CANCER COMMITTEE MEMBERSHIP 2012

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Providing Complete connected care™ to cancer patients and families

Lowell General Hospital
THE CANCER CENTER
A GUIDE TO CANCER CARE
Complete connected care™
A Message from Murat Anamur, MD
Medical Director, Cancer Services
at Lowell General Hospital

Lowell General Hospital’s cancer program has been a leader that defines quality care for patients with cancer and influences change to continually improve cancer care. We promote the entire continuum of quality cancer care for our patients and our community. Our Cancer Committee develops, approves, and implements the strategic plans, goals, and objectives for new programs and provides oversight for ongoing programs and services. Our multidisciplinary cancer conferences are conducted on a timely basis to ensure that all patients and practitioners have access to consultative services.

As a Center of Excellence, our cancer program was granted a three-year Approval with Commendation as a Comprehensive Community Cancer program by the Commission on Cancer (CoC) of the American College of Surgeons (ACoS). The CoC has also awarded Lowell General its Outstanding Achievement Award which is designed to recognize cancer programs that strive for excellence in providing quality care to cancer patients.

The Cancer Center at Lowell General Hospital is also accredited by the American College of Radiology (ACR). The ACR is a national organization that awards accreditation to facilities for achievement of high practice standards.

In October 2012, we consolidated outpatient cancer services to the Lowell General Main campus. The success of this consolidation could never have been accomplished without the continued support from all care providers at both the Saints and the Main campuses.

Our Oncology team members work as patient navigators to ensure the patient, their family members, and caregivers move through the complexities of the system in a timely fashion.

With cutting edge technology and dedicated professionals working together, I am proud to represent the Department of Oncology for another year and present to you our program highlights in this Cancer Program Annual Report presentation.

Murat Anamur, MD
Medical Director, Cancer Services
Chief of the Department of Oncology
Chairman of the Cancer Committee
Tobacco prevention and education is one of our major focus areas. One of our goals is to reduce the use of tobacco in adults. Another part of that same goal is to increase the knowledge around the dangers of tobacco use in youth.

Oncology CME Conference Meetings
In 2012, we offered the following CME programs: “Survivorship and our role in it as clinicians,” presented by Dr. Ing Lennes, and “Updates on head and neck treatment,” presented by Dr. Paul Bause from Massachusetts General Hospital.

Grand Rounds Conferences
We held Grand Rounds presentations during 2012. Featured speakers and topics were: Dr. Mihir Kamdar from Massachusetts General Hospital who presented “Treatment of Chronic Benign Pain,” and Dr. Elizabeth Ransdell from Brigham and Women’s Hospital who presented “Cancer and Thrombosis.”

Ongoing Education
Nursing and Medical In-services held at the Cancer Center for staff included:
• Update on Erbitux
• Stivarga (new drug)
• Ziv-Afi bercept (new drug)
• Adcetris (update)
• Afi nitor (update)

Support Group
Lowell General Hospital also offers a Smoking Cessation Support Group open to the public. This support group meets one time per month at the Main Campus. The instructor of this group is a Freedom from Smoking facilitator who brings a great deal of experience to the table. This group is geared towards people who are in the stages of quitting smoking. It helps them with tips and support to continue on their journey. It is also a safe place to discuss the troubles they are having in an understanding and empathetic environment.

Partnership with American Cancer Society
American Cancer Society staff and volunteers are available in our Cancer Center to see patients one-on-one or to present programs. The Look Good Feel Better Program is held in the Cancer Center and has been very well attended. Personal Health Organizers and Reach to Recovery were some of the brochures and pamphlets given out by volunteers. Close to 300 patients met with ACS staff members.

Relay for Life was held April 20 at UMass Lowell. The Cancer Prevention Study-3 screened and enrolled patients on October 3 when an enrollment day was held on the Main campus of the hospital. Daffodil Day’s Gifts of Hope were provided free of charge to patients on March 20-23.

Tobacco prevention and education is one of our major focus areas. One of our goals is to reduce the use of tobacco in adults. Another part of that same goal is to increase the knowledge around the dangers of tobacco use in youth.
Once again breaking previous records, the 13th annual TeamWalk for CancerCare was held on May 20 and collected $908,000 to provide services and support for local cancer patients and their families. The Merrimack Valley’s largest single-day fundraising event brought more than 5,000 walkers, volunteers, and supporters on a day that featured gorgeous sunshine and comfortable temperatures. Many participants donned t-shirts for loved ones as they made the 3- or 6.2-mile route through historic downtown Lowell and its river ways.

All funds raised directly support patients at the Cancer Center at Lowell General Hospital and those fighting cancer throughout the Merrimack Valley. The generosity of contributions to TeamWalk provide transportation to and from treatments, support groups and services, wigs, medication costs for those in need, and many health and wellness programs.

This year’s event welcomed co-masters of ceremonies Matt Noyes, meteorologist at NECN, and air personality Lori Grande of WKLB Country 102.5. Other notable guests included Bruins crooner Rene Rancourt with his signature performance of the National Anthem during opening ceremonies, New England Patriots cheerleaders and Lowell mayor Patrick Murphy.

Since the walk began in 2000, more than six million dollars has been raised to provide assistance to well over 15,000 people in the community. The difference this event makes directly impacts others – enhancing the likelihood of completing treatment, connecting patients and families to resources, and improving quality of life at each step along the way. “I couldn’t be prouder of how it has evolved,” said Steve Normandin who has chaired the event for the past four years. “Each year it gets bigger and better. That translates to the hospital’s increased ability to have a major and profound impact on the quality of life of patients and their families as they are undergoing cancer treatment. That’s what making a difference is all about.”

Steve Normandin, 2012 Chairman

All year long, individuals, organizations and businesses raise money for Lowell General Hospital’s TeamWalk for CancerCare through third party events. The funds that are raised from these events will help support the mission of TeamWalk, to provide services, goods and support to local patients and their families. Third party fundraisers can be as simple or as extravagant as you wish and can raise anywhere from $100 to $10,000 or more. We want to thank all the individuals, families, organizations and businesses that worked hard to make their events and TeamWalk a success.

- Jewels in the Rough Golf Tournament
- Team Riverside Harvest Party
- Team Riverside Calendar Raffle
- Lowell High School Girls’ Soccer Team Pink Out
- TeamWalk Glo-Ball Tournament
- Evolution Spa October Pink Hair Extensions
- Bria Bar Bistro – Lisa & Lou Sylas
- Eyeful Beauty Fundraiser
- Brush Gallery Art Show
- Pink in the Rank
- TeamWalk Karaoke Night - Lowell General Hospital Security Team
- O’Hariz Tacos in honor of James Goksin
- Roger J. Pimentaude Memorial Polar Plunge
- Nashoba Valley Tipping Night
- TeamWalk Night at UML Hockey
- Team Lippy’s Party & Bake Sale
- CarWalk for CancerCare Fashion Show
- Fight Against Cancer Dance in memory of Pete & Richard Morrissette
- Morissette Family Matters Fundraiser
- TeamWalk Spaghetti Supper
- TeamWalk Mahjong Sun Trip
- Team JoMaria Fundraiser
- Friends Who Care Association Fundraiser
- Evol Beach Comedy Night
- TeamWalk Trivia Night
- Eastern Bank Fundraiser
- Kelly Family & Team HIM Fundraiser in memory of Richard Kelly
- Lowell General Hospital Cancer Center Staff Raffle
- The Dream Travis Frosting of Spirit
- Marcia Lemkin’s 5K Run & Walk
- Gabriel Martinez Paddle for Cancer
- Tangle-A-Thon
- Joker’s Lounge Motorcycle Run
- McNamara’s Automotive Cash for Keys
- Over 31 Baseball, Inc.

“Each year TeamWalk gets bigger and better. That translates to the hospital’s increased ability to have a major and profound impact on the quality of life of patients and their families as they are undergoing cancer treatment. That’s what making a difference is all about.”
We offer advice for conversations with family and friends. People with cancer may wonder how parents, children, friends, and coworkers will react to the diagnosis. An oncology social worker can help them prepare for conversations and cope with the reactions they may receive.

For people diagnosed with cancer, an oncology social worker is an important member of the healthcare team helping them navigate the healthcare system and find support to manage the day-to-day challenges of living with cancer. This may include counseling, education, information services, discharge/home care planning services, and referrals to community resources for families, friends, and people with cancer. We currently have two social workers who are oncology certified through the Board of Oncology Social Work.

The Department of Oncology Social Work follows cancer patients throughout their care path. We begin with the diagnosis and follow through treatment and into survivorship. We follow and support patients that come to us from both the inpatient and outpatient setting. We assess all patients at the time they begin treatment with chemotherapy and radiation. We have begun to leverage the NCCN Distress Screening Thermometer with nursing staff using designated points of care as assessment targets. Data is reviewed to adjust for unfavorable or missed opportunities. Here are some of the ways social workers provide a patient-centered experience.

We attend to the needs of the whole person. An oncology social worker understands that cancer affects each person in a different way and that many aspects of a person's life contribute to the experience, including a person's ethnicity, spirituality, personality, life experiences, and family situation. An oncology social worker talks to people about their feelings and the challenges they face managing their healthcare. We help them develop strategies to address their concerns. Talking with a professional who has assisted other people in similar situations may help people living with cancer identify ways to improve their quality of life, manage fears, and find hope. This process can happen through counseling, support groups, and referrals to community agencies that have additional support programs.

We can help to facilitate changes in roles and responsibilities. Some may wonder if they will be able to manage the many responsibilities of life such as working in a demanding job, caring for young children, or assisting an older parent during cancer treatment. A social worker can arrange a meeting with the people involved to talk about how roles and responsibilities might change and what support the person with cancer will need while undergoing treatment.

Social workers serve as a bridge to the medical care team. They act as a liaison between the patient and physicians. Equipped with advanced education in cancer treatment and an understanding of how the treatment affects people, an oncology social worker helps families understand the treatment options. For example, an oncology social worker may gather information about a patient's treatment options and talk through their decision. A social worker can also provide additional information about cancer and treatment or connect them with community organizations that offer similar services.

We also help by providing access to resources. The social worker helps people find resources for practical help. For some people, this involves receiving a referral to the financial aid office of the hospital, instructions for applying for disability benefits or an explanation of rights covered under the Family Medical Leave Act. For others, it means learning about support groups at a local community wellness center. An oncology social worker may also help begin discussions about managing the cost of cancer care.

Social workers can help with relationship and intimacy issues. People living with cancer may have questions about how their treatment will affect their relationship with their spouse or partner, including issues related to intimacy. An oncology social worker can answer questions about sexuality and intimacy and help partners talk about how to manage physical and emotional changes they may experience because of cancer treatment. A social worker may encourage the couple to seek additional counseling to work through relationship challenges.

We also provide assistance to help in the adjustment to life after treatment. Many people find that the months after completing cancer treatment are especially difficult, dealing with the physical recovery and concerns about future health as they try to return to a normal lifestyle. Oncology social workers continue to work with individuals through the period of survivorship. Many people find this an ideal time to process the experience with a trained professional, like a social worker. Others join a support group for survivors, finding understanding and help from other people in similar situations. An oncology social worker may coordinate such support groups or provide information about those available in the community.

Oncology Social Work
Lowell General Hospital has been a regional and national leader in providing state-of-the-art technology used for the precise, safe delivery of radiation treatments for cancer care. With Varian TrueBeam™ Radiotherapy, Lowell General provides highly accurate, precise treatment coordinated by a multidisciplinary team of doctors, therapists, dosimetrists and medical physicists. Radiation therapy can be designed to account for motion, both day-to-day and even within a given treatment. Complex techniques such as image-guided radiation therapy (IGRT) and stereotactic radiation therapy are provided.

Stereotactic radiation has traditionally been given for the brain as a single dose, called stereotactic radiosurgery (SRS). Increasingly this treatment technique can be used in other parts of the body, often called stereotactic body radiation therapy (SBRT). SBRT is a highly effective curative treatment for some medical inoperable lung cancers, can relieve symptoms of pain, and in selected circumstances, can be used to re-irradiate certain tumors that may not have responded to standard treatment.

Changes in technique and technologies have brought Lowell General Hospital new expertise. It has also brought new ways to treat breast cancer, using a prone position that for some women may help lessen the side effects of treatment. Newer treatment approaches sometimes permit shorter courses of treatment, making radiation therapy less disruptive for cancer patients.

Complementing the technical delivery of treatment is the clinical expertise of radiation oncology nurses, social work, and many other allied health professionals. Increasingly close collaboration with surgeons, medical oncologists, and other doctors now allows the department to provide more coordinated care.

In radiation oncology, patients have access to many clinical trials, reducing the need to travel for some newer treatments. Lowell General Hospital is very active in cooperative group trials for many malignancies. It has also been selected as one of 30 sites nationwide to participate in the National Radiation Oncology Registry (NROR), focusing on the quality of prostate cancer care.

Patients who come to the Cancer Center at Lowell General Hospital can expect a caring, responsive team committed to providing individualized care. With cutting edge technology and dedicated professionals working together, Lowell General can make a difficult time as easy as possible for each patient and his or her family.

Great changes occurred in the Medical Oncology Infusion Room in 2012. In October we consolidated outpatient cancer services to the Lowell General Hospital Main campus. In order to accommodate the consolidation of Oncology patients in the infusion room, some non-oncology patients are now being serviced at the Medical Day Care Center located at the Saints campus.

Great efforts were made by all staff on both campuses to make the transition as smooth as possible for our patients. Many patients, although initially reluctant to have to change locations where they received their treatments, were pleasantly surprised by their experience in our Infusion Room.

A full-time social worker previously based at the Saints campus is now dedicated to the Infusion Room. We are able to address patient’s psychosocial needs in real time with the addition of this position. Several other employees previously based at the Saints campus now work at the Lowell General Hospital Infusion Room. Those familiar faces greatly helped with our patients’ transition.

Survivorship… it is a journey that begins at the very moment of cancer diagnosis and continues with you, forever. On June 13 survivors and their loved ones, along with caregivers and staff of the Cancer Center filled the Clark Auditorium for the 5th Annual Survivorship Day celebration.

With spirit, hope and encouragement, the evening featured dinner; music, and camaraderie. Our cancer survivors shared their stories with all in attendance. Special words of encouragement were given by Dr. Blair Ardman. Guests enjoyed chair massages and raffle prize drawings that had everyone laughing. A beautiful luminary service, followed by the inspirational words of Nicole Rinehart, president of the Central Georgia chapter of the Susan G. Komen Foundation, concluded the evening by bringing a calm peace to all attendees, and sent them on their way filled with love, thanks, courage and hope.

Through the efforts of the Survivorship Day planning team at the Cancer Center, survivors had an evening that brought positivity to the fight against cancer and celebrated the wonderful spirit of courage and strength of our patients.

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Clinical Research

The Department of Clinical Research again showed continued growth in clinical trial options that are available to patients at Lowell General Hospital. Under the direction of Dr. Blair Ardman, Medical Director of Clinical Research and through a partnership with Dana-Farber Cancer Institute, the Cancer Center at Lowell General Hospital continues to provide patients with the option of participating in local and national trials. This collaborative effort allows our patients’ access to treatments that are new and sometimes cutting-edge, right here in the community without the need for travel to Boston.

During the past year we successfully integrated our two campuses and combined two clinical research departments into one. The resulting increase in patient volume will help to support further growth within the department leading to even more clinical trial opportunities for our patients. We also welcomed a new Radiation Oncology group and have since increased the number of trials available to that patient population.

We continue to be active members of both the Cancer and Leukemia Group B (CALGB) and the Radiation Therapy Oncology Group (RTOG), with access to other cooperative group trials through the Cancer Trials Support Unit (CTSU) and National Cancer Institute’s Centralized Institutional Review Board.

During the year, 40 of our patients enrolled in clinical trials, which is 4% of our patient population. We had an average of 20 trials available to patients being treated for breast, prostate, colon, kidney and brain cancers. One of our most popular studies closed as it had reached maximum participation. This study is looking at whether Metformin will work with other therapies to keep cancer and brain cancers. One of our most popular studies closed as it had reached maximum participation. This study is looking at whether Metformin will work with other therapies to keep cancer and brain cancers. One of our most popular studies closed as it had reached maximum participation. This study is looking at whether Metformin will work with other therapies to keep cancer and brain cancers. One of our most popular studies closed as it had reached maximum participation. This study is looking at whether Metformin will work with other therapies to keep cancer and brain cancers. 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In October, we were pleased to host the American Cancer Society’s Cancer Prevention Study-3. This study is hoping to enroll at least 300,000 adults from various racial and ethnic backgrounds from across the US, who have no personal history of cancer. CPS-3 is a grassroots effort where local communities from across the country can support cancer research not just through fundraising efforts, but also by participating actively in this historic research study. Almost 150 subjects enrolled and participated in the study at Lowell General Hospital, taking time to fill out questionnaires and have blood samples taken.

We are looking forward to continued growth within the clinical research department and being able to continue to offer an important option for those in the midst of cancer treatment. By promoting participation in clinical trials, we not only offer a valuable service to our patients, but we are contributing to the overall knowledge and progress against cancer.

Cancer Registry

The Cancer Registry is staffed by three full-time and one part-time registrar, and a Program Manager. Together the registrars have abstracted over 1000 cases for 2012, and have maintained an incredible follow-up rate both for the total registry and the last five years.

In 2012 the hospital merged cancer programs with the Saints Medical Center program. This meant that a new merged/network program was formed. Documents filed with the Commission on Cancer provided us with a new status of a network cancer program. The Saints Medical Center data now was managed by this team. Starting in January of 2012 all of the newly diagnosed cancer cases were entered into the Lowell General Hospital database as we are now one cancer program. The cases that were entered prior to 2012 into the Saints database are now updated and maintained by this team. Regular follow-up and updates are handled by Lowell General. During this transition time, four different computer systems were utilized to update, track, and abstract. In 2013, the main electronic medical record system at the Saints campus became the same as the Lowell General Hospital system. This will allow for ease of abstracting.

Listed on this page are samples of some of the activities that are tracked for compliance and reviewed for program development.

<table>
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<td>Total number of</td>
<td>cases meeting CAP</td>
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<td>Protocol</td>
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Lung/Rational for Study

There has been a lot of discussion lately around the need to screen high risk patients for lung cancer. Several healthcare institutions have begun to use CT scanning for this purpose, offering the scans at reduced rates. Insurance companies at present do not support the use of the CT scanner as a screening tool and will not reimburse for this test. The Cancer Committee decided to review our data and further discuss the development of an enhanced lung program.

Study Indicators

1. Did the patient present with symptoms?
2. Stage of disease at diagnosis: L=Limited (Stage I, II), E=Extensive (Stage III, IV)
3. Was this an incidental finding?
4. Insurance Type: P=Private, M=Medicare, S=Medicaid

Tamoxifen or third generation aromatase inhibitor is considered or administered within 1 year of diagnosis (Women AJCC T1cN0M0 or stage II or III hormone receptor negative).

Breast Quality of Care

Patients are evaluated for Radiation Therapy

Indicator #1: Radiation therapy is administered within 1 year of diagnosis (<70 receiving conserving surgery breast cancer)

Evaluation of Chemotherapy

Indicator #2: Combination chemo is considered or administered within 4 months of diagnosis (<70 AJCC T1cN0M0 stage II or III hormone receptor negative)

Evaluation of Therapy Hormone

Indicator #3: Tamoxifen or third generation aromatase inhibitor is considered or administered within 1 year of diagnosis (Women AJCC T1cN0M0 or stage II or III hormone receptor positive).

Study Findings

There were 341 patients included in this cohort. The patients with an incidental finding had presented with a limited stage of disease. 100% of patients that presented with symptoms unfortunately presented with extensive stage of disease at the time of diagnosis. This is why CT scanning as a screening tool is currently being investigated.

The national average is 60-70% of all patients present with extensive disease at the time of diagnosis. Lowell General reported 68% of our patients with extensive disease at the time of diagnosis. All patients had insurance coverage with the highest being 65% covered by Medicare, 21% covered by private insurers and 14% with Medicaid coverage.

What this study results revealed to us is a CT scanning program for screening high risk patients was put into place, more patients may present with limited stage of disease and have a better survival rate. More investigation is needed. Further discussion on this topic is scheduled for future meetings.

Head and Neck Quality of Care Study

Adherence to NCCN Guidelines

Indicator #1: Nutritional needs were evaluated?

Indicator #2: Patient was seen by Speech Therapist?

Indicator #3: Patient was evaluated for swallowing?

Indicator #4: Patient was seen in MDC? (MD referral)

Indicator #5: Social Worker evaluated patient needs?

Indicator #6: Quality of Life was documented by physician?

Quality Dashboards

Ensuring evidence based practices
There are two different clinics held for ENT patients. The first one is the multidisciplinary clinic for new patients. The second one is help for patients on follow-up treatment that are seen along with the Radiation Oncologist. Psychosocial care and Rehab services are evaluated on all patients during the new patient assessment. Speech and swallowing for ENT patients.

Tumor Board meetings are held twice each month with a consultant from a Boston based tertiary care center present for one conference during each month. There were 24 conferences held at the Main campus and 13 conference held at the Saints campus in 2012. A total of 186 patient cases were discussed.

<table>
<thead>
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* There are two different clinics held for ENT patients. The first one is the multidisciplinary clinic for new patients. The second one is help for patients on follow-up treatment that are seen along with the Radiation Oncologist. Psychosocial care and Rehab services are evaluated on all patients during the new patient assessment. Speech and swallowing for ENT patients.

<table>
<thead>
<tr>
<th>Tumor Boards</th>
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<tr>
<td>Breast</td>
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The interventional radiology team works closely with Cancer Center staff to advance care, such as delivering chemotherapy directly to the affected organ (chemoembolization), killing the tumor with heat via radiofrequency ablation, and other applications that can target and treat the cancer without harming the healthy cells in the body. Generally, these treatments are easier on the patient than traditional chemotherapy, and also allow for localized, higher dosing. Collaboration between interventional radiology and oncology is the key to new advances and better patient care.

Over the past five years, interventional oncology has been one of the fastest growing areas within the field of interventional radiology. New discoveries are made on an almost daily basis in areas such as tumor biology, genetics, immunology, and therapeutic agents that target factors involved in tumor initiation, progression, growth and metastasis.

### Primary Site Table

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Lung cancer is the second most common cancer and the leading cause of cancer death of men and women in United States. Although certain types of lung cancer are associated with smoking, some other types are not. Age, sex, race and exposure to certain environmental agents like Radon gas are also other determinants of lung cancer risk.

The clinical symptoms of lung cancer may range from no symptoms to chronic cough, shortness of breath, chest pain or unintended weight loss. Sometimes, the tumor might have spread to the brain, bone marrow, liver or a lymph node in the neck, which may be the first time the tumor is detected. In some patients, the tumor, if located close to the pleural surface, might lead to fluid accumulation within the thoracic cavity. This fluid may be aspirated by the physician and evaluated further to identify the type of tumor. Some tumors may be discovered while the patient is being evaluated for other diseases. Tumors may be discovered by a radiologist while they evaluate the patient’s imaging studies. Once the tumor is identified, a complete clinical and imaging evaluation is initiated to determine the extent and spread of the disease. Residual lung function will also be evaluated by studies like pulmonary function tests. If widespread at the time of diagnosis, the treatment options might be limited.

Lung carcinomas are broadly classified into two groups: small cell carcinomas and non small cell carcinomas. Most of the tumors (about 85%) are non small cell carcinomas. Once the diagnosis of tumor is suspected, we will briefly discuss small cell lung carcinomas first and then focus on the non small cell lung carcinomas.

Small cell lung carcinomas are very aggressive form of the tumor. The cells of this type of tumor have very little cytoplasm and the nuclei of the tumor cells demonstrate nuclear molding and have a fine chromatin pattern, commonly described as salt and pepper chromatin pattern (see Figure 1). These tumors often present with metastasis to the mediastinal lymph nodes, or distant metastasis. Sometimes the tumors cause clinical syndromes, called paraneoplastic syndromes that might cause endocrine, neurologic or muscle involvement. The pathologists use specific tests that help them identify this type of tumor (e.g., synaptophysin or chromogranin stains). This is a rapidly fatal type of lung cancer and two year survival is only about 40% in limited stage disease and 5% in extensive disease, even after appropriate therapy, which may include chemotherapy and radiation therapy.

The major types of non small cell lung carcinomas are squamous cell carcinomas, adenocarcinomas and large cell carcinomas. Compared to the dismal prognosis in patients with small cell carcinomas, great strides have been made in the treatment of non small cell lung carcinomas, especially adenocarcinomas. Squamous cell carcinomas are identified by the keratinization noted in the cytoplasm of the tumor cells (Figure 2a) or by the nuclear staining by the marker p63 (Figure 2b). Adenocarcinomas demonstrate gland formation (Figure 3a) and may show cytoplasmic mucin (Figure 3b), or by nuclear expression of the marker TTF-1 (Figure 3c). Large cell carcinomas are those that do not have either squamous cell carcinoma or adenocarcinoma differentiation.

Within the past decade, evaluations of genetic alteration within the tumor cells of the non small cell lung carcinomas have shed light on specific molecular changes identified in such tumors. Mutations of the Epidermal growth factor receptor (EGFR) gene or gene rearrangements of Anaplastic Lymphoma Kinase (ALK) and echinoderm microtubule associated protein like 4 (ALK-EML-4) fusion can lead to uncontrolled growth of tumor cells. When such genetic alterations are identified in the tumor, targeted therapy that can be combined with chemotherapy and radiation therapy are helpful adjuvants in treatment.

Once diagnosed with any type of lung carcinoma, the patients will continue to need close clinical follow up, palliative and supportive care as necessary. A team approach is essential in the care of such patients and their family members.
Focus Study - Lung Cancer (cont.)

Total Number of Cases by Year of Diagnosis — 2003-2012

Age at Diagnosis — 2002-2011

Five Year Survival — National Cancer Data Base

Five Year Survival — Lowell General Hospital