

CANCER

SENTARA
CANCER NETWORK

2010
ANNUAL REPORT



Sentara Cancer Network – By the Numbers:

More than **6,000**
cancer patients treated each year

More than **50,000**
patients documented in
Cancer Registry since 1995

8,770
Cases Presented in Cancer
Conferences (2006-2010)

13
facilities providing care
to cancer patients

More than **70** clinical trials
available for
patients

17,729
community members reached through
outreach programs in 2010

The Sentara Cancer Network is Virginia's only Accredited Cancer Network, a distinction of the American College of Surgeons' Commission on Cancer (CoC).

The CoC also presented its Outstanding Achievement Award to the Sentara Cancer Network in 2009, a three-year distinction. The CoC Outstanding Achievement Award is designed to recognize cancer programs that strive for excellence in providing quality care to cancer patients. The award is granted to facilities that demonstrate a Commendation level of compliance with seven standards that represent six areas of cancer program activity: cancer committee leadership, cancer data management, clinical management, research, community outreach, and quality improvement.

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Collaboration

Leads to Quality Outcomes, Convenient Access and Personalized Care.

For cancer patients in Hampton Roads, the Sentara Cancer Network provides a combination of hope and healing. The Sentara Cancer Network's high level of quality, a collaborative approach and access to clinical research is typical of a large academic medical center. It's this depth and experience of our network that means patients don't need to travel away from home to receive the benefits of advanced cancer care.

This vast network of physician experts is an invaluable resource to the Hampton Roads community, treating more than 6,000 cancer patients each year. No matter where you enter the Sentara Cancer Network, you have the support and expertise of a vast network of specialists working together to provide an unmatched level of care.

Sentara Network Cancer Committee Members

Physicians

Thomas Alberico, MD - Medical Oncology,
Cancer Committee Chair

James Schneider, MD - Surgical Oncology,
Cancer Liaison Physician

Victor Archie, MD - Radiation Oncology

Joseph Dalton, MD - General Surgery

Krista Dobbie, MD - Palliative Care

Eric Feliberti, MD - Surgical Oncology

Mark Fleming, MD - Medical Oncology

Richard Hoefler, DO - Surgical Oncology

Lester Johnson, MD - Radiology

Ray Lance, MD - Urology

John Paschold, MD - Medical Oncology

Marc Silverberg, MD - Pathology

Scott Williams, MD - Radiation Oncology

Non-Physicians

Cynthia Allen - Director of Clinical and Business Development
for Cancer Centers of Virginia

Deb Anderson - Strategy

Joani Brough - Administration

Connie Bush - Community Outreach

Nicky Dozier - VOA Research

Cindi Estes - Oncology Nursing

Natalie Jones - American Cancer Society

Vonia Ickes - Clinical Nutrition

Theresa Hanlin - Oncology Nursing

Bill Hoefler - Administration

Brad Kirby - Cancer Information Manager

Louise Lubin, PhD - Psychosocial Support

Kathleen Marcia - Cancer Registry

Cynthia Freeman - Cancer Registry

Maureen McGrath - VOA Administration

June Robertson - Administration

Joanne Inman - Administration

Mark Szalwinski - Corporate Vice President, Oncology Service Line

Jennifer Taylor - Administration

Linda McKee - Administration

Dorothy Weeks - Hospice

Rose West - Marketing

Lynne Whitlock - Administration

Patient Experience

Cancer patients have a variety of emotional and spiritual needs. Our team is comprised of caring professionals who understand the perspective of a patient facing even the most frightening diagnosis.

With a standardized approach to patient experience across the network, Sentara is able to provide not only consistent clinical quality, but also coordinated care through the entire patient journey. As part of our commitment to improving the patient experience, patient navigators are available throughout the network to assist in navigating the complexity of cancer care.

Sentara Cancer Network navigators help patients navigate the medical system, providing answers, education and support along the way. From diagnosis through recovery, patients find guidance from a Patient Navigator who is with them every step of the way. These dedicated professionals, who are registered nurses certified and trained in oncology, help patients with paperwork, provide education about the disease and serve as a liaison between the patient and the care providers. Navigators often assist with coordinating doctor visits and addressing any treatment schedule issues that a patient may encounter. Navigators also work closely with the Sentara Health Foundation and assist patients who qualify for assistance from the Cancer Mission Fund.



Meet our physicians and patient navigators and hear local patients' personal stories of cancer diagnosis and treatment.
sentara.com/cancer

About Sentara Healthcare

Sentara Healthcare operates more than 100 sites of care including 10 acute care hospitals: seven in Hampton Roads, one in Northern Virginia, and two in the Blue Ridge Virginia region. The system is also comprised of advanced imaging centers, nursing and assisted-living centers, outpatient campuses, physical therapy and rehabilitation services, two home health and hospice agencies, a 3,680-provider medical staff, and three medical groups with 618 providers. Sentara offers medical transport ambulances and Nightingale air ambulance. Optima Health, an award-winning Sentara-owned health plan, serves 433,000 members in Virginia.

Sentara also is a national leader in heart and kidney care, stroke care, infection prevention and was the first in the nation to pioneer and develop the eICU[®], a remote monitoring system for intensive care. Striving to improve the wellness of the community, Sentara continues to participate in national and international research trials as a means to increase the medical options available to patients well into the future.



Sentara Healthcare ranked the #1 most integrated healthcare system in the nation according to SDI (www.sdihealth.com) and *Modern Health Care* magazine. Sentara has been listed in the top 10 for the last 13 years, ranked #1 in 2001, 2010 and 2011.

Multidisciplinary Approach to Care

The Sentara Cancer Network is one of the largest in the nation and is the only accredited cancer network in Virginia. This distinction from the American College of Surgeons Commission on Cancer means we are held to the highest standards in delivering cancer care to our community.

Comprehensive services are provided at centers across the region by a team of specialists who share information via a growing number of Multi-disciplinary Cancer Conferences and an advanced electronic medical record system, Sentara eCare®.

More than 50,000 patients have been diagnosed and/or treated within our network and documented in the Cancer Registry since 1995. This database provides a central location for collecting, analyzing and disseminating data that helps assess patterns of care and outcomes, ultimately leading to improvements in quality of care.

Figure 1.
2010 Sentara Cancer Network Top 15 Analytic Cancer Sites

Breast cancer is the leading primary site, accounting for 25% (1,303 cases) of the total analytic cancer caseload (5,145 cases). Breast cancer is followed by lung cancer, prostate cancer, colon cancer, and melanoma as the top five sites for 2010. Other sites account for 15% of the total caseload and include all primary sites not in the top 14 for the Sentara Cancer Network.

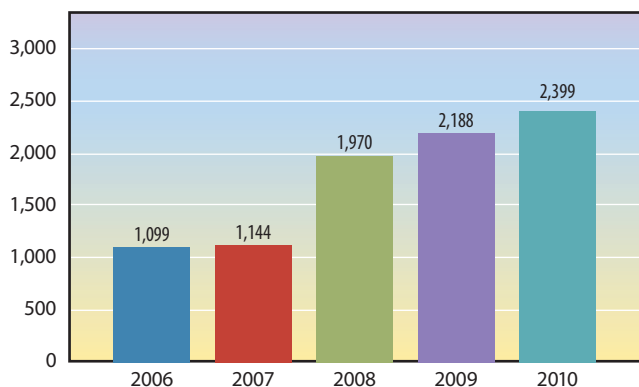
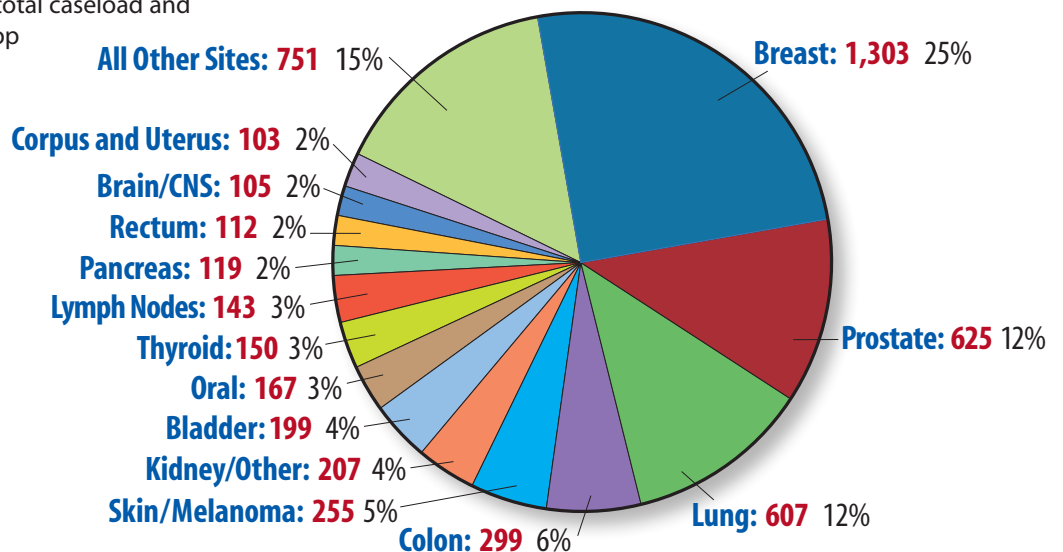


Figure 2.
Sentara Cancer Network Cancer Conference Program - Number of Cases Presented 2006-2010

Each year, an increasing number of patients benefit from the collaborative understanding of the Sentara Network Multi-disciplinary Cancer Conferences. Physicians meet in person and virtually to share expert knowledge and create individualized care plans and ensure the best possible patient outcomes.

Commitment

to the Community

Residents of Hampton Roads are fortunate to have access to top quality cancer care, conveniently located close to home. With multiple points of entry, a myriad of physician experts, and innovative technology, the Sentara Cancer Network provides everything the community needs for diagnosing and treating cancer.

17,729

Number of Lives Reached by The Sentara Cancer Network Outreach and Education Program in 2010

Outreach Recognition

The American Cancer Society presented the **Hospital Patient Services Award** to the Sentara Cancer Network for outstanding support to core programs.

Outreach efforts at individual hospitals also earned recognition: Reach to Recovery Patient Services Award for Sentara Virginia Beach General Hospital; Road to Recovery Patient Services Award for Sentara Obici Hospital; and Look Good...Feel Better Patient Services Award for Sentara Leigh Hospital.

As part of our mission to improve health every day, Sentara is committed to cancer education, prevention and early detection. The Sentara Cancer Network offers support groups, screenings and educational programs to raise awareness, encourage early detection and enhance the patient experience.

In 2010:

- 1,555 men received lifesaving prostate cancer screenings and education
- 2,598 people participated in 49 breast cancer awareness events or programs
- 211 people benefited from free colorectal cancer screenings
- 156 people participated in free skin cancer screenings
- 2,036 cancer patients and their families found much-needed support in cancer support groups
- 1,300 people took a stand against breast cancer in "Get Pink with Sentara" Facebook campaign
- 494 mammograms provided by Mobile Mammography Van
- 6,657 people attended Sentara Cancer Network health fairs
- 482 events held across Hampton Roads by Sentara Cancer Network

Innovation

When you first receive a cancer diagnosis, there is a lot of information and emotion to process. And after all the options are explored, the concern usually boils down to one big question:

“What is my best chance for survival?”

At Sentara, cancer patients rest assured that the most sophisticated technology and proven results are on their side. The Sentara Cancer Network is helping more patients in our community survive cancer every day.

The Sentara Cancer Network brings the leading-edge in radiation therapy to the local market. Recent innovations include RapidArc® radiotherapy technology that improves dose conformity while significantly shortening treatment times. Two other innovations – Electromagnetic Navigation Bronchoscopy® and XSight® Lung Tracking – enhance the level of care and treatment provided with the CyberKnife® radiosurgery system.

RapidArc Therapy – RapidArc radiotherapy technology is a major advance from Varian Medical Systems that improves dose conformity while significantly shortening treatment times. RapidArc delivers treatments two to eight times faster than the standard dynamic treatments today and increases precision - a winning combination that enables physicians to improve the standard of care.

XSight Lung Tracking – The XSight lung tracking system uses the actual image intensity of the lung tumor for targeting the beam. By tracking the tumor directly, clinicians can use radiosurgery to treat lung tumors with confidence while minimizing dose to healthy tissue.

As an enhancement to CyberKnife, this new technology intelligently tracks, detects and corrects for tumor movement with continual image guidance, allowing patients to breathe normally during treatment.

Electromagnetic Navigation Bronchoscopy® provides minimally invasive access to lesions deep in the lungs as well as mediastinal lymph nodes. By extending the reach of conventional bronchoscopes, the system enables physicians to diagnose benign and malignant lung lesions, enhancing treatment decisions and avoiding the need for higher-risk procedures. As part of CyberKnife treatments, it facilitates the placement of fiducial markers with a safer technique.

Cutting-Edge Research

Because of our tremendous commitment to research, the Sentara Cancer Network has an outstanding 11% accrual rate for participation in clinical trials. This means that 11% of the patients who are treated by the Sentara Cancer Network are able to take advantage of groundbreaking and lifesaving clinical research trials that are not available to patients in other communities.

Breast Cancer Program

Sentara breast specialists have developed the expertise that comes with experience and high volumes typically associated with large academic medical centers. Our quality outcomes are equally as impressive, with breast cancer survival rates superior to the national average as published by the National Cancer Data Base.

All of the comprehensive breast centers at Sentara are accredited by the National Accreditation Program for Breast Centers. To gain the accreditation, the centers must follow a multidisciplinary team approach, provide access to clinical trial information and offer new treatment options, among other requirements.

Sentara's multidisciplinary team consists of dedicated breast health specialists including surgeons, radiologists specializing in mammography, medical oncologists, radiation oncologists, primary care physicians, genetic counselors, pathologists, nurse navigators and oncology certified nurses. They meet regularly in cancer conferences to review cases and determine the best individual course of treatment for each patient.

"Often the subtle issues discussed at tumor board meetings are not immediately apparent in reviewing reports independently," explains Michael Danso, MD, medical oncologist and co-chair of the Sentara Breast Program Leadership Committee. "There is an incredible amount of knowledge and expertise available among the colleagues in those meetings – each specialist brings a unique and qualified perspective to the table and it all works together to benefit the patient."

This collaborative approach not only provides the best possible clinical care, but it also ensures a more cohesive cancer care experience for patients. The Sentara Breast Program Leadership Committee is continuously improving the patient experience by focusing on clinical excellence and opportunities to expand access to services. The goal is to improve quality and service through collaboration and consistency.



Watch a video online at sentara.com/cancer

Figure 3. Observed Survival for Breast Cases Diagnosed - Sentara Cancer Network - 1998 - 2002

These graphs illustrate the 5-year survival of all breast cancer cases 1998-2002 in the National Cancer Data Base and the 5-year survival of all breast cancer cases in the Sentara Cancer Network Cancer Registries from 1998-2002. Sentara Cancer Network's 0, I, II, and III rates are similar to national data. The stage IV survival rate is much better (27.1%) than the NCD's survival rate (19.6%).

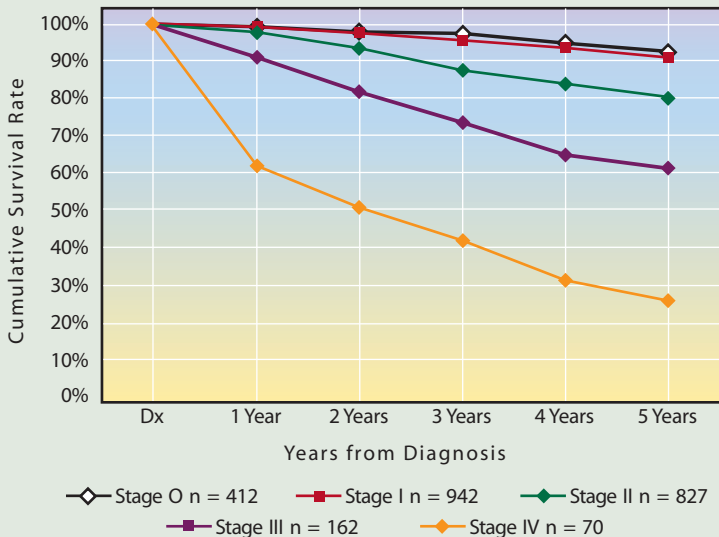


Figure 4. Observed Survival for Breast Cases - National Cancer Data Base - 1998 - 2002

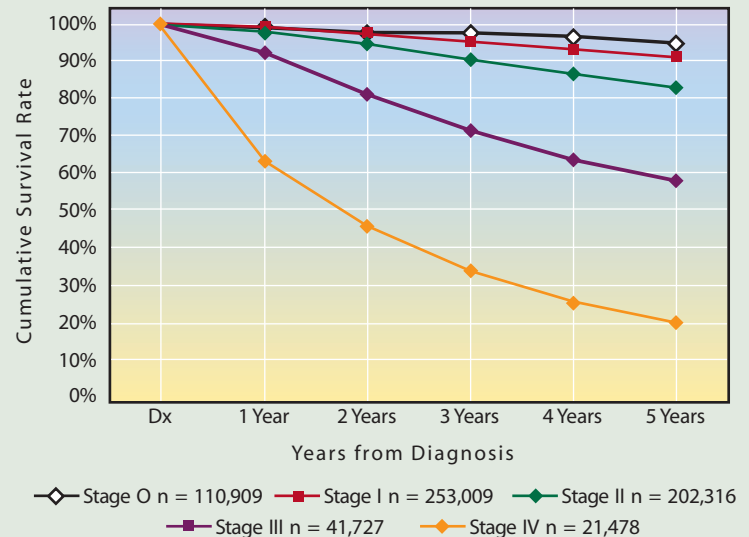
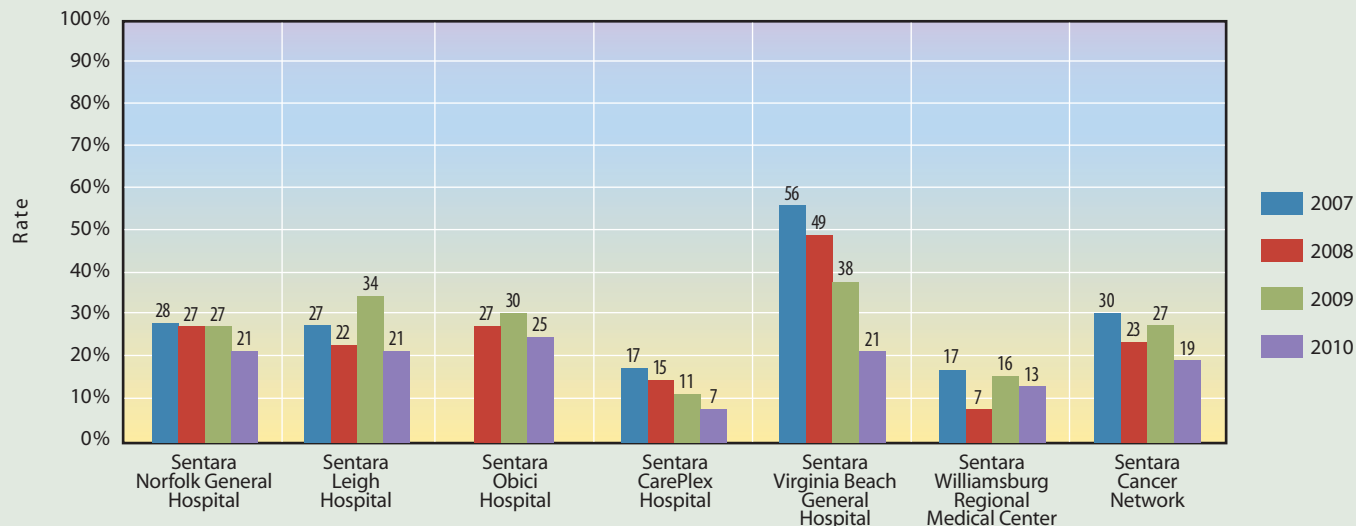


Figure 5.

Breast Re-excision Rate - Goal: < 25% (Sentara) - 2007 - 2010

Source: Cancer Registry

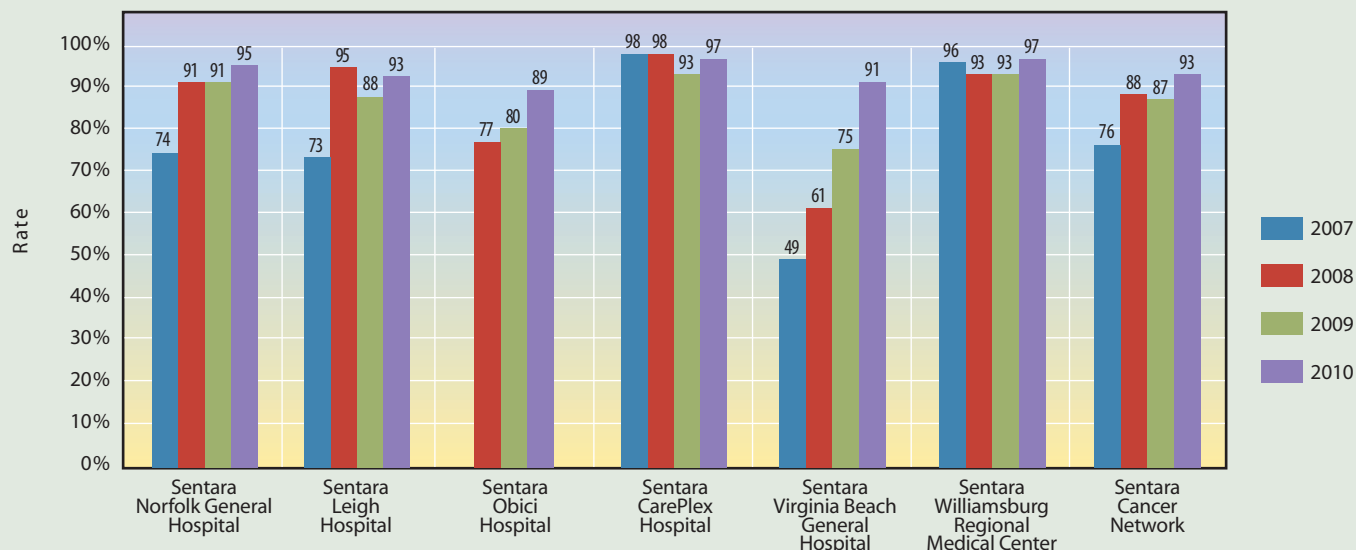


Standard 2.9 of the National Accreditation Program for Breast Centers (NAPBC) standards states, "Palpation Guided or image-guided needle biopsy is the initial diagnostic approach rather than open biopsy." Open surgical biopsy as an initial approach should be avoided as it does not allow for treatment planning and is associated with a high re-excision rate. Figures 5 and 6 demonstrate Sentara's performance with the Needle Biopsy before Surgery rate as well as the Re-excision rate at each breast center in the Network.

Figure 6.

Needle Biopsy Before Surgery Rate Goal: 90% (NAPBC) - 2007 - 2010

Source: Cancer Registry



Sentara Breast Program Leadership Committee

Thomas Alberico, MD Medical Oncologist
Kelley Allison, MD SCP/PW Mammographer
Victor Archie, MD SOH Radiation Oncologist
Mary Blumberg, MD Pathologist
Thomas Clifford, MD Surgeon
Michael Danso, MD Co-Chair, Medical Oncologist
Melinda Dunn, MD Mammographer
Nina Fabiszewski, MD Mammographer
Eric Feliberti, MD Surgical Oncologist

Kevin Halista, MD Radiologist
Richard Hoefer, DO Co-Chair, Surgical Oncologist
Andrew Loiacono, MD Radiologist
Jennifer Reed, MD Surgeon
Mark Sinesi, MD Radiation Oncologist
Terryl Times, MD Surgeon
Scott Williams, MD Radiation Oncologist

Figure 7.
% of Eligible Patients with Sentinel Lymph Node Biopsy Goal: 90% (NAPBC) - 2008 - 2010

Standard 2.4 of the National Accreditation Program for Breast Centers (NAPBC) standards states, "Axillary sentinel lymph node biopsy is considered or performed for patients with early stage breast cancer (Clinical stage I, II)." Figure 7 illustrates each breast center's compliance with this standard. Source: Cancer Registry

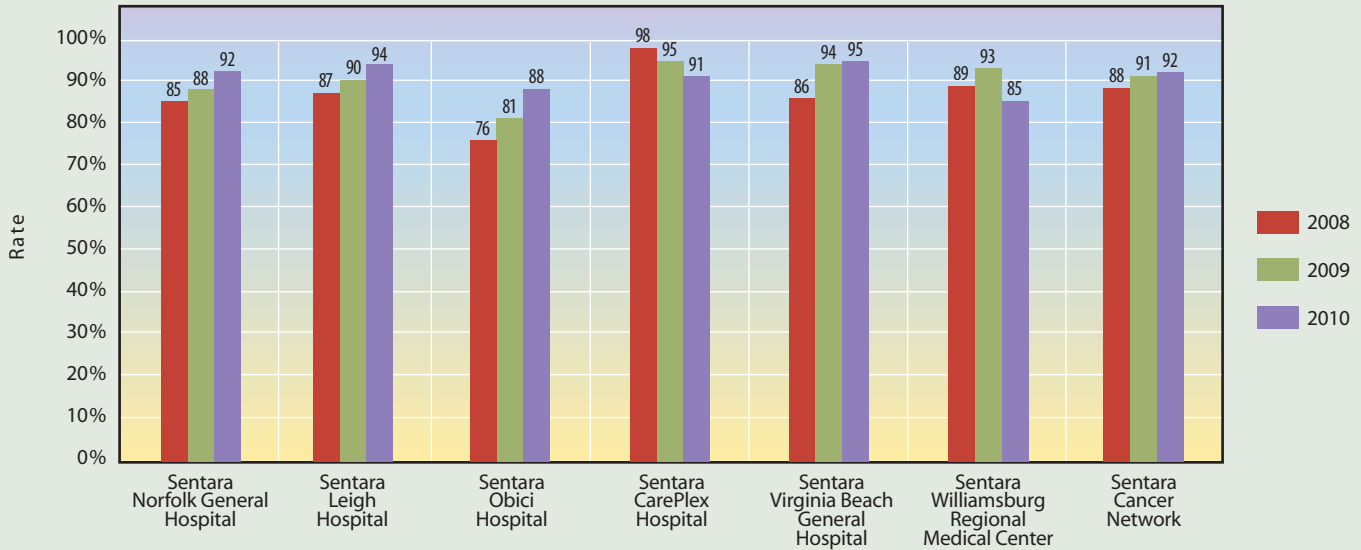


Figure 8.
Sentara Cancer Network - 2007-2010 Breast Cancers Stage 0/I vs. II/III/IV

Figure 8 illustrates the stage at diagnosis for Sentara Cancer Network breast cancers between 2007 and 2010. Early stage diagnosis is approximately 4% greater than the NCDB percentage.

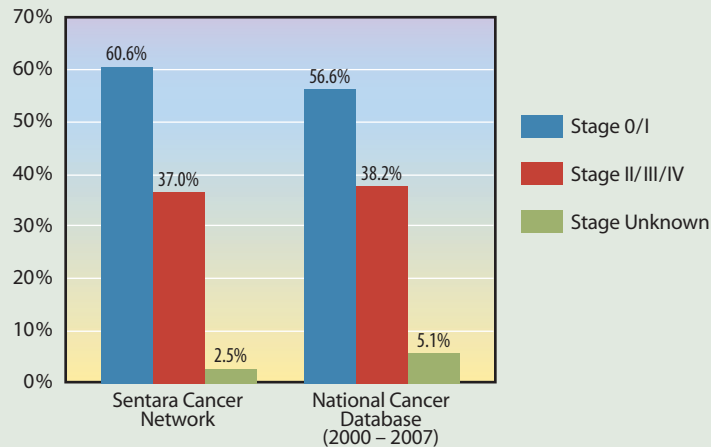


Figure 9.
Screening Mammogram Volume

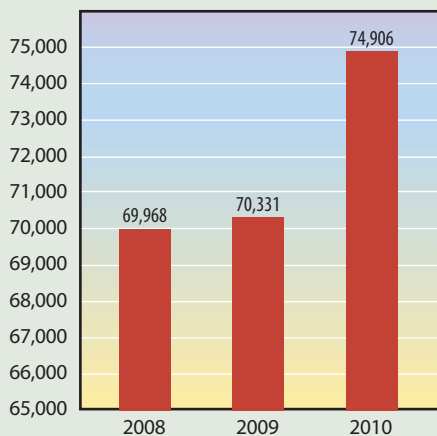
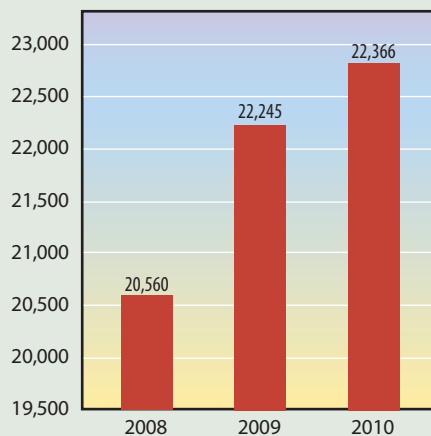


Figure 10.
Diagnostic Mammogram Volume



Figures 9 and 10 show the increase in volume of screening and diagnostic mammography within Sentara Cancer Network. Sentara's screening and diagnostic mammography have both increased significantly between 2008 and 2010.

Community Awareness Initiatives

Sentara is dedicated to raising breast cancer awareness within the communities we serve. One of the recent community events features the “Get Pink with Sentara” challenge. In recognition of Cancer Survivor Month, Sentara launched a Facebook campaign dedicated to raising awareness for breast health and educating women about breast cancer screening. Through the power of social media, Sentara encouraged women in Hampton Roads to engage in conversation by sharing information about breast health, events and new developments.

- Get Pink with Sentara by painting Facebook Pink April 15 – 30, 2011. Women were invited to download an image of a pink flower to use as their profile picture during the campaign to support breast cancer awareness.
- The promotion raised awareness through a strategic partnership with McDonald Garden Centers in Hampton Roads, where Pink Day celebrations were held, raising funds for the Susan G. Komen Foundation Tidewater affiliate.
- More than 1,300 to date have connected with Sentara on the Get Pink with Sentara Facebook page to share information and inspiring stories about breast health.
- Nearly 300 enthusiastic team members participated on the “Get Pink with Sentara” team for the 2011 Komen Race for the Cure.
- In addition to the Komen Race for the Cure, the “Get Pink with Sentara” initiative included a variety of activities and events designed to raise awareness and funds for breast cancer. These included a Pink Passion Fashion Show, participation in the “Making Strides Against Breast Cancer” walk, a house dedicated to breast cancer awareness at the Homearama home show, the “Many Faces of Breast Cancer” event with Virginia Oncology Associates, a Zumbathon, a breast center open house and a breast cancer survivor retreat.



Watch a video online
at sentara.com/cancer

Online Mammography Scheduling sentara.com/mammogram



Women in Hampton Roads have access to 15 different locations for convenient mammography appointments with the ability to request a mammography appointment at any of these sites online. All Sentara sites, including the Mobile Mammography Van, employ leading-edge digital mammogram technology.

The Sentara Cancer Network recommends that women 40 years old and over get annual mammograms, and to help make getting a mammogram as easy as possible, several Sentara mammography sites have added extended evening and weekend hours to make access to an appointment more flexible. The Mobile Mammography Van also visits many sites each month so that women can have their mammograms without leaving the workplace.

Prostate Cancer Program

When patients access Sentara for prostate care, they are tapping into a comprehensive cancer network with specialized expertise.

Each individual patient is presented with guidance on the treatment that is best matched with his age, lifestyle, and overall health conditions. The nationally accredited Sentara Cancer Network provides the most advanced cancer care in the region from diagnosis and treatment to follow-up and support.

The network includes several sub-specialty trained oncologic urologists, and a multidisciplinary genitourinary cancer conference (tumor board). One of the most significant recent advances is the availability of new chemotherapy options for prostate cancer. The network contributed to the approval of these drugs through local research and collaboration.

“Through the collaborative participation of the Sentara Cancer Network, Urology of Virginia and Virginia Oncology Associates in clinical research, there have been several drugs that have been approved for the treatment of prostate cancer,” says Mark Fleming, MD, of Virginia Oncology Associates and a medical oncologist with fellowship training in urogenital cancer. “There is tremendous work being done in this area and it is very exciting.”

The prostate cancer program offers:

- Board-certified, fellowship-trained prostate cancer specialists
- Leading-edge minimally invasive surgery using the da Vinci robot
- Advanced treatments including external beam radiation, cryoablation and seed therapy
- Access to the latest prostate cancer research and clinical trials in partnership with Eastern Virginia Medical School
- Patient navigators and ongoing support groups



Watch a video online at sentara.com/cancer

Figure 11.
Observed Survival for Prostate Cases - Sentara Cancer Network 1998 - 2002

Figures 11 and 12 illustrate 5-year observed survival for prostate cancer patients at Sentara Cancer Network compared to patients in the National Cancer Data Base (NCDB). Stages 0 and I have insufficient volume to produce curves for the Sentara Cancer Network. Stages II, III, and IV are all similar to the NCDB's percentages.

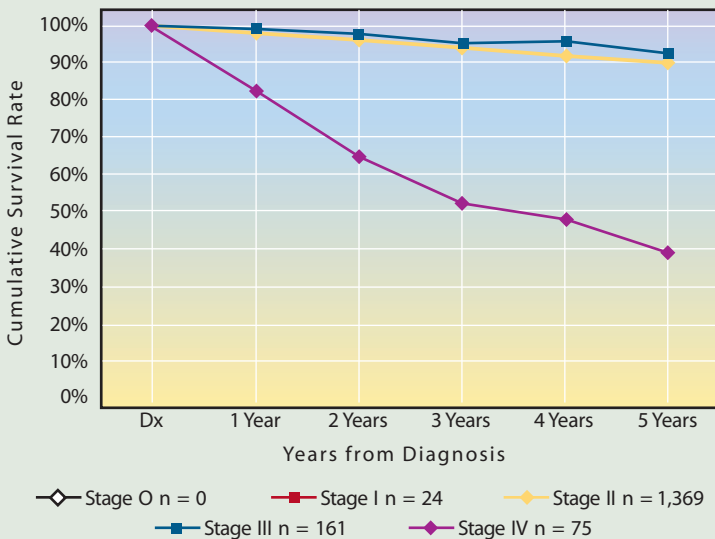
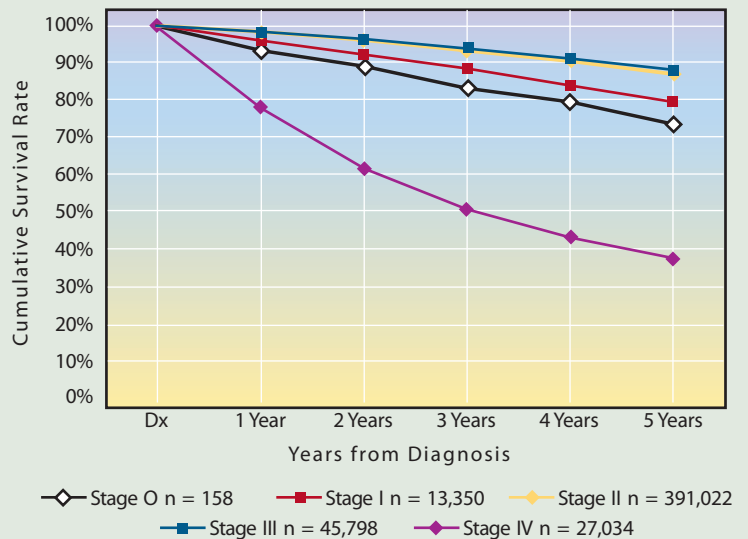


Figure 12.
Observed Survival for Prostate Cases - National Cancer Data Base 1998 - 2002



In 2010, more than 1,500 men received lifesaving prostate cancer screenings. These annual activities of the network's community outreach educators and physicians contribute to the health of our communities.

Figure 13.
Sentara Cancer Network - 2007 - 2010 Prostate Cancers Stage 0/I vs. II/III/IV

Figure 13 illustrates the stage at diagnosis for Sentara Cancer Network Prostate cancers between 2007 and 2010. Early stage diagnosis is over 6% greater than the National Cancer Data Base percentage. Sentara Cancer Network also has less late stage diagnoses and unknown stage diagnoses for prostate cancer.

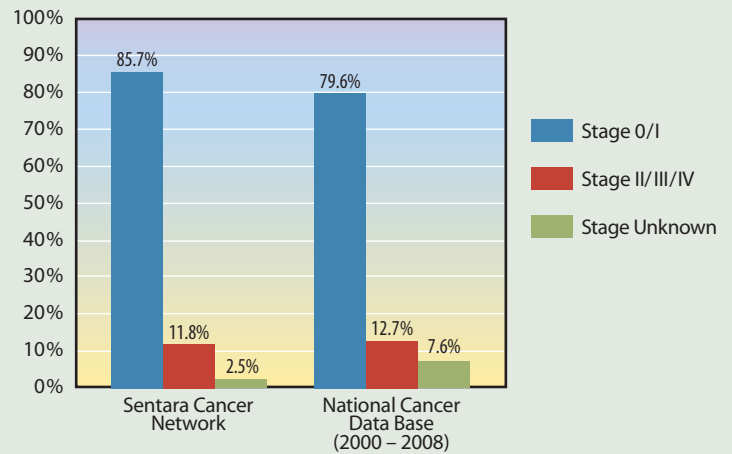
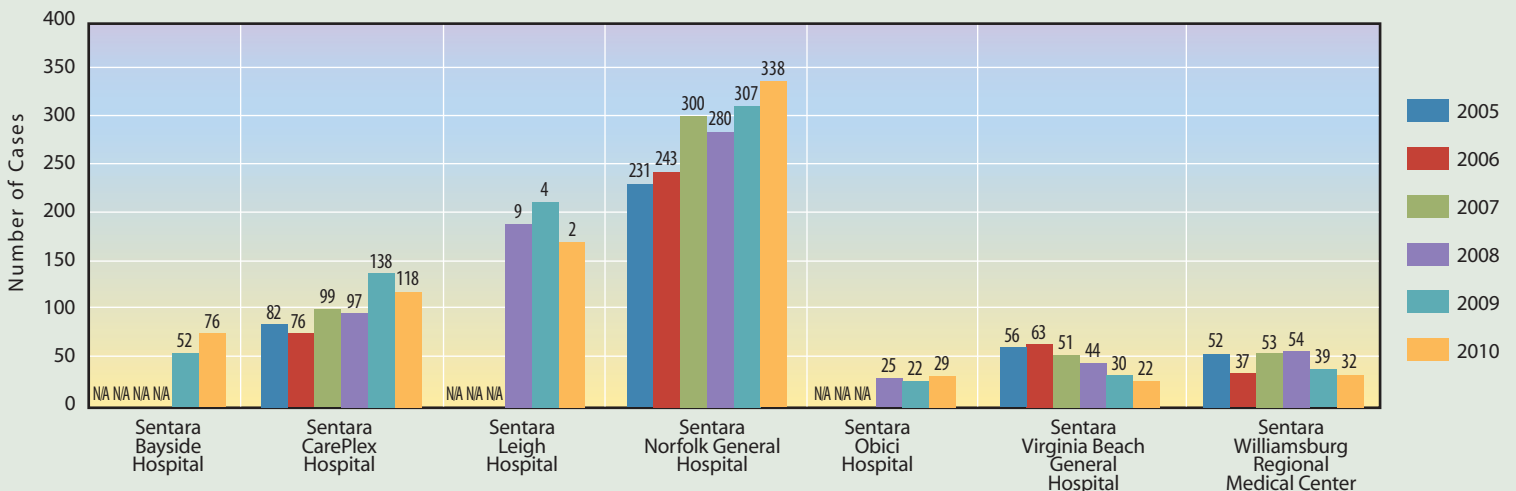


Figure 14.
Prostate Cancer Analytic Case Volumes 2005 - 2010

This graph depicts the prostate cancer volumes for each Sentara Cancer Network hospital from 2005 to 2010. Volumes are highest at Sentara Norfolk General Hospital where the da Vinci prostatectomy procedure is performed. Source: Cancer Registry



Thoracic Cancer Program

The collaborative, multidisciplinary approach of the Sentara Cancer Network is showing promising results in the Thoracic Cancer Program. Thanks to a system-wide initiative to track quality thoracic outcomes against a national database published by the Society of Thoracic Surgery, our survival rates have improved and complication rates have decreased.

What began as a handful of surgeons working together to enhance quality at a single facility has now grown to a multidisciplinary system-wide team including medical oncologists, radiation oncologists, interventional radiologists, pulmonologists, critical care specialists,

pathologists, anesthesiologists and other clinicians forming the Sentara System Thoracic Leadership Committee. Together they form a dedicated and subspecialized team caring for patients with thoracic disease. Through the use of today's technology, the collaboration among team members is streamlined and effective. It's not uncommon for physicians to pick up their cell phone and dial a colleague for an instant consult, with the patient right there in the room.

A pioneer in the field, the Sentara Thoracic Surgery Center at Sentara Heart Hospital was one of only 14 programs in the country participating in the collection and reporting of

quality outcomes data through the Society of Thoracic Surgery (STS) in 2003. With a clear understanding of the value of this quality tracking, the visionary team made it a goal to expand the STS tracking throughout the five hospitals in the Sentara system that provide thoracic surgery services. That goal became a reality in 2011.

"This was no easy task," says Joseph R. Newton Jr., MD. "It required complete transparency and a commitment from physicians across the system to actively and continuously report outcomes, and present them for

peer review." Because of our ongoing efforts to track and improve outcomes, the Sentara Thoracic Surgery Center at Sentara Heart Hospital is able to demonstrate that since 2002 the inpatient mortality rate has averaged 0.80% which is below the STS national average. Now that we are tracking these outcomes across our network we hope to be able to report similar outcomes as data is collected at each of our five hospitals providing thoracic services.

The improvement efforts are becoming evident. The team has seen a decrease in mortality and complication rates and an improvement in quality of life, plus reducing delays in patient evaluation and presenting more options for patients.

Sentara Thoracic Program Leadership Committee

John Bowers, III, MD

Scott Cross, MD

Jeffrey Forman, MD

Jim Frick, MD

Richard Hoefer, DO

Wilkes Hubbard, MD

Steve Julian, MD Co-Chair

Peter Moy, MD

Joseph Newton, MD Co-Chair

Vijay Subramaniam, MD

Bethany Tan, MD

Scott Williams, MD

Figure 15.
Observed Survival for Lung Cases - Sentara Cancer Network - 1998 - 2002

These graphs illustrate the 5-year survival of all non-small cell lung cancer cases 1998-2002 in the National Cancer Data Base and the 5-year survival of all non-small cell lung cancer cases in the Sentara Cancer Network Cancer Registries from 1998-2002. Stage 0 has insufficient data to display for Sentara. The other stages all have slightly higher survival at Sentara than the NCCDB rate ranging from 0.3% better for Stage I to 3.3% better for stage II.

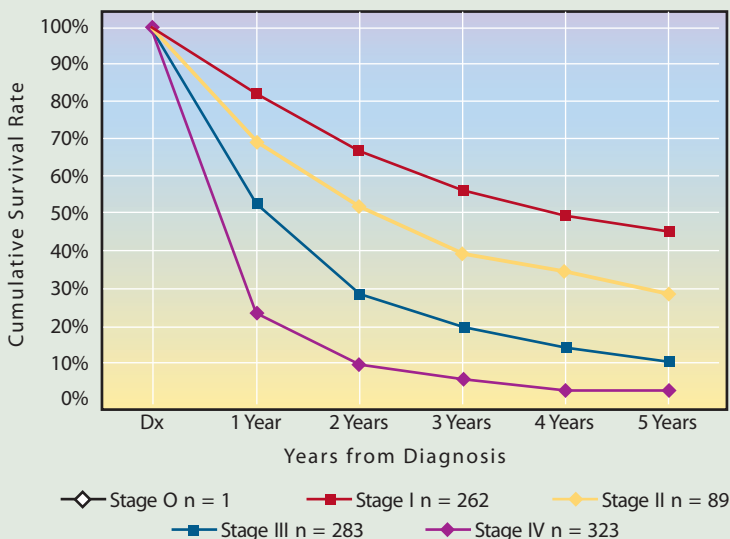


Figure 16.
Observed Survival for Lung Cases - National Cancer Data Base - 1998 - 2002

These graphs illustrate the 5-year survival of all non-small cell lung cancer cases 1998-2002 in the National Cancer Data Base and the 5-year survival of all non-small cell lung cancer cases in the Sentara Cancer Network Cancer Registries from 1998-2002. Stage 0 has insufficient data to display for Sentara. The other stages all have slightly higher survival at Sentara than the NCCDB rate ranging from 0.3% better for Stage I to 3.3% better for stage II.

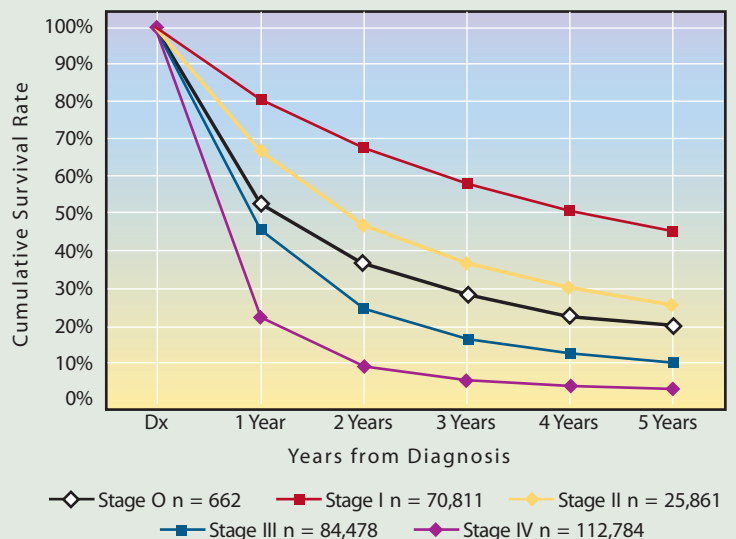


Figure 17.
Sentara Cancer Network - 2007 - 2010 Non-Small Cell Lung Cancers Stage 0/I vs. II/III/IV

Figure 17 illustrates the stage at diagnosis for Sentara Cancer Network lung cancers between 2007 and 2010. Early stage diagnosis is slightly greater (1.8%) than the NCCDB percentage.

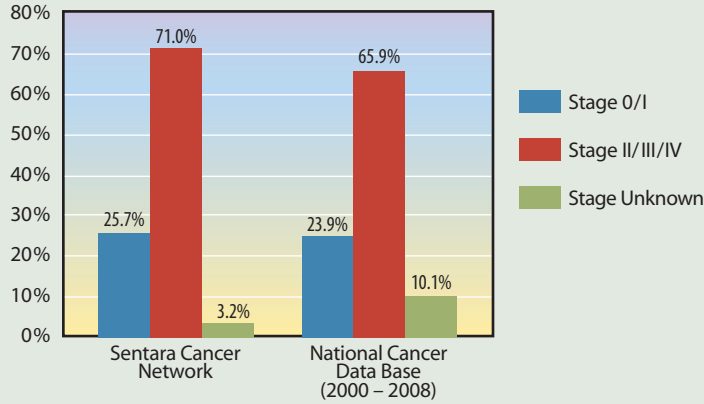


Figure 18.
Sentara Cancer Network Society of Thoracic Surgeons (STS) Lung Lobectomy Mortality Data

Figure 18 illustrates the Sentara Cancer Network's lobectomy mortality for 2010. Of the 99 patients entered into the Society of Thoracic Surgeons (STS) Database, only one patient expired, accounting for a 1% mortality rate. The STS national average is 1.5%.

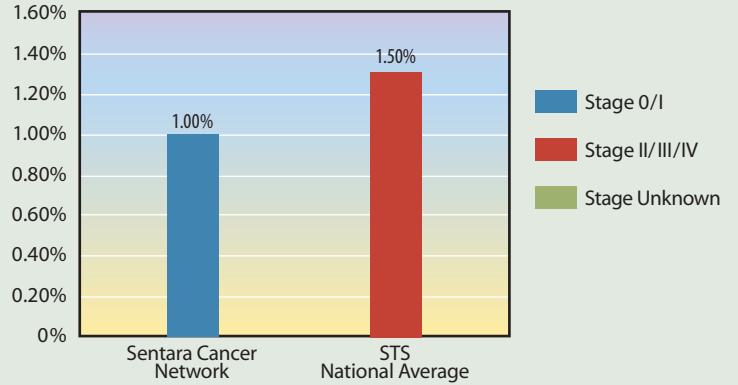


Figure 19.
Esophagus Volumes – Sentara Cancer Network

Figures 19 and 20 illustrate esophagus and lung volumes by Sentara Cancer Network hospital. Volumes for both esophageal cancers and lung cancers have had a general upward trend since 2005.

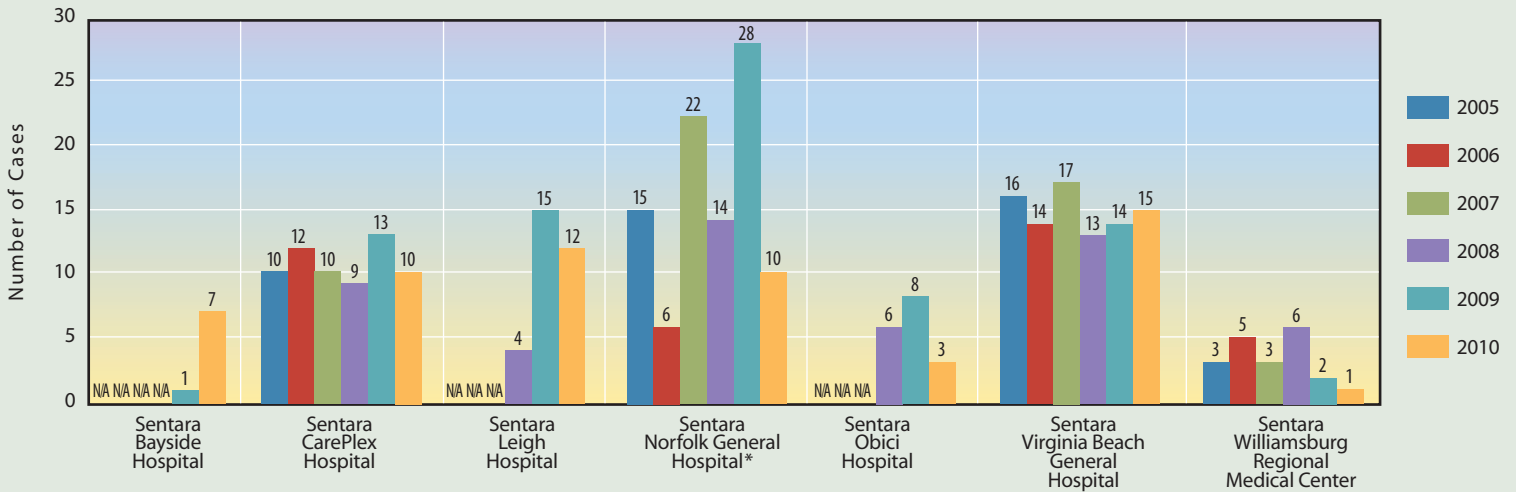
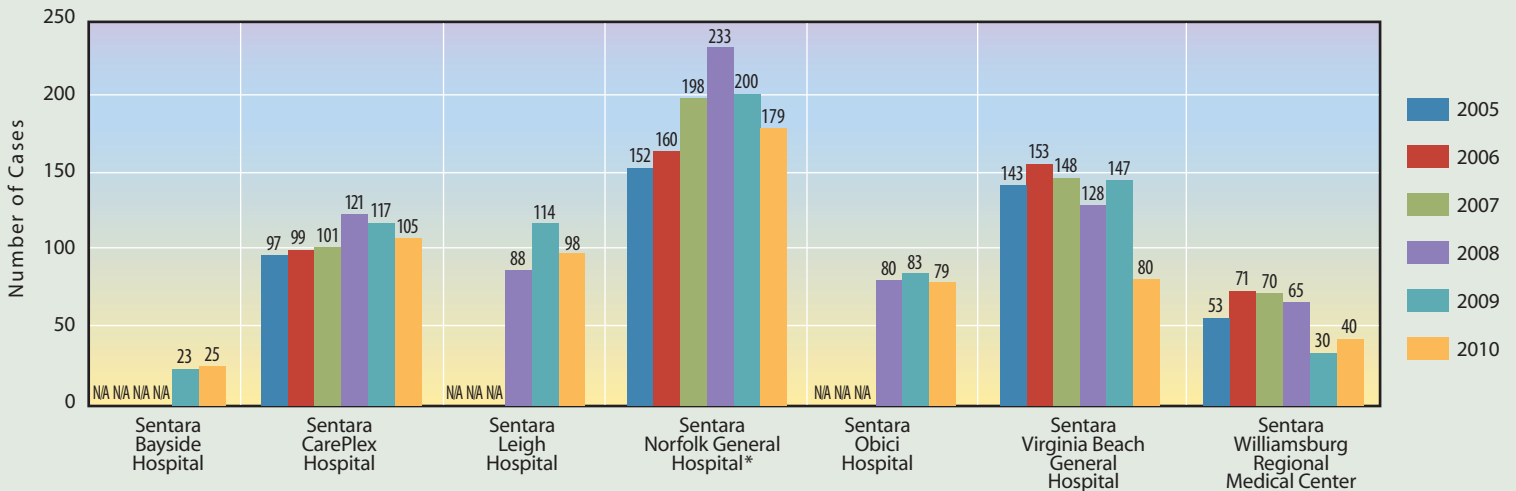


Figure 20.
Lung Volumes – Sentara Cancer Network



* Includes Sentara Thoracic Surgery Center at Sentara Heart Hospital

Colorectal Cancer Program

Colorectal cancer, the third deadliest cancer in the U.S., refers to cancers of the large intestine (colon) or the last few inches of the large intestine (rectum). The most critical factor in treating colorectal cancer is early identification. But the challenge is in identifying the disease earlier than most people think – years before the onset of symptoms. In fact, when colon cancer is found, it has usually been there for years. When a tumor is discovered, that patient may have literally been sitting on colon cancer for up to 10 years, drastically reducing the chance of survival.

The Sentara Cancer Network dedicates a tremendous amount of resources and effort to educating the community and encouraging early diagnosis through appropriate colonoscopy screening. This is particularly important in Hampton Roads because Portsmouth, Western Tidewater and Chesapeake have among the highest mortality rates from colorectal cancer in Virginia, well above the Virginia average.

Fortunately, 90% of colorectal cancer is preventable by following American Cancer Society guidelines for screenings:

- Most American adults should be screened for colon cancer at age 50.
- For African-Americans, the recommended first screening is five years earlier at age 45.
- Anyone with a family history of colorectal cancer should be screened 10 years prior to the age at which the close family member was diagnosed.

Sentara hosts a variety of community education programs to encourage early detection and provide access to colonoscopy screening. In 2010-2011, several Sentara facilities held Colon Cancer Community Awareness events and free screenings. Thanks to the efforts of the Sentara Cancer Network, the 5-year survival rate for colorectal cancer at Sentara is well above the national average published by the National Cancer Data Base.

Armed with the latest technology, Sentara physicians are able to treat colorectal cancer patients. Sentara CarePlex Hospital was the first in the area to introduce transanal endoscopic microsurgery, a cutting-edge, minimally-invasive technique to remove certain tumors from the anus without an abdominal incision.

In addition to community education and innovative technology, the Sentara Colorectal Cancer program offers a multidisciplinary team approach to patient care to ensure the best possible outcomes and patient experience. A comprehensive network of dedicated specialists meet regularly in cancer conferences to collaborate and make recommendations on patient treatment. This multi-disciplinary team comprises surgeons, medical oncologists, radiologists, pathologists, nurses, therapists and other specialists dedicated to providing the best possible care to colorectal cancer patients. A patient navigator serves as a resource guiding patients through the treatment process and offering assistance to patients and their families.

Figure 21.
Observed Survival for Colorectal Cases - Sentara Cancer Network 1998 - 2002

These graphs are a comparison between the 5-year survival for colon cancer in the National Cancer Data Base and the 5-year survival for the Sentara Cancer Network. Stage 0 (in-situ), Stage I, and Stage IV colorectal cancers have a higher survival rate within Sentara than in the NCDB. Stage II and III are slightly lower in Sentara than at the NCDB.

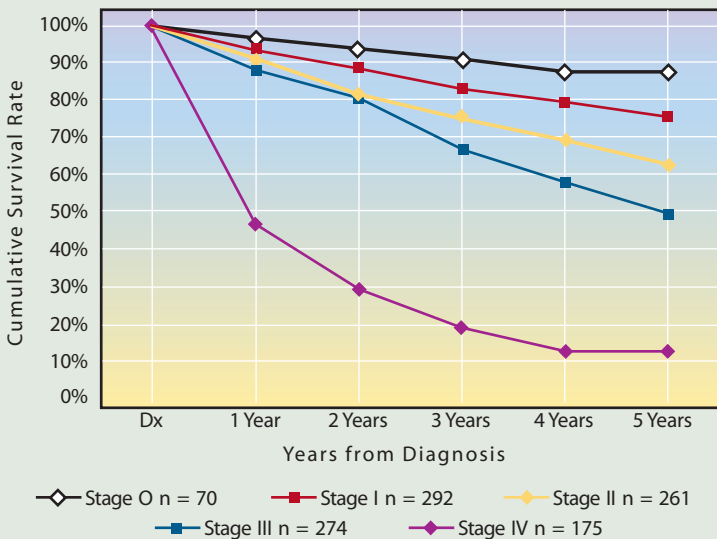


Figure 22.
Observed Survival for Colorectal Cases - National Cancer Data Base 1998 - 2002

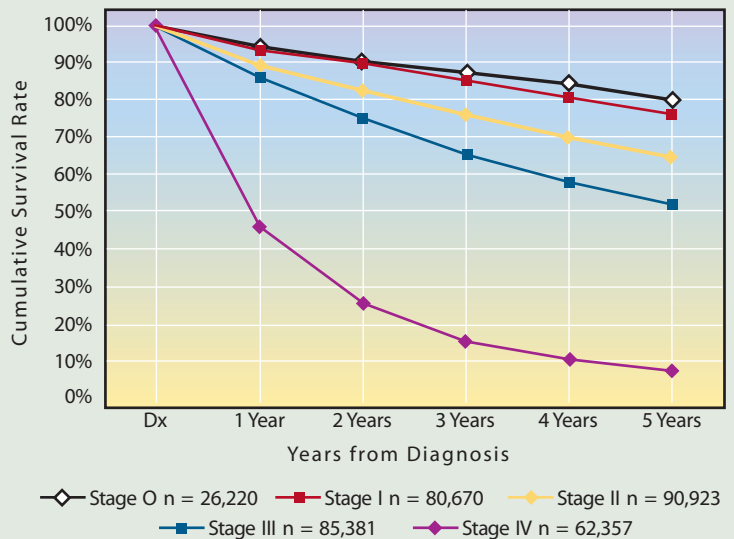


Figure 23.

Sentara Cancer Network - % of Stage III Colon Cancer Receiving Adjuvant Chemotherapy - 2007 - 2010

The Commission on Cancer (CoC) and National Quality Forum (NQF) endorse this indicator.

Figure 23 demonstrates Sentara Cancer Network's compliance by hospital.

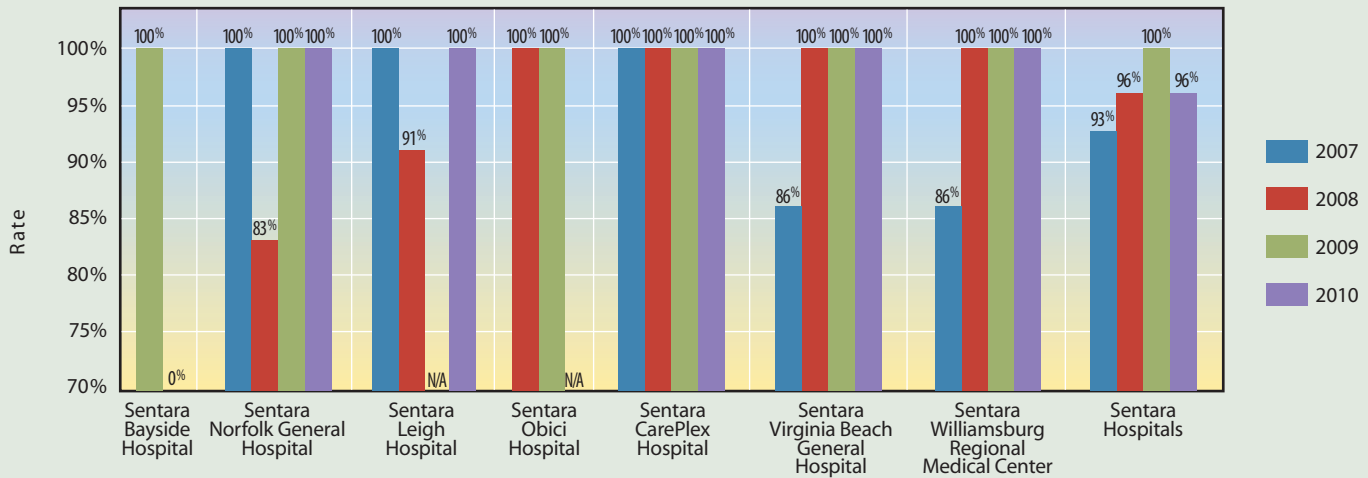
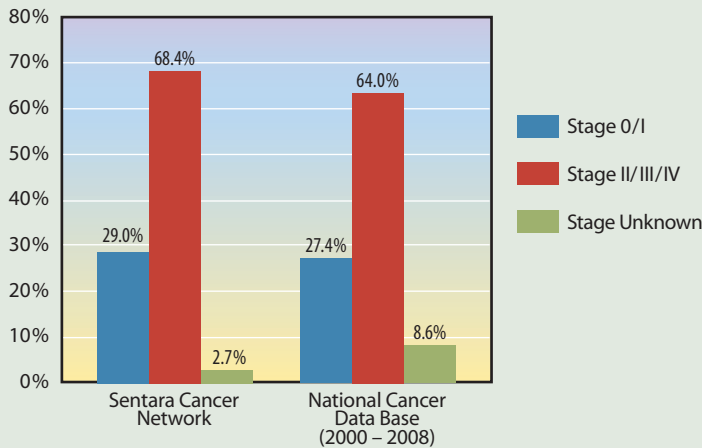


Figure 24.

Sentara Cancer Network - 2007-2010 Colon Cancers Stage 0/I vs. II/III/IV

Figure 24 illustrates the stage at diagnosis for Sentara Cancer Network colon cancers between 2007 and 2010. Early stage diagnosis is only slightly greater (1.6%) than the NCDB percentage.



Sentara Colorectal Program Leadership Committee

Celeste Bremer, MD

Gregory FitzHarris, MD

Richard Hoefler, DO

William Rudolph, MD, *facilitator*

John Sayles, MD



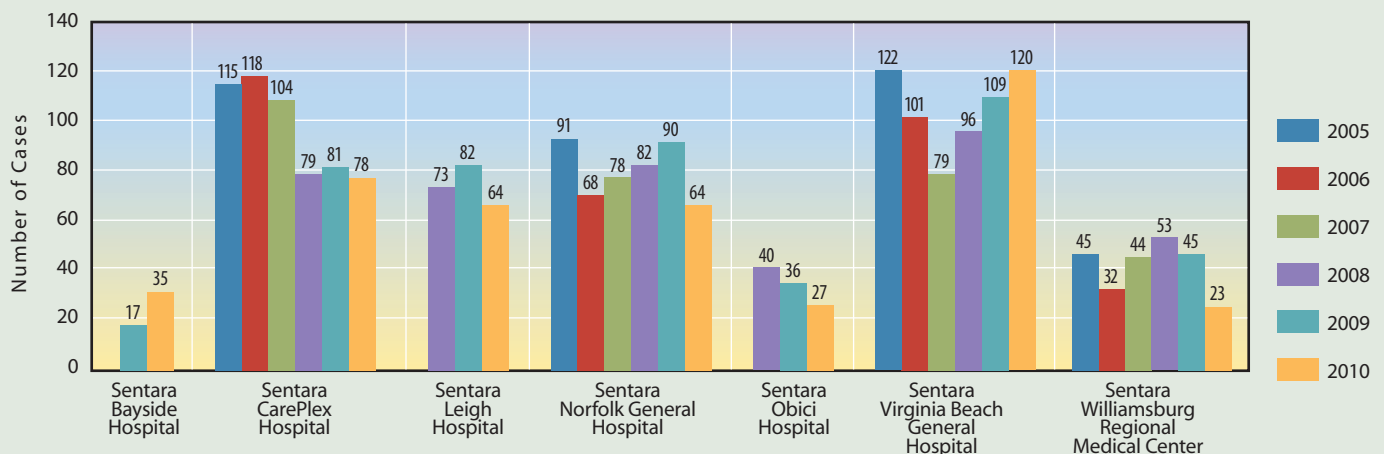
Watch a video online

at sentara.com/cancer

Figure 25.

Colorectal Cancer Analytic Case Volumes 2005 - 2010

This graph shows colorectal cancer volumes for each Sentara Cancer Network hospital from 2005 to 2010. Volumes are highest at Sentara CarePlex, Sentara Norfolk General, and Sentara Virginia Beach General. Source: Cancer Registry



Head & Neck Cancer Program

The Sentara Cancer Network offers a regional referral center for the treatment of head and neck cancer, as well as the only dedicated head and neck oncology team in the Hampton Roads region. The team features two fellowship-trained surgeons, and a dedicated team of microvascular reconstruction specialist, pathologist and oncology research nurse.

In July 2010, the Sentara Cancer Network and Eastern Virginia Medical School were the first in the state to introduce a minimally-invasive surgical procedure for removing tumors of the voice box, throat, tongue and esophagus: TransOral Robotic Surgery (TORS) – enables

surgeons to use the mouth as a natural orifice to remove tumors without the surgical incisions in the face and neck that are required in traditional surgical methods.

The TORS approach incorporates the da Vinci robotic surgical system to offer many advantages. With the robotic endoscopic video equipment, 3-D magnification and small instruments, the surgeon has an enhanced view of the surgical field, without external surgical cuts. This offers patients many benefits, including less scarring, less risk of infection, quicker return to daily activities, better swallowing results following surgery, lower risk of blood transfusion and no routine tracheotomy during surgery.

Figure 26.
Sentara Cancer Network Head and Neck Cancer Volumes - 2005 - 2010

The accompanying graph demonstrates the head and neck cancer volumes from 2005 to 2010. Head and Neck Cancer includes oral cavity/pharynx, larynx, nasal/sinuses, and thyroid. Sentara Norfolk General Hospital sees the vast majority of head and neck cancer in the Network.

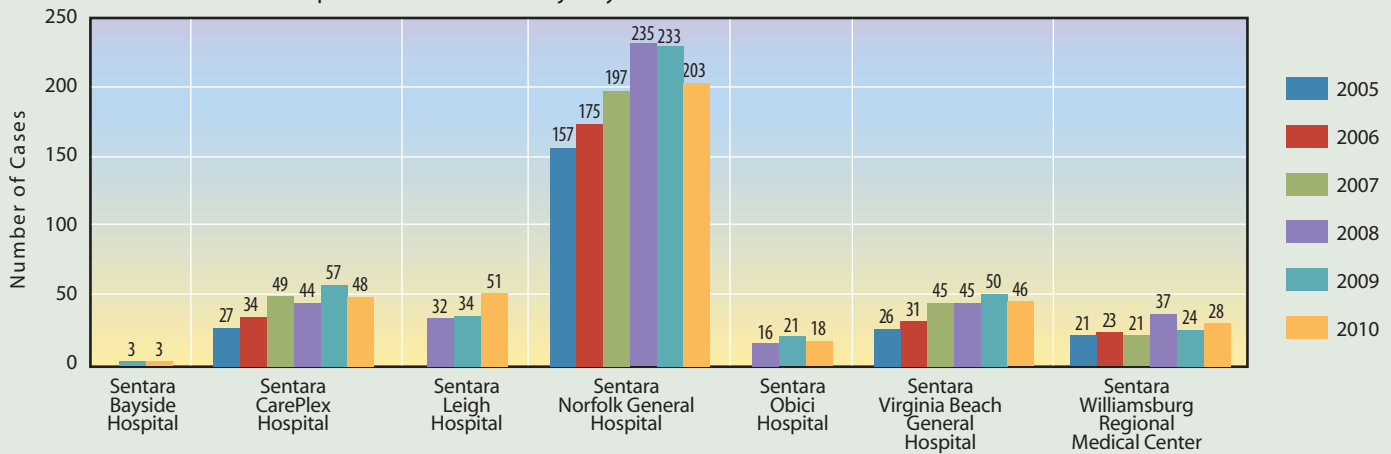
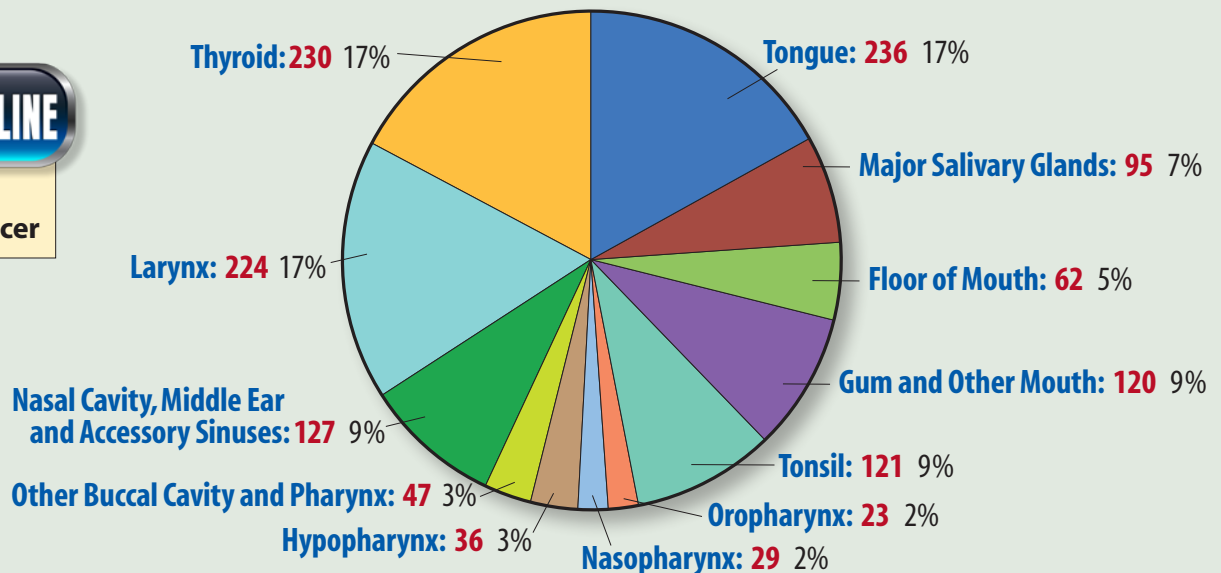


Figure 27.
Sentara Norfolk General Head and Neck Cancer Conference - 2007 - 2010 Case Presentations

The pie graph shows the breakdown of head and neck cases presented at the Head and Neck Cancer Conference at Sentara Norfolk General between 2007 and 2010.



MORE ONLINE
Watch a video at sentara.com/cancer

Hematology/Oncology Cancer Program

The Hematology/Oncology program at Sentara Cancer Network offers a multidisciplinary approach to the diagnosis of leukemia and lymphoma as well as other blood disorders. The team meets biweekly at cancer conferences to collaborate among medical oncologists, radiologists, pathologists and other members of the team.

“The tumor board gives us a chance to sit with our colleagues – medical oncology, surgical oncology, pathology, radiation oncology, and radiology – and we literally review the case,” says Scott Kruger, MD, a medical oncologist with Virginia Oncology Associates. “I will present the case to my colleagues, we look at the pathology report, we’ll look at all the x-rays and together I’ll get opinions not only of my own but of my colleagues on how they would best treat the patient.”

The Hematopathology Services at the Sentara Cancer Network include a dedicated flow cytometry lab, ImmunoStain capabilities, a molecular lab, cytogenetics lab and fluorescence in situ hybridization (FISH)

studies. Over the past seven years, the lab has tripled its volume of bone marrow studies, now performing more than 1,000 bone marrow studies each year. These higher volumes are a testament to the clinical expertise and commitment to high quality and expeditious service.

“One of the reasons our outcomes are so good is that we get the right diagnosis the first time,” explains Stephen Fisher, MD, hematopathologist. “We have the technology and expertise to diagnose all sorts of blood disorders right here in Hampton Roads, and we don’t hesitate to send specimens to National Institutes of Health (NIH) when we need a second opinion.

“Patients may not realize that there are many specialists involved in making the diagnosis and treatment recommendations,” says Fisher. “It’s not uncommon for 10 different board-certified specialists to contribute to one patient’s case.”

Sentara Hematology Program Leadership Committee

Burton Alexander, MD

Daniel Atienza, MD

Scott Kruger, MD

Scott Cross, MD

Stephen Fisher, MD

Lora Herman, MD

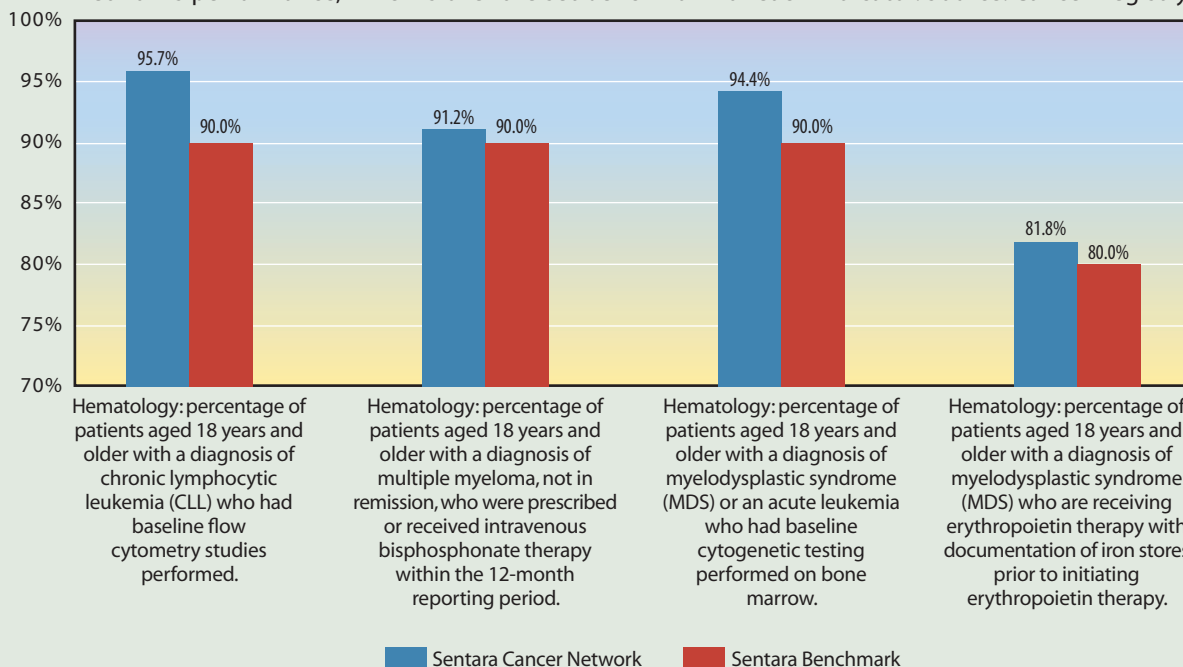
H. Raymond Tahhan, MD

Wozhan Tang, MD



Figure 28.
Sentara Cancer Network Hematology Quality Indicators Data

The Sentara Cancer Network Hematology Committee developed quality indicators for hematology and set internal Sentara goals for each. The graph below describes the quality indicator and shows the Network’s performance, which is over the set benchmark for each indicator. Source: Cancer Registry



Pancreatic Cancer Program

Pancreatic cancer accounts for only 2% of all new cancers in the United States, but it is the fourth leading cause of cancer deaths. This rare but aggressive cancer has an overall 5-year survival rate of only 4%. Unfortunately, these statistics are a result of the difficulty in identifying pancreatic cancer in its early stages (more than half of pancreatic cancers have metastasized at the time of diagnosis) and the lack of a curative treatment.

At Sentara, we recognize the greatest chance of survival from pancreatic cancer is offered through the collaborative efforts of highly qualified physician specialists who are committed to sharing knowledge, using advanced technology and conducting innovative research. Within the Sentara Cancer Network, the focus of a multidisciplinary Pancreatic Cancer team is to achieve and maintain excellent clinical outcomes, provide access to innovative national clinical trials and educate clinical providers on pancreatic cancer care and management.

These dedicated subspecialists meet biweekly in a virtual multidisciplinary cancer conference using web conferencing technology. Physicians on Sentara medical staffs across the region communicate regularly to discuss complex cancer cases, review

eligibility for clinical trials and recommend appropriate courses of treatment. In 2010, the group implemented several review processes and began monitoring quality metrics to improve outcomes.

The efforts of this team collaboration is evident in the high quality outcomes observed. In fact, the Sentara Cancer Network mortality rate for pancreatic surgical procedures was better than the expected rate published by Thomson Reuters CareDiscovery in 2010.

In addition to the physicians and technology that give Sentara pancreatic cancer patients the best possible care, the Sentara Cancer Network also provides all the necessary support systems for patients facing a diagnosis of pancreatic cancer – access to clinical trials, smoking cessation support, counseling and pain management.



Watch a video online at sentara.com/cancer

Figure 29.
Sentara Cancer Network Pancreatic Cancer Volumes 2005 - 2010

Pancreatic cancer volumes are shown in Figure 29. Sentara CarePlex Hospital, Sentara Virginia Beach General Hospital and Sentara Norfolk Hospital see the majority of pancreatic cancers in the Network. Source: Cancer Registry

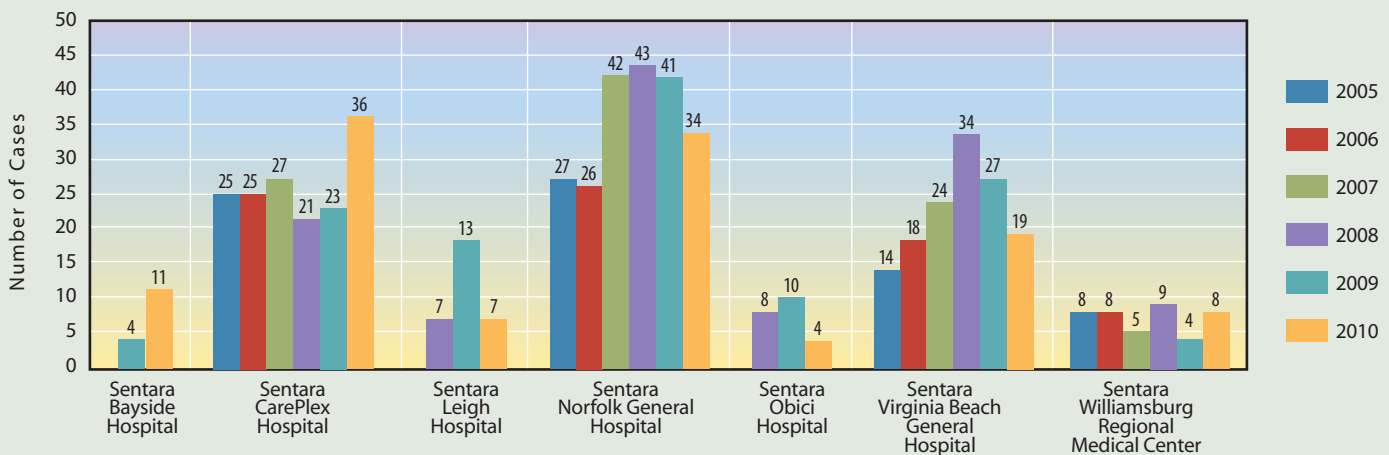


Figure 30.
Pancreatic Cancer Procedure Mortality -
Qualified Discharges 2009 - 2010

72 pancreatic cancer resections (partial and total) were identified as qualified discharges in 2009 and 48 in 2010. Of the 2009 qualified discharges, there were 5 observed deaths which were greater than the 2.71 expected deaths. Of the 2010 qualified discharges, there were 3 observed deaths, which was better than the 4.65 expected deaths. Source: CareDiscovery

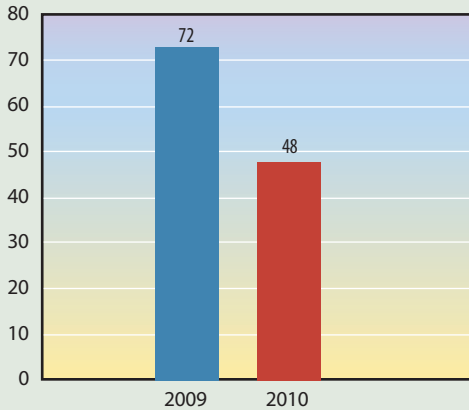
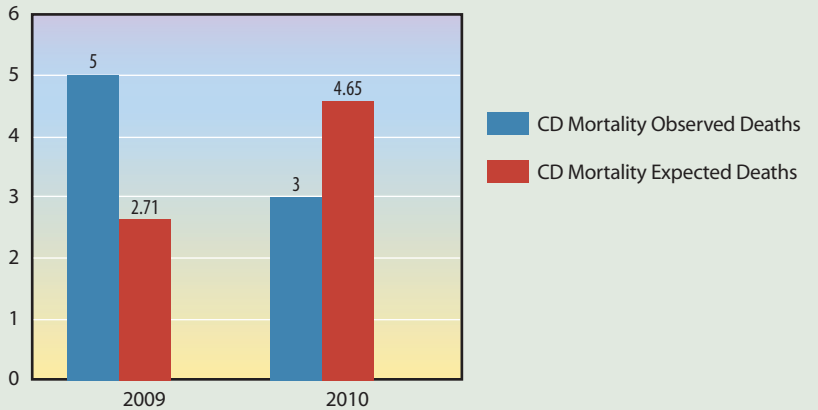


Figure 31.
Pancreatic Cancer Procedure Mortality -
2009 to 2010 Observed vs. Expected



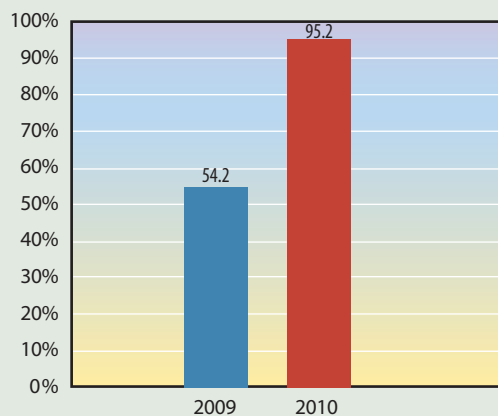
Sentara Pancreatic Program Leadership Committee

Rebecca Alston, MD
 Glen Arluk, MD
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 Scott Cross, MD
 Eric Feliberti, MD
 Greg FitzHarris, MD
 Mark Fleming, MD
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 Valerio Genta, MD
 Steven Hall, MD
 Richard Hoefler, DO
 Kevin Hornbuckle, MD
 Doug Howerton, MD
 Song Kang, MD
 John Kessler, MD
 Michael Lilly, MD
 David Marcheschi, MD
 Michael Montileone, MD
 Peter Moy, MD
 John Paschold, MD

Roger Perry, MD
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 David Powell, MD
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 Kishore Rao, MD
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 Niria Sanchez, MD
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 Ravi Shamaingar, MD
 Sarah Shaves, MD
 Mark Sinesi, MD
 Bill Skenderis, MD
 James Sparrer, MD
 Scott Stanley, MD
 Audrey Steck, MD
 Edward Trapani, MD
 Jeffrey Vandesand, MD
 Harlan Vingam, MD
 Marshall Weissberger, MD
 Scott Williams, MD

Figure 32.
10 or More Lymph Nodes at Pancreatic Resection -
2009 vs. 2010 - Sentara Cancer Network

In late 2009, the Sentara Cancer Network Pancreatic Committee adopted a benchmark of 10 or more lymph nodes harvested at the time of resection. The graph below illustrates the compliance with this standard for the complete year of 2009 versus the year of 2010. Source: Cancer Registries



2009 Sentara Cancer Network Primary Site Table

Analytic cases are cases diagnosed and/or treated during the first course of treatment at the assigned institution.
Total cases include cases that enter the institution for recurrences or later courses of treatment as well.

| Primary Site | SBH | | SCH | | SLH | | SNGH | | SOH | | SVBGH | | SWRMC | | Sentara Cancer Network Total Caseload | Sentara Cancer Network Total Analytic Caseload |
|---------------|------------|------------|-------------|------------|------------|------------|-------------|-------------|------------|------------|------------|------------|------------|------------|---------------------------------------|--|
| | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | | |
| Oral | 1 | 1 | 17 | 17 | 5 | 3 | 142 | 125 | 10 | 8 | 30 | 26 | 8 | 8 | 213 | 188 |
| Esophagus | 2 | 1 | 13 | 13 | 16 | 15 | 30 | 28 | 8 | 8 | 14 | 14 | 2 | 2 | 85 | 81 |
| Stomach | 3 | 3 | 19 | 17 | 12 | 9 | 15 | 14 | 9 | 9 | 20 | 18 | 4 | 4 | 82 | 74 |
| Colon | 17 | 17 | 62 | 56 | 62 | 57 | 76 | 63 | 36 | 28 | 72 | 70 | 36 | 36 | 361 | 327 |
| Rectum | 2 | 0 | 26 | 25 | 29 | 25 | 37 | 27 | 13 | 8 | 39 | 39 | 9 | 9 | 155 | 133 |
| Liver/Biliary | 2 | 2 | 8 | 8 | 8 | 8 | 18 | 18 | 11 | 10 | 13 | 11 | 8 | 8 | 68 | 65 |
| Pancreas | 4 | 4 | 23 | 23 | 15 | 13 | 43 | 41 | 12 | 10 | 27 | 27 | 4 | 4 | 128 | 122 |
| Larynx | 0 | 0 | 10 | 10 | 1 | 1 | 38 | 32 | 4 | 4 | 7 | 7 | 0 | 0 | 60 | 54 |
| Lung | 26 | 23 | 128 | 117 | 126 | 114 | 238 | 200 | 91 | 82 | 161 | 146 | 30 | 29 | 800 | 711 |
| Connective | 1 | 1 | 8 | 8 | 8 | 5 | 13 | 10 | 4 | 2 | 8 | 7 | 3 | 2 | 45 | 35 |
| Skin/Melanoma | 11 | 9 | 59 | 56 | 21 | 17 | 126 | 94 | 26 | 22 | 50 | 38 | 14 | 13 | 307 | 249 |
| Breast | 50 | 47 | 259 | 246 | 279 | 251 | 509 | 377 | 109 | 99 | 226 | 207 | 158 | 154 | 1590 | 1381 |
| Cervix Uteri | 0 | 0 | 4 | 4 | 6 | 5 | 5 | 5 | 5 | 5 | 2 | 1 | 3 | 1 | 25 | 21 |
| Corpus Uteri | 1 | 1 | 24 | 22 | 25 | 24 | 14 | 11 | 13 | 9 | 12 | 10 | 24 | 22 | 113 | 99 |
| Ovary | 2 | 1 | 8 | 6 | 8 | 8 | 4 | 2 | 7 | 5 | 9 | 7 | 10 | 9 | 48 | 38 |
| Prostate | 54 | 52 | 156 | 137 | 9 | 4 | 650 | 306 | 29 | 22 | 50 | 30 | 43 | 39 | 991 | 590 |
| Testis | 1 | 1 | 2 | 1 | 1 | 1 | 6 | 4 | 1 | 1 | 4 | 3 | 2 | 2 | 17 | 13 |
| Bladder | 14 | 6 | 27 | 22 | 36 | 23 | 97 | 71 | 11 | 8 | 42 | 40 | 22 | 20 | 249 | 190 |
| Kidney/Other | 0 | 0 | 24 | 20 | 33 | 27 | 175 | 167 | 8 | 6 | 7 | 5 | 12 | 11 | 259 | 236 |
| Brain/CNS | 0 | 0 | 6 | 3 | 0 | 0 | 100 | 58 | 4 | 3 | 25 | 20 | 0 | 0 | 135 | 84 |
| Thyroid | 1 | 1 | 28 | 28 | 29 | 29 | 66 | 61 | 6 | 6 | 18 | 17 | 16 | 16 | 164 | 158 |
| Heme | 6 | 5 | 34 | 28 | 20 | 13 | 48 | 31 | 9 | 6 | 24 | 16 | 12 | 9 | 153 | 108 |
| Lymph Nodes | 4 | 4 | 24 | 14 | 34 | 27 | 55 | 41 | 15 | 12 | 43 | 37 | 16 | 12 | 191 | 147 |
| Other | 6 | 5 | 36 | 33 | 41 | 34 | 113 | 74 | 17 | 14 | 52 | 43 | 26 | 26 | 291 | 229 |
| TOTAL | 208 | 184 | 1005 | 914 | 824 | 713 | 2618 | 1860 | 458 | 387 | 955 | 839 | 462 | 436 | 6530 | 5333 |

SBH Sentara Bayside Hospital
SCH Sentara CarePlex Hospital
SLH Sentara Leigh Hospital
SNGH Sentara Norfolk General Hospital

SOH Sentara Obici Hospital
SVBGH Sentara Virginia Beach General Hospital
SWRMC Sentara Williamsburg Regional Medical Center

2010 Sentara Cancer Network Primary Site Table

Analytic cases are cases diagnosed and/or treated during the first course of treatment at the assigned institution.
Total cases include cases that enter the institution for recurrences or later courses of treatment as well.

| Primary Site | SBH | | SCH | | SLH | | SNGH | | SOH | | SVBGH | | SWRMC | | Sentara Cancer Network Total Caseload | Sentara Cancer Network Total Analytic Caseload |
|---------------|------------|------------|------------|------------|------------|------------|-------------|-------------|------------|------------|------------|------------|------------|------------|---------------------------------------|--|
| | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | Total | Analytic | | |
| Oral | 3 | 2 | 21 | 18 | 15 | 13 | 118 | 100 | 7 | 6 | 22 | 18 | 11 | 10 | 197 | 167 |
| Esophagus | 8 | 7 | 11 | 10 | 15 | 12 | 15 | 10 | 5 | 3 | 19 | 15 | 2 | 1 | 75 | 58 |
| Stomach | 6 | 6 | 18 | 17 | 13 | 9 | 22 | 17 | 10 | 10 | 16 | 14 | 8 | 6 | 93 | 79 |
| Colon | 24 | 24 | 58 | 51 | 52 | 48 | 61 | 49 | 30 | 20 | 90 | 87 | 22 | 20 | 337 | 299 |
| Rectum | 11 | 11 | 27 | 27 | 16 | 16 | 21 | 15 | 8 | 7 | 37 | 33 | 4 | 3 | 124 | 112 |
| Liver/Biliary | 4 | 4 | 15 | 15 | 19 | 12 | 30 | 27 | 3 | 2 | 14 | 13 | 5 | 4 | 90 | 77 |
| Pancreas | 12 | 11 | 36 | 36 | 11 | 7 | 40 | 34 | 5 | 4 | 22 | 19 | 9 | 8 | 135 | 119 |
| Larynx | 0 | 0 | 9 | 9 | 9 | 8 | 41 | 36 | 4 | 4 | 9 | 9 | 0 | 0 | 72 | 66 |
| Lung | 31 | 25 | 113 | 105 | 131 | 98 | 209 | 179 | 84 | 79 | 95 | 81 | 46 | 40 | 709 | 607 |
| Connective | 1 | 1 | 10 | 7 | 4 | 4 | 19 | 15 | 3 | 3 | 9 | 7 | 1 | 1 | 47 | 38 |
| Skin/Melanoma | 14 | 14 | 55 | 53 | 17 | 15 | 114 | 81 | 16 | 15 | 88 | 65 | 13 | 12 | 317 | 255 |
| Breast | 88 | 75 | 236 | 217 | 296 | 271 | 482 | 304 | 114 | 100 | 216 | 195 | 143 | 141 | 1575 | 1303 |
| Cervix Uteri | 0 | 0 | 4 | 4 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 10 | 10 | 24 | 21 |
| Corpus Uteri | 3 | 2 | 17 | 16 | 26 | 25 | 12 | 11 | 7 | 6 | 17 | 14 | 29 | 29 | 111 | 103 |
| Ovary | 0 | 0 | 20 | 16 | 16 | 15 | 4 | 3 | 4 | 4 | 14 | 12 | 10 | 10 | 68 | 60 |
| Prostate | 80 | 77 | 133 | 118 | 9 | 2 | 673 | 345 | 43 | 29 | 35 | 22 | 36 | 32 | 1009 | 625 |
| Testis | 3 | 3 | 1 | 1 | 4 | 4 | 10 | 10 | 1 | 0 | 3 | 3 | 1 | 1 | 23 | 22 |
| Bladder | 20 | 16 | 27 | 25 | 22 | 13 | 94 | 75 | 11 | 8 | 43 | 39 | 25 | 23 | 242 | 199 |
| Kidney/Other | 4 | 3 | 16 | 12 | 17 | 12 | 156 | 151 | 4 | 3 | 7 | 7 | 21 | 19 | 225 | 207 |
| Brain/CNS | 2 | 2 | 13 | 11 | 4 | 4 | 74 | 66 | 2 | 2 | 23 | 20 | 0 | 0 | 118 | 105 |
| Thyroid | 1 | 1 | 18 | 17 | 29 | 28 | 65 | 62 | 7 | 7 | 22 | 18 | 17 | 17 | 159 | 150 |
| Heme | 7 | 5 | 25 | 22 | 20 | 15 | 123 | 29 | 12 | 8 | 22 | 15 | 10 | 9 | 219 | 103 |
| Lymph nodes | 9 | 7 | 24 | 22 | 48 | 35 | 52 | 27 | 15 | 12 | 35 | 28 | 12 | 12 | 195 | 143 |
| Other | 10 | 10 | 37 | 30 | 42 | 38 | 86 | 64 | 19 | 16 | 46 | 39 | 34 | 30 | 274 | 227 |
| TOTAL | 341 | 306 | 944 | 859 | 838 | 707 | 2524 | 1711 | 416 | 349 | 906 | 775 | 469 | 438 | 6438 | 5145 |

Data Compiled by Sentara Cancer Network Registry Subcommittee:

Jane Allmaras; Tammy Berryhill, CTR; Karrie Brickhouse, CTR; Kristy Bridgeman; Dana Carey; Taquilla Diggs-Wright; Sandra Edwards; Cynthia Freeman, CTR; Holanda Harding; June Harlow; Brad Kirby, CTR; Kathleen Marcia, CTR; Cressetta Peterson; Terry Reich; Lana Tyree, CTR.

Sentara Cancer Network – Points of Care



Sentara's unique program is recognized for the strength of its vast network of cancer experts, coupled with the personal care of its many community cancer centers conveniently located throughout the region.

When you receive care at any one of these locations, you access a comprehensive network of cancer care. And the most impressive feature of that network is its ability to collaborate and provide a multidisciplinary approach that leads to better quality – and a better patient experience.

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