We are pleased to present our 2016 Annual Report highlighting advances in state of the art cancer care at the Roper St. Francis Cancer Program. Our goal is to fulfill the Roper St. Francis mission of healing all people with compassion, faith and excellence. To that end we provide a range of services in the areas of cancer prevention, screening, diagnostics, therapeutics, cancer patient support and survivorship.

Some of the 2016 highlights of our comprehensive program of services include:

- Outreach prevention and screening programs for breast and colorectal cancer held at the Roper St. Francis Cancer Center on the Bon Secours St. Francis campus in Charleston and the Cross Community Center in Berkeley County.
- Establishing the Hank and Laurel Greer Colorectal Cancer Program, thanks to a generous donation, that will emphasize colorectal cancer prevention and screening.
- Opening of a dedicated new cancer patient survivorship clinic at the Roper St. Francis Cancer Center staffed by an oncology certified nurse practitioner.
- Expansion of the services provided by the Donna Fielding Cancer Wellness Institute that include psychological and financial counseling, nutritional counseling, an exercise rehabilitation program, therapeutic massage, art and music therapy and a pro-bono legal clinic.
- Implementation of 3D tomographic mammography at four of our breast imaging centers.
- Continued emphasis on coordinated, multidisciplinary cancer care anchored by dedicated case conferences attended by surgeons, radiation and medical oncologists, our cancer geneticist, diagnostic radiologists and pathologists. Individual conferences are dedicated to breast cancer, thoracic malignancies, hepatobiliary and pancreatic malignancies, genitourinary cancers and central nervous system cancers.
- Continued compliance with all of the standards mandated by the Commission on Cancer of the American College of Surgeons (CoC) that have enabled our CoC accreditation with the highest level of commendation as well as our accreditation by the National Accreditation Program for Breast Centers.
- Expansion of our robust clinical trials program. In 2016 we opened additional national cooperative group clinical trials via our membership in the Southeast Clinical Oncology Research Consortium, additional pharmaceutical trials and new investigator initiated trials via our affiliation with the Levine Cancer Institute.
• Continued emphasis on acquiring state of the art technologies to improve patient care, with numerous new additions in 2016, including:
  – Providing, in collaboration with Coastal Pathology, in house next generation sequencing using the Ion Torrent platform to identify somatic genetic alterations in our patients’ cancers that may help guide therapeutic decisions.
  – Acquiring the BK intraoperative ultrasound system that enables improved cancer staging and intraoperative visualization.
  – Acquiring the Uronav prostate fusion biopsy system that fuses MRI and ultrasound imaging of the prostate to allow targeted biopsy of high risk prostatic lesions.
  – Acquiring the Spyglass biliary ductal visualization system that facilitates visualization and biopsy of bile duct lesions.
• Bringing online an additional True Beam linear accelerator with Rapid Arc and stereotactic capabilities at the Roper St. Francis Cancer Center. Dr. Joshua Mondschein will elaborate on the capabilities and value added by this new technology in this Annual Report.

This year we would like to highlight our thoracic malignancies program. Lung cancer is the most common cause of cancer related mortality in both American men and women. However, there is hope for better outcomes. Low dose lung CT screening of high risk individuals (principally heavy current and former smokers) has been demonstrated to help identify cancers at early curable stages, and to reduce lung cancer deaths. As part of our thoracic malignancies program, Roper St. Francis offers low dose lung CT screening at all of our CT imaging facilities. In this Annual Report Dr. Curtis Quinn will elaborate on how our thoracic malignancies program provides comprehensive multidisciplinary state of the art care for potential and actual lung cancer patients, beginning with screening and lung nodule evaluation, pathologic and molecular diagnosis, appropriate staging, and surgical, radiation, and medical oncologic treatment.

We hope that this report provides helpful information to the community we serve. We continue to endeavor to provide compassionate individualized care to all who come to us for help.

The Truebeam: Delivering State of the Art Radiation Therapy

Joshua K. Mondschein, MD

In keeping with our commitment to providing the highest standard of cancer care to residents in the Lowcountry, the Roper St. Francis Department of Radiation Oncology introduced the TrueBeam radiotherapy system in 2016. Developed by Varian Medical Systems, the market leader in radiation oncology technology, the TrueBeam system was engineered to deliver powerful radiation treatments with pinpoint precision.

The TrueBeam system has the most advanced imaging and motion management technologies ever produced. These technologies make it possible to closely monitor both patient breathing motion and tumor movement and subsequently deliver treatment with accuracy that is measured in fractions of millimeters. Furthermore, the TrueBeam allows treatments to be delivered faster than ever before. Faster treatments provide a more comfortable patient experience with less time on the treatment table. They can also reduce the probability of significant tumor motion during treatment and can help reduce radiation dosage to normal healthy tissues.

The TrueBeam is an extremely versatile weapon in the fight against cancer and can be used for many different kinds of advanced treatment techniques, including image-guided radiation therapy (IGRT), intensity-modulated radiation therapy (IMRT), radiosurgery (SRS), and stereotactic body radiation therapy (SBRT). With this level of flexibility, the TrueBeam system can deliver treatment that is specifically tailored to each patient’s unique case.

Almost everyone is touched by cancer at some point in his or her life – either personally or through a loved one. Staffed by three highly experienced, board certified radiation oncology physicians who are trained on the TrueBeam platform, the Roper St. Francis Department of Radiation Oncology looks forward to guiding patients through the complex journey of cancer care from initial diagnosis to survivorship.

Steven A. Akman, MD
Medical Director, Roper St. Francis Cancer Care
Studies of Quality: Early Detection of Lung Cancer

Curtis C. Quinn, MD

Every year in the US more people die from lung cancer than the next four deadliest cancers combined (breast, colon, pancreas and prostate). The overall five-year survival rate for patients diagnosed with lung cancer remains 15%, only a little better than survival from the 1970s. The principal contributor to poor outcomes has been that most cancers of the lung (75%) are already late state III and IV when diagnosed.

2016 Estimated Total Cancer Deaths: Lung vs. Next 4 Cancers

![Bar chart showing estimated total cancer deaths for lung and next 4 cancers in 2016.]

Program Outcomes: Prevention and Screening

2016 Community Outreach

In 2016, Roper St. Francis Cancer Care participated in over 25 community events reaching more than 10,732 participants from Charleston, Dorchester, Berkeley, Hampton and Colleton counties.

Community members participating in events received education on cancer prevention and early detection regarding many disease sites, such as breast, skin, colorectal and lung cancers. In addition, The Donna Fielding Cancer Wellness Institute provided monthly wellness activities, including nutrition support, exercise and yoga (Relax and Restore). Patients and caregivers also had access to massage and music therapy, self-exploration writing workshops; breast, bladder and general cancer support groups; and legal clinics offered in collaboration with the Charleston School of Law. In 2016, Roper St. Francis Cancer Care opened a dedicated Survivorship Clinic to help patients on their journey to recovery.

In 2016, RSF Cancer Care offered cancer screening events throughout the year with the assistance of physicians and clinical volunteers. Screening focused on lung and breast for a total of 623 participants. All abnormal finding results found during the screening events were referred for further follow-up or intervention. Results from 2016 screenings:

### BREAST SCREENING

- 110 Participants
- 104 Normal Exams
- 6 Findings that warranted referrals to appropriate physicians for follow-up care. Based on follow-up diagnostic procedures, two breast cancers were diagnosed. Some results still pending.

### LUNG SCREENING

- 513 Low Dose CT’s performed
- 178 Lung Rads 1
- 248 Lung Rads 2
- 47 Lung Rads 3
- 40 Lung Rads 4

All Lung Rads 3 and 4 were reviewed by the Multidisciplinary Thoracic Oncology Program (MTOP) Cancer Conferences and additional diagnostic evaluations were recommended when appropriate. Six lung cancers were diagnosed by further diagnostic evaluation.

Roper St. Francis Lung Screening Program Growth

<table>
<thead>
<tr>
<th>YEARS</th>
<th>LDCT</th>
<th>CANCER FOUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>128</td>
<td>4</td>
</tr>
<tr>
<td>2015</td>
<td>437</td>
<td>6</td>
</tr>
<tr>
<td>2016 (Jan. – June)</td>
<td>370 (est. 740)</td>
<td>6 (est. 12)</td>
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However, new hope comes from a recent study, the National Lung Screening Trial, which proposed to produce a dramatic increase in survival by using low dose CT lung scanning (LDCT) in high risk (active and former cigarette smokers) people to diagnose cancers at an early stage. Studies show stage 1 lung cancers that are less than 2cm in size can have 90% 5 year survival.
Roper St. Francis was an early adopter of lung screening, and its low dose CT scanning program is now entering its fourth year. Annual volumes have almost doubled and our ability to find early stage cancer is growing as more primary care physicians realize the value of screening. We are already finding almost five times as many cancers as the NLST study did, with one cancer identified per every 62 LDCT scans at Roper St. Francis in 2016.

Finding early stage lung cancer is the key to improving survival. Our data shows screening has not only increased the total lung cancers found, but also has identified more stage I and II cancers.

Lung Cancers Diagnosed by Stage for 2013 – 2015 Roper St. Francis

The National Comprehensive Cancer Network recommends that if lung screening is performed, scans are best evaluated by a multi-disciplinary team to both identify early suspicious lesions and avoid unnecessary procedures. Once a suspicious lung nodule is found, it needs prompt evaluation by an aggressive and experienced care team. Concerted group experience and collaboration is the new gold standard.

That's exactly what Roper St. Francis offers patients evaluated in our Multidisciplinary Thoracic Oncology Program (MTOP). Our MTOP thoracic surgeons, oncologists, pulmonologists, pathologists, radiation oncologists and team specialists meet weekly to streamline care, ensure national treatment guidelines are followed, and ultimately reduce the time it takes from detection of an abnormal X-ray to implementation of a treatment plan. In contrast, when care is not coordinated, that period can be months.

Analysis of our MTOP data addressing time from initial abnormal image to treatment of lung cancer is shown below. Compared to the time required to evaluate and treat lung cancer patients who were referred to Roper St. Francis from outside of our institution, the internal Roper St. Francis evaluation and treatment time is cut nearly in half for patients with stage 1 lung cancers. Effective coordination of evaluation and treatment by the providers participating in our MTOP is largely responsible for rapid implementation of potentially lifesaving care.

<table>
<thead>
<tr>
<th>LUNG CANCER BY STAGE</th>
<th>INTERNAL RSF DIAGNOSIS TO TREATMENT/DAYS</th>
<th>EXTERNAL DIAGNOSIS TO TREATMENT/DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I (N=63)</td>
<td>44.6</td>
<td>(N=18) 79.3</td>
</tr>
<tr>
<td>Stage II (N=22)</td>
<td>40</td>
<td>(N=6) 49.7</td>
</tr>
<tr>
<td>Stage III (N=41)</td>
<td>34.3</td>
<td>(N=11) 42.4</td>
</tr>
</tbody>
</table>

Lung cancer remains responsible for the most cancer deaths each year in both men and women. However, recent developments in screening and multidisciplinary care have finally shed a light on how to improve the outcome for many patients diagnosed with lung cancer. Roper St. Francis MTOP team remains dedicated to prevention, early detection, prompt treatment and providing world-class compassionate lung cancer care to each and every patient.