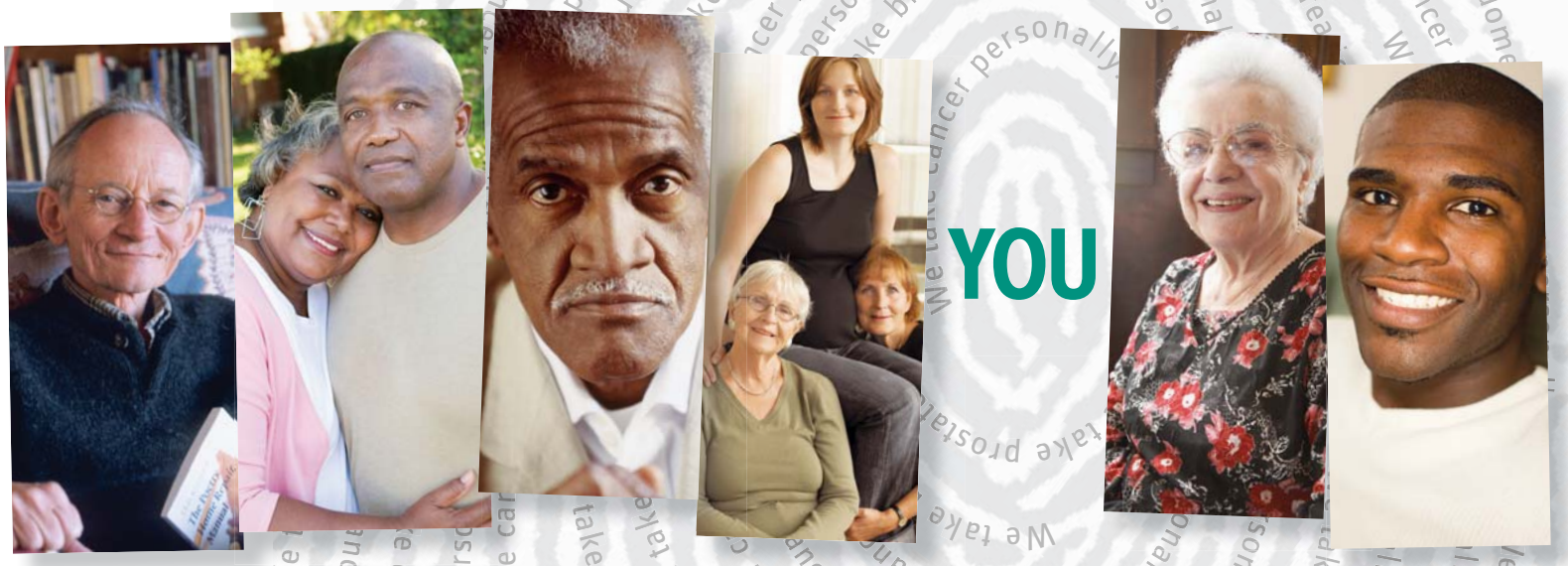
Riverside Cancer Care

We take cancer personally.



Riverside Cancer Services 2010 Annual Review

2010
Oncology Committee Members

Joseph D. Layser, MD, Chair.....*Radiation Oncology*
Michael Peyser, MD, Cancer Liaison Physician .....*Surgical Oncology*
Steven Scott, MD.....*Cardiothoracic Surgery*
Brian Billings, MD.....*Colorectal Surgery*
William Irvin, MD .....*GYN Oncology*
John Mattern, II, DO .....*Medical Oncology*
Guy Tillinghast, MD.....*Medical Oncology*
Mashour Yousef, MD .....*Medical Oncology*
Michael Schwartz, MD .....*Pathology*
Vicki Slattery .....*Pharmacy*
Lori Gillespie, MD.....*Radiation Oncology*
Curtis Stoldt, DO .....*Radiology*
Scott Burgess, MD .....*Urology*
Richard Rento, MD .....*Urology*
Faye Petro Gargiulo .....*Vice President, Physician/Service Line Development*
Keith Gregory .....*Service Line Administrator, Oncology*
Paula Burcher .....*Administrative Director, Radiology*
Beverly Voglewede.....*Director, Radiation Oncology Services*
Michelle Wooten.....*Dir. Med/Surg. Svcs/Oncology Services*
Heather Blair.....*Physical Therapist, Rehab*
Kim Monroe .....*Nurse Manager, 5-West, Hem/Onc*
Arlene Messina .....*Director, Performance Improvement*
Reverend Doug Watson .....*Director, Pastoral Care*
Ora Mae Jackson.....*Protocol Manager*
Yvonne Pike .....*Breast Cancer Patient Navigator*
Cyndee Willis.....*Prostate Cancer Patient Navigator*
Terri Rose .....*Lung Cancer Patient Navigator*
Harolette Kelley.....*Colorectal Cancer Patient Navigator*
Charlene Thompson.....*Social Worker, Care Management*
Jackie Ward .....*Educator, Staff Development*
Sharron Nichols .....*Nurse Manager, Riverside Hospice*
Ann Tatterson.....*Director, Riverside Hospice Agencies*
Paige Williams .....*Registered Dietician, Dietary*
Fran Holcomb.....*Cancer Education/Outreach Nurse*
Jennifer Brown .....*Cancer Registry Supervisor*
Pauline Shofner.....*Cancer Registrar*
Carol Richards .....*Cancer Registrar*
Jan Bennett .....*Representative, American Cancer Society*

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For additional information regarding Riverside Cancer Services, please call (800) 520-7006.
For comments or questions regarding this Annual Report or the Cancer Registry, please call (757) 594-3054.

Cancer Services Annual Report 2010

Once I again thank the reader for your interest in the Riverside Regional Medical Center Cancer program. The Riverside Health System continues to place a high priority on the growth and high quality of our cancer program. Our program has lost of one its most stalwart supporters in the passing of Dr. Mark Ellis. We thank his wife and family members for all the time that he devoted to our program. We know it was a labor of love and the success of our program will be a testament to the solid foundation Dr. Ellis helped develop and serves as a lasting tribute to his memory.

The Cancer Service Line has a new administrator in Mr. Keith Gregory who comes to us from Tennessee and New Mexico. He has a great deal of experience in both radiation oncology administration and general oncology leadership roles. With his guidance the program will continue to grow.

Riverside continues to attract new physicians. Dr. John Miller has been added to the PCI Medical Oncology group. Dr. Scott Backus in pathology and Dr. Zach Elliott in radiology are both contributing to our weekly tumor board which is scheduled each Tuesday morning and is the backbone of our multi-disciplinary tumor program. Tumor boards have been expanded to include breast cancer, lung cancer and neurosciences tumor board, all of which meet weekly.

The navigation program continues to grow. Yvonne Pike serves as breast cancer navigator and the program leader. She is supported by Terri Rose in lung cancer, Cyndee Willis in prostate and Harolette Kelley is the new GI navigator.

The new oncology ICU and oncology unit on 5-West were completed last year and this certainly has added an element of beauty as well as functionality to the inpatient arena.

A special thanks to Reverend Doug Watson after having served 34 years in the Riverside Health System. He not only provided counseling for our patients, he served for many years on the Institutional Review Board, the Ethics Committee and the Oncology Committee and helped train many students in pastoral services over the years.

I thank all of the Riverside employees who maybe unmentioned in this introduction but who provide important services for our cancer patients.

Joseph D. Layser, MD
Chair, Riverside Oncology Committee
Medical Director, Riverside Cancer Care Center
Radiation Oncology

As the Cancer Liaison Physician for Riverside Regional Medical Center, I have the privilege to present to you the 2010 Annual Report of the Riverside Cancer Program. Riverside Health System continues to grow and is composed of four hospitals covering a large geographic area with over four hundred providers. We continue to be a strong leader in Oncology and provide excellent cancer care to our community.

The previous year has seen an explosion of our analytic caseload. Each of the four most common tumor types at RRMC increased from 2008. Breast cancer, lung cancer, colorectal cancer, and prostate cancer increased by 45%, 32%, 40%, and 5%, respectively. Part of this growth can be attributed to the streamlined cancer care which we provide. Riverside has several committees composed of Medical Oncologists, Surgeons, Pathologists, Radiation Oncologists, Radiologists, and Patient Navigators. They have developed algorithms to efficiently transition patients through the complicated and emotional pathway of cancer care. These groups often meet to share ideas, plan for the future, and discuss nationally and locally accepted quality standards of care.

Our cancer program is further strengthened by our Patient Navigators. Early on, Riverside recognized the need to support this endeavor long before others had defined patient navigation. Riverside is now home to four navigators: Yvonne Pike, Terrie Rose, Harolette Kelley, and Cyndee Willis. They support patients utilizing their experiences with oncology case management, hospice, surgery and support groups. They interact with multiple departments throughout the hospital and physicians' offices to connect the patient and assure access to care.

Of course, our cancer program is well-defined due to the tireless work of the Tumor Registry department. As supervisor and Certified Tumor Registrar, Jennifer Brown has the huge task of tracking quality indicators in the form of tumor-specific dashboards including data from all of the subspecialties. Jennifer, along with Pauline Shofner and Carol Richards, coordinate multiple tumor boards, prepare for Oncology Committee and other ad-hoc meetings, and keep our cancer program competitive by maintaining our certification with the Commission on Cancer. In addition, Jennifer was instrumental in organizing Riverside's First Annual Oncology Symposium.

These accomplishments are due to a team effort; but we know that Dr. Mark Ellis was instrumental in our success. Recently, the Riverside family lost Dr. Ellis. Mark was part of the oncology community on the Peninsula for many years and was a guiding beacon in the Riverside system. His tireless work as the Service Line Chief and clinician has helped us to forge the way to an integrated program staying true to standards of care; but above all, taking great care of the patients.

To quote Dr. Ellis from a previous Annual Report, "*The future of the Riverside Cancer Program continues to be very bright, and I am optimistic that our program will continue to be the leader in cancer care in our region.*"

Michael B. Peyser, M.D., FACS
Cancer Liaison Physician
American College of Surgeons/Commission on Cancer
Fellow, Society of Surgical Oncology
Riverside Regional Medical Center

Riverside Cancer Services

American College of Surgeons Accreditation: Riverside Regional Medical Center has been accredited as a Community Hospital Comprehensive Cancer Program by the American College of Surgeons' Commission on Cancer since 1982. Riverside Regional Medical Center was re-accredited in December 2009 and received 6 of 7 possible commendations from the College. Accreditation by the ACOS indicates that the five key elements of a cancer program are in place:

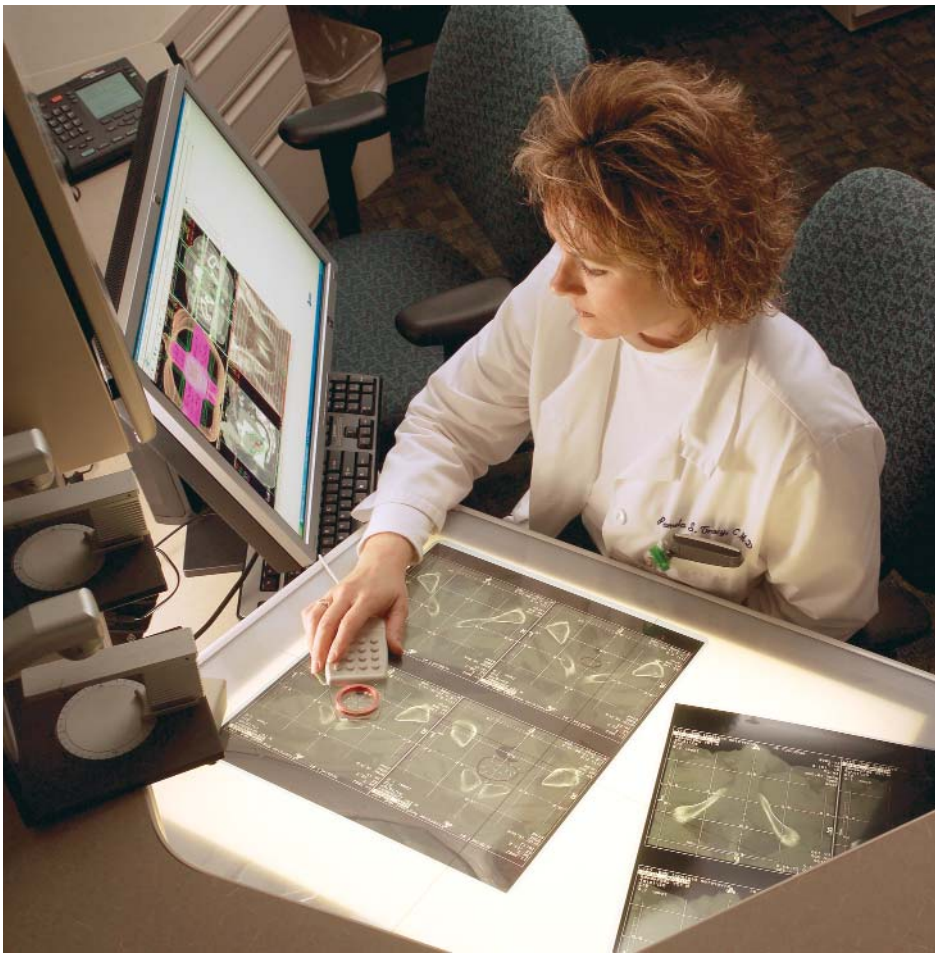
1) state of the art clinical services;
2) a multi-disciplinary cancer committee;
3) a cancer registry to monitor the quality of care;
4) patient oriented case-conferences; and
5) a quality improvement program for improving patient outcomes.

Oncology Committee: Riverside Regional Medical Center's Oncology Committee is a multi-disciplinary team that convenes every other month to provide leadership and professional guidance to the cancer care program.

Cancer Registry: To adhere to state, federal and ACOS guidelines, RRMC's Cancer Registry has been maintaining its database of cancer cases since 1979. Data from the registry is submitted to the Virginia Cancer Registry and the National Cancer Data Base (NCDB), which serves as a comprehensive clinical surveillance center for the entire country. Information on each case is submitted annually to keep the information current. The NCDB combines the data from 1,438 hospitals in all 50 states to provide insight into the long-term outcomes of treatments. This helps researchers and physicians better investigate and evaluate advances in diagnostics and treatment. This Annual Report contains a review of all 2009 accessions (new cases), as well as site-specific studies on colorectal and thyroid cancer.

Cancer Case Conferences (Tumor Boards): Tumor Boards provide an opportunity for physicians to prospectively review cases with the multidisciplinary team. In addition to the weekly general tumor board, there are site-specific conferences for neurosciences, breast cancer and lung cancer. As well as helping to determine treatment plans, case conferences serve as important education offerings for the physicians and other members of the healthcare team.

Research and Clinical Trials: Offering access to clinical trials is an important aspect of any cancer care program. While not appropriate for every patient, clinical trials can sometimes offer access to treatments that would be otherwise unavailable. The ACOS requires that 2% of the patients each year be enrolled in clinical trials, and Riverside is proud to once again exceed that benchmark.



Diagnostic Services

Imaging: Riverside offers a wide range of diagnostic imaging services across seven locations (Riverside Regional Medical Center, Riverside Diagnostic and Breast Imaging Center - Oyster Point, Riverside Diagnostic Center -Williamsburg, Riverside Walter Reed Medical Center and Riverside Tappahannock Hospital, Riverside Diagnostic Center-Hampton and Riverside Diagnostic Center- Smithfield). Riverside is proud to work with the physicians of Peninsula Radiologic Associates to bring you the following services:

- Mammography and Breast Imaging Services (screening, diagnostic, stereotactic, ultrasound, MRI, breast specific gamma imaging)
- X Ray
- Ultrasound
- CT
- MRI
- Nuclear Medicine
- PET/CT

Laboratory and Pathology: Riverside provides a complete range of laboratory and pathology services. The physicians of Peninsula Pathology Associates work closely with the referring physicians and surgeons to provide the most accurate diagnosis to allow for the most precise treatment plan. In addition to the expertise of the physicians on staff, Riverside has partnered with The Mayo Clinic in Minnesota as a reference lab for the more unique tests that may be required or for second opinions on some specimens.

Inpatient Services

Riverside Regional Medical Center, the Peninsula's only Level II Trauma Center, offers a wide range of inpatient services. For oncology patients, the most commonly utilized departments and services include:

Care Management: The Oncology Care Management team is there to help patients and their supporters navigate the often confusing array of tests, treatments and feelings. The care coordinator works with the entire inter-disciplinary healthcare team to focus on minimizing the length of necessary hospital stays, while maximizing access to the best care available and preparing the patient and family for discharge to home or another facility.

5-East Post Surgical Unit: 5-East is a general surgical unit, which specializes in the care of the post-operative patient. 5-East also offers a four bed step-down unit for patients requiring an increased level of nursing care following surgery. The nursing staff on 5-East are experts in helping a patient recover as rapidly as possible from a surgical intervention, including wound care issues, anesthesia recovery, pain management and getting the patient back to the activities of daily living.

Outpatient Services

5-West Oncology Unit: 5-West is an 18 bed medical unit which specializes in the care of the oncology patient. Specialized offerings include one lead-lined room for patients who have received cesium implants and radioactive iodine therapy. Additionally, all of the RNs are certified in chemotherapy, and there are two Oncology Certified Nurses on the unit.

Hematology/Oncology Unit: The Hematology/Oncology Intensive Care Unit ("Hem/Onc") is a 6 bed specialty care unit designed for the critically ill oncology patient located as part of the new 5-West Unit. As on 5-West, the nursing staff is chemotherapy certified, and the unit boasts four Oncology Certified Nurses. The Hem/Onc staff members are also trained in critical care nursing, and are able to accommodate the most complex oncology patients, including intra-peritoneal chemotherapy.

Surgeons: Riverside's surgeons are talented physicians who have spent years studying how to best operate on specific areas of the body. Depending on the type of cancer a patient has, they could see one of the following: Ear Nose & Throat (ENT) Surgeon, General Surgeon, Colorectal Surgeon, Gynecologic Oncologist, Neurosurgeon, Plastic Surgeon, Surgical Oncologist, Thoracic Surgeon or Urologist.

Surgical Services: For many cancer patients, their only inpatient stay is immediately following surgery. Riverside's Surgical Services – from pre-operative testing, to the Operating Room to the Post-Anesthesia Care Unit (PACU) - is there to ensure that the right patient has the right procedure in the most safe and effective manner, and recovers as quickly as possible.

Home Care: Riverside Home Care offers a variety of services to patients in the Peninsula, Middle Peninsula and Northern Neck regions including home health, infusion, pharmacy and hospice services. Admission begins with a referral from the physician and a visit from an RN, physical or speech therapist to identify needs, establish goals for treatment and begin planning for continued care when home care services are no longer required.

Hospice: The Hospice program affirms life and regards dying as a natural process. The hospice program exists to provide support and care for patients, their families and caregivers in the last phases of incurable disease so the patient might live as fully and comfortably as possible. Hospice services neither hasten nor postpone death.

Medical Oncology / Peninsula Cancer Institute: Medical Oncology is a critical component of any cancer program. Riverside is thrilled to partner with the physicians of Peninsula Cancer Institute to offer medical oncology services, including outpatient chemotherapy at three sites (Newport News, Gloucester and Williamsburg). Riverside has joined with PCI and three other Southside medical oncology facilities to form the Riverside Cancer Infusion Center.

Radiation Oncology: Riverside Cancer Care Center, Riverside Middle Peninsula Cancer Center and Williamsburg Radiation Therapy Center provided radiation oncology services to approximately 1100 new patients in 2009. A full range of external beam radiation and brachytherapy services, with the latest treatment options such as Intensity Modulated Radiation Therapy (IMRT), Prostate Seed Implants and Mammosite, are available for the Newport News, Williamsburg and Middle Peninsula communities. The focus of the Riverside Cancer Care Center in Newport News encompasses new technology development for radiation oncology known as Image Guided Radiation Therapy (IGRT).

Riverside and University of Virginia Radiosurgery Center: Offering both Gamma Knife® and Synergy-S® technology, the Riverside and University of Virginia Radiosurgery Center opens up the world of knifeless surgery to patients with tumors in the brain, spine and other areas of the body. Using precise beams of intense radiation, the center allows outpatient surgery to previously inoperable tumors. Riverside is proud to offer the only Gamma Knife® in the Tidewater region, and is proud to be the only health system to offer both Gamma Knife® and Synergy-S® technology in the Commonwealth of Virginia.

Support Services

Bereavement Support: Riverside Hospice's Bereavement Aftercare Program provides support to adults as they adjust to life following the death of a loved one. Support and education are offered to help individuals learn about the grief process, and a support group meets twice a month.

Cancer Resource Library: Located on the first floor of the Riverside Cancer Care Center, the library is for patients, family members, community members and staff who want to learn more about cancer issues. The library offers resources on specific types of cancer – including prevention, diagnosis and treatment issues. There is also a wide array of books on the important psychosocial concerns of facing a cancer diagnosis, as well as a children's section. Additionally, there are two computers where individuals can research issues online.

Cancer Services - Outreach and Community Education: Riverside's Cancer Services offers a wide range of support, outreach, education and early detection programs to the community. Working with medical staff, oncology nurses, allied health care professionals and community partners, such as The American Cancer Society and the Leukemia and Lymphoma Society, Cancer Services sponsors numerous educational and screening events throughout the year. Programs include: community health fairs, prostate, cervical, breast and skin cancer screenings, Look Good Feel Better classes, nutritional and health information programs.

Connections with Community Organizations: Riverside Cancer Services recognizes its role in the broader cancer community, and works actively with numerous local and national cancer organizations. In addition to its work with local health departments, Riverside works with the American Cancer Society, Leukemia and Lymphoma Society, Tidewater Affiliate of the Susan G Komen Foundation, Peninsula Cancer Prevention Coalition, Peninsula Tobacco Free Coalition many local church groups, and the Lackey, Tappahannock and Gloucester-Matthews Free Clinics.

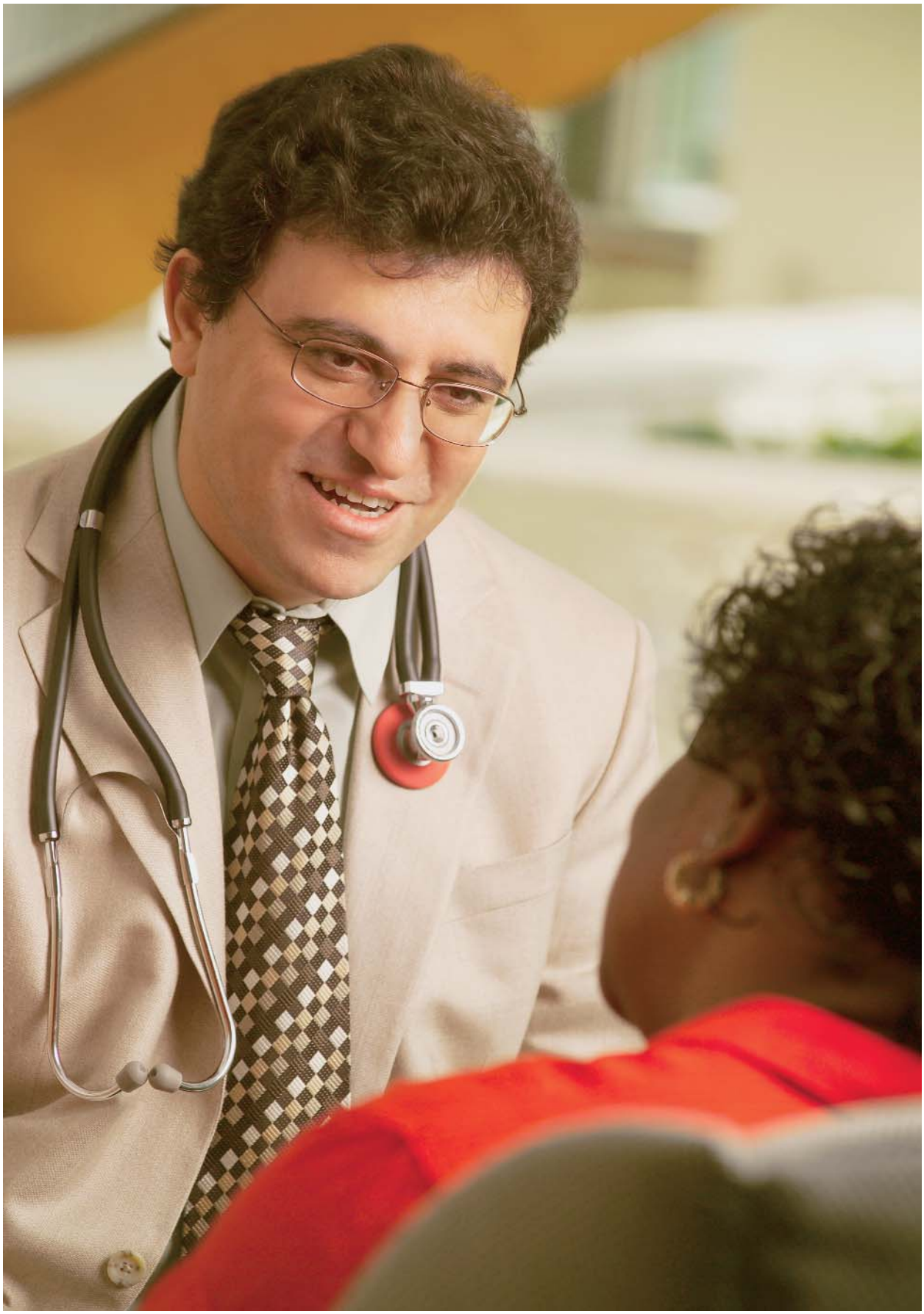
In 2009 the Junior League of Hampton Roads and Riverside partnered to help women in our community get the facts about gynecological cancers and other disorders of the female reproductive system. Each of these cancers is unique with different signs and symptoms and preventative strategies. Awareness and education are the keys to better health.

Grant Programs: Riverside is proud to be the recipient of two major grants that allow access to breast and cervical cancer screenings for women who might not otherwise be able to get screened. The Every Woman's Life Grant is a part of the Centers for Disease Control and Prevention's Breast and Cervical Cancer Early Detection Program as managed through the Virginia Department of Health. Additionally, Riverside also receives funds from the Tidewater Affiliate of the Susan G. Komen Foundation for the Breast Health Alliance Program. Between the two programs, Riverside is able to provide these critical screenings to uninsured or underinsured women who meet the necessary age and income guidelines. Additionally, those women who detect a breast cancer can be enrolled in to the Every Woman's Life treatment Act of 2001 which provides Medicaid funding for cancer treatments.

Pastoral Care: Chaplains are there to support cancer patients, families and friends in making use of faith or spiritual values to work with the challenges of cancer. Pastoral Care may include conversation, prayer, liturgy, worship, sacraments, scripture reading, reflection and referral. The pastoral care service is interfaith, personal, and specific for the individual and family in need.

Patient Navigation: Patient Navigators are there for patients and their loved ones from diagnosis through the entire treatment process. As most cancer patients discover, the diagnosis and treatment process is often confusing, and involves many physicians, nurses, therapists and locations, not to mention the overwhelming emotional component in addition to being sick. Patient Navigators are there to simplify the journey, and to be the one person you can always call with a question. They also help patients and caregivers know what to expect from various procedures and treatments. Currently, Riverside offers Patient Navigation to any patient in the breast, prostate, lung or colorectal cancer programs. The hope is to expand that to additional diagnoses in coming years.

Support Groups: There are numerous support groups to support the cancer patient and their loved ones. Call Cancer Services for an up to date schedule of times and locations of the various groups.



Review of 2009 Accessions

As part of the cancer program standards set forth by the American College of Surgeons Commission on Cancer (ACoS CoC) facilities are required to maintain a cancer registry program. Riverside Regional Medical Center's registry has been in existence since 1979. Over the years the cancer registry has seen first hand the changes in cancer care and data capture. In January 2010 the American Joint Committee on Cancer (AJCC) released its seventh edition staging manual. Cancer staging schemas were created for some sites and revised for existing ones. The cancer registry department has been essential in teaching staff physicians about the revisions. Also in January 2010, the Collaborative Staging System version 2 was released. This system is used by registrars across the country to stage cancers and incorporates clinical and pathologic information about the tumor. Cancer registrars are now collecting more site specific data on tumors then ever before.

This has proven to be another record year for the Riverside Cancer Registry, identifying over 1800 new cases in 2009, with 1,475 (82%) of those being analytic- diagnosed and/or treated at RRMC. Our top sites continue to include Breast, Prostate, Lung, and Colorectal. These four sites alone comprise over 60% of the analytic cases seen at RRMC.

Caseload growth from 2008 to 2009 was seen for several sites, most notable Melanoma (54.8%), Breast (45.2%), Bladder (44.1%) and Colorectal (40%). From 2008 to 2009 a decrease in caseload for Leukemia (-21.4%, -3 cases) and Brain (-31.3%, -10 cases) did occur.

As a CoC approved program, Riverside is required to maintain over 90% follow-up on all of its cancer patients. Current follow-up for Riverside Regional Medical Center is 91%.

The cancer registry staff has achieved several accolades over the past year. Supervisor, Jennifer Brown is currently serving as Vice President of the Virginia Cancer Registrars Association (2009-2011). Cancer Services', including the cancer registry, was successful in two surveys last year, the National Accreditation Program for Breast Centers (NAPBC) and the ACoS CoC Accreditation survey. The NAPBC is a new program and Riverside received an excellent rating it's first year. The ACoS CoC survey is a renewal survey, with expectations of meeting new standards. Riverside Regional Medical Center received a 3-Year Approval with Commendation for its program. Riverside's next step is to host its first Oncology Symposium during the fall of 2010.

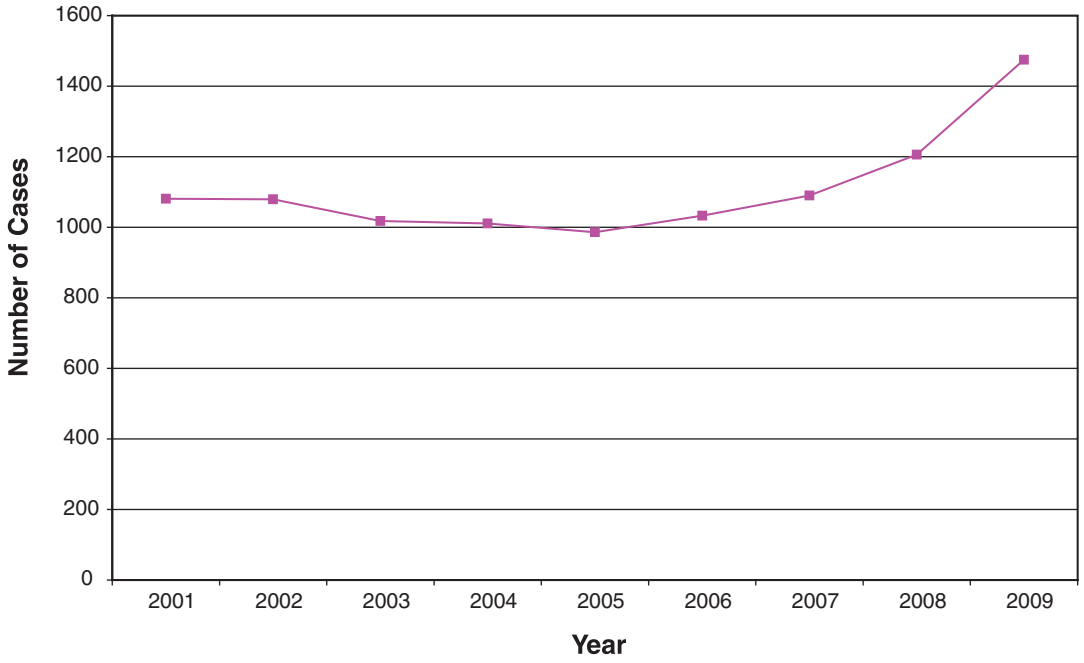
Jennifer L. Brown, BS, CTR
Cancer Registry Supervisor

Review of 2009 Accessions

Primary Site	Cases	%	Sex		Class of Cases		Stage Distribution - Analytic Cases Only						
			M	F	Analytic	Non-Analytic	0	I	II	III	IV	Unk	Blank/Inv
ORAL CAVITY & PHARYNX	**43**	**2.4%**	**24**	**19**	**33**	**10**	**1**	**7**	**2**	**5**	**14**	**4**	**0**
Lip	1	0.1%	1	0	1	0	0	1	0	0	0	0	0
Tongue	16	0.9%	8	8	12	4	0	1	0	0	9	2	0
Salivary Glands	2	0.1%	1	1	1	1	0	1	0	0	0	0	0
Floor of Mouth	1	0.1%	1	0	1	0	0	0	1	0	0	0	0
Gum & Other Mouth	9	0.5%	4	5	6	3	1	3	0	1	0	1	0
Nasopharynx	4	0.2%	3	1	3	1	0	0	0	2	1	0	0
Tonsil	7	0.4%	5	2	6	1	0	1	1	1	3	0	0
Oropharynx	1	0.1%	0	1	1	0	0	0	0	1	0	0	0
Hypopharynx	2	0.1%	1	1	2	0	0	0	0	0	1	1	0
DIGESTIVE SYSTEM	**206**	**11.3%**	**116**	**90**	**176**	**30**	**1**	**38**	**47**	**42**	**36**	**4**	**8**
Esophagus	18	1.0%	13	5	16	2	0	8	5	2	1	0	0
Stomach	17	0.9%	11	6	15	2	0	3	3	4	3	0	2
Small Intestine	4	0.2%	3	1	4	0	0	1	0	1	0	0	2
Colon Excluding Rectum	79	4.3%	43	36	63	16	0	13	20	13	16	0	1
Rectum & Rectosigmoid	40	2.2%	27	13	35	5	1	3	9	14	6	0	2
Anus, Anal Canal & Anorectum	5	0.3%	2	3	5	0	0	2	2	1	0	1	0
Liver & Intrahepatic Bile Duct	11	0.6%	8	3	9	2	0	3	0	1	3	2	0
Gallbladder	3	0.2%	0	3	3	0	0	0	2	0	1	0	0
Other Biliary	4	0.2%	2	2	4	0	0	1	1	1	0	1	0
Pancreas	24	1.3%	7	17	21	3	0	4	5	5	6	1	0
Peritoneum, Omentum & Mesentery	1	0.1%	0	1	1	0	0	0	0	0	0	0	1
RESPIRATORY SYSTEM	**309**	**17.0%**	**167**	**142**	**274**	**35**	**1**	**68**	**10**	**80**	**108**	**2**	**5**
Nasal Cavity, Middle Ear & Accessory Sinuses	2	0.1%	0	2	1	1	0	0	0	0	1	0	0
Larynx	19	1.0%	19	0	18	1	1	5	3	5	4	0	0
Lung & Bronchus	288	15.8%	148	140	255	33	0	63	7	75	103	2	5
SOFT TISSUE	**11**	**0.6%**	**5**	**6**	**8**	**3**	**0**	**3**	**1**	**0**	**2**	**2**	**0**
Soft Tissue (including Heart)	11	0.6%	5	6	8	3	0	3	1	0	2	2	0
SKIN EXCLUDING BASAL & SQUAMOUS	**71**	**3.9%**	**49**	**22**	**54**	**17**	**8**	**33**	**4**	**5**	**2**	**1**	**1**
Melanoma — Skin	64	3.5%	47	17	48	16	8	29	4	4	2	1	0
Other Nonepithelial Skin	7	0.4%	2	5	6	1	0	4	0	1	0	0	1
BREAST	**346**	**19.0%**	**3**	**343**	**315**	**31**	**72**	**125**	**67**	**27**	**13**	**10**	**1**
Breast	346	19.0%	3	343	315	31	72	125	67	27	13	10	1
FEMALE GENITAL SYSTEM	**80**	**4.4%**	**0**	**80**	**64**	**16**	**0**	**36**	**7**	**16**	**3**	**0**	**2**
Cervix Uteri	14	0.8%	0	14	10	4	0	8	1	1	0	0	0
Corpus & Uterus, NOS	38	2.1%	0	38	33	5	0	20	4	7	1	0	1
Ovary	18	1.0%	0	18	16	2	0	4	2	7	2	0	1
Vagina	3	0.2%	0	3	2	1	0	2	0	0	0	0	0
Vulva	7	0.4%	0	7	3	4	0	2	0	1	0	0	0
MALE GENITAL SYSTEM	**328**	**18.0%**	**328**	**0**	**247**	**81**	**0**	**4**	**200**	**21**	**8**	**1**	**0**
Prostate	322	17.7%	322	0	241	81	0	0	224	9	7	1	0
Testis	5	0.3%	5	0	5	0	0	3	1	1	0	0	0
Penis	1	0.1%	1	0	1	0	0	0	0	0	1	0	0

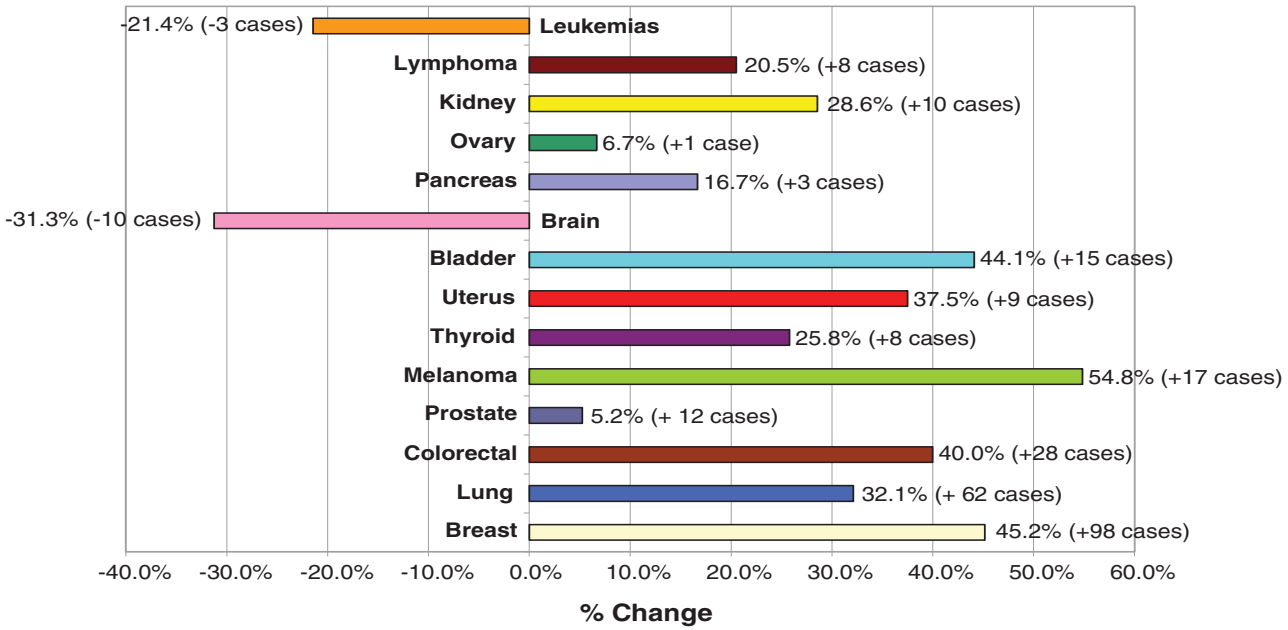
Primary Site	Cases	%	Sex		Class of Cases		Stage Distribution - Analytic Cases Only						
			M	F	Analytic	Non-Analytic	0	I	II	III	IV	Unk	Blank/Inv
URINARY SYSTEM	**123**	**6.7%**	**88**	**35**	**96**	**27**	**32**	**29**	**11**	**6**	**17**	**1**	**0**
Urinary Bladder	70	3.8%	50	20	49	21	28	8	8	2	3	0	0
Kidney & Renal Pelvis	51	2.8%	36	15	45	6	2	21	3	4	14	1	0
Ureter	2	0.1%	2	0	2	0	2	0	0	0	0	0	0
BRAIN & OTHER NERVOUS SYSTEM	**74**	**4.1%**	**25**	**49**	**52**	**22**	**0**	**0**	**0**	**0**	**0**	**0**	**52**
Brain	23	1.3%	11	12	22	1	0	0	0	0	0	0	22
Other Nervous System	51	2.8%	14	37	30	21	0	0	0	0	0	0	30
ENDOCRINE SYSTEM	**52**	**2.9%**	**18**	**34**	**46**	**6**	**0**	**26**	**4**	**3**	**6**	**0**	**7**
Thyroid	42	2.3%	11	31	39	3	0	26	4	3	6	0	0
Other Endocrine (including Thymus)	10	0.5%	7	3	7	3	0	0	0	0	0	0	7
LYMPHOMAS	**70**	**3.8%**	**39**	**31**	**47**	**23**	**0**	**14**	**13**	**4**	**15**	**1**	**0**
Hodgkin Lymphoma	6	0.4%	5	1	5	1	0	1	2	2	0	0	0
Non-Hodgkin Lymphoma	60	3.7%	29	31	34	26	0	13	11	2	15	1	0
MULTIPLE MYELOMA	**32**	**1.8%**	**18**	**14**	**17**	**15**	**0**	**0**	**0**	**0**	**0**	**0**	**17**
Multiple Myeloma	32	1.8%	18	14	17	15	0	0	0	0	0	0	17
LEUKEMIAS	**30**	**1.6%**	**17**	**13**	**11**	**19**	**0**	**0**	**0**	**0**	**0**	**0**	**11**
Lymphocytic Leukemia	18	1.0%	11	7	5	13	0	0	0	0	0	0	5
Myeloid & Monocytic Leukemia	10	0.5%	5	5	4	6	0	0	0	0	0	0	4
Other Leukemia	2	0.1%	1	1	2	0	0	0	0	0	0	0	2
MESOTHELIOMA	**7**	**0.4%**	**5**	**2**	**5**	**2**	**0**	**1**	**2**	**2**	**0**	**0**	**0**
Mesothelioma	7	0.4%	5	2	5	2	0	1	2	2	0	0	0
KAPOSI SARCOMA	**1**	**0.1%**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
Kaposi Sarcoma	1	0.1%	1	0	1	0	0	0	0	0	0	0	1
MISCELLANEOUS	**46**	**2.8%**	**30**	**16**	**29**	**17**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Miscellaneous Sites	46	2.8%	30	16	29	17	0	0	0	0	0	0	0
Total	**1,823**		**923**	**900**	**1,475**	**348**	**115**	**383**	**393**	**200**	**224**	**25**	**135**

RRMC Cancer Registry Data Base
Analytic Cases 2001-2009



*NOTE: These are analytic cases ONLY (diagnosed and/or treated here during the first course of treatment). Since 2005, RRMC has experienced a steady increase in the analytic caseload.

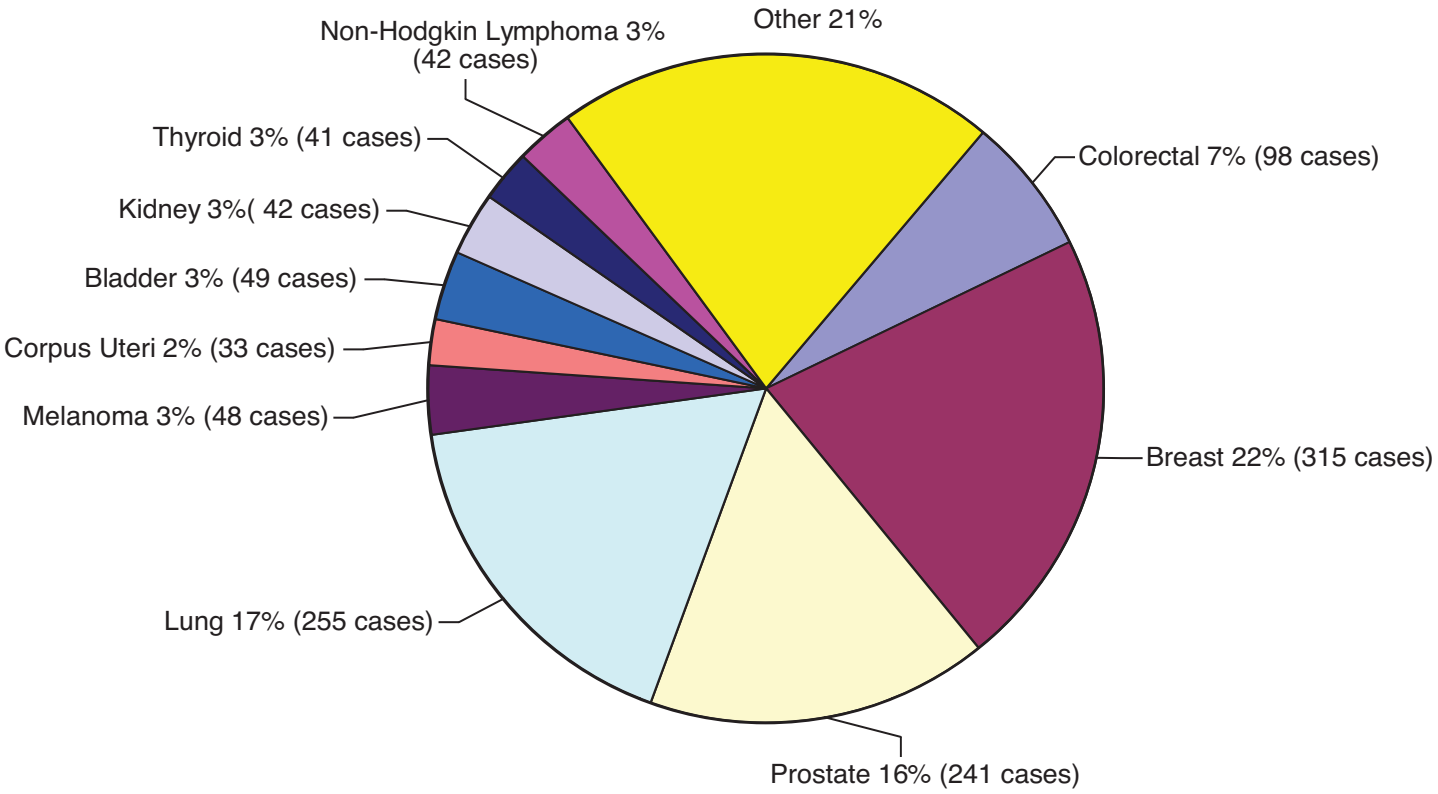
Analytic Cases: % Change 2008-2009
(Diagnosed and /or Treated at RRMC)



RRMC 2009 Top 10 Cancer Sites

(Accounting for both Analytic and Non-Analytic Cases)

(n=1475 cases, "Other" includes all sites not broken out in graph,
analytic refers to cases diagnosed and/or treated at facility)



Colorectal Cancer at Riverside Regional Medical Center

Colorectal Surgeon

Brian Billings, MD
Hampton Roads Surgical Specialists

Adenocarcinoma, the most common neoplasm originating from the colon and rectum, is very common. Recent data show colorectal cancer to be the third most common malignancy in both men and women, and the second most common cause of cancer related death. In 2010, it is estimated 142,570 new case of colorectal cancer will be diagnosed with 51,370 succumbing to their disease.[1]

Colorectal cancer is one of the first malignancies to be traced through its development from early benign genetic changes to invasive malignancy. All colorectal cancers begin with polyp formation which is the basis of colon cancer screening. Early detection of small polyps and their excision can reduce the mortality from colon cancer. The Federal Agency for Health Care Policy and Research, under the recommendations of the American College of Gastroenterology, American Gastroenterological Association, American Society of Colon and Rectal Surgeons, American Society for Gastrointestinal Endoscopy, and Society of American Gastrointestinal Surgeons developed clear guidelines for colorectal cancer screening (**Table 1**). Unfortunately, it is estimated only 10%-30% of adults over 50 years of age are appropriately screened.[2]

Table 1

RISK CATEGORY	SCREENING METHOD	AGE TO BEGIN SCREENING
Average Risk	Choose on of the following: • FOBT* Annually • Flexible Sigmoidoscopy ever 5 yr • FOBT Annually + Flex. Sigmoidoscopy every 5 yr • Air Contrast BE every 5-10 yr • Colonoscopy every 10 yr	50 yr
Family History	Choose one of the following: • Colonoscopy every 10 yr • Air contrast BE every 5 yr	40 yr, or 10 yr before diagnosis of the youngest affected family member, whichever is earliest
HNPCC	Colonoscopy every 1-3 yrs	21 yr
FAP	Flexible Sigmoidoscopy or colonoscopy every 1-2 yr	Puberty
Ulcerative Colitis	Colonoscopy with biopsies for dysplasia every 1-2 yr	7-8 yr after the diagnosis of pancolitis; 12-15 yr after the diagnosis of left-sided colitis

FOBT-Fecal Occult Blood Testing
HNPCC-Hereditary NonPolyposis Colon Cancer (Lynch Syndrome)
FAP-Familial Adenomatous Polyposis

Colonoscopy involves a bowel cleansing regimen followed by an outpatient procedure with light sedation and carries very little surgical risk. At the time of the colonoscopy, every effort is made to survey the entire colon and to remove any polyps identified. If the polyp is not amenable to endoscopic resection due to size or location, it will be biopsied and submitted for pathology. Generally any polyp not amenable to endoscopic resection deserves surgical resection depending on the fitness of the patient.

The possible relation between colorectal cancer and dietary factors has been studied extensively. While the data may be contradictory regarding decreased dietary fat, red meat and increased fruits and vegetables it appears decreasing daily alcohol consumption, increasing dietary or supplemental calcium and daily NSAID use may be protective. There are genetic or hereditary sources of increased risk as well. Family members of patients with a history of colorectal cancer carry an increased risk of colon cancer. Three well defined genetic syndromes have been identified which carry a significant risk of colorectal cancer.

Familial Adenomatous Polyposis (FAP) inherited as an autosomal dominant, was the first such syndrome identified. This involves a mutation in the APC gene and carries a 100% risk of colon cancer, usually at a young age. The syndrome is often identified on screening colonoscopy with a finding a polyps carpeting the colon. With the advent of advanced genetic screening, family members at risk can be identified early and offered prophylactic life saving surgery prior to the development of colorectal cancer.

Hereditary NonPolyposis Colon Cancer (HNPCC) or Lynch Syndrome is similar to FAP but with decreased number of polyps and increased risk of cancers outside the colon and rectum. It is also inherited in a dominant fashion. Again, the proband, or first patient identified at risk, is usually found on colonoscopy or early onset colon cancer. There are screening guidelines available to identify patients who should go on to genetic investigation for the syndrome. Patients identified via criteria will undergo genetic screening with blood tests. Peninsula Cancer Institute (a member of Riverside Medical Group) and Myriad Genetics can now offer these forms of advanced genetic screening to the Riverside community. Patients identified as having HNPCC, and their family members deemed to be at risk by genetic screening can be offered prophylactic surgery-removing the colon at risk for future malignancy-and greatly reduce their risk of colorectal cancer and extra-gastrointestinal malignancies.

MYH Associated Polyposis (MAP) is a more recent discovery. This involves a mutation in the MYH gene and contrary to HNPCC and FAP, is inherited in a recessive fashion. It is believed the risk of future colorectal cancer in patients with the defect is similar to HNPCC and the recommended surgery is identical.

Certain chronic diseases of the gastrointestinal tract can lead to increased risk of colorectal malignancy, most notably Chronic Ulcerative Colitis and to a lesser extent Crohns disease. The increased risk of colon cancer warrants frequent surveillance colonoscopies in these patients, especially those with disease over eight years duration. Findings on colonoscopy can lead to life saving prophylactic surgery.

Staging colon and rectal cancer, like most malignancies, relies on American Joint Committee on Cancer (AJCC) **TNM** staging system. The **T** stage represents the depth of invasion by the tumor. It is roughly divided into five classes. **Tis** represents a carcinoma in situ, this has low malignant potential. **T1** neoplasms have invaded the submucosa of the colon. **T2** tumors have invaded the muscularis propria. **T3** tumors have penetrated the full thickness of the colon or rectal wall, and **T4** tumors have invaded structures next to the colon. The **N** stage represents the status of lymph nodes draining the colon associated with the neoplasm. It is divided into three categories. **N0** with no lymph node involvement, **N1** with 1-3 lymph nodes involved, **N2** with more than 4 lymph nodes involved. The **M** stage is only divided into two stages dependant on the presence (**M1**) or absence of (**M0**) distant metastatic disease.

After the diagnosis of colorectal cancer is made, the patient will undergo preoperative (or clinical staging) with radiographic evaluation (CT scan, MRI and Ultrasound). The outcomes of preoperative staging help define surgical management. Pathologic staging refers to the evaluation of the resected specimen by a Pathologist. Staging is critical in the treatment of colorectal cancer as it allows identification of patients at increased risk for local recurrent disease or metastatic disease. It is based in the pathologic staging that decisions regarding chemotherapy or radiation therapy are based.

Surgical management of colon and rectal cancer is predicated on the segmental blood supply each portion of the

colon receives. This segmental blood supply identifies the lymph nodes reliably responsible for draining specific areas of the colon and rectum. During surgery, these draining lymph nodes are removed with the colon involved. Most colon cancers can be resected with a primary anastomosis thus preserving intestinal continuity. Colostomies are uncommon and reserved for cases of obstruction or perforation of the colon.

In 2004 Nelson et al in the COST trial evaluated the efficacy of laparoscopic colon resection for malignancy. Their study with almost 5 years of follow up, showed similar rates of recurrence and no difference in survival between conventional or open surgery vs. minimally invasive laparoscopic surgery. Laparoscopic colorectal surgery offers several advantages compared to conventional open surgery including decreased length of stay in the hospital, quicker return to work and activities, improved cosmesis, less postoperative pain and shortened time to tolerating diet. These procedures require advanced training. At Riverside, we perform the vast majority of our colorectal cancer surgery laparoscopically. Additionally, the availability of a high volume surgeon specializing in Colorectal Surgery has been found to be associated with lower perioperative complications and improved survival following surgery for colorectal cancer.[3-4]

Rectal cancer is approached differently than colon cancer due to its inherent increased potential for local recurrence. Local recurrence for colon cancer is very uncommon, while the historic local recurrence of rectal cancer has been found to be as high as 30% in the era prior to radiation therapy and advanced surgical techniques. If, on preoperative clinical staging, the tumor is found to have penetrated the wall of the rectum or if suspicious lymph nodes are identified, surgery is often preceded by chemotherapy and radiation. The goals of chemotherapy and radiation are decreased local recurrence and increased sphincter preservation.

Surgical management of rectal cancers is predicated on the distance of the tumor from the anal sphincters and anus. Tumors in the proximal rectum (furthest from the anus) can often be resected in a single stage procedure. The tumor is excised and the colon is re-attached to the rectum. Tumors closer to the anus, especially those less than 6 cm require a two stage operation for resection. The connection (anastomosis) between the rectum and the colon after extirpation of the tumor; when less than 6 cm from the anus; is at a significant risk for a leak after resection. A temporary diverting stoma is placed "up stream" in these situations to protect the anastomosis as it heals. Multiple studies have shown a significant increase in sphincter preserving surgery when the surgeon has been specially trained in Colorectal surgery. This translates into decreased permanent colostomy rates for patients with access to these services. Additionally, as with colon cancer, surgeons with specialized training in colon and rectal surgery have been found to have significantly improved survival and recurrence rates when compared to surgeons without this additional training.

1. Cancer Facts and Statistics 2010. Atlanta: American Cancer Society

2. Anderson LM, May DS. Has the use of cervical, breast, and colorectal cancer screening increased in the United States? Am J Public Health 1995;840-842

3. Dimick JB, Cowan JA, Upchurch GR, Colletti LM. Hospital volume and surgical outcomes of elderly patients with colorectal cancer in the United States. J Surg Res 2003;114(1):50-56

4. Gordon TA, Bowman HM, Bass ED et al. Complex gastrointestinal surgery: impact of provider experience on clinical and economic outcomes. J Am Coll Surg 1999;189(1):46-56

Medical Oncologist

Cancer that begins in the colon, roughly the first six feet of the large intestine, is termed colon cancer. On the other hand cancer that begins in the rectum, the final six inches of the straight portion of the large intestine, is known as rectal cancer. Cancers affecting either of these organs are also referred to as colorectal cancer. Both colon cancer and rectal cancer have identical risk factors and biology, but their treatment modalities can differ.

Colorectal cancer affects approximately 147,000 patients in the United States every year. Among all cancers, it is the second leading cause of death in the United States, with about 50,000 deaths annually, affecting both men and women equally. Colorectal cancers arise from adenomatous (precancerous) polyps.

Treatment of colorectal cancer requires a multidisciplinary approach that brings together experts in gastroenterology, colorectal surgery, medical oncology, and radiation oncology. The team works with patients and their families to develop treatment plans tailored to their individual disease circumstances. The type of treatment offered depends upon the stage of the cancer. The stage of a cancer is a description of how much the cancer has spread and takes into account the size of a tumor, whether it has invaded adjacent organs, how many lymph nodes it has spread to, and whether any distant organs are affected by cancer. Staging is usually determined at the time of surgery and with diagnostic imaging such as CT scans. Staging is important because the stage is the most powerful predictor of survival and treatment can be altered based on the stage.

Surgical resection of the bowel is the only necessary treatment for stage 0 colon cancer, when cancer is found only in the innermost lining (mucosa) of the colon, and stage I colon cancer, when cancer is confined to the inner lining or muscular wall of the colon, but has not penetrated the outer wall of the colon.

Stage II colon cancer extends through the outer muscular wall of the colon, but no cancer is found in the lymph nodes. Surgery is the standard treatment for Stage II colon cancer and chemotherapy is recommended on an individual basis if the cancer has certain high risk features that increase risk of recurrence. Stage III colon cancer has spread outside the colon to one or more lymph nodes near the bowel. Patients with stage III cancer benefit from chemotherapy after they have recovered from surgery.

John Miller, MD
Peninsula Cancer Institute

Chemotherapy given after the cancer is surgically removed is termed adjuvant chemotherapy. Surgery may not eliminate all of the cancer cells, so the goal of adjuvant chemotherapy treatment is to kill any cancer cells that remain in the body. 5-Fluorouracil (5-FU) , an intravenous chemotherapy, has been the first-choice drug for colorectal cancer treatment for many years. It is used in combination with leucovorin, a vitamin, which enhances the effectiveness of 5-FU. Oxaliplatin (Eloxatin) is another intravenous chemotherapy drug that is used in conjunction with 5-FU and leucovorin and is commonly used in the United States for the treatment of colon cancer in a regimen known as FOLFOX. Capecitabine (Xeloda) is an oral form of 5-FU that can be used in the adjuvant treatment of high risk stage stage II and stage III colon cancers. Most adjuvant treatment regimens typically last for 24 weeks.

In Stage IV colon cancer, the cancer is metastatic and has spread outside the colon to other parts of the body, typically the liver or lungs. Treatment for Stage IV colon cancer varies. Surgery is used to prevent blockage of the colon and maintain normal function. Also, surgery is performed to remove cancer that has spread to the liver or lung in some cases, but surgical procedures can not be done in the majority of these cases.

Chemotherapy is the mainstay treatment to control symptoms in metastatic disease. In the last decade many new options have developed for the treatment of metastatic disease. In 2004, the U.S. Food and Drug Administration approved bevacizumab (Avastin) and cetuximab (Erbitux) and in 2006 Panitumumab (Vectibix) received approval for the treatment of colorectal cancer. Avastin impedes angiogenesis, the process tumors use to develop new blood vessels to receive nutrients needed to survive. Cetuximab and Panitumumab target a protein called the epidermal growth factor receptor (EGFR) found on cancer cells. Although, chemotherapy does not cure metastatic colon cancer it can increase overall survival and improve quality of life.

Cancers arising in the rectum are associated with a

higher overall risk of recurrence than the recurrence risk associated with similar stages of colon cancer and are treated in a different manner. In Stage II and III rectal cancer chemotherapy and radiation therapy are combined and used prior to surgery in a manner called neoadjuvant therapy. Stage IV rectal cancers are treated in a similar manner to Stage IV colon cancers.

Follow-up care for colon cancer after completion of treatment is vital because the disease can return. Physical exam, laboratory tests, colonoscopy, CT scans, and other tests can help identify any health changes. As with any other cancer, early detection of these changes can significantly improve outcomes.

Radiation Oncologist

Mark Chisam, MD
Radiation Oncology Specialist

In 2009, an estimated 40,870 new cases of rectal cancer were diagnosed. The most common type of rectal cancer is adenocarcinoma, which is a cancer arising from the lining of the rectum. Cancer cells typically grow within the wall of the rectum, but can spread to the lymph nodes on their way to other parts of the body. The prognosis and treatment of rectal cancer depends on how deeply the cancer has invaded the rectal wall, lymph node involvement, or if the tumor has spread to other parts of the body.

Patients with rectal cancer most commonly present with bleeding, anemia or change in bowel symptoms. Evaluation should include a colonoscopy, staging CT scans, laboratory work including CEA (carcinoembryonic antigen) and an endorectal ultrasound.

Determination of an optimal treatment plan for rectal cancer is a complex process. At Riverside, the work up and management of all patients diagnosed with rectal cancer is coordinated by a team of physicians consisting of a medical oncologist, surgical oncologist and radiation oncologist. The goals of treating localized rectal cancer are to ensure the removal the cancer and to prevent a recurrence of the disease. Just as important is the preservation of normal bowel function with minimal impact of the quality of life.

For very small tumors, surgery is likely to be the only necessary step in treatment. However, for more advanced tumors, chemotherapy and radiation therapy may be required. Because the rectum is in the pelvis and in close proximity to the anal sphincter (the muscle that controls the ability to hold stool in the rectum), rectal surgery can be difficult. In some cases, chemotherapy and radiation therapy can be delivered before surgery to shrink to tumor, which may allow for sphincter preservation. Surgical resection typically follows in 5 to 10 weeks followed by a discussion with their oncologist to determine if any additional chemotherapy will be needed.

Typically, radiation treatments are given daily, 5 days a week, for up to 6 weeks. Each treatment lasts only a few minutes and is completely painless; it is similar to having an x-ray film taken. The main side effects of radiation therapy for rectal cancer include mild skin irritation, diarrhea, rectal or bladder irritation, and fatigue. These side effects usually resolve within a few weeks of completing treatment.

Because a risk exists of rectal cancer coming back after treatment, routine follow-up care is necessary. Follow-up care usually consists of regular visits to the doctor's office for physical exams, blood studies, colonoscopy and other imaging studies.

Pathologist

The American Cancer Society states: “Not counting skin cancers, colorectal cancer is the third most common cancer found in men and women in this country”. However, the death rate from colorectal cancer has been going down. This is likely due to increased screening of patients and earlier treatment of colorectal cancers, along with improvements in available types of treatment.

Patients who have no symptoms may undergo a screening colonoscopy performed by a gastroenterologist or other physician. Patients with symptoms, such as rectal bleeding, may undergo this same procedure for diagnosis. The endoscopist (physician performing the colonoscopy) will perform biopsies of polyps or masses identified through the endoscope. The tissue biopsy samples are then sent to the pathology laboratory for processing. Once glass slides containing stained sections of the tissue biopsy or biopsies are prepared, the pathologist will perform a microscopic examination.

Polyps of the colon and rectum are commonly found during colonoscopy. Some colon polyps are diagnosed as one of several variants of “adenoma”. An adenomatous polyp of the colon or rectum has abnormalities that are pre-malignant. This means that the polyp has the potential to develop into cancer at a future date.

Cancers of the colon and rectum are almost always adenocarcinomas (or gland-forming cancer). Adenocarcinoma is usually diagnosed when the endoscopist identifies a mass and takes biopsies. Sometimes, an adenomatous polyp may contain areas of invasive adenocarcinoma.

Once a patient is diagnosed with colon or rectal cancer, he or she is likely to have the cancer removed by a surgeon. The pathologist will examine the colon / rectal resection specimen obtained during surgery. One of the primary goals of this examination is to establish the extent of cancer in the specimen, also known as cancer staging. Both the depth of invasion by the cancer through the wall of the colon/ rectum and invasion into any adjacent structures, if present, will be identified. Lymph nodes are present alongside the segment of colon or rectum within fatty tissues in the resection specimen. They will be carefully examined for metastasis (spread) of the cancer. These two elements, tumor depth and lymph node involvement, (if present) along with any identified distant metastasis (usually determined by other means) are used to establish the stage of the patient’s cancer. The stage of a colon or rectal cancer is the most important information used in establishing a prognosis (forecasting the likelihood of long-term survival or cure). The lower the stage of cancer, the higher the chance of long-term survival.

David Smith, MD
Peninsula Pathology Associates

Colorectal cancer research has led investigators to discover several genetic pathways where adenomatous polyps transform into invasive cancer. While most colon and rectal cancers are thought to arise sporadically (not inherited), there are several forms of inherited cancer. Newer genetic tests are available to evaluate if a colon or rectal cancer patient fits into an inherited pattern. Genetic counseling and screening may then be recommended to the patient and their close relatives.

Colorectal Navigator

Harolette Kelley, RN, BSN

The Colorectal Cancer Navigator is a brand new position at Riverside Regional Medical Center. I'm starting from scratch, but with the prior disease-specific cancer patient Navigation programs at Riverside, I have other established models to help guide me. My challenge has been to work with other team members to tailor a program that uniquely serves this population of patients and their families. I have found my role to be two fold. Colorectal cancer is the third most commonly diagnosed cancer and the second leading cause of cancer death in both men and women in the US. That being said, the first part of my role is to support my patients and their families once they have been diagnosed, through the cancer care continuum. This includes identifying and addressing any barriers to care, being their one-stop resource person, and providing emotional and educational support. Unfortunately, there are many disparities in healthcare, and our healthcare system is increasingly sophisticated-but complex. The ultimate goal for all of our patients is early diagnosis and treatment at a curable stage. I've found I really enjoy meeting people, forming new relationships and "paying it forward'. The other part of my role is to participate in increasing community awareness for colorectal screening. I want people to know that colorectal cancer screening saves lives!

In the beginning I spent a good deal of time establishing relationships with surgeons, gastroenterologists, nurses and other community resources. They have all helped me to define my role further by sharing a wealth of information about colorectal cancer and its treatment. Daily I am reminded there is always much more to learn. One of my primary goals is to bridge gaps between in-patient and out-patient care. At each point in their treatment, be it surgery, chemotherapy or radiation, our patients have cancer care team members providing their expertise to them and their family members. All of our patients deserve timely access to quality medical care so they can achieve better outcomes. I can help them to figure out what assistance they need and where to find it. Whether it is financial assistance, problems with transportation, counseling or food that is needed, I strive to step in and help fill in the gaps.

When patients hear that they have colorectal cancer, they are so "shell-shocked" they don't know what questions need to be asked or what steps need to be made next. It's a difficult and confusing time. Many people wonder: "Am I going to die? What about my children, spouse and family members? What about my job and finances? A cancer diagnosis is often life-changing and all of these threats to "normalcy" can be overwhelming. This is where I can be most useful. I am available as a constant link, ensuring they have the information, knowledge and support they need. We don't want anyone to "fall through the cracks" because they lack resources.

The second part of my role is assisting with development of community outreach and education initiatives. With regular screening, colorectal cancer can be found early, when treatment is most effective. It is vital to educate the public about colorectal cancer screening. Discussions about colorectal cancer is sometimes awkward or considered inappropriate in our society because it affects parts of the body that people often find embarrassing to talk about. Misunderstandings about this simple screening process are common. Lack of general public awareness of the disease has kept colon cancer patients unaware of their treatment options and prevented early detection and treatment in far too many cases. It's definitely time to make a change.

Just think, not too long ago, this diagnosis meant that a person wouldn't be around for long. Now there are new drugs, treatments and therapies to extend the quality and length of life. I am still constantly learning and defining my role each day. Even though some days can be very trying, it's so rewarding when someone says "you have made my day. Thank you so much." I am grateful to be part of a very important program that can help save lives and improve the quality of lives touched by colorectal cancer.

Riverside Cancer Registry Data

Figure 1: Total Number of Analytic Colorectal Cases from 2005 to 2009 (n= 396)

** includes sites C180 - C189, C209 only*

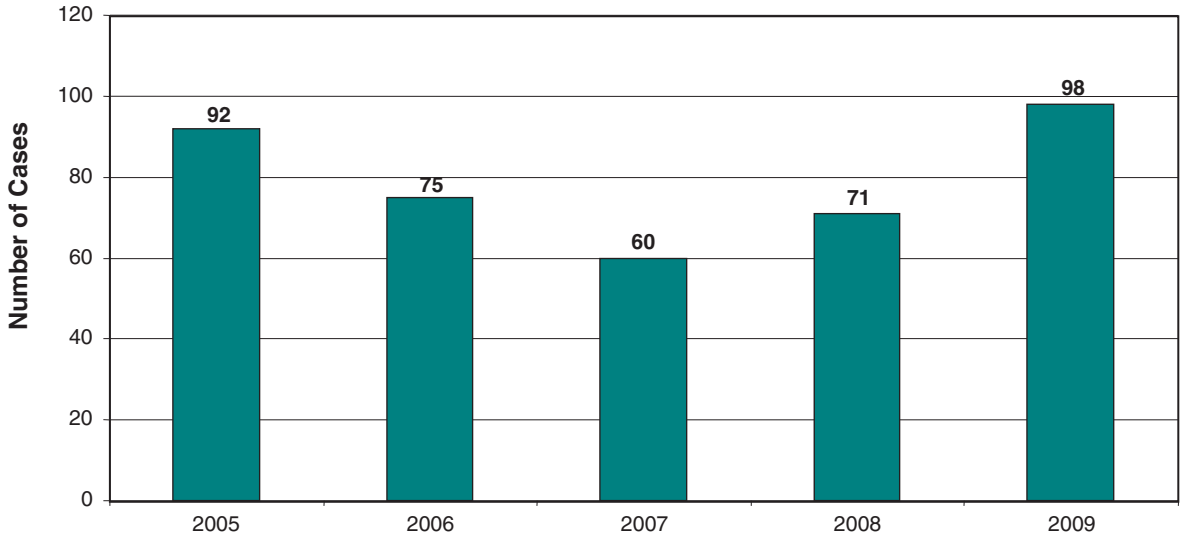


Figure 2: Distribution of Sex vs. Race for Analytic Colorectal Cancers Diagnosed from 2005 to 2009 (n= 394)

**includes sites C180 - C189, C199, C209*

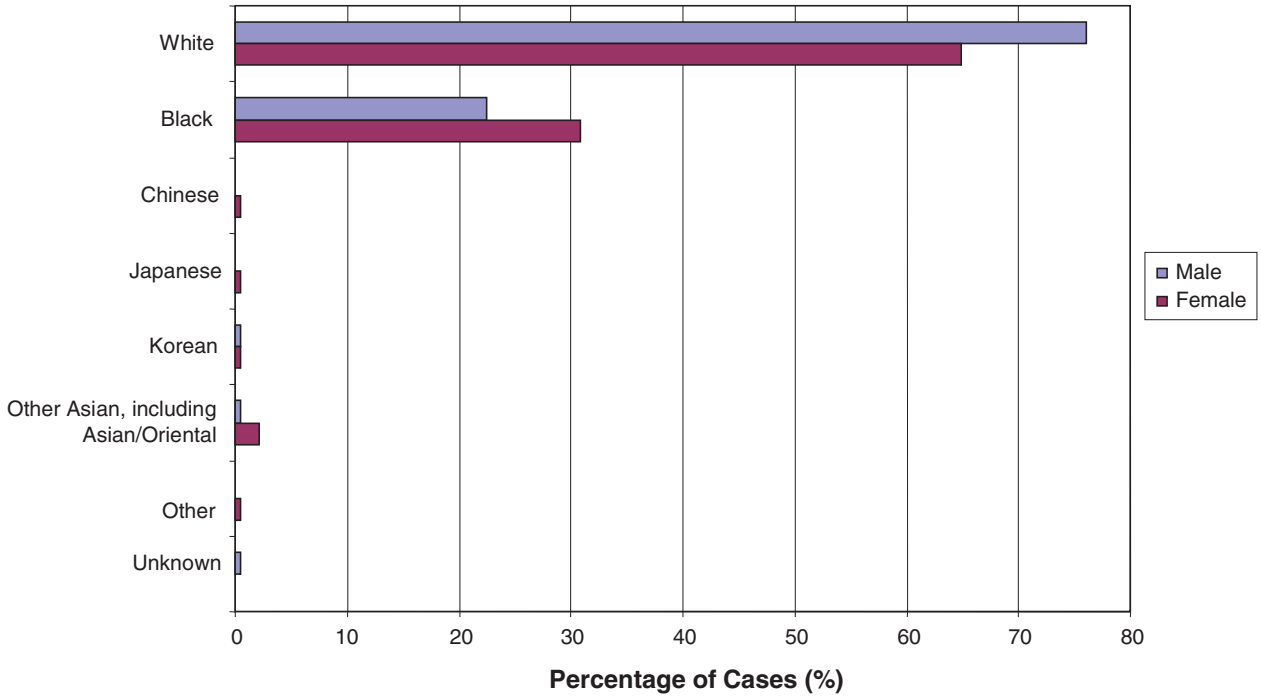


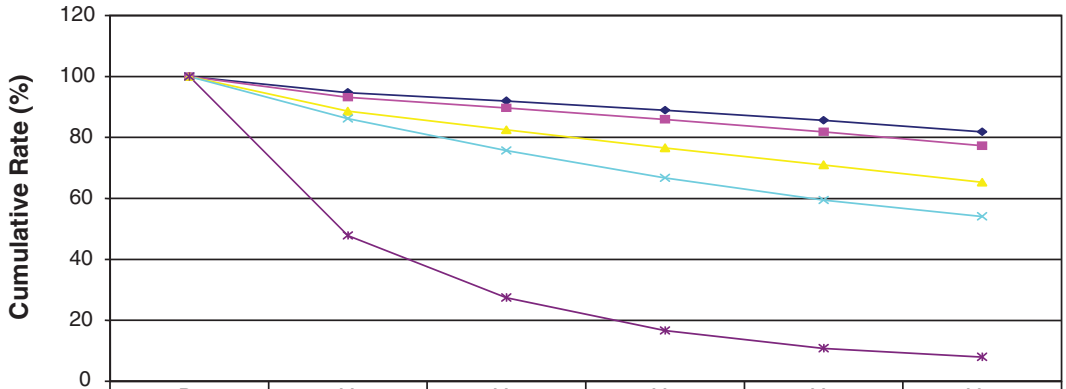
Figure 1 shows the analytic caseload growth since 2007. In 2009 RRMC reached a record number of colorectal cases seen in the last 5 years.

Figure 2 demonstrates that among all races seen at RRMC, colorectal cancer is more prevalent in whites. There does not appear to be a favoring between sexes.

Riverside Cancer Registry Data

Figure 3: 2003 Observed 5-Year Survival Rate for Colorectal Cancer - NCDB Comprehensive Community Cancer Centers (545 Programs)

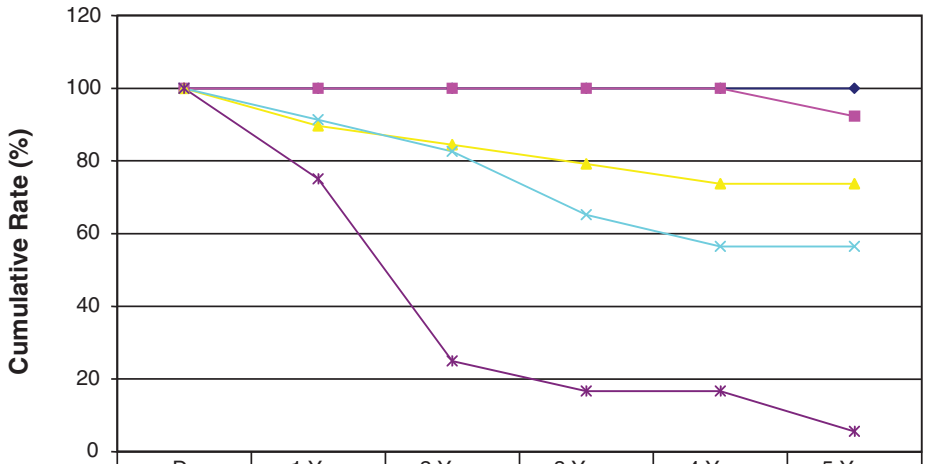
** rectosigmoid and anus were excluded*



	Dx	1 Year	2 Years	3 Years	4 Years	5 Years
Stage 0 n=2745	100	94.7	92	88.9	85.6	81.8
Stage I n=8168	100	93.2	89.7	85.9	81.8	77.3
Stage II n=9024	100	88.6	82.5	76.6	71	65.3
Stage III n=8508	100	86.2	75.7	66.7	59.4	54.1
Stage IV n=6427	100	47.8	27.4	16.6	10.8	8

Figure 4: 2003 Observed 5-Year Survival Rate for Colorectal Cancer at RRMC

** Analytic cases only, rectosigmoid and anus were excluded*



	Dx	1 Year	2 Years	3 Years	4 Years	5 Years
Stage 0 (n=2)	100	100	100	100	100	100
Stage I (n=17)	100	100	100	100	100	92.3
Stage II (n=20)	100	89.7	84.5	79.2	73.7	73.7
Stage III (n=23)	100	91.3	82.6	65.2	56.5	56.5
Stage IV (n=12)	100	75	25	16.7	16.7	5.6

Figures 3 and 4 illustrate colorectal survival rates for both Comprehensive Community Hospitals nationwide and Riverside Regional Medical Center. RRMC survival rates are in concordance with national trends.

Thyroid Cancer at Riverside Regional Medical Center

Surgeon

Thyroid cancer is not an uncommon entity, with the National Cancer Institute estimating 44,670 new cases with 1,690 deaths in 2010. Surgical management of these tumors can be somewhat complicated, as well as controversial. However, an attempt will be made to discuss the more commonly accepted mechanisms of treatment of thyroid cancer.

Treatment of thyroid cancer is reserved for surgical removal of thyroid tissue, as well as postoperative radiation therapy. Occasionally, additional therapy may be indicated, including chemotherapy and external beam radiation therapy, but these latter treatments are usually reserved for very advanced carcinoma. Fortunately, this advanced carcinoma is not the norm, and the vast majority of thyroid malignancies are treated with the former modalities.

Discussion of the treatment of thyroid cancer must first be initiated by discussion of the most common entities. The thyroid cancers are usually divided into papillary carcinoma, follicular carcinoma, medullary carcinoma, and anaplastic carcinoma. There may be some rare carcinomas such as squamous cell lymphomas or plasma cell tumors. However, for this discussion, we will limit it to the above four.

Papillary carcinomas comprise approximately 80% of all malignancies in the United States. They may develop at any age, but are most commonly seen between the third and the fifth decades with a female propensity of approximately 2-1. There is a propensity for multicentricity; however, these are fairly slow-growing tumors with an overall excellent prognosis.

Follicular carcinomas comprise approximately 10% of carcinomas and are more common in iodine-deficient areas. Although slightly more aggressive than papillary carcinomas, there is still a high degree of success with treatment of these carcinomas.

Medullary carcinomas comprise approximately 5% of all thyroid malignancies, and they are much more aggressive than either follicular or papillary carcinomas. There is also a high degree of metastasis to cervical lymph nodes.

Anaplastic carcinomas are fairly rare and usually affect the elderly population. These are very aggressive tumors with very poor prognoses. Fortunately these are quite rare.

Pierre Martin, MD

Thyroid cancer may manifest with either regional or distant metastasis. This also is markedly important when determining the surgical and postsurgical treatment.

The type of surgery that should be performed can be somewhat controversial. Frequently thyroid cancer cannot be determined preoperatively and may be determined intraoperatively when a portion of the thyroid gland has been sent to the pathologist for intraoperative determination. Should this intraoperative determination reveal carcinoma, further surgery is necessary.

The most common controversy is the amount of thyroid tissue to be removed with the diagnosis of a carcinoma. There are proponents for a total thyroidectomy (complete removal of the thyroid tissue) versus a subtotal thyroidectomy (a procedure leaving behind some thyroid tissue).

The advantages of a total thyroidectomy are numerous. However, first and foremost, it is thought to be a better oncologic operation. Removal of all thyroid tissue, especially in papillary carcinoma, which has a propensity for multicentricity, is thought to be advantageous. In addition, any thyroid tissue that is left behind may facilitate the need for postoperative diagnostic scans to rule-out any potential recurrence. Tissue left behind may also need to be ablated with radioactive iodine before any effective scanning or treatment.

A total thyroidectomy is probably the most commonly accepted treatment for a thyroid carcinoma; however, some may argue that a subtotal thyroidectomy has its advantages. These include simplicity along with less morbidity. The morbidity of a thyroidectomy includes injury to parathyroid glands, located adjacent to the thyroid gland, as well as injury to the recurrent laryngeal nerves, which lie underneath the thyroid gland,

which are responsible for vocal production. Subtotal thyroidectomy has a less incidence of injury to these structures.

If thyroid carcinoma does extend beyond the level of the thyroid gland, further treatment is usually indicated. The majority of thyroid carcinomas (follicular and papillary) rarely spread other structures and, if they do, it is most common in the cervical area. Only 20% will have a likelihood of spread. This rate, however, is higher in medullary and anaplastic carcinoma. Usually if any lymph nodes are present in the central neck, where the thyroid gland is located, these are usually removed. Should the lymph nodes be spread to the lateral neck, consideration may be given for a neck dissection. This is a procedure that has many variances. However, the standard neck dissection performed for thyroid carcinoma is limited to stripping the involved neck of all lymphatics and fat, leaving behind vital structures such as the sternocleidomastoid muscle, as well as any large blood vessels and important nerves. Prophylactic neck dissections are not performed and have very limited usefulness. Hence, surgical removal of the lymph nodes is usually performed only when disease is well-documented.

A common scenario encountered is that of an intraoperative pathologic determination which is found postoperatively to be malignant. In this case, the surgeon usually removes a portion of the thyroid gland, sends this to the pathology department for intraoperative determination, and it is found to be a benign entity. The remainder of the thyroid tissue is left intact, and the surgery completed.

Occasionally the surgeon may find out from the pathology department that the original determination was inaccurate and, upon further review of the specimen, carcinoma may be found. In this case, the patient will require completion thyroidectomy. This is usually best performed within the first week. Controversy exists whether this is indeed necessary. These people may argue that removal of the carcinoma itself should suffice. Most, however, agree that for any carcinoma greater than 1 cm in size, that completion thyroidectomy would be indicated since this will allow for improved use of postoperative radiation therapy.

Another scenario frequently encountered is that of a very small carcinoma noted in the thyroid gland, which might be a few millimeters in size and completely excised with the specimen. This can also be somewhat controversial. Most would agree that in these cases, the likelihood of potential spread is minimal; however, frequently the patients' opinions may be consulted. Many patients, especially younger patients, are very uncomfortable with what they may consider inadequate removal of thyroid tissue for a very small carcinoma. Most studies have indicated that carcinomas less than 1 cm in size may be adequately treated with surgical removal alone, which may also include leaving behind some thyroid tissue in the neck. Statistics have shown that patients such as these have a very high degree of success with no recurrence. In this scenario, patients cannot be treated with radioactive iodine since the remaining thyroid tissue may interfere with the results radioactive iodine scanning and treatment.

In summation, thyroid cancer is usually treated with complete removal of the thyroid gland followed by postoperative radiation therapy. When cervical metastasis is present, the lymph nodes in the involved area may need to be removed. Occasionally in very small cancers, partial removal of the thyroid gland may suffice, if the patient is comfortable with this treatment plan.

Treatment of thyroid carcinoma involves very close cooperation between the surgeon, the pathologist and the endocrinologist, all whom have important and appropriate roles in the diagnosis, treatment, and follow-up in such carcinomas.

Medical Oncologist

Carcinoma of the thyroid gland, while an uncommon cancer; is the most common malignancy of the endocrine system, and its incidence has been increasing steadily over the last decade. Annually, the United States has an estimated 45,000 new cases, with about 1700 deaths. Thyroid cancer affects women more often than men, and usually occurs in people between the ages of 25 and 65 years. It commonly presents as a cold nodule. The overall incidence of cancer in a cold nodule is 12% to 15%, but it is higher in people younger than 40 years and in people with calcifications present on preoperative ultrasound.

The most common thyroid cancers are what are usually called the differentiated tumors, which include papillary and follicular carcinomas. They are highly treatable and usually curable, especially in earlier stages.

The less common tumors are the poorly differentiated types, including the medullary carcinomas, and the usually fatal anaplastic carcinomas. These tumors are usually discovered in later stages, and they are aggressive, with early metastases, very poor prognosis, and short survival.

Medullary thyroid cancer (MTC) comprises 3-4 % of all thyroid cancers, and approximately 25 % of these cases are familial, including multiple endocrine neoplasia type 2A (MEN2A), which is the most common; multiple endocrine neoplasia type 2B (MEN2B); and familial non-MEN syndromes. Any patient with a familial variant should be screened for other associated endocrine tumors, particularly parathyroid hyperplasia and pheochromocytoma.

MTC can secrete calcitonin and other peptide substances. Determining the level of calcitonin is useful for diagnostic purposes and for following the results of treatment. In addition, all patients with MTC (whether familial or sporadic) should be tested for ret proto-oncogene, or *RET,* gene mutations. Family members should also be screened for calcitonin elevation and/or for the *RET* mutation to identify other individuals at risk for developing familial MTC. Family members who are gene carriers should undergo prophylactic thyroidectomy at an early age.

In general, the overall survival of patients with MTC is 86 % at 5 years and 65 % at 10 years. Poor prognostic factors include advanced age, advanced stage, prior neck surgery, and associated MEN2B.

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Anaplastic thyroid cancer is not responsive to I^{131} therapy; and it is usually treated with surgery in earlier stages, or external-beam radiation treatment for patients who are not surgical candidates.

The combination of chemotherapy plus radiation therapy in patients following resection may provide prolonged survival but has not been compared to any one modality alone.

The role of the medical oncologist is usually limited to the management of the advanced stages of these malignancies, especially for the above-mentioned differentiated types. They can, however, still be salvaged by surgical resection and/or radiotherapy, including I^{131} therapy. This is especially true in the setting of local recurrence, regional node metastases, or in limited metastatic setting, like single pulmonary metastasis.

The patients who are treated for differentiated thyroid cancer should be followed carefully with physical examination, serum quantitative thyroglobulin levels, and radiologic studies based on individual risk for recurrent disease.

About 10-30 % of patients who are thought to be disease-free after initial treatment will develop recurrence (80 %) and/or metastases (20 %). The most common site of distant metastasis is the lung, followed by bone. The prognosis for patients with clinically detectable recurrences is generally poor, regardless of cell type. However, patients who recur with local or regional tumor detected only by I^{131} have a better prognosis.

Up to 25 % of recurrence and metastases from well-differentiated thyroid cancer may not show I^{131} uptake. For these patients other imaging techniques could be of value; including thallium-201, MRI, and pentavalent dimercaptosuccinic acid. In these cases, external-beam or intraoperative radiation can be useful in controlling the symptoms related to local tumor recurrence.

Chemotherapy has been reported to produce occasional

objective responses, usually of short duration. Several randomized trials have shown clearly that a combination of chemotherapy agents, like Doxorubicin /Cisplatin, is far superior to single agent Doxorubicin, in regards to response rate and quality of response, with no major increase in toxicities.

Another combination chemotherapy with Bleomycin, Adriamycin, and platinum (BAP regimen) was tested in advanced thyroid cancer, in patients who have disseminated disease, unresponsive to hormonal and /or isotopic treatment, with finding of objective in more than 40 % of cases. This included long-lasting complete response in 10 % of cases. Stable disease was also observed in 19 % of cases. The median duration of response was 12 months (range, 6-29 months), with a median survival of 11 months (range, 1-57 months); including 2 out of 22 patients who were actually disease free. Several histologic types of thyroid carcinoma responded, but the best responses were observed in medullary and anaplastic giant-cell carcinomas with the conclusion that the BAP regimen can achieve reasonable palliation, and probably increase survival in poor- prognosis thyroid cancers.

Phase II trial (UPCC 03305) looked at the activity of Sorafenib, which is an orally active mutityrosine kinase inhibitor, which affects tumor cell proliferation and angiogenesis. This trial was administered to 30 patients with advanced, iodine-refractory thyroid cancer. Among 25 assessable patients, there were seven patients with partial responses and 16 patients with stable disease. The progression-free survival for differentiated thyroid cancer patients was 84 weeks, warranting further investigation of this approach in phase III trials.

In conclusion, recurrent and advanced thyroid carcinomas, especially the poorly -differentiated types, still present a major challenge in their management. There continues to be an urgent need for a novel treatment approach and more effective agents, especially for the medullary and anaplastic types of thyroid cancer. It is extremely essential that these patients be considered for enrollment in the current investigational trials for theses diseases, some of which are readily available in the local and regional cancer centers.

Radiation Oncologist

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Radiation Oncology Specialist

There were 37,200 new thyroid cancers diagnosed in our country last year and it was seen 2 -3 times more commonly in women than men. This cancer is not common, and accounts only for about 1% of all cancers and less than 1% of United States cancer deaths. The prognosis varies widely. For instance, patients younger than age 45 with differentiated lesions have a good prognosis and this age distinction is included in the current AJCC staging system. Even metastatic disease in papillary and follicular subtypes is stage II, rather than stage IV, in patients younger than 45. At the opposite end of the spectrum is the almost uniformly fatal anaplastic thyroid carcinoma, with all cases considered to be stage IV.

Ionizing radiation is the only well-documented cause of thyroid cancer especially when the exposure occurs before puberty. Data from Hiroshima and Nagasaki has shown that women who were teenagers during the bombings with exposure rates above 0.5 Gy had an almost 8.8 times greater thyroid cancer rate than matched cohorts exposed to less than 0.01 Gy. After the 1986 Chernobyl accident in the Ukraine, an increased number of children developed papillary thyroid cancer from the radioactive exposure.

Histologic types are divided into 3 main categories: differentiated, medullary and anaplastic. Lymphoma involving the thyroid gland can also occur with intermediate grade diffuse large B-cell lymphoma being the most common histologic type.

If possible, surgical resection is the initial treatment of choice for most of these tumors with further therapy requiring a multidisciplinary approach. Endocrinology also plays a critical role in the management of these patients as they require long term suppression of their thyroid-stimulating hormone (TSH) with levothyroxine, a replacement hormone. Serial thyroglobulin levels should be followed after thyroidectomy in patients with differentiated tumors. As thyroglobulin is only produced by the thyroid gland, elevated serum levels after thyroidec-

tomy and I-131 should indicate residual or recurrent differentiated disease.

From a Radiation Oncology perspective, thyroid cancer treatment falls into one of two categories, oral Iodine 131 ablation or treatment or external beam radiation.

Thyroid cells are unique in that they can absorb iodine. The use of I-131 therapy for thyroid conditions started in the 1940s. I-131 has a physical half-life of 8.06 days and a biological half-life ranging from as short as 17 hours to as long as 4- 5 days after thyroidectomy.

A total or near-total thyroidectomy is needed if Iodine 131 is expected to be part of the treatment for well differentiated, meaning papillary and follicular and some Hurthle cell, thyroid cancers. Papillary and follicular tumors make up about 90% of the cases.

Iodine 123 (average of 2 mCi) diagnostic imaging prior to Iodine 131 ablation can show if any large amounts of residual thyroid tissue remains requiring further surgery. It may also show previously undiagnosed metastases requiring alteration of therapy. Disease spread to the lungs is the most common metastatic site. I-123 is now being used instead of low dose I-131 for imaging in order to avoid thyroid "stunning", a condition in which the diagnostic dose used decreases the uptake of subsequent therapeutic doses.

Iodine 131 **ablation** (average 30 - 100 mCi) is used post-operatively to eradicate any remnants of thyroid tissue after thyroidectomy.

Iodine 131 **treatment** (average 100 - 200 mCi) is used to destroy remaining thyroid gland cancer and distant metastases. Currently, the Society of Nuclear Medicine recommends I-131 treatment for differentiated tumors >1.5 cm, tumors <1.5 cm with unfavorable histology, lymph node involvement, multifocal disease, lymphvascular space invasion, extracapsular extension and metastatic disease.

The current Nuclear Regulatory Commission (NRC) guidelines allow all patients receiving I-131 of less than 33 mCi to be given on an outpatient basis. In the past, patients were admitted to the hospital for about 24 to 48 hours after higher doses. Since 1997, even after the administration of 200 mCi, patients can be discharged to home. Few patients are admitted today for I-131 except in rare situations such as medical necessity or when there is concern regarding exposure to household members.

Indications for external beam radiation include non-iodine avid tumors, residual bulky disease that is unlikely to be controlled with I-131 alone, palliation of metastatic disease and superior vena cava syndrome. External beam is also used in conjunction with chemotherapy for anaplastic carcinoma and lymphoma and for patients with recurrence after reaching a maximum life-time cumulative I-131 dose of 800 to 1,000 mCi.

References:

1. NCCN 2010 Guidelines for Thyroid Cancer.
2. Society of Nuclear Medicine Procedure Guidelines for Therapy of Thyroid Disease with Iodine-131. Version 2.0
3. American Thyroid Association Professional Guidelines 2010.

Pathologist

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The thyroid gland is a small, butterfly or shield-like (Greek thureos) endocrine organ located in the anterior neck. The follicular epithelial cells of the thyroid form ball-like follicles that contain a substance called colloid. The colloid is composed primarily of a protein called thyroglobulin that is combined with iodine to produce thyroid hormones that regulate the body's metabolic rate. The parafollicular or C cells of the thyroid are neuroendocrine or neurosecretory cells that synthesize and secrete the hormone calcitonin, used to increase calcium absorption and inhibit bone resorption.

Cancer can arise in the thyroid gland. It is relatively uncommon in the United States (1.5% of all cancers). Four major subtypes of thyroid cancer are recognized:

Papillary thyroid carcinoma
Follicular thyroid carcinoma
Medullary thyroid carcinoma
Anaplastic thyroid carcinoma

The two most common subtypes, papillary carcinoma (75%-85% of cases) and follicular carcinoma (10%-20%) are derived from follicular epithelial cells. Medullary carcinoma (5% of cases) arises from parafollicular C cells. Anaplastic carcinoma (less than 5%) is an undifferentiated tumor whose cells are thought to have undergone genetic alterations that cause them to lose their follicular epithelial identity (cells do not look like follicular cells, do not form follicles, do not produce colloid).

Papillary carcinoma is most commonly seen in younger adults (20s to 40s) and in those with a prior history of radiation exposure. Spread of the cancer is usually via the lymphatic system. Prognosis is generally excellent (95% 10-year survival) but is less favorable in persons over 40 or if the cancer has spread locally outside the thyroid or metastasized to other organs. Genetic mutations associated with papillary carcinoma include RET/PTC fusion genes and BRAF and RAS mutations.

Follicular carcinoma is most frequently seen in older women (40s and 50s). Invasion of blood vessels is more common than lymph nodes, and prognosis depends on extent of local invasion and metastatic spread. Genetic mutations associated with follicular carcinoma include RAS oncogene mutations and PAX8-PPARgamma1 fusions.

Medullary carcinoma may arise sporadically (80% of the time) or as part of a familial syndrome (multiple endocrine neoplasia: MEN2) caused by an inherited genetic activating point mutation in the RET proto-oncogene located on chromosome 10. Prognosis is worse than papillary and follicular carcinoma if the tumor has spread beyond the thyroid.

Anaplastic carcinoma is usually seen in the elderly (over 65) and is extremely aggressive with close to 100% mortality (former Supreme Court Chief Justice William Rehnquist was believed to have anaplastic thyroid carcinoma). Many patients have a history of (or concurrent) differentiated thyroid tumor (e.g. papillary carcinoma).

Thyroid cancer typically presents as a lump, nodule, or mass in the neck but must be distinguished from other more common benign (non-cancerous) conditions including benign neoplasms such as follicular adenomas or non-neoplastic conditions including cysts, nodular hyperplasia (goiter), and thyroiditis. The incidence of solitary palpable nodules in adults in the United States is estimated at 1% to 10% (with as many as 50% of adults developing a nodule during their lifetime), but less than 1% of these will be cancer. In other words, solitary thyroid nodules are extremely common, whereas thyroid carcinoma is rather uncommon.

Fine needle aspiration biopsy (FNA) is key to evaluating thyroid nodules without resorting to immediate surgical removal of the entire thyroid gland. Thyroid FNA, which is most often performed by radiologists, pathologists, endocrinologists, or surgeons, involves extracting a small quantity of cells and other materials (such as colloid) from the thyroid gland with a very small needle. Ultrasound is often used to guide placement of the needle. The material extracted is placed on a glass slide and examined by a pathologist with the aid of a microscope. Since most thyroid nodules are benign, a benign result is the most common FNA interpretation (65% of cases). Thyroid surgery can thus often be avoided for patients with benign diagnoses such as benign follicular nodule (Graves' disease, multinodular goiter) or lymphocytic (Hashimoto's) thyroiditis.

Papillary thyroid carcinoma (PTC) receives its name from its classical architectural pattern. The arrangement of follicular epithelial cells around a central stalk with a blood vessel at its core evokes the image of papillary fronds (think ferns or palm trees). However, the diagnostic hallmark of papillary carcinoma is its constellation of cytologic abnormalities (nuclear enlargement, nuclear grooves, pseudonuclear inclusions, Orphan Annie eyes, etc.). These nuclear changes are frequently readily apparent on FNA cytologic preparations.

While FNA is a useful triage tool and helpful in diagnosing papillary carcinoma, it only allows the pathologist to examine cytologic features (cell morphology), not histologic features (architectural pattern of the tissue). In addition, an FNA biopsy represents only a very small sample of both the nodule and total thyroid tissue. Definitive diagnosis, particularly of follicular neoplasms often requires partial or total thyroidectomy.

Follicular neoplasms include benign follicular adenomas, follicular carcinoma, and the follicular variant of papillary thyroid carcinoma (FVPTC). Each of these has a pattern similar to normal thyroid (circles of cells surrounding colloid), although they usually have more cells and less colloid. FVPTC can be distinguished by its cytologic features, which are the same nuclear abnormalities seen in classical PTC (and hence can often be recognized on FNA). On the other hand, follicular adenomas and follicular carcinomas generally share both cytologic and architectural features and can only be distinguished by examination of the tumor capsule. Follicular carcinoma is distinguished from follicular adenoma by INVASION (invasion of the capsule and/or spread into adjacent thyroid, tissue outside the thyroid, or invasion of blood vessels by the tumor cells).

Under the microscope, medullary thyroid cancer is composed of oval cells arranged in a variety of patterns (ribbons, solid nests, etc.). The tumor may look similar to neuroendocrine tumors of other sites (gut carcinoid, pancreatic neuroendocrine tumor, etc.) Diagnosis often requires the use of immunohistochemical methods to demonstrate the presence of neurosecretory granules (chromogranin A) and calcitonin and thus confirm the neurosecretory and thyroid origin of the tumor cells.

In summary, thyroid cancer is a relatively uncommon disease with a relatively good prognosis that must be distinguished from other, benign, thyroid diseases (goiter, thyroiditis, adenoma) that present in a similar fashion. The pathologist's role is to separate benign from malignant, diagnose thyroid cancer and its specific subtype, and help determine the disease stage and prognosis by confirming local and distant spread of the tumor. A longer term goal is to further elucidate the pathogenesis of thyroid cancers. Currently known factors include environmental risk factors (radiation exposure, possibly long-standing nodular goiter) and genetic factors, both inherited and sporadic.

Riverside Cancer Registry Data

Figure 5: Distribution by Age and Sex for Analytic Thyroid Cancer Cases at RRMC 2005-2009 (n=160)

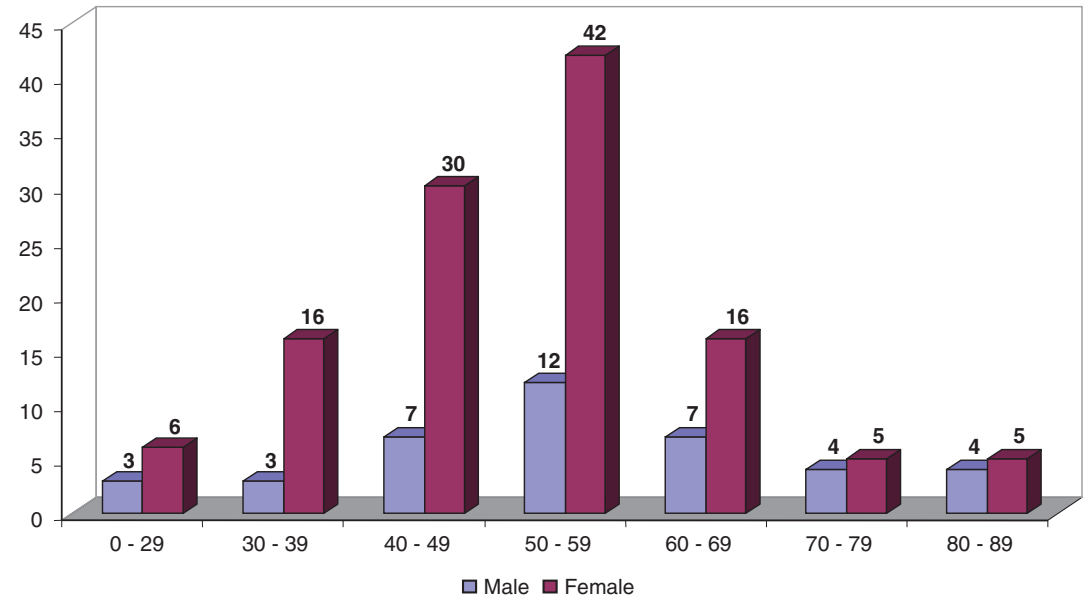

Figure 6: 2000 - 2008 Stage of Thyroid Cancer at Diagnoses, RRMC vs. Other Comprehensive Hospitals in the United States

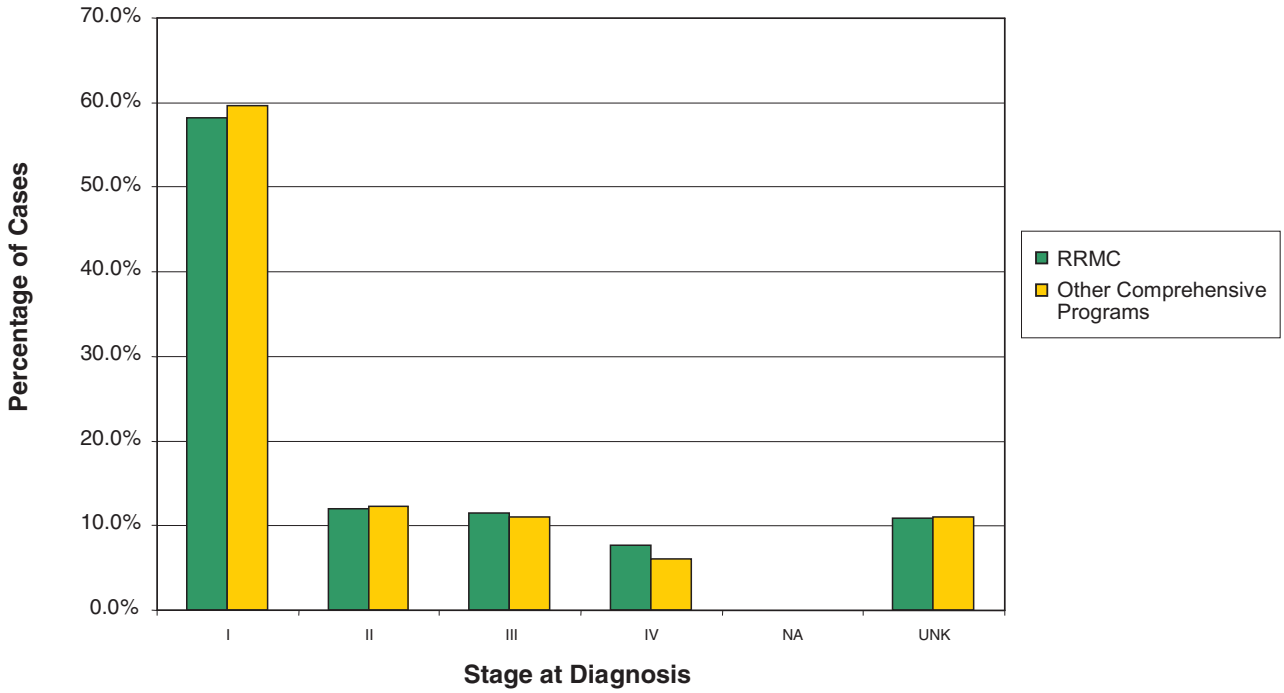

Figure 5 illustrates the bell curve trend for age at diagnosis for both men and women. Thyroid cancer is shown to be more prevalent among women.

Figure 6 shows that staging of thyroid cancer at RRMC follows what is being seen at the national level for comprehensive community hospitals.

Glossary of Terms

Accession

The addition of new cancer cases to the Riverside Cancer Registry.
Each patient is assigned a separate and permanent accession number.

Class of Case

Analytic: The determination of a patient's diagnosis and treatment status at first admission to Riverside Regional Medical Center.

Non-Analytic: Any case first diagnosed and/or receiving all or part of the first course of treatment at Riverside (Class 0, 1, 2).

Any case diagnosed prior to RRMC's reference date (1/1/79), or diagnosed elsewhere and receiving the first course of treatment at that facility, or diagnosed at autopsy (Class3, 4, 5).

Stage of Disease

A process by which the extent of disease at the time of diagnosis is rated according to a recognized system of classification. This process allows morbidity, mortality and treatment efficacy to be reviewed across similar categories of patients.

Summary Stage: General stating system to categorize most cancer sites.
In situ - Non invasive cancer. Also termed pre- invasive, non-filtrating, or Stage 0. A cancer in this category has not spread beyond the immediate area of diagnosis.
Local - Tumor confined to tissue of organ of origin.
Regional - Tumor that has spread directly to adjacent organs or tissues and/or to regional lymph nodes, but has spread no further.
Distant - Tumor that has spread to parts of the body remote from the organ of origin.
Unknown - Stage cannot be determined.

TNM Staging: The American Joint Commission on Cancer Staging System is used at RRMC and is based on assessment of three components:
T - Extent of primary tumor.
N - Extent of regional lymph node metastasis.
M - Absence or presence of distant metastasis.

Age of Patient

Analytic cases: Age is recorded in completed years at time of diagnosis.
Non-Analytic cases: Age is recorded as patient's age when first entered into RRMC Cancer Registry.

Notes

We take cancer personally.

Taking cancer personally means treatment that is as personalized as your fingerprint. We don't just fight cancer; we fight the cancer that affects you and your family. There are many types of cancer.

But only one of YOU.

Cancer Services

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