Rhode Island Hospital
Cancer Program

Annual Report
2011

Report of the Cancer Committee

2011 Annual Report

Rhode Island Hospital Cancer Committee

Content

Content

Introduction

Rhode Island Hospital's Comprehensive Cancer Center offers complete care for patients who have been diagnosed with cancer or hematological disorders. Our team of expert surgeons, medical oncologists, hematologists, radiation oncologists, radiologists, pathologists, nurses, clinical pharmacists, patient navigators, social workers and dietitians are dedicated to the diagnosis, treatment, and prevention of cancer. They closely and compassionately work with patients and families to ensure the best possible care is provided to achieve the best possible outcome.

In 2010, the Cancer Program at Rhode Island Hospital, designated a Teaching Research Hospital, was awarded a 3 year renewed accreditation with commendation from the American College of Surgeons (ACoS), Commission on Cancer (CoC). This voluntary accreditation validates that Rhode Island Hospital's Comprehensive Cancer Center meets and exceeds the rigorous standards set by the American College of Surgeons (ACoS), Commission on Cancer (CoC).

The 2011 Annual Report provides a summary of 2010 Cancer Program statistics. In 2010, a total of 2,671 cases were accessioned into the database; of these, 2,222 were analytic cases and 449 were non-analytic cases. A lifelong follow-up rate of at least 90% is maintained on the patients diagnosed and treated at Rhode Island Hospital.

In 2011, the Cancer Committee elected to conduct an outcome analysis on Bladder Cancer. This report provides an overview of the Rhode Island Hospital experience with this complex cancer. Bladder cancer is one of the most common malignancies in Western society and is the 4th most common type of cancer in men and the 9th most common cancer in women.

2011 Cancer Committee Membership

Pamela Bakalarski, MPA, CCRP	Administrator	Lifespan Oncology Clinical Research
Nancy Barrett	Vice President	Information Services
Cindy Benson, MS, CGC	Genetic Counselor	Genetics Clinic
Lois Brown, RN	Clinical Manager	Ambulatory Pediatric Hematology/Oncology
James Butera, MD	Hematology Oncology	The Comprehensive Cancer Center
Christine Collins, MBA, RPh	Director	Pharmacy
Thomas DiPetrillo, MD	Clinical Director Chair, Cancer Committee	Radiation Oncology
Damian Dupuy, MD	Director	Diagnostic Imaging
Alexandra Fiore	Representative	American Cancer Society
Paulette Gagner, RN, C, BSN	Clinical Manager	Inpatient Pediatric Hematology/Oncology
Douglas Gnepp, MD	Pathologist	Pathology Services
Theresa Graves, MD	Breast Surgeon	Cancer Liaison Physician, American College of Surgeons State Chair
Camille Gregorian, LISCW	Clinical Manager	Clinical Social Work
Marita Headley, RN, BSN, MBA	Clinical Nurse Manager	Adult Ambulatory Hematology/Oncology
Meredith Hurley, RN, BSN, OCN	Clinical Manager	Adult Inpatient Oncology Nursing
Susan Leckie	Manager	Health Information Services
Shannon Levesque, PharmD	Clinical Pharmacist	Pharmacy and Pain Management
Charles Mahoney, RPh, MS	Vice President	Pharmacy & Cancer Services
Beth Measley, RPh	Director	The Comprehensive Cancer Center

Karen Pasquazzi, RD	Senior Dietitian	Adult Ambulatory Hematology/Oncology
Margot Powell, RN	Coordinator	Avon Breast Navigator Program
Peter Quesenberry, MD	Director and Chairman	Adult Hematology/Oncology
Marlene Reidl, RN, CPON	Coordinator	Children's Five ACM (Pediatrics)
Ann Rochette, RN, MS	Coordinator	Tomorrow Fund
Fred Schiffman, MD	Medical Director	The Comprehensive Cancer Center
Cindy Schwartz, MD	Director	Pediatric Hematology/Oncology
Carol Sepe, PT	Clinical Education Coordinator	Rehabilitation Clinical Education
Deborah Smith	State VP of Cancer Control	American Cancer Society
Marsha Stephenson, RN	Clinical Coordinator	Home & Hospice Care of Rhode Island
Debra Sumner, RN	Quality & Saftey Coordinator	The Comprehensive Cancer Center
Tara Szymanski, CTR	Manager	Oncology Data Management
Michael Vezeridis, MD	Surgeon	University Surgical Associates
Adrienne Walsh	Manager	Volunteer Services
Marsha Weiss, RN, MS	LCHS/Director	Community Outreach
Pat Wolfe, PT	Director	Rehabilitation Services

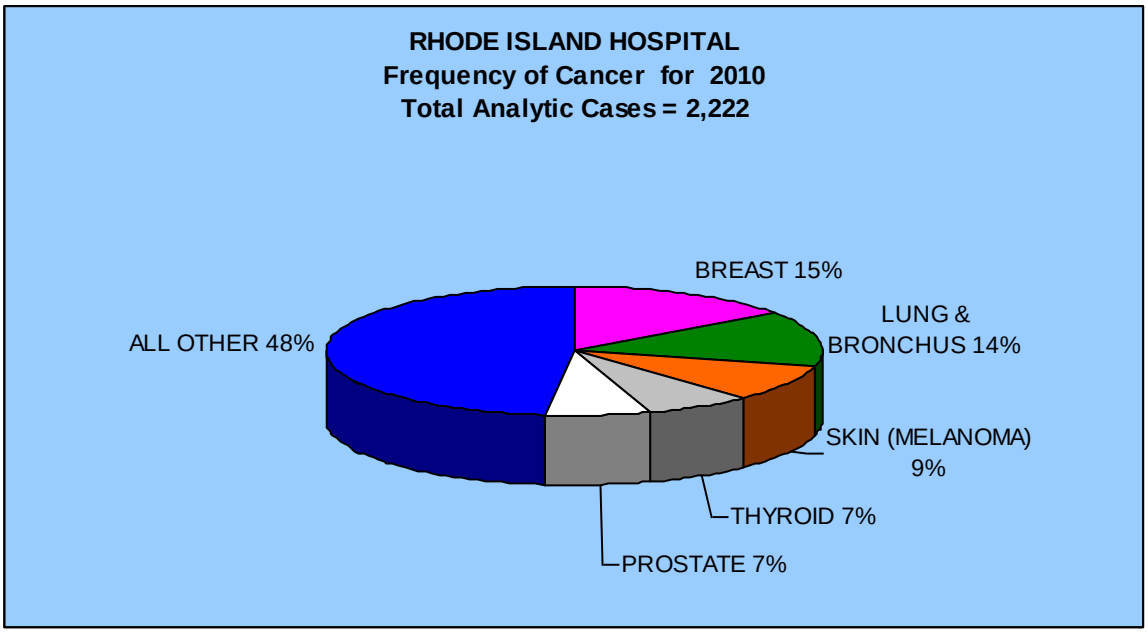
2010 Analytic Case Distribution by Primary Site

PRIMARY SITE	TOTAL	SEX		AJCC STAGE					Stage Unknown	Stage Not Applicable
		M	F	0	1	2	3	4	99	88
Oral Cavity	52	37	15	2	10	5	6	25	3	1
Lip	0	0	0	0	0	0	0	0	0	0
Tongue	19	15	4	0	3	2	2	11	1	0
Salivary Gland	7	3	4	0	3	2	2	0	0	0
Floor of Mouth	5	4	1	1	1	0	0	3	0	0
Gum & Other Mouth	3	1	2	0	2	0	0	0	1	0
Nasopharynx	1	1	0	0	0	0	1	0	0	0
Tonsil	4	3	1	1	0	0	1	2	0	0
Oropharynx	6	5	1	0	1	0	0	5	0	0
Hypopharynx	6	5	1	0	0	1	0	4	1	0
Other Oral Cavity Organs	1	0	1	0	0	0	0	0	0	1
Digestive System	313	178	135	13	60	76	68	75	18	3
Esophagus	26	20	6	1	8	2	10	4	1	0
Stomach	26	19	7	0	8	8	4	5	1	0
Small Intestine	13	5	8	0	3	3	3	1	2	1
Colon	97	44	53	10	16	22	22	21	6	0
Rectum & Rectosigmoid	40	22	18	0	6	8	13	12	1	0
Anus & Anorectum	8	3	5	0	1	5	1	1	0	0
Liver & Intrahepatic Duct	33	26	7	0	11	8	4	7	1	2
Gallbladder	5	2	3	0	0	3	1	1	0	0
Other Biliary	14	10	4	0	2	3	1	5	3	0
Pancreas	47	26	21	2	5	12	7	18	3	0
Retroperitoneum	3	1	2	0	0	2	1	0	0	0
Other Digestive Organs	1	0	1	0	0	0	1	0	0	0
Respiratory System	344	168	176	1	81	30	60	150	19	3
Larynx	18	14	4	1	7	0	3	3	3	1
Lung & Bronchus	322	152	170	0	73	30	57	146	16	0
Other Respiratory	4	2	2	0	1	0	0	1	0	2
Mesothelioma	4	4	0	0	2	0	1	1	0	0
Bone & Soft Tissue	32	19	13	0	11	8	5	3	3	2
Bone & Joints	5	2	3	0	4	0	0	0	1	0
Soft Tissue	27	17	10	0	7	8	5	3	2	2
Skin Excluding Basal & Squamous Cell	204	110	94	61	86	17	13	5	20	2
Melanoma – Skin	199	106	93	61	85	16	13	5	19	0
Other Non-Epithelial Skin	5	4	1	0	1	1	0	0	1	2

PRIMARY SITE	TOTAL	SEX		AJCC STAGE					Stage Unknown	Stage Not Applicable
		M	F	0	1	2	3	4	99	88
Other Defined Sites	71	41	30	0	0	0	0	0	0	71
Breast	335	7	328	96	112	73	14	14	26	0
Female System	76	NA	76	0	20	17	25	10	3	1
Cervix Uteri	26	NA	26	0	7	9	6	3	1	0
Corpus & Uterus, NOS	32	NA	32	0	12	6	11	3	0	0
Ovary	8	NA	8	0	0	0	5	2	1	0
Vagina	1	NA	1	0	0	0	0	1	0	0
Vulva	8	NA	8	0	1	2	3	1	1	0
Other Female Organs	1	NA	1	0	0	0	0	0	0	1
Male System	159	159	NA	0	13	108	9	13	16	0
Prostate	154	154	NA	0	10	107	8	13	16	0
Testis	5	5	NA	0	3	1	1	0	0	0
Penis	0	0	NA	0	0	0	0	0	0	0
Other Male Organs	0	0	NA	0	0	0	0	0	0	0
Urinary System	116	70	46	11	62	8	12	17	2	4
Urinary Bladder	30	17	13	10	10	1	1	7	1	0
Kidney & Renal Pelvis	81	50	31	1	52	5	10	9	1	3
Ureter	4	2	2	0	0	2	1	1	0	0
Other Urinary Organs	1	1	0	0	0	0	0	0	0	1
Brain & Other Nervous System	141	68	73	0	0	0	0	0	0	141
Brain	78	44	34	0	0	0	0	0	0	78
Cranial Nerves & Other	63	24	39	0	0	0	0	0	0	63
Endocrine System	191	49	142	0	120	9	28	9	1	24
Thyroid Gland	165	35	130	0	120	8	28	8	1	0
Other including Thymus	26	14	12	0	0	1	0	1	0	24
Hematopoietic System	89	46	43	0	0	0	0	0	0	89
Leukemia	69	37	32	0	0	0	0	0	0	69
Myeloma	20	9	11	0	0	0	0	0	0	20
Lymphomas	93	44	49	0	23	28	19	17	5	1
Hodgkin's Disease	16	10	6	0	2	10	4	0	0	0
Non-Hodgkin's	77	34	43	0	21	18	15	17	5	1
Kaposi Sarcoma	2	2	0	0	0	0	0	0	0	2
Total Analytic Cases	**2,222**	**1,002**	**1,220**	**184**	**600**	**379**	**260**	**339**	**116**	**344**
		45%	**55%**	**8%**	**27%**	**17%**	**12%**	**15%**	**5%**	**16%**

Top Five Sites for Rhode Island Hospital

The five most common sites for Rhode Island Hospital's 2010 analytic* cases are (in descending order by percent of total incidence) Breast (15%), Lung and Bronchus (14%), Skin (Melanoma) (9%), Thyroid (7%), and Prostate (7%). This distribution differs from that of the American Cancer Society (ACS) (statistics based on incidence rates from 46 states and the District of Columbia) which is noted to be (in descending order by percent of total incidence) Lung and Bronchus (15%), Prostate (14%), Female Breast (13%), Colon & Rectum (9%), and Urinary Bladder (5%).

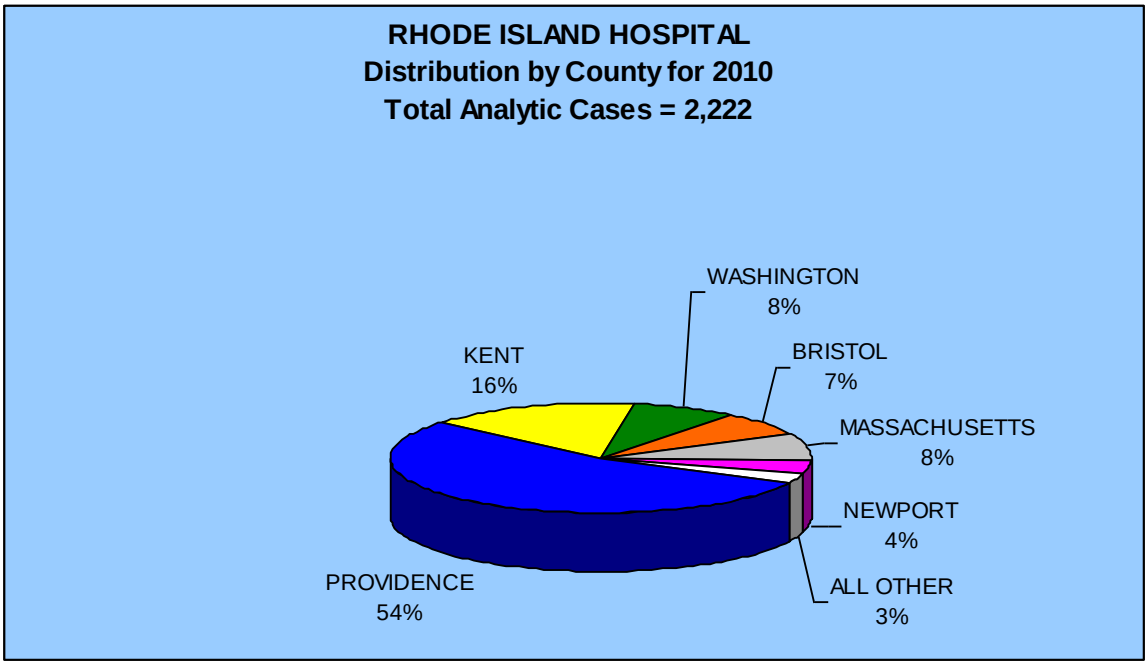


*Analytic - cancer case that was diagnosed and/or received all or part of the first course treatment at the reporting facility

Source: Rhode Island Hospital Oncology Data Management Department
Source: http://www.cancer.org/acs/groups/content/@epidemiologysurveilance/documents/document/acspc-026238.pdf

Residence at Diagnosis

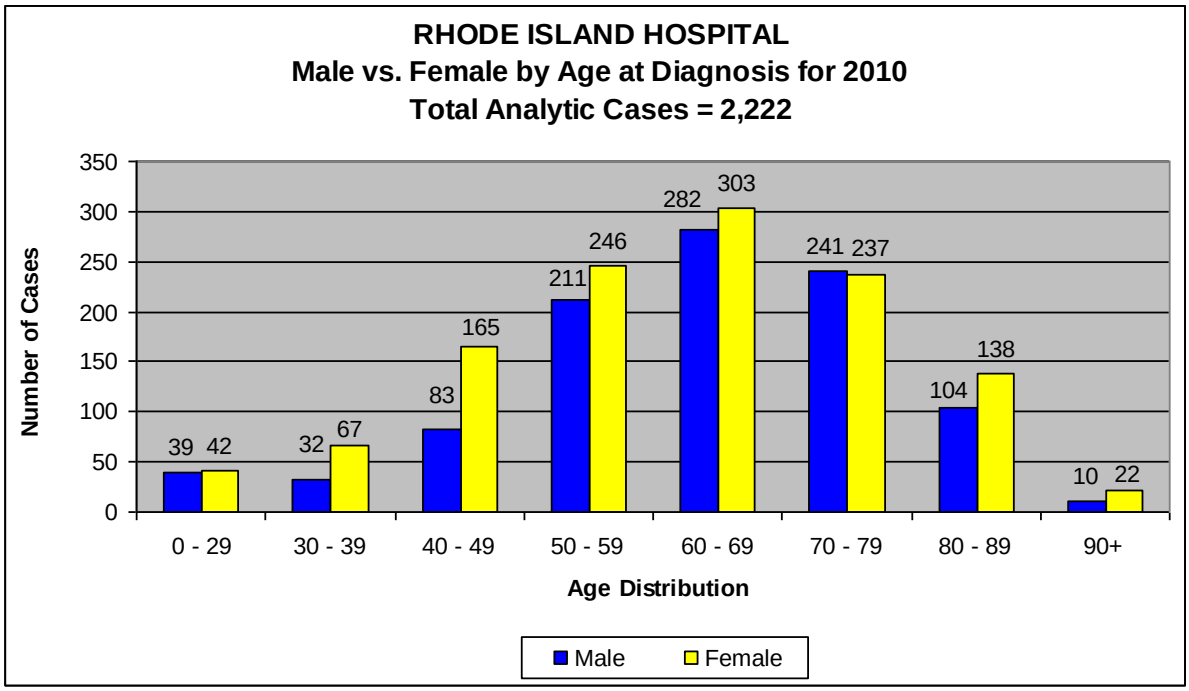
Rhode Island Hospital, located in Providence County serves as a major referral center for Rhode Island, Massachusetts, and the surrounding areas. More than 50% of the Hospital's analytic cancer patients accessioned in 2010 reside in Providence County. The remainder of the Hospital's analytic cancer patients are distributed throughout Rhode Island and Massachusetts.



Source: Rhode Island Hospital Oncology Data Management Department

Gender by Age

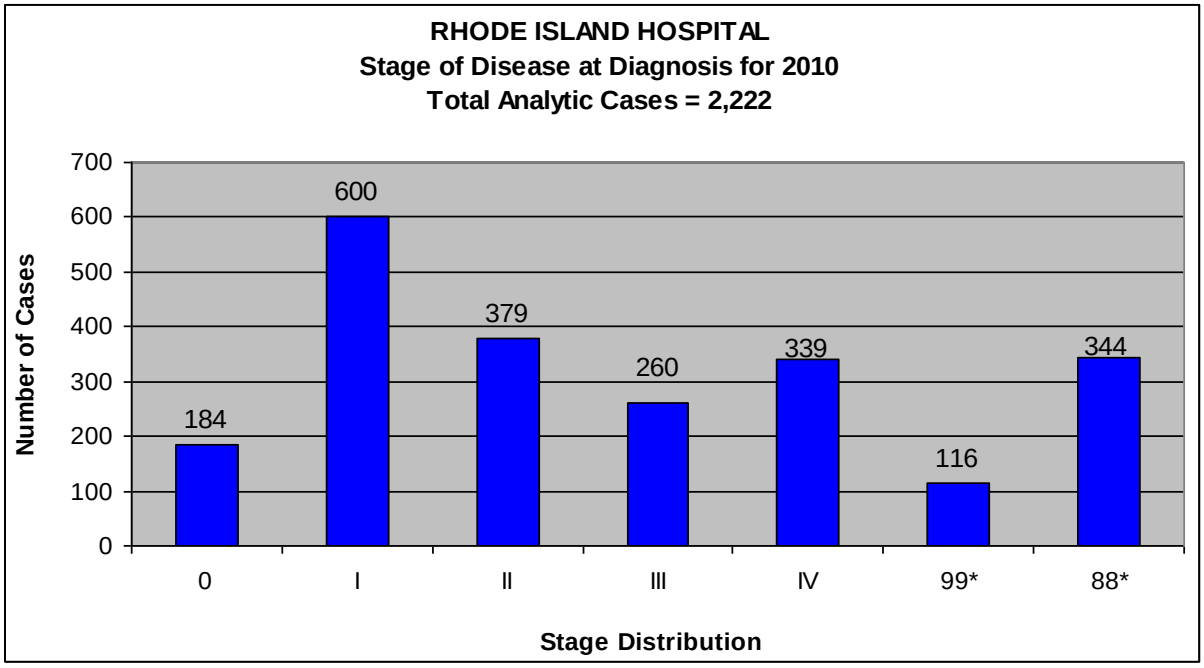
The gender distribution for Rhode Island Hospital was 45% male and 55% female. This distribution differs from the American Cancer Society (ACS) gender distribution. Based on American Cancer Society (ACS) data, the estimated gender distribution of US cancer cases in 2010 was 52% male and 48% female. The most common age group for Rhode Island Hospital was 60 – 69; approximately 26% of patients were in this age group at the time of initial diagnosis.



Source: Rhode Island Hospital Oncology Data Management Department
Source: http://www.cancer.org/acs/groups/content/@epidemiologysurveilance/documents/document/acspc-026238.pdf

Stage of Disease at Diagnosis

Cases entered into the Rhode Island Hospital Cancer Registry are categorized according to the tumor/node/metastases (TNM) staging system developed by the American Joint Committee on Cancer (AJCC) to describe the extent or spread of disease at diagnosis, which is generally predictive of survival. Of the analytic cases entered into the Rhode Island Hospital Cancer Registry, 184 (8%) were classified as TNM stage 0, 600 (27%) as stage I, 379 (17%) as stage II, 260 (12%) as stage III, 339 (15%) as stage IV, 116 (5%) were classified as not staged, and 344 (16%) were not applicable for the TNM staging system.

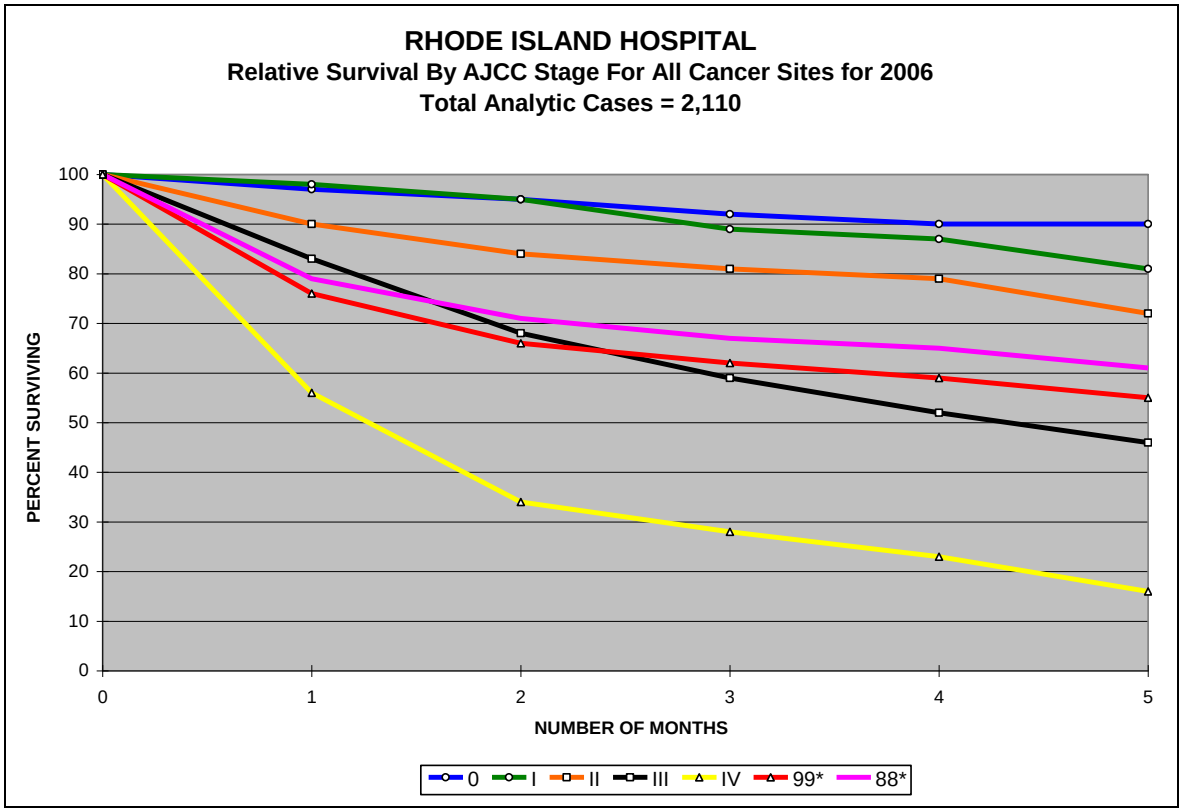


*99 – AJCC stage is unknown
*88 – AJCC stage is not applicable

Source: Rhode Island Hospital Oncology Data Management Department

Survival by AJCC Stage for All Cancer Sites

Relative survival rates by stage were as expected. The survival rate for stage 0 was best overall, with 90% alive at five years. This rate was followed by stage I with over 80% alive at five years.



*This survival graph is based on 2006 data, for 2006 a total of 2,110 analytic cases were collected.

*99 – AJCC stage is unknown
*88 – AJCC stage is not applicable

Source: Rhode Island Hospital Oncology Data Management Department

Thomas DiPetrillo, MD, Cancer Committee Chair
Tara Szymanski, CTR, Manager, Oncology Data Management Department

Bladder cancer is one of the most common malignancies in Western society and is the 4th most common type of cancer in men and the 9th most common cancer in women. In 2011, an estimated 69,250 (52,020 males and 17,230 females) Americans will be diagnosed with cancer of the bladder and 14,990 (10,670 male and 4,320 females) will succumb to their disease. The rates of new cancers and of cancer deaths have remained fairly stable over the past 20 years. There are currently more than 500,000 people in the United States surviving their disease.

As with most cancers, the exact cause of bladder cancer is uncertain. However, researchers have identified certain risk factors and are beginning to understand how these factors cause cells in the bladder to become cancerous.

Risk Factors

1. Tobacco Use	Smokers are more than twice as likely to develop bladder cancer as nonsmokers.
2. Age	About 9 out of 10 people with this disease are over the age of 55.
3. Gender	Men are more than twice as likely as women to develop bladder cancer.
4. Race and Ethnicity	Caucasians are about twice as likely to develop bladder cancer as African Americans. Hispanics, Asian Americans, and American Indians are noted to have lower rates of bladder cancer.
5. Chronic Bladder Irritation & Infections	Urinary infections, kidney and bladder stones, and other causes of chronic bladder irritation have been linked with this disease (especially squamous cell carcinoma) but they do not necessarily cause bladder cancer.
6. Workplace Exposures	Certain industrial chemicals called aromatic amines, such as benzidine and beta-naphthylamine, which are sometimes used in the dye industry, can cause bladder cancer.
7. Family History	Individuals with a family history of bladder cancer are at greater risk as they inherit a certain susceptibility to the disease.

Signs/Symptoms of Bladder Cancer

- Blood in urine (hematuria)
- Abdominal pain
- Bone pain or tenderness
- Painful urination
- Urinary frequency
- Urinary urgency
- Urine leakage (incontinence)
- Weight loss

There are also several accepted screening and diagnostic techniques that assist the physician in diagnosing the disease and planning the treatment.

Screening Tests and Diagnostic Techniques

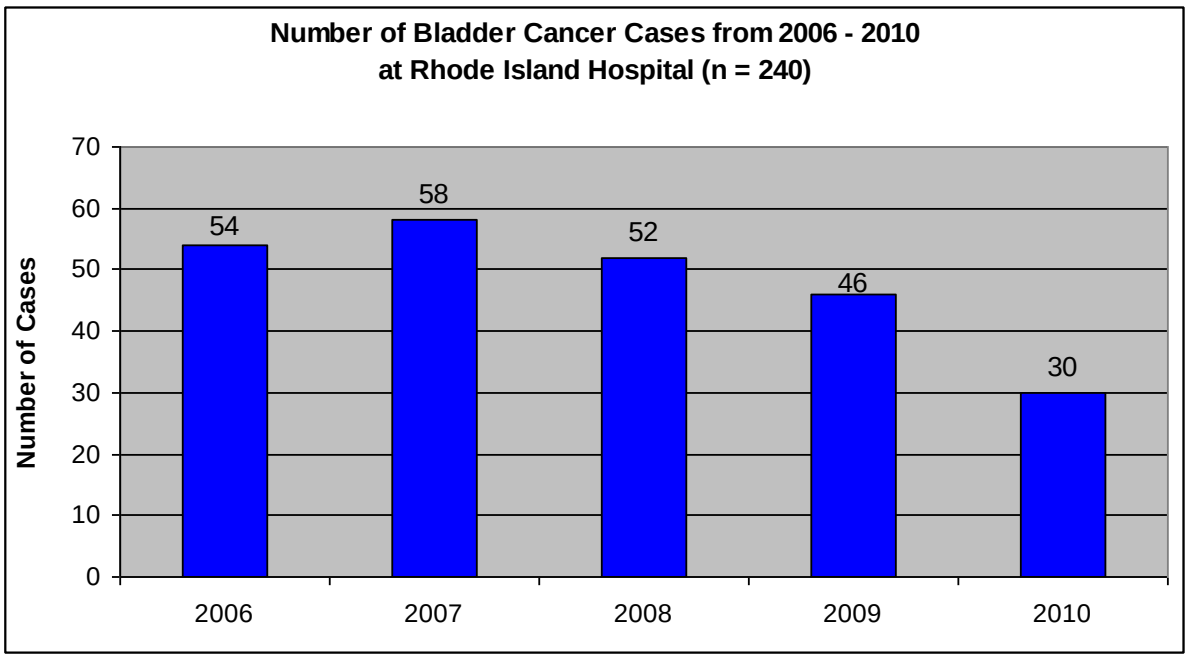
1. Urinalysis	This test is used to check for blood in the urine (hematuria). Blood in the urine is usually caused by benign (non-cancerous) conditions such as infections, but it can be the first sign of bladder cancer.
2. Urine tests for tumor markers	Several newer tests such as UroVysion and Immunocyt look for substances in the urine that may indicate bladder cancer.
3. Intravenous Pyelogram (IVP)	Also called intravenous urogram (IVU), is an x-ray of the urinary system, taken after injecting special dye into a vein. This will clearly outline the organs on x-ray and help identify tumors in the urinary tract.
4. Retrograde Pyelogram	This procedure uses a thin tube (catheter) which is inserted through the urethra and up into the bladder or into a ureter. A dye is injected through the catheter to make the lining of the bladder, ureters, and kidneys easier to identify on x-ray. This test is not used as often as IVP, but may be done for individuals who cannot have an IVP.
5. Ultrasound	Utilizes sound waves to create pictures of internal organs and can be useful in determining the size of a bladder cancer and whether it has spread beyond the bladder to nearby tissue or organs.

Screening Tests and Diagnostic Techniques (Continued)

6. Cystoscopy Is performed using a cystoscope which is a slender tube with a light and lens or a small video camera on the end. The cystoscope is inserted through the opening in the urethra and advances into the bladder. Sterile salt water is then injected through the scope to expand the bladder and allow the physician to look at the bladder lining. If an abnormal area or growth is seen, it will be biopsied.

7. Bladder biopsy Bladder biopsy samples are most often obtained during cystoscopy and are used to identify important features of the cancer, such as the invasiveness. The invasiveness will show how deeply the cancer has invaded into the bladder wall, which is important in deciding treatment.

From 2006 through 2010, the Oncology Data Management department at Rhode Island Hospital accessioned 240 patients with bladder cancer.



Source: Rhode Island Hospital Oncology Data Management Department

ACoS Commission on Cancer – National Cancer Data Base (NCDB)
Hospital comparison benchmark reports are available from the National Cancer Data Base (NCDB) for the years 2000 to 2008. Various comparisons can be made by primary site, hospital type, by geographical location (individual state or all states) and by year of diagnosis.

Throughout this report are samples of hospital comparison benchmarks on bladder cancer generated for ACoS approved Teaching Research Cancer Programs in the United States and the ACoS Cancer Programs in Rhode Island. This will be a valuable tool for assessing our diagnostic and therapeutic efforts as more data from proceeding years is added to the database.

The table below is based on information obtained from the National Cancer Data Base (NCDB) and illustrates case distribution comparison between Rhode Island Hospital and the other hospitals within the state of Rhode Island.

Bladder Cancer Diagnosed 2000 to 2008 by YEAR
All Reported Cases – Hospital Type: All Types/Systems
Rhode Island Hospital, Providence, RI vs. Hospitals in the State of Rhode Island

	Number of Cases		Percent of Cases
	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital	Rhode Island Hospital
YEAR			
2000	282	72	25.53%
2001	258	76	29.46%
2002	264	57	21.59%
2003	255	63	24.71%
2004	254	64	25.20%
2005	239	64	26.78%
2006	292	52	17.81%
2007	282	56	19.86%
2008	299	52	17.39%
Total	2,425	556	22.93%

Source: 2011 National Cancer Data Base (NCBD)/Commission on Cancer (CoC)/Developer: Florin Petrescu

2011 Bladder Cancer Patient Outcome Analysis

In 2011, an estimated 69,250 individuals will learn they have bladder cancer. The highest overall bladder cancer incidence rates are in Caucasians. Caucasians are twice as likely as other races to develop bladder cancer. Hispanics and American Indians are noted to have lower incidence rates and Asians have been found to have the overall lowest incidence rate for developing this cancer.

The table below illustrates a race comparison between Rhode Island Hospital and the other hospitals within the state of Rhode Island. The table is based on information obtained from the National Cancer Data Base (NCDB).

Bladder Cancer Diagnosed 2000 to 2008 by RACE
All Hospitals in the State of Rhode Island vs.
Rhode Island Hospital, Providence, RI

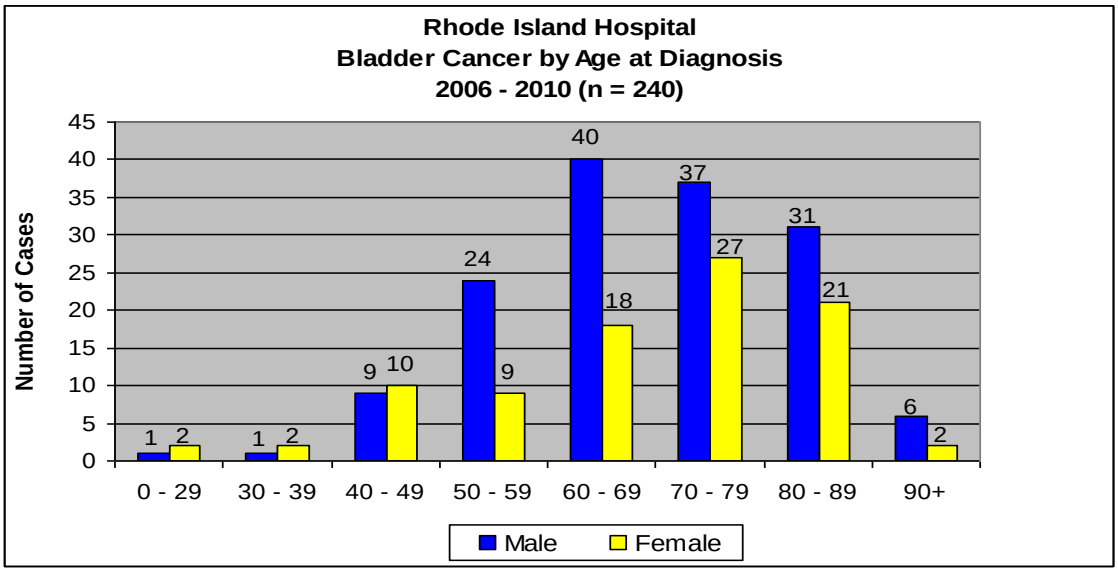
	Number of Cases		Percent of Total Bladder Cancer Cases by Race	
	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital
RACE				
White	2,331	527	96.12%	94.78%
Black	32	9	1.32%	1.62%
Hispanic	26	11	1.07%	1.98%
Asian/Pacific Islands	7	1	0.29%	0.18%
Native American	8	2	0.33%	0.36%
Other/Unknown	21	6	0.87%	1.08%
Total	2,425	556	100%	100%

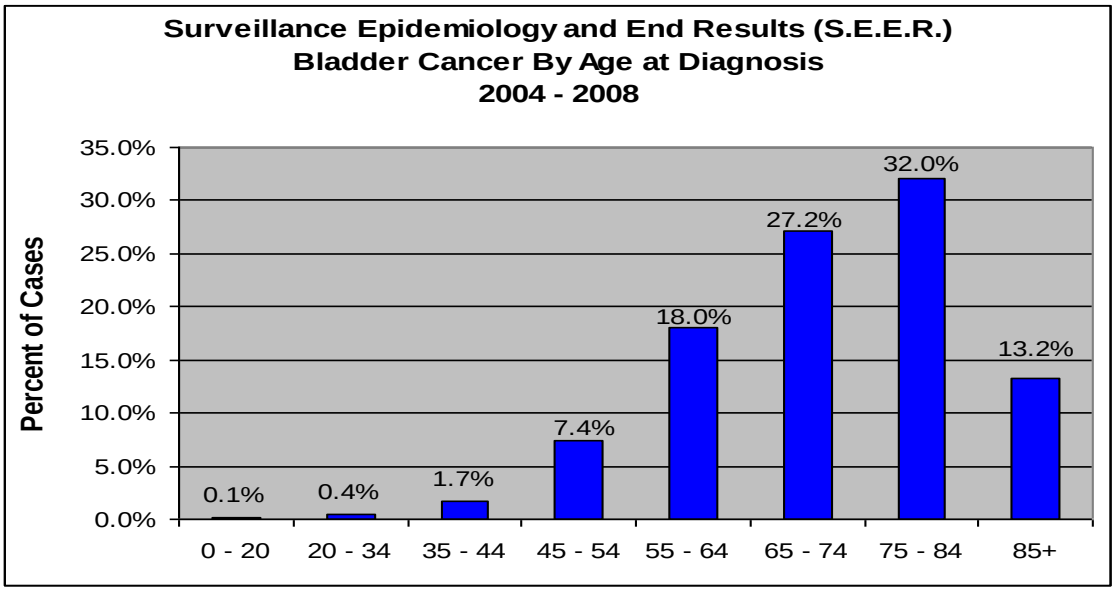
Source: 2011 National Cancer Data Base (NCBD)/Commission on Cancer (CoC)/Developer: Florin Petrescu

2011 Bladder Cancer Patient Outcome Analysis

Bladder cancer is the 4th most common type of cancer in men and the 9th most common cancer in women. Men have been noted to be three (3) times more likely to develop bladder cancer during their lifetime than women. Overall, the chance men will develop this cancer is about one (1) in twenty-six (26) and for women the chance is about one (1) in eight-six (86) (risk may be higher or lower based on risk factors).

The age distribution for bladder cancer at Rhode Island Hospital ranges from 23 to 95 with the majority occurring in patients' age 70 to 79. The age distribution for Rhode Island Hospital is illustrated in the graph below and is based on overall age distribution and is not limited by any specific histology.





Source: Rhode Island Hospital Oncology Data Management
Per S.E.E.R Website: http://seer.cancer.gov/statfacts/html/urinb.html

2011 Bladder Cancer Patient Outcome Analysis

The table below illustrates an age comparison between National reporting Teaching Research hospitals, other hospitals within the state of Rhode Island, and Rhode Island Hospital. The table is based on information obtained from the National Cancer Data Base (NCDB).

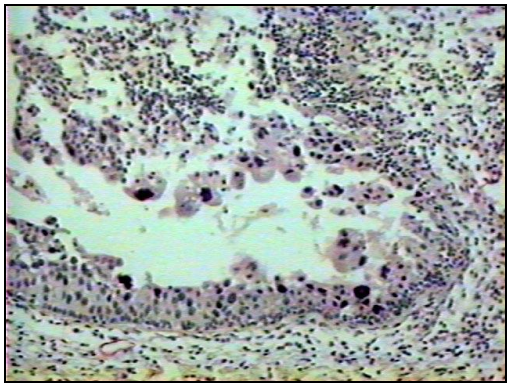
Bladder Cancer Diagnosed 2000 to 2008 by AGE
Teaching Research Hospitals in All States vs. All Hospitals in the State of Rhode Island vs. Rhode Island Hospital, Providence, RI

	Number of Cases			Percent of Total Bladder Cancer Cases by Age		
	Teaching Research Hospitals	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital	Teaching Research Hospitals	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital
AGE						
Under 20	120	1	1	0.12%	0.04%	0.18%
20-29	227	5	2	0.23%	0.21%	0.36%
30-39	1,162	18	6	1.2%	0.74%	1.08%
40-49	4,921	96	37	5.08%	3.96%	6.65%
50-59	14,335	321	75	14.80%	13.24%	13.49%
60-69	24,057	506	115	24.84%	20.87%	20.68%
70-79	30,732	753	197	31.73%	31.05%	35.43%
80-89	18,771	614	101	19.38%	25.32%	18.17%
90+	2,521	111	22	2.60%	4.58%	3.96%
Total	96,846	2,245	556	100%	100%	100%

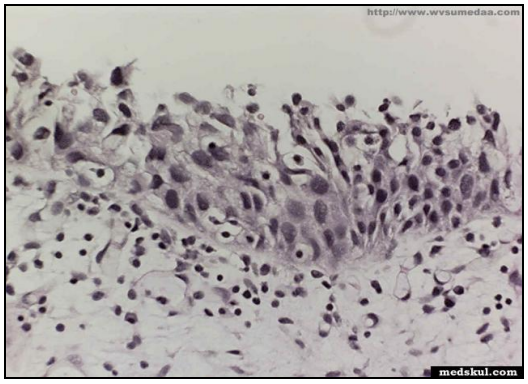
Source: 2011 National Cancer Data Base (NCBD)/Commission on Cancer (CoC)/Developer: Florin Petrescu

There are four (4) main types of bladder cancers with transitional cell carcinomas (urothelial carcinoma) accounting for the majority (95%). Transitional cell carcinomas are divided into two (2) subtypes, papillary and flat. Papillary carcinomas grow in small, finger-like projections from the inner surface of the bladder toward the hollow center without invading the deeper layers whereas flat carcinomas do not grow toward the hollow center. In both cases if the tumor is limited to the inner layers of the bladder it will be classified as a non-invasive carcinoma or a carcinoma in-situ. Papillary and flat carcinomas may also invade the lamina propria or deeper into the muscle layer. In this instance they are termed invasive carcinomas and are more likely to spread to adjacent tissue or organs. In about half of all cases, patients are diagnosed while the cancer is in the non-invasive or in-situ phase.

Other histology's found in bladder cancers include Squamous cell carcinomas which account for 1% to 2% of bladder carcinomas. These are followed closely by adenocarcinoma which account for only 1%. Small cell carcinomas have also been identified in bladder cancers and account for less than 1%.



Papillary Transitional Cell Carcinoma



Urothelial Carcinoma in-situ

The bladder cancer histological distribution for Rhode Island Hospital is displayed in the table below.

Bladder Cancer Histological Distribution	Number of Cases Per Histology	Percentage of Cases Per Histology
Transitional Cell Carcinoma In Situ	17	7.05%
Transitional Cell Carcinoma, NOS	56	23.24%
Papillary Transitional Cell, Non-Invasive	97	40.25%
Papillary Transitional Cell	56	23.24%
Other	15	6.22%

Source Image 1: http://www.tigerpath.com/images/unit_06/069_B...
Source Image 2: http://www.wvsumedaa.com
Source: http://www.cancer.org/Cancer/BladderCancer/DetailedGuide/index

Staging System

The most widely used staging scheme is the AJCC Cancer Staging Manual (TNM). The TNM describes the extent of the primary Tumor (T stage), whether or not the cancer has spread to regional lymph Nodes (N stage), and the absence or presence or distant Metastases (M stage). Patients diagnosed with bladder cancer after January 1, 2003 are staged with the AJCC Cancer Staging Manual 6th Edition. The 7th Edition Staging Manual was implemented for cancers diagnosed on or after January 1, 2010.

Definition of TNM for Bladder Cancer (based on the AJCC 7th Edition)

Primary Tumor (T)

TX	Primary tumor cannot be assessed
T0	No evidence of primary tumor
Ta	Noninvasive papillary carcinoma
Tis	Carcinoma in situ: “flat tumor”
T1	Tumor invades subepithelial connective tissue
T2	Tumor invades muscularis propria
T2a	Tumor invades superficial muscularis propria (inner half)
T2b	Tumor invades deep muscularis propria (outer half)
T3	Tumor invades perivesical tissue
T3a	Microscopically
T3b	Macroscopically (extravesical mass)
T4	Tumor invades any of the following: prostatic stroma, seminal vesicels, uterus, vagina, pelvic wall, abdominal wall
T4a	Tumor invades prostatic stroma, uterus, vagina
T4b	Tumor invades pelvic wall, abdominal wall

Regional Lymph Nodes (N)

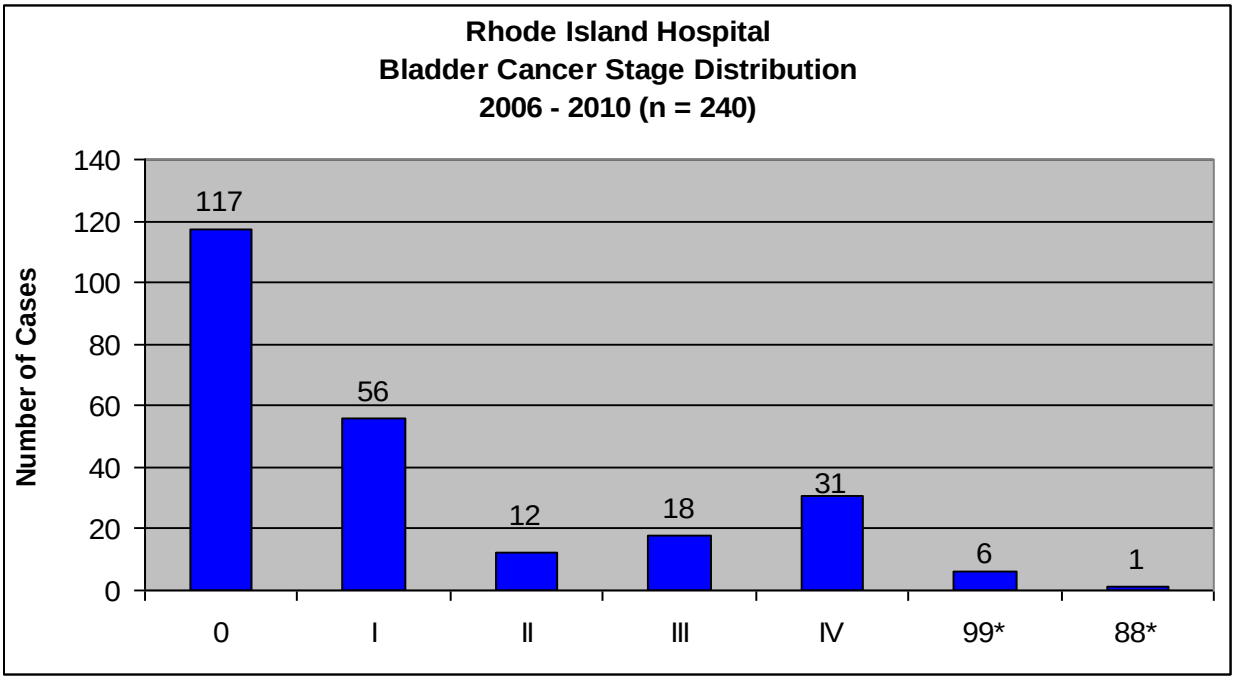
NX	Lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Single regional lymph node metastasis in the true pelvis (hypogastric, obturator, external iliac, or presacral lymph node)
N2	Multiple regional lymph node metastasis in the true pelvis (hypogastric, obturator, external iliac, or presacral lymph node metastasis)
N3	Lymph node metastasis to the common iliac lymph nodes

Distant Metastasis (M)

M0	No distant metastasis
M1	Distant metastasis

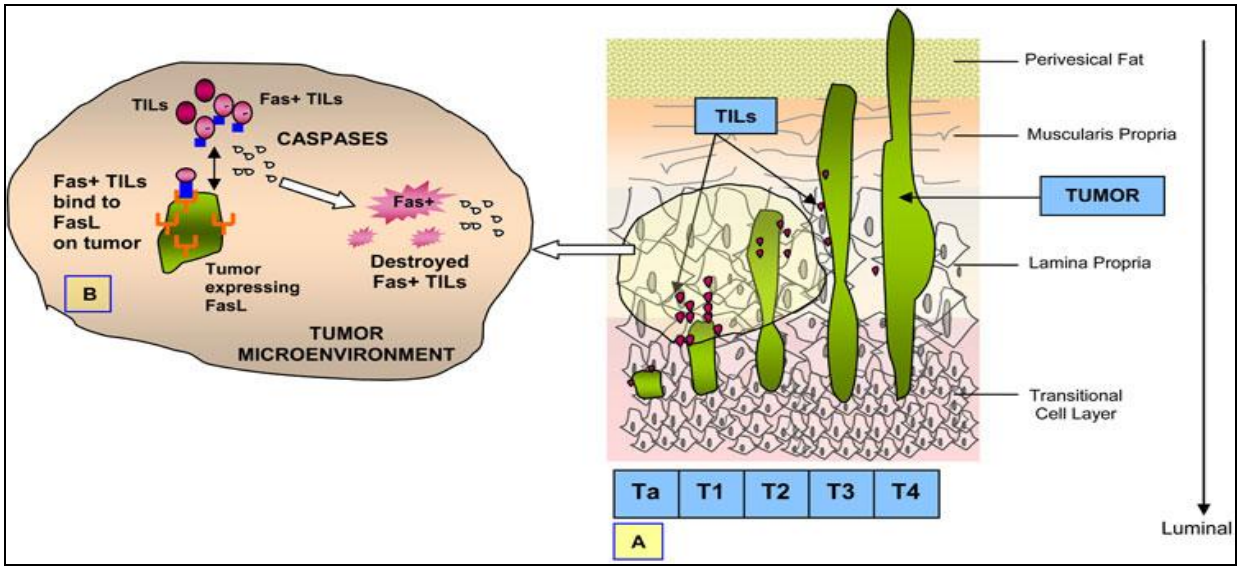
2011 Bladder Cancer Patient Outcome Analysis

The graph below displays the stage distribution for the 240 patients diagnosed with bladder cancer at Rhode Island Hospital from 2006 to 2010.



*99 – AJCC stage is unknown
*88 – AJCC stage is not applicable

Source: Rhode Island Hospital Oncology Data Management Department



Source: http://www.cancerimmunity.org/v7p10/070610_fig1.jpg

2011 Bladder Cancer Patient Outcome Analysis

The table below illustrates a stage comparison between National reporting Teaching Research hospitals, other hospitals within the state of Rhode Island, and Rhode Island Hospital. The table is based on information obtained from the National Cancer Data Base (NCDB).

Bladder Cancer Diagnosed 2000 to 2008 by STAGE
Teaching Research Hospitals in All States vs. All Hospitals in the State of Rhode Island vs. Rhode Island Hospital, Providence, RI

	Number of Cases			Percent of Total Bladder Cancer Cases by Stage		
	Teaching Research Hospitals	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital	Teaching Research Hospitals	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital
STAGE						
0	39,084	1,179	235	40.36%	48.62%	42.27%
I	19,673	544	96	20.31%	22.43%	17.27%
II	11,459	225	48	11.83%	9.28%	8.63%
III	6,738	67	42	6.96%	2.76%	7.55%
IV	9,156	64	43	9.45%	2.64%	7.73%
Not Applicable	241	6	0	0.25%	0.25%	0%
Unknown	10,495	340	92	10.84%	14.02%	16.55%
Total	96,846	2,425	556	100%	100%	100%

Source: 2011 National Cancer Data Base (NCBD)/Commission on Cancer (CoC)/Developer: Florin Petrescu

Treatment for Bladder Cancer

There are four (4) main categories of treatment for bladder cancer: intravesical therapy, chemotherapy, radiation therapy, and/or surgery. The treatment options will depend on the stage of the tumor, the severity of the symptoms, and the patients overall health status. In general, tumors involving the lining of the bladder are treated with surgery that removes the cancerous tissue and/or systemic therapy. More invasive tumors that have penetrated the wall of the bladder require surgery that removes a portion of the bladder. Systemic therapy and/or radiation therapy may be administered.

- Transurethral Resection (TUR) – is the most common treatment for bladder cancer. For this procedure a resectoscope is placed into the bladder through the urethra. The resectoscope has a wire loop at its end to remove any abnormal tissue or tumors.

- Partial Cystectomy – procedure which removes only a portion of the bladder, leaving enough to store urine and urinate comfortably. Nearby lymph nodes may also be removed.

- Radical Cystectomy – this operation removes the entire bladder and nearby lymph nodes. In men, the prostate is also removed. In women, the ovaries, fallopian tubes, the uterus, and a small portion of the vagina are often removed along with the bladder.

- Reconstructive Surgery – if the whole bladder is removed, you will need another way to store and remove urine. Several types of reconstructive surgery can be done depending the patients overall health status. One option may be to remove a small piece of the intestine and connect it to the ureters, creating a passageway known as an ileal conduit. The conduit is connected to the skin on the front of the abdomen by an opening called a urostomy. Another option may be a continent diversion. For this, a valve is created in a pouch made from a piece of intestine. The valve allows urine to be stored in the pouch. The pouch is emptied several times a day by placing a catheter into the urostomy through the valve. A newer method is to use a neobladder which also utilizes a reservoir made from a piece of intestine. As with the ileal conduit and continent diversion, the ureters are connected to the neobladder. The difference is that the neobladder is also sewn to the urethra. This allows patients to urinate normally.

- Intravesical Therapy – is used only for non-invasive (stage 0) or minimally invasive (stage 1) bladder cancers. A drug called Bacillus Calmette-Guerin (BCG) is administered directly into the bladder through a catheter and will cause a treatment inflammation but have little or no long term effect on cells surrounding the tissue. This may be administered along with a transurethral resection of the cancer.

Treatment for Bladder Cancer (Continued)

- Chemotherapy – utilizes anticancer drugs to destroy actively growing cancer cells. Chemotherapy may be given prior to surgery to shrink a large tumor allowing for easier surgical resection. This method is referred to as neoadjuvant therapy. Chemotherapy may also be given after surgery to kill any remaining cancer cells and lower the risk of disease recurrence. This method is referred to as adjuvant therapy.

- Radiation Therapy – External bean radiation, most often used to treat bladder cancer focuses radiation from outside of the body on the cancer. This therapy may be used to treat earlier stage bladder cancer, after limited surgery. It may also be used for patients with early stage cancers who can't undergo a surgical procedure. Radiation therapy is also used to prevent or treat symptoms caused by advanced bladder cancer.

The table below illustrates a treatment comparison between National reporting Teaching Research hospitals, other hospitals within the state of Rhode Island, and Rhode Island Hospital. The table is based on information obtained from the National Cancer Data Base (NCDB).

Bladder Cancer Diagnosed 2000 to 2008 by TREATMENT
Teaching Research Hospitals in All States vs. All Hospitals in the State of Rhode Island vs. Rhode Island Hospital, Providence, RI

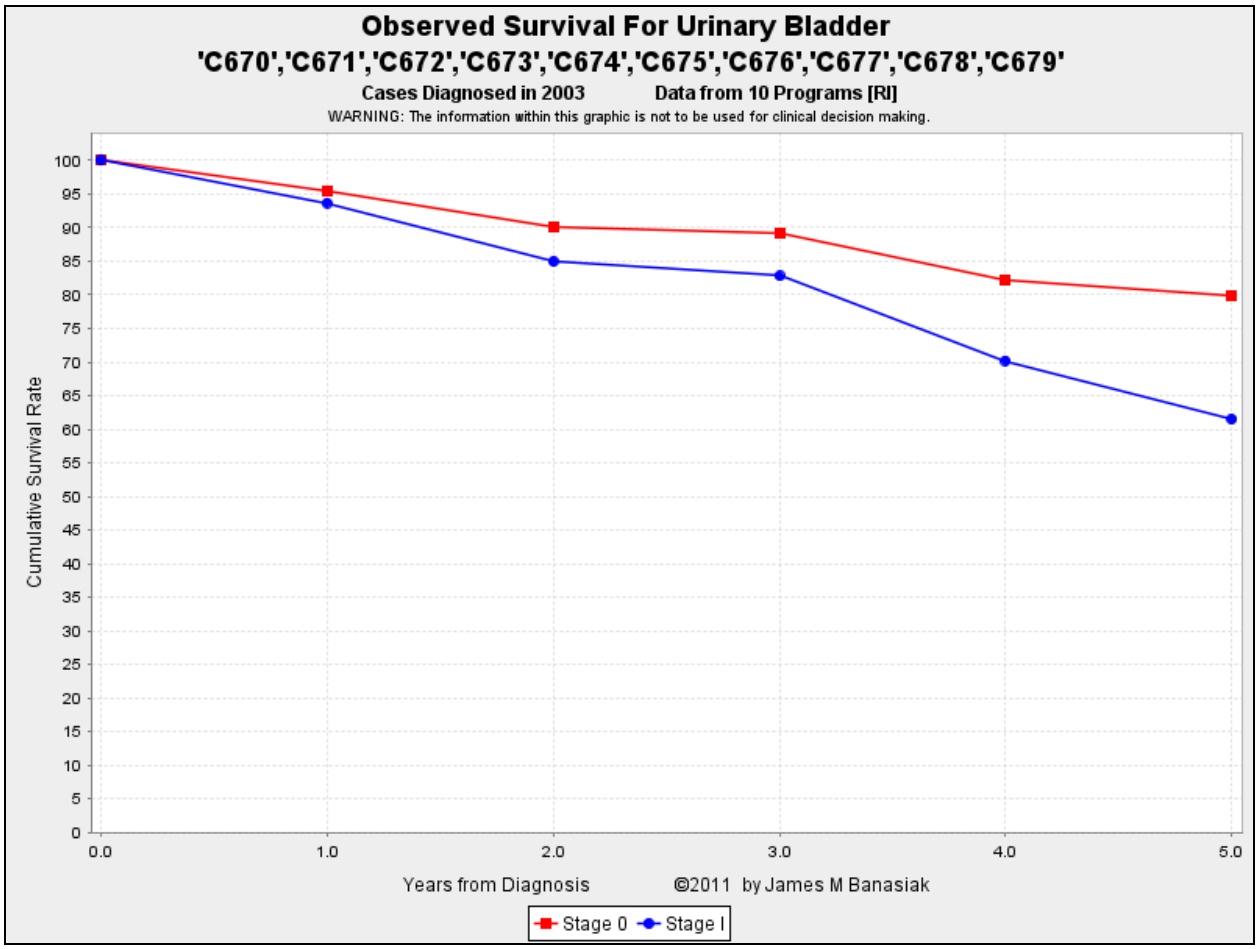
	Number of Cases			Percent of Total Bladder Cancer Cases by Treatment		
	Teaching Research Hospitals	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital	Teaching Research Hospitals	Other Reporting Hospitals In Rhode Island	Rhode Island Hospital
TREATMENT						
Surgery Only	65,042	1,693	446	67.16%	69.81%	80.22%
Surgery & Chemotherapy	10,716	221	29	11.06%	9.11%	5.22%
Surgery & BRM	7,871	229	49	8.13%	9.44%	8.81%
Other Specified Therapy	9,543	208	14	9.85%	8.58%	2.52%
No 1st Course Treatment	3,674	74	18	3.79%	3.24%	3.24%
Total	96,846	2,425	556	100%	100%	100%

Source: 2011 National Cancer Data Base (NCBD)/Commission on Cancer (CoC)/Developer: Florin Petrescu

2011 Bladder Cancer Patient Outcome Analysis

Survival Analysis

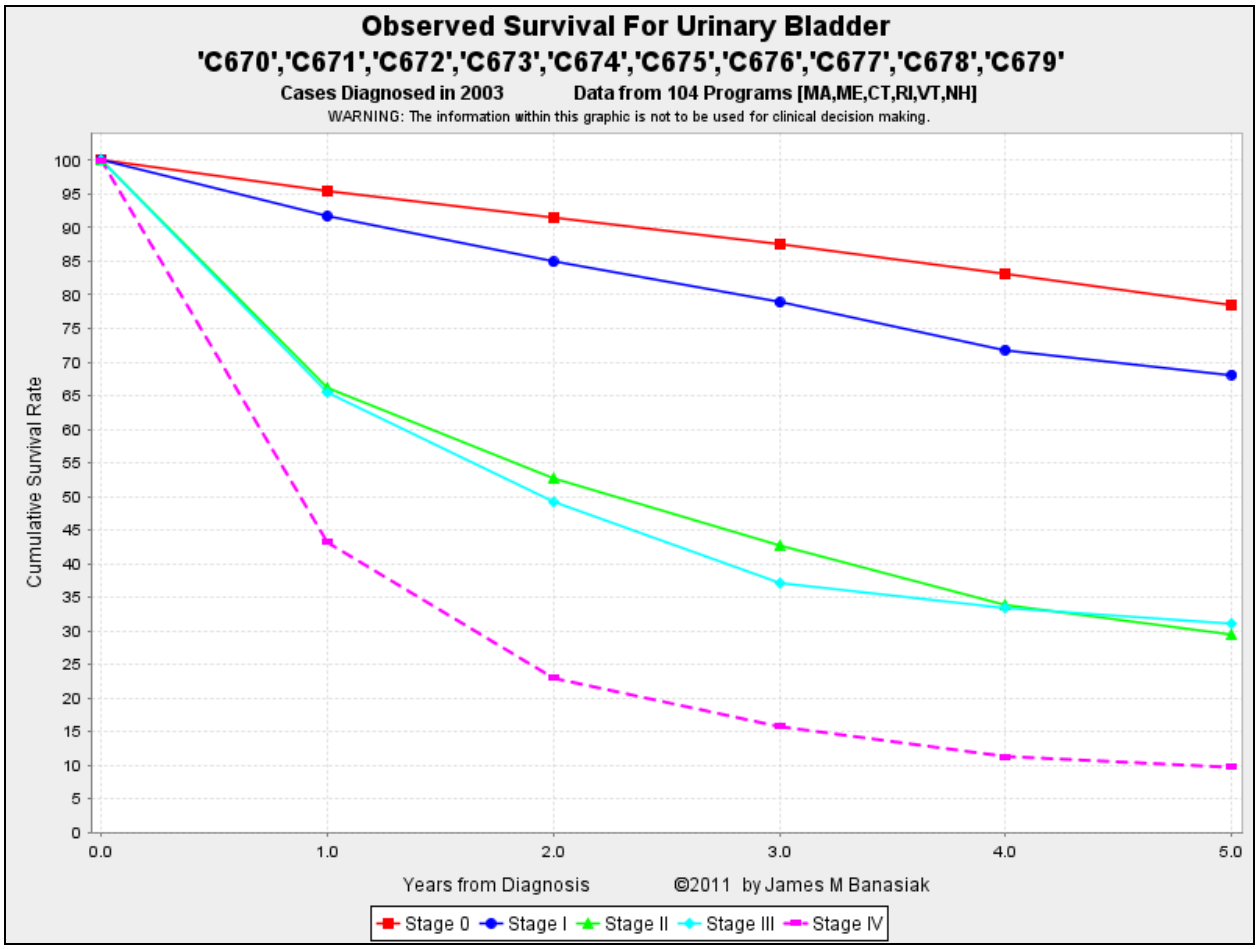
The graph below is based on information obtained from the National Cancer Data Base (NCDB) and illustrates the survival for bladder cancer patients diagnosed in 2003. The data reflects information received from hospitals in the state of Rhode Island (10 hospitals).



Stage of Disease	ENTER	0.0 yr	1.0 yr	2.0 yr	3.0 yr	4.0 yr	5.0 yr	95% Confidence Interval
Stage 0	114	100.0	95.5	90.1	89.1	82.1	79.8	72 - 87.7
Stage I	48	100.0	93.7	85.0	82.8	70.2	61.5	46.7 - 76.4
Stage II	13	Insufficient cases to display survival information						
Stage III	8	Insufficient cases to display survival information						
Stage IV	11	Insufficient cases to display survival information						

Survival Analysis

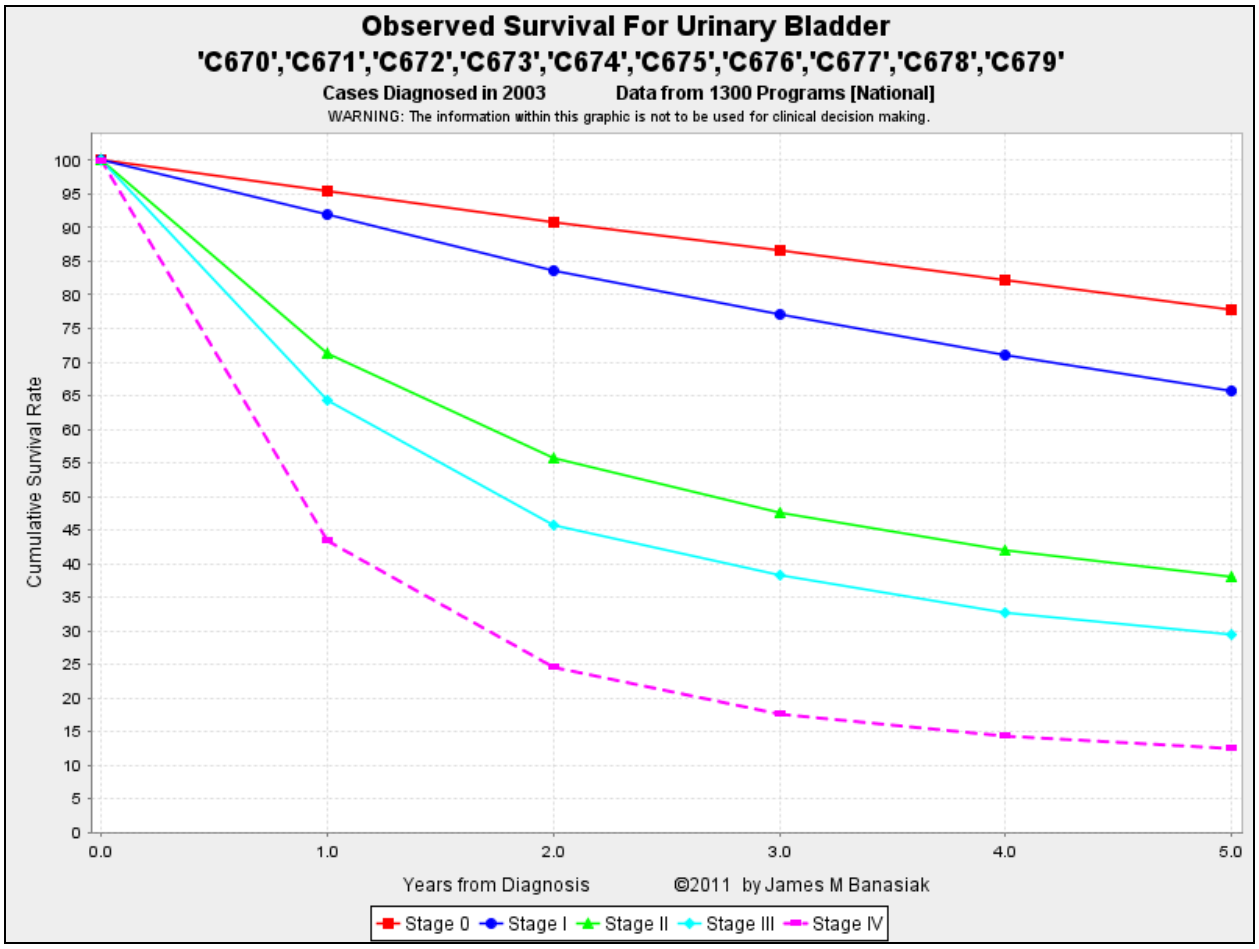
The graph below is based on information obtained from the National Cancer Data Base (NCDB) and illustrates the survival for bladder cancer patients diagnosed in 2003. The data reflects information received from hospitals in the Northeast (104 Programs, MA, ME, CT, RI, VT, NH).



Stage of Disease	ENTER	0.0 yr	1.0 yr	2.0 yr	3.0 yr	4.0 yr	5.0 yr	95% Confidence Interval
Stage 0	1164	100.0	95.5	91.6	87.5	83.2	78.5	76.1 - 81
Stage I	496	100.0	91.7	84.9	78.9	71.8	68.1	63.8 - 72.3
Stage II	224	100.0	66.1	52.8	42.7	33.9	29.4	23.3 - 35.5
Stage III	87	100.0	65.5	49.1	37.1	33.5	31.1	21.5 - 40.7
Stage IV	139	100.0	43.2	23.0	15.8	11.3	9.8	5.1 - 14.5

Survival Analysis

The graph below is based on information obtained from the National Cancer Data Base (NCDB) and illustrates the survival for bladder cancer patients diagnosed in 2003. The data reflects information received from 1,300 Programs (National).



Stage of Disease	ENTER	0.0 yr	1.0 yr	2.0 yr	3.0 yr	4.0 yr	5.0 yr	95% Confidence Interval
Stage 0	13118	100.0	95.4	90.9	86.7	82.3	77.7	76.9 - 78.4
Stage I	6036	100.0	91.9	83.6	77.1	71.0	65.7	64.4 - 66.9
Stage II	3033	100.0	71.2	55.7	47.6	41.9	38.1	36.4 - 39.9
Stage III	1373	100.0	64.3	45.8	38.3	32.7	29.4	26.9 - 31.8
Stage IV	1832	100.0	43.5	24.6	17.7	14.4	12.6	11.1 - 14.1

2011 Bladder Cancer Patient Outcome Analysis

Summary
As seen in the rest of Rhode Island, Caucasians made-up the vast majority of bladder cancer cases at Rhode Island Hospital but unlike the rest of the State, Hispanics made-up the second most common group as opposed to African Americans. Our distribution of bladder cancers by age was similar to that found in national Teaching Research hospitals and other hospitals in Rhode Island with the majority occurring between the ages of 70 and 79.

The stage distribution of bladder cancer at Rhode Island Hospital was similar to that found in national Teaching Research hospitals. When compared to other hospitals in the state, Rhode Island Hospital was found to have a higher percent of stage III and IV cancers. Overall stage 0 cancers were the most frequently reported by Rhode Island Hospital, other hospitals in the state, and national Teaching Research hospitals.

The Comprehensive Cancer Center at Rhode Island Hospital adheres to NCCN (National Comprehensive Cancer Network) Clinical Practice Guidelines for treatment of all cancers. The majority of patients treated for bladder cancer at Rhode Island Hospital underwent surgery alone, which is consistent with the treatment distribution seen at other hospitals in the state, and at national Teaching Research hospitals.

Five year overall survival in Rhode Island was 2% higher for stage 0 cancers and 5% lower for stage I cancers when compared with national survival data reported by the National Cancer Data Base (NCDB) for 2003 (the most recent year reported by NCDB). The number of stage II, III, and IV bladder cancer cases in Rhode Island is statistically insufficient for comparison to national survival data.