be able to quickly assess changes in patient condition, intervene early, and escalate care. Nurses in outpatient settings often express discomfort with clinical emergencies and resuscitative measures due to the complex nature of these events. In partnership with the hospital's Rapid Response Team, Infusion Nurse Leadership designed a sustainable educational program for the nursing staff. Infusion nurses were surveyed regarding equipment, medications, and clinical scenarios they felt needed further reinforcement. Multi-disciplinary debriefing sessions following events highlighted further opportunities for education. Literature review provided nurses with the most relevant strategies for managing hypersensitivity reactions and anaphylaxis. The program consisted of 60-minute small group sessions led by a Rapid Response Nurse Coordinator in an infusion room for a realistic training experience. Didactic teaching was combined with simulation of a hypersensitivity event, progressing to full cardiopulmonary arrest. Nurses had the opportunity to practice with the department's emergency equipment, including cardiac monitors, AEDs, portable suction, and bag valve masks. Roles of staff during an arrest event were reviewed, and nurses were able to practice resuscitating a manikin and documenting on the hospital's standardized code documentation sheet. Return demonstrations and teach-back methods evaluated competency. Patient experience responses to the question skill and knowledge of the nurse was at the 9th percentile pre-intervention for FY17. Following the implementation of the educational program, patient responses increased to the 35th percentile for FY18. The program was maintained annually, with 100% of staff participating, and scores for skill and knowledge of the nurse improved again at the 44th percentile for FY19. Qualitative data from nursing evaluations rate the program favorably across all categories. As cancer care continues to shift to the ambulatory setting, infusion nurses must adapt their skill and knowledge for managing acute patient events. Given the success of this model for clinical emergency nursing education,



it had been adapted and implemented in satellite infusion suites across the health system.

### **DEVELOPING ONCOLOGY NURSES THROUGH A TRANSITIONAL ONCOLOGY NURSE ACADEMY**

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The lack of experienced oncology nurses can strongly impact the ability of oncology centers to meet the needs of patient with cancer. This is particularly true in some parts of south Florida, where the shortage threaten to make it impossible of new outpatient oncology centers to deliver optimal care. The purpose was to develop a transitional oncology nurse residency program capable of taking experienced nurses without oncology specialty training and provide them with the basic knowledge needed to safely care for cancer patients. Using sources such as COPI, FACT, Joint Commission, and ONS educational requirements for oncology nurse competency were identified. Using these standards as a starting point, a group of expert nurse educators surveyed current oncology training programs offered at our hospital system and identified potential gaps. From these gaps, curriculum was developed and formalized into a 12-week Transitional Nurse Oncology Academy. Students were evaluated on knowledge of domains such as safe administration of chemotherapy and immunotherapy, hazardous drug safety, symptom management, and oncologic emergencies at baseline and completion. Since October 2018, a total of 27 RNs in 3 separate cohorts have successfully completed the 12 week program. Retention among RNs in the program has been 100%. The average pre-test score among nurses was 42%. Following successful completion of the program average scores rose to 98.2%. Results show a structured 12-week transitional oncology nurse academy developed by nursing experts using educational standards issued by benchmark societies can successfully increase nursing knowledge of key domains in oncology and successfully prepare nurses to transition into oncology practice. This program developed by nurses in coordination with established benchmarks provides a practical means of addressing an oncology nursing shortage.

### **IMPROVING COMPLIANCE IN KEY SAFETY METRICS BY IMPLEMENTING NURSE SCORECARDS**

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Cancer care in the ambulatory setting is high-risk and complex, and errors can lead to catastrophic outcomes. Leaders of high reliability organizations must

continually monitor compliance of key performance metrics and adherence to safety standards; identifying opportunities for improvement and coaching staff to meet expectations. Smilow Cancer Hospital is Connecticut's largest provider of cancer care with 12 locations throughout Connecticut and the only comprehensive cancer facility in the Northeast. At three of these Cancer Care Centers a review of overall compliance scores in regards to verification of chemotherapy, completion of post-treatment phone calls, and providing written instructions to patients after an infusion visit, identified adherence less than 100% throughout 2018. The purpose was to improve compliance in three safety domains: (1) performance of 2-RN verification of chemotherapy prior to administration; (2) documenting post-treatment calls within 72 hours of a cycle one, day one, chemotherapy administration; and (3) providing the infusion patient with an after visit summary. Regular discussions at each Cancer Care Center highlighted the impact to the patient, patient experience, and safety outcomes when compliance was 100% for the safety domains. An Excel workbook was used to collect and record compliance data and create individual nursing scorecards which were emailed monthly to each nurse. Additionally, positive feedback was included in the email to highlight success, along with verbiage of expectations for improvement when compliance was less than 80%. Individual scorecards increased the nurses' awareness of their performance in each safety domain. Routine dialogue with peers and Care Center leaders became commonplace and nurses worked together to identify and employ systems to achieve 100% compliance. Scores in all three safety domains significantly increased month over month. Nurses who did not meet goal would request the cases for which they were not compliant and perform research to identify the gap and then share what they would do in the future to achieve 100% compliance with leadership. To achieve great results a leader must communicate effectively with the team, establish and convey clear goals, and provide consistent and fair feedback. By doing this, nursing behaviors changed and compliance scores improved in all three safety domains. The use of a monthly scorecard with a personal note providing feedback improved compliance in key safety metrics.

### **INCLUSION OF SELF-CARE IN THE INTERDISCIPLINARY PROGRAM DEVELOPMENT AND EVALUATION OF AN HCT DISCHARGE CLASS FOR CAREGIVERS**

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Caregivers experience significant stress, especially caring for the Hematopoietic Cell Transplant (HCT) patient. Many hospitals require a caregiver to be with a patient post-transplant. A focus on caregivers is critical because their distress can match or surpass the distress levels of the HCT patient. Caregivers report lack of support and skills in self-care and higher rates of depression and anxiety. This negatively impacts caregivers' physical and mental health, and the patient's recovery. An interdisciplinary team at a NCI-designated cancer center was established to develop the HCT Discharge Class for Caregivers, which aims to prepare caregivers to care for the HCT patient at home and promotes caregivers self-care. The team consisted of oncology Clinical Social Workers (CSW), Registered Nurses (RN), a health educator, and consultative members (hematology physicians, dietitians, occupational therapy). The health educator applied health literacy best practices. The class was offered twice monthly in the hospital and was co-lead by an RN and CSW. The CSW provided education on self-care practices, sexuality, relationship adjustments, and caregiver resources. The RN covered the home environment, pets, socializing, food safety, nutrition, infection precautions, medication management, daily health assessment, graft versus host disease, and communicating with the medical team. PowerPoint presentations were supported by print materials, a caregiver toolkit, and open discussion of caregiver concerns. The class survey assessed caregiver readiness for the care for HCT patient at home and self-care awareness. Among 48 caregivers, ages 18–65+; 71% female and 43% spouse/partner. Pre and post surveys were analyzed using a paired t-test. Using a 0–10 point Likert scale, caregiver readiness to care for the patient was significantly higher in the post-survey  $8.63 \pm 2.21$  than the pre-survey  $6.81 \pm 2.83$ ,  $t_{48} = -3.50$ ,  $p < 0.05$ . Awareness of caregivers' own needs were also higher in the post-study  $8.83 \pm 2.09$  than the pre-survey  $7.33 \pm 2.48$ ,  $t_{48} = -3.21$ ,  $p < 0.05$ . HCT educational programs are routinely offered to prepare caregivers for patient needs, however less content has focused on education to prepare caregivers for self-care. After attending this class, caregivers report feeling more prepared for patient care at discharge as well as meeting their own needs. The program capitalizes on an interdisciplinary oncology care team

to create a class that supports home care of the HCT patient while directly addressing caregiver self-care needs.

### CHANGE IS GOOD: MODIFYING THE ORIENTATION STRUCTURE FOR NEW GRADUATE NURSES

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In February 2019, the oncology service line at Nebraska Medicine, which includes four 36-bed inpatient units, identified an opportunity to improve orientation for new graduate nurses by modifying the orientation structure. For each inpatient unit, the traditional orientation structure consisted of 3, 12-hour shifts each week with varying lengths of 8 to 12 weeks depending on the unit's level of care. Pressure from budget reductions and inadequate staffing prompted our team to focus on modifying the orientation timeline to help address these challenges. The purpose of modifying our orientation structure was to better support both the new graduate nurse and organization. The goals included decreased orientation length, repetition of technical skills, teamwork, accelerated socialization into the unit, bridging relationships with medical teams, increased knowledge retention, consistent patient assignments, continuity of care for the patient and increased professional development opportunities for current staff (i.e. precepting). Following a review of literature and house-wide orientation practices, our leadership team modified the orientation structure utilizing a combination of 8- and 12-hour shifts. This change was implemented to provide the orientee more consistent exposure to the specialized patient population, skills and the multidisciplinary team approach. Repeat exposure decreases gaps in learning, which can be anxiety-inducing and lead to digression of orientation. Through post-orientation surveys and progress meetings, new graduate nurses self-reported: increased comfort, continuous learning, easier task recall, more experiences than working 3-days per week, continued leadership support, development of time management skills and accelerated socialization into the unit. Utilizing the modified orientation structure, the length of orientation was reduced by 48 to 60 hours, per individual, depending on the unit's level of care. The modification of the orientation structure for new graduate nurses was not only successful for the oncology service line, but is also considered best practice for other Nebraska Medicine units. Between the four inpatient

units, 46 out of 49 nurses (94%) were successful in coming off orientation in the expected shortened time frame. By reducing the length of orientation, average cost savings was approximately \$1,600 per new graduate nurse, with a \$74,000 overall cost savings for our oncology service line. Additionally, new graduate nurses were able to begin working as full-functioning staff nurses two weeks sooner, helping to reduce the staffing shortages the units were facing.

### **NURSE-DRIVEN COLON CANCER SCREENING INITIATIVE TO REACH UNSCREENED ADULTS IN THE COMMUNITY**

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Colorectal cancer is the second leading cause of cancer death in the United States. Our hospital's NCDB (National Cancer Database) stage at diagnosis data reveals that our late-stage (IV) colon cancer incidence at diagnosis was 26% compared to 20% in 1385 hospitals throughout the country between the years of 2012–2016. According to the American Cancer Society's (ACS) 2019 Cancer Facts and Figures, "screening can prevent colorectal cancer through the detection and removal of precancerous growths, as well as detect cancer at an early stage, when treatment is more successful." Working toward our hospital's mission of enhancing the health of our community, oncology nurses sought solutions to address this disparity and ultimately improve colon cancer screening compliance. Intent on reaching those adults who have eschewed colonoscopy, we researched barriers to preventative colon screenings, then devised a feasible program to overcome many impediments. Following the ACS guidelines, the planning process included selection of FIT (fecal immunochemical test) colon cancer screening method, funding, advertisement, format, and nurse-led small group education and follow-up. The first biannual colon cancer screening event was held on a Saturday in November 2016 to offer vital colon health screenings and education in an accessible and non-threatening manner. Of the 307 adults ages 45–78 attending the six screening events, 72% of FIT tests were returned. Those who posted a negative FIT result are called then sent reminder letters a year later to follow-up with their doctor for

another FIT test or colonoscopy. All but one of the 29 participants with positive results committed to having a colonoscopy; 88% of the colonoscopies done required removal of polyps. One colon cancer was detected, but many potential cancers were prevented. By offering the screening at no cost to all, providing free transportation for those who need it, educating all who attend, and following up with personal phone calls and letters, we are hopefully instilling a lifelong commitment to healthier screening habits with the ultimate goal of preventing deadly colon cancers. This nurse-led screening initiative, "It Takes a Village to Raise Awareness: Making Colon Cancer Screening Easy and Accessible," received the 2018 Community Champions Achievement Award by the Hospital Healthsystem Association of Pennsylvania for improving quality, satisfaction, efficiency, and innovation, and has been reproduced in other facilities.

### **INCREASING THE NUMBERS OF ADVANCED CERTIFIED NURSES IN ONCOLOGY AND BLOOD AND MARROW TRANSPLANT**

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Advanced certification is important for staff engagement and ultimately increased patient safety and quality outcomes for any organization. Leadership at this 36 bed oncology/blood and marrow transplant department strives for Commission on Cancer (CoC) commendation for certification. A survey was sent to nurses questioning the desire and motivation to become an Oncology Certified Nurse (OCN) or a Bone Marrow Transplant Nurse (BMTCN) and barriers to certification. Overwhelmingly, staff were interested but lacked motivation for the following reasons: (a) minimum of two years of experience in oncology required to test, (b) cost of certification, (c) reimbursement limited to one certification annually, and (d) lack of recognition. The purpose of the project was to increase the amount of certified nurses by 22% (to meet CoC commendation) by the year 2020. Even though some of the following interventions were already in place, informing staff about the benefits proved beneficial. With the support of department leadership, additional interventions were implemented to help foster and reward those who pursued and achieved certification. One float pass, per certification, per quarter was given to nurses who earned their certification. A monthly, four-hour long, study group was offered, attendees were paid for their time. Review books were purchased and available for

check-out. Certified nurses had priority in the blood and marrow transplant unit. Certified nurses received reimbursement up to \$500 per year. Bulletin boards were hung in each department with pictures and names of all certified nurses, and information about the benefits of certification was posted for all to see. Each nurse was given a hospital identification badge, with their new credentials. Each nurse was given a certification pin. Certified nurses were recognized at quarterly staff meetings. Emails were sent to all department staff, service line leadership, and administration, congratulating each nurse as they achieved certification. Certification rates increased from 3% to 32% by September 2019. The interventions proved beneficial for the department. Nurses felt prestige among their peers and recognition from patients and leadership continued to encourage more nurses to pursue certification. The hospital achieved commendation with CoC. Additional implications for nursing identified: (a) Offer certification review classes. (b) Pay for testing/bulk testing options through Oncology Nursing Certification Corporation. (c) Certification recognition day for all certified nurses within the hospital. (d) Increase the reimbursement to cover dual certification.

### **NURSE LEADERS DRIVING PATIENT SAFETY AT THE ORGANIZATIONAL LEVEL**

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Oncology patients are at an increased risk for falls compared with the general population due to unique risk factors of disease and treatment side effects. To date, a gap in the literature exists regarding the implementation of fall prevention programs in the ambulatory setting. Given that the vast majority of oncology treatment is now provided in the ambulatory setting, the need to develop effective screening, interventions, and evidence-based practices for this setting is paramount. Nursing leadership at a National Comprehensive Cancer Network designated center in the Northeast, saw this opportunity to collaborate across disciplines and stratify fall events to the clinic-level as a means of identifying successful fall prevention tactics. To address fall prevention strategies in the ambulatory setting, nurse leaders took the initiative to drive patient safety at an organizational level through a multidisciplinary workgroup. The falls

workgroup developed a programmatic, structured approach to address patient falls in the ambulatory setting. Structures and processes were established to enhance the culture of safety and falls prevention efforts. Interventions included standardization of screening and assessment tools in the electronic medical record (EMR), implementation of a fall risk banner in the EMR, unit level data measurement with national benchmarking, enhancement of the organization's falls safety reporting form, revision of the falls prevention policy, installation of fall signage across the organization, development of a peer review process, and targeted education. As the work progressed, the workgroup transitioned to a chartered, nurse led, organization-wide, multidisciplinary committee. Measures of success include increased organizational awareness of the importance of developing and sustaining a comprehensive fall prevention program that includes multidisciplinary event review. One example of success is together with Facilities, it was determined that a flooring issue was contributing to the underperformance of falls with injury rates for three consecutive quarters. Once flooring addressed, the next quarter and most recent results, demonstrate an improvement in falls with injury rates. As an organization we continue to reevaluate the falls prevention program and demonstrate our commitment to learning from each fall event or near miss. A multidisciplinary approach to falls prevention in the ambulatory setting may represent a novel tactic that organizations can consider in improving fall and fall with injury rates across the oncology continuum of care.

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### **QUALITY IMPROVEMENT**

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#### **THE DEVELOPMENT OF AN ASSISTIVE PERSONNEL ROLE TO SUPPORT QUALITY INITIATIVE COMPLIANCE AND IMPROVE PATIENT OUTCOMES ON A 53-BED INPATIENT HEMATOLOGY/ONCOLOGY UNIT**

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Today's inpatient Registered Nurses (RN) are saturated with task overload, high patient acuity, and increased required documentation while simultaneously starting

and sustaining quality initiatives (QI). Oncology nursing has a long history of asking and answering focused clinical questions with a goal of improving outcomes. Due to the numerous QI projects, there is a need for a liaison who tracks and audits these initiatives to support their success; hiring an Assistive Personnel (AP) is a cost effective solution. An AP in this role assists with QI projects while supporting front-line personnel in giving compliant patient care. Two goals are outlined, the first is improving documentation compliance in EPIC; the second is reducing hospital-acquired conditions: central line associated blood stream infections (CLABSI), catheter associated urinary tract infections (CAUTI), pneumonia (HAP), unit acquired pressure injuries (UAPI), and falls. The main intervention is the transition of an AP role from bedside vitals and hourly rounds to auditing charts, maintaining patient room safety, performing catheter care, coordinating turns for at-risk patients, and reinforcing patient education topics. By creating a paper rounding tool, the AP is able to accomplish these goals on 53 patients daily. When deficiencies are found, the AP leaves a "Check Me Out" sign on the door to communicate to the RN areas needing attention. The AP collects data on a daily basis which is sent to an analyst to measure the impact. This role has defined goals to decrease the amount of CLAB-SIs, CAUTIs, HAP, UAPI, and falls as well as increase documentation compliance. In 6 months, it has shown a marked decrease in the number of CLAB-SIs from 12 to 8, HAPs from 4 to 2, UAPIs from 15 to 6 and falls from 40 to 26 including injurious falls from 12 to 8. Patients with cancer diagnosis are at an especially high risk for hospital acquired conditions because of impaired levels of physical function, physiological changes and intense treatments. This innovative role has been an opportunity to strengthen the care provided, lower unit infections, and decrease patients' hospital comorbidities in a cost effective way while supporting the culture of quality improvement and improving patient outcomes.

#### **AN INTERDISCIPLINARY APPROACH TO DECREASING DOOR TO DRIP TIME**

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When a patient is scheduled for inpatient chemotherapy there are delays in waiting for an available bed and physician teams. Delaying patient treatment decreases the patient experience and leads to unnecessary time

spent in the hospital as well as patients often not receiving chemotherapy on the day of admission. Thus there was a critical need for revising our current scheduled admission process. The purpose of this project was to decrease the delays from the time of reaching the hospital to the time treatment started. Multifactorial delays were occurring with patient treatment which led to unnecessary patient days in the hospital. The scope of this project included all patients at a large academic medical center diagnosed with cancer who were being admitted for scheduled chemotherapy. Our primary objective was to utilize our outpatient Infusion Center as a "staging ground" for patients begin their care, including beginning the scheduled chemotherapy. Once a bed and physician team became available, the patient would be directly admitted. Several tools that were developed including various admission process maps, Words and Ways that Work for patient education, and process steps for line placement. These tools helped to facilitate all scheduled admissions entering the hospital through outpatient infusion center in the morning, verifying lab work and readiness to receive treatment. Thus allowing for an earlier chemotherapy start time and transition to inpatient. To date the result of these initiatives is a reduction in length of stay of 1.6 days, reduction in door to therapy time by 7.11 hours, and reduction in the frequency of patients not receiving chemotherapy on admission day from 33% to 0%. Since we knew that late discharges were causing a noted impact on length of stay and patient flow bottlenecks this project introduced an innovative and multidisciplinary approach to optimize the time patients were spending waiting for a bed by getting lab work, pre-medications administered and treatment started during those hours that traditionally would have just been spent waiting.

#### **YOU CAN'T HURRY [ORDERS], NO YOU JUST HAVE TO WAIT: A NURSE-DRIVEN PROTOCOL FOR IV HYDRATION IN PATIENTS UNDERGOING DAILY RADIATION THERAPY (RT)**

**Olivia Franek, BSN, RN, OCN®, Duke Cancer Center, Durham, NC**

Radiation oncology patients often require supportive care with intravenous (IV) hydration during their RT course. Nursing assessments based on empirical data often clearly indicate the need for IV hydration for side effect management, yet there was no established algorithm in our department to initiate hydration. Delayed provider order entry contributed to lengthy wait times



for patients causing delays in patient care and nursing frustration. The purpose of the project was to develop a nurse-driven and patient-centered algorithm for IV hydration based on orthostatic vital signs and patient assessment. Pre-intervention, 86 patients received IV hydration over 2 months in the RT triage area. Chart review demonstrated patients waited an average of forty minutes from nursing assessment to orders placed for IV hydration. In a pre-intervention survey, ~60% of nurses reported that wait times for patients and order entry were unacceptable. In collaboration with the multidisciplinary team, nurses developed an IV hydration evidence based algorithm. The algorithm was piloted for head/neck and gastrointestinal radiation patients. Based on pilot data, the algorithm was then revised to include lab orders, improving efficiency and patient care. The algorithm was fully implemented in August 2019. Nurses were educated through staff meetings and one-on-one trainings. Now when patients present with dehydration, the algorithm is pivotal to their care and safety. Key concepts that drive nursing interventions are: (a) weight loss, (b) dizziness, vomiting, diarrhea and/or anorexia, and (c) orthostatic vital signs. Post-intervention data demonstrated that patients received hydration within 9 minutes from taking vital signs and gaining IV access as compared to pre-algorithm of 40 minutes ( $p < .05$ ,  $n = 102$ ). This significant decrease in wait time impacts patients and nurses positively; satisfaction scores with nurses using the algorithm increased to ~92% on the post-intervention survey. Nurses felt empowered as shown by these survey comments: “The algorithm has given RNs more autonomy.” “Clearly define(s) roles and workflow.” “Helped tremendously with wait times.” Implementation of the nurse-driven algorithm significantly decreased patient wait times. Nurses report high levels of satisfaction. Algorithm can be easily adapted into other settings. Next steps: (a) Build an order set in the electronic medical record system. (b) Continue to evaluate and revise the algorithm if evidence for practice changes.

#### **OUTPATIENT CASE MANAGEMENT—AN EVOLUTION TOWARD VALUE-BASED CARE**

**Karley Kinsey, BSN, RN, OCN®, UC Davis Health Comprehensive Cancer Center, Sacramento, CA**

Adult Infusion Center is experiencing a 16% cancellation rate with most cancellations occurring with less than 1-day notice, negatively impacting access to care and department revenue. A case management model was introduced to proactively identify issues to reduce same-day cancellations. A shift to the outpatient care necessitates changes in nursing practice balancing

financial aspects in the care equation including high quality, cost effective care. Case management isn't a new concept but hasn't been used widely in an Infusion Center or measured in terms of its value to patient outcomes or financial contribution. An Infusion RN transitioned to a case manager charged with conducting new patient calls, chart triage and reviewing clinical treatment issues. A study instrument was developed to collect data to measure metrics for improved access and quantify value. Reasons for late cancellations were also collected. During the 14-month project 2450 chart reviews, patient calls and treatment discussions took place with the care team. The case manager took charge to confirm patients were scheduled for appropriate amount of treatment time, facilitated getting chemotherapy orders signed or obtain orders for standing labs needed to evaluate treatment parameters prior to administering chemotherapy and verified appropriateness of blood orders. The case manager is empowered to take action if necessary and take steps to reduce fragmentation leading to improved care delivery and the patient experience. 581 cancellations were identified in advance by the case manager. Having more than 1-day notice enabled a high percentage of appointments to be refilled by patients needing access. 788 cases were also identified with treatment related issues reducing delays in care delivery. We estimate having a case manager had a financial impact of \$4.7 million for average charges/unit during the fiscal year. Case management in the Adult Infusion Center is a key position shown to have direct impact on quality of care, compliance and revenue. Introducing this model improved communication leading to collaborative care, helped to decrease same-day cancellations and maximized filling available appointments.

#### **LOOKING BACKWARD AND MOVING FORWARD: A BONE MARROW TRANSPLANT SURVIVORSHIP PATIENT SATISFACTION SURVEY**

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Statistics project by 2030 up to 500,000 bone marrow transplant (BMT) survivors will live in the United States. Clinics need to innovatively meet the unique demands of cancer survivors including late effects and

ongoing psychosocial needs. In 2016, our BMT program opened an interdisciplinary survivorship clinic led by advanced practice providers. As patient and provider perceptions vary, it is imperative patients perceive benefit in survivorship care for successful long-term patient engagement. Two years after opening, we conducted a patient satisfaction survey to evaluate patients' perceptions of the new survivorship clinic. Ninety-one patients were seen in the survivorship clinic within the previous year, and these eligible patients received an electronic or print letter with the survey link. Twenty seven patients (30%) responded who were transplanted between 1988 and 2016. Using a 0–5 point Likert scale, patients rated their average overall experience at 4.22; medical provider experience at 4.59; and psychologist experience at 4.44. While most patients traveled less than 50 miles, 30% travelled over 100 miles. Most co-pays were \$30–\$50. The patients saw 122 additional providers. Patients reported 50 unplanned medical encounters over the past year; would recommend the clinic to peers 92.6% of the time; and 67% identified ongoing needs the clinic can help meet. While most patients responded positively, opportunities included seeing a familiar provider and need for sense of security. BMT survivors have multifaceted needs impacting their survivorship. As best practices continue to evolve, clinicians should consider not only current evidence but also patients' perceptions to best map survivorship care. As our institution has worked to expand survivorship impact, we have transitioned our BMT survivorship clinic to a unique and separate survivorship space. This change affords patients familiar space and staff, thus meeting one of their identified needs. We have integrated a validated quality of life tool to continue addressing survivors' concerns; are continuing our interdisciplinary approach with a psychologist seeing patients in this safe space; and have included a satisfaction survey each visit to continue ongoing exploration and integration of patients' perceptions in BMT survivorship.

### MEETING THE CHALLENGE OF UNITED STATES PHARMACOPEIA <800>

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In response to the potential harm hazardous drugs (HDs) pose to healthcare workers the United States

Pharmacopeia (USP) developed USP<800>. As of December 2019, compliance with USP<800> will be mandatory and regulated by multiple local and certifying agencies. A community hospital in the Northeast with a hospital based cancer center met this challenge by gathering a multidisciplinary team of nurses from the cancer center and the inpatient unit, pharmacy, plant operations and environmental services. The purpose of this quality improvement project was to implement processes and work flows to meet 100% compliance with USP<800>. The team examined our current practices regarding the flow of HDs through the hospital to identify areas that were not meeting USP<800> requirements. The most significant gap identified was a concise and clear method to alert staff to the different risk levels that HDs present. Staff need to tailor their actions based on the specific risk of each HD to prevent over or underutilization of resources. The National Institute for Occupational Safety and Health list of manufacturing recommendations was used to evaluate all drugs on formulary. The team developed a color-coded grid that divided HDs into four risk categories: high, moderate, low and minimum to inform staff of required personal protective equipment (PPE), patient precautions, compounding, disposal requirements and general drug information. Drugs dispensed from the pharmacy are color coded with stickers to correlate to the HD risk categories. Copies of the color-coded risk category grids were placed in medication rooms, dispensing areas and on the hospital intranet. Other issues the team addressed were the impact of transporting HDs throughout the hospital from receiving to disposal; providing HD education on hire and annually to all necessary staff that corresponds to their role; and requiring all affected staff to sign an attestation on hire acknowledging their potential exposure to HDs. In the six months following implementation compliance with USP <800> was 99%. Reducing the potential for inadvertent exposure to HDs through improved engineering, work flows and consistent PPE use needs be a continued priority of healthcare organizations.

### APPOINTMENT AND TRIAGE SYSTEM: AN APPROACH TO REDUCE WAITING TIME IN AN OUTPATIENT CHEMOTHERAPY UNIT

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The First Come, First Served (FCFS) is the accustomed approach in queueing patients for treatment or procedures. In a government-owned tertiary center, where number of procedures frequently exceeds its usual average, FCFS creates traffic in an Outpatient Chemotherapy Unit (OCU) leading to long waiting time and unwise utilization of resources. This study describes Appointment and Triage System (ATS) outcome in comparison with FCFS queueing approach. ATS preschedules patient in advance and assigns long procedures in the morning (>4 hours), short procedures ( $\leq 4$  hours) anytime within the day and express service for quick procedures (<15 minutes). The purpose of the project was to know the outcome difference between the FCFS & ATS in an OCU. We reviewed the arrival patterns and waiting times of patients in the following time frames: before 8:00 am (TF A), 8:00 am to 12:00 pm (TF B), and after 12:00 pm (TF C). Patient encounters from April to June 2019 (N=1,337) formed baseline data (FCFS). Intervention (ATS) was introduced in July 2019 documenting the arrival pattern and waiting times on the same time frames (TF A,B,C) (N=561). At baseline (FCFS), the percentage of patients were as follows: (TF A) 56%, (TF B) 39%, and (TF C) 5%. The average waiting time of patients in minutes were 190 (TF A), 105 (TF B), and 50 (TF C), respectively. During the intervention phase (ATS), arrival patterns have shifted to 40% (TF A), 56% (TF B), and 4% (TF C). The average waiting time in minutes has reduced to 104 (TF A), 80 (TF B), and 28.5 (TF C), respectively. Mann Whitney U-test revealed that there is a significant difference in the average waiting time between ATS and FCFS across all treatment types and three time frames. When compared with the ideal waiting time, Wilcoxon Signed Rank Test implied that the actual waiting time of long and short treatment patients meets the ideal waiting time in the ATS group. ATS evens out the arrival patterns of patients in an OCU which results to reduction of patient waiting time and better utilization of resources. Innovation: Creation of a shared electronic file for Appointment and Triage System which was named FASTER (Files for Appointment and Scheduling of Treatment thru Electronic Recording).

## **BLOOD AND MARROW TRANSPLANT PATIENT EDUCATION CLASS EVALUATION**

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Blood and marrow transplant (BMT) is an intensive treatment that may be difficult for patients and their caregivers to understand. As BMT treatment continues to shift to outpatient settings, it is imperative that patients and their caregivers fully understand the processes, risks and symptoms to report to their clinicians. At this NCI designated Comprehensive Cancer Center, patients and their caregivers receive education at multiple intervals prior to their transplant, including an introduction to BMT class. The purpose of this class is to teach patients and their caregivers about what to expect during their BMT treatment. Class topics include the purpose of BMT, potential side effects and/or complications, emergency phone numbers and caregiver support. This one-hour class is taught by experienced BMT nurses using a PowerPoint slide presentation, class discussion, and related educational materials. A BMT education class evaluation form was developed and presented to the oncology research committee as a quality improvement project to determine how well the BMT class was meeting patients and their caregivers' educational needs. The 14-item evaluation consisted of seven Likert-scale statements, five multiple-choice items, and two open-ended questions. From February to August 2019, patients and caregivers were asked to complete the evaluation form at the end of each class. Data were collected over the six months and entered into REDCap. During this period, 169 patients were scheduled for the BMT class and 114 evaluations were completed—81 by patients and 33 by caregivers. The results indicated that the content and instructional methods successfully prepared patients and their caregivers for BMT with more than 95% agreeing that they knew the purpose of BMT and could state potential side effects and complications. Participants indicated that more than 95% of the time the information provided was helpful and presented in an easily understood way by a knowledgeable presenter. The results of this project validated the importance of a class to prepare patients and their caregivers for their transplants. This feedback will help guide the BMT educator group in revising the class materials and teaching methods. Future goals for this group are to create similar patient evaluations to validate the information taught in the BMT discharge class, which patients and their caregivers attend before transitioning to the next phase of their care.

## IMPLEMENTATION OF INTERDISCIPLINARY PRACTICE TO IMPROVE OUTCOME

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The purpose of this project is to design and implement a team based interdisciplinary rounding model to improve patient safety, experience, and collegial interdisciplinary relationship in an acute stem cell transplant unit. This initiative aligned with the organization's strategic goals for its customers. The current health care setting is complex. The positive impact of an effective interprofessional team in delivering safe, coordinated care delivery is supported by literature. Health care organizations that fosters interdisciplinary practice, report improved patient outcomes, coordinated care experience, high reliability culture and elevated level of nurse satisfaction. Current rounding model in the unit lacked consistency and primary nurse involvement. Considering the broad scope of the project, a multiprong approach was utilized combining the principles of Inter Professional Education Collaborative (IPEC), Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS), and Lean methodology. A pre-implementation survey assessed the current rounding efficiency, culture of safety and the needs of the team. Rapid Cycle Improvement (RCI) method was used throughout the initiative. The taskforce led by unit leaders, consisted of frontline nurses, physician champions, pharmacist, discharge planners and advance practice providers. A rounding structure was developed after a swim lane exercise that revealed the lack of coordination between disciplines. Elements of collaborative practice, primary nurse involvement, and patient engagement served as the pillars of new model with interventions that focused on improving efficiency, in regards to time and quality. A steady improvement in overall nurse and physician communication scores and care transition was seen in the patient experience report (>75 to 99th percentile ranking) by end of first quarter. A 90% decline in safety events with harm was reported from the unit. Results of nurse satisfaction survey and post implementation survey results are pending. High functioning teams use integrated approach to make treatment decisions and ensures smooth coordination of care, regardless of the setting. Nurses are advantageously positioned in care teams to advocate, initiate or boost the performance of interdisciplinary teams by adopting evidence-based strategies. Nurse

leaders play a vital role in creating and managing collaborative teams, connected with the elements of relationship and trust to help them achieve results at a consistently high level.

## IMPLEMENTATION OF A STANDARDIZED SALINE AND TURBULENT OR PULSATILE FLUSH PROCEDURE IN CVCS TO ELIMINATE HEPARIN

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Cancer patients undergoing complex therapies often require central venous catheters. For decades, heparin, has been standardly used as a flush solution for maintenance of catheter patency. Heparin is associated with serious complications such as bleeding, allergic reactions, biofilm formation, and heparin-induced thrombocytopenia. Adequate flushing with saline using a pulsatile technique has been shown to be as effective as heparin for prevention of occlusions. The purpose of this project was to implement a saline and pulsatile flush procedure for hematologic malignancy patients with central venous catheters to replace heparin. The project occurred within an academic medical center. Nurses completed a baseline knowledge and practice assessment. Nursing flush technique observations, based on a skills competency checklist, were conducted at baseline and five and eight weeks post implementation of the saline flush procedure. Nurses received education on the rationale for the practice change and participated in a skills lab. A retrospective chart audit of 40 cancer patients, flushed with heparin, established baseline demographic data and patient outcomes. Patients (n=76) treated with the saline flush procedure were compared with baseline data. A paired-sample t-test was conducted to compare pre and post knowledge and practice. There was a statistically significant improvement in the scores for seven of ten questions. Prior to education, 6.7% of nurses flushed according to best practice guidelines. After education and a skills the flush procedure adherence increased to 84.4%, and 90% respectively. Differences in demographic and clinical characteristics of patients in each group were not statistically significant. Analysis of both groups from central venous catheter insertion to removal showed the rate of giving alteplase was 0.012 per catheter day in the heparin-flushed patients, compared to

0.014 per catheter day in the saline-flushed patients. Patients with pheresis catheters had a significant reduction in occlusions when flushed with the saline and pulsatile procedure, 0.005 per catheter day compared to heparin 0.012 per catheter day. There were no cases of major vessel thrombus or catheter-related infection in the saline flush group. Focused education with a hands-on skills lab significantly improved nursing staff compliance with a saline pulsatile flush procedure and increased knowledge of the practice change. Saline and pulsatile flush is an effective and safe alternative to heparin for flushing central venous catheters in hematologic malignancy patients.

### **NURSE-DRIVEN INTERVENTIONS FOR SUSPECTED FEBRILE NEUTROPENIA IN THE 24-HOUR CANCER CLINIC**

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Neutropenic fever (NF) is an oncologic emergency requiring prompt intervention to decrease the risk of morbidity and mortality in presenting patients. Benchmarks for care necessitate intervention with antimicrobial therapy within one hour of symptom presentation. Current literature supports the use of protocol-based interventions for NF to significantly reduce the time to antibiotic administration. One hundred percent of all BMT patients will develop neutropenia during their course of treatment. Bone Marrow transplant (BMT) patients represent individuals at high risk of developing NF. In an academic medical center's 24-hour cancer clinic, time to intervention with antimicrobial therapy was inconsistent. This project was created in order to support nursing autonomy to provide safe, timely care to BMT patients with NF. It was hypothesized that when given the support to function at the maximum scope of practice nurses would be able to facilitate faster care, consistent with national guidelines. A nurse-driven protocol was developed to allow nurses autonomy to provide safe, timely care. The project targeted BMT patients who called the 24-hour clinic with suspected NF. A protocol with defined criteria was

developed and implemented for nurse-driven antibiotic intervention. The project was evaluated based on time elapsed between patient arrival and intervention with antimicrobial therapy. Prior to the project, time to antibiotic ranged from 46–502 minutes, with a mean time to antibiotics of 211.6 minutes (n=24). All patients treated using the protocol received antibiotics within the 60 minute goal with a mean time of 22 minutes (n=8). Post-intervention, triage and antibiotic intervention times improved, limiting care delays and streamlining interventions. The project continues to accrue more patients, which will result in the ability to perform a more robust data analysis. Maintenance phases are underway following aggregate preliminary data. Nurses were able to work to the top of their licensure using a nurse-driven protocol to provide safe, timely care to patients with suspected NF. More work is needed in order to evaluate the use of protocols in 24-hour clinic settings given these findings and the literature supporting the use of protocols and intervention times in practice.

### **ACCIDENTS HAPPEN: IMPROVING SPILL RESPONSE AND SAFETY WITH CHEMO SPILL DRILLS**

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Oncology nurses are responsible for the management of chemotherapy spills, presenting unique risks for hazardous drug exposure. Inpatient oncology nurses at the organization articulated that they did not feel confident or competent responding to a chemotherapy spill safely. The institution's oncology clinical educator, Clinical Nurse Specialist, and nurse manager agreed that a quality improvement project was crucial. The literature states that female healthcare workers exposed to hazardous drugs may incur higher rates of infertility, miscarriage, and birth defects than their unexposed counterparts may. Oncology nurses also face an increased risk of developing cancer. Despite awareness of these hazards, studies show that nurses are inconsistent in their compliance to safe handling guidelines. Observation and survey of the institution's current nursing practice confirmed that staff were not consistently following evidence-based guidelines. Utilizing resources including the institution's policy on hazardous drug spills, chemo spill competency behavior checklist, the ONS Toolkit for Safe Handling of Hazardous Drugs, and USP General Chapter <800>, an evaluation tool was created to calculate nursing compliance when responding to



chemotherapy spills. On several occasions, the educator placed actual fluid on the floors of various areas of the unit. Oncology nurses responded to these “spills” as though they were true chemotherapy spills. Post-drill debriefings were conducted, including review of safe handling guidelines. Nursing Assistant (NA) education was also disseminated, including handling excreta, soiled linens, fertility precautions, and personal protective equipment. The goal of this project is to improve nursing compliance and confidence in chemo spill management. Pre- and post-drill data includes compliance to the behavior checklist and reported confidence. Although chemo spill drills are ongoing, post-drill data to present-day reflects 100% nurse compliance, a 55% improvement. Likert scale data indicates a substantial increase in self-reported nurse confidence. This data reveals a significant change in nursing practice, and can ultimately affect nurse safety, patient safety, and hazardous drug exposures. In the future, these drills may supplement annual competency requirements similarly to many institutions who practice code blue drills. Additionally, drills will be implemented at the organization’s outpatient infusion center. These drills would be of benefit to any area that administers hazardous drugs, including physicians’ offices, pharmacies, and settings where patients are receiving continuous infusions.

### **CHANGE THE GAME: CHANGING THE CULTURE OF CHG CARE TO REDUCE CLABSI RATES**

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Central-line blood-stream infections (CLABSIs) are a major concern for patients with central lines and for the healthcare system as a whole, because they are known to significantly increase length of stay and healthcare care costs. On an adult inpatient hematology/oncology unit for a six-month period in 2019 CLABSI incidence increased by 300% compared to 2018. An examination of that in relation to knowledge gaps among nursing staff and patients pointed to an opportunity for a collaborative intervention. The purpose of the project was to create an interactive process to engage patients in central line care in order to achieve increased compliance of evidence-based central-line-care interventions and decreased overall incidence of CLABSI events. Based on results of a survey sent to the nursing staff measuring potential knowledge gaps related to central line care, a brief evidence-based informational

booklet was developed along with an interactive weekly calendar to track evidence-based interventions: Chlorhexidine (CHG) wipes, showering and linen changes. In addition to tracking those three metrics, the calendar includes a diagram demonstrating correct usage of CHG wipes and a “Fact of the day” section with daily discussion points related to central line care. Education was provided to all nursing staff members about the informational booklet, as well as the purpose of the calendar. In order to track the success of the project, four data points were measured: CHG compliance (measured as a percentage of eligible patients); knowledge of proper CHG usage (measured as percentage of nursing staff); calendar compliance (percentage of eligible patients); and overall CLABSI incidence. Data was collected pre-intervention and then at one month intervals post-intervention for three months. Implementation of the interactive calendar had an overall positive effect on CHG compliance and CLABSI incidence. CHG compliance reached 100%. CLABSI incidence reduced to 0 incidents in the three months post-intervention. Nurses’ knowledge of the correct usage of CHG wipes saw the most dramatic increase going from 45% to 94%. Finally, compliance with the calendar remained a weaker point, ranging between 40%–77%.

### **MENTORING CENTRAL LINE-ASSOCIATED BLOOD STREAM INFECTION CHAMPIONS: BRINGING BEST PRACTICE AND STANDARDS TO THE BEDSIDE**

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The effectiveness of unit-based skin champions is well reported in the literature to promote professional nursing practice and decrease adverse events such as Hospital Acquired Pressure Injuries. Translating this best practice strategy to a different nursing sensitive indicator, Central Line-Associated Blood Stream Infections (CLABSI), has potential to reduce infection rates and improve patient outcomes. A two year-long initiative to train and engage unit-based central line champions (CLCs) was led by Clinical Nurse Specialists (CNSs) with expertise in vascular access devices. CLABSI rates have been above the benchmark at our National Cancer Institute (NCI) designated comprehensive cancer center. The purpose of this quality improvement project was to reduce CLABSI rates

to zero by training and engaging unit-based CLCs to bring best practice and standards to the bedside. A hospital-wide, standardized training program was held for 88 self-selected nurses during the initial year. The program reviewed best practices for central line care and featured presentation, videos, and hands-on simulation. Prevalence rounds were established in the second year to assess all central lines on all units. These CNS-led, collaborative prevalence rounds provide quarterly opportunities for champion engagement, education, and contact with CNS mentors. Prevalence rounds also provide real-time education for unit nurses, with CLCs taking the lead to provide education and feedback on the floors they surveyed. CLCs from inpatient and outpatient areas and representing all specialties in the cancer center, have sustained engagement in the champion role by participating in prevalence studies, attending bimonthly champion meetings, sharing staff concerns or unit specific issues around central lines, and reviewing and distributing unit specific prevalence results. Since the CLC program started, CLABSI rates have decreased 52%, from 1.54 to 0.82 per 1,000 central line days ( $p$ -value = 0.047) and there has been a 10% decrease in central line days over 12 months. Pending results of a CLC satisfaction survey will be shared at time of presentation. Translating the champion strategy to a different nurse sensitive indicator was an effective approach to reducing CLABSI rates. The multifaceted approach, maintained engagement and allowed champions to work closely with CNS mentors to develop leadership skills, encourage data sharing, and employ debriefing and real time education to improve practice. The method of quarterly prevalence rounds has assisted with sustainability of this initiative.

### **IMPROVED MEDICATION ADHERENCE TO DECREASE GRAFT VERSUS HOST DISEASE AND INFECTIONS IN THE BONE MARROW TRANSPLANT CARE TRANSITION PROCESS**

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BMTs are lifesaving treatments for many cancer patients. Care transitions from controlled inpatient hospital settings with follow up visits in outpatient clinics are often complicated by complex medication plans. Patients are discharged on multiple antimicrobials, immunosuppressants and other comorbid condition medications. Scheduling administration times, understanding drug interactions and updating frequent dosage changes are challenging for patients/caregivers. Medication adherence and education

are key prevention components for life threatening post-transplant complications including GVHD and infections. The purpose of this quality improvement (QI) project was to decrease the incidence of GVHD and infections in the adult BMT patient utilizing improved medication adherence and educational practices across the care transition. The transplant educational process consists of pre-transplant clinic visits, inpatient hospitalization and post-transplant visits. Using a QI model, the drivers for this project included improving the processes of patient medication education, discharge prescriptions and the care transition plan. Pre-transplant medication sessions were completed with coordinators/pharmacists. Upon admission, staff RNs introduced the teach back process by progressing from an initial review of meds to eventually quizzing the patients about their medications/schedules. Educational tools included calendars, tip sheets and pillboxes developed by nurses/pharmacists. Utilizing the hospital's medications discharge delivery to bedside process allowed staff to observe the patient/ family member appropriately filling the pillboxes. Patient compliance self-surveys were completed post-transplant. Patient outcomes, measured by incidence of infections, decreased from 75% to 17% and GVHD rates decreased from 50% to 0 over the 4-month implementation. Process outcomes were measured through patient self-survey report (93% adherence rate) and therapeutic drug levels (improving from 50% to 86%). Positive nursing/patient comments indicated the program was beneficial to both. Medication adherence has been widely recognized as an opportunity to improve patient health. The use of a QI process to improve collaborative medication education and adherence did improve the care transitions for this population. It helped to identify those at risk for nonadherence requiring further assistance with medication preparation, as well as those needing additional education. This innovative and collaborative stepwise approach to patient education allowed patients and their caregivers to engage in the process of learning safely and self-paced with the support of the interdisciplinary team. It increased opportunities to review medication education components during pre-transplant, hospitalization and post-transplant.

### **BETTER TOGETHER: LEADING REDUCTION IN CATHETER ASSOCIATED URINARY TRACT INFECTIONS**

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Catheter associated urinary tract infections (CAUTI) contribute to increased morbidity, hospital length of stay, and healthcare costs. Oncology patients are at higher risk for CAUTIs because of immunocompromising effects of treatment. 2018 had a dramatic increase in CAUTI on the adult 42-bed Medical Oncology Unit. Data review revealed an increase in utilization ratios. Nurse leadership identified a knowledge deficit regarding actions necessary to minimize CAUTI. However, education of unit nurses did not impact CAUTI rates. Research showed leadership rounds to be an important aspect of integrating and sustaining best practices at the bedside. Nurse leadership rounds (NLR) were implemented and led to a partnership with the interdisciplinary team (IDT) to ensure timely removal of indwelling catheters (IC) and recognition of alternatives. The goal was to reduce CAUTI rate by reducing utilization ratios through standardized NLRs. Nurse leadership engaged nurses and assisted them in removing barriers to proactively removing all unnecessary ICs. Evaluation of ICs was incorporated into daily IDT rounds. Nurse leadership tracked patients with ICs on the unit; reviewed necessity; reinforced IC care; and increased awareness and use of external urine collection devices. CAUTI rate from January–May 2018 was 13.4 (CAUTI infections per 1000 catheter-days). Compared with June–December 2018, CAUTI rate decreased significantly [13.4 vs. 0.00,  $p=0.02$ ]. Also, the utilization ratio (number of catheter days/number of patient-days) decreased significantly between the periods of January–May 2018 and June–December 2018 (10.90% vs. 8.16%,  $p<0.001$ ). Notable reduction in CAUTI has been sustained in 2019. NLRs which engaged all was integral to our success. NLRs raised awareness and served as a reminder that each played a role in CAUTI prevention. Challenges included getting nurses to understand their role in preventing CAUTI; overcoming reluctance to discontinue unnecessary ICs and trying alternative external collection methods and/or voiding trials. Assimilation of CAUTI prevention measures into daily practice by the IDT through NLRs was crucial in achieving the goal of CAUTI reduction.

### **THE ROLE OF ONCOLOGY NAVIGATION AND MULTIDISCIPLINARY CARE IN IMPROVING ACCESS TO ONCOLOGY REHABILITATION**

### **FOR PATIENTS WITH HEAD AND NECK CANCER**

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Patients who have undergone radiation for head and neck cancer (HNC) are at risk for difficulty eating, difficulty speaking, and lymphedema. Oncology rehabilitation includes supportive therapies which may minimize, improve, and treat these side effects. The HNC oncology nurse navigator (ONN) completed a quality assurance study in 2014. This revealed inconsistent screening for weight loss and swallow dysfunction; only 66% of patients continued physician follow up (f/u) after six months and only 43% had initiated oncology rehabilitation. The goal of this quality improvement (QI) study was to improve HNC patients access to support services and oncology rehabilitation. A multidisciplinary head and neck f/u visit was developed in collaboration with the radiation oncologists. This visit included the physician, the ONN and the clinical oncology dietitian (RD). The speech pathologist (SLP) was added to the multidisciplinary team in June 2015. The ONN implemented a system to provide f/u reminder calls to all HNC patients for 24 months post-treatment. The goal was for all HNC patients to have consistent evaluation and treatment for altered nutrition, dysphagia and lymphedema. The addition of the ONN and RD to f/u visits improved access to dietitian evaluation and patient education. While many patients in 2014 described swallow difficulty, many did not feel compelled to seek treatment. The SLP was added to the multidisciplinary H&N visit to better determine if swallow difficulty, voice changes and/or lymphedema required medical intervention. QI data collection proceeded for patients treated from 2016–2018. This study reveals that 90–100% of HNC patients are now screened for swallow dysfunction, see the RD and SLP prior to and post treatment. 2016–2018 f/u adherence improved to: 94% >6–12 months; 86% >12–18 months and 77% > 18–24 months (2016–2017). Improved screening increased appropriate referrals for oncology rehabilitation from <50% (2013) to 97% (2016) and 76% (2017). Completion of data collection for 2018 remains pending. Clinical care with SLP and RD to prevent or minimize side effects is not covered

by medical insurance. This facility utilized philanthropic funds to cover the costs for a part-time SLP and the addition of a second RD. The addition of these professionals to the multidisciplinary team allows evaluation and implementation of patient-specific nutrition and swallow interventions throughout the continuum of care.

### DECREASING C. DIFFICILE INFECTION RATES: THE BUNDLE APPROACH

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Hospital Acquired Infections (HAI) can increase oncology patient's morbidity and mortality. It is known that items shared between patients are often not cleaned properly, and bacteria on these items can remain on surfaces for weeks. Decreasing shared patient items can reduce the spread of bacteria, and therefore reduce HAIs. Specifically, *Clostridium difficile*, a bacteria that causes life-threatening diarrhea, is a huge health threat, especially in people with weakened immune systems or previous infection. While *Clostridium difficile* infection (CDI) rates have been a consistent hospital measure, in 2018 our unit noted a spike in CDI. This suggested a spread of bacteria by shared items or staff. A root-cause analysis was completed, which identified opportunities to develop an intervention plan. The purpose of this project was to decrease CDI rates on an 18 bed hematology (Heme)/oncology (Onc)/hematopoietic stem cell transplant (HSCT) unit by implementing an intervention bundle. Over 8 months our unit has implemented a multistep process to decrease our CDI rates. Our intervention bundle included: Staff education with a post test, removal of alcohol gel option outside patient room, partnership with environmental services including deep cleaning and re-education of their staff, bath compliance project, disposing of all removable commode parts including hat and bucket, and keeping vital sign machines in patient room. All of these interventions were aimed at decreasing CDI. Our unit infection rates were evaluated before the intervention bundle was implemented. In 2018, we had a total of 28 CDIs. With each intervention our unit identified a decrease in CDI and as of August 31, 2019, there have only been a total of 7 CDIs. CDI rates are measured and compared month by month from 2018 to 2019 demonstrating a significant decrease. Oncology

patients with CDI have a significantly higher mortality rate. CDI incidence is increasing nationally among oncology patients, increasing healthcare costs. Therefore, our recommendation is to maintain a high focus on CDI prevention with continual CDI education for all staff, including environmental services, patients, and families, as well as utilizing single patient items. This intervention bundle shows a best practice for reducing CDI rates on oncology units. This project shows a new multidisciplinary collaboration and bundle approach to CDI prevention.

### IMPROVING ADVERSE INFUSION REACTION RESPONSE

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Hypersensitivity reactions (HSR) to chemotherapy vary in timing, severity and predictability. They may range from mild to life threatening and can interfere with chemotherapy treatment that may otherwise be efficacious. Principles of management are important to oncology patient safety and quality of care. The prompt administration of emergency medications is essential to successful management. In a satellite clinic of a National Comprehensive Cancer Network designated cancer center in the Northeast, adverse infusion reactions occurred an average of five times per month. Divergence from the HSR Treatment Algorithm resulted in inconsistent management of these infusion reactions. The purpose of this project was to increase the percentage of infusion reaction events in which emergency medications are administered in accordance with established standards specified in a hypersensitivity treatment algorithm. A secondary aim was to evaluate the algorithm for usability among care team members. A multi-disciplinary team was formed to determine the process map for management of a hypersensitivity reaction in the clinic. Through chart review it was determined that the greatest deviation in management of hypersensitivity reactions was lack of algorithm adherence in drug administration. Feedback from care team members resulted in a revised nursing flowsheet with the goal of improving HSR algorithm adherence. This flowsheet combined the HSR grading tool and provided the order and type of emergency medications to be administered per the organization's Allergy team recommendations. In the initial phase of the project, two interventions were developed: 1. a flowsheet with

an integrated grading tool for nursing to use during a reaction, and 2. HSR management education sessions for nursing, pharmacy and provider teams. Prior to implementing these interventions, we had an average of 60% algorithm adherence across 6 months. We increased our average to 71% across a subsequent 5 month span. Chemotherapy related HSRs challenge nurses to provide prompt and effective emergency interventions. Education and involvement in the development of an evidence-based algorithmic tool for chemotherapy HSR intervention can improve adherence, resulting in improved quality and consistency of care. The results of this project prompted a review of the HSR algorithm across the organization. Revisions are underway to incorporate the grading tool and update structure to better support nursing practice.

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## RESEARCH

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### **GUIDELINE CONCORDANT CARE FOR PREVENTION OF ACUTE CHEMOTHERAPY-INDUCED NAUSEA AND VOMITING IN CHILDREN, ADOLESCENTS, AND YOUNG ADULTS**

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Chemotherapy-induced nausea and vomiting (CINV) is a common treatment-related adverse effect in children, adolescents and young adults with cancer that impacts treatment adherence and quality of life. Prescribing guideline-recommended anti-emetics is an effective strategy to prevent CINV. However, the rate of guideline concordant care (GCC) is not well-understood. Using electronic health record data from 2016 through 2018, a retrospective single-institution cohort study was conducted to investigate how often patients less than 26 years of age receive GCC to prevent CINV prior to administration of emetogenic chemotherapy. GCC was defined from the Pediatric Oncology Group of Ontario guideline for patients < 18 years and the American Society of Clinical Oncology guideline for those ≥ 18 years. Independent variables included: sex, age, insurance status, race, ethnicity,

cancer type, chemotherapy regimen, clinical setting (adult or pediatric oncology), level of emetogenicity, and patient location (inpatient or outpatient). Predictors of GCC were determined using multiple logistic regression. Of 180 eligible patients, 65 (36.1%) received GCC. In multivariable analysis, being treated in adult oncology (aOR: 14.3, CI<sub>95</sub>: 5.3–38.6), with a cisplatin-based regimen (aOR: 3.5, CI<sub>95</sub>: 1.4–9.0), solid tumor diagnosis (aOR: 2.2, CI<sub>95</sub>: 1.0–4.8), and commercial insurance (aOR: 2.4, CI<sub>95</sub>: 1.1–5.2) were associated with significantly higher likelihood of receiving GCC. Patient clinical and sociodemographic, as well as provider characteristics were all identified as being associated with receiving GCC for prevention of CINV in children, adolescents, and young adults receiving emetogenic chemotherapy. These findings can inform current efforts to optimize implementation strategies for supportive care guidelines by focusing on multi-level factors.

### **EXAMINING THE MEANING, BARRIERS, AND FACILITATORS OF ONCOLOGY NURSES' PROFESSIONAL QUALITY OF LIFE**

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Witnessing suffering and loss are intrinsic to the practice of oncology nursing and can exert a strong, cumulative effect on nurses' professional quality of life (QOL). Professional QOL is most commonly described as compassion satisfaction and compassion fatigue. Current professional QOL literature reveals a lack of an inductively derived theoretical perspective grounded in the views of oncology nurses, a lack of the "voice" and perspective that reflects the uniqueness of the practice of oncology nursing, and inconsistent findings related to facilitators and barriers. The purpose of this grounded theory study was to explore how oncology nurses experience professional QOL with a specific focus on facilitators/barriers and the actions and processes used to enhance professional QOL. Using purposive sampling, 14 oncology nurses from 10 health systems in six states participated in semi-structured interviews. Participants provided photographs to depict their perspectives of professional QOL and to promote richness in discussions during interviews. Applying Strauss and Corbin's methodology, data analysis involved open, axial, and selective coding. The central theme of professional QOL for oncology nurses is "reconciling incongruencies", which involves navigating role



strain, reconciling dissonance, and balancing competing conditions and factors. Examples of competing condition and factors include personal/professional demands, sadness/joy, and energy draining/energy generating experiences. Three related themes include the processes of “pursing a calling”, “being valued”, and “bettering the world”. The categories of extrinsic factors that can facilitate or inhibit oncology nurses’ professional QOL include the nature of oncology patients, supportive relationships and networks, and system/organizational factors. Individually, oncology nurses described strategies for processing difficult experiences, caring for themselves, regulating their approach, and addressing their response to the realities of oncology nursing to enhance their professional QOL. This theory of professional QOL differs from the currently used definitions that are apply to a broad base of caring professionals. Findings provide a theory-based foundation for future research and practice including instrument development and potential strategies to enhance professional QOL specific to oncology nurses. Novel themes identified include the core category of “reconciling incongruencies” and the importance of “presence of colleagues” and “being with patients”. This study addressed the three gaps listed above.

### **MICROBIAL GROWTH ON FINGERNAILS OF DIRECT PATIENT CARE NURSES WEARING NAIL POLISH**

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The purpose of this double-blind, randomized controlled trial was to compare the type and degree of bacterial load on fingernails of direct-care nurses with and without nail polish. Hospitalized oncology patients with sepsis due to hospital-acquired infection have 2.32 times greater odds of dying than non-cancer patients. Hand hygiene, a critical factor in preventing transmission of bacteria to patients,

has been studied extensively. Little is known about the growth of microbes on the hands of direct care nurses outside of the operative setting, particularly with respect to wearing nail polish. Rigorous evidence about the relationship of wearing nail polish to bacterial growth on nurses’ fingernails is needed in order to implement more efficacious hand hygiene to decrease the risk of transmitting pathogens to vulnerable oncology patients. Participants included 89 direct-care nurses from a multi-site comprehensive cancer center of a Midwestern academic healthcare organization. Participants’ fingers on one hand were randomly assigned to nail polish treatments: unpolished, one-day-old, and four-day-old. Nail lacquer from identical bottles was applied using consistent technique. Participants performed usual work and hand hygiene before bacterial cultures were obtained from their fingernails after one and four days. Colony forming units (CFUs) were used as a proxy measure for patient infection outcomes. Comparison of CFUs revealed that nails with intact one-day-old polish grew fewer gram-positive microorganisms than unpolished ( $p=0.04$ ). Nails with damaged four-day-old polish grew significantly more microorganisms than one-day-old ( $p=0.03$ ). Gram-negative results were similar, but statistically insignificant ( $p=0.30$ , and  $p=0.17$ ). Consistent with the Evidence-Based Model for Hand Transmission During Patient Care, increased microbial growth due to damaged polish may increase the risk of patient infection. The evidence suggests prohibiting nail polish use may help to prevent infections in patients. Key implications included: (a) Hand hygiene may be less effective for direct-care nurses wearing damaged polish than those with unpolished nails. (b) Undamaged polish may transiently reduce microbial growth. (c) Polish may remain undamaged too briefly for HAI prevention. Prior studies lacked sufficient generalizability and rigor. Based on the evidence, the optimal strategy for preventing infection transmission from nurses’ hands to oncology patients appears to be for nurses not to wear nail polish or other nail adornments.

### **GUT MICROBIOME AND SYMPTOM BURDEN IN WOMEN RECEIVING TAXANE-BASED CHEMOTHERAPY FOR BREAST CANCER**

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Unrelieved gastrointestinal (GI) symptoms in people with cancer can lead to increased symptom burden, reduced QoL, and increased mortality. Changes in the

naturally occurring bacteria of the gut, known as the GI microbiome, may influence GI symptom burden. However, microbiome research is relatively new and there is no clear evidence for if and how the GI microbiome changes during chemotherapy or if this change influences GI symptoms. The purpose of this project was to describe the GI microbiome and GI symptom burden in women with breast cancer receiving chemotherapy. This is a descriptive, cross-sectional design collecting stool samples, symptoms, symptom interference with daily life, and quality of life (QoL) from 25 women with breast cancer receiving taxane-based chemotherapy and women with no recent history of cancer. Stool will be prepared for 16S Ribosomal RNA analysis using methods adapted from the NIH-Human Microbiome Project. The GI microbiome will be described based on presence and abundance of bacteria. Symptom burden will be measured using a modified version of the Memorial Symptom Assessment Scale, the MD Anderson Symptom Inventory, and the Fox Simple QoL Scale. Absolute numbers and relative percentages of GI bacteria will be quantified for people with cancer and compared to that of age and sex matched controls using the Wilcoxon-Mann-Whitney test. Stool collection is complete and analysis is in progress. Should GI microbiome and symptom burden differ between the breast cancer and healthy control groups, further analyses will explore if individual bacteria may be responsible for these differences in symptom burden. Understanding how the GI microbiome may change due to cancer and chemotherapy and how these changes may influence symptom presence or severity is critical to understanding potential biologic mechanisms underlying symptom burden. This knowledge will lead to the development of therapies to prevent or correct alterations in the GI microbiome, thus improving QoL in women with breast cancer. This work is innovative in that we are using “omic” analysis to explore causes for symptom burden in people with cancer. Understanding the biologic mechanisms driving symptoms is necessary for the development of customized therapies to prevent or correct imbalances in the GI microbiome which will reduce symptoms and improve QoL in people with cancer.

#### **CAN SELF-REPORTED ARM SWELLING AND LYMPHEDEMA SYMPTOMS OBJECTIVELY PREDICT MEASURABLE LYMPHEDEMA?**

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Self-reported arm-swelling and lymphedema symptoms in breast cancer survivors are often the first indication of lymphedema. However, objective measures of lymph volume change (LVC) have been used to assess and detect lymphedema and little is known about the relationship between self-report of arm-swelling and lymphedema symptoms and objectively measured LVC. The purpose of this study was to determine if self-reported arm-swelling and lymphedema symptoms objectively predict measurable LVC. The data were prospectively collected from 140 women between December 2011 and April 2014. The inclusion criteria were women aged 21 years and older with a first-time diagnosis of stage I–III breast cancer and scheduled for surgical treatment. We compared LVC  $\geq 5\%$  measured by perometer with self-report of arm-swelling and 22 lymphedema symptoms on the Breast Cancer & Lymphedema Symptom Experience (BCLE-SEI) at pre-surgery, four to eight-weeks and one-year post surgery. There were significant associations between self-reported arm-swelling and LVC  $\geq 5\%$  at four to eight-weeks ( $r=.202$ ,  $p=.017$ ) and at one-year post-surgery ( $r=.422$ ,  $p=.000$ ). The mean lymphedema symptom score for LVC  $\geq 5\%$  was 16.3 (SD=11.2,  $p=.005$ ) and 10.0 (SD=12.8,  $p=.013$ ) at four to eight-weeks and one-year post-surgery, respectively. Participants who reported swelling (No vs. Yes) were five and eight times more likely to have LVC  $\geq 5\%$  at four to eight-weeks (OR=5.852,  $p=.002$ , 95% CI=1.867–18.339) and one-year (OR=8.784,  $p=.000$ , 95% CI=3.285–23.487) post-surgery. Women who reported having arm-swelling somewhat, quite a bit or severe were 24 times and 36 times more likely to have LVC  $\geq 5\%$  at four to eight-weeks (OR=24,  $p=.006$ , 95% CI=2.544–226.453) and one-year (OR=36.174,  $p=.001$ , 95% CI=4.310–308.592) post-surgery. Participants who reported total lymphedema symptom score  $\geq 5$  are 2.9 times more likely to have LVC  $\geq 5\%$  at one-year post-surgery (OR=2.90,  $p=.011$ , 95% CI= 1.274–6.648). Early detection is essential for successful clinical management of lymphedema. Our study demonstrates that self-report of arm swelling and lymphedema symptoms using the BCL-SEI can be a cost-effective lymphedema screening tool.

#### **EXPLORING FINANCIAL HARDSHIP AND QUALITY OF LIFE IN PATIENTS WITH ADVANCED CANCER IN THE AMBULATORY PALLIATIVE CARE SETTING**

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Cancer patients are experiencing increasing financial hardship (FH) and associated negative health outcomes as cancer care costs rise. Previous FH studies have neglected patients with advanced cancers, impeding vital communication about how FH impacts patients' wellbeing and goals of care. The purpose of this study is to describe FH and explore its relationship to quality of life (QOL) in patients with advanced cancer receiving ambulatory palliative care services. This ongoing, cross-sectional, descriptive pilot study of adults with advanced cancer is recruiting from two ambulatory palliative care clinics serving rural and urban communities in the Southeast. We assess subjective and objective FH (Comprehensive Score for financial Toxicity [COST; 0–44, lower=worse] and Medical Expenditure Panel Survey Cancer Supplement); QOL (RAND SF36 [eight 0–100 scales, lower=worse]); symptom burden (PRO-CTCAE [0–4, none-very severe]); and sociodemographic and clinical characteristics (self-report and medical record review). We computed descriptive statistics to characterize the sample and describe FH. We ran Pearson product-moment correlations to determine relationships between FH and QOL. The average participant (n=50) age was 56.1 years (SD=11.6). Most were female (65%), White (64%) or Black (32%), married (50%) or divorced (24%), and had a broad range of educational backgrounds and cancer diagnoses. Median time since cancer diagnosis was 35 months (IQR=58.5–8.5). ECOG performance status was <1 for most (74%). Almost half (48%) identified themselves as their primary caregiver. Highest mean symptom severity scores were for pain (2.3, SD=1.0) and fatigue (2.1, SD=1.1). The mean COST score was 16.0 (SD=10.4). 58% had some (n=25) or extreme (n=4) difficulty paying for basic needs. 28% (n=14) incurred family debt due to cancer. Lowest mean QOL scale scores were for role limitations due to physical (21.4, SD=35.4) and emotional (33.3, SD=40.4) problems. A weak positive correlation was found between the COST subjective measure of FH and the QOL Role Limitations Due to Emotional Problems scale ( $r = .282$ ,  $n = 50$ ,  $p = .047$ ). High FH, low QOL, and moderate pain and fatigue scores demonstrate the need for continued

clinical support for and research among patients with advanced cancer. Data support links between FH and QOL role limitations. Larger, longitudinal studies are needed to fill research gaps about how FH affects QOL in patients with advanced cancer.

## EXPLORING SYMPTOM CLUSTERS IN PROSTATE CANCER SURVIVORS

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A symptom cluster is a group of two or more symptoms that are correlated with each other and that occur simultaneously. Little research has focused on symptom clusters in prostate cancer, particularly in survivors who may persistently experience or newly develop multiple, concurrent symptoms after treatment ends. The purpose of this study is to (1) identify symptom clusters based on four highly prevalent symptoms (pain, fatigue, sleep disturbance, depressive symptoms), (2) to determine socio-demographic and clinical factors influencing symptom cluster membership, and (3) explore the impact of symptom clusters on functional outcomes. This study was guided by the theory of unpleasant symptoms (TUS). It utilized a large, nationally representative sample, well-validated/reliable patient-reported outcomes, and an advanced statistical approach, latent class analysis, which is the key for accurate symptom cluster identification. This study is a cross sectional secondary analysis of data obtained from My-Health study in partnership with four SEER cancer registries located in California (two), Louisiana, and New Jersey. The sample included 1,060 prostate cancer survivors who were evaluated 6–13 months after diagnosis. Four symptoms (pain, fatigue, sleep disturbance, and depressive symptoms) and functional outcomes (physical, social role, and cognitive functions) were measured by PROMIS®. Symptom clusters were explored using latent class profile analysis. The subjects were predominately age 21–64 years at diagnosis (69%), Caucasian (51%), married/cohabitating (73%) and unemployed (57%). The prevalence rates include: pain (37%), fatigue (46%), sleep disturbance (48%), and depressive symptoms (25%). Four distinct symptom clusters were identified: symptoms within normal limits (Class 1), pain with fatigue and sleep disturbance (Class 2), depression with fatigue

and sleep disturbance (Class 3), and all high symptom burden (Class 4). Characteristics associated with class membership included age < 65 at diagnosis, unmarried, low education levels, low income, unemployment, and increased comorbidities. Prostate cancer survivors in the symptomatic clusters (Class 2, 3, 4) experienced lower physical, social role, and cognitive functions. Identification of symptom clusters will be useful for recognition of symptoms as a group rather than isolated experiences among prostate cancer survivors. These clinical insights may promote the development and delivery of efficacious strategies that target co-occurring symptoms. In addition, information about patient risk for a higher symptom burden may be helpful to guide individualized symptom management interventions.

### **SYMPTOM CLUSTERS IN CANCER SURVIVORS: IDENTIFYING DIFFERENCES BASED ON TYPE OF CANCER**

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Research on symptom clusters in oncology is progressing. Several important questions, however, remain unanswered. One question is whether the number and types of symptom clusters differ based on types of cancer. Nonetheless, little consistency exists in symptom clusters depending on cancer types. The purpose of this study is to identify symptom clusters based on four highly prevalent symptoms (pain, fatigue, sleep disturbance, and depression); and to investigate the consistency of the number and types of symptom clusters. This study a cross-sectional secondary analysis of data obtained from a community-based cancer registry linked survey. The sample included 4,762 cancer survivors 6–13 months following diagnosis of one of seven cancers (prostate, non-small cell lung, Non-Hodgkin lymphoma (NHL), breast, uterine, cervical or colorectal). Latent class profile analysis was used to identify clusters in four symptoms (PROMIS® pain, fatigue, sleep disturbance, and depression). Subjects were primarily young (59% age 21–64 years), Caucasian (41%), married/cohabitating (58%) and unemployed (55%). In prostate, lung, NHL, and breast cancer survivors, four symptom clusters were identified: Symptoms within normal limits (SWNL) (Class 1); Pain with fatigue and sleep disturbance (FS) (Class 2); Depression with FS (Class 3);

and All high symptom burden (Class 4). In uterine and cervical cancer survivors, we found three symptom clusters: SWNL (Class 1); FS (Class 2); and All high symptom burden (Class 3). Two clusters were identified in survivors with colorectal cancer; SWNL (Class 1); and All high symptom burden (Class 2). This study is the first known to identify and compare symptom clusters based on cancer types. Identification of symptom clusters in heterogeneous populations of cancer survivors may lead to the development of innovative and effective targeted interventions for cancer survivors. Further research is needed to establish extensive knowledge in samples of patients who undergoing active cancer treatment, in terms of their cancer diagnoses and/or types of cancer treatment.

### **EVALUATING SLEEP QUALITY AS A PRELIMINARY OUTCOME OF BREATHE EASIER: A MINDFULNESS-BASED INTERVENTION FOR SURVIVORS OF LUNG CANCER AND FAMILY MEMBERS (DYADS)**

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Improvements in early detection and curative therapies have led to increased numbers of long-term survivors of non-small cell lung cancer (NSCLC). Improving the quality of life of survivors requires attention to persistent, burdensome symptoms, including sleep quality. This study explored the effect of a Breathe Easier intervention on self-reported sleep quality and quantity in early-stage (I–IIIA) survivors of NSCLC and their family members (together, forming dyads). The study employed a prospective, one-group, repeated measures design. Two cancer survivors and 30 dyads (N=62), each composed of the survivor and family member, were recruited from two community cancer programs in the Southeastern United States. Participants completed an 8-week, face-to-face intervention accompanied by home assignments. The intervention included breathing exercises, individual and partner yoga movements, meditations, and group discussion. Sleep quality and quantity were measured pre- and post-intervention using the Pittsburgh Sleep Quality Index. Descriptive statistics included means, medians, and frequencies; Student's t-tests or chi-square tests were performed



to assess subset differences. Stratified analyses were conducted separately on the survivor and family member groups due to within-dyad correlation. The majority of survivors were females (56%; n=18) and African Americans (63%; n=20). Most family members (57%; n = 17) were spouses. Post-intervention, all participants reported improved global sleep quality, sleep efficiency, increased sleep duration, and decreased daytime dysfunction. Sleep onset latency, sleep disturbance, and use of sleep medication also decreased. Survivors and their family members experience poor sleep quality. Preliminary outcome data indicate sleep benefits due to Breathe Easier. Further research is needed to develop a comprehensive understanding of the sleep characteristics and other influencing factors for survivors and family members. This research contributes to the minimal evidence in the literature addressing symptoms and symptom management of survivors of early-stage lung cancer. Second, this research includes an understudied population, African-Americans. Third, findings contribute to the growing field of sleep quality, which affect survivors of lung cancer, their family members, and individuals with other cancer diagnoses. Fourth, dyadic interventions are increasingly showing promise as improvements are seen simultaneously in survivors and family members.

### **STABILITY OF SYMPTOMS AND SYMPTOM CLUSTERS OVER TIME FOR WOMEN WITH RECURRENT OVARIAN CANCER ON GOG-259—A GOG/NRG ONCOLOGY STUDY**

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Women with recurrent ovarian cancer are living longer and experience a wide range of co-occurring symptoms. While the symptom experiences of women with recurrent ovarian cancer have been well described, little is known about the stability and

clustering of symptoms over time. The purposes of this study were to 1) evaluate the stability of individual symptoms over time and 2) evaluate differences in the number and types of symptom clusters across time. This sub-sample of patients included women (n=294) with recurrent ovarian cancer experiencing 3 or more bothersome symptoms who participated in the GOG-259 WRITE Symptoms trial (total N=497), AND completed 4 consecutive monthly symptom severity reports during the long-term follow up phase of the WRITE Symptoms study. The Symptom Representation Questionnaire was used to assess the occurrence and severity of 19 priority symptoms for women with ovarian cancer. Stability of symptoms was evaluated using intra-class correlations with a 2-way mixed-effects model and using an absolute agreement definition. Stability of symptom clusters was evaluated comparing exploratory factor analyses at each timepoint. The most stable symptoms over time were lymphedema (ICC=.721); Peripheral Neuropathy (ICC=.760) and; Sexuality Concerns (ICC=.741). The least stable symptom was Nausea (ICC=.442). Across the four assessments, six distinct symptom clusters were identified; however, only three of these clusters (Emotional/Cognitive, GI Distress, and Peripheral Pain/Swelling) were relatively stable over time. Symptoms demonstrated varying levels of stability over time. Knowledge about the relative stability of different symptoms could guide clinical assessment, intervention and education of women with recurrent ovarian cancer. The presence of 3 stable symptom clusters can guide future research by providing insight into possible mechanisms of common symptom clusters in women with recurrent ovarian cancer.

### **CONGRUENCE OF PAIN PERCEPTIONS BETWEEN AFRICAN AMERICAN CANCER PATIENTS AND THEIR CAREGIVERS**

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The role of informal caregivers (CG) in pain assessment is a primary component of pain management. Little is known about congruence of pain perceptions



between African American (AA) cancer patients and their CG. This study aimed to evaluate congruence in pain severity and interference among AA patients taking opioids for cancer pain and their CG. Using a cross-sectional study design (N=50 dyads), AA cancer patients and their CG independently assessed patients' pain severity (current, average, worst) and pain interference in daily activities (e.g., relations with others, enjoyment of life, and sleep) using the Brief Pain Inventory (BPI) (0–10 numerical rating scales). Paired sample t-tests and intraclass correlation coefficient (ICC) based on a one-way random effects model were used to test congruence on pain severity and interference. Bland-Altman plot were used to visualize the congruence. Based on literature, a cutoff of clinically relevant mean differences in pain scores was established as 2 points. Among 50 dyads, 62.0% of patients and 56.0% of CG were female. Patients were significantly older than CG (56.5 vs. 49.9 years,  $p=.008$ ). Neither statistically significant (t-test) nor clinically relevant mean differences in pain severity and interference were found. At a dyad level, congruence was poor in current ( $ICC=0.35$ , 95% Confidence Intervals [CI]=[-0.14, 0.63]) and average pain severity ( $ICC=0.44$ , CI=[0.01, 0.68]), but moderate in worst pain severity ( $ICC=0.69$ , CI=[0.46, 0.83]). Congruence on overall pain interference was moderate ( $ICC=0.69$ , CI=[0.29, 0.78]). Among pain interference items, relations with others ( $ICC=0.15$ , CI=[-0.49, 0.52]), enjoyment of life ( $ICC=0.22$ , CI=[-0.38, 0.55]), and sleep ( $ICC=0.39$ , CI=[-0.49, 0.52]) indicated poor congruence. The Bland-Altman plots of individual items showed a wide range of 95% limits of agreement exceeding the cutoff of clinically relevant substantial differences ( $\geq 4$  points) in pain severity and inference. Health-care providers often rely on CG to assess patients' cancer pain. At the dyad level, CG tended to have a poor congruence on pain severity and interference with AA cancer patients taking opioids. Better communication about pain may result in better congruence between patients and CG in pain perception, positively impacting pain management and the safety of opioids use. Paying attention to patients' pain experience could be a key to optimal and safe pain management in AA cancer patients taking opioids.

#### **MUSCLE STRENGTH AND BODY COMPOSITION AS OBJECTIVE INDICATORS OF CANCER-RELATED FATIGUE: A SYSTEMATIC REVIEW**

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There is limited information about muscle strength-related objective measurements to assess Cancer-related Fatigue (CRF). Therefore, the purpose of this systematic review was to identify muscle strength and body composition as objective measurements for fatigue in cancer patients and further analyze the correlations of muscle strength variables and fatigue. A systematic electronic literature search was conducted using PubMed, PsycINFO, CINAHL databases, and manual searches from January 2008–August 2019. The search strategy involved using the combined terms “fatigue” AND “cancer” OR “cancer related fatigue” with “muscle strength” “physical performance” “physical capability” “body composition” OR “muscle mass” OR “percentage of body fat.” The search yielded 1074 CRF and muscle strength records. Of those, 14 articles were selected after applying inclusion and exclusion criteria with a sample size of 147. Twenty-three objective muscle strength and body composition measurements were identified in the 14 studies. Among those studies, the measurement of handgrip strength and percentage of body fat were the most commonly used criteria. The correlation coefficient of strength between fatigue and handgrip strength was from very weak to very strong positively while only one study stated that greater handgrip strength was significantly associated with lower physical fatigue. There were 3 studies which showed that lower limbs muscle strength was significantly associated with higher levels of fatigue, although 3 of those studies reported a null association between lower body strength and fatigue. Two studies reported a significant association between 6-minute walk test (6MWT) results and fatigue while one study represented this as nonsignificant. Higher percentage of body fat was associated with higher levels of fatigue in 2 of studies while one study indicated this as a null association. Handgrip strength, lower strength, 6MWT and percentage of body fat were shown to have significant association in several studies. However, further investigation on the testing of the association of handgrip strength, percentage of body fat and fatigue is required for determining an optimal test with better accuracy and quality to evaluate CRF. The objective measurements for CRF assessment might be helpful to evaluate fatigue more concretely. Further studies on the causal inference testing on handgrip strength and percentage of body fat as indicators for CRF is needed.

## **DISTINCT SENSORY PROFILES IN CANCER SURVIVORS WITH CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY (CIPN)**

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CIPN occurs in approximately 40% of cancer survivors and has deleterious effects on their functional status and quality of life (QOL). While these effects are well documented, it is not known if subgroups of survivors have different CIPN sensory profiles. The determination of these subgroups and associated characteristics could lead to the identification of high risk survivors and to the initiation of more prompt, albeit limited interventions. The purpose was to identify subgroups of survivors with distinct CIPN sensory profiles and to evaluate for differences in demographic and clinical characteristics, as well as QOL outcomes between these subgroups. The 405 survivors with CIPN completed self-report questions and underwent a neurological examination that included an evaluation of light touch, cold, and pain sensations; vibration thresholds; and balance. Latent profile analysis was used to identify subgroups of survivors with distinct CIPN sensory profiles using ratings of worst pain, as well as objective measures of sensation, vibration, and balance. Differences between the latent classes were evaluated using Independent Student's t-tests and Chi Square analyses. Two subgroups of survivors with distinct CIPN sensory profiles were identified (i.e., less severe loss of lower extremity (LE) function (76.5%); more severe loss of LE function (23.5%). Compared to the less severe subgroup, survivors in the more severe subgroup had higher worst pain scores, higher number of sites with loss of protective sensations, and worse balance scores. Survivors in the more severe class were: older, more likely to be male, live alone, be unemployed, have a lower annual household income, have a higher body mass index, a worse comorbidity profile, a poorer functional status, and were more likely to be a current or previous smoker and less likely to exercise on a regular basis. Of note, these survivors had worse QOL scores. Findings suggest that subgroups of survivors with distinct CIPN profiles can be identified. Some of the risk factors associated with the more severe profile are modifiable (e.g., body mass index, exercise) and can be targeted with nursing interventions. Oncology nurses need to perform a comprehensive neurological assessment of

survivors with CIPN to determine the degree of sensory loss and associated balance problems. Additional research is warranted to determine the underlying mechanisms for these two distinct CIPN profiles.

## **NOVEL METHODS FOR INTERVENTION DESIGN BY CANCER SURVIVORS, FOR CANCER SURVIVORS**

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With the aging of the population and improving cancer detection/treatment, an estimated 16.9 million cancer survivors in the US require expert nursing care. The number is expected to increase to 20.3 million by 2026. Lacking strong empirical evidence, survivorship care is largely based on expert opinion and generally lacks attention to patient perspectives. A 3-year partnership of 17–23 cancer survivors, health-care providers, family caregivers, researchers, and advocates collaboratively created a novel, post-treatment intervention for survivors of cancer. The purpose of this presentation is to describe the intervention designed by and for survivors of cancer. The partnership collaboratively identified issues and challenges post-treatment survivors experience then used varied methods (group meetings, literature review, surveys, focus groups, expert interviews, training workshops) over 2 years to consolidate the issues into the most common and pressing needs of initial post-treatment survivorship. Survivor-led teams gathered patient-centered data from 18 cancer survivors selected purposively to include varied diagnoses, ages, and lengths of survivorship. Interview data were thematically analyzed and poignant quotes selected to richly define the themes. Data analysis confirmed five phases of early post-treatment survivorship identified as validate, connect, embrace, reset and reframe, and take charge. The partnership created a manualized intervention based on the five phases. Delivered over six months beginning eight weeks after completion of active treatment, the intervention includes calls from trained professional and lay research assistants at five time points. Examples of intervention content and structure pertaining to the five phases will be shared. Attention to patient-centeredness in research is growing; patient engagement is time intensive but invaluable. The presentation will discuss creative methods to enable patient engagement in research.

Intervention development fostered innovative work for and by survivors and resulted in a novel plan to transform survivorship care. Further testing of the intervention is being planned.

### **COLLECTIVE SUFFERING IN ISOLATION: USE OF STORYTELLING THROUGH MUSIC TO DECREASE LONELINESS AMONG ONCOLOGY NURSES**

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The rates of burnout are increasing among health-care professionals in the US. While heavy workloads contribute to workplace stress, loneliness within the context of emotional exhaustion also contributes significantly to burnout. Loneliness has a tremendous impact on psychological and physical health and longevity. Research indicates that oncology nurses cope with work-related emotions in isolation. The relationship between loneliness and burnout has been studied in physicians, but little research has been done with nurses. The purpose of this study was to explore the effects of an innovative 6-week intervention that combines storytelling, expressive writing, and music to address the workplace emotions, including loneliness, related to caring for people with cancer. Two-group, quasi-experimental design utilizing both quantitative and qualitative methods. Convenience sampling was used to recruit 43 oncology nurses to either the intervention or comparison group. Data were collected in both groups at 4 different time points, pre- and post-intervention, with self-report scales and open-ended questionnaires. Participants were primarily female (95%) and white (98%), yet 27% self-reported Hispanic ethnicity. The average age was 38.2 years and 65% had at least a bachelor's degree. The majority of the sample were working full-time in an outpatient oncology setting. There were no background differences between the intervention and comparison groups. Bivariate correlations were conducted on all measures and background data at time 1 (N=43) and revealed that higher levels of loneliness were significantly correlated with more burnout ( $r=.685$ ,  $p<.001$ ) and depression ( $r=.587$ ,  $p<.001$ ), lower compassion satisfaction ( $r=-.536$ ,  $p<.001$ ) and self-compassion ( $r=-.362$ ,  $p<.05$ ), and working with adult patients ( $r=-.306$ ,  $p<.05$ ). Across the 4-time points, those who participated in the intervention had a significant decrease in loneliness  $F(3, 98) =$

$7.46$ ,  $p<.001$ ; ( $=.157$ ) compared to those who did not. Qualitative comments reflect that one of the most meaningful aspects of participation was realizing that they were not alone in their emotional experience. In healthcare, there is little opportunity to reflect on the impact caregiving has on self. "Storytelling Through Music" provided a setting for the oncology nurses to discuss their emotions with their peers, thus providing a community and the opportunity to learn that they are not alone. Interventions aimed at addressing emotional exhaustion and decreasing loneliness may significantly contribute to decreasing burnout and warrant further study.

### **BARRIERS TO ADEQUATE PAIN CONTROL AND OPIOID USE AMONG CANCER SURVIVORS**

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The purpose of this study was to explore perceptions of opioid use and pain management among cancer survivors, who often have unresolved pain that results from cancer or cancer treatment. Recent opioid-specific policy enactments and regulations have caused restricted prescribing of pain medication for cancer survivors who suffer both short and long term effects of cancer or cancer treatment. Such policy and regulations, in addition to media coverage of the opioid epidemic, have resulted in both direct and indirect challenges to adequate pain control and access to pain medication for cancer survivors. Inadequate pain control can lead to decreased physical function, depressive symptoms, anxiety, loss of employment, and decreased quality of life. This research was an exploratory pilot study using individual in-depth qualitative interviews with cancer survivors to assess perceptions of opioid use and pain management. Community-based recruitment strategies were employed. Data was analyzed using applied thematic analysis techniques. Twenty-five cancer survivors were interviewed. The sample was mostly female (96%) with breast cancer (87.5%). Mean age was 56 years. Participants identified as White (36%), African American (48%), Hispanic (12%), or multicultural (4%). Barriers to adequate pain control were multifactorial and included: 1) lack of education regarding

opioids; 2) fear of addiction; 3) negative experiences with or perceptions of opioids; 4) influence of family and/or personal concern over side effects of opioids; 5) taking less opioid medication than prescribed; 6) hesitancy of the physician to prescribe pain medication; 7) lack of local pharmacy supply of prescribed opioids and/or tight restrictions for picking up the opioid; 8) lack of insurance coverage/costly out of pocket fees for alternative treatments for pain; and 9) new restrictive opioid-specific policies and regulations. Cancer survivors have unmanaged pain due to a multitude of both internal and external factors. Oncology nurses are at the forefront of assessing and addressing pain. Nurses need to advocate for proper pain management in survivorship by supporting policy change including appropriate insurance coverage for opioids and alternative treatments for pain, appropriate opioid prescribing guidelines cancer survivors who may suffer both short and long term effects of cancer or cancer treatment, and standardized education specific to opioids.

### **A CULTURALLY TAILORED EDUCATION PROGRAM TO REDUCE BREAST CANCER RISK IN KOREAN IMMIGRANT WOMEN: OVERVIEW AND PARTICIPANT CHARACTERISTICS**

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Asian American women often receive diagnoses for several diseases in their advanced stages, including breast cancer. In fact, the increase in breast cancer rates among Korean American (KA) women, coupled with their low screening rates, strongly suggest the need for effective, culture-specific interventions. An ongoing, 3-year study aims to develop, implement, and evaluate a community-based, and culturally tailored educational program in NYC to reduce breast cancer risk factors and to increase uptake of breast cancer screening among overweight or obese KA women aged 40 or over. The “Korean Breast Cancer Risk Reduction

Program (KBCRRP)” was developed to achieve 4 specific goals: a) healthy weight; b) physically active lifestyle; c) healthy diet, and d) breast cancer screening and adherence. KBCRRP is specifically targeted to address traditional Korean health beliefs to reduce breast cancer risk factors and structural and cultural barriers for breast cancer screening. The intervention involves 8 weeks of in-person group sessions led by a team of health professionals and 16 weeks of follow-up sessions involving smart phone applications, phone calls, and text messaging from lifestyle coaches. A control group receives written/online materials regarding general cancer risk factors, screening guidelines, and healthy lifestyle. Members of both groups will receive the same opportunities to obtain free mammography during the program. In year 1, 30 participants (15 control and 15 intervention) were enrolled, completed the 8-week program, and are currently undergoing follow-up sessions. Descriptive statistics were conducted to document sample characteristics and healthcare access and utilization. The average age of participants was 58.23 years (SD: 6.64), the majority was married, were at least high school graduates, employed, and spoke Korean at home with limited English proficiency. Two thirds reported chronic diseases and perceived their health as fair to poor. The majority had health insurance and a usual source of care and had seen their health providers last year. However, participants did not often receive preventive services: in the past year, only 63.3% had a regular physical exam, 46.7% had a mammogram, and 40% had a clinical breast exam, and only 60% had a Pap smear in the last 3 years. We hypothesize that KBCRRP will increase breast cancer related health care access and utilization and reduce its morbidity and mortality among participating KA women.

### **MANAGING SYMPTOMS VIA HOME-BASED CAREGIVER-DELIVERED REFLEXOLOGY**

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The involvement of friend or family caregivers in the home may be a significant avenue for the delivery of supportive care. This trial tested the effects of caregiver-delivered reflexology on multiple symptoms experienced by women undergoing chemotherapy, targeted or hormonal therapy for advanced breast cancer.



We present the results from an analysis that treats multiple symptoms as nested within patients and overcomes the drawbacks of lumping multiple symptoms into an index. This trial enrolled 256 patient-caregiver dyads that were randomized to either 4 weeks of reflexology or attention control. Caregivers were trained by reflexology providers to deliver weekly 30-minute sessions to patients. Thirteen symptoms were assessed for all patients at baseline, weekly over 4 weeks, and at week 5 using the M.D. Anderson Symptom Inventory. Each symptom was categorized as mild, moderate, or severe using established interference-based cut-points, and symptom response was defined as an improvement by at least one category. Symptom responses were treated as multiple events within patients and analyzed using generalized estimating equations technique. Reflexology was more successful than attention control in producing responses for fatigue [odds ratio (OR) 1.76, 95% confidence interval (CI) (1.01, 3.09),  $p=.05$ ] and pain [OR=1.84, 95% CI (1.05, 3.21),  $p=.03$ ], with no significant difference for other symptoms. In the reflexology group, 56% of patients were responders on fatigue and had on average fewer comorbid conditions than non-responders, difference of 1.86 [95% CI (0.72, 3.00),  $p<.01$ ]. Responders on pain (76%) had lower average Center for Epidemiologic Studies-Depression score compared to non-responders, difference of 7.08 [95% CI (2.21, 11.21),  $p<.01$ ]. Home-based caregiver-delivered reflexology is helpful in producing responses on physical symptoms of fatigue and pain. Comorbid conditions and depression are potentially important tailoring factors for future research and can be used to identify patients who may benefit from reflexology. Tailored care for cancer patients in treatment can be achieved through brief weekly symptom assessments and consideration of comorbid conditions.

#### **FACTORS ASSOCIATED WITH CAREGIVING BURDEN AND PSYCHOLOGICAL DISTRESS IN CANCER CAREGIVERS PROVIDING COMPLEMENTARY THERAPIES AS HOME-BASED SYMPTOM MANAGEMENT**

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Informal caregivers are anticipated to perform the supportive care to people with cancer at the home setting. These may experience high levels of perceived

burden and increased psychological distress associated with caregiving responsibilities. The purpose of this study was to explore factors associated with caregiver burden including socio-demographic characteristics, comorbid conditions, anxiety, and depression among caregivers who agreed to provide a home-based symptom management intervention to cancer patients undergoing chemotherapy or targeted therapy for solid tumor cancers. Participants included 308 caregivers who agreed to be trained in the delivery of complementary therapies, reflexology or meditative practices, to manage symptoms experienced by their care recipients. Baseline data from a sequential multiple assignment randomized trial (SMART), collected prior to caregiver training in or delivery of interventions, were analyzed. Caregiver burden and caregivers' comorbid conditions, anxiety, and depression were measured using self-reported instruments including the Caregiver Reaction Assessment Tool (CRAT), Bayliss Comorbidity Tool, and PROMIS-29 v1.0-Anxiety and Depression Short Forms. Multivariable general linear models were used to relate these variables to the five dimensions of caregiver burden: self-esteem, health burden, schedule interruption, family support, and financial burden. The majority of caregivers (57%) were female, 61% were spouses or partners, and 74% resided with the care recipient. Younger caregiver age, race other than white, being spouse or partner of the care recipient, being employed, higher depression and anxiety were significantly associated with increasing risk of problems in the CRAT dimensions of self-esteem, health, and schedule burden (10%–26% of explained variance in the multivariable models). Caregiver depression and anxiety but not socio-demographic characteristics were significant factors influencing the CRAT dimensions of family support and financial burden, with 8%–10% of explained variance. Assessment of caregiver's socio-demographic characteristics, depression, and anxiety may be used to identify caregivers with the greatest pre-existing perceived caregiver burden prior to participation in intervention trials.

#### **THE EFFECTS OF UNCERTAINTY AND EMOTIONAL DISTRESS ON QUALITY OF LIFE IN PATIENTS WITH ADVANCED CANCER AND THEIR FAMILY CAREGIVERS: TESTING DYADIC RELATIONSHIP USING THE ACTOR-PARTNER INTERDEPENDENT MODEL**

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This analysis examines whether interdependence of the psychological experience (i.e., uncertainty, emotional distress) in older patients with advanced cancer and their family caregivers influences their quality of life (QoL). The specific aims are to: (1) examine the effects of patients' and caregivers' uncertainty on their own (i.e., actor effect) and the other dyad members' QoL (i.e., partner effect) and (2) explore the effects of patients' and caregivers' emotional distress on their own and the other dyad members' QoL. Both patients with advanced cancer and their caregivers experience uncertainty and emotional distress, which negatively influences QoL. Studies suggest that emotional distress in patients and caregivers are interrelated. However, few studies have examined the interrelationships, specifically the degree to which patient uncertainty and emotional distress are related to caregiver QoL and vice versa. This secondary analysis uses baseline data from a national cluster randomized controlled trial (PI: Mohile) examining a geriatric assessment based intervention in older patients with advanced cancer

and their family caregivers. Patients and caregivers completed the modified 9-item Mishel Uncertainty in Illness Scale and the Distress Thermometer. Quality of life was assessed with the Functional Assessment of Cancer Therapy (patients), and the SF-12 (caregivers). Dyadic data were analyzed using the Actor-Partner Interdependence Model with a distinguishable dyad regression model using SPSS 24.0. The sample included 372 dyads (patient age  $M=76.69$ ,  $SD=5.38$ ; caregiver age  $M=66.48$ ,  $SD=12.48$ ). Uncertainty exhibited an actor effect on QoL for both patients and caregivers ( $\beta=-.33$ ,  $p<.001$ ), but no partner effects of uncertainty were observed ( $\beta=-.03$ ,  $p=.227$ ). Patient and caregiver emotional distress were significant predictors of their own QoL ( $\beta=-.36$ ,  $p<.001$ ) and the other dyad member's QoL ( $\beta=-.06$ ,  $p=.032$ ). In our sample of older adults with advanced cancer and their caregivers, an individual's own uncertainty exerted a more negative influence on their QoL than their partner's uncertainty whereas emotional distress had a stronger interdependent effect. These results reinforce the importance of addressing uncertainty and emotional distress in both older patients with cancer and their caregivers in clinical practice. Future research should examine whether dyadic or individual focused interventions for patients and their caregivers are optimal.