

# Late-Breaking Abstracts

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## RESEARCH PODIUM SESSIONS

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### LONG-TERM TRAJECTORY OF OBJECTIVELY MEASURED COGNITIVE FUNCTION WITH AROMATASE INHIBITOR THERAPY IN WOMEN WITH EARLY-STAGE BREAST CANCER

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We previously found deteriorations in working memory and attention with aromatase inhibitor (AI) therapy in postmenopausal women with breast cancer and that, compared to matched-controls, women with breast cancer have poorer executive function before adjuvant therapy (AI +/- chemotherapy) that persists through the first 18 months of therapy. However, the trajectory of cognitive function through the 5-year AI therapy course has not been documented, nor is it clear whether cognitive function recovers post-therapy. The purpose of this study was to determine the long term effect of AI therapy on objectively-measured cognitive function in postmenopausal women with early stage breast cancer and whether cognitive function recovers 1 year post-therapy relative to pre-therapy and the last assessment while on therapy. Using a comprehensive, objective battery, cognitive function was assessed before therapy, semiannually years 1 and 2 of therapy, annually years 3 through 5 of therapy and one year post-therapy in 83 postmenopausal women with breast cancer and matched controls. Data were analyzed using linear mixed modeling; covariates including age, IQ (National Adult Reading Test-R), depression (Beck Depression Inventory-II), anxiety (Profile of Mood States (POMS) Tension/Anxiety), fatigue (POMS Fatigue/Inertia) and pain (Brief Pain Inventory) were assessed concurrently with cognitive function. Relative to pre-therapy, women who received AIs alone had poorer concentration ( $p=.02$ ) and psychomotor speed ( $p=.004$ ) one year post-therapy and poorer concentration relative to the last assessment during therapy ( $p=.02$ ). No covariates were associated with performance in these cognitive domains. In contrast, women with breast cancer and controls had improved executive function, attention, working memory and verbal memory at therapy completion relative to pre-therapy and at one year post-therapy relative to pre-therapy ( $p=.05$  to  $<.001$ ).

Deficits in concentration and psychomotor speed may persist after completion of AI therapy in women with breast cancer. Improvements in performance in other cognitive domains likely represent practice effects. While these results need to be verified in a larger sample, they point to a need for interventions to help women compensate for persistent cognitive changes they may experience after AI therapy. This is the first known study to examine cognitive function through the full, 5-year trajectory of AI therapy and to examine whether cognitive function recovers post-therapy in women with breast cancer.

### RELATIONSHIP BETWEEN AROMATASE INHIBITORS USE AND EXERCISE AMONG BREAST CANCER SURVIVORS: A SECONDARY DATA ANALYSIS

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Aromatase inhibitors (AIs) are the standard treatment to prevent recurrence for postmenopausal breast cancer survivors with positive hormone-receptor. Unfortunately, up to 57% of survivors taking AIs, experience arthralgia and myalgia, which contributes to treatment discontinuation. Exercise can decrease AI-induced pain. However, for patients taking AIs, pain may be a barrier to exercise. Alternatively, having pain may motivate these survivors to exercise as a means to decrease pain. The impact of pain on preventing and motivating exercise among survivors taking AIs is unknown. Therefore, the purpose of this study was to explore differences in exercise beliefs and behaviors between survivors taking and not taking AIs. This is a secondary data analysis of a randomized controlled trial. Exercise beliefs were measured with validated exercise outcome expectation and self-efficacy scales and exercise was measured as exercise intentions and a Godin Leisure-Time Exercise index. Data was analyzed using descriptive analysis, Mann-Whitney U test, Chi-square, and Pearson correlation coefficient. Outliers were winsorized. No significant difference in demographic and clinical characteristics was found between participants with ( $n=17$ ) and without ( $n=28$ ) AIs use. Comparing to group with no AIs use, group with AIs use had higher expectations for exercise to decrease pain (no AIs vs. AIs=  $3.08\pm 0.95$  vs.  $3.75\pm 0.88$ ) and exercised more (no AIs vs. AIs=  $25.43\pm 12.89$  vs.  $28.29\pm 13.19$ ); yet lower exercise self-efficacy (no AIs

vs. AIs= 2.76±0.63 vs. 2.44±0.92) and exercise intentions (no AIs vs. AIs= 6.07±0.64 vs. 5.90±0.91). Only expectations for exercise to decrease pain showed significant difference between the two groups (U=146, p=0.03). The current results show that expectations of exercise to decrease pain may motivate survivors to exercise. These preliminary findings are consistent with the experiences shared by breast cancer survivors that exercise is expected to improve pain. However, research indicates that AI-induced pain may decrease exercise. Future prospective, longitudinal research with a sufficient sample size is suggested to better understand these relationships between pain and exercise. Oncology nurses should discuss exercise as a potential strategy to decrease pain for survivors taking AIs. Also, developing an intervention which is well-tolerated by survivors suffering from AI-induced pain is needed. This is an innovative study because it is the first study explore the relationships of pain as both a barrier and benefit of exercise for breast cancer survivors.

#### **IDENTIFYING LANGUAGE FEATURES ASSOCIATED WITH NEEDS OF OVARIAN CANCER PATIENTS AND CAREGIVERS USING SOCIAL MEDIA**

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Social media has gained an attention as a source to learn the perspectives, values, and needs of patients and caregivers in naturalistic settings. A thorough understanding of their concerns and needs is the first step to develop interventions for the target population. Language written in the social media can be cues of needs, however, manually identifying those cues is time-consuming and labor-intensive. The purpose was to identify language features that are associated with needs of ovarian cancer (OvCa) patients and caregivers on social media using machine learning approach. We analyzed initial postings of patients and caregivers (n=855) collected from Cancer Survivors Network online forum (<http://csn.cancer.org>). First, we coded each posting with 12 types of needs based on the literature (physical; psychological/emotional; family-related;

social; interpersonal/intimacy; practical; daily living; spiritual/existential; health information; patient-clinician communication; cognitive needs; miscellaneous), allowing multiple needs annotated for a posting. Then, we applied machine learning to build a computational model to decide whether a posting has the given need or not. In our model, we used bag-of-words (BOW) features considering each word in a posting as a feature to classify needs. Then, we performed chi-square-based feature selection to automatically identify more important features for each need category. We evaluated the model using the F1 score, a performance metric for classification. Top most frequently occurring needs across postings were health information, social, psychological/emotional, and physical needs (n=456, 307, 141, 109). 39% of postings described both information and social needs (n=130) in the same posting. Our model reported F1 scores of 0.93, 0.87, 0.83, and 0.88 for health information, social, psychological/emotional, and physical needs, respectively. Words that describe psychological states (e.g., "anger", "anxiety") were important features for the classification of psychological/emotional and social needs, and medical terms (e.g., "endoscopy", "colonoscopy") for physical and information needs. Result showed even using simple word features can detect needs with high accuracy. Same features can predict multiple needs (e.g., social and information needs) which may indicate important cues for clinicians to understand patients. The first study to develop an initial model for automatically classifying needs of OvCa patients and caregivers on social media. Our results suggests the potential of using multiple language features and classification methods to develop more sophisticated model. Our future work involves exploring other language features (e.g., groups of words clustered by using topic modeling techniques, taxonomies, etc.).

#### **VALIDATION OF THE CHINESE VERSION OF THE CHEMOTHERAPY-INDUCED TASTE ALTERATION SCALE: A PSYCHOMETRIC STUDY**

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The prevalence of chemotherapy-induced taste alterations ranges between 20% and 84% in cancer

patients. It is even ranked as one of the most troublesome problems by cancer patients. Despite the many objective measurements, there is a need for an internationally validated subjective instrument. The chemotherapy-induced taste alteration scale (CiTAS) is a reliable and valid instrument to comprehensively assess patients' taste alterations in an easy way. The purpose of the study was to translate the CiTAS and test its psychometric properties among Chinese cancer patients undergoing chemotherapy. A convenience sample of 227 cancer patients were recruited in a tertiary cancer hospital in Beijing. The Chinese version of the CiTAS (C-CiTAS) was developed via rigorous translation methods. Item analysis was conducted among all the 18 items. Exploratory factor analysis was used to test its construct validity. Correlations between the C-CiTAS scores and the European Organization for Research and Treatment of Cancer (EORTC) QLQ-C30 scores were calculated for convergent validity. The overall taste alterations scale (OTAS) score was used to test its discriminant validity. Reliabilities were also examined. Semantically, items remained comparable during the translation and back-translation process. After reviewed by five cancer patients and two Chinese language experts, the statements of six items were modified. Considering the results of item analysis and the first exploratory factor analysis, two items were removed. The C-CiTAS with the rest 16 items demonstrated good construct validity, convergent validity and discriminant validity. The Cronbach's alphas of the C-CiTAS were 0.903 for the overall scale and from 0.719 to 0.878 for the four subscales. Its test-retest reliability was 0.815 ( $p < 0.01$ ). Due to dietetic cultural differences between China and other countries, item 11 "have a bad taste in the mouth" and item 15 "have difficulty eating hot food" were removed. Item 3 "having difficulty tasting saltiness" and item 6 "having difficulty tasting umami (savory: it's like a brothy taste or the taste brought out by adding monosodium glutamate (MSG))" were grouped into the factor "general taste alterations" instead of the factor "decline in basic taste". The final C-CiTAS demonstrated good reliabilities and validities. The C-CiTAS can be used by health care professionals, patients and researchers to better understand Chinese patients' taste problems related to chemotherapeutic treatments. Moreover, the results are easy to be compared internationally.

#### **SYMPTOM SEVERITY IS NEGATIVELY ASSOCIATED WITH SYMPTOM COMMUNICATION OVERTIME AMONG**

#### **OVARIAN CANCER SURVIVORS: ESTABLISHING THE NEED FOR APPROPRIATE SYMPTOM COMMUNICATION**

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Women with ovarian cancer often struggle to communicate their cancer- and treatment-related symptoms to their healthcare providers. The purpose of this study is to examine the frequency by which women with ovarian cancer communicate their priority symptoms with their healthcare providers and the longitudinal association between symptom severity and communication. Women with recurrent ovarian cancer were recruited from 68 Gynecological Oncology Group (GOG) sites to the Written Representational Intervention to Ease (WRITE) Symptoms<sup>®</sup> (GOG-0259) randomized clinical trial. Participants ( $N=497$ ) completed monthly questionnaires including the Symptom Representation Questionnaire rating the severity of 28 symptoms on an 11-point scale. They prioritized three symptoms over which they wanted to gain better control. A 4-item communication questionnaire assessed symptom communication with providers, and was dichotomized based on patients' symptom severity score as appropriate (severity 0–10 and any level of communication) or inappropriate (severity 5–10 and no or limited communication). We performed a stepwise binary logistic regression to develop a predictive model of inappropriate symptom communication styles at baseline controlling for age, education, optimism, anxiety, depression, and social support. Second, we analyzed changes in symptoms and communication overtime by calculating mean score differences and Pearson product-moment correlations between symptom severity and communication appropriateness at each time-point (baseline, 4, 8, and 12 weeks). Appropriate communication occurred for 42–94% of women's top symptoms. Symptom severity was the strongest predictor of appropriate communication at baseline ( $OR=0.63$ , 95%CI (0.61–0.65),  $p < 0.001$ ). Women with high symptom severity scores were 37% less likely to have appropriate communication at baseline compared to women with low symptom severity scores. Symptom severity decreased ( $t(2616)=18.81$ ,  $p < 0.001$ ) and appropriateness of communication increased ( $\chi^2(3)=115.15$ ,

$p < 0.001$ ) from baseline to 12 weeks. Symptom severity negatively predicted appropriate communication at the same time-point ( $r = -0.45$ – $-0.59$ ,  $p < 0.001$ ). These results demonstrate that symptom severity was inversely related to appropriate communication. Women experiencing severe symptoms severity were less likely to report having appropriate communication about that symptom with their healthcare provider. This study underscores the need for healthcare providers to break the cycle of inappropriate symptom communication to ensure patients' symptoms are adequately discussed and managed throughout women's cancer experience. This study provides new evidence that patients with high symptom severity may not communicate their symptoms with healthcare providers.

### **NETWORK ANALYSIS OF SYMPTOMS AMONG WOMEN WITH RECURRENT OVARIAN CANCER**

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Uncontrolled symptoms severely affect quality of life (QOL) and function. Symptom burden is especially high in ovarian cancer (OvCa) patients, who experience an average of 10–12 concurrent symptoms with correspondingly low QOL. Symptom management could be improved with a better understanding of relationships among concurrent symptoms. Network analysis (NA) is a methodology that can discover and visualize relationships among components of a phenomenon to identify influential components. The purpose of this study was to apply NA to a sample of OvCa survivors to identify the most influential symptoms as priority symptoms for intervention development. WRITE (Written Representational Intervention to Ease Symptoms) study, a longitudinal trial in which OvCa patients ( $n=497$ ) reported severity of 28 cancer and/or treatment-related symptoms while participating in an online symptom management intervention. Participants completed the symptom assessment on average nine times over the course of 13 months. We analyzed symptom collected at baseline (T1;  $n=497$ ) and 4 months (T4;  $n=379$ ) of WRITE. Participants rated the severity of each symptom at its worst in the past week on a 0 (did not have the symptom)–10 (as bad as I can imagine) scale. We

dichotomized severity scores using a cut-point of  $<3$  and  $\geq 3$ , then constructed NA to examine relationship between symptoms. The node size represents frequency of each symptom. We added weight to network connections using co-occurrence of symptoms that may represent important relationships between symptoms. After constructing the network of symptoms, we compared T1 and T4 networks by calculating node-specific centrality measures of each network: betweenness, closeness, and eigenvector using R and the Organizational Risk Analyzer. A comparison of networks demonstrated nodes and links were consistent across networks. Vomiting and weight loss had the highest betweenness at T1 and T4 respectively (0.537, 0.387). Result suggests that vomiting and weight loss assert the highest influence over the severity of other concurrent symptoms (a symptom “gatekeeper”). At both networks, fatigue had the highest eigenvectors (0.450 and 0.527, respectively), indicating that it connects to the highest number of other symptoms. Vomiting, weight loss, and fatigue are priority symptoms to be managed to decrease overall symptom burden in OvCa. This study was the first to construct symptom networks for OvCa patients. Our approach can guide symptom management interventions in the future by identifying symptoms that should be specifically targeted to maximize patient QOL and minimize nursing time and resources.

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### **INDUSTRY-SUPPORTED ABSTRACTS**

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#### **HOW TAKING LEADERSHIP CAN MAKE A DIFFERENCE FOR PATIENTS**

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With the long lead time for approval of new products, a key frustration for oncology nurses is that while many current products distributed to patients are functional, they are not sightly or long-lasting. Furthermore, patients in different areas have different needs and sometimes wearable items are not designed to accommodate all patients across the country. When leading healthwear provider Care+Wear introduced their ultra-soft, antimicrobial PICC Line Cover as a replacement to the traditional tube sock for cancer patients receiving treatment through a PICC Line, the University of North Carolina Wayne Memorial launched a pilot program to test the covers. The machine washable covers are unique in that they feature a mesh window allowing for functionality and

visibility of the line and dressing, while also providing patients with a discreet look. While the covers were well received by patients and clinicians alike, it was the nurse team that realized improvements could be made. Cancer patients at University of North Carolina Wayne Memorial were using PICC Lines with long double lumens, too long to comfortably fit under the short PICC Line cover. With the feedback from the nursing team who provided measurements from patients, the University of North Carolina Wayne Memorial was able to directly work with Care+Wear to swiftly design and launch a long version of Care+Wear's PICC Line Cover. With the updated measurements, additional hospitals who placed their PICC Lines differently from other hospitals were also able to use these long covers. This project, and the ongoing demand and availability of long Care+Wear PICC Line covers, demonstrates the importance of nurse feedback and how taking ownership of patient needs can result in the implementation of the most effective products for patients. Feedback from the project showed overall improved patient experiences with products specifically designed to accommodate patient needs at the hospital. The project demonstrates the ability of each and every nurse to make a difference throughout the treatment process.

### **CLINICAL TRIALS USING TTFIELDS: PAST, PRESENT AND FUTURE**

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Tumor Treating Fields, also known as TTFIELDS, are low-intensity, alternating electric fields at an intermediate frequency, tuned to disrupt normal cancer cell division. Optune™ is a portable, noninvasive device that provides localized treatment with TTFIELDS to patients with Glioblastoma multiforme (GBM). Optune received FDA approval for recurrent GBM in 2011 based upon favorable quality of life and safety data. In 2015, Optune received expanded approval for newly diagnosed GBM based upon a phase 3 trial that demonstrated a 4.9 month improvement in median overall survival when given with adjuvant Temozolomide. Optune is included in the NCCN guidelines as a category 1 treatment recommendation for patients with newly diagnosed GBM, and a category 2b for recurrent GBM. TTFIELDS have shown promise in a variety of malignancies, demonstrating feasibility, safety, and clinical benefit in several Phase 2 studies. In the STELLAR study, 80 patients with previously untreated, non-resectable Malignant Pleural Mesothelioma who received TTFIELDS with pemetrexed

and either cisplatin or carboplatin demonstrated a median overall survival of 18.2 months compared to 12.1 months in a historical control. In Non-Small Cell Lung Cancer, 42 inoperable stage IIIb (with pleural effusion) and IV patients who had had tumor progression received pemetrexed together with TTFIELDS therapy until disease progression. Median OS was 13.8 months, and 1 year survival was 57%, both of which compare favorably to historical controls. In the PANOVA study, 40 patients with advanced pancreatic cancer received TTFIELDS plus gemcitabine, or TTFIELDS plus gemcitabine and nab-paclitaxel. In both cohorts, PFS and the one-year survival rate were more than double those of historical controls. In the INNOVATE trial, 31 patients with recurrent ovarian cancer received TTFIELDS along with weekly paclitaxel. Median PFS was 8.9 months, compared to 3.9 months in paclitaxel-alone historical controls. Median OS was not yet reached, and median one-year survival in the TTF-treated group was 61%. Building upon these successes, Novocure has recently launched Phase 3 global studies in NSCLC, Pancreatic and Ovarian cancer. Additionally, a phase 2 study of TTFIELDS plus Sorafenib for Hepatocellular carcinoma is planned. Nurses play an important role with recruitment into all studies. Familiarity with the basic MOA of TTFIELDS, common adverse events, management of known skin irritation, and knowledge of existing clinical data is crucial for successful trial enrollment.

### **STRESS MANAGEMENT “AWARENESS PRACTICES” AND SELF-CARE TIPS**

**Ellen Dermody, MSN, RN, OCN®, NC-BC, NYU Winthrop Hospital, Mineola, NY**

The purpose of the study was to integrate advanced nursing knowledge on how to prevent and treat job stress for nurses by analyzing, developing, implementing, and evaluating an education program on awareness and prevention related to job stress. Conducted a literature search on how to prevent and treat job stress for nurses. Analyzed the educational needs of staff nurses relating to job stress by developing and administering a needs assessment survey using an instrument such as the likert scale, and narrative response. This assessed nurse's current stress levels and knowledge regarding preventative measures on how to relieve stress at work. Target population “Westchester Jewish Community Services,” NY—eight staff nurses completed the needs assessment and confirmed there was an educational need on how to relieve stress at work. Developed and implemented an awareness and prevention educational program

on job stress for staff nurses. A post-assessment questionnaire was developed for the staff nurses to complete at the end of the program using quantitative and qualitative methods. Data was analyzed and evaluated regarding the effectiveness of the practicum project implemented. Eight nurses strongly agreed they are more aware how to prevent and treat job-related stress, and two nurses agreed. Also, another important finding four nurses strongly agreed the presentation motivated them to take action five agreed, and only one nurse remained neutral. Hence, not only did my research prove nurses are stressed but need to learn preventative measures how to prevent or reduce stress at work. Furthermore, research has proven how Nurses should strive for optimal health, as stress not only has a negative effect on the nurse but also those they provide care to. In conclusion I developed a 1.0 hour accredited Continuing Nursing Education class “Coping with Stress in the Workplace: Self-Care tips. Approved through the American Association of Occupational Health Nurses (AAOHN). American Credentialing Center’s Commission on Accreditation accredits AAOHN as an approver of continuing nursing education.

### **USABILITY TESTING OF A CLINICAL DECISION SUPPORT TOOL VIA MOBILE APPLICATION FOR PHARMACOGENETICS AMONG ONCOLOGY NURSE PRACTITIONERS**

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Medications are associated with adverse reactions, but precision medicine provides a way to individualize drug therapy. One obstacle to implementation of precision medicine is the lack of accessible, peer-reviewed clinical practice guidelines. Furthermore, the use of mobile apps for prescribing medications has increased since the introduction of physician order entry. Decision support apps have improved provider performance and studies have shown broader adoption is crucial for the success of these tools. Therefore, successful use of mobile apps will depend on perceptions of users. The purpose of this activity is to discuss the development of a clinical decision support tool for pharmacogenetics via mobile app and to provide an evaluation of perceptions and usability of this prototype among oncology nurse practitioners. A mixed method design with the use of snowball sampling was utilized. The sample included 25 oncology nurse practitioners. A clinical decision support tool that housed

one pharmacogenetic dosage guideline related to the oncology field was created. The System Usability Scale was utilized to measure the usability of this prototype. Furthermore, telephone interviews were conducted with each nurse practitioner. Interviews followed a semi-structured interview guide to capture information necessary to understand the use of clinical decision support tools. The outcome of this activity will highlight an innovative clinical support decision tool that can be utilized within practice. Additionally, the goal for this activity will be to improve knowledge beyond their initial understanding of precision medicine. This activity will facilitate application of precision medicine into practice, patient education, and advocacy. This knowledge will promote confidence when caring for patients undergoing personalized therapies. The implications for nursing is to become knowledgeable about this topic that will only become more prevalent in the future. The development of this mobile application will be applicable to nurses who have prescriptive privileges as well as an educational tool for nurses to understand the rationale behind the prescription of certain medications and alternate dosages. Additionally, having a nurse conduct research in this field is an innovation in and of itself. There are currently few nurse researchers in this field. A different perspective, through the lens of nursing, will afford innovative approaches to translating the current research findings surrounding pharmacogenomics into medical and nursing practice.

### **IMPROVING NUTRITION SCREENING IN AN OUTPATIENT INFUSION CENTER**

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Cancer patients receiving infusion therapy are at increased risk for nutritional challenges. Diminished appetite is reported by 40% of cancer patients and 67% endorse chemosensory changes such as distorted taste or olfactory sensitivity. These nutritional issues have the potential to impact treatment compliance, and quality of life. In an effort to correctly identify and refer nutritionally at-risk patients, our program developed a robust, reliable, and consistent system for nutritional screening. We set a goal of screening cancer patients at 75% of their Infusion Center visits. Screening findings are reviewed by an on-site Registered Dietician (RD) to develop recommendations. A paper screening questionnaire was developed by the RD in 2017. However, only approximately 25% of patients completed it. With this in mind, the questionnaire evolved to a

multidisciplinary initiative, documented in the Electronic Health Record by the infusion nurses. This shift negligibly improved nutritional screening. In January and February of 2018, compliance was 32% and 34% respectively. Several actions were implemented to achieve the goal of screening 75% of patients during infusion visits. Infusion Center Nursing Leadership emphasized the importance and pertinence of nutritional screening during staff meetings, huddles, and 1:1 discussions. Screening compliance data was collected monthly via random audits and shared during staff meetings and included on the Nursing Quality Scorecard. Deficiencies were shared, and reinforcement was applied. Subsequently, nutritional screening compliance steadily improved. Based on random monthly audits, it became evident that these gains were substantial and sustained. As of September 2018, nutritional screening completion successfully reached 100%, outpacing the original goal. The 100% completion rate was maintained in October, November and December 2018. While the oncology nurses recognized the importance of having an RD on staff, providing access to this service was inconsistent. In improving screening by nurses, the RD was able to appropriately and dependably triage patients currently on treatment, and be alerted to changes in reported nutrition-associated symptoms. Ultimately, providing nutritional support is imperative for improved outcomes. Malnutrition and weight loss are prevalent in cancer patients. This can negatively impact physical function, quality of life, treatment compliance, and ultimately survival. By assessing current practice, appreciating opportunities, and creating improved processes, nurses were instrumental in improving care delivery.

### **BALANCED NURSING ASSIGNMENTS LEADS TO INCREASES IN PATIENT VOLUME**

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Challenges with efficiency in an outpatient infusion center led to patient and nursing dissatisfaction, increased patient wait times, and uneven nursing patient assignments. Patient visit volume was decreasing, compared to budgeted volume, to a low of 87% of budgeted volume. Evidence supports that an acuity-based model is a valuable tool to appropriately assign patients to nurses based on complexity, and can improve operational efficiency. Immediately

prior to beginning this initiative, the monthly treatment volume was between 91–95% (January and April 2017) of budgeted volume. Using an evidence-based acuity-based staffing tool can allow for an increase in patient volume. The goal of this initiative was to optimize nursing staffing resources by evenly distributing patients to improve patient flow and volume. After reviewing the published evidence and surveying the nursing team, a unit-specific acuity tool was created, based on current literature. Beginning in November 2017, the tool was utilized daily for nursing patient assignments. This allowed for balanced assignments created objectively and consistently across the department. After the utilization of an acuity system to weigh the complexity of the patients, the assignments were more balanced between the nurses, which decreased patient wait time. This also led to increased nursing satisfaction because nurses were able to provide consistent high quality nursing care. After the implementation, the Infusion Center volume increased to 117% (November) and 104% (December) of budgeted volume. After utilizing this tool, the department was able to increase patient volume without having to concurrently increase staffing resources. With the increase in patient volume, patient satisfaction also increased. We believe this was attributed to decreasing wait times. This improved nursing satisfaction by decreasing delays and back-up in the treatment space, which had been a source of nursing stress prior to this intervention. This initiative describes an innovative, evidence-based model to create nursing patient assignments in an infusion center. The acuity-based tool allowed for an increase in patient volume without sacrificing patient or nursing satisfaction, and while maintaining quality nursing care.

### **SAFETY PROFILE AND MANAGEMENT OF ADVERSE EVENTS ASSOCIATED WITH DUVELISIB IN PATIENTS WITH ADVANCED HEMATOLOGIC MALIGNANCIES**

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Duvelisib is the first oral PI3K- $\delta,\gamma$  dual inhibitor approved for patients with relapsed or refractory (R/R) CLL/SLL and FL after  $\geq 2$  prior therapies or systemic therapies, respectively, and for whom limited treatment options exist. The side effect profile of PI3K- $\delta$  inhibitors, including adverse events of special interest (AESI)

such as infections, diarrhea, colitis, neutropenia, rash, transaminase elevations, and pneumonitis, are well described. The purpose was of this study was to underscore the importance of the oncology nurse in patient education about possible AESIs and initiation of timely and appropriate interventions to mitigate AESIs, therefore optimizing outcomes. AESIs were managed using dose modifications (interruption and/or reduction) or discontinuation and protocol-specified algorithms developed from experience with PI3K inhibitors. 442 patients with previously treated advanced hematologic malignancies, primarily CLL/SLL (69%) and FL (22%), received duvelisib 25 mg twice daily in 4 clinical trials. The median exposure duration was 9 months; the median time to first dose modification/discontinuation due to an AESI was 4 months, most occurring within 7 months. The most common all-grade/grade  $\geq 3$  AESIs included infections (62%/27%), diarrhea or colitis (50%/23%), neutropenia (34%/30%), rash (31%/9%), transaminase elevation (15%/8%), and pneumonitis (7%/4%). Based on our experience and the clinical safety profile of duvelisib, patient education and early intervention by the treatment team are critical. The nurse's knowledge of potential duvelisib AESIs as well as the use of evidence-based algorithms will ensure prompt patient management and optimal treatment outcomes. Duvelisib demonstrated a manageable safety profile in patients with advanced hematologic malignancies. Nurses play a pivotal role in patient education, AE monitoring, and early detection of AESIs; therefore, it is important for the nurse to be familiar with the side effect profile of duvelisib and evidence-based algorithms for AESI management. Early identification and intervention are critical for effective management and resolution of most AESIs, resulting in low rates of discontinuations, improved patient quality of care, and enhanced adherence to therapy. Duvelisib is a new oral treatment option for patients with R/R CLL/SLL and FL, with the potential for durable responses and good tolerability over time. AESIs were generally reversible, often managed through dose modifications, and, in most cases, did not lead to treatment discontinuation. Patient education, early intervention, and use of evidence-based algorithms for AESI management are critical for patient quality of care.

### **ONCOLOGY NURSE BURNOUT AND COMPASSION FATIGUE: A MIXED-METHODS INVESTIGATION AND RESILIENCE INTERVENTION**

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Oncology nurses comprise a fundamental care team for cancer patients, performing highly skilled medical tasks, providing emotional support, and coordinating care in the greater multiteam system (i.e., team of teams) of cancer care. Due to the long hours and special patient population, oncology nurse teams are susceptible to burnout. This research aimed to better understand and address factors contributing to occupational stress and burnout among oncology nurse teams. Using a mixed-methods approach, 30 interviews and observations were conducted of inpatient and outpatient nursing units at a large southern healthcare system. Emergent themes included difficulty psychologically detaching from work after shifts, minimal opportunities to engage in coping during shifts, and an increase in administrative burdens. Nurses conveyed that interactions with patients and fellow nurses (both team social support and teamwork behaviors) serve as sources of resilience. Baseline survey data indicate that 40% of respondents experience symptoms of burnout and 25% experience daily physical fatigue. Results of qualitative data informed the development of a targeted 6-month stress management and team resilience intervention to address the emergent stressor themes and leverage sources of resilience. Team resiliency and retention, as well as patient experience outcomes, are expected to be positively impacted. The proposed session will discuss both the results of this study and the research process as a whole. The systematic approach to identifying and addressing team stress and resilience will be relevant to many healthcare disciplines interested in improving team efficiency and quality of patient care.

### **ESTABLISHING A UNIQUE VASCULAR ACCESS TEAM**

**Amy Gregory, MSHL, RN, Mayo Clinic Florida, Jacksonville, FL; Suzanne Shaw, MSN, RN, Mayo Clinic Florida, Jacksonville, FL**

Central line-associated blood stream infections (CLABSI) continues to plague hospitalized patients despite efforts to prevent these never events. Development of a fully dedicated vascular access team (VAT) to maintain central lines improved patient safety, satisfaction, and outcomes. CLABSI rates showed little improvement with annual rates of 1.1 and 0.8/1000 days. CLABSIs associated with line insertion were increasing. Central line dressings and maintenance varied from in-patient care unit to unit. Little consideration

was given to what type of line would be best suited to meet patient needs. Providing a dedicated 6 nurse VAT provided consistency in evidence-based practice adherence of required lines, appropriate insertion techniques, and line maintenance. The VAT worked with stakeholders to initiate an evidence-based algorithm for central line appropriateness and patient safety. The algorithm considered clinical criteria, medication and duration ordered, and established central venous catheter guidelines. A VAT Consult was created for providers to access when considering lines needed to meet patient needs. VAT demand quickly grew and soon partnered with IR to take ownership of all non-tunneled PICC lines providing both insertion and all dressing change needs. The team also places 800 plus ultrasound peripheral IV's, a previously untapped billable hospital service. Workflows were redesigned to support a 2-person approach to dressing changes to ensure sterile technique. VAT members partnered with the nursing practice council to modify procedures for evidence-based practice adoption. The VAT assists with nursing education and competency validation. This unique approach to evidence based care delivery was a first step in reducing CLABSIs. Patient safety improved with the evidence-based algorithm. Correct line placement avoided delayed care. VAT demand justified the creation of 7 additional positions for a total of 13 dedicated VAT positions. USIV revenue will exceed \$3.8 million in 2018, funding the positions. CLABSI rates reduced to 0.6 in 6 months. Sustainable improvement is on-going. This unique approach to evidence-based care delivery reinvented how central line access and care is provided to patients. The development and transformation of the VAT increased patient safety and outcomes, reduced time to treatment, and improved overall nurse and patient satisfaction.

### **WILL A SIX-WEEK ZEN CONNECTION PROGRAM IMPACT INTEGRATIVE HOLISTIC CARE FOR BREAST CANCER SURVIVORS?**

**Sharon Inzetta, RN, MS, CBCN®, CN-BN, ONN-CG, Summa Health, Akron, OH**

Breast cancer survivors often report depression, anxiety, and stress before and after a breast cancer diagnosis. The median age is 62 for breast cancer. The impact financially, socially and emotionally of these aging “baby boomers” is critical for health care delivery today. These survivors are at higher risk for cancer related treatment side effects and functional decline with physical inactivity threatening their independence. Integrative, holistic care combining mind, body, and spirit healing was developed in our ZEN Connection

Program. Exploring the impact this 6 week program may have on mindfulness, self-efficacy, and symptom management for Panic (pain, anxiety, nausea, insomnia, constipation and fatigue) became the objective of our program. Combining the five core healing modalities would be offered including: yoga therapy, Reiki, essential oils, nutrition and contemplative care. Financial support was obtained through our hospital women's board to offer our free ZEN Connections program. Six week sessions (one class week) were held March-December 2018. Class size averaged 12 participants, sessions were 90 minutes offered either Monday or Thursday. A certified Urban Zen instructor conducted the classes. The program was advertised to the local community and all breast cancer survivors were invited to participate. Accommodations were made using chairs/ tables for restorative yoga poses. Participants needed a medical waiver to participate, and to complete a demographic survey, Mindful Attention Awareness Scale (MAAS), Self-efficacy for Exercise Scale (SEE) and weekly managing treatment related symptoms logs. Survivors were instructed on restorative poses, relaxation, breath awareness and mindfulness. Classes used essential oils (lemon, lavender and peppermint). Reiki was administered during restorative poses. Weekly symptom management was discussed. Instructional handouts were developed and provided for continued practice. Qualitative data collected weekly demonstrated improvement in symptom self-management. Quantitative data reported pre and post MAAS and SEE scores. Participants overwhelmingly reported program impact and continued self-practice of integrative therapies for symptom management and coping strategies. Empowering survivors to be active participants in their holistic care was accomplished combining Eastern Complementary healing therapies with the Western Medical Model for cancer treatment. Survivors have adopted integrative modalities for self-management of treatment related symptoms and learned coping strategies. Participants enjoyed shared lived experiences of breast cancer survivorship and weekly story telling validated social survivorship connectedness.

### **PATIENT EDUCATION: GUIDING NEWLY DIAGNOSED CANCER PATIENTS THROUGH TREATMENT**

**Ashley Kennedy, RN, BSN, OCN®, Emory Healthcare, Sugar Hill, GA; Cheryl Billish, RN, BSN, OCN®, Emory Healthcare, Woodstock, GA; Ashley Morgan, RN, MSN, CNL, Emory Healthcare, Lawrenceville, GA**

Winship Cancer Institute of Emory takes pride in the patient experience and making cancer treatment

as pleasant as possible. Patient satisfaction surveys revealed that patient education was an area for improvement. The main need for improvement was in educating patients and family members on what to expect when they came to our facility for treatment. Our purpose for this project is to improve the quality of patient-centered care, patient safety, and overall experience in the Ambulatory Infusion Center by providing clear and simple treatment related information. We created a comprehensive and user-friendly Education Book designed to walk patients through every step of the treatment process and answer common questions. This book includes the following sections: welcome statement, check-in process, what to wear/bring, food and drink, medications, what to expect, length of treatment, visitor policy, treatment side effects, transfusions, appointments, labs, etc. Ten established patients were chosen to complete a pre-survey prior to viewing the Education Book. The goal was to assess the patient's knowledge and preparedness prior to their first treatment. Then they were then given the Education Book to read through and took a post survey following. Based on the pre-survey that was given, 59% of patients felt they had the knowledge they needed to be prepared for their first treatment. Upon completion of reviewing the Education book, the post survey results revealed that 98% of patients would have felt prepared for their first day of treatment if they had this book prior to starting treatment. This Education Book showed to be a huge benefit to our patients. Since first presenting it to a small group of patients we have made necessary edits and are in the final approval stages in our institution. Once we receive approval, we will have the books printed and will provide an individualized education session with newly diagnosed patients and present them with this book in order to help guide them through their journey. The primary purpose of this Education Book is to provide a comprehensive view of cancer treatment at Winship Cancer Institute. Patients travel among multiple sites during their treatment. This Education Book will allow standardization of oncology education to patients regardless of which location they visit.

#### **NURSES' COMPETENCE AND CONFIDENCE GAPS MANAGING IMMUNE-MEDIATED ADVERSE EVENTS IN PATIENTS RECEIVING IMMUNE CHECKPOINT INHIBITOR THERAPY**

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Immune checkpoint inhibitors (ICIs) are now firmly established in the treatment of several cancers. This new class of medications, however, has a unique safety profile based on their immunologic mechanism of action. Immune-mediated adverse events (imAEs) differ dramatically from AEs associated with chemotherapy, and nurses must have a high suspicion for imAEs in their ICI-treated patients. As core members of the care team, they must be able to identify and manage imAEs and provide appropriate education to their patients. The objective of this study was to assess nurses' baseline competence and confidence managing imAEs to determine the need for future education on this critical topic. Medscape Oncology launched an online educational activity on June 23, 2018. This 30-minute video roundtable discussion with synchronized slides featured three oncology nurses discussing the "top ten" things nurses need to know about imAEs, such as strategies for timely identification, monitoring tests, management strategies, and best practices for patient education. Three case-based, multiple-choice questions were posed before and after content exposure to gauge participants' competence identifying, managing, and educating patients about imAEs. A 5-point Likert-type scale measured participants' confidence managing imAEs. Baseline data (pre-activity) presented herein were collected through July 26, 2018. Updated data will be presented at the meeting. A total of 698 nurses and advance practice nurses (APNs) had completed the pre-activity questions as of July 26, 2018. The proportion who correctly answered all three multiple-choice questions was 16%, and 19% answered none of the three questions correctly. Individual questions assessed the following aspects of imAE management, and the proportion answering correctly before any education were: (a) Recognition and management of Grade 3 colitis, 47%, (b) Management of a Grade 2 rash that is no longer responsive to oral antihistamines and topical steroids, 43%, and (c) Providing patient education about what to do in the event of side effects from combined PD-1/CTLA-4 inhibitor therapy, 52%. Accordingly, participants lacked confidence managing imAEs. A large proportion of nurses lack the necessary competence and confidence to identify and manage imAEs and provide appropriate patient education. Ongoing education designed specifically to meet nurses' identified needs is critical to improve nurses' competence and confidence to increase the safe and effective use of ICIs in clinical practice.

## **NEW ANDROGEN ANTAGONISTS IN NON-METASTATIC CASTRATION-RESISTANT PROSTATE CANCER**

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Androgen deprivation therapy (ADT) is the standard of care for patients whose prostate cancer relapses after primary local treatment. Despite ADT, most patients eventually progress with rising prostate-specific antigen levels. Some of these patients have no detectable metastases and their disease is classified as non-metastatic castration-resistant prostate cancer (nmCRPC). For these patients, delaying metastasis with minimal adverse events (AEs) is an important treatment goal. Recently, two second-generation androgen receptor (AR) inhibitors, apalutamide and enzalutamide, were approved based on their significant efficacy to delay metastases in patients with nmCRPC as demonstrated in the SPARTAN and PROSPER phase 3 trials. However, the benefits of prolonging metastasis-free survival (MFS) need to be balanced with the potential toxicities of these treatments. Common AEs associated with ADT include fatigue, hot flashes, decreased libido, body composition changes, increased bone fracture risk and depression, which all require management by oncology nurses. Though generally well tolerated, treatment with apalutamide or enzalutamide in addition to ADT is associated with increased prevalence of certain AEs: fatigue, fractures, cognitive impairment, hypertension (with enzalutamide), rash, and hypothyroidism (with apalutamide). Seizures are rare but serious AEs associated with these therapies. Darolutamide is a structurally unique AR antagonist in development for the treatment of prostate cancer. In the recent ARAMIS double-blind, placebo-controlled, phase 3 trial, men with nmCRPC received darolutamide or placebo. Darolutamide significantly prolonged MFS and demonstrated a very favorable safety profile. Incidences of most AEs were comparable between the darolutamide and placebo arms; all were <10%, except fatigue (which was 12.1% vs 8.7% with placebo). Darolutamide treatment was not associated with increased rates of falls, fractures, cognitive disorders, hypertension, or seizures. The increased AE risk from adding second-generation AR

inhibitors to ongoing ADT may be managed by dose reductions and addition of medications to decrease the risk of skeletal-related events. Education provided by oncology nurses throughout the treatment (for example, on lifestyle changes to lessen the impact of fatigue or safety measures to prevent falls), is critical to minimize the risks and impacts of AEs. Darolutamide expands potentially practice-changing therapy options for delaying metastases in men with nmCRPC, with a minimal risk of harm beyond that of ongoing ADT and maintenance of quality of life. Clinical trial information: NCT02200614

## **TRANSITIONING INTRAPERITONEAL CHEMOTHERAPY FOR TREATMENT OF OVARIAN CANCER FROM INPATIENT TO OUTPATIENT SETTING**

**Connie Masters, RN, MBA, MSN, OCN®, Emory Healthcare, Johns Creek, GA**

Combining intraperitoneal (IP) chemotherapy with intravenous chemotherapy improves survival in women with advanced ovarian cancer. IP chemotherapy is delivered through an implanted port that drains into the cavity of the abdomen, allowing direct access of the chemotherapy to cancer cells in the peritoneal cavity. This treatment approach provides a higher concentration of chemotherapy directly to tumor cells. Potential side effects include abdominal pain, nausea, vomiting, and possible catheter complications which can lead to treatment discontinuation. In previous years, IP chemotherapy was administered at Saint Joseph's Hospital Ambulatory Infusion Center, however the protocol for IP chemotherapy was last updated in early 2000. The purpose of this study was to appropriately and safely administer IP chemotherapy to ovarian cancer patients at Winship Cancer Institute's ambulatory infusion centers at Emory Johns Creek and Emory Saint Josephs by updating the current IP protocol and providing staff education. In February 2018, a multidisciplinary team consisting of nursing and pharmacy team members developed an outpatient IP chemotherapy protocol. Standard nursing procedures were revised to safely and effectively administer IP chemotherapy. This initiative required substantial collaboration amongst outpatient and inpatient nursing staff, nursing leadership, clinical nurse specialists, unit nurse educators, and pharmacists. This multidisciplinary team partnered to formulate, research, discuss, and implement best practices in the outpatient setting. To date, two patients have completed IP treatment without major side effects or infusion reactions. One patient received

all six cycles, while the other patient completed three cycles. Patients were encouraged to rotate positions and ambulate during the administration of IP chemotherapy. Registered nurses closely observed the IP port throughout the treatment for possible leakage, redness, swelling, or dislodgment. Five nurses were trained to administer IP chemotherapy and access abdominal implanted ports. Nursing and pharmacy collaborated to establish standard operating procedures for the IP administration of chemotherapy order protocol. This protocol was reviewed by a multidisciplinary team (nurses, pharmacists, gynecologic oncologist, Chemotherapy Quality & Safety Council, and information technology department for orderset development in pharmacy order processing). Following the National Comprehensive Cancer Network guidelines, IP chemotherapy is now offered to advanced ovarian cancer patients at Winship Cancer Institute–Emory Johns Creek and Emory Saint Joseph’s Ambulatory Infusion Centers.

### **DESIGNING FOR EFFECTIVE POST-TREATMENT, PATIENT COMFORT AND CARE**

**Chaitenya Razdan, MBA, Care+Wear, New York, NY;**  
**David Song, MD, MedStar Health, Washington, DC**

Patients who undergo mastectomies often face consequences both physically and mentally. Nurses are at the front lines of post-op breast cancer care, offering advice for at home care, while acknowledging that what is currently available is not always suitable for all patients. Mastectomy bras are designed to support patients’ post-treatment, but are often uncomfortable or do not allow for proper drainage. Current options often damage reconstructed nipples and are difficult to put on resulting in pain and many additional issues for patients. Working in conjunction with leading healthwear company Care+Wear and doctors and nurses from the MedStar Georgetown team, a project to create an improved mastectomy bra for post-surgery use that would improve healing experiences was conceived. The insights from a variety of groups were instrumental in the success of this partnership. Nurses provided feedback as to how comfort, skin sensitivity, temperature regulation, fit, and adjustability should be taken into account during the design process. The clinical team jointly provided valuable feedback to ensure that the product that met the patient’s needs. The final design provides breathability for patients with nipple reconstruction through a soft, antimicrobial mesh window and includes adjustable velcro closures for the straps. The bra opens at the front with an adjustable hook and

eye closure for easy access for both patients and clinicians. Following feedback from the MedStar nursing team, the bra is finished with a scalloped rib band for comfort, stretch and access to the drain tube. The bra’s lining pockets can also be inserted with pads for “normal” bra wear or cooling relief post-surgery. The project is a key advancement in post-treatment recovery for mastectomies, demonstrating the importance of collaboration between innovative healthwear companies, clinicians and patients to enhance patient experiences.

### **THE ROLE OF FASHION IN HEALTHCARE—REINVENTING TRADITIONAL TREATMENT CLOTHING**

**Chaitenya Razdan, MBA, Care+Wear, New York, NY**

Healthwear design has traditionally been an area focused solely on function rather than fashion. There are very few clothing and accessory items available to cancer clothing that are elegant, but also medically compliant. In 2014, renowned fashion designer Oscar De La Renta passed away from cancer, having received treatment at the University of Miami Sylvester Comprehensive Cancer Center through a port-a-cath. In his memory, his family and namesake label pursued a project to thank his treatment center and help cancer patients. In partnership with leading healthwear company Care+Wear, Oscar de la Renta decided to design a chest access hoodie for cancer patients undergoing treatment at the University of Miami Sylvester Comprehensive Cancer Center to improve the patient experience. Working with nurses from the Sylvester Comprehensive Cancer Center, Oscar de la Renta and Care+Wear created a hoodie design with two strategically placed diagonal zippers to allow for easy access to chest ports without the patient having to undress and with snaps at the top of the zippers so that treatment lines can reach the chest area while still keeping the patient warm in the hospital. Nurses and clinicians from leading hospitals such as the Sylvester Comprehensive Cancer Center, Sentara Healthcare, Massachusetts General Hospital, Johns Hopkins and the University of Virginia provided critical feedback on the design’s color, zipper placement, length, sizing and material to ensure comfort, quality, style, accessibility and compliance with medical needs. In addition to providing an innovative solution for patients at the University of Miami, the project demonstrates the importance of nurse feedback and involvement in the creation of healthwear products and raised awareness of the ongoing needs of patients during treatment.

### **PHASE III STUDY (CANOPY-A) OF CANAKINUMAB (ACZ885) AS ADJUVANT THERAPY IN PATIENTS WITH SURGICALLY RESECTED NON-SMALL CELL LUNG CANCER (NSCLC)—IMPLICATIONS FOR NURSES**

**Blanca Ledezma, NP, UCLA Hematology Oncology, Santa Monica, CA; Laura Moore, RN, VCS Virginia Cancer Specialists, Fairfax, VA; Margaret Tiktin, NP, Case Western Reserve University and VA Medical Center, Cleveland, OH**

Preclinical and clinical data suggest that the cytokine interleukin (IL)-1 $\beta$  promotes tumor growth and invasiveness. Canakinumab (ACZ885) is a high-affinity human IgG $\kappa$  anti-IL-1 $\beta$  monoclonal antibody approved for patients with IL-1-driven auto-inflammatory diseases. In the phase III Canakinumab Anti-Inflammatory Thrombosis Outcomes Study (CANTOS) study in patients with atherosclerosis and elevated high-sensitivity C-reactive protein levels, canakinumab was associated with a significant reduction in fatal and non-fatal lung cancer incidence. The Canakinumab Outcomes in Patients with NSCLC Study—Adjuvant (CANOPY-A) trial will evaluate the efficacy and safety of adjuvant canakinumab versus placebo in patients with surgically resected NSCLC. Education targeted at nurses is needed to understand this trial and the challenges faced, with earlier-stage patients navigating their care post-surgery. This phase III, randomized, double-blind, placebo-controlled study is enrolling NSCLC patients ( $\geq 18$  years, ECOG PS $\leq 1$ ) with completely resected (R<sub>0</sub>) stages II–IIIA and IIIB (T $> 5$  cm and N<sub>2</sub>) disease, who have completed standard-of-care adjuvant treatments, including cisplatin-based chemotherapy and mediastinal radiation therapy. Prior treatment with neoadjuvant chemotherapy or radiotherapy is not permitted. Randomization will be stratified by AJCC/UICC v.8 stage, tumor histology, and region. Patients (N=1500) will be randomized 1:1 to receive canakinumab (200mg every 3 weeks [Q3W], subcutaneous [s.c.]) or placebo (Q3W, s.c.) on Day 1 of 21-day cycles for 18 cycles or until disease recurrence, unacceptable toxicity, treatment discontinuation at the discretion of the investigator or patient, death, or loss to follow-up. After baseline screening, imaging assessment will be performed every 12 weeks for Year 1 (treatment phase) following Cycle 1 Day 1, then every 26 weeks during Years 2/3, and annually during Years 4/5 (post-treatment surveillance phase). The primary objective will compare disease-free survival in the canakinumab versus placebo arms (determined by local investigator assessment). Secondary objectives

compare both treatment groups with respect to overall survival, lung cancer-specific survival, safety, pharmacokinetics and immunogenicity of canakinumab, and patient-reported outcomes. Exploratory objectives include assessing the relationship between pharmacokinetics, pharmacodynamics, safety, efficacy, and correlation between biomarkers and efficacy endpoints. Enrollment is ongoing. This study will investigate a novel therapeutic approach for surgically resected NSCLC in the adjuvant setting, with a crucial new role and challenges for oncology nurses and nurse navigators in facilitating care coordination, preventing loss to follow-up, and recommending survivorship plans with earlier-stage disease.

### **HEALTHWEAR'S ROLE IN IMPROVING EXPERIENCES FOR CANCER PATIENTS WITH PERIPHERALLY INSERTED CENTRAL CATHETERS AND PORT-A-CATHS**

**Erica Sheehan, RN, Mt. Sinai and Care+Wear, New York, NY; Chaitenya Razdan, MBA, Care+Wear, New York, NY**

In a world where new drugs and technologies to improve healthcare are launched every day, there is a surprising dearth of innovative clothing solutions for cancer patients. Current products provided in hospitals are focused on function and not on how they look or make patients feel. Care+Wear, a leading provider of innovative healthwear, recognized the growing need to bring innovation and design to the healthcare industry. Working in partnership with leading hospitals, patients and clinicians, Care+Wear created a variety of clothing and accessories to improve patient experiences. Care+Wear's ultra-soft, antimicrobial, breathable and machine washable PICC Line Cover, was designed to replace the traditional tube sock typically assigned to protect and cover the PICC line site. The Cover features a mesh window allowing for breathability and visibility of the PICC Line site for both patients and clinicians. Internal surveys conducted of patients who received covers at the University of Virginia Health System and Johns Hopkins demonstrated satisfaction with the cover. Realizing the broader need to help cancer patients with wearable clothing solutions, Care+Wear launched Chest Access Shirts for patients with chest port-a-caths to allow for easy access and convenient treatment for patients and clinicians alike. These products are now available at such leading hospitals as Cleveland Clinic, Mayo Clinic, Hospital Corporations of America, the Department of Veterans Affairs, Massachusetts General, Johns Hopkins, University of Virginia and

directly for purchase online. The continuing success of these products demonstrates the growing demand for healthwear during the cancer treatment process.

### **THE LONG HAUL—COLLABORATING WITH INDUSTRY PARTNERS AND PHYSICIANS ON HEALTHWEAR TO HELP PATIENTS**

**Atara Schechter, BS, Care+Wear, New York, NY;**

**Chaitenya Razdan, MBA, Care+Wear, New York, NY**

Nurses are at the forefront of patient care, often guiding patients before, during and after both major and minor procedures. By collaborating with doctors, patients, designers and leading healthwear providers, nurses can inform the designs that can dramatically alter a patient's experience during and after cancer. Innovative healthwear company Care+Wear created designs for cancer patients in consultation with clinicians, patients, and designers to make sure the needs of all parties are met. Care+Wear's founding product, an ultra-soft, antimicrobial, breathable and machine washable PICC Line Cover, is a perfect example of the power of these kinds of partnerships. The key, patent-pending feature of the Cover, a mesh window allowing for breathability and visibility of the PICC Line site for both patients and clinicians, was included as a direct result of feedback from clinicians at Johns Hopkins and the University of Virginia. The machine washable feature of the product was also an outcome of conversations with nurses who understood the burdens of traditional tubesock PICC covers for caretakers who do not have enough time to hand-wash covers. Even with the success of this product, nurses were essential in providing ongoing feedback for the cover to accommodate the needs of different patient populations across the country. At the University of North Carolina Wayne Memorial Hospital, nurses realized that patients required longer covers to protect the longer lumens of patients. With this advice, Care+Wear was able to swiftly create and pilot a long PICC Line Cover successfully at the hospital. Care+Wear's Chest Access Shirts, created with strategically placed zippers for patients receiving through a port-a-cath, were also designed following the suggestions of clinicians who needed options for cancer patients receiving longer-term chemotherapy and antibiotics. Clinicians provided advice on the length of the zippers to allow for accessibility to the port-a-cath, while preventing patients from being exposed. The ongoing demand for these products to improve patient experiences demonstrates the importance of the involvement of nurses in the innovation process of healthwear companies.

### **INNOVATIVE EDUCATIONAL APPROACHES TO ENHANCE PATIENT AND CAREGIVER UNDERSTANDING OF TUMOR TREATING FIELDS, A FDA APPROVED TREATMENT FOR GLIOBLASTOMA**

**Melissa Shackelford, RN, MSN, MPPM, Novocure, Inc, New York, NY; Renae Adams, RN, BSN, Novocure, Inc, New York, NY; Anne Thomas, RN, BS, OCN®, Novocure, Inc, New York, NY; Peggy Frongillo, RN, BSN, Novocure, Inc, New York, NY; Alice Reichenberger, RN, BS, OCN®, Novocure, Inc, New York, NY**

Glioblastoma (GBM) is the most common aggressive malignant brain tumor with median survival of 15 months. Recent data from the EF-14 trial demonstrated a significant improvement in survival. GBM patients face the devastation of their diagnosis and the challenge of obtaining accurate information on treatment options to make informed decisions. With evolving technology-enhanced methods of learning, an educational paradigm shift has occurred challenging traditional ways that oncology nurses educate patients and caregivers. To supplement healthcare provider (HCP) education and guide patients and caregivers towards appropriate information regarding tumor treating fields (Optune®), Novocure, the device manufacture, sought to bring innovative platforms to patients and caregivers seeking information about Optune. Emerging technology methods were employed focusing on patient and caregiver frequently asked questions. The issues addressed included: treatment overview, mechanism of action, treatment initiation and management. Educational platforms included direct to patient-caregiver events such as: connecting potential patients-caregivers with current Optune patients and their caregivers via live and web-based open-house events and also direct patient-caregiver discussions with current Optune users and their caregivers via the phone-based Buddy Program. A dedicated Optune Facebook page was launched, as well as a first ever industry led Facebook Live event, allowing patients and caregivers to discuss their unique issues during a national broadcast. Additionally, vignettes including videos and written stories, were shared via a dedicated patient-caregiver website and You-Tube channel. Upon receiving a diagnosis of GBM, Oncology nurses play a key role in educating patients and caregivers regarding treatment recommendations and management, during a stressful point in their lives. To enhance the educational exchange between the oncology nurse and to help meet the educational needs of patients, numerous strategies utilizing emerging technologies were employed. The aim of this poster is to review these platforms and associated

outcomes. Oncology nurses foster excellence in delivering transformative cancer care in the ever-growing social and digital era, thus it is imperative that they are aware of innovative ways in reaching and teaching cancer patients. Oncology nurses are strong advocates serving as conduits connecting cancer patients to exemplary care. Additionally, the forward-thinking innovative oncology nurse can expand their role connecting cancer patients to emerging educational delivery systems as well.

### **EXAMINING SURFACE CONTAMINATION WITH ANTINEOPLASTIC DRUGS IN INPATIENT ONCOLOGY**

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Healthcare workers are at risk for adverse health outcomes from exposure to antineoplastic drugs. Even low levels of dermal exposure present risk. Despite policy and recommendations to limit exposure to hazardous drugs for healthcare workers, exposure potential persists due to inadequacies in training, sub-optimal use of personal protective equipment (PPE), and workplace safety climate. Our interdisciplinary team aimed to: Describe inpatient oncology surfaces most contaminated with antineoplastic drugs and characterize inpatient oncology nursing staff PPE use and factors that predict use. This is a descriptive study of two inpatient oncology units in a southeastern medical center administering etoposide and cyclophosphamide. Surfaces (n=140; average area 180 cm<sup>2</sup>) were sampled in four patient rooms and selected shared areas. Surfaces were wiped with swabs saturated with a solution of methanol/acetonitrile/water. Samples were stored at -80°C until analysis by liquid chromatography-mass spectrometry. Demographics, PPE use, and factors affecting PPE use were collected via a survey administered to the staff. Contamination with cyclophosphamide and etoposide was detectable and quantifiable in 86/140 (61%) and 42/140 (30%) of surfaces tested, respectively. Of these, levels greater than 0.05 ng/cm<sup>2</sup> (a level commonly reported in commercial wipe testing) were measured in 25% (22/86)

for cyclophosphamide and 17% (7/42) for etoposide. The top three most contaminated surfaces were two toilet seats and a remote control in a patient room for cyclophosphamide and two toilet seats and a floor near the IV administration pole for etoposide. One toilet seat was contaminated with both drugs. Nursing staff completed the online survey (n=37) and reported sub-optimal use of PPE that varied when administering, disposing, and handling excreta of patients. Workplace safety climate was the only factor predictive of PPE use. Our survey findings are consistent with those in studies including insufficient use of PPE by nurses, and workplace safety climate as a key predictor of PPE use. Contamination exists on surfaces in inpatient oncology units presenting exposure risks. Future interventions to limit exposure and routine surface sampling recommended by USP <800> should focus on those areas of greatest contamination, including toilet seats which was an innovative finding from our study. Improving workplace safety climate which includes availability and training about PPE, and supervisor involvement in safety are also needed to minimize exposure.

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### **RESEARCH POSTER ABSTRACTS**

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#### **COST-EFFECTIVENESS OF STRATAXRT<sup>®</sup> VERSUS SORBOLENE FOR RADIODERMATITIS IN HEAD AND NECK CANCER PATIENTS: A TRIAL-BASED ECONOMIC EVALUATION**

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Radiodermatitis is a common symptom of radiotherapy. Prevention and management of radiodermatitis can be time-consuming and costly. Economic evaluation studies of preventative and management strategies for radiodermatitis are absent in the literature. The aim of this study was to estimate the incremental cost-effectiveness ratio (ICER) of StrataXRT<sup>®</sup> versus Sorbolene for preventing > Grade 3 radiodermatitis as assessed by the Common Terminology Criteria for Adverse Events V4. The trial from which cost and effect estimates were derived, examined the comparative-efficacy of two forms

of radiodermatitis prophylaxis (and management) administered to patients with head and neck cancer receiving radiation therapy. Incremental cost-effectiveness ratio was used to estimate cost/incident of  $\geq$ Grade 3 radiodermatitis prevented with 95% confidence ellipse plotted on a cost-effectiveness quadrant using bootstrap resampling. A healthcare provider perspective was used with a time horizon period of radiation treatment and then 4 weeks post radiation. Discounting was not considered warranted. Resource and cost data were collected prospectively during the trial. One primary analysis and two sensitivity analyses were conducted to examine the potential robustness of findings under two alternative costing scenarios. Enrolled participants (n=181/197, 92%) were included in the cost-effectiveness analysis. Intervention effect results demonstrated Grade  $\geq 3$  radiodermatitis cases were significantly lower in the StrataXRT group (p=0.01) with an odds ratio (OR 2.35) favouring StrataXRT. Nursing occasions of service managing radiodermatitis (p<0.001) and wound management consumables costs differed between groups favouring StrataXRT (b=41.0 95% CI -17.1–64.9, p=0.001) with an associated reduction in nursing labour costs (p=0.02). Primary cost-effectiveness analysis estimated StrataXRT cost more than Sorbolene per grade 3 radiodermatitis prevented, although a willingness to pay threshold was not known. Cost-effectiveness acceptability curves for primary and secondary analyses demonstrated similar results for primary and second sensitivity analyses. First sensitivity analysis cost acceptability curve on a best case type scenario, demonstrated a 36% probability StrataXRT would be cost neutral or lead to net savings for the health service. These findings provide a guide for services considering whether StrataXRT is likely to be cost-effective from a healthcare provider viewpoint. This first trial-based economic evaluation examined cost-effectiveness for preventing  $\geq$ grade 3 radiodermatitis, and may provide foundations for future economic evaluations to assist healthcare decision makers whilst ensuring value for money.

#### **ANECDOTAL DATA EXTRACTED FROM CAREGIVER END-OF-LIFE (EOL) SATISFACTION INTERVIEWS**

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Satisfaction with EOL care can be influenced by multiple factors including communication between the health care team, patient, and family regarding goals of care, symptom management, and psychological support. Communication between the patient, caregiver, and the healthcare team directly influences goals consistent to their wishes. The goal of this study is to examine EOL care satisfaction for caregivers of patients with Stage IV gastrointestinal (GI) and lung cancer using caregiver interview data. The parent study was a longitudinal descriptive correlational study involving patients with advanced cancer and their caregivers. The focus of the study was to evaluate patient and caregiver goals of care, preferences, and caregiver satisfaction with EOL care. Patients and caregivers provided data every 3 months until death or end of the study period (15 months). An EOL satisfaction of care survey, Family Satisfaction with EOL Care (FAMCARE) was administered to caregivers two months post patient death via a telephone interview. The survey measured how satisfied the family member was with healthcare providers, hospital, and hospice services at EOL with higher scores indicating a higher level of satisfaction. An open-ended question at the end of the survey asked caregivers to describe their experience. The responses to this question also provided data for this presentation. Examination of responses to the open-ended question revealed that caregiver comments fell into three broad categories: Concerns regarding transitions (hospice), questions regarding transparency of healthcare providers in sharing bad news at EOL, and complaints regarding management of pain and other symptoms. Although 87% (84/97) of caregivers rated their overall satisfaction with EOL care as satisfied or very satisfied, in many cases, the caregivers still expressed frustration regarding the lack of communication and transparency during transition of care from active treatment to comfort care. Nursing practice implications include initiating conversations and assessment of patient and family centered needs related to issues pertaining to transition of care. These conversations could potentially provide a better understanding of the EOL care process and allow the transition from curative care to comfort care to go smoothly. These conversations could potentially allow both patient and family to have a clearer understanding of what to expect during this process.

## **SITUATIONAL ANALYSIS REGARDING THE STATUS OF PEDIATRIC PALLIATIVE CARE SERVICES IN THE PHILIPPINES TOWARDS DEVELOPMENT OF A WEB-BASED PALLIATIVE CARE PROGRAM**

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In the Philippines two-thirds of pediatric oncology clients are diagnosed at advanced stages. This data reflects increased need for palliative care. There is a dearth of information on the current status of palliative care in the Philippines with available data focusing on adults. However, such information is deemed essential for creating an effective pediatric palliative care program. Thus, the study aims to analyze the current status of pediatric palliative care in the Philippines focusing on children with cancer and determine the palliative care needs based on the perspective of caregivers, healthcare providers and cancer/ palliative care facility managers so towards development of a palliative care program in the country. A situational analysis was done involving 4 tertiary hospitals from key regions of the country, through: a focus group discussion (FGD) of healthcare team members involved in the care of children with cancer; a key informant interview with heads/managers of pediatric cancer facility and palliative care service; and a survey interview with parents of children with cancer all utilizing the needs assessment tools by the WHO (2004). The situational analysis revealed that of the 4 hospitals, 2 have a well-established palliative care service catering to children. Only one facility provides palliative care at home, and most of them have an average of 2 trained palliative care specialist to cater to pediatric cases. Only one hospital provides specialized training for pediatric palliative care. Common barriers cited were lack of manpower resources, problematic referral system, perception about palliative care and workload. Top 3 perceived palliative care needs as per the perspective of the health professionals and managers (n=31) were access to pain medications; psychosocial care needs; and need for increased awareness of the primary care givers on home care. With regards to the primary caregivers' perspective

(n=186), accessibility to cancer/health facility (26.3%), access to and availability of cancer and/or treatment related medications required (13.4%) and problems addressing psychosocial changes (12.4%) were identified as the palliative care needs. Above data was used to create a web-based palliative care program for children with cancer with a learning management system for health professionals and caregivers covering physiologic and psychosocial care, a telemedicine platform with referral system for home-based palliative care via NGO to address access to health care.

## **COGNITIVE FUNCTION IN COLORECTAL CANCER SURVIVORS RECEIVING CHEMOTHERAPY: A SYSTEMATIC REVIEW**

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Impaired cognitive function (CF) caused by neurotoxicity from antineoplastic agents has been understudied in colorectal cancer (CRC) survivors. The treatment-related effects may decrease patients' physical function, ability to work, and quality of life. CRC is the 3rd most common cancer in the US and is primarily treated with antineoplastic agents that have a risk for neurotoxicity. The purpose of this review was to explore impaired CF and identify risk factors in CRC survivors receiving chemotherapy. Guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), a systematic search was conducted in PubMed, CINAHL, and PsycINFO databases with no year limitation to maximize the number of articles. The inclusion criteria were: (1) published in English or Chinese; (2) observational research using quantitative and/or qualitative method; (3) participants aged 18 years and older; and (4) CRC survivors receiving chemotherapy. The initial search yielded 573 articles. Ten articles, 5 longitudinal and 5 cross-sectional, published across 8 countries between 2009 and 2018 met criteria for final inclusion. Findings from 8 articles revealed that CRC survivors receiving chemotherapy experienced some degree of impaired CF over time or when compared with those did not receive chemotherapy. However, only 2 articles from the same study found these changes to be significant, while others did not. Additionally, between studies, extensive variability in CF measures

and data collection time points was noted. Across all studies, risk factors associated with impaired CF including age, gender, education, chemotherapy regimen, treatment-related side-effects, and emotional distress. With no date restrictions on this review, only 6 articles were located that aimed to explore CF experienced by CRC survivors. Further, inconsistencies in methodology complicated synthesis across studies. There is a critical need for future research to better understand the trajectory and risk factors of impaired CF domain experienced by CRC survivors using longitudinal design with sufficient sample size. This would enable nurse researchers to develop potential interventions; and oncology nurses to identify patients who are at a high risk for impaired CF to facilitate early identification before and after chemotherapy initiation. This review is innovative because it is the first to identify risk factors for impaired CF and examine how the experience of this common and troublesome treatment side effect changes over time among CRC survivors.

#### **DEVELOPMENT OF A PEDIATRIC CANCER REGISTRY SYSTEM AND MAPPING OF PEDIATRIC CANCER PATIENTS USING GEOGRAPHIC INFORMATION SYSTEM**

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In the Philippines, cancer statistics are mostly population-based and are not regularly published. This problem stems from the fact that a national cancer registry system is yet to be established. Various efforts have been made on this aspect, mostly cancer society based. Most recent effort is a system created by the Department of Health requiring hospitals to log-in relevant patient data into their website to track the incidence and prevalence rates of cancer. However, hospitals find this challenging as reported in a conducted needs assessment. The study aimed to develop a cancer registry system and utilize a Geographic Information System (QGIS 3.4 Madeira) to map the location of Pediatric Cancer Patients for locating concentration of patients and utilization for further studies on hazards identification and epidemiologic

studies. A Systematic Review of Literature on Cancer Registries and their development and a Focused Group Discussion with health professionals were conducted to determine the content of the Cancer Registry and the best mechanism for entry of data while ensuring data privacy. Members of the research team underwent training on the use of GIS for the mapping of the pediatric cancer patients. The primary data determined as necessary for the cancer registry are the cancer type, medical diagnosis, cancer staging, type of therapy, and disease status. The mapping of pediatric cancer patients revealed that cancer centers, specifically the country's primary children's hospital, caters to as far as 407 miles north and 968 miles south of the country. Patients from far-flung areas tend to consult to distant hospitals even when a more adjacent cancer center is accessible. This adds to cancer care burden of patients by increasing travel, accommodation costs and other non-medical costs. The GIS patient mapping revealed patient concentration in top five areas: Metropolitan Manila (n=58, 31%), Bulacan (n=20, 11%), Rizal (n=11, 6%), Albay (n=9, 5%), and Laguna (n=8, 4.3%). In Metropolitan Manila, the cities with highest patient concentrations are Quezon, Caloocan, and Manila. The Web-based Pediatric Cancer Registry System and use of GIS showed a more efficient way of developing a national cancer registry for children with cancer and a mechanism to identify areas of high prevalence rate that can be targeted for future health promotion and cancer disease prevention programs in the country.

#### **THE IMPACT OF THE CHILD'S CONCERNS ABOUT THEIR MOTHER'S BREAST CANCER ON THE CHILD'S ANXIETY OVER TIME: TEST OF A STRUCTURAL EQUATION MODEL**

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Maternal cancer diagnosis leads to substantial changes in the mother-child relationship; children struggle with anxiety, worries, and threats to their attachment security. However, very little is known about what mediates the impact of the child's concerns or the mother's depressed mood on the child's anxiety. The purpose of this study was to test a model of school age children's adjustment to maternal breast cancer that was derived from Attachment Theory. We first examined the relationship between the child's illness-related concerns, their behavioral attempts to verify the security of their relationship with their ill mother (proximity seeking behavior), the child's anxiety, and the mother's

depressed mood. Second, we tested whether the child's proximity seeking behavior mediated the influence of the child's illness-related concerns and mother's depressed mood on the child's anxiety over time. A total of 202 children (7–12 years) and mothers with early stage and newly diagnosed with breast cancer were enrolled. Mothers completed a standardized measure of depressed mood and children were assessed on their illness-related concerns, proximity seeking behavior, and anxiety. The model was tested using structural equation modeling and bootstrapping was used to test for mediation effects. The model provided a good fit to the data. Results of the direct relationships indicated that a higher frequency of children's concerns was significantly associated with higher levels of maternal depressed mood. Children's illness-related concerns significantly predicted their proximity seeking and anxiety over time. However, maternal depressed mood inversely predicted child's proximity seeking. Namely, when the mother was more depressed, the child's proximity seeking behavior was diminished ( $P$ -values  $< 0.05$ ). Furthermore, proximity seeking behavior significantly mediated the relationship between the child's concerns and anxiety over time. Maternal depressed mood and children's illness-related concerns have deleterious effects over time on the child's anxiety. When children are highly concerned about the illness, they increase their proximity seeking behavior to control their worries. However, when the mother is more depressed, children do not turn to her to alleviate their concerns. As a result, their unattended concerns and threatened security increase their anxiety. Oncology nurses can be patient educators and child advocates, helping mothers gain communication skills to help reduce attachment threat. Maternal depressed mood is a mutable risk factor for child anxiety and needs professionals' attention.

### **CERVICAL CANCER SURVIVORS' PERSPECTIVES ON PROVIDER COMMUNICATION RELATED TO TREATMENT IMPACT ON HEALTH IN THE SEXUAL DOMAIN**

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The American Cancer Society projects that more than 13,000 women will be diagnosed with invasive cervical cancer (CC) in 2018. Patient-oncology provider communication often focuses on combating disease rather than discussions of fertility, sexuality or intimacy. Treatment for CC includes surgery, chemotherapy and/or radiation. Women who receive radiotherapy report poor sexual health and more sexual dysfunction

than women receiving surgery alone or with chemotherapy. Survivors feel that providers should routinely ask their patients about sexual issues but report that the topic of sex is not introduced. The purpose of this descriptive study was to collect the experiences of CC survivors related to the information they received about how their diagnosis and treatment may impact their sexual health. The BETTER model was modified into electronic survey format. The study ( $n = 89$ ) had 15 variables and two open ended questions. Independent variables were: Age (current and at diagnosis); CC stage; Race; Ethnicity; Insurance status at diagnosis; Educational completion; and Urbanicity. Participants also reported independent variables related to provider gender and type. Dependent variables were five modified BETTER model questions and a question regarding the offer of fertility options following treatment. Open ended questions on the social/cultural impact of diagnosis and the opportunity to share any questions they wished they had asked were included adding depth to the closed ended questions. Outcomes revealed three significant findings. 1) Of respondents reporting that their provider did not explain that they could discuss any concerns during their treatment more than half fell at the lower end of the educational level. 2) There was an association between provider gender and offers of information about fertility preservation. 3) Female providers were 31% more likely to offer fertility information. Although not statistically significant, nearly 50% of the CC survivors reported that issues in the sexual domain were not introduced during discussion of treatment options. This study supports use of the BETTER model as a teaching tool for nurses in oncology practices facilitating quality patient centered care by reducing gaps in addressing sexual domain issues related to treatment options. Ultimately, participant perspectives will be used to modify public domain educational materials used in oncology practices and cancer support organizations to reflect a more patient centered approach to health in the sexual domain.

### **TECHNOLOGY-BASED INTERVENTIONS TO IMPROVE ANXIETY, DEPRESSION AND HEALTH RELATED QUALITY OF LIFE AMONG PATIENTS WITH PROSTATE CANCER: A SYSTEMATIC REVIEW**

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Health care providers often fail to meet the psycho-social needs of prostate cancer patients. Technology-Based

Interventions (TBIs) can improve psychological status and Health-Related Quality of Life (HRQoL) for prostate cancer patients. TBIs have the potential to deliver cost-effective programs, facilitate engagement in survivorship care, and reduce the fear of stigma related to mental services. However, little is known about the effectiveness and utility of TBIs on anxiety, depression, and HRQoL among cancer patients including prostate cancer patients. The findings from this review will provide integrated evidence for designing effective TBIs to enhance supportive care for prostate cancer patients. The review was conducted according to the PRISMA guidelines using the CINAHL, EMBASE, "Library & Information Science Abstracts," "Library, Information Science & Technology Abstracts," "Library & Information Science Source," PsycINFO, and PubMed. We used the Cochrane Handbook for Systematic Reviews of Interventions as a guide to extract from the eligible studies. The Cochrane risk of bias criteria were also used to evaluate whether the risk of bias was low, unclear, or high risk. Among the six RCTs and four quasi-experimental studies that met our inclusion criteria, the TBIs aimed to provide informational support, self-care management, or psycho-social support. Five studies used self-guided websites; four used web-based programs facilitated by medical professionals, and one used a mobile app under clinical nurse supervision. The intervention duration ranged from four weeks to three months in eight studies and from six to 12 months in two studies. Participants' platform use was about 60–94% across studies. Compared to the patients in usual care, the TBI users reported a significant reduction in anxiety, improvement in depression, and improvement in HRQoL in one, two, and two studies, respectively. Future research needs to be rigorously designed using randomized control trials and sufficiently powered to examine the effects of TBIs on the health outcomes among patients with prostate cancer. Moreover, future researchers must ensure that they examine the effect of actual intervention use, intervention components, and duration on the TBIs benefits. TBIs are promising in improving health-related outcomes such as anxiety, depression, and HRQoL among prostate cancer patients.

### **FINANCIAL TOXICITY IN ONCOLOGY PATIENTS: THE IMPACT OF AN EDUCATIONAL INTERVENTION FOR NURSES**

**Erika Rosato, RN, MHA, OCN®, NE-BC, Massachusetts General Hospital, Boston, MA**

Financial toxicity describes the harmful personal financial burden faced by patients and families

receiving costly medical care and is seen quite often when a patient is receiving cancer treatment. Evidence suggests that oncology patients pay more out of pocket for care than those with other chronic illnesses. Ramifications of financial toxicity range from emotional distress to personal bankruptcy. Increasing nurses' understanding of financial toxicity can help oncology patients to better manage the expense associated with their cancer treatment through connecting them to the appropriate team members. The purpose of this scholarly project was to 1) educate oncology nurses on the impact of financial toxicity on oncology patients and 2) increase nurses' confidence in their knowledge, of how to facilitate management of financial toxicity in oncology patients. The aims of the study were to 1) develop and implement an educational program for registered nurses regarding financial toxicity, 2) describe nurses' knowledge of financial toxicity through a pre and post education survey measurement tool and 3) describe nurses' confidence levels in addressing financial toxicity through a pre and post survey measurement tool. This quality improvement project utilized a pre and post educational program, web-based survey design. A convenience sample of approximately four hundred oncology registered nurses that belong to the Boston Oncology Nursing Society (BONS) were invited to participate. Pre/post web-based surveys were used to measure nurse's knowledge and confidence related to the topic of financial toxicity and the methods to facilitate management of the toxicity. Data collection methods consisted of demographic, Likert-type scale, and open-ended questions. Descriptive statistics were utilized to summarize the participant demographics and survey results. Comparative statistics were used to analyze pre and post educational survey results to evaluate the impact of the educational intervention on the participants. This project has the potential to help nurses become more knowledgeable and confident with addressing their patient's financial concerns which will minimize the financial burdens their patients and families encounter.

### **THE FEASIBILITY OF USING LAVENDER AROMATHERAPY PATCHES WITH INPATIENT HEMATOLOGY/ONCOLOGY PATIENTS**

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Lavender aromatherapy has been frequently used in complementary and alternative medicine (CAM) across various patient populations. Because of lavender's relaxing properties, this particular essential oil could be used in the inpatient hematology/oncology population to provide a sense of calm during hospitalization. Even though lavender is a popular essential oil, few studies have examined the use of lavender aromatherapy in the inpatient hematology/oncology population. The purpose of this study was to determine the feasibility of wearing a lavender aromatherapy patch overnight in the inpatient hematology/oncology patient population. This mixed-methods feasibility study was conducted over two months in an inpatient hematology/oncology unit. Nurses placed a lavender patch on participants' apparel at bedtime. Once patches were removed in the morning, patients completed two surveys consisting of demographic and lavender satisfaction questions, in addition to the General Anxiety Disorder-7 (GAD-7) scale. The GAD-7 was pilot tested for administration feasibility and as a preliminary assessment of anxiety symptom severity. Forty participants with a mean age of 60 years (SD = 11.5, range 29–81) completed the study. More female (62.5%) than male (37.5%) participants enrolled diagnosed with both solid and hematologic cancers. Most participants (70%) were satisfied wearing the lavender patch. Some participants noted they preferred alternative scents, such as vanilla and citrus. The majority of participants (71.8%) reported they would use the lavender patch again, describing it as pleasant and relaxing. Additionally, participants reported they felt the patch helped them sleep. The GAD-7 anxiety severity scores ranged from mild to severe. The mean score was 5.95 (SD = 5.61) with a range between 0 and 21. The sample's mean score indicated mild anxiety symptom severity. Almost half (45%) of the participants scored in the mild anxiety symptom range. Based on participants' responses, the use of a lavender patch is feasible in the inpatient hematology/oncology population. Participants perceived better sleep quality and had mild anxiety scores, which may have been related to wearing the lavender patch. Further studies are recommended to determine the effectiveness of lavender aromatherapy use to improve sleep quality and to promote relaxation while hospitalized. This intervention represents a low-cost, patient-centered, and nurse driven therapy to hospitalized patients. Additionally, it gives patients the opportunity to actively participate in their care.

## **A PHENOMENOLOGICAL APPROACH TO SEXUAL RECOVERY IN POST-SURGICAL PROSTATE CANCER PATIENTS**

**Asa Smith, BSN, RN, University of Michigan, Ann Arbor, MI**

Prostate cancer is the second leading cancer type in American men. Five-year survival rates following surgical intervention for prostate cancer have remained high, which has increased attention to long term quality of life issues. One of these issues is sexual health, which is negatively impacted though subsequent urinary incontinence and erectile dysfunction. However, there remains little literature that empirically describes the experiential process of sexual recovery undergone by patients and their partners. Understanding the overall trajectory of sexual recovery in this population is vital to inform points of potential intervention. This secondary qualitative analysis aimed to describe how patients experience their sexual recovery process after prostate cancer surgery. Transcripts of interviews with 8 heterosexual couples were randomly selected from a sample of 18 at 3 months post-prostatectomy. The study applied Interpretive Phenomenological Analysis (IPA) to examine couples' sexual recovery in depth through the subjects' perspective. Transcripts were reviewed and coded for themes, keeping the analysis grounded in the participant's account without higher level abstraction. Relevant themes that emerged were then clustered, detailed, and connected across patients. Rigor was maintained through a strict audit trail and reflexivity journal to bracket off personal biases. Themes were only added into the final table if they were present in at least three participants. Analysis was conducted using Atlas.ti. Patients developed varied expectations of their recovery process (n=4) and some wished for their sexuality to return sooner (n=4). Patients expressed a wide range of emotional responses to recovery including surprise at the sexual function changes (n=5), hardship and willingness to persevere in navigating sexuality issues (n=3), uncertainty about the future of their recovery (n=4), optimism about their recovery process (n=3), and frustration with the difficulties of recovery and the need for sexual aids (n=4). Patients also discussed their mixed experiences with using sexual aids (n=6), and the potential they saw in therapy and counseling services (n=4). This study illuminates the complexities of navigating sexual recovery in prostate cancer patients, which include both physical and psychosocial challenges. Ultimately nursing assessment of the constellation of these experiences will be key in understanding the

couple's pathway to sexual recovery. Disentangling these positive and negative experiences will be crucial for future nursing intervention.

### **ELEVATING NURSING PRACTICE: TELEMETRY CERTIFYING ONCOLOGY RNS**

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With the frequent administration of cardio toxic chemotherapy/biotherapy agents, high acuity of oncological patients, and unnecessary patient transfers to non-oncology units, all Oncology nurses obtained Telemetry Certification from the American Association of Critical Care Nurses (ACCN). There was an increase in patient transfers from the Oncology Unit to Telemetry Units for arrhythmia and cardiac management. The National Comprehensive Cancer Network (NCCN) and Oncology Nursing Society (ONS) recommend recognition and management of treatment induced cardiac toxicity from chemotherapy agents. Moreover, oncological patients are at significant risk for numerous cardiac events, such as electrolyte imbalances and possible tumor infiltration into the cardiac wall. Per ONS, Oncology Certified RNs play a critical role in the delivery of care to hospitalized patients with cancer. Additionally, the Commission on Cancer's Clinical Practice Guideline 1 states that the complex needs of patients with cancer and their families require specialized oncology nursing knowledge and skills to achieve optimal care outcomes. In order to provide better continuity of care as well as elevate oncology nursing practice, all RNs on the oncology unit were required to obtain Telemetry Certification from the American Association of Critical Care Nurses (ACCN). All RNs were enrolled in the online ACCN Telemetry certification course, attended a live didactic course for arrhythmia management that focused specifically on cardiac management in oncology patients, and completed a written test. This allowed specialty trained oncology nurses to provide appropriate oncology and cardiac care to a specialized patient population. Prior to implementation, 22% of oncology patients were transferred off of the oncology unit for cardiac care. In 2018, after successful implementation and education to all stakeholders, oncology patient transfers decreased to 3%. Year to date, oncology transfers are down to less than 1%. Patient satisfaction scores for overall rating of care improved to the 95th percentile since implementation. Per national guidelines, oncology patients must be monitored for cardiac

events related to treatment and the disease process. Through certification, nurses are able to recognize cardiac events and treat appropriately. This certification also improved continuity of care by specialized nurses.

### **EXPERIENCE AND KNOWLEDGE OF PAIN MANAGEMENT IN CANCER OUTPATIENTS: IMPLICATIONS FOR PRACTICE**

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Pain has been identified as one of the most frequent and distressing symptoms among all cancer patients. Management of cancer pain is considered to be complex. In spite of the existing practice guidelines and knowledge for effective pain management, a big proportion of cancer patients are still treated inadequately for pain. Under-treatment of pain is particular important for ambulatory oncology patients with advanced diseases, because studies have shown that patients are often not fully assessed for pain in the outpatient settings. The purpose of this study is to explore outpatient cancer patients' experience for cancer pain management. This is a prospective, cross-sectional study of cancer patients who were seen at outpatient clinics in a cancer center in Taipei, Taiwan. Brief Pain Inventory (BPI), Pain Management Index (PMI), and Morisky Medication Adherence Scale (MMAS) were administered to measure pain intensity, pain management quality, adherence for pain medication, and knowledge and experience of patients in managing cancer pain. Sixty patients with advanced cancer diseases participated in this study, and about 60% of these patients' report of the worst pain in 24 hours was moderate and severe. The average pain interference total score measured by BPI was 24.5 with SD of 17.3 (range from 0 to 63); in which subscale scores the average affective interference score is higher than activity interference score (11.5+9.8 vs. 9.8+7.4). Bivariate analysis found that patients' PMI was directly related to average pain severity and pain interference scores. About 85% of these patients were in the category of low and moderate pain-medication adherence which was measured by the MMAS. Cancer outpatients have to manage their pain at home on a daily basis. Our results identify the need to incorporate patient-reported outcomes in the assessment and treatment of cancer pain in the outpatient settings. The results may also highlight the importance of self-management support to enable patients in managing their pain at home.

## **SELF-MANAGEMENT INTERVENTION WITH MULTIMEDIA FOR PATIENTS WITH HEAD AND NECK CANCER**

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Head and Neck (H&N) cancer is among the ten most frequent in Brazil. Educational interventions should be developed to assist patient in the process of adaptation and self-management skills. We sought to develop an educational program, to evaluate its benefit, assessing quality of life, anxiety and depression at 4 time points, from the beginning of the treatment to the follow-up period. We also aimed to evaluate the reception, based on the self-management principles. This study was done in three phases: (1) methodological study, for the construction and validation of a script for the development of learning objects, (2) experimental study, randomized and controlled, quantitative, to evaluate the educational intervention based on the usual action versus the multimedia (video and print material) through the instruments Functional Assessment of Cancer Therapy-Head and Neck (FACT-H & N) and Hospital Anxiety and Depression Scale (HADS) and (3) qualitative study to evaluate the educational material developed on the basis of the principle of the reception study. The results were analyzed according to the study design of each phase. First phase, the script was approved by 99 percent of all health professionals. The kappa free-marginal statistical test was 0.68%. Second phase, 20 patients from a single public institution (São Paulo, Brazil) were included. The control group (CG) reported gradual decrease on the health-related quality of life (HRQOL) scores over the time points, while those reported by the experiment group (EG) has progressively increased. The prevalence of anxiety and depression symptoms was low in both groups, similar to the one described in the literature. A significant correlation was found between symptoms of anxiety/depression and poor HRQOL. CG patients showed significant worsening in social/family well-being and on the prevalence of additional H&N concerns, while in the EG symptoms of anxiety have decreased and emotional well-being has increased. In the last phase, the educational material was satisfactory evaluated in view of its goals, content, structure, length, language and illustration. These findings suggested evidence of validation and effectiveness of this

educational materials. The educational intervention improved the quality of life and reduced anxiety and depression. The educational material generated skills for self-management. Development of an educational program based on the principles of self-management for underserved Brazilian patients with cancer.

## **SLEEP SBIRT: A PROFESSIONAL DEVELOPMENT PROGRAM**

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Poor sleep in cancer patients and survivors occurs all along the diagnosis and disease treatment trajectory. This “poor sleep” could be attributed to the presence of one or more underlying sleep disorders. However, sleep disorders screening is not routine in cancer programs despite its inclusion in national initiatives and practice guidelines. Nurses, the most trusted profession, are in a position to provide sleep disorder screening, a brief intervention and referral for further treatment to improve sleep quality and ultimately improve outcomes. Through online education and practice with simulation followed by debriefing, nurses can reinforce their learning in a supportive, constructive environment. The purpose of this project was to explore the feasibility and acceptability of a professional development program for Sleep disorders Screening, deliver a Brief Intervention and provide Referral for Treatment (Sleep-SBIRT), by assessing knowledge, clinical confidence and participation by ambulatory cancer nurses. Participants reviewed online education and were prepared to define six sleep disorders (i.e. sleep disordered breathing, circadian rhythm sleep disorders, parasomnias, narcolepsy, restless legs syndrome, insomnia), interpret two Holland Sleep Disorders Questionnaires during two in situ simulations using standardized patients and debriefing. Online quizzes, self-reported Dysfunctional Beliefs and Attitudes About Sleep scale (DBAS) and Student Satisfaction and Self-Confidence in Learning were used to evaluate feasibility and acceptability of Sleep-SBIRT. We recruited 22 nurses for this ongoing trial. Among 12 participants who completed: mean age 42.6 (SD=10.8), 100% (n=12) female, 92% (n=11) Caucasian, 83% (n=10) baccalaureate degree or higher, average nursing experience

was 18 years (SD=11) and all (n=12) were direct care ambulatory cancer nurses. Online quizzes revealed all nurses scored 100%. Overall nurses were satisfied and felt confident in learning (Mean = 60.33; SD = 5.1; Skewness score = -1.42). DBAS was higher in pre-test (Mean=122.8; SD=25.3) than in post-test (Mean=116.6; SD=32.9), indicating improvement from nurses' DBAS, but not significantly (p = 0.45). Results are preliminary, but promising. The ambulatory setting provides substantial ongoing care to cancer survivors and this professional development program may lead to the empowerment of ambulatory cancer nurses to immediately assist, or, if necessary, provide referrals to sleep experts. Sleep-SBIRT utilizes online education and in situ simulation to bring academics into the clinical setting to help professionals self-reflect with the help of a trained facilitator.

### **IMPACT OF PRACTICE CT DATE ON ANESTHESIA UTILIZATION FOR PEDIATRIC RADIATION ONCOLOGY PATIENTS**

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For pediatric patients undergoing radiation therapy for cancer treatment, it is necessary to first have the patient receive a CT scan for treatment planning. The scan requires the child to stay motionless, as does daily treatment with proton therapy. Prior to March 2016, there was no formal process in place for pediatric radiation oncology patients completing CT simulation at the Northwestern Medicine Chicago Proton Center. For children aged 8 or less, the Radiation Therapists working in the CT department would attempt to work with the child to get through the CT simulation without anesthesia on the day of their consultation. If this was found not to work, the patient would undergo CT with anesthesia and proceed with daily anesthesia for treatment. A structured, practice CT was established as of January 16th, 2017. This included a pre-call from the Child Life Specialist to evaluate the patient and parent needs and expectations. The day of practice CT simulation, time is scheduled (30–45 minutes) for Child Life to

meet with the patient and the parent. The Child Life Specialist used age appropriate explanations as well as visual aids to guide the patient through what will happen, then works with the child throughout CT simulation to help them tolerate the procedure. If the patient is unable to tolerate the CT simulation despite Child Life intervention, but it is generally felt that the patient has potential to complete without anesthesia, another appointment may be attempted. If patient is unable to tolerate the scan after the second attempt, the patient will complete the CT simulation, as well as daily proton therapy treatment, under anesthesia. Based on pre-screening by intake, 23 out of 46 children aged 4–9 were determined to be viable candidates for receiving an official structured practice day. Of these 23 children, 22 have successfully completed their CT simulation, and subsequent treatment, without anesthesia. This translates into a 97% success rate. This process has reduced the treatment burden on the child and family by eliminating the need for daily anesthesia, thus reducing the total treatment time and treatment cost.

### **INFECTIONS UPON ADMISSION OF PEDIATRIC ONCOLOGY PATIENTS TO PEDIATRIC INTENSIVE CARE UNIT (PICU) IN THE OCCUPIED PALESTINIAN TERRITORY**

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Infection Disease remain an important global problem, cancer is the second leading cause of death in children, after accidents. Infections frequently complicate the course of cancer treatment and prolongs hospital stay, intensive care unit continues to play an important role in the care of these patients. The purpose of this study to identify pattern in the type extent and sequela of infections of pediatric oncology patient in Palestinian hospitals. The study was undertaken at the pediatric intensive care unit at Makassed hospital, East Jerusalem occupied Palestinian territory hospital. Prospective, descriptive study using statistics (percentage, mean, frequency). Infection rate was calculated in percentage (number of infected per 100 clients). Using the CDC and prevention definitions to the diagnose nosocomial infections and the NISS methodology. Microbiologic tests, the medical charts of all oncologic patients admitted to Pediatric intensive care unit over one year from September 2017 to August 2018 were analyzed. Intensive care unit admissions are frequently limited by the availability of beds. Total of 21 children (13 girls and 8 boys) of 42 oncology admissions met the inclusion criteria for

the study to have malignancy, and to have at least one positive culture, all positive culture were identified, using clients records, lab investigations and diagnostic test to identify high risk patients and analysis of positive cultures. Cancer patients represented 11.83% of all Pediatric intensive care unit admissions. The rate of infection was 21 (50%), per 100 admission to pediatric intensive care unit. 17 (80.95%) referred with positive culture. rectal infections 6 (28.57%) are the most common infections. 4 (19.047%) matched the diagnosis (NIS). The most common microorganism isolated were E. coli (28.5%), klebsiella (23.8%). 11 (26.19%) were found having more than two organism, average age 4.5 years, length of stay more than 10 days, 14 (66%) were on mechanical ventilation, 17 (80.95%) brain tumor are the most common tumor frequent diagnosed. E-coli infections are nosocomial, preventing infection is possible; health care setting must adopt prevention practices. Innovation: High lights the importance of control measures used in Palestinian hospitals to prevent infections. Hand washing is the main and most important cost effective major to prevent infection.

### **IDENTIFICATION OF FACTORS ASSOCIATED WITH THIRTY-DAY READMISSIONS IN ADULT SOLID TUMOR PATIENTS**

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Readmission rates for oncology patients range between 11%–27.4% as reported in the literature. The medical oncology solid tumor patients at this National Cancer Institute–Comprehensive Cancer Center had a 30-day readmission rate of 34.7% from 2015–2016. This Institutional Review Board approved study is an effort to identify demographic and clinical variables associated with 30-day readmissions for adult patients with solid tumors and identify which of these variables can be modified. This study uses a retrospective chart review design with a 20% random sample (855 patients) drawn from all solid tumor admissions from 2012–2016. The 63 variables collected reflect an evidence-based review of the literature and input from expert nursing clinicians. Readmission variables identified for adult oncology and general medical patient populations included multiple comorbidities, increased healthcare utilization, and low albumin levels. Factors related to patient mobility, self-care, comorbidities, functional

status, caregiver capabilities, socioeconomic variables and polypharmacy were also identified. Electronic health record documentation from nursing, providers and ancillary disciplines were used to extract demographic, clinical, and laboratory data. A comparison between the two groups (readmitted and not readmitted) using Chi-squared and paired t-tests was performed. The study showed a readmission rate of 23%. The most frequently identified diagnosis for admission and readmission was pancreatic cancer (n=17%). The primary reason for admission and readmission for the entire sample was pain (n=17%). Statistically significant findings for higher rates of readmission included; patients with more hospital/emergency room encounters in the prior twelve months, and there were increased readmissions for African Americans who lived alone. Patients who were more active and mobile at discharge had a higher rate of readmission. Patients who received a pain and palliative care consults closer to discharge also had higher rate of readmission. Limitations of this study include missing and incomplete data, inability to track readmissions to other facilities and difficulty in separating symptoms that may be modifiable from acute conditions that require admission. Our goal to identify variables of readmission were accomplished and have also identified pain management and African Americans who live also as potential variables that may be modified to reduce readmissions.

### **MEASUREMENT OF THE IMPACT OF A 2018 CASE-STUDY BASED MYELOMA SYMPOSIUM ON NURSING BEHAVIOR**

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There has been an explosion of new therapies to treat myeloma in the last decade. The increased availability of treatment options for myeloma patients and the importance of nurses advocating for patient input on therapeutic decisions have created new challenges for nurses. Nurses have expressed the need for up-to-date education in these areas. However, there is a lack of data on whether symposia-style, case-study based education enacts practice change for nurses, or whether nurses recognize their influence on myeloma

patient outcomes. The Nurse Leadership Board of the International Myeloma Foundation has delivered a symposium at the ONS Congress for 12 years with the purpose of educating nurses who care for patients with MM. Since 2013, a case-study approach has been utilized. Thus, we sought to evaluate the ability of the symposia-style program to effect change in nursing practice by measuring self-reported follow-through on Level 4 Continuing Education Outcomes (Competence) two months after the symposium. Two types of practice change were measured in 2018. First, 66 ONS symposium attendees who committed to an intended practice change based on learned information were surveyed 2 months after the symposium via email. 40% of 15 respondents indicated that they made the practice change, 40% partially made the change. 20% had not made the change and all indicated this was due to lack of opportunity. Secondly, nurses willing to receive a follow-up email (n=342) were asked to complete a multiple-choice electronic survey, two months after the symposium, indicating whether they had changed the five behaviors targeted by the symposium. 62 of 342 responded. 90% reported making a change in at least one category. Notably, 45/62 (72.5%) respondents were more mindful of their influence on myeloma patient outcomes, and 40/62 (64.5%) were more attentive to myeloma research. Nurses who attended a case-based myeloma symposium and indicated a high commitment level to making a practice change had a high rate of conversion to making those changes. Additionally, a significant percentage of nurses who attended the symposium were more aware of their influence on myeloma patient outcomes. Results of this analysis support the benefit of symposia-style, case-based education for oncology nurses to enact Level 4 outcomes and raise awareness of their influence on patients.

#### **PREDICTORS OF QUALITY OF LIFE IN WOMEN WITH BREAST CANCER AFTER DOCETAXEL TREATMENT**

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Breast cancer is the number one female cancer incidence in Taiwan with an overall five-year survival rate of 85%. Chemotherapy accounts for 60.2% of all breast cancer treatments, the majority of patients receiving

docetaxel. With the early detection and treatment advancement, more women have survived from breast cancer. However, still these women suffered from the immediate or long-term physiological, psychosocial distresses that hampered their quality of life. The study purposes were to investigate predictors of quality of life, and to explore the association between symptoms and quality of life in women with breast cancer after docetaxel. This was a cross-sectional, correlational study employing purposive sampling to recruit 75 women newly diagnosed with breast cancer. Inclusion criteria were adult women, with a pathological report of breast cancer, completion of docetaxel treatment, and able to communicate in Mandarin or Taiwanese. Research variables included physiological and psychological symptoms and quality of life. The utilization of Pearson correlation and multiple linear regression to explore the association between variables and predictors of quality of life, respectively. The mean age of participants was 51.89 years. The symptoms were significantly correlated with quality of life at a low to moderate level ( $r=-0.43-0.50$ ,  $p<0.001$ ). Moreover, physiological ( $B=-0.33$ ,  $R^2=45.3\%$ ,  $p<0.001$ ) and psychological ( $B=-0.86$ ,  $R^2=0.18$ ,  $p<0.001$ ) symptoms significantly predicted quality of life in this study ( $F=69.78$ ,  $R^2=0.63$ ,  $p<0.001$ ). Results indicated that physiological symptoms, anxiety and depression were predictors of quality of life in women with breast cancer after docetaxel. Clinical staff should be able to timely assess symptoms in women with breast cancer undergoing chemotherapy and provide referrals, psychological support or assistance to communicate with the medical team. In doing so, clinical staff may promote these women's quality of life.

#### **ASSESSMENT OF THE KNOWLEDGE, ATTITUDE, PRACTICES, PERCEIVED BARRIERS AND SUPPORT REGARDING PALLIATIVE AND END OF LIFE CARE AMONG CRITICAL CARE NURSES AT A TERTIARY CARE HOSPITAL, NEW DELHI, INDIA**

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Death is an inevitable life event. In recent years, the scope of palliative care has expanded and nurses form the most valuable palliative care team members. A critical factor influencing a successful delivery of palliative care is nurses' knowledge, beliefs and experiences, which determine their procedure as well as

behaviour during care of patients. There were limited studies in India regarding palliative and EOLC and to initiate relevant education programme for nurses, baseline is to be assessed first. The present study was conducted with aim to assess knowledge, attitude, practices, perceived barriers and support regarding palliative and end of life care (EOLC). A cross sectional study was conducted among 386 ICU nurses of tertiary care hospital, New Delhi, India, selected through convenient sampling technique. Data was collected during August–December ‘2018, using standardized tool for attitude and pre-tested valid, reliable self structured tools for other variables, analyzed using IBM SPSS. Only 7% nurses have good knowledge, 36.5% have satisfactory practice whereas 88.1% have favorable attitude towards palliative & EOLC. One of the major barriers in providing palliative and EOLC was being called for attending to other newly admitted patients as reported by 61.7% nurses. Knowledge scores of nurses were found to be significantly associated to their gender ( $p=.016$ ) and training ( $p=.001$ ). Practice scores of nurses were significantly associated with their qualification ( $p=.021$ ). There was a significant association of nurses attitude with their age ( $p=.038$ ), training ( $p=.016$ ), qualification ( $p=.002$ ), experience ( $p=.025$ ) & speciality of ICU in which they work ( $p=.016$ ). Age of nurses was found to be negatively correlated to their attitude ( $p=.014$ ) whereas nurse’s practice was positively correlated to the attitude ( $p=.001$ ) and knowledge( $p=.006$ ). There is a huge gap between nurse’s knowledge and practices, inspite of having good attitude regarding palliative and end of life care. Attitude of nurses was significantly associated to qualification, consistent with present study.

### **NON-TRADITIONAL SELF-MANAGEMENT INTERVENTIONS IN CANCER PATIENTS WITH PAIN: A MIXED-METHOD REVIEW**

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Thirty to 85% of cancer patients experience pain while they are undergoing pain treatment. Traditional pain interventions such as medications have many undesirable side effects, including addiction. Thus, many of them seek non-traditional interventions to manage their pain. Cancer patients require self-management (SM) ability or skill to manage their pain symptoms and daily cares. One of the best ways to improve patient’s SM is that researchers or healthcare providers choose specific interventions for their patients. SM quantitative and qualitative

intervention studies based on cancer patient’s home were evaluated. PubMed, CINAHL, and Scopus were used for this review from 2011 to 2018. A total of 16 quantitative and 2 qualitative studies were included for this review. All interventions are divided into 3 types: educational program, complementary and alternative medicine (CAM) therapy, and exercise. The 16 quantitative studies utilized educational program ( $n = 12$ ), CAM therapy ( $n = 3$ ), and exercise ( $n = 1$ ). All CAM studies used only AA intervention. Three AA studies in this review showed that AA was statistically effective in relieving cancer pain. Most of studies measured pain severity and interference, but only one study measured blood bio-markers as pain outcomes changed. The resistance and aerobic exercise training were effective on cancer survivors with pain three via online. Six of the 12 educational studies were statistically significant. These studies were used PRO-SELF pain control program, psycho-educational program, cognitive behavioral program, and problem-solving training. The two qualitative studies incorporated only educational programs. The qualitative studies suggested that pain intervention and management should tailor to individual culture. The number of AA/CAM and exercise intervention studies have increased since 2015. On the other hand, the number of educational and/or counseling intervention studies have decreased since 2013. All were AA/CAM and exercise intervention studies statistically significant on pain outcomes. Thus, AA and exercise interventions are promising to enhance pain management in cancer patients compared to only educational intervention. However, the small number of AA and exercise studies cannot conclude that AA and exercise therapies are better than educational intervention. This review is the first time to evaluate both qualitative and quantitative SM non-traditional intervention studies in cancer pain.

### **COLORECTAL CANCER SCREENING EDUCATION IN CHURCHILL COUNTY, NV**

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Rural residents undergo CRC screening at a lower rate than urban residents due to unique barriers, leading to rural residents having poorer outcomes from CRC than urban residents. Churchill County is a rural county in Nevada, and had the highest incidence of CRC mortality in Nevada. Education has the potential to increase CRC screening adherence and is a cost effective method to improve CRC screening adherence in rural Nevada. The purpose was to determine

if a patient education program will help increase willingness to undergo CRC screening in rural Nevada. The educational program was presented four times in public places in Churchill County. 30 people attended the sessions, and 17 were eligible for the study. A pretest was given prior to the education that measured CRC knowledge, willingness to undergo CRC screening, and barriers to care. A posttest was given after the education that measured knowledge, willingness to undergo CRC screening, and asked if the participant felt they had the tools and knowledge to undergo screening. Knowledge was scored from the same three questions pretest and posttest. Willingness to undergo CRC screening was measured on an ordinal scale with lower scores showing increased willingness to undergo screening. The scores from the pretest and posttest were run through SPSS statistical software to determine statistical significance. Knowledge increased from 2.18 to 2.88. Willingness to undergo screening improved from 2.51 to 2.12. The education program was successful in increasing CRC knowledge and willingness to undergo CRC screening. Education can be a useful tool in improving CRC screening adherence. Oncology Nurse Navigators can be integral in implementing education programs for rural areas, and decreasing CRC screening disparities. Combining with rural community leaders, nurse navigators can reach more residents to provide education and options for CRC screening. Educational interventions to improve CRC screening have not been studied in rural Nevada previously. There is a healthcare provider shortage in rural Nevada, and many screening options are not available in these areas. Nurses can help bridge this gap by providing education and navigating patients to available screening options. Oncology nurse navigators are poised to expand their scope of practice to include navigation for cancer screenings, and can be a useful resource in rural Nevada and beyond.

#### **LEVEL OF KNOWLEDGE AND NEEDS ON FERTILITY PRESERVATION IN REPRODUCTIVE-AGED MALE PATIENTS WITH CANCER**

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There is a growing concern about the fertility preservation (FP) for cancer patients of childbearing age. Very little literature exists about current situations of FP in male cancer survivors in Chinese text. The purpose was to describe the knowledge level, attitude and practice behaviors among physicians concerning fertility preservation in adult cancer patients

in China. A cross-sectional survey with 12-item was conducted to assess the knowledge and needs regarding fertility issues in male cancer survivors with reproductive age. Three hundred and thirty-two male patients (92.2%) responded to this study. The score of knowledge regarding FP was  $3.5 \pm 0.67$  (overall scores were 8). The younger patients were more likely to show higher knowledge level than older patients (OR=0.86, P=0.03). The knowledge level of participants with family income of RMB 4-8 thousand yuan was lower compared with that of patients with family income of more than RMB 8 thousand yuan (OR=0.03; 0.23). Patients with young age and fewer children were more likely to make FP arrangements before treatments (OR=0.78; 0.11). In this study, only 10.6% of male patients had chosen sperm bank to preserve fertility before treatments, but 68.7% of them became interested in receiving information about FP during anti-cancer therapies. Reproductive-aged male patients with cancer had limited FP-related knowledge, and majority of them lack of motivation to make arrangements for FP prior to treatment. These results highlight the importance of discussion and education on male patients regarding FP issues before treatments. In addition, the full assessment on patients' understanding of FP-related knowledge after discussion is also suggested in clinical practice. This study is first to describe the knowledge level and needs concerning FP in reproductive-aged male patients with cancer in China. The change of patients' needs indicates that medical staff need to discuss the options of fertility preservation with patients before their cancer treatment, protect patients' rights and interests, and avoid the occurrence of clinical disputes.

#### **A CANCER SURVIVORSHIP PROGRAM FOCUSED ON INTEGRATIVE THERAPIES IN A RURAL COMMUNITY**

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With increasing numbers of cancer survivors in the United States, cancer survivorship is of significant concern for oncology nursing practice. The American Society of Clinical Oncology (ASCO) recommends cancer survivorship care programs to meet needs of survivors through appropriate monitoring and follow-up. Rural locations are at risk for poorer health care outcomes in cancer survivorship. A successful cancer survivorship program should incorporate integrative therapies to meet the various and individualized needs of cancer survivors. The purpose of this study was to understand the unmet needs of

cancer survivors and their caregivers, as well as attitudes and beliefs related to cancer survivorship and integrative therapies. This pilot program measured the intent of participants to utilize the information learned. The program consisted of four-weekly sessions open to cancer survivors and their caregivers in a rural county in New York. Integrative therapies were presented by experts in the field at each session (music therapy, oncology massage, yoga, and mindfulness-based stress reduction). Participants completed a CaSUN questionnaire measuring unmet needs as well as a survey detailing their attitudes, beliefs, and utilization of cancer survivorship care and integrative therapies. Participants completed a post-survey following attendance that measured their attitudes, beliefs, intent to use, and satisfaction after attending. Participants were mailed a reflective survey four weeks after the program ended. Funding for this program was made possible by the Richard C. and Mary Anne Palermo Family Fund. There were 11 participants (all cancer survivors, no caregivers) who attended one or all sessions. Unmet needs in cancer survivorship included concerns related to stress, lack of availability of integrative therapies, side effects of treatment, and quality of life concerns. Participants stated intent to use oncology massage and yoga. The program results yielded participant desire for a sustained oncology program. Unmet needs in cancer survivorship continue to be a challenge in the field of oncology. Cancer survivorship programs focusing on various therapies including integrative modalities are useful for addressing these unmet needs. A sustained program focusing on cancer survivorship are essential for improving outcomes in this population.

### **PUTTING EVIDENCE INTO PRACTICE: AN UPDATE OF EVIDENCE-BASED INTERVENTIONS TO REDUCE FAMILY CAREGIVER STRAIN AND BURDEN**

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Caregivers of patients with cancer experience high levels of strain and burden. Cancer caregiving is complex and can change dramatically in short

periods depending on the cancer trajectory. Often, this experience leads to poor health outcomes for the caregiver. Healthcare providers should implement evidence-based interventions to alleviate caregiver burden. However, a comprehensive synthesis of the current state of the evidence on interventions has not been published. The purpose was to critically appraise the empirical evidence focusing on caregiver strain and burden published between January 2007 and October 2017. One hundred and twenty interventional studies published in PubMed and CINAHL were appraised and categorized based on the Oncology Nursing Society's Putting Evidence into Practice schema. Psychoeducation, support care/support interventions and cognitive behavioral interventions are recommended for practice to decrease CGS. Caregiver skill training, couples therapy, decision support, mindfulness-based stress reduction, multicomponent interventions, and palliative care are likely to be effective. The evidence is not established for 13 interventions such as music, expressive writing, and spiritual interventions. Nurses are in a unique position to provide information, emotional support, and connect caregivers with resources to assist in meeting caregiver needs and reducing their burden. Nurses should assess caregiver needs and burden, encourage caregivers to discuss their experience, facilitate access to relevant resources, and make referrals to members of the interdisciplinary team with relevant expertise such as counseling. Despite the proliferation of studies focusing on caregiver burden, studies with stronger designs and larger samples are needed. Future studies should focus on testing interventions in light of emerging technologies. This review suggests that some routine interventions, such as skills training, have not been well studied and therefore do not rise to the level of recommended for practice. Clarity of the content, format, dosage, duration and timing of such interventions is needed. Future research should focus on testing feasibility of recommended interventions, documenting cost, and designing bundled interventions. Lastly, the evidence was mixed about how to best assess caregiver strain during interventions as well as the best format (caregiver or dyad) for various interventions; research comparing approaches is needed.

### **PERIPHERAL NEUROPATHY IN BREAST CANCER PATIENTS PRIOR TO THROUGH 12 MONTHS AFTER TREATMENT: A LONGITUDINAL OBSERVATION**

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Peripheral neuropathy is a commonly reported change in sensory and/or motor function caused by nerve damage processes which occur due to primary malignancy or its treatment including surgery, chemotherapy or radiation. Chemotherapy-induced peripheral neuropathy is a subset of cancer-related neuropathic pain syndromes with dose-, regimen-, and time-dependent changing patterns. Literature demonstrated that uncontrolled symptoms persisted six months and two years after chemotherapy. However, a few studies were published to identify the clinical characteristics, causing factors, and impact of daily functioning and health-related quality of life (HRQOL). Thus, we examined persistent neuropathic symptoms prior to through 12 months after treatment, factors associated with these symptoms, and impact of neuropathic symptoms and changes in HRQOL. Women newly diagnosed with non-metastatic breast cancer (N=140) were enrolled prior to surgery and 118 patients were assessed before surgery (baseline), before adjuvant treatment, three-, six-, and 12-month after baseline, coinciding with during, immediately after, and 6-month after chemotherapy. Well-established questionnaires were used to measure neuropathic symptoms, HRQOL, and covariates such as coexisting physical and psychological symptoms, medical characteristics, and health habits. Repeated measures analysis examined changes in neuropathic symptoms over time and multiple regression analysis was used to identify associated factors and impact on HRQOL. Sensory and motor dysfunction significantly differed before and after surgery. Overall, chemotherapy-treated participants showed a gradual increase in these symptoms from baseline to immediately after chemotherapy and a slight recovery at six-month post-chemotherapy while those treated without chemotherapy showed similar scores over time. In liner mixed models, a membership of receiving chemotherapy, physical symptoms, depression, and fatigue were significantly associated with sensory and motor dysfunction. Changes in neuropathic symptoms explained 36.9% in the variance of changes in HRQOL when controlling for covariates. Sensorimotor neuropathic dysfunction may be evident in chemotherapy-treated patients immediately after chemotherapy with a gradual decline over the remaining period. However, a subset of patients

still had persistent symptoms which might contribute to reduced HRQOL post-treatment. In addition, findings suggest the possibility that neuropathic symptoms may share biological mechanisms with physical and psychological vulnerabilities in breast cancer patients. This study highlighted the significant impact of persistent sensorimotor dysfunction on HRQOL and modifiable factors that can be targeted to reduce persistent neuropathic symptoms in breast cancer patients.

### **WALKING TO REDUCE CHEMOTHERAPY-INDUCED PERIPHERAL NEUROPATHY: A PILOT FEASIBILITY RCT**

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Chemotherapy-induced peripheral neuropathy—hands/foot numbness, tingling, and/or neuropathic pain—affects 85% of oxaliplatin-receiving GI cancer survivors and can impair function and quality of life. No preventive treatments have been found; however, studies have linked exercise with less severe chemotherapy-, specifically oxaliplatin-induced peripheral neuropathy (OIPN). The purpose was to evaluate the feasibility of an ongoing pilot RCT of the MI-Walk Intervention—an 8-week home-, motivational enhancement therapy (MET)-based walking intervention to reduce OIPN—compared to physical activity (PA) education alone in GI cancer survivors receiving oxaliplatin. GI cancer survivors (N=25) were recruited from and started the MI-Walk Intervention (n=13) or education control condition (n=12) at multiple cancer centers during their second oxaliplatin cycle. The MI-Walk Intervention included the education; and 3 semi-scripted brief MET (motivational interviewing, SMAART goals, and if-then statements) sessions; a tailored progressive walking plan, Fitbit, exercise diary, patient testimony, email group with all the MI-Walk participants, and optional weekly walking groups. Enrollment and completion rates, self-reported PA levels, adverse events, intervention adherence (Fitbit), and acceptability (Adapted Acceptability E-Scale survey) were evaluated. 50% of screened individuals enrolled in the study. One patient withdrew due to the excessive study time requirement; two individuals became ineligible after

consenting due to cancer treatment changes (84% completion rate). The MI-Walk group reported exercising at moderate-strenuous intensity for 99.42 (SD 130.62) minutes per week at baseline and 133 (SD 138.15) minutes per week at 8-week follow-up; however, the Fitbit measured a mean of 263.67 (SD 272.15) weekly minutes moderate-strenuous exercise. The control group reported weekly exercising for 223.11 (SD 152.45) minutes at 8 weeks. On a 1 to 5 scale, the MI-Walk Intervention was rated (mean, SD) easy (4, SD 1.53), understandable (4.71, SD 0.76), enjoyable (3.43, SD 1.81), helpful in managing OIPN (3.71, SD 1.5), and satisfactory (4.43, SD 1.13). Participants reported high likelihood that they would continue the intervention (4.86, SD 0.38). Participants rated the helpfulness of the MET sessions (mean 3.14, SD 1.57) and Fitbit (mean 3.57, SD 1.4) highest. No adverse events occurred. This study preliminarily suggests an 8-week home-, MET-based walking intervention is safe and feasible in GI cancer survivors receiving oxaliplatin. More research is needed to evaluate interventions that more effectively promote aerobic exercise in this population.

#### **DEVELOPMENT AND VALIDATION OF A COGNITIVE DEMAND QUESTIONNAIRE FOR WOMEN TREATED FOR BREAST CANCER**

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Cancer- and treatment-related cognitive deficits refer to neurocognitive changes in attention, memory, and executive function in individuals with cancer. Results from neurocognitive studies revealed that cognitive deficits occurred in 16–80% of cancer patients prior to, during, immediately after, and several years after treatment. According to the Attention Restoration Theory, attentional demands require the overuse of attention which may produce deficits in cognitive functioning. Our previous qualitative study showed that women experienced various types of cognitive demands which were closely linked with changes induced by cancer and its treatment and cultural tendency represented as collectivism and Confucian familism. To date, no tool has emerged to measure cognitive demands in female cancer patients. The purpose of this study is to develop and validate a

questionnaire to evaluate demands affecting effectiveness in cognitive function among breast cancer survivors. The questionnaire was developed by item generation through interview with women with breast cancer and literature review. Face validity and content validity were performed through patient and expert reviews, respectively. Psychometric properties of the final instrument were assessed in a sample of 506 women treated for breast cancer. The first version of this questionnaire included 58 items and 28 items were retained through face and content validity processes. Exploratory factor analysis identified a five-factor solution including 18 items, accounting for 65.61% of the total variance. The confirmatory factor analysis supported this five-factor model (Comparative Fit Index = .92, Tucker-Lewis Index = .90, Root Mean Square Error of Approximation = .065). The Cronbach's alpha coefficient for this questionnaire was .866. The criterion-related validity was supported by a significant relationship between cognitive function measured by the FACT-cog and scores of this questionnaire. This study indicates that the 18-item questionnaire is a valid and reliable instrument to assess cognitive demand affecting effectiveness in cognitive functioning among women treated for breast cancer. This instrument can contribute to assessment of affective, informational, environmental, situational, and cultural factors which need to overuse of cognition for suppression or management. This study provides important information about cognitive demands which breast cancer patients may encounter in real life settings. The assessment process and outcome can enable oncology nurses to gain a deeper understanding of cognitive demand and deficits in women with breast cancer.

#### **DISTINGUISHING SKIN TOXICITY AND EXTRAVASATION SYMPTOMS WITH DOCETAXEL: A SYSTEMATIC REVIEW**

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This systematic review identifies differentiating symptomatology related to extravasation injuries from other skin toxicities with docetaxel infusions in adult solid tumor cancer patients. Distinguishing

extravasation symptoms from other skin toxicities would create a foundation for developing an algorithm identifying the differentiation of altered skin integrity in patients receiving docetaxel. Empirical evidence reveals drug specific measurements such as guidelines or algorithms, which are used to quantify actual from suspected extravasations or adverse skin reactions. Paclitaxel is known to be proportional in injury to the volume of drug lost in the tissue, however literature is inconsistent regarding docetaxel. Confirming extravasation during treatment administration is challenging due to the unique collection of somatic experiences by patients and symptoms that can be objectively measured. Clinicians are encouraged to err on the side of caution, ensuring patient safety, and stop the docetaxel infusion even though an extravasation may only be suspected. Methodology according to the Joanna Briggs Institute for systematic reviews was used. Databases searched included PubMed, Embase, Cochrane, Cumulative Index for Nursing and Allied Health and Web of Science, all documents in Open Grey, meeting abstracts in the Biosis Citation Index, and theses. Quantifiable symptomatology was assigned a numerical value, plotted for comparison to other extravasations, then visually compared for trends. Unlike paclitaxel, docetaxel cases reported affected areas greater than ten times the original site. The severity of docetaxel extravasation symptoms suggests a disproportional response in relation to lost volume. Case studies that identify specific symptoms such as redness, border demarcation and desquamation, cannot be measured against the general description of cutaneous symptoms, and thus contribute to variation in their true incidence with extravasation. However, edema was the single symptom consistently reported with extravasation. The overlap and severity of skin reactions and extravasation symptoms are substantially more complex in patients receiving docetaxel than paclitaxel. Initial analysis suggests that there may be symptomatology that would allow extravasation discovery after infusion completion to be distinguished from other skin toxicities. Complex skin reactions may mimic extravasation symptoms causing assessment of docetaxel extravasation to be a clinical and quality improvement priority. Research focused on skin integrity during treatment course is needed to reduce general symptomatology to precise terminology.

### **SELF-REPORTED COGNITIVE FUNCTION OF POSTMENOPAUSAL WOMEN WITH BREAST CANCER: FOLLOW-UP THROUGH 1 YEAR**

### **AFTER THE COMPLETION OF ADJUVANT SYSTEMIC THERAPIES**

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Adjuvant systemic therapies, including chemotherapy and endocrine therapy, accelerate cognitive decline for some women with breast cancer, with mixed findings reported in the literature. Recent studies have reported the long-term effect of systemic therapies on self-reported cognitive function, but few focused on a well-characterized sample with a comprehensive consideration of relevant variables (e.g., mood, pain). The purpose of this analysis was to extend the examination of the long-term effect of systemic therapies on self-reported cognitive function to one year after completion of therapy in postmenopausal women with early stage breast cancer. We assessed self-reported cognitive function, using the Patient Assessment of Own Functioning Inventory (PAOFI), and potential covariates (anxiety, fatigue, depressive symptoms, pain, age, estimated verbal intelligence) before chemotherapy and/or aromatase inhibitor (AI) therapy, semiannually years 1 and 2 of AI therapy, annually years 3 through 5 of AI therapy, and one year after completion of therapies in three cohorts of postmenopausal women who: 1) received AI alone; 2) received chemotherapy+AI; and 3) without cancer and matched on age and education. Linear mixed modeling was conducted to compare group, time, and group by time differences, adjusted for covariates, among the cohorts for the PAOFI total and subscale scores (memory, language/communication, use of hands/sensory-perceptual, higher level cognitive and intellectual). Eighty-three participants with 2 missing assessments were included in modeling. Compared to pre-therapy, the AI alone cohorts reported significantly worse perceived use of hands/sensory-perceptual function at 1 year after completion ( $p=.04$ ) of therapy. Compared to pre-therapy, the chemotherapy+AI cohort reported improved memory at completion of therapy ( $p=.03$ ). Fatigue ( $p<.01$ ) and pain ( $p=.03$ ) were significant covariates in the parsimonious linear mixed models. No significant time differences were found for the PAOFI total and other

subscale scores. Our findings emphasize the importance of considering fatigue and pain within the context of self-reported cognitive function in clinical settings. Future studies are suggested to confirm the long-term effect of adjuvant systemic therapies on self-reported cognitive function in a domain-specific manner (especially memory and use of hands/sensory-perceptual function domains). To our knowledge, this is the first study to extend the examination of the effect of systemic therapies on self-reported cognitive function to one year after completion of therapy for postmenopausal women with breast cancer.

### **IMPLEMENTATION OF A STRUCTURED PATIENT/FAMILY EDUCATION INTERVENTION IN PEDIATRIC ONCOLOGY: IMPACT ON NURSE SATISFACTION**

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The provision of patient/family education to parents of newly diagnosed pediatric oncology patients is a core nursing responsibility. In 2016, the Children's Oncology Group (COG) published expert recommendations for providing education to parents of newly-diagnosed children with cancer; however, these recommendations have not been empirically tested. In a tertiary children's hospital, we tested a structured nurse-led intervention (comprised of a teaching checklist/roadmap, modular teaching plans, and parent teaching materials) that incorporated the COG expert recommendations, for use by nurses providing education to parents of newly-diagnosed pediatric oncology patients, and assessed the intervention's impact on nurse satisfaction with the education process. Training was provided to all available inpatient and outpatient oncology nurses over a 3-month period (January to March 2018) prior to implementing the intervention. We measured nurse satisfaction prior to the 3-month training (December 2017) [T1] and 9-months after implementing the intervention (December 2018) [T2] via an 11-item anonymous survey [items rated across a 10-point Likert scale (1=not at all satisfied; 10=completely satisfied)]. The difference in response to each

question and overall satisfaction between time points is reported by effect size (ES) (Cohen's *d*; small=0.2; moderate=0.5; large=0.8, [Cohen 1988]) relative to pre-intervention standard deviation. Significance was tested using two-sided t-tests. Survey response rate was 86.3% (126/146 nurses; 63 responses at each time point); 60% worked inpatient (55% on day shift); 27% worked outpatient, and 13% worked across both units; 90% were RNs and 10% NPs. Satisfaction ratings increased significantly at T2 (vs T1) for: quality of teaching (ES=0.45; P=0.02), ease of determining necessary content (ES=0.79; P<0.01), quality of nurse tools (ES=0.90; P<0.01), quality of parent tools (ES=0.92; P<0.01), ease of accessing teaching tools (ES=0.79; P<0.01), team communication regarding teaching (ES=0.78; P<0.01), and ease of determining multidisciplinary contributions to teaching (ES=0.49; P<0.01). In a model adjusted for unit, shift, and nurse type, the intervention significantly increased overall nurse satisfaction at T2 vs. T1, (adjusted ES=0.76; P<0.01). Nurse satisfaction with the process of providing education for parents of newly-diagnosed childhood cancer patients increased significantly, showing a moderate clinically relevant effect size, following implementation of a structured teaching intervention at a tertiary children's hospital. Further research is needed to test the intervention across diverse pediatric oncology settings.

### **SELF-REPORTED INSURANCE/FINANCIAL PROBLEMS SIGNIFICANTLY INCREASE MAGNITUDE OF DEPRESSION, ANXIETY, AND DISTRESS IN CANCER PATIENTS**

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For many oncology patients medical debt is a struggle compounding the distress of their cancer diagnosis as reflected in previous research. The current study was designed to evaluate the extent to which insurance/financial problems influence the magnitude of psychiatric symptoms in cancer patients. All adult patients seen in the MD Anderson Cancer Center (MDACC) outpatient psychiatry oncology clinic who provided informed consent were included (N=2,130). Primary assessments included the PHQ-9 to assess depression, the GAD-7 to assess anxiety, and the NCCN Distress Thermometer (DT) to assess distress. Insurance/Financial Problems was assessed as

a categorical variable (Yes/No) using the DT. Demographic variables included age, sex, race/ethnicity, and marital status. Data are presented as percentages or Mean±S.D. Patients who self-reported insurance/financial problems, as compared to those who did not, were younger (54.6±13.5 vs. 50.3±12.3,  $F_{1,2128}=5.32$ ,  $p<.0001$ ), more likely to be female versus male (40% vs. 34%,  $X^2=7.9$ ,  $p=.005$ ), Black or Hispanic versus White (47% or 46% vs. 36%,  $X^2=21.5$ ,  $p<.0001$ ), and alone as compared to together marital status (46% vs. 33%,  $X^2=33.5$ ,  $p<.0001$ ). Importantly, patients who self-reported insurance/financial problems exhibited significantly higher total scores for the PHQ-9 (12.5±5.8 vs. 9.3±5.6,  $F_{1,2128}=150.7$ ,  $p<.0001$ ), GAD-7 (11.2±5.7 vs. 8.1±5.6,  $F_{1,2128}=153.5$ ,  $p<.0001$ ) and DT (6.4±2.6 vs. 4.8±3.0,  $F_{1,2128}=150.1$ ,  $p<.0001$ ). An alternative means of analyzing these data was using the ESAS item “Financial Distress” which was collected in a subset of patients (N=586), which is on a scale of 0–10. The outcomes confirm the findings shown above (all  $p$ 's  $<.0001$ ). The data indicate that approximately 1/3 of all patients seen at the MDACC Psychiatric Oncology Center self-report insurance/financial problems and that these individuals exhibit significantly higher levels of depression, anxiety, and distress. The fact that individuals with insurance/financial problems exhibit a 25% increase in magnitude of psychiatric symptoms should be of particular importance to clinicians. This data supports an indication for thorough nursing assessment to identify if finances are a contributing factor in patient distress. Nurses have the ability to impact patient costs and distress levels through empathic rapport, expert care coordination, patient education and advocacy, and referral sources that assist with expenses and that treat distress.

### **PREDICTORS OF NURSE PRACTITIONER PRESCRIPTION OF OPIOIDS FOR CANCER PAIN**

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Nurse practitioners (NPs) have assumed a greater role in managing cancer pain, yet it is unclear what factors influence their prescription of opioids for patients with cancer. A descriptive comparative study used a nationwide convenience sample of NPs working in oncology to investigate whether dominant personality, decision style or demographic factors influenced an opioid decision score (ODS) when prescribing opioids. One hundred-eighty participants completed

the study. Univariate linear regression revealed a statistically significant increase in the ODS as the BFI Openness scale score increased. NPs reporting advanced specialty certification in oncology and hospice/palliative care scored significantly higher on the ODS versus those with no advanced specialty certification. There were no statistically significant results for the dominant personality, decision style, combination of dominant personality and decision style, or the remaining demographic variables on NP opioid prescribing. Qualitative analysis revealed the impact on the quality of life of the patient as the positive factor associated with prescribing opioids for cancer pain. Concerns about addiction, insurance company restrictions, and the effect of the opioid epidemic on practice were the dominant negative factors associated with prescribing opioids. Results of this study highlight the value of advanced specialty certification, the need for greater knowledge regarding the treatment of cancer pain, and the need for further research on the topic of NP opioid prescribing.

### **DIFFICULTIES AND COPING STRATEGIES IN NURSING AND MEDICAL CARE FOR CANCER PATIENTS WITH DEMENTIA: A QUALITATIVE STUDY**

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Patients with dementia who receive cancer treatment may have critical problems that medical professionals have to deal with. This study aimed to describe difficulties and coping strategies in nursing and medical care for cancer patients with dementia in a university hospital. Qualitative and descriptive research design was used in this study. Nurses and physicians, who have engaged in nursing or medical care of cancer patients with dementia were recruited. The eligible nurses had nursing experience for at least 3 years and received a training program on dementia. Semi-Structured interviews were conducted to nurses and physicians. Study participants were asked difficulties in nursing and medical care for cancer patients with dementia and coping strategies for difficulties. Interviews were recorded on the IC recorder with agreement of the participants. A content analysis was performed for verbatim transcription of the interview data. Nine nurses and 9 physicians participated in this study. Common themes of difficulties in nurses and physicians were emerged: grasp of

patients' thoughts and provision of nursing/medical care according to patients' needs. Specific themes of difficulties in nurses included: facilitation of patients' understanding, maintaining of patients' safety, and obtaining cooperation from patients' family. Specific themes of difficulties in physicians included: decision-making about cancer treatment and performing of treatment as planned. Regarding to coping strategies, common themes in nurses and physicians were emerged: understanding of patients with non-verbal information, providing information to patients according to their cognitive function, preventing and managing to ensure patients' safety, and collaboration among medical professionals. Specific themes of coping strategies in nurses included: coordination of patients' family and enhancing nurses' knowledge of dementia. Specific theme of coping strategies in physicians included communicating with patients and their family. Nurses and physicians had common problems and specific problems in their practice for cancer patients with dementia. In addition, this study revealed that physicians provided both care and treatment for cancer patients with dementia. Oncology nurses should share problems of patients care with physicians and develop support system for cancer patients with dementia.

### **THE IMPORTANCE OF NURSE PARTICIPATION IN THE DEVELOPMENT OF EDUCATIONAL MATERIAL FOR CHILDREN WITH CANCER**

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Despite the large amount of cancer information available to patients, there is still difficulty understanding the disease, which may hinder treatment engagement and impair expected results. This is because many informative materials are inadequate, both in Design and in Information Architecture. The purpose of this study was to analyze the participation of health stakeholders in the creation and development of a guide for children in cancer treatment. The Beabook, an educational booklet consisting of oncologic terms, is already in the second edition, with more than 6,000 units distributed in Brazil and more than 10 countries around the world. It is approved and indicated by the Brazilian Society of Pediatric Oncology. The process of creating the material was divided into two phases: the first, writing and curating; the second, revision and collaboration. The first edition is composed of 97 terms related to the disease and the treatment of cancer, in order to facilitate the understanding and

communication of children with their relatives and health professionals. In post-production research of the first edition, the terms were separated into categories, to analyze the effective participation of nurses in the creation of the material. The interaction of the other health professionals (stakeholders) with patients was also analyzed. Of the total terms created, the most participatory professional in the creation of the material was the nurse, both in the first and second phases. Regarding the interactions with patients (points of contact), the nurse and the doctor presented the same exposure to patient in relation to the terms discussed in the guide. The importance of accurate information for cancer patients and the role of oncology nurses in the education of these patients is well known. Generally, however, these areas act independently. One creating the information and the other disseminating it. When oncology nurses and information professionals work collaboratively and interprofessional, including other stakeholders, the outcome goes beyond information, influencing the care of patients and their families. The increase in the search for health information is a natural tendency that accompanies the advance of Information Technology, especially in environments in which patients are avid for it. The great innovation is to reconcile the technological part with the human part, creating methodologies of interdisciplinarity and approaches centered in the relations.

### **MAPPING GLOBAL ONCOLOGY NURSING PROJECTS FROM NCI-DESIGNATED CANCER CENTERS: RESULTS FROM THE 2018 NCI/ASCO GLOBAL ONCOLOGY SURVEY OF NCI-DESIGNATED CANCER CENTERS**

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Nurses provide most of the cancer care in LMICs yet receive limited oncology nursing training opportunities. To better understand global oncology activities led by NCI-Designated Cancer Centers (NDCCs), including those to strengthen oncology nursing, the National Cancer Institute Center for Global Health

(NCI-CGH) collaborated with the American Society of Clinical Oncology (ASCO) to conduct the 2018 NCI/ASCO Global Oncology Survey of NDCCs. The 70 NDCCs received a two-part survey that focused on global oncology programs at NDCCs and non-NIH funded global oncology projects led by the NDCCs with an international collaborator. 65 NDCCs responded to the survey, and 57 NDCCs reported non-NIH funded global oncology projects. Data were cleaned, coded, and analyzed by NCI-CGH staff. A total of 538 non-NIH funded global oncology projects were reported. 11 NDCCs (15.7%) reported 28 non-NIH funded global oncology projects that mentioned nursing in the project summary (5.2% of total projects reported). All nursing projects mentioned building capacity or providing training for nurses. The top cancer sites addressed in these projects were non-site-specific cancers (15) and pediatric cancers (8), and projects addressed broad topics such as tobacco control, palliative care, and the implementation of national cancer control programs. The nursing projects received funding from a variety of sources including: non-profit funding organizations (9), administrative funds from NDCCs (10), and industry sources (4). The 28 projects involved collaborators from 29 countries from six world regions. This survey shows that oncology nursing training is a small focus of NDCCs' global oncology activities. These data build on the 2017 NCI Nursing Oncology Study, which focused more narrowly on global nursing oncology projects at 62 NDCCs and found 29 projects from 21 NDCCs. As the global cancer burden rises in LMICs, tracking current global oncology nursing activities will help to advocate for increased oncology nursing capacity building. Strategic integration of oncology nursing capacity building as a broader component of NDCC global oncology activities will be important for meeting LMIC oncology workforce needs.

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### **SELF-REPORTED COGNITIVE IMPAIRMENT AND CORRELATES IN LONG-TERM HEAD AND NECK CANCER SURVIVORS**

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Emerging research suggests that head and neck cancer (HNC) survivors experience cognitive impairments following chemoradiation. However, these studies focused on the immediate post-treatment period. Exploration of self-reported cognitive impairments and correlates is limited in long-term HNC survivors. The purpose of this analysis was to determine the incidence of self-reported cognitive impairments and correlates, including anxiety, depressive symptoms, and fatigue, in HNC survivors. We conducted a secondary analysis of self-reported cognitive impairment and correlates collected as part of a comprehensive survey of late and long-term effects administered to post-treatment HNC survivors; those with a history of recurrence, additional cancer diagnoses, or metastasis were excluded. Survivors rated distress, fatigue, and difficulty thinking and remembering in the last seven days (presence/absence). Demographic and clinical characteristics were obtained from medical record review. Logistic regression was utilized to explore the separate relationships between cognitive function and fatigue, anxiety, and feeling down; controlling for age, gender, and education in all models. Survivors (N=159) were predominately male (64.2%) and, on average 64.7 years of age (SD=10.3). Primary tumor sites were oral cavity (44.7%), oropharynx (26.4%), and larynx/hypopharynx (28.9%). Half of the survivors (52.8%) were diagnosed with advanced cancer and were, on average, 3.97 years (SD=5.3) post-treatment. Sixty survivors (42.2%) underwent surgery alone, 30 (18.9%) underwent non-operative treatment, and 69 (43.4%) underwent surgery and adjuvant therapy. Sixty survivors (38.5%) self-reported cognitive impairment. The odds of reporting cognitive impairment for survivors who reported fatigue is estimated to be 8.794 (95% CI: [3.724, 20.766], p-value: <0.0001) times higher than those who do not report fatigue. Similarly, the odds of reporting cognitive impairment for survivors reporting anxiety is estimated to be 4.019 (95% CI: [1.848, 8.743], p-value: 0.0005) times higher than those who do not report anxiety. Finally, the odds of reporting cognitive impairment for survivors reporting feeling down is estimated to be 6.454 (95% CI: [2.947, 14.135], p-value: <0.0001) times higher of the odds for those without feeling down. Long-term head and neck survivors who experience fatigue and emotional distress are more likely to self-report cognitive impairment. Further work is needed to describe the long-term trajectory of cognitive changes in survivors. This is the first known study to examine self-reported cognitive function and correlates in long-term HNC survivors.

## **PUPILLARY RESPONSE, DRIVING SIMULATION, AND INCREASED COGNITIVE LOAD: ASSESSMENT OF COGNITIVE EFFORT FOR BREAST CANCER SURVIVORS**

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Breast cancer survivors (BCS) experience changes in cognitive function attributed to disease and treatment. BCS report difficulty across several cognitive domains, but performance on standard neurocognitive tests frequently does not correlate with self-report of cognitive changes. Standard neurocognitive testing may not be sensitive to the amount of expended cognitive effort. Great interest exists in the investigation of novel methods to assess cognitive effort. One promising area of research is the investigation of pupillary response (PR) as a measure of cognitive effort. We sought to improve the ecologic validity of our neurocognitive battery to include testing for visuospatial ability and processing speed during driving simulation and PR measurement. The purpose of this study was to enhance a neurocognitive battery assessing cognitive effort by testing visuospatial ability and processing speed in an ecologically valid setting for breast cancer survivors (BCS). The primary aim was to compare cognitive effort (indexed by PR) between BCS and healthy controls (HC) during driving simulation (DS) with/without the additional cognitive load from simultaneous testing of working memory/sustained attention (N-back task). PR, visuospatial ability, and processing speed were measured for 38 participants (21 BCS, 17 HC) during two DSs (with/without N-back testing). Between- and within-group scores were compared. Between-group effect size (ES/Cohen's *d*) and change scores were calculated for each outcome. No between-group differences were noted for PR during DS. However, BCS' within-group PR was higher during DS with simultaneous N-back testing ( $p < 0.05$ ). Additionally, ES ( $d = 0.3 - 0.52$ ) indicated BCS had greater visuospatial/processing speed performance difficulties (collisions, speeding, poor

lane position) during DS alone. BCS' N-back response time was slower than HC ( $d = 0.5$ ). BCS demonstrated greater improvement for break application, collisions, and lane positioning than HC ( $p < 0.05$ ). Within-group PR was greater for BCS during DS with the additional cognitive load of N-back testing, although visuospatial performance improved. BCS' performance improvement during the second DS may be due to practice effect and ability to compensate for tasks requiring increased cognitive effort. Study results provide additional preliminary evidence for use of PR as an innovative measure of cognitive effort for BCS. These results will inform the design of future studies to further investigate PR sensitivity to cognitive effort in larger samples and more difficult DS scenarios.

## **MOTIVATION FOR PHYSICAL ACTIVITY IN PATIENTS BEFORE AND AFTER HEMATOPOIETIC STEM CELL TRANSPLANTATION**

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Hematopoietic stem cell transplantation (HSCT) is a curative treatment for many hematologic diseases. Physical activity after HSCT is reduced due to regimen-related toxicity and physical symptoms, thus decreasing activities of daily living and performance status, and diminishing quality of life. Healthcare professionals need to support HSCT patients in maintaining physical activities and enhancing motivation for physical activity during hospitalization. The purpose of this study was to identify the motivation for physical activity in patients undergoing hematopoietic stem cell transplantation. We conducted semi-structured interviews of 7 HSCT patients twice: before starting the conditioning regimen; and after leaving the biological clean room. All interviews were recorded. Transcripts of the interviews were analyzed using a content analysis method. The data collection period was from May to December 2018. The protocol for this study was approved by the Clinical Trial Center at The University of Tokushima. The motivation for physical activity in patients before HSCT was classified into eight categories: "I want to live and return home," "I want to survive my transplantation," "I want to

prevent infection so that I can live and return home,” “I want to look after myself on my own,” “I want to do my best in response to the donor’s feelings,” “For the sake of my family, I cannot die yet,” “The existence of reliable healthcare professionals,” and “The existence of people with the same disease with whom I can share the experience of transplantation.” The motivation for Physical activity in patients after HSCT was classified into another eight categories. “I want to return to my former lifestyle,” “I want to walk out of the biological clean room,” “I want to be able to move again,” “I must clean myself to prevent infection,” “I want to look after myself as far as this is possible,” “A message wishing for me to live,” “Encouragement and support from healthcare professionals who understand me,” and “The existence of people with the same disease with whom I can share the experience of transplantation.” The motivations for physical activity identified in this study are useful for HSCT patients to support maintaining physical activity during hospitalization. This work was supported by the Sasakawa Memorial Health Foundation in Japan.

### **RADIATION THERAPY PROVIDERS’ PERSPECTIVES ON SURVIVORSHIP EDUCATION AND CARE**

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Radiation therapy is indicated in most solid tumor cancers and the majority of radiation oncologists provide long-term surveillance of their patients, with over 30% following their patients indefinitely. The need for long-term surveillance is rooted in the unique toxicities that can occur several years after receiving radiation treatment, including radiation-induced second malignancies. The role of radiation oncology health-care providers in providing survivorship care and education is not well-defined and the content, frequency, and time allocated to these discussions has not been studied. Existing Survivorship Care Plans minimally address radiation related toxicities. This study was designed to identify priorities for improvement in cancer survivorship education for patients after completion of radiation therapy. An investigator-developed online survey of health-care provider communication with patients regarding cancer survivorship was administered within an academic radiation oncology practice. Seventeen survivorship categories were evaluated for each provider, including when

and how often survivorship issues were addressed, perceived priority of issues, and provider knowledge of survivorship resources. Twenty-three providers responded. The 5 most important patient concerns were fear of recurrence, radiation side effects, surveillance, preventive measures and nutrition, and stress management. The most time was spent discussing side effects and recurrence risk, with 57% and 30% of providers, respectively, spending  $\geq 40$  minutes on each topic. Over 60% of providers reported that physicians and nurse case managers spend equal time discussing the top 3 topics, with nurses typically addressing preventive measures, nutrition, and stress management. Discussion during weekly visits commonly included emotional and mental health, exercise, and stress management. Recurrence and radiation side effects were ranked by providers as most important to patients. Weekly patient visits during radiotherapy may provide an opportunity to expand discussions of survivorship care and optimal health. Results demonstrated a potential to maximize the role of the Oncology Nurse Case Manager in survivorship discussions and education, and serves as an opportunity for future research and practice that will (a) identify barriers patients may face in understanding and adhering to surveillance guidelines; (b) provide tools to patients for better self-management of cancer as a chronic disease rather than an acute diagnosis, and (c) identify patient-specific needs for which an individual survivorship program could be tailored.

### **A QUALITATIVE STUDY EXPLORING BREAST CANCER SURVIVORS’ UNMET NEEDS AFTER COMPLETION OF RADIATION THERAPY**

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Breast cancer is among the most common of cancer sites representing over 3 million cancer survivors. Radiation treatment for breast cancer is recommended as part of a multi-modality treatment and most often occurs after surgery and systemic therapy. No studies have exclusively explored, from the patient perspective, unmet needs of breast cancer patients up to 10 years after radiation treatment has ended. The purpose of this study was to identify short- and long-term unmet needs of breast cancer survivors after receiving radiation therapy. A qualitative descriptive study was undertaken within a radiation therapy academic practice. Patients who received radiation treatment

for unilateral breast cancer with minimum 6 months follow-up and no disease progression were eligible, and randomly selected for participation in this study. Semi-structured interviews were conducted, framed by the five domains of the Survivor Unmet Needs Survey (SUNS) (emotional health, access and continuity of care, relationships, financial concerns, and information needs) and analyzed using an iterative inductive and deductive process. Of 24 survivors invited, 16 women and 1 man agreed to interview. Median time since completion of radiotherapy for breast cancer was approximately 3.5 years (range, 0.5–11 years). Six had mastectomy, 8 chemotherapy, and 13 endocrine therapy. The dominant themes emerged from the emotional and information needs domains: 1) the struggle with adapting to body image changes; 2) unexpected impact of radiation dermatitis; and 3) the need for educational tools for symptom self-management. Healthcare providers should assess the information needs of breast cancer patients. Enhanced patient education for radiation dermatitis and support for change in body image emerged as topics on which future efforts should focus. Symptom self-management assessment tools are needed to address patients' confidence in managing acute, intermediate and long-term side effects of radiation therapy. This study is unique in the approach of understanding and identifying, from the breast cancer patients' perspectives, common themes of unmet needs after completion of radiation therapy. Establishing a comprehensive and consistent, evidence-based educational program will promote bridging the gap in care coordination and meeting the physical, psychosocial, and financial needs of breast cancer patients.

### **INSTRUMENTS USED TO EVALUATE COMPONENTS OF SELF-MANAGEMENT OF RADIATION DERMATITIS: AN INTEGRATIVE REVIEW**

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Radiation dermatitis is an expected side effect of radiation to the breast and chest wall. Healthcare providers

routinely grade the severity of this skin reaction without assessing the impact radiation dermatitis has on the quality of life for breast cancer patients. Instruments are needed to identify a patient's ability and confidence to self-manage radiation dermatitis. The significance of this review is grounded in improving healthcare delivery focused on patient reported symptom management. Identifying validated instruments used to address breast cancer patients' needs, educational programs can be created or implemented to promote better self-management, self-efficacy, and confidence in navigating through the skin-related side effects experienced from radiation treatment. Using Whittemore and Knafl (2005) framework, a literature search was conducted of published literature from 2001-2018 including patients who had received radiation therapy for breast cancer, and a validated instrument was used to assess radiation dermatitis. After utilizing key word searches, 166 articles were initially identified. After applying inclusion criteria, relevance, and duplicates, 41 articles remained. Eleven instruments were identified and evaluated for congruence with each subcategory of the Individual and Family Self-Management Theory. Eleven instruments addressed one or more risk or protective factors of the Context domain. Four instruments assessed Distal Outcomes. The only identified instrument to measure a patient's ability to self-manage symptoms was the PROMIS Self-efficacy for Managing Chronic Conditions–Manage Symptoms. This instrument incorporated all items of the theoretical framework, has a high reliability (Cronbach's  $\alpha=0.96$ ) and should be considered for implementation within the breast cancer radiation population. Utilizing a validated instrument to assess patients' needs and ability to self-manage symptoms will promote personalized care plans tailored to each individual patient's needs. Findings from this review can be used to evaluate the feasibility of implementing a patient reported outcome measure into clinical practice. Educational programs can be designed to increase patient's knowledge of disease and prevention. Potential barriers to healthy outcomes and surveillance can be identified and addressed.