We will provide superior quality, accessible, comprehensive cancer treatment, prevention and patient support services for western North Carolina and the surrounding region.

ONCOLOGY SERVICE LINE MISSION STATEMENT
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</tr>
</tbody>
</table>
LETTER FROM THE
Cancer Committee Chair

One question I am often asked is how are we doing with cancer treatment. The answer is usually that we are gaining ground rapidly in some areas but still quite slowly in others. At the cancer program at Mission Hospital, there has been an emphasis over the 2016 year to move to more sub-specialization as part of the quality programs for which we continue to strive. To help guide the clinical program, Dr. Donald Gajewski an Orthopaedic Oncology Surgeon took on the interim role as Cancer Center Director. His joining the staff has brought a needed treatment modality for cancer patients in the region in the management of both primary tumors of bones and frequently metastatic tumors involving bone.

As part of the attempt to improve quality in 2016, there was expansion of the multidisciplinary clinics and conferences. The head and neck conference under the direction of Dr. Eric Kuehn with input of many medical specialists as well as support specialists, including speech therapy, nutritional support, and social work has become a strong working conference. During the same year, an active GI conference was started and has expanded tremendously. The thoracic multidisciplinary conference, the first multidisciplinary conference and clinic has continued to grow. A much needed neurologic conference was started with plans to expand into a multidisciplinary neuro-oncology clinic. By expanding these conferences, many patients at Mission Hospital have their cases discussed and their care outlined in the best form of decision-making.

One of the largest programs at Mission Hospital is the breast program. Under the guidance of Dr. Rachel Raab, the breast program underwent accreditation through the NAPBC (National Accreditation Program for Breast Centers). This was the second re-accreditation and the third visit by this organization. During this year, Dr. Jennifer McAlister, fellowship-trained breast surgeon, joined the program and in the same year, expansion of the plastic surgery program as well.
Further expansion of the surgical portion of the cancer program occurred with the movement of Dr. Paul Ahearne, surgical oncologist, into the Cancer Center and expanding his clinic into the multidisciplinary area of the center. Dr. Ahearne offers consultations following one of the multidisciplinary conferences. Although Dr. Ahearne has been part of the cancer program for many years, this brought him into the actual facility.

Personalized medicine and pharmacy expansion occurred again in 2016. The Infusion Center has become extremely busy, with the addition of further oncology pharmacists and a personalized medicine pharmacist to assist in genomic test interpretation and patient counseling. Further expansion of the genetics lab to incorporate many state of the art assays including chromosomal microarray analysis and next-generation sequencing which are vital in the diagnosis and treatment of solid and hematologic malignancies.

The big question is, where do we go from here? The simple answer is, we continue to go up. The program continues to grow and there are expansions in all areas. The Cancer Center leadership with Marika Loveless and coordination through the efforts of the Directors of Cancer Care of Western North Carolina, Department of Radiation Oncology, Department of Surgical Oncology and Pediatrics, bring excellent care to the western region of North Carolina. Expansion of research efforts will continue. Knowledge and understanding of the multitude of treatment changes that are occurring will give patients in this region the best care possible.

Michael J. Messino, MD
Cancer Committee Chairman
Medical Oncologist
2016 MISSION ONCOLOGY SERVICE LINE

Committee Members

PHYSICIANS

Michael J. Messino, MD, Medical Oncology, Chairman
Randall Johnson, MD, Surgery, Cancer Liaison Physician
Jennifer McAlister, MD, Surgery
Paul Ahearne, MD, Surgical Oncology
David Schuetze, DO, Pathology
Eric Kuehn, MD, Radiation Oncology
Kellie S. Condra, MD, Radiation Oncology
Sesalie Smathers, MD, Radiation Oncology
Matthew Hull, MD, Radiation Oncology
Christopher H. Chay, MD, Medical Oncology
Rachel Raab, MD, Medical Oncology
Timothy Vanderkwaak, MD, Gynecologic Oncology
Ashley Case, MD, Gynecologic Oncology

David Hetzel, MD, Gynecologic Oncology
Cameron Blair Harkness, MD, Gynecologic Oncology
Wieslawa Pekal, MD, Medical Oncology
Trevor Austin, MD, Medical Oncology
Shonda Asaad, MD, Medical Oncology
Raymond Thertulien, PhD, MD, Medical Oncology
Praveen Vashist, MD, Medical Oncology
Peter H. Rosal, MD, Radiology
Sheri Fleeman, MD, Radiology
Krystal Bottom, MD, Pediatric Medical Oncology
Doug Scothorn, MD, Pediatric Medical Oncology
Ginna Priola, MD, Pediatric Medical Oncology
Michael Parmer, MD, Palliative Care

NON-PHYSICIANS

Jonathan Bailey, VP, Administration
Marika Loveless, MHA, RN, Administration
Jolynn Sessions, PharmD, Pharmacy
Stephen Aiken, PharmD, Pharmacy
Melanie Clark, RN, Pediatric Oncology
Deborah Gentry, MSN, RN, Outpatient Infusion
Darren Coleman, MSN, RN, Inpatient Oncology
Kerry Crandall, MS, CGC, Genetics
Camilla Shanahan, MS, CGC, Genetics
Lynn Dressler, DrPH, Personalized Medicine
Gillian Bell, PharmD, Personalized Medicine
Janet Magruder, RN, Breast Nurse Navigator
Denise Steuber, RN, Survivorship Coordinator
Charlotte Lail, MSN, RN, Nurse Navigator
Carol Logan-Thompson, MSN, RN, Lung Nurse Navigator
Cathi Durham, MBA, MHA, Business Development

Linda Nall, RN, Integrative Health
Kathleen Usher, RN, Integrative Health
Michelle Mulvey, RN, Integrative Health
Amanda Pearson, Administrative Assistant
Stephanie Porter, RN, Outpatient Infusion & Research
Kate McPolin, RN, Research
Pearl Abernathy, RN, Research
Leslie Verner, RN, Research
Mike Hellig, DPT, Rehab Services
Elizabeth Tilley, MA, ACS Representative
Kim Battle, ACS Patient Resource Navigator
Christen Fulk, Foundation
Sedope Kunutsor, MPH, CTR, Cancer Registry
Alice Myer, LCSW, Hope Women’s Cancer Center
Carey Baumgarten, LCSW, SECU Cancer Center
Laura Kerzwick, BSRT, Radiation Therapy

Lisa Stephenson, Performance Improvement
Jeffrey Whitridge, RD, Clinical Nutrition
Lyndsay Mountz, Marketing
Cathy Trimby, Performance Improvement
Jon Brown, VP, Information Technology
Anna Eller, RN, Nurse Educator
Dianna Traylor, MSN, Oncology Informatics
Tony Mai, PharmD, Oncology Informatics
John Coletti, Physics – Radiation Therapy
Debbie Kent, RN, Breast Nurse Navigator
Terri Kuczynski, M.Div., Chaplain
Donna Borowski, Nicotine Cessation – System Wellness
Laurie Stradley, System Wellness
Annie Rogers, Arts for Life – Pediatric Oncology
Kortne Waginger, RN, Multidisciplinary Clinic
Kimberly Brittingham, H&N/Neuro Nurse Navigator
CCWNC Sub-specialization – Cancer Care of WNC (CCWNC) was established in 1990 with Dr. Michael Messino as the founding medical oncologist. Since its inception, the practice has continued to grow and develop professionally at the Asheville location and in the region. The first community outreach clinic for CCWNC was in Sylva, NC where the practice continues to thrive today. Currently, CCWNC also has established medical oncology services in Brevard, Franklin, McDowell, and Spruce Pine. The physician’s at CCWNC are board certified and committed to providing quality oncology and hematology care that is evidence-based and guided by national standards. In 2010 the practice received certification from the American Society of Clinical Oncology (ASCO), for the high quality standards and care provided to its patient population. CCWNC has maintained this certification, designating the practice as the only QOPI (Quality Oncology Practice Initiative) certified practice in Asheville and the surrounding communities.

In order to better serve our patient population, CCWNC began an initiative to sub-specialize within the practice. Sub-specialization provides the opportunity for the oncologist/hematologist to stay current on the ever changing treatments and treatment modalities for their assigned malignancies. All our medical oncologists are trained and experienced in managing all malignancies and will continue to provide this service throughout the region. Sub-specialization, however, will empower the practice with internal resource experts for specific oncology disease states. This sub-specialization, along with the incorporation of a Survivorship and Triage clinic within the practice, supports the goal for our facilities to provide the highest quality of care and best standards of care for our patients, while considering the needs of the whole patient.

The sub-specialization list for our physicians is outlined below. CCWNC physicians are available for consultation, support and educational updates within the cancer center and in the region.

<table>
<thead>
<tr>
<th>CCWNC Physician</th>
<th>Sub-Specialties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michael Messino, MD</td>
<td>Head and neck malignancies, CNS (Brain) tumors and breast cancer</td>
</tr>
<tr>
<td>Charles Bryan, MD</td>
<td>Lung cancer, cancers of the genitourinary system (bladder, ureter, kidney, testicular, prostate)</td>
</tr>
<tr>
<td>Christopher Chay, MD</td>
<td>Malignancies of the genitourinary system (bladder, ureter, kidney, testicular, prostate) and lung cancer</td>
</tr>
<tr>
<td>Shantae Lucas, MD</td>
<td>Head and neck malignancies, CNS (Brain) tumors and breast cancer</td>
</tr>
<tr>
<td>Mohan Thakuri, MD</td>
<td>Hematological malignancies including: acute and chronic leukemia, lymphoma and myeloma</td>
</tr>
<tr>
<td>Greg Pollack, MD</td>
<td>Hematological malignancies including: acute and chronic leukemia, lymphoma and myeloma</td>
</tr>
<tr>
<td>Martin Palmeri, MD</td>
<td>Malignancies of the GI tract (colorectal, stomach, esophagus, liver and pancreas) and melanoma</td>
</tr>
<tr>
<td>Trevor Austin, MD</td>
<td>Malignancies of the GI tract (colorectal, stomach, esophagus, liver and pancreas) and melanoma</td>
</tr>
<tr>
<td>Rachel Raab, MD</td>
<td>Breast and gynecological malignancies</td>
</tr>
<tr>
<td>Lynn Howie, MD</td>
<td>Breast and gynecological malignancies</td>
</tr>
<tr>
<td>Mirudu Chand, MD</td>
<td>Melanoma, Sarcoma and GI malignancies</td>
</tr>
<tr>
<td>Wieslawa Pekal, MD</td>
<td>Hematological disorders, including anemia’s and sickle cell disease</td>
</tr>
</tbody>
</table>
MRO Partnership with Mission Health – Mountain Radiation Oncology (MRO) and Mission Health enhanced their existing relationship by entering into a Professional Services Agreement in August 2016. With this agreement, Mountain Radiation Oncology will provide radiation oncology services on behalf of Mission Health. The physicians within MRO have a long-standing relationship with Mission Health, providing high quality and compassionate care alongside other clinicians at Mission’s SECU Cancer Center.

Radiation oncology is one of the three primary specialties involved in the treatment of cancer. Radiation oncologists work closely with other physicians such as surgical oncologists and medical oncologists as part of the multidisciplinary cancer team.

“This agreement is in line with our ongoing effort to expand and strengthen our multidisciplinary team approach within Mission Cancer Services and continue to elevate the quality of care our patients are receiving” said Jonathan Bailey, Chief Program Development Officer at Mission Health.

“This relationship is a natural extension of a greater than 35 year partnership between Mission and Mountain Radiation Oncology. It will allow even closer alignment in oncology care, which will ultimately benefit the cancer patients of our region,” said Eric Kuehn, MD at Mountain Radiation Oncology.

Mountain Radiation Oncology is made up of five board certified physicians:
Eric Kuehn, MD, Medical Director
Kellie Condra, MD
Matthew Hull, MD
Sesalie Smathers, MD
W. Mark McCollough, MD

Pediatric Hematology Oncology welcomes Dr. Ginna Priola

Dr. Priola joined the SECU Cancer Center’s Peds Hem/Onc department in October 2016. She is originally an east coast native born in Virginia and is thrilled to be back on the east coast. Dr. Priola spent her childhood in Virginia and attended the University of Virginia. After graduating, she decided to explore New England and joined AmeriCorps working with a branch of the American Red Cross in Brunswick, ME as part of the Disaster Response Team. She truly believes that experience laid the foundation to how she approaches her patients and their families following a diagnosis of cancer. After completing a year with AmeriCorps, she went back home to Virginia where she attended medical school at Eastern Virginia Medical School in Norfolk. It was during those four years she realized her desire to pursue Pediatric Hematology Oncology. Her training then took her to the Midwest in Cleveland, OH where she did her residency in pediatrics at Rainbow Babies and Children’s Hospital, part of Case Western Reserve University. She stayed an additional year as one of the chief pediatric residents; but once again, the east coast was calling her to come back home. She returned to earn her Fellowship in Pediatric Hematology Oncology at the University of North Carolina at Chapel Hill. She enjoyed her three years in the Raleigh-Durham area, but life had one more adventure for her, thus taking her to explore why everything was bigger in Texas. Dr. Priola spent two years as an attending Pediatric Hematology Oncologist at Texas Children’s Hospital in Houston. Outside the walls of the hospital, she enjoys cooking, traveling, running and spending time with her family and friends.
Welcome Dr. Don Gajewski, Interim Medical Director for Mission Cancer Care and Oncology Services

Dr. Gajewski joined Asheville Orthopaedic Associates, an affiliate of Mission Health, in the summer of 2015 from the Brooke Army Medical Center Department of Orthopaedics and Rehabilitation Services in San Antonio, Texas, where he served as an Orthopaedic Surgeon and the Director of the Center for the Intrepid – world class state-of-the-art physical rehabilitation facility for American’s wounded warriors. Dr. Gajewski earned his medical degree from Temple University School of Medicine in Philadelphia, PA. He completed his Orthopaedic Surgery residency at Walter Reed Army Medical Center in Washington, D.C., and later earned his Fellowship in Musculoskeletal Oncology from the University of Miami School of Medicine. Dr. Gajewski is board certified in Orthopaedic Surgery. He has received several military awards and has been published in numerous peer reviewed, scholarly journals. We are thrilled that Dr. Gajewski has decided to take on this additional role to partner with the Mission Cancer Center team to further build and expand this critical clinical program.
The cancer registry maintains a complete database of cancer cases diagnosed and/or treated at Mission Health since January 2000. Since that time, approximately 50,437 patients have presented to Mission Health for diagnosis or treatment of some type of malignancy, with approximately an additional 3,950 cases reported in 2016. All living patients in the registry are required to be followed throughout their lifetime. Long-term follow-up is essential to evaluate outcomes of cancer care. Accurate follow-up data enables the program to compare outcomes with state, regional or national statistics. The data analysts (Registrars) regularly review inpatient visits, outpatient discharge and other external sources to obtain current information on our patients. Letters are also sent to the managing physicians and patients to obtain updated information.

Statistical information gathered from the registry is used by area physicians, the American Cancer Society, the North Carolina Central Cancer Registry, the National Cancer Data Base and local hospitals to review trends and outcomes for cancer patients. Monitoring survival statistics and disease recurrence helps improve the standard of care for patients who have cancer, certain diseases of the blood and lymphatic systems and non-malignant brain tumors, as well as providing data to prompt new research studies and clinical trials. Hospital administration and medical staff benefit from using cancer registry data for resource planning, physician recruitment and cancer program marketing, among other uses.

Each year, complete and accurate data for all requested analytic cases are submitted to the National Cancer Data Base (NCDB). Data submitted to the NCDB are used to provide feedback to assess the quality of patient care. This feedback enables cancer programs to compare treatment and outcomes with state, regional and national patterns of care.

The NCDB is a nationwide oncology outcomes database used as a clinical surveillance mechanism to monitor changes and variation in patterns of cancer care and patient outcomes. The NCDB data are useful benchmarks for patient care and continuous quality improvement for cancer programs.

Sedope Kunutsor, MPH, CTR
Manager, Cancer Data Services
2000-2016
Annual Cancer Case Volume

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<tr>
<th>Year</th>
<th># of cases</th>
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<tr>
<td>2000</td>
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<tr>
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<td>1,971</td>
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<tr>
<td>2002</td>
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<td>2003</td>
<td>2,220</td>
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<tr>
<td>2004</td>
<td>2,424</td>
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<tr>
<td>2005</td>
<td>2,522</td>
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<tr>
<td>2006</td>
<td>2,651</td>
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<td>2007</td>
<td>2,894</td>
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<td>2008</td>
<td>3,078</td>
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<tr>
<td>2009</td>
<td>3,414</td>
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<td>2014</td>
<td>3,726</td>
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<tr>
<td>2015</td>
<td>3,910</td>
</tr>
<tr>
<td>2016</td>
<td>3,950</td>
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MISSION CANCER CARE

2016 Cancer Incidences

The statistics presented below for Mission Health are based on the actual number of new cancer cases seen at our facilities in 2016 with the exception of carcinoma in-situ of the cervix, squamous cell and basal cell skin cancers and intraepithelial neoplasia cases. Also excluded from the statistical analysis are cases that were diagnosed and received all treatments at other facilities prior to referral to any of Mission's facilities at the time of progression of disease.

Analytic Case:
A case that was diagnosed at Mission or cases in which all or part of the first course of therapy was given at Mission after the reference date.

Non-Analytic Case:
A case involving a patient who was diagnosed and treated elsewhere or was diagnosed and treated prior to the reference date. These patients are excluded from the survival statistics.
### MISSION CANCER CARE

#### 2016 Cancer Incidences

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>ANALYTIC CASES</th>
<th>STAGE AT DIAGNOSIS</th>
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<tbody>
<tr>
<td></td>
<td>Total Cases</td>
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</tr>
<tr>
<td>ALL SITES</td>
<td>3,252</td>
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<tr>
<td>ORAL CAVITY</td>
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</tr>
<tr>
<td>LIP</td>
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</tr>
<tr>
<td>TONGUE</td>
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<td>OROPHARYNX</td>
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<td>HYPOPHARYNX</td>
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</tr>
<tr>
<td>OTHER</td>
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<td>DIGESTIVE SYSTEM</td>
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<tr>
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<td>70</td>
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<td>ANUS/ANAL CANAL</td>
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<tr>
<td>LIVER</td>
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<td>PANCREAS</td>
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<td>NASAL/SINUS</td>
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<td>LARYNX</td>
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</tr>
<tr>
<td>LUNG/BRONCHUS</td>
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<tr>
<td>OTHER</td>
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<tr>
<td>BLOOD &amp; BONE MARROW</td>
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<tr>
<td>LEUKEMIA</td>
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<tr>
<td>MULTIPLE MYELOMA</td>
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<tr>
<td>OTHER</td>
<td>44</td>
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</tr>
<tr>
<td>BONE</td>
<td>4</td>
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</tr>
<tr>
<td>CONNECT/SOFT TISSUE</td>
<td>21</td>
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</tr>
<tr>
<td>SKIN</td>
<td>169</td>
<td>16%</td>
</tr>
<tr>
<td>MELANOMA</td>
<td>161</td>
<td>17%</td>
</tr>
<tr>
<td>OTHER</td>
<td>8</td>
<td>0%</td>
</tr>
</tbody>
</table>
## 2016 Cancer Incidences

<table>
<thead>
<tr>
<th>PRIMARY SITE</th>
<th>ANALYTIC CASES</th>
<th>STAGE AT DIAGNOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Cases</td>
<td>0</td>
</tr>
<tr>
<td><strong>BREAST</strong></td>
<td>663</td>
<td>14%</td>
</tr>
<tr>
<td><strong>FEMALE GENITAL</strong></td>
<td>286</td>
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</tr>
<tr>
<td><strong>CERVIX UTERI</strong></td>
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<tr>
<td><strong>CORPUS UTERI</strong></td>
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<td>1%</td>
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<tr>
<td><strong>OVARY</strong></td>
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<td>2%</td>
</tr>
<tr>
<td><strong>VULVA</strong></td>
<td>28</td>
<td>1%</td>
</tr>
<tr>
<td><strong>OTHER</strong></td>
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<tr>
<td><strong>MALE GENITAL</strong></td>
<td>181</td>
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<tr>
<td><strong>PROSTATE</strong></td>
<td>158</td>
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<tr>
<td><strong>TESTIS</strong></td>
<td>111</td>
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<td><strong>OTHER</strong></td>
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</tr>
<tr>
<td><strong>URINARY SYSTEM</strong></td>
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</tr>
<tr>
<td><strong>BLADDER</strong></td>
<td>126</td>
<td>4%</td>
</tr>
<tr>
<td><strong>KIDNEY/RENAL</strong></td>
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</tr>
<tr>
<td><strong>OTHER</strong></td>
<td>9</td>
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</tr>
<tr>
<td><strong>BRAIN &amp; CNS</strong></td>
<td>164</td>
<td>5%</td>
</tr>
<tr>
<td><strong>BRAIN (BENIGN)</strong></td>
<td>6</td>
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</tr>
<tr>
<td><strong>BRAIN (MALIGNANT)</strong></td>
<td>64</td>
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</tr>
<tr>
<td><strong>OTHER</strong></td>
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<td><strong>ENDOCRINE</strong></td>
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<tr>
<td><strong>THYROID</strong></td>
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<td>23</td>
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<tr>
<td><strong>LYMPHATIC SYSTEM</strong></td>
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<tr>
<td><strong>HODGKIN'S DISEASE</strong></td>
<td>10</td>
<td>0%</td>
</tr>
<tr>
<td><strong>NON-HODGKIN'S</strong></td>
<td>123</td>
<td>4%</td>
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<tr>
<td><strong>UNKNOWN PRIMARY</strong></td>
<td>31</td>
<td>1%</td>
</tr>
<tr>
<td><strong>OTHER/ILL-DEFINED</strong></td>
<td>10</td>
<td>0%</td>
</tr>
</tbody>
</table>
Overview

2016 saw a significant expansion of Mission Hospital’s longstanding program of multidisciplinary cancer conferences. These meetings are central components to Mission Hospital’s Oncology Program and are vital to the management of oncology patients in the SECU Cancer Center. Historically, there has been a weekly general multidisciplinary cancer conference at Mission Hospital, which has been ongoing for more than 25 years. A site-specific breast cancer conference was also added several years ago. Since the opening of the SECU Cancer Center in 2012, additional specialized meetings covering thoracic, pediatric and gynecologic patients have been added to the weekly schedule. A dedicated Head and Neck cancer conference was started in 2015. In the calendar year, multidisciplinary gastrointestinal and neuro-oncology conferences were also started and have proven very successful.

Each of these conferences is multidisciplinary in nature and is attended by a variety of physician and non-physician specialties. Attendees include surgeons, medical oncologists, radiation oncologists, internal medicine subspecialties, pathologists and radiologists. Additionally, nurses, pharmacists, geneticists, cancer data service personnel and research staff often participate. The majority of the conferences are held on a weekly basis, while the breast, thoracic and neuro-oncology conferences are accompanied by disease-specific clinics. At these clinics, patients who are presented and discussed may be evaluated by the involved physicians and ancillary personnel.

The format of each of these conferences is similar in that, patient cases are presented to the entire group for review and discussion, with the goal to reach a consensus on optimal approaches to their management. An in-depth presentation of the pertinent diagnostic data, with interactive discussion is undertaken. The patient’s pertinent radiographic and pathologic findings are often reviewed. Candidacy for open clinical trials is considered and the NCCN or other relevant guidelines are incorporated into the treatment recommendation. The ultimate goal is to enhance patient care for the individual patient by providing subspecialty expertise in a multidisciplinary setting. These conferences remain a cornerstone of the overall oncology program at Mission Hospital.
Total Prospective Cases Presented

For the calendar year 2016, a total of 1,478 new cases were presented at these conferences. This represented 51% of the new analytic cases seen at Mission Hospital, rate far exceeding the ACOS standards for cancer programs. The breakdown of number of cases for each individual conference is illustrated below:

<table>
<thead>
<tr>
<th>Conference Type &amp; Frequency</th>
<th>2014 # of cases presented</th>
<th>2015 # of cases presented</th>
<th>2016 # of cases presented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoracic (Weekly)</td>
<td>385</td>
<td>326</td>
<td>464</td>
</tr>
<tr>
<td>Breast (Weekly)</td>
<td>134</td>
<td>168</td>
<td>252</td>
</tr>
<tr>
<td>General (Weekly)</td>
<td>169</td>
<td>177</td>
<td>170</td>
</tr>
<tr>
<td>GYN (Biweekly)</td>
<td>167</td>
<td>222</td>
<td>220</td>
</tr>
<tr>
<td>Peds-Mission only (Weekly)</td>
<td>14</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Head &amp; Neck (Weekly)</td>
<td>--</td>
<td>48</td>
<td>68</td>
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<tr>
<td>Neuro-Oncology (Weekly)</td>
<td>--</td>
<td>--</td>
<td>201</td>
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<tr>
<td>Gastrointestinal (Weekly)</td>
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<td>85</td>
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<tr>
<td>Total New Cases Discussed</td>
<td>869</td>
<td>962</td>
<td>1478</td>
</tr>
<tr>
<td>Percentage New Analytic Cases Presented</td>
<td>31%</td>
<td>34%</td>
<td>51%</td>
</tr>
</tbody>
</table>

Eric Kuehn, MD  
Cancer Conference Physician Coordinator  
Radiation Oncologist
Mission Hospital established a breast cancer program in 2002 to encourage multidisciplinary care for breast cancer patients. The program was initially accredited by the National Accreditation Program for Breast Centers (NAPBC) in 2010, reaccredited in 2013 and again in October 2016. This program provides a framework for measuring and evaluating the quality of breast cancer care across the country and the Mission Breast Program exceeded the expectations of our surveyor by meeting all 27 NAPBC core standards. Between 2013-2016, some of the accomplishments of our breast cancer program include creation of the breast program committee, development of the Breast Patient Family Advisory Council, creation of the High Risk Breast Clinic, development of a multidisciplinary breast cancer clinic at SECU Cancer Center and multidisciplinary care at Hope Women’s Cancer Center, an increase in the number of patients presented at the breast cancer conference, development of a new process for selection of clinical trials, increased support services at both SECU and Hope, and offering of radiation oncology consultations at Hope Women’s Cancer Center.

Breast cancer care requires a team approach, and encompasses screening, diagnosis, treatment and survivorship. Team members include diagnostic radiologists, pathologists, surgeons, plastic surgeons, medical oncologists, radiation oncologists, nurses, support and rehabilitation services, genetic counselors, and research nurses. Each of these disciplines is required to meet quality assurance practices including accreditation through their sponsoring organizations and continued maintenance of certification.

Providers meet weekly to facilitate multidisciplinary care for newly diagnosed and recurrent breast cancer patients. The breast cancer conference is integral to improving the care of patients and serves as a forum to provide education for physicians and staff.

The heart of our breast cancer program is our nurse navigators Janet Magruder, RN, BSN, OSN, CBCN and Brandy Firmin, RN. They help patients to “navigate” through the many treatment paths encountered by the breast cancer patient. They offer individualized assistance to overcome healthcare system barriers and provide patients with education, support and coordination. They also coordinate outreach programs to underserved communities such as Ladies Night Out.

The breast cancer program places the patient at the center of care. We aspire to work together as a team to provide superior quality and accessible comprehensive cancer treatment. I appreciate the opportunity to be a part of this community of providers and gain my motivation daily from my patients.

In the following pages are a few of the representative NAPBC standards that reflect multidisciplinary care required for the treatment and management of breast cancer.

Rachel E. Raab, MD
Breast Program Chair
Medical Oncologist
The National Accreditation Program for Breast Centers (NAPBC) is a consortium of national professional organizations focused on breast health, and dedicated to the improvement of quality care and outcomes of patients with diseases of the breast through evidence-based standards and patient and professional education. The NAPBC encourages hospitals, treatment centers, individual physician practices, and other facilities committed to breast health care to improve the quality of care available at their center(s) through various breast-related programs. These programs are concerned with prevention, early detection, diagnosis, pre-treatment evaluation, staging, optimal treatment, rehabilitation, surveillance for recurrent disease, support services, and end-of-life care. The availability of a full range of medical services, along with a multidisciplinary team approach to patient care, ensures the provision of continuity of care for patients with diseases of the breast (NAPBC, Breast Center Standards Manual, 2014 Edition).

The NAPBC introduced certain standards that require breast cancer programs to achieve specified levels of performance for defined measures of care. These measures have been validated as the standard of care through the clinical trial process and demonstrate good practice.

I. NAPBC Standard 2.3 - At least 50 percent of all eligible patients diagnosed with early stage breast cancer are offered or treated with breast conserving surgery (BCS):

In 2015, every single eligible patient diagnosed with Stage 0, I or II breast cancer at Mission Hospital was either offered or treated with breast conserving surgery as part of their disease management. Surgeons involved in breast care have educated patients who are suitable candidates for breast conservation of their equivalent survival to mastectomy.
**II. NAPBC Standard 2.4 - Axillary sentinel lymph node biopsy is considered or performed for patients with early stage breast cancer:**

In 2015, 96 percent of all eligible patients diagnosed with Stage I and II breast cancer at Mission Hospital were considered for or had axillary sentinel lymph node biopsy performed as part of their disease management. Axillary sentinel lymph node biopsy, a less invasive technique in comparison to axillary dissection, has been adopted as a standard by surgeons in our community.

**III. NAPBC Standard 2.9 – Palpation-guided or image-guided needle biopsy is the initial diagnostic approach rather than open biopsy:**

In 2015, 96 percent of all eligible patients diagnosed with breast cancer at Mission Hospital had needle/core biopsy done before surgery. This rate is reflective of an actively involved radiology program and commitment of surgeons to avoid open surgical biopsies. This allows for treatment planning and limits re-excision rates.

**IV. NAPBC Standard 2.12 - Radiation therapy is administered within 1 year of diagnosis for women under age 70 receiving breast conserving surgery for breast cancer:**

As indicated in the graph below, 90 percent of all eligible breast cancer patients who received breast conserving surgery at Mission Hospital were also treated with radiation therapy within 1 year of diagnosis. Contributing to this achievement was the multidisciplinary care provided in our community and the high level of patient care provided by Radiation Oncology as evidenced by continued accreditation by American College of Radiology (ACR). All our Radiation Oncologists are board certified and participate in maintenance of certification and Practice Quality Improvement (PQI).
V. NAPBC Standard 2.13 - Combination chemotherapy is considered or administered within 4 months of diagnosis for women under 70 with AJCC T1cN0M0, or Stage II or III hormone receptor negative breast cancer:

As indicated in the graph below, every single eligible breast cancer patient at Mission Hospital received combination chemotherapy within 4 months of diagnosis, which is within the national guidelines.

VI. NAPBC Standard 2.13 - Tamoxifen or third generation aromatase inhibitor is considered or administered within 1 year of diagnosis for women with AJCC T1cN0M0, or Stage II or III hormone receptor positive breast cancer:

Also indicated in the graph below, 96 percent of all eligible breast cancer patients at Mission Hospital received hormonal therapy within 1 year of diagnosis, which is within the national guidelines.

Our Medical Oncology physician group participates in the Quality Oncology Practice Initiative (QOPI) program. This quality improvement program promotes excellence in cancer care by creating a culture of self-examination and improvement. All our Medical Oncologists are also board certified and participate in maintenance of certification.

VII. NAPBC Standard 2.18 – All appropriate patients undergoing mastectomy are offered a preoperative referral to a reconstructive/plastic surgeon:

Every single patient undergoing mastectomy was offered or referred to the plastic surgeon. Our board certified plastic surgeons participate in the Breast Program Leadership meetings and breast cancer conferences.
I. NAPBC Standards 3.1 & 3.2 – Information about the availability of breast cancer-related clinical trials is provided to patients through a formal mechanism. Two percent or more of all eligible breast cancer patients are accrued to treatment-related breast cancer clinical trials and/or research protocols annually: 

Clinical trials are performed to determine whether new drugs or treatments are effective. These trials are developed to identify the best participants and maintain safety standards. Participants in clinical trials play a more active role in their own health care, gain access to new research treatments and help others by contributing to medical research. Mission Hospital is a member of the Southeast Cancer Control Consortium, a program funded by the National Cancer Institute. This affiliation means we use national standards of care for cancer clinical trials. Certified research nurses meet with eligible patients and provide information about the most current and existing breast cancer-related clinical trials. They also attend the weekly breast cancer conference and discuss available protocols. Since 2010, Mission Hospital Cancer Research has annually accrued more than 6 percent of breast patients onto treatment-related clinical trials. A total of 29 patients were enrolled in clinical trials in 2015.

II. NAPBC Standards 2.16 – Cancer risk assessment, genetic counseling and genetic testing services are provided or referred:

According to the National Cancer Institute, a woman’s risk of developing breast and/or ovarian cancer is greatly increased if she inherits a deleterious (harmful) mutation in the BRCA1 gene or the BRCA2 gene. Men with these mutations also have an increased risk of breast cancer, and both men and women who have harmful BRCA1 or BRCA2 mutations may be at increased risk of additional types of cancer. Genetic tests can check for BRCA1 and BRCA2 mutations in people with a family history of cancer that suggests the possible presence of a harmful mutation in one of these genes. If a harmful BRCA1 or BRCA2 mutation is found, several options are available to help a person manage their cancer risk. Additional hereditary cancer syndromes that increase the risk of breast cancer are also screened for.

Timely genetic counseling and risk assessment services are provided by the Fullerton Genetic Center which is part of Mission Hospital. Patients who are referred for genetic testing are seen by a board certified genetic counselor followed by a board certified medical geneticist. During the appointment, a 3-generation family history is obtained, interpreted and further education provided about the benefits and limitations of testing. Follow-up services are provided for patients who elect to pursue genetic testing. Telehealth services are also available for people who are not able to travel. Once someone is found to be at risk for hereditary cancer, recommendations for cancer screening and prevention methods relevant to the family history are provided.
Breast cancer is the most common cancer in women. Based on current breast cancer incidence rates, experts estimate that about one out of every eight women will be affected by breast cancer during her lifetime. According to the 2015-2016 Breast Cancer Facts & Figures of the American Cancer Society, an estimated 231,840 new cancer cases of invasive and 60,290 in-situ breast cancers will be diagnosed among women and approximately 40,290 women are expected to die from breast cancer. It is the second leading cause of cancer-related death among women in the United States.

The exact cause of breast cancer is not clearly understood, besides being female, other risk factors such as age, genetic predisposition, family history of breast cancer and certain lifestyle behavior are thought to increase the chances of developing breast cancer. Positive lifestyle changes and regular screening examinations such as a mammogram and self-breast examination can help in prevention and early detection.

During 2013 through 2015 Mission Hospital diagnosed and/or treated 1,555 patients for breast cancer from Western NC and beyond, with 51 percent of our breast cancer patient population coming from Buncombe county.
The incidence of breast cancer increases with age, and this is illustrated by the fact that 83 percent of patients diagnosed with breast cancer at Mission Hospital are older than 50 years of age.
Breast cancer incidence rates are higher in non-Hispanic white women than African American women for most age groups. However, African American women have a higher incidence rate before age 40 and are more likely to die from breast cancer at every age. According to the North Carolina State Center for Health Statistics, the age-adjusted breast cancer incidence rate for white women in North Carolina is 1.1 times the rate for African American women. However, the age-adjusted breast cancer death rate for African American women is 1.5 times the rate for white women. Much of this difference is due to African American women being substantially more likely than white women to have breast cancer diagnosed at the regional or distant stage. Mortality is higher when breast cancer is diagnosed at a later stage. 93 percent of the female population in Western North Carolina is white, and the remaining 7 percent are minorities. From 2012 through 2014, 94 percent of breast cancer patients seen at Mission were white and 3 percent were African American.
As previously mentioned, patients with early stage breast cancer have a better survival outcome. 89 percent of our patients presented with early stage breast cancer from 2012 to 2014. This reflects the efforts and resources provided by the hospital to the community to encourage early screening, prevention and community outreach programs.

### 2012-2014 Breast Cancer Incidence Rate by Stage at Diagnosis

**Mission Hospital vs National Data**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Mission Hospital</th>
<th>National Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>18%</td>
<td>21%</td>
</tr>
<tr>
<td>I</td>
<td>46%</td>
<td>42%</td>
</tr>
<tr>
<td>II</td>
<td>25%</td>
<td>24%</td>
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<tr>
<td>III</td>
<td>6%</td>
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<td>IV</td>
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</tr>
<tr>
<td>UNK</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>N/A</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Overall five-year survival data for breast cancer both locally and nationally indicates that the observed survival rate is highest in patients with early stage cancer, as shown in the graph below. Patients with stage IV disease have a much poorer outcome with a five-year survival rate of 18.4 percent. As with other types of cancers, these findings highlight the importance of designing programs to promote awareness and provide early detection and screening for patients at risk for breast cancer.
In 2016 we officially opened our surgical oncology clinics at the SECU Cancer Center. Our goal is to provide full multidisciplinary care for all of our cancer patients. We currently have surgical oncology clinics multiple days each week. Initially starting with breast cancer multidisciplinary clinic and general surgical oncology clinic, we were able to expand our services beyond the thoracic oncology multidisciplinary clinic opened in 2012. We plan to continue expanding our services in 2017 to include more site specific surgical clinics such as orthopedic oncology, gastrointestinal oncology and skin cancer. As we continued to grow, we will increase our services to include multiple other surgical disciplines.

The presence of surgery within the cancer center fulfills true multidisciplinary care utilizing fellowship trained surgeons in breast cancer, surgical oncology, thoracic surgery and orthopedic oncology. Our surgeons work in conjunction with medical oncology, radiation oncology and all of the support services available at the SECU Cancer Center.

Paul Ahearne, MD
Surgical Oncologist
The oncology clinical pharmacy program continues to develop. Efforts during 2016 focused on direct patient care, research and quality projects, and review of newly-approved therapies for cancer and cancer-related issues. With the involvement of 8 pharmacy students, 2 pharmacy residents, and infusion center and clinical pharmacists, some 1000 direct patient encounters were completed in this timeframe. This broadens the impact of drug-focused review and patients’ understanding of their care and self-management.

In academic year 2015-2016, five studies were completed by the oncology clinical pharmacy program. Three of these studies helped to meet the ACOS/COC standard 4.7 - studies of quality. This was with the dedicated efforts of pharmacy students and residents with dedicated mentors.

Two studies shared a theme of reviewing the use of myeloid (white blood cell) growth factors according to national standards (National Comprehensive Cancer Network or NCCN guidelines). Both studies reviewed data from 5/1/2013-4/30/2015. Myeloid growth factors are drugs that stimulate the production of white blood cells, which are the primary cells that fight bacterial infections. The goal of giving myeloid growth factors is to either minimize and prevent life-threatening infections due to chemotherapy, or help the body fight infections when the white blood cells are low. Pegfilgrastim is a myeloid growth factor drug. The first study focused on the up-front use of pegfilgrastim with chemotherapy according to NCCN guidelines. Two hundred ninety three patients were reviewed, who were receiving chemotherapy for a wide variety of cancers. This analysis demonstrated that for more than three quarters of the time, use of pegfilgrastim was congruent with national recommendations. Opportunities were identified in the use of pegfilgrastim in patients receiving chemotherapy with an intermediate risk of neutropenic infection. The second study with myeloid growth factors focused on patients who were admitted to the hospital for neutropenic infections, and reviewed myeloid growth factor use. During the defined time frame, 111 hospital admissions were identified and myeloid growth factors were utilized according to national guidelines 96% of the time while hospitalized. Similar to its partner study, it was demonstrated that there were opportunities in patients receiving chemotherapy with an intermediate risk of neutropenic infections. The combined conclusions of these studies were that SECU Mission Cancer Center/Cancer Program has a high rate of guideline adherence with myeloid growth factor. Opportunities exist particularly with patients receiving chemotherapy with an intermediate risk of neutropenic infection. Efforts are underway to assist oncology providers with a risk-adapted prescribing of pegfilgrastim.

An additional study investigated the use of a specific tumor marker to help drive drug therapy decisions in patients with lung cancer. Certain lung cancers have specific abnormalities that can be targeted by specific drugs (targeted therapy). Epidermal growth factor receptor (EGFR) mutations occur in up to 15% of lung cancers in the United States, and data demonstrate that drugs that target these EGFR mutations are much more effective in the presence of an EGFR mutation. The NCCN guidelines for non-small cell lung cancer recommend that all lung cancers of the adenocarcinoma sub-type be assessed for EGFR and other mutations, in order to provide these targeted therapies to patients as initial therapy.
This study reviewed two things: what is Mission Cancer Program’s congruence with the NCCN recommendation to perform baseline testing for advanced adenocarcinoma of the lung, and in patients where we used targeted therapy how often did we know the EGFR status prior to start of the targeted therapy. It was determined that historically in just over half of newly diagnosed advanced adenocarcinoma of the lung (a sub-set of non-small cell lung cancer), testing for the EGFR mutations were occurring at diagnosis. This prompted the cancer program to change our processes so that assessment of specific mutations are performed reflexively, as a standard practice now.

The second portion of this lung cancer study reviewed the use of EGFR mutation testing prior to using a targeted therapy. In 67% of patients, the EGFR testing was ordered and performed for applicable patients. Additional data has been utilized to optimize our care of people with lung cancer and using patient-specific data to develop a unique care plan for that person.

Two additional projects were completed in 2016. One project quantified the prior use and utility of genomic testing for patients with advanced cancer. A second management project evaluated various models for a specialty pharmacy within the Mission Health System, ultimately to determine the best model for the system and the region.

Jolynn K. Sessions, PharmD, BCOP
Oncology Clinical Pharmacist
Associate Professor of Clinical Education
Mission Cancer Center and UNC Eshelman School of Pharmacy
What is a Patient and Family Advisory Council?
The Patient and Family Advisory Council (PFAC) is dedicated to the improvement of quality in patient and family care at Mission Health Cancer Center. The Advisory Council is comprised of past and present patients and family and staff members of Mission Cancer Center. Patients and their families are often the most knowledgeable members of the care team, and can offer unique perspectives and valuable feedback regarding the standard of care they receive. As part of this process, patients and families are invited to serve as advisors to ensure that the consumer’s perspective and experience are not only heard, but also integrated into quality improvements that are engineered to ensure excellent service and customer-centered care. Through their unique perspectives, they give input on issues that impact care, ensuring that the next patient or family member’s journey is easier.

Breast Patient and Family Advisory Council (BPFAC)
Mission Health Cancer Center embarked on a journey to implement a Patient and Family Advisory Council for the cancer patients served in the community. The decision was made by the steering committee to focus on a smaller group and one diagnosis as the pilot program. In January 2016, past and current breast patients were invited to an educational session outlining this pilot program.

BPFAC Mission Statement
Mission Cancer Center Breast Patient and Family Advisory Council will ensure that patients have a voice in their own cancer journey. We will accomplish this by strengthening communication to do the following:

• Create a partnership with patients, caregivers and the healthcare team to provide excellence in prevention, treatment, education and research
• Provide integration of care and services
• Provide access to cancer related information, education and support to minimize apprehension and fear

BPFAC Vision Statement:
To partner with the Mission Breast Program to create an exceptional experience for patients and their caregivers.

The process and results:
Of the sixteen women invited to the informational session, six women and one husband committed to a six month advisory council pilot. After applications, interviews, background checks and orientation, the group began meeting in June 2016. Volunteers participated in an extensive walk-through of the cancer center to glean information about the entire process from parking to treatment, covered all aspects of the cancer program, including radiation therapy, outpatient infusion, and Hope Cancer Center.
Within 6 months of the commencement of this program, the group came up with the following suggestions - Some have been implemented and others pending implementation:

- Updated educational materials to 5th grade education level
- Wayfinding to include exterior, interior and parking signage
- Improve the entry ways to the cancer center
- Staff coaching on how to involve family and caregivers in patient’s care – raising awareness
- Beta test group for survivorship care planning
- Creation of family and caregiver after-hour tours of the cancer center
- Creation of support group for children with parents who have cancer
- Provided feedback for renovations/expansion of Hope Women’s Cancer Center
- Provided feedback on breast program educational packet
- Provided feedback on diagnostic testing for breast cancer patients
- Provided feedback on delivery of diagnosis
- Provided feedback on breast patient tops in radiation therapy

Additional activities:

- Providing the community with information about PFAC (three advisors served on the Cancer Consortium Panel discussion)
- Advisors volunteered to speak to the Executive Quality Team during early morning rounding session
- Advisors volunteered to speak to the Breast Program Committee

BPFAC Steering Committee:

- Physician Champion: Rachel Raab, MD, Medical Oncologist
- Administrative Representative: Marika Loveless, Executive Director Cancer Program
- Linda Hummel, VP Quality and Safety
- PFAC Coordinator: Laura Kerzwick, Manager of Radiation Therapy
- Nonclinical liaison: Mariann Smith, Director of Hope Women’s Cancer Center
- Clinical liaisons: Denise Steuber, Survivorship Coordinator
- Alice Myer, Patient and Family Counselor at Hope
- Patient Experience Representative: CJ Merrill, RN, Patient Experience Officer
BPFAC Advisors

The BPFAC comprises of a dedicated group of patients and family members who have received or experienced some type of care at Mission Cancer Center. They volunteer their time, expertise and input to making a difference in patient care. They include:

- Alan Caudle – Spouse
- Donna Caudle – 4 year survivor
- Carolyn Comeau – 10 year survivor
- Mary deBeus – 1 year and 6 month survivor
- Lisa Grefe – 1 year and 9 month survivor
- Cathy Summa – 1 year and 7 month survivor
- Julie Young – 5 year survivor

From our advisors

"My involvement in the Breast Patient and Family Advisory Council has provided me the healing opportunity to reflect on my own cancer journey and to connect with other survivors, which is a gift. In turn, I hope I’ve helped to provide a constructive framework for Mission Health as it serves current and future patients, and meaningfully contributed to how enlightened advanced patient care is thought about, planned, and implemented."

"The PFAC has provided a great opportunity to brainstorm, constructively critique, and hopefully optimize breast cancer patients' care and treatment."

Advisors (from left to right), Cathy Summa and Carolyn Comeau share their BPFAC experience with the Breast Program Committee

Laura Kerzwick
Patient and Family Advisory Council Coordinator
Mission Health System is proud to offer the very best in Oncology Nursing for our cancer patients. Becoming part of the family is a side role for most of our nurses and their patients. Nurses serve in a variety of roles throughout our program to help navigate, encourage, medicate, and serve those in need with compassion, love and hope; through (what can be) one of the toughest of all diagnosis...hearing the words “you have cancer”.

Professionalism is alive and well at Mission, with nurses serving patients in roles such as Navigators, Radiation Oncology, Infusion, Inpatient Oncology, Pediatric, Survivorship, Multidisciplinary Clinics and Clinical Research.

Our team of Infusion nurses have an average of 17 years with Mission, with a greater than 50% of them having achieved the highest designation of Oncology Certified Nurse. All Registered Nurses administering Chemotherapy hold the Oncology Nursing Society’s, Chemotherapy and Biotherapy Provider Card Certification.

Wherever your treatment begins...

- Inpatient
- Radiation
- Outpatient Infusion Center
- HOPE Women’s Cancer Center
- Multidisciplinary Clinics

...know that our nurses will be with you from the beginning of treatment and will be celebrating with you and your family when you finish your treatment. The compassion and helping hand is always there when patients need us the most. To complement our nursing team, Licensed Social Workers, Chaplaincy, and Registered Dieticians ensure the care is patient centered.

Debbie Gentry, MSN, RN, OCN, CBCN
Director of Ambulatory Oncology Nursing
In Mission’s radiation therapy department we use carefully targeted and calibrated doses of high-energy radiation to destroy cancer cells. The radiation causes some of the cancer cells to die immediately after treatment but most of the cells die or become incapacitated as a result of the radiation-induced damage to the cancer cell’s chromosomes and DNA. Mission’s radiation therapy services combine the quality and capability of state-of-the-art technology with the expertise and compassion of our medical staff.

Our team of five board certified radiation oncologists will work closely with the surgeons and medical oncologists to determine the best treatment options. Supporting our physicians is a talented staff of 6 nurses, 1 CNA, and 1 CMA who meet with the patients to discuss any problems, questions or concerns regarding radiation treatment; a team of 12 radiation therapists who have been specially trained to administer daily radiation treatments; 2 certified medical dosimetrists who work “behind the scenes” with the radiation oncologist to design a specific treatment plan for the patient; and 3 medical physicists who ensure a precise and accurate delivery of the treatment plan by testing, monitoring and calibrating the sophisticated technology used in radiation therapy. Our office staff team of 4 are on hand to schedule appointments, maintain records and assist with directions and parking.

Mission’s radiation therapy department is currently working towards an accreditation through the American Society for Therapeutic Radiation Oncology Accreditation Program for Excellence (APEx). This accreditation involves an independent, impartial peer review and evaluation of patient care with an evaluation of staff, equipment, treatment planning and records, patient safety and quality control activities.

At Mission radiation therapy we perform the following therapeutic procedures:

- External beam radiation therapy
- Intensity modulated radiation therapy
- Volumetric modulated radiation therapy
- Image guided radiation therapy
- Stereotactic radiosurgery
- Stereotactic body radiotherapy
- High dose rate brachytherapy
- Prostate seed implant brachytherapy
- Cyberknife radiosurgery
Radiation therapy had many accomplishments in 2016, including:

- Patient safety quality checklist in Mosaiq implemented to standardize workflow of new patients from simulation to first treatment
- Prostate seed implant program - new laptop, software, ultrasound scanner and grid
- Standardized technical and professional billing in Mosaiq
- Implementation of new physician schedule, improving patient wait times
- Prostate education that is streamlined and consistent for all patients
- The implementation of Dragon transcription to improve turnaround time of documentation
- Patients self-scan check-in that improves the process
- Radiation Oncologists presence at HOPE improving patient satisfaction

Eric Kuehn, MD
Medical Director
Radiation Oncology
Mission’s Pediatric Hematology/Oncology department had no formalized education process for newly diagnosed oncology patients. While patients were provided education, it was not standardized and was incomplete in some cases. At the time of diagnosis, patients and caregivers are faced with having to process a large amount of information about disease states, treatments and associated adverse effect, clinic processes, clinical trials and other complex concepts. The pediatric hem/onc team identified the need for a more comprehensive education program that included didactic and verbal instruction.

An interdisciplinary team which included research nurses, oncology pharmacist, child life specialist, and pediatric oncologists developed a Power Point presentation with standardized talking points. A packet containing a thermometer, refrigerator magnet with contact information, pill box and corresponding educational handout was also provided to the patients and families. This educational program was presented to patients and caregivers following diagnosis and within ten days of discharge from initial hospitalization or clinic visit.

A second educational project aimed to refresh knowledge and emphasize key points was developed for caregivers and patients entering the maintenance phase of therapy for acute lymphoblastic leukemia (ALL). Maintenance therapy consists of mostly oral chemotherapy and may last between 2 and 3 years. Lower adherence to these oral regimens increases the risk of relapse. In a recent study, nearly 60% of all disease relapses were attributable to nonadherence. The maintenance education program was to be presented on or before the first day of maintenance therapy for all patients with ALL.

**Patients and Methods**

- All newly diagnosed pediatric oncology patients were identified.
  - Upon discharge from initial hospitalization or clinic visit an appointment was made with oncology research nurse within 10 business days.

- An interactive presentation was given to the patient/family by research/staff nurse with involvement of child life and the oncology pharmacist.

- The research/staff nurse identified ALL patients entering maintenance therapy.
  - They were scheduled for appointments with the research nurse on or prior to starting maintenance therapy.
  - An interactive presentation was given to patient/parent regarding the importance of adherence to oral medications and strategies for remembering to take medications.

- Quizzes were imbedded in the presentations to allow staff to assess comprehension and provide a means for the audience to demonstrate knowledge of the information.

- Two written surveys were developed, one for new patients and one for those entering maintenance therapy. These surveys were designed to assess the effectiveness of the educational program.
  - Surveys were given to parents/patient at the end of the presentation and collected by the front desk staff upon discharge from clinic.

- The interdisciplinary team met to review and revise the educational program based on feedback collected from the surveys.
Results

A total of 23 new oncology patients were diagnosed between October 2015 and December 2016. All (100%) patients received the new formalized education.

- Twenty (87%) of these participated in the educational program within the targeted timeframe.

- Seven ALL patients entered maintenance therapy.
- All seven (100%) received formalized maintenance education within the timeframe.

- A total of 31 patients/families received education of either type. Twenty-eight received surveys and 15 surveys were returned.
- The overall effectiveness of the education program was assessed using feedback received from the surveys.

Conclusions and Future Goals

All new oncology patients and ALL patients entering the maintenance phase of treatment received formalized education provided by an interdisciplinary team. Processes were improved in order to facilitate provision of education to all patients within the target timeframe. The effectiveness of the educational program was assessed using a survey. These surveys were reviewed and evaluated by the interdisciplinary team and revisions to the program were made based on this feedback.

Realizing the value of the survey comments, the team redoubled their efforts to encourage families to return the surveys. The front desk staff was recruited to collect surveys and route them to the education team. The team identified that it was difficult for families requiring interpreters to complete the evaluation survey. The education team partnered with interpreter services to help collect this valuable feedback.

A scoring system for the survey will be used to quantify the effectiveness of education program. New metrics to quantify effectiveness will be developed by the team.

Adherence during maintenance will be measured using data collected from medication diaries/calendars. This data will be compared with historical controls with the hopes of achieving a statistical difference in the rate of adherence.

Physician Champions:
Krystal Bottom, MD
Pediatric Hematology & Oncology

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Introduction

What is Personalized Medicine? Personalized Medicine evaluates the genetic and genomic mutations found in an individual cancer patient’s tumor to predict which cancer treatments are most likely to work for that patient. With advances in the field of cancer genomic medicine, it is now standard of care in many advanced cancers to perform personalized medicine testing of a patient’s tumor to provide patients, health care providers and health insurers with information that could minimize toxic side effects from cancer drug treatment and maximize cancer drug effectiveness. Testing for a patient’s response to drugs, before they get the drug, makes good clinical sense, meets best practices and FDA recommendations and provides clinicians and patient’s key information to enhance patient drug management. Personalized Medicine holds the promise of optimizing cancer patient experiences and quality of life, and decreasing cost of care. Overall, personalized medicine testing strives to replace the trial and error approach to management of cancer with a scientifically, individually guided approach.

How does Personalized Medicine work? In cancer patients, tests are performed on the patient’s individual tumor to analyze mutations that are associated with tumor growth. We then try to match the tumor mutation(s) to drugs that target those mutations. By using “targeted therapy” we can utilize the most effective drug to target (and hopefully destroy) the tumor cells that carry the mutation, and leave the normal cells intact. This should lead to less toxicity and more effective management of the cancer for each patient.

Highlights of Program Accomplishments

A. Innovation and Program Development: Clinical Consultation for Genomic Profiling in Advanced Stage Cancers: Mission’s Personalized Medicine Program in cancer began offering clinical consultation and interpretation of cancer genomic profiling to match tumor mutations to drugs that target those mutations. This consultative service provides expertise and efficiency to the cancer physician, distilling results from a 13 page report to a 2 page summary, matching a patient’s tumor mutations to FDA approved drugs or to local clinical trials. This is a service that it usually found only in major academic medical centers.
B. Highlights of Program Services: Enhancing quality, safety and consistency of cancer patient care:

- **Meeting/exceeding national guidelines for tumor marker testing to predict response to therapy:** Following national guidelines (NCCN, ASCO, and ACMG) the PMP worked with oncology, pathology and genetics to develop and implement a proposal for routine tumor marker testing in a certain type of head and neck cancer. Cancers forming in the back of the mouth (oropharyngeal cancer) are often positive for the human papilloma virus (HPV). The virus can be detected in tumor tissue and can aid in understanding the prognosis, staging and response to therapy. This proposal implemented routine testing for HPV, not requiring a physician request. Although head and neck cancer are often associated with cigarette smoking and alcohol use, the high association with HPV is very important and has changed the way this cancer is managed and treated.

- **Transition to in-house cancer testing for adult and pediatric leukemia:** The Personalized Medicine team spearheaded and coordinated the effort to have Mission Genetics Laboratory and Mission Pathology provide tumor testing for leukemia in our own laboratories, offering patients even more personalized services.

- **Quality Improvement studies:** Quality improvement (QI) studies evaluate how well we are following guidelines once they have been implemented in our center. In 2016, we conducted QI studies, one in

  - **Lynch Syndrome and colorectal cancer and one in breast cancer evaluating use of a test associated with benefit from chemotherapy.** Lynch Syndrome in Colorectal Cancer: Building on the work conducted in 2015 to develop and implement proposals for Universal Lynch Syndrome Testing for newly diagnosed colorectal (especially those patients <70 years of age), the PMP sought to evaluate how well we were following the proposals approximately 1 year after implementation. This evaluation included the consistency with which a complex decision tree was being followed and utilized. Our evaluation demonstrated excellent agreement with the decision tree and also identified opportunities to improve communication. New process and policy is now in place to ensure that any patient (whether being treated at Mission or elsewhere) and their physician have the appropriate information about Lynch Syndrome results in a timely fashion to manage their care.

  - **Use of the Oncotype Dx Test to guide chemotherapy in early stage breast cancer:** Following the ASCO Guidelines published in early 2016, we conducted a quality improvement study to determine how well Mission providers are following the guidelines. Preliminary data for the first quarter of 2016 demonstrated that clinicians were 100% compliant with ASCO guidelines regarding use of the Oncotype Dx score to guide use of chemotherapy in estrogen receptor positive, HER2 negative, node negative, breast cancers. The study will continue for 1 year.

  - **Health Informatics and Access to test results:** Working with Mission informatics, pathology and genetics teams, we inventoried and developed new rules and guidelines for ordering tumor marker testing for adult and pediatric cancer patients, facilitating the opportunity for a smooth transition to our new Power Chart Oncology electronic medical record.

  - **Education of providers and patients regarding Personalized Medicine Cancer Testing:** The PMP sponsored two educational sessions to discuss different aspects of personalized medicine testing: Dr. Javier Torres Roca, Moffitt Cancer Center spoke at our cancer grand rounds regarding a genomic test to predict response and dose of radiation therapy; Drs Dressler and Bell, Mission Personalized Medicine Program, spoke at our monthly evening cancer education session (for pharmacists, nurses and other clinical staff) regarding how personalized medicine testing in cancer patients, both tumor tissue testing and inherited germline testing can help predict response to cancer therapy and provide enhanced safety and quality of care for our cancer patients.
C. Publications, Presentations, Honors and Grants:

- National invitation to join DIGITIZE: Mission’s Personalized Medicine Program was invited by the Institutes of Medicine/National Academy of Medicine to join a national effort to minimize risk of lethal toxicity to select drugs. Most of these drugs have been designated by the FDA with a black box warning, strongly recommending that patients get genetic testing prior to receiving these drugs. The national effort also includes having this genetic information integrated into the patient’s electronic medical record. Mission is the only community health system invited to be part of this effort (along with Mt Sinai, Duke, Johns Hopkins, and other academic medical centers).

- Policy developed by Mission’s Personalized Medicine Program adopted by State of NC: Mission’s Personalized Medicine Program’s policy to remove codeine from the pediatric drug formulary was adopted by the North Carolina State Medicaid Office. This policy minimizes the risk of any child having a lethal response to codeine. Mission Health has set a standard for safe and quality care in pain management in children having impact on population health throughout the state.

- Two publications in peer reviewed scientific journals: The first study identified the need for more consistent education for cancer patients taking oral anti-cancer therapy. Patients in this study reported that they were confused about when or how to take their medication, citing different directions from their clinical team and/or the drug vial. The second study identified that patients were most interested in receiving results for which there was a medical intervention, but also wanted to know of results that were currently in the gray zone.


- Invited speaker at national conference:


D. Plans for 2017:

- With pathology, develop proposal and implement tumor markers for neuro-oncology.

- With pathology and oncology conduct a QI study on genomic profiling used in Stage IV cancer patients and how these markers are utilized to guide care

- With IT, oncology and pathology, integrate clinical decision support for germline variants to guide care in leukemia.

- Develop a demonstration project for access to pharmacogenetics testing to guide supportive care drug management in cancer patients.

Lynn Dressler, Dr. P.H.
Director, Personalized Medicine
At the Fullerton Genetics Center, we have established a Hereditary Cancer Screening Program to help identify individuals at higher risk of developing certain cancers because of their genetic makeup. Working with the local medical community, we hope to decrease the incidence of cancer and/or increase diagnosis in the early stages when cancer is most treatable.

We are the only genetic center located in Western North Carolina and provide services to individuals from Murphy to Hickory as well as neighboring areas in Tennessee, Georgia and South Carolina. In the field of cancer care, we understand newly diagnosed patients may need results of genetic testing to help determine their plan of care. Therefore we have established an appointment system that allows us to schedule those individuals on an urgent basis upon request to help provide the best care possible.
Genetic counselors collaborate with the cancer center in many ways, including:

- Participation in weekly breast cancer care conferences and GI tumor board meetings to help in the provision of true multidisciplinary care
- Participation in care process model development for breast cancer screening
- Developed a decision tree for lynch syndrome tumor testing
- Create educational materials and guidelines based medical management

As genetic testing expands, it requires professionals with the background and experience to understand the available tests, costs, and benefits to determine the best approach to genetic testing for each individual. Families considering genetic testing also frequently require psychosocial support, decision-making support and resources unique to hereditary conditions. The Staff at the Fullerton Genetic Center is uniquely qualified to provide this service.

We are available to meet with patients at the request of referring physicians to review their personal and/or family history of cancer. We discuss the genetics of cancer, and whether their history is suggestive of a hereditary cancer syndrome. If so, we discuss the most appropriate and cost-effective testing options, and the benefits and limitations of genetic testing. If the patient elects to proceed with testing, we coordinate the process and provide thorough follow up on the results. Because genetic testing has implications for both the individual patient as well as their extended family, we spend time discussing the importance of sharing this information with their family and provide templates patients can use to share results with extended family members. Genetic counselors ensure that patients have a good understanding of complicated information, are making informed decisions that right for their family, provide detailed follow up education and support, and are available for any future questions that may arise.

The Clinical team includes: 2 Medical Geneticists and 5 board certified master's level trained genetic counselors, all of whom keep abreast of the most up to date information about the genetics of cancer by attending national conferences and having monthly journal clubs. We value our role in the Mission SECU Cancer Center and look forward to expanding that role as our understanding of the genetics of cancer continues to grow.
Mission Fullerton Genetics Laboratory:

The Mission Fullerton Genetics Laboratory provides a variety of genetic and genomic testing for the people of western North Carolina and beyond. The laboratory is recognized nationally and internationally for expertise in chromosomal microarray analysis, next generation sequencing, single gene mutation analysis, and classical chromosome analysis. As new technologies change how diagnosis and treatments are delivered, the laboratory is positioned to be a leader in this new era of genomics and targeted therapies. Mission Fullerton Genetics Laboratory is the only hospital-based genetics laboratory in western North Carolina.

Recent oncology additions to the laboratory’s test menu include chromosome analysis for bone marrow samples and microsatellite instability testing of tumor samples. The laboratory has continued plans for growth and expansion of its oncology services in the near future.

The diagnostic laboratory team includes 3 American Board of Medical Genetics and Genomics certified laboratory geneticists, one bioinformaticist, 10 genetic technologists, and 3 clinical support staff team members. The team is committed to staying abreast of the genetic literature in order to provide the most up-to-date information available and works closely with the Genetics Clinic to provide quality services, information, and support to patients, families, physicians and other healthcare professionals. The center is in a unique position as a regional genetics center and offers the personalized care that patients and their families want and need.
Mission Cancer Program provides comprehensive multidisciplinary supportive care services that supports the treatment of the entire patient holistically. This includes a Survivorship team which consists of Advance Nurse Practitioners and Registered Nurses who work with the patient regarding their care plan post treatment. This care plan is provided to the patient and the patient’s primary care physician for appropriate follow up care. The Cancer Program has a team of Nurse Navigators who serve as patient liaisons to guide patients through their treatment process.

Our Integrative Health team has expanded services to Hope Women’s Cancer Center and delivering complimentary services such as aromatherapy, healing touch, reiki and massage therapies. Numerous patients have voiced their gratitude for having access to these programs that assist them through their continuum of treatment. Our Pastoral Care team visits with our patients while they are receiving treatment and through consultations. Social Work provides supportive care on as needed basis. Nutritional services adds consultations and assessments to the patient’s care plans, provides them with diets to assist in weight maintenance and helps patients through their treatment regimens. American Cancer Society provides assistance in the form of travel assistance to and from their treatment appointments, lodging, financial, medication assistance, and access to other resources that allows patients to complete their treatment plan successfully.

Thoracic navigators made approximately 5,300 contacts in 2016 and Breast Navigators performed approximately 3,500 contacts. Navigation was expanded to include Gastrointestinal and Neuro-oncology patients with approximately 267 contacts with GI patients and 124 Neuro-oncology contacts. At Mission Cancer Program our Mission is our patient’s lives and ensuring patients have the highest quality of care throughout their continuum of care from the time of diagnosis through survivorship.

Marika Loveless, RN, MHA, OCN
Executive Director, Mission Health Cancer Program
Mission Health has been named one of the nation’s Top 15 Health Systems and Mission Hospital one of the nation’s Top 100 Hospitals by Truven Health Analytics.