

2015-16

Cancer Program Annual Report

Prepared and released: April 2017

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Chairman's Report

This report covers two years: 2015 and 2016. In the past, the timing of our annual report was driven by the schedule of cancer data management which completes data collection on new cases of cancer within six months of diagnosis. This six-month "lag" allows for completion of the workup and initiation of treatment, and it is also to comply with the requirements of the Commission on Cancer. However our annual report therefore came out toward the end of the following year. The Cancer Committee agreed we should publish our annual report as soon after completion of the calendar year as was practical to make it more timely in reflecting changes and highlights in our program.

Both 2015 and 2016 have brought some important changes. During this time span, we have cemented our relationship with Lahey Health as part of the Lahey Health Cancer Institute. This has expanded the scope and depth of our program to allow us to provide comprehensive care to our patients with cancers. It furthers our goal of providing the right care to each patient in the right setting, and in their own community whenever possible.

One of the major initiatives has been the introduction of a new electronic medical record system, Epic. This was rolled out at Lahey Hospital & Medical Center in April 2015 and then at Beverly and Addison Gilbert Hospitals in August 2015. We now have a year and a half of experience with the new system and are seeing the advantages. Within cancer care, it has facilitated better standardization of treatment protocols across all sites and better coordination of complex care that is shared between sites.

Our Breast Health Center sought and received accreditation from the National Accreditation Program of Breast Centers (NAPBC). Breast cancer remains our most common cancer diagnosis, and we have tried to meet this challenge with a comprehensive program which includes weekly multidisciplinary clinics and conferences, dedicated imaging equipment, a certified genetics counselor, and structured survivorship planning. Using this model we have also introduced a thoracic oncology multidisciplinary conference which meets twice each month. We have gained experience with video conferencing to bring together different expertise at a given site, and we are looking to improve our use of this emerging technology.

Another recent initiative this past year has been the launch of the CMS Oncology Care Model. This is an ambitious demonstration project announced by Medicare aimed at improving care and lowering

costs. 196 practices comprised of 2,000 medical groups and 17 payers have been accepted into the project. We are excited to be part of this new five-year project, which we hope will give us an opportunity to refine our clinical care and shine on a national stage. This is more fully described in the body of the report.

Lastly it seems important to acknowledge some of the changes in personnel in our cancer program. 2016 saw the departure of two of our medical oncologists, Dr. Neelam Desai and Dr. Rajitha Sunkara, both for more academic jobs in the Boston area. We are very pleased to have recruited Dr. Shakeeb Yunus from the University of Massachusetts in Worcester to come as a new Director of medical oncology. Dr. Vinod Narra, our former medical liaison physician, has also taken another job and we are grateful that Dr. Gary Rogers has graciously agreed to take on this important role. We would be remiss if we did not also take this opportunity to recognize the many contributions of Dr. Mayo Johnson who passed away August 14, 2016. His career as a surgeon spanned 45 years at Beverly Hospital during which he served in multiple capacities including president of the medical staff and cancer liaison physician for our cancer program. Even after his retirement in 2010, he continued to attend our conferences and give us the benefit of his keen perceptions and advice. He had a lifelong interest in cancer care and his compassionate, calm demeanor and wealth of clinical experience are sorely missed in our conferences and in our program.

Respectfully submitted,

Angus P. McIntyre, MD

2016 Cancer Committee Members

CHAIRPERSON:

Angus McIntyre, MD
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VP, Lahey Health Cancer Institute

Judith Wells, RN, OCN
BH Team Leader

Kim Willis, NP-C, CBPN-IC
Breast Nurse Navigator

Gene Wong, MD
Radiation Oncology

Rebecca Yang, MD
Surgery

Breast Health Clinic

Breast Health Center Annual Report

The Breast Health Center provides comprehensive management of breast care with medical supervision to individuals with varying conditions or disease processes which require therapy and/or interventions, as well as associated monitoring, following guidelines set forth by regulatory and accrediting bodies such as ACR, ACS, NCCN, NAPBC and FDA (MQSA). The goals of the program are to perform comprehensive, yet specialized breast care-focused evaluations and assessments to determine appropriate therapies and/or interventions to effectively promote ongoing breast health and/or manage disease processes. Goals also include educating and counseling individuals/family/significant others about breast health management and/or their specific condition or disease process, as well as their medications and associated effects, thereby enhancing identified outcomes.

The Breast Health Center saw growth in clinic visits by 26% from FY15 to FY16. A number of initiatives have taken place during FY15 and FY16 such as:

- In 2015, the Breast Health Center achieved accreditation from the American College of Surgeons, National Accreditation Program of Breast Centers (NAPBC), with zero deficiencies and a best practice nomination.
- A Certified Genetics Counselor (CGC) began seeing patients in the Breast Health Center. This affords breast cancer and high risk patients the opportunity to meet with the CGC whom can provide education and counseling to the patient.

- Survivorship planning efforts began in 2015. Breast Cancer patients are seen by a Nurse Practitioner, Certified Breast Patient Navigator, in the Breast Health Center within six months of completing active treatment and no longer than one year from the date of diagnosis. The Nurse Practitioner provides the patient with a comprehensive, multidisciplinary plan, designed to facilitate and coordinate the post treatment care and follow up testing for the patient.
- The Breast Health Center and all mammography sites of Beverly Hospital have tomosynthesis technology. Tomosynthesis technology enables the radiologist to see the breast tissue in layers and is proven to reduce call back rates and false positives while detecting more cancers, at earlier stages.
- Lahey Outpatient Center, Danvers is the first in the U.S. to offer the state-of-the-art, in-bore Ambient MRI Experience – the most soothing patient environment available for MRI scans while giving physicians high-quality results. Ambient MRI has been clinically proven to decrease anxiety and increase patient well-being. Patients can choose their own music, lighting and wall images to transform the wide and spacious MRI suite into a soothing multi-dimensional theater. Patients of the Breast Health Center, needing Breast MRI, have their scans performed on the new Ambient MRI.

2015 and 2016 Cancer Conferences

(Includes all disease specific conferences and tumor boards)

The table on the right shows the number of cancer sites discussed at all of our conferences during 2015 and 2016. A total of 161 cases were presented in 2015, composing 22% of 735 total analytic cases. 361 cases were presented in 2016; the total number of analytic cases for 2016 is unavailable at the time of publication. The American College of Surgeons Commission on Cancer (ACOS CoC) requires that at least 10% of the institution's analytic cases be presented in this forum.

Beverly and Addison Gilbert Hospital holds four types of cancer conference per month: one general tumor board and three specialty site tumor boards. New for 2016 was Dermatology Oncology Tumor Boards lead by Dr. Gary Rogers. General Tumor Board is held the second, third, fourth and fifth week on Tuesdays at BH; Thoracic Tumor Board the second and fourth Tuesday of the month; and Breast Multidisciplinary Conference is held at LOCD on the first Tuesday of the month and the second, third and fourth Mondays of the month. Conferences are shared via video connection with AGH and LHS. A disease specific medical oncologist from LHS participates in each of these conferences.

Beverly and Addison Gilbert Hospitals ACOS CoC conference site tally

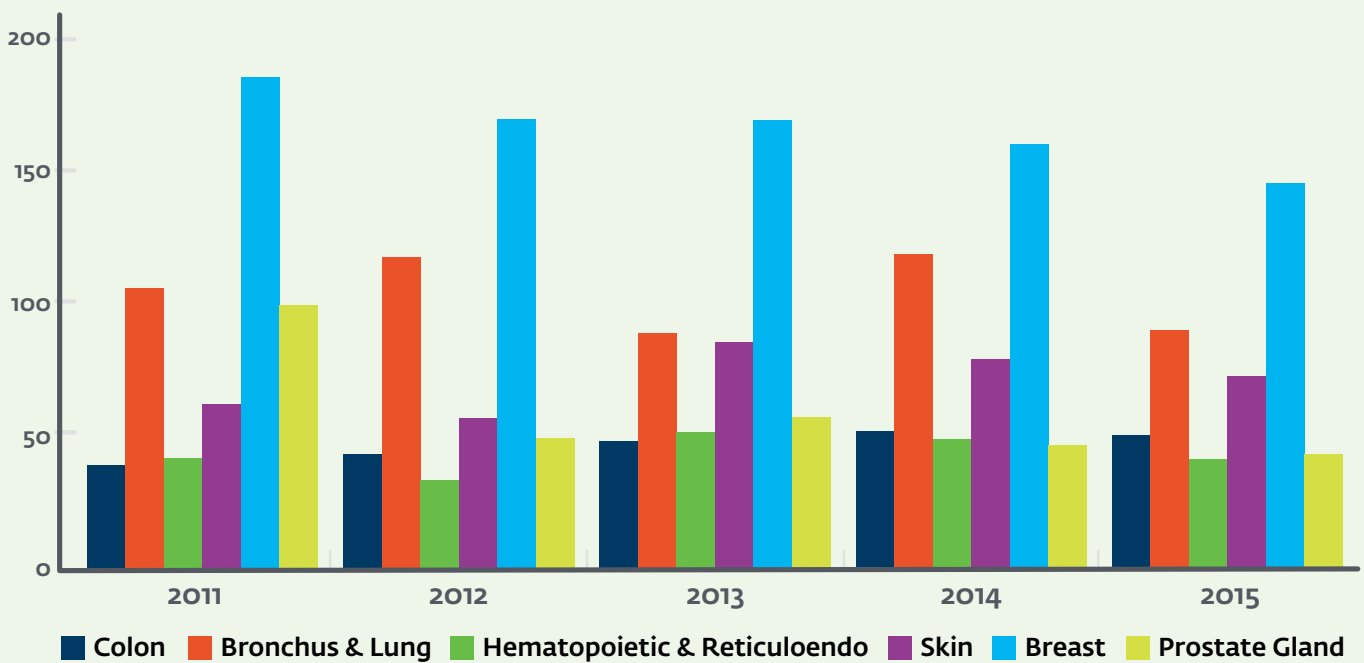
Sites Presented	2015 Jan. 1, 2015 – Dec. 31, 2015	2016 Jan. 1, 2016 – Dec. 27, 2016
Oropharynx	0	1
Oral Cavity	0	1
Nasal Cavity	0	1
Nasopharynx	2	0
Head/Neck	1	1
Esophagus	1	11
Stomach	1	3
Small Intestine	0	2
Colon	7	12
Rectum	4	12
Anus	0	4
Liver	0	2
Gallbladder	0	2
Bile Duct	0	1
Pancreas	5	8
Appendix (Carcinoid)	1	3
Other (Apocrine)	0	2
Lung	43	53
Thymus	0	1
Sarcoma	1	5
Bones, Joints, Cartilage	0	1
Hematopoietic	6	10
Skin/Non-Melanoma	18	39
Melanoma	10	37
Breast	44	97
Uterus	0	2
Prostate	3	2
Testis	1	0
Other male genital	0	1
Kidney	1	4
Ureter	2	0
Bladder	0	5
Brain	1	0
Lymph Node	6	24
Unknown Primary	2	10
Soft tissue	1	0
Neuroendocrine	0	3
Total	161	361

Cancer Data Management (CDM)

The CDM department is a required component of all cancer programs accredited by the CoC. In 2015, there were a total of 735 cases newly diagnosed or “analytic” cancer cases. CDM department provides the means to collect demographics, staging, treatment, and follow-up of each case of cancer seen at Beverly and Addison Gilbert Hospitals. Data processed by the cancer registry is used to produce various data reports requested by administration and by the medical staff. New cancer cases are submitted to the

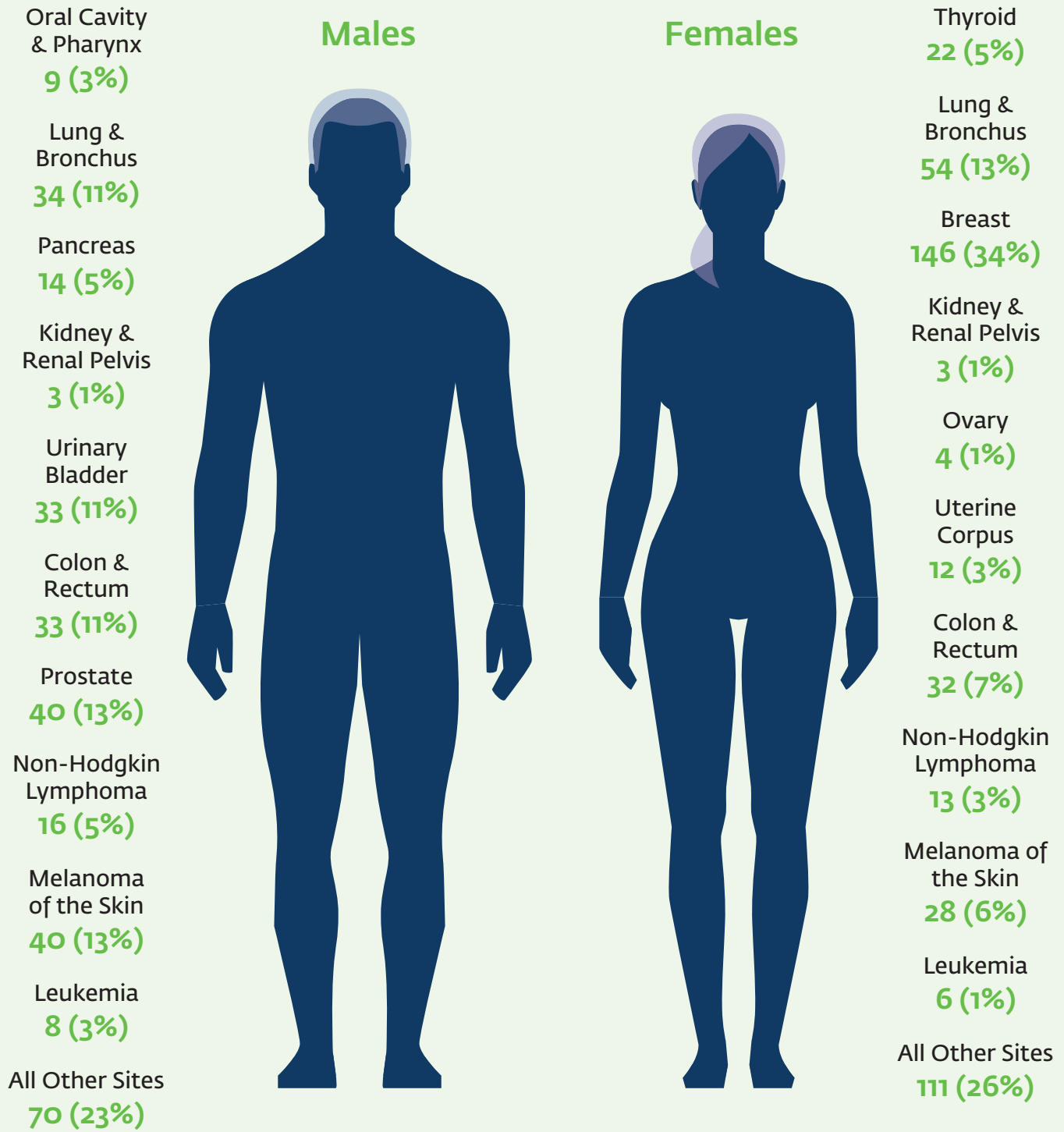
Massachusetts Cancer Registry and the National Cancer Database of the CoC. All rules established by HIPAA are observed. In 2016, follow-up of an achieved AGH database was discontinued. The year 2016 ended with 6,075 cases with, 3,808 requiring follow-up. The 2016 follow-up rate, which is used in the calculation of survival data, was 90.4% for Beverly and Addison Gilbert Hospital; nationally the follow-up rate is 90%. In 2016, CDM staff attended 2 conferences, NCRA in Las Vegas, NV and CRANE in Portland, ME.

Top 10 Primary Sites 2011 – 2016 Beverly and Addison Gilbert Hospital



The most frequent sites of cancer seen at Beverly and Addison Gilbert Hospital in 2015 were breast (n=148), lung (n=88), melanoma (n=68), colorectal (n=65), and bladder (n=53). The majority of patients were female (n=431), compared to male (n=300).

2015 Primary Site by Body Systems by Gender



Cancer Support Groups

All support groups listed below are offered FREE OF CHARGE unless noted

AGH Campus:

298 Washington St., Gloucester

Breast Cancer Support Group

The Breast Cancer Support Group at AGH meets on the third Tuesday of each month from 6:30 – 8 p.m. in the Longan Room, located inside the Washington Street entrance. Pre-registration is not required. This group does not meet in July and August.

General Cancer Support Group

The Cape Ann Cancer Support Group meets on the fourth Tuesday of each month from 4:30 – 6 p.m. in the Longan Room, located inside the Washington Street entrance. Pre-registration is not required. This group does not meet in July or August.

Look Good . . . Feel Better Program

ACS program for women going under cancer treatment. Every other month (even month) meeting at AGH, and at our Peabody campus on the opposite months.

Polycythemia Vera Support Group

The Polycythemia Vera support group is held several times a year. Family members and friends are welcome.

BH Campus:

85 Herrick St., Beverly

Breast Cancer Support Group

The Breast Cancer Support Group at BH meets on the third Tuesday of each month from 7 to 8:30 p.m. at The Herrick House located on the upper campus of Beverly Hospital. Pre-registration is not required.

Melanoma Support Group

The Melanoma Foundation of New England sponsors a support group open to all those who have been diagnosed with melanoma. The group is facilitated by a licensed social worker. The group meets on the second Tuesday of each month from 6 p.m. to 7:30 p.m.

Ostomy Support Group

The Ostomy Support Group is held at BH campus, in the Women's Health and Medical Arts Building and meets throughout the year. (April, May, July, October and December) The program is facilitated by certified ostomy nurses. Pre-registration is requested by calling 888.253.0800. Walk-in guests are also welcome.

Smoking Cessation

Free eight-week program, Freedom from Smoking, held at the Lahey Medical Center, Peabody and Lahey Hospital & Medical Center, Burlington campuses. (Lahey.org/smokingcessation/ for more information and schedules) Massachusetts Quit Works Program: free program, your physician can refer you. <http://quitworks.makesmokinghistory.org/about/how-it-works.html>.

2015 & 2016 Chaplain/Pastoral Care

The Department of Pastoral Care is led by the Director of Pastoral Care Sister Sara-Ann Buckley, SND. Sr. Buckley is a member of the BH Ethics Committee and attends the Cancer Committee and the Tumor Board, when possible. Through the Clinical Pastoral Education Program (CPE) chaplains, priests, Eucharistic ministers, local clergy and rabbis all provide ongoing support and ministry to oncology patients throughout Beverly and Addison Gilbert Hospital by providing pastoral care, through conversation, compassionate care and spiritual conversation. Chaplains assist people to find integration, wholeness and health by focusing on specific life issues.

The chaplains are involved in the multidisciplinary care of the oncology patients through direct referrals, as well as participation in regular inpatient staff rounds and rounding. The program

involves approximately 18 clergy per year, made up of seminarians, clergy and lay people of a variety of faith traditions and is a resource to patients, their families and staff. Ongoing support for this program is provided yearly through donations from local congregations and individuals to the Chaplaincy Endowment Fund (established in 1992), student tuitions and grants, in addition to the Pastoral Care budget.

The chaplains provide spirituality groups and one-on-one conversation for hospital patients, on Leland, residents at Herrick House, Ledgewood, and Turtle Creek/Turtle Woods. The chaplains assist in building community in the various settings by providing a pastoral presence. A chaplain is assigned to the Oncology clinics and spends several hours each week ministering to the patients who come in for treatment.

Clinical Trials

Research studies open for enrollment at Beverly and Addison Gilbert Hospital are aimed at reducing the morbidity and mortality of cancer, correlating biological and genetic characteristics of cancer to clinical outcomes and the prevention of cancer.

Beverly and Addison Gilbert Hospital participate in National Cancer Institute (NCI) sponsored clinical trials through national cooperative research

groups like Southwest Oncology Group (SWOG) and the Clinical Trials Support Unit (CTSU). Our affiliation with Lahey Hospital & Medical Center has broadened our ability to provide clinical research studies to our community.

Actively accruing Beverly and Addison Gilbert Hospital clinical trials can be viewed on the website (BeverlyHospital.org)

Community Services

In 2016, Beverly and Addison Gilbert Hospitals participated in and sponsored a variety of community programming including health fairs and wellness events. A free Speakers Bureau is also available where physicians, nurses and other health care providers speak on a various health topics. Highlighted below are just some of the programs and events held in 2016.

2016 Events

Month	Event Name	Town	# Attended
March	Health Fair at the North Shore Mall	Danvers	
April	Marblehead Health Fair	Marblehead	200
June	Lahey Health Cancer Walk	Burlington	5,000
	American Cancer Society - Relay for Life	Beverly/Danvers	
June	Kids Karma Night	Lynnfield	300
July	Slip, Slop, Slap & Wrap Campaign		1000
August	Gloucester Sidewalk Days	Gloucester	
September	Falls Prevention Day	Beverly	
September	Gloucester High School Health Fair & Resource Day	Gloucester	800
November	NOAA Health Fair	Gloucester	100

2016 Beverly and Addison Gilbert Hospital Support Groups

Month	Event Name	Town
Ongoing Monthly	Breast Cancer Support Group	Beverly
Ongoing Monthly	Prostate Cancer Support Group	Beverly
Ongoing Monthly	Breast Cancer Support Group	Gloucester
Ongoing Quarterly	Look Good Feel Better	Gloucester
Ongoing	Smoking Cessation	Danvers
Ongoing	Sun Safety Campaign at Market Street	Lynnfield

Other Projects

BH-AGH Community Health Needs Assessment: Comprehensive assessment conducted every three years as per federal requirements. This is available at BeverlyHospital.org.

Ethics Committee

The Ethics Committee is a multidisciplinary committee composed of representatives from medical, legal and spiritual disciplines, as well as religious leaders and community members. The Ethics Committee is responsible for:

1. Reviewing policies and procedures as related to patient rights.
2. Educating the membership as well as medical staff, personnel and the community on the subject of bioethics.
3. Providing a forum for medical staff, hospital staff, patients and families to discuss ethical issues.

The Ethics Committee is not an arbitrating or decision-making body, but rather serves in an advisory capacity to assist medical professionals, staff, patients, and families to reach decisions

based on ethics principles. The Committee members focused on their own continuing education and development by devoting meeting time to discussing case studies and reporting on contemporary readings on ethics literature. Ethics related publications of interest were suggested and numerous articles were copied, reviewed/discussed and sent to committee members as information. Discussions were held throughout the year regarding the planning of Ethics Committee Educational Sessions for committee members, healthcare system staff and the community. Ethics Education Sub-committee meetings were held. Ethics Committee members attended several educational programs throughout the year, including Schwartz Center Rounds and Harvard Medical School Annual Bioethics Course. There were three consultations requested in 2015 and one consultation requested for 2016.

Hospice

Care Dimensions (formerly Hospice of the North Shore & Greater Boston) enriches quality of life by providing expert care, support, education and consultation for those affected by life-limiting illness, death and loss. Hospice care is a team-oriented approach to manage symptoms and enhance quality of life by integrating physical, emotional, social and spiritual support to meet the needs of the patient and loved ones. Care Dimensions offers a variety of complementary therapies (such as massage, Reiki, aromatherapy, music, art and pet therapy) to further enhance quality of life for patients, families and caregivers. Care Dimensions has provided a wealth of education to hospital staff regarding topics relative to end of life, including pain and symptom management, palliative and hospice care, advanced directives and grief management. Care Dimensions offers support and involvement with various committees at Beverly and Addison

Gilbert Hospitals to support the mission and goals of the organization.

Inpatient hospice care at both hospitals is managed by the Hospitalist Physician Service, with support from the interdisciplinary team from Care Dimensions. Care Dimensions provides palliative care consultations at Beverly Hospital with a physician or nurse practitioner available five days a week, with additional support from a social worker if needed. For patients at end of life who need acute pain and symptom management, Care Dimensions provides seamless and expedient transfers to its Kaplan Family Hospice House, which provides inpatient-level care in a home-like environment. Care Dimensions also offers open access to patients who are hospice eligible, but who want to continue with selected treatments, such as palliative radiation for symptom management.

Below is the summary of 2015 patient involvement by the Care Dimensions team:

Addison Gilbert Hospital:

- 16** patients received inpatient hospice care at the hospice suite on Steele 1.
- 7** patients were transferred to a nursing home/assisted living facility with hospice services.
- 10** patients went home with hospice services.
- 24** patients were transferred to the Kaplan Family Hospice House.

Beverly Hospital:

- 30** patients received inpatient hospice care on various units at the hospital.
- 67** patients were transferred to a nursing home/assisted living facility with hospice services.
- 57** patients went home with hospice services.
- 137** patients went to Kaplan Family Hospice House.

Nursing

Across all of the patient care areas at Beverly and Addison Gilbert Hospital, the nursing staff has a heightened awareness and attentiveness for oncology patients. Many have acquired oncology-specific training or education that enhances the care and safety of our patient population. Because cancer care is a multidisciplinary, multimodality model, nearly every nursing unit encounters oncology patients to care for in their routine assignments – from the emergency room to radiology to the critical care units and the medical-surgical units as well. Special attention and care is given to ensure patients with complex medical histories and potentially compromised immune systems receive the care they require to avoid complications and accelerate recovery and recuperation.

Both the BH and AGH campuses have 10 chair hematology-oncology infusion clinics where outpatient adults receive the majority of their oncology care. The care ranges from education around and administration of chemotherapy and biotherapies, to supportive care such as maintenance of central lines to hydration and transfusions. The clinics are overseen by the hematology-oncology physicians of the Northeast Medical Practice and Harvard Vanguard's Beverly office. In total, there are 18 registered nurses including the Nurse Manager for Cancer Services and the practice nurses for two of the physician

offices, all providing care to the patients that we serve. All of the RN's hold either a national certification (OCN) from the Oncology Nursing Society or the society's Chemotherapy/Biotherapy Provider card.

On the inpatient unit of J6 at Beverly Hospital, there are nurses who have received advanced education on the safe handling and administration of chemotherapy and the care of the oncology patient. These nurses manage the care of the hospitalized oncology patient at key points in time (diagnosis, complications and end of life).

Nursing Leadership for Beverly and Addison Gilbert Cancer Services Teams:

Jannell Foster, RN
Nurse Manager J6

Joanne Gibbs, RN OCN
Team Leader AGH

Judy Wells, RN OCN
Team Leader BH

Karin Leppanen, RN MS OCN
Nurse Manager for Cancer Services

Robbin Miraglia, RN PhD
Nurse Educator

Sandra Brown, RN OCN
Team Leader BH

Nutrition

Registered licensed clinical dietitians see outpatients for nutritional assessment in the Oncology Clinics at both BH and AGH on a consultative basis. All new chemotherapy patients fill out an initial nutrition screening form that is reviewed by a registered dietitian; nutrition consults may also be requested by an

MD or RN as needed. Recent enhancements to nutritional offerings in Outpatient Oncology include weekly office hours, a trial of scheduling dietitian appointments in Epic, and an update to the nutrition screening form to allow better communication between infusion suite staff and dietitian.

2016 Launch of the CMS Oncology Care Model

Respectfully Submitted by Linda Weller-Ferris, PhD, Vice President, Lahey Health Cancer Institute

What is the CMS Oncology Care Model?

The big buzz in the oncology community is the launch by CMS (also known as Medicare) of the Oncology Care Model (OCM) demonstration project. On 6/29/2016, CMS announced that 196 practices, comprised of 2,000 medical groups and 17 payers were accepted into the demonstration project. The medical oncologists who furnish chemotherapy treatments within the Lahey Health Cancer Institute, comprised of cancer programs at Lahey Hospital & Medical Center, Lahey Medical Center, Peabody, Winchester Hospital Center for Cancer Care, and Beverly Hospital and Addison Gilbert Hospital, were all accepted into the project. This is a five-year demonstration project, which launched on July 1, 2016.

CMS has three overarching goals for the project: *“Better care, smarter spending, healthier people.”* The expressed goals of the Oncology Care Model (OCM) are to align financial incentives, improve care coordination, the appropriateness of care, quality, access, and reduce costs associated with Medicare patients receiving oral or intravenous chemotherapy. OCM incentivizes medical oncology practices to improve quality of care and lower costs, with a particular focus on preventing ER utilization and unplanned inpatient admissions while receiving chemotherapy.

Practice Changes for Lahey Health Entities

Participating programs are expected to use their MEOS payments to make investments in their practices to enhance their delivery system and meet the mandatory requirements of the program. For Lahey Health, five improvements were identified in the application. They included the following:

- 1) **Manage chemotherapy events through risk stratification with Nurse Navigators:** Lahey Health, including Beverly Hospital and Addison Gilbert Hospital, will adopt the Elders Risk Assessment Index (ERA) to risk stratify patients in the OCM project.
- 2) **Increased Care Coordination Using Dedicated Nurse Navigators for the Program:** to help address psychosocial distress and actively engaging patients and caregivers in care decisions and symptom management.

NCCN Guidelines: Ensure Compliance with NCCN Guidelines and provide clinical decision support electronically to providers.

Palliative Care Services: Increase Palliative Care services in the outpatient setting, addressing unmet psychological and emotional distress needs and managing symptoms more effectively.

End of Life Care: Assess end of life care and patient decisions in a multidisciplinary setting, to ensure chemotherapy is not over-utilized very near to end of life, not to increase ER visits and hospitalizations in the ICU for terminal patients, and not to underuse hospice services.

As CMS launches this bold initiative, it is apparent that this is a demanding program for the practices that were selected and then chose to participate. It does give all medical oncologists nationally a glimpse of the future. With the claims data collected and the quality metrics selected, CMS is likely crafting a path over the next five years to move slowly from FFS for chemotherapy to value-based care. With this project, CMS will clearly have the data they need to move into bundled payments for chemotherapy episodes. Interesting times!

Pathology Department

The pathology department is a full service anatomic and clinical pathology department certified by the College of American Pathologists (CAP). We completed our most recent inspection in May of 2016. There are three board certified AP/CP pathologists, with subspecialties in breast pathology, gastrointestinal pathology, forensic pathology and hematopathology.

In 2015, there were 15,698 surgical cases examined from a variety of anatomic sites. any cases are routinely subjected to intra-departmental review at a daily pathology conference. Such cases include breast core biopsies and excisions, prostate biopsies, skin biopsies, new tumor diagnoses, and pap smears with high grade

dysplasia. All frozen sections are also co-reviewed if another pathologist is available. All tumor cases are reported in a synoptic format according to the CAP guidelines.

The cytology department is full service with three cytotechnologists. All non-gyn cytology as well as pap smears are pre-screened by a cytotechnologist before pathologist review. The Cytec thin prep system with automated image analysis remains in place. 12,991 pap smears were reviewed in 2015. 735 Non-gyn cytology cases and fine needle aspirates were also examined in 2015, a subset of which immediate interpretation was performed to determine adequacy.

Radiation Oncology

The Radiation Oncology service at Lahey Hospital & Medical Center offers our patients state-of-the-art therapies in a compassionate and patient-centered environment. Our treatment philosophy is rooted in teamwork, ease of access and patient empowerment.

The clinical team is dedicated to educating our patients, to allow them to make informed treatment decisions that best suit their individual needs. We take a precise, focused approach to radiotherapy. Our treatment options are adapted to treat the patient with the least amount of radiation needed, as evidenced by our successful Intraoperative Radiotherapy program, our state of the art Stereotactic Radiotherapy programs and our comprehensive HDR program. This approach allows for superior outcomes, increased patient satisfaction and, most importantly, higher quality treatment. The five most frequent sites for radiation treatments for Lahey Hospital & Medical Center patients continue to be breast, lung, prostate, head and neck, and brain.

Quality and safety are of critical importance in Radiation Oncology. Through our Radiation Oncology Safety Initiative team we have developed a rigorous radiation quality and safety program. The department has become early

adopters of Failure Modes and Effects Analysis to evaluate the strength of our clinical processes. We are also members of the Clarity Patient Safety Organization which operates the National Radiation Oncology Incident Learning System, which is jointly sponsored by the American Society for Radiation Oncology and the American Association of Physicists in Medicine.

Lahey Hospital & Medical Center Radiation Oncology site at Peabody is equipped with 2 linear accelerators, including a new, state of the art True Beam Linear Accelerator with Brain Lab patient motion management capabilities, 1 Computed Tomography Simulator, 1 High Dose Rate Brachytherapy unit, complete photon, electron and brachytherapy capabilities, on-board imaging using cone beam Computed tomography, as well as conformal 3D therapy, Intensity Modulated Radiation Therapy, Volumetric Modulated Arc Therapy, Image Guided Radiotherapy, stereotactic radiotherapy, stereotactic radiosurgery and low-dose rate brachytherapy.

Radiation Oncology received full re-accreditation by the American College of Radiology in 2014. We continue to grow our research program and continue to look for ways to improve the patient experience both during and after treatment.

Radiology

2016 saw the establishment of a more comprehensive Interventional Oncology program at Beverly Hospital. Interventional Radiology is now able to perform Radio Embolization with catheter directed treatment of cancerous lesions in the liver which are either from the liver itself or have spread to the liver from other sites. This treatment option is more easily tolerated than some chemotherapy regimens, requiring usually only a half day in the hospital with no need for

general anesthesia. In the coming months, we also look forward to offering a cutting edge thermal ablation procedure for cancerous lesions in the spine. This is also performed by interventional radiologists in a single visit. Early results indicate that this procedure, which uses heat to directly kill a tumor, is complementary to radiation therapy in the spine, adding strength to a diseased spine in a safe manner.

Rehabilitation Services

Based on the recommendations in the Institute of Medicine's 2013 report on delivering high quality cancer care, Beverly and Addison Gilbert Hospitals joined LHMC's partnership with Oncology Rehab Partners and their survivorship, training and rehab program ("STAR") to provide preoperative lymphedema screening and education, impairment and functional disability screenings as well as formal cancer rehabilitation to cancer survivors.

The STAR cancer rehabilitation program is an evidenced based, multi-disciplinary cancer rehabilitation program. In 2015, 10 clinicians from rehabilitation, nutritional services and nursing across all of Beverly and Addison Gilbert Hospital underwent training and certification. In 2016, an additional 11 clinicians were certified.

The gap in care for cancer patients is narrowing. The evidence shows that approximately 65-

90% of cancer survivors should be referred for rehabilitation based on having physical impairments and functional disabilities as a result of their cancer treatment. In 2014 only 3.4% of newly diagnosed cancer patients at Beverly and Addison Gilbert Hospital were referred for rehabilitation services. The Cancer Committee supported increased utilization of this patient resource and made referrals to rehab services a programmatic goal in 2016 to achieve a 20% rate of referral. Following initiation of the STAR program, referrals rose to 11% in 2015 and over 21% this past year.

Oncology Rehab Partners ceased operations as of December 2016 but LHS's commitment to oncology rehabilitation remains strong and the system is working to revamp and rename the program, while maintaining the commitment to our patients.

Thoracic Clinic

In addition to the twice monthly Thoracic Oncology Tumor Board, a weekly Thoracic Surgery Clinic for patients with both benign and malignant lung and esophageal diseases. The patients are seen by a thoracic oncology nurse and the thoracic surgeon. Visits include consultation, post-operative care, long term follow up and patient education. Minor procedures can also be performed during the clinic visit. For patients who also see a physician in the medical oncology practice, the appointments are coordinated for convenience and efficiency.

In 2016, a total of 218 patient appointments were completed with Drs. Syed Quadri and Elliot Servais of Lahey's Thoracic Surgery Department. This was an increase from our 2015 clinic, which saw 124 patients in clinic during a year when we saw provider transition from Dr. Shalini Reddy to Dr. Quadri in the clinic. The thoracic nursing team consists of Melissa Dube, RN; Kathleen Wilbur, RN, OCN; Kristen Nicastro, RN, OCN and Amanda Marr, RN.

2005-2015 Multiple Myeloma

Dr. Angus McIntyre

In 2015, we had 10 new cases of myeloma, representing the largest number over the past 10 years. The cancer committee voted to review multiple myeloma although it remains an uncommon malignancy, representing 1.5 percent of our total cases.

Myeloma is a cancer of plasma cells, predominantly affecting the bone marrow. Malignant plasma cells can also perform macroscopic tumors called

plasmacytomas and visceral organs can sometimes be involved. It commonly results in destructive bone lesions that predispose to fracture and it causes compromise of the immune system resulting in infection. Both of these features may lead to significant morbidity during the patient's remaining lifetime.

Myeloma represented 1.5 percent of the total cases for NHC for 2015 and 1.8 percent

nationally estimated for 2016. The risk of developing myeloma was 0.8 percent for both males and females per the National Cancer Institute. This study will review and compare cases from two five-year windows (2005-2010 and 2011-2015) for sex, age, workup, and treatment. The five-year relative survival for 2005-2011 was 64.2 percent for NHC, which is higher than the SEER five-year relative survival.

TABLE I: Myeloma from 2005 to 2015

Year of 1st Contact	Count (N)
2005	5
2006	5
2007	5
2008	9
2009	8
2010	3
2011	7
2012	3
2013	8
2014	7
2015	10
Total	70

***The number of myeloma cases increased in 2008 (n=9) from 2007 (n=5), again in 2013 (n=8) from 2012 (n=3) and 2015 (n=10) from 2014 (n=6).*

TABLE II: 2005-2015 NHC Multiple Myeloma by Gender

Gender	2005-2010	2011-2015
Male	15	16
Female	20	19
Total	35	35

TABLE III: 2005-2015 NHC by Age

Age	2005-2010	2011-2015
50-59	6	7
60-69	11	3
70-79	9	15
80-89	7	8
90+	2	1
Female	20	19
Total	35	35

NHC age range for the 10 patients was between ages 44-91 years of age. NCI states the most frequent age groups is between 65-74 years of age. The mean age for 2005-2010 is 71 years old and for 2011-2015 is 72 years old. The age range for 2005-2010 is 54-91 years, and for 2011-2015 is 44-90 years

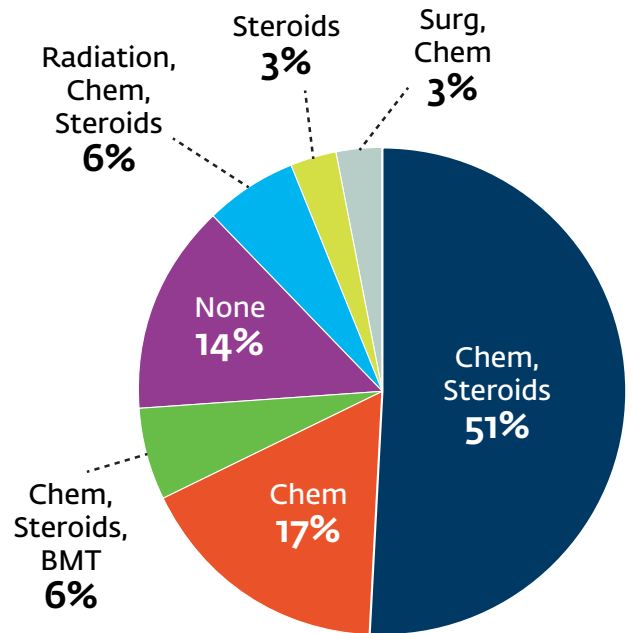
TABLE IV: 2005-2011 versus 2011-2015 NHC Myeloma by 1st Course of Treatment

Treatment	2005-2010	2011-2015
Chemotherapy	6	1
Steroid*	1	2
Other	1	0
Radiation	0	1
Chemo/Steroid	17	16
Chemo/Steroids/BRM	0	2
Rad/Chemo/Steroids/BRM	0	1
Rad/Chemo/Steroids	2	0
Chemo/Steroid/BRM/BMT	0	1
Chemo/Steroid/BMT	2	0
Steroids/Rad	0	0
Chemo/BMT	0	1
Chemo/Steroids/Other	1	0
None	5	9
Total	35	35

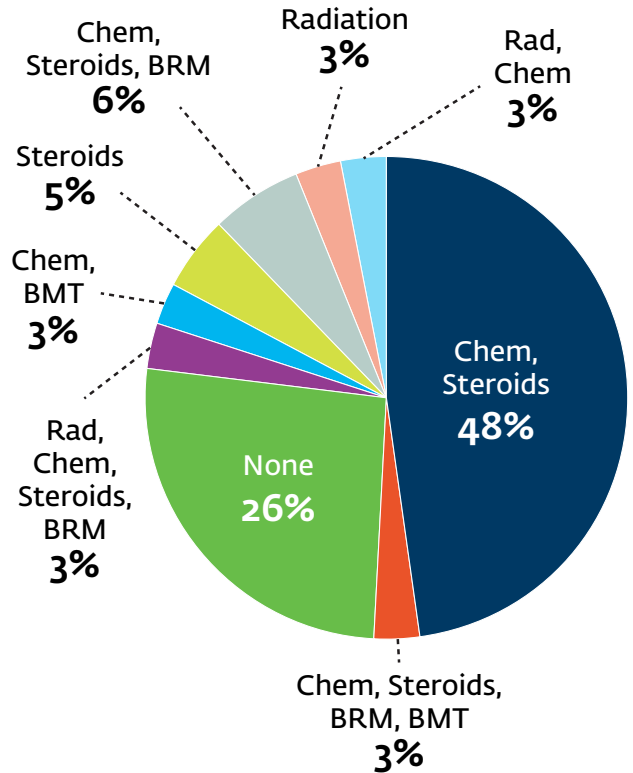
BMT = bone marrow transplant, Hormone = Steroids, BRM = immunotherapy, Rad = Radiation Therapy

2 patients had bone marrow biopsy only. One patient had smoldering myeloma and the other patient had insurance issue and went to Boston with recommendation of bone marrow transplant.

GRAPH V: 2005-2010 versus 2011-2015 NHC by 1st Course Treatment



In 2005-2010, the majority of the patients were treated with chemotherapy.



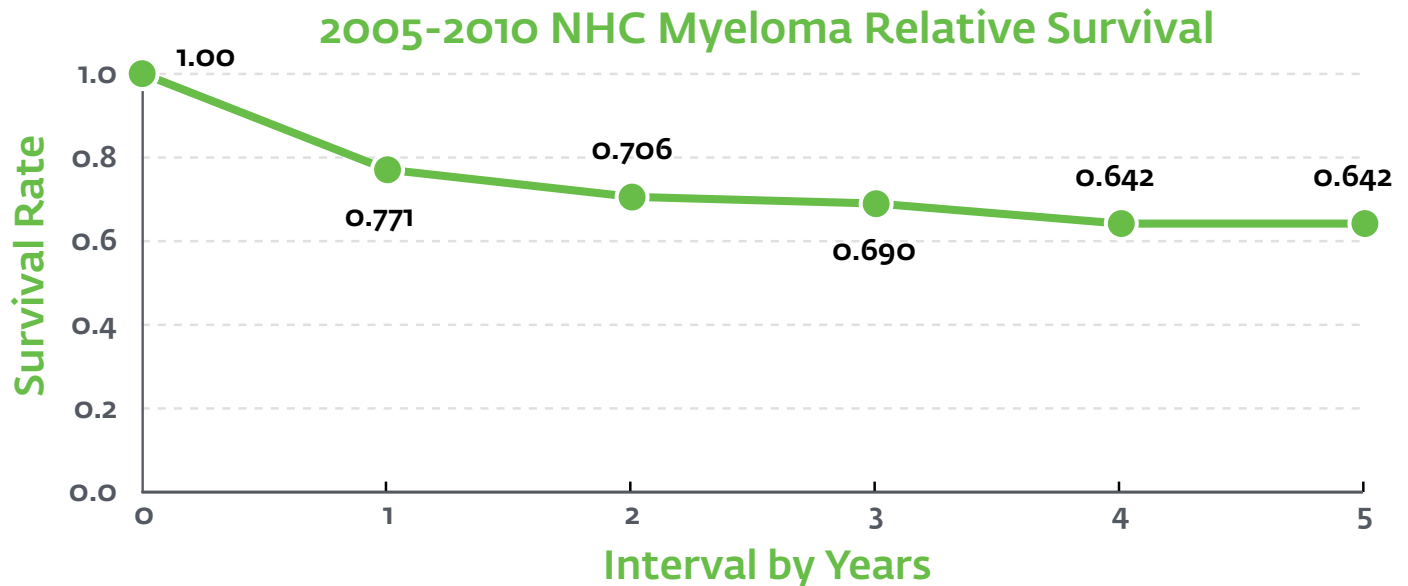
In 2011-2015, chemotherapy is still the treatment of choice.

TABLE VI: 2015 vs 2005 NHC Myeloma Systemic Treatment Modalities

NHC Systemic Treatment	2015	2005
	N	N
Bortezomib (CH) & Dexamethasone (S)	4	0
Bortezomib (CH), Cyclophosphamide (CH), Dexamethasone (S)	2	1
Bortezomib (CH), Lenalidomide (BRM), Dexamethasone (S), Radiation	1	0
Bortezomib (CH), Lenalidomide (BRM), Dexamethasone (S)	1	0
Bortezomib (CH), Lenalidomide (BRM), Denosumab (BRM), Bone Marrow Transplant	1	0
Bortezomib (CH), Thalidomide (BRM), Dexamethasone (S)	0	1
Thalidomide (BRM)	0	1
Melphalan (CH), Prednisone	0	1
Dexamethasone (S)	0	1
No Chemotherapy or Steroids	2	0

CH= Chemotherapy, S = Steroids, BRM = Biological Response Modified, eg Immunotherapy

GRAPH VII: 5 Year Relative Survival for 2005 - 2010 NHC Multiple Myeloma



There were 35 myeloma cases diagnosed between the years 2005-2010 at NHC. When comparing NHC survival to SEER, NHC had a better survival rate. SEER 5 year Relative Survival is 49.6% (2003-2008) as compared to 5 year Relative Survival for NHC IS 64.2%

Conclusion:

Myeloma remains an uncommon malignancy and our review showed 70 cases over the 11 year period spanning 2005 through 2015, giving an average of about 6.4 cases per year. The 10 cases in 2015 represented 1.5% of total cases for NHC that year. This compares with 1.8% of cases reported nationally. Cases were fairly evenly split by sex although with a slight predominance of females who accounted for 39 cases compared with 31 males for 2005 - 2015. Our age distribution appeared to match national statistics. We had only one case under the age of 50. Our largest number of cases was in patients in their 70s although with sizable numbers in their 60s and 80s and also a significant number in their 50s.

Treatment of myeloma has evolved in a major way over the past 15-20 years during the time span of our two cohorts (2005-2010 and 2011-2015.) In the past, treatment was limited to several older chemotherapy agents, steroids, radiation, and occasionally bone marrow transplant. In the past 15 years a host of new therapeutic agents encompassing completely new classes of drugs have been developed, vetted through clinical trials, and introduced into clinical practice.

Steroids, most often dexamethasone, remain part of most regimens. Radiation is still used to manage painful, localized bony involvement, and bone marrow transplant remains an important option for younger, fitter patients although improvements in supportive care have progressively raised the age for which transplant may be considered.

New drugs include proteasome inhibitors such as bortezomib (Velcade), carfilzomib, and ixazomib, immunomodulatory drugs or Imids, originally thalidomide but subsequently, lenalidomide (Revlimid) and others. Most recently 2 monoclonal antibodies have also become available with a flurry of FDA approvals in the past 2 years. Older drugs, most notably cyclophosphamide, are still in use but have taken a back seat. In 2005, 3 of our patients received a new drug, either bortezomib or thalidomide. By 2015, 9 patients received at least one of these new drugs as part of their initial treatment.

Our numbers for any one year remain small, however a review of relative survival for the 35 patients diagnosed between 2005 and 2010 indicates a respectable 5 year relative survival of 64.2% compared to the national SEER result of 49.6% for the cohort diagnosed from 2003 to 2008. The data in our registry gives only a high vantage point overview of our experience with myeloma and does not give a flavor for the month to month reality of living with myeloma, however a multitude of new drugs, better supportive care, and the judicious use of radiation and bone marrow transplant have significantly improved the outlook and decreased the morbidity of this illness for our patients.

Glossary

ACR: American College of Radiology

ACS: American Cancer Society

ACoS: American College of Surgeons

Accessioned: A term defined as the cases entered into the Cancer Registry database according to the year of first contact by Beverly and Addison Gilbert Hospital.

AGH: Addison Gilbert Hospital

AJCC Staging (TNM staging – tumor, lymph nodes and metastases): System used to stage selected cancers of the head/neck, digestive system, thorax, musculoskeleton, skin, breast, gynecologic tumors, GU cancer, prostate cancer, colorectal, ophthalmic, lymphomas and pediatric cancer.

Analytic Cases: Cases seen at Beverly and Addison Gilbert Hospital with a new diagnosis of cancer and/or receiving part of first course of treatment at Beverly and Addison Gilbert Hospital.

BH: Beverly Hospital

CoC: Commission on Cancer branch of the American College of Surgeons

FDA (MQSA): Federal Drug Administration’s Mammography Quality Standards Act

First course of treatment: The initial tumor-directed treatment or series of treatment initiated within four months following diagnosis.

Follow-up: To monitor all patients entered into the Cancer Registry database to ensure follow-up through contacting physician offices, hospital readmittance or patient contact.

FORDS: Facility Oncology Registry Data Standards (Guidelines for cancer registry operations beginning with 2003 cases)

Incidence: The extent to which disease occurs in the population. Cancer incidence is the number of new cases of cancer diagnosed each year.

LHS: Lahey Health System

LOCD: Lahey Outpatient Center Danvers (formerly known as “Beverly Hospital Danvers” or “BHD”)

Localized: A neoplasm that appears to be confined to the organ of origin

Median: The middle value by sorting the observations in order of smallest to largest

NAPBC: National Accreditation Program of Breast Centers – a division ACoS

NCCN: National Comprehensive Cancer Network

NCDB: National Cancer Data Base a subdivision of the American College of Surgeons Commission on Cancer

NHC: Northeast Health Corporation

Non-analytic: term referring to the cases first seen at Beverly and Addison Gilbert Hospital after a full course of therapy has been completed or that were first diagnosed at autopsy with unsuspected malignancy.

Radiation therapy: Treatment with high-energy rays to destroy cancer cells.

Relative Survival Rate: A measurement of the proportion of persons surviving regardless of cause of death.

RBA (Reportable by agreement) cases: Cases not specified by FORDS Manual as reportable malignancies but reportable for the Massachusetts Central Cancer Registry, and/or the Cancer Committee.

SEER: A diversion of the National Institutes of Health, National Cancer Institute

Stage of Disease: A system of evaluating the spread of malignant tumors; extent of disease.

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Notes

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