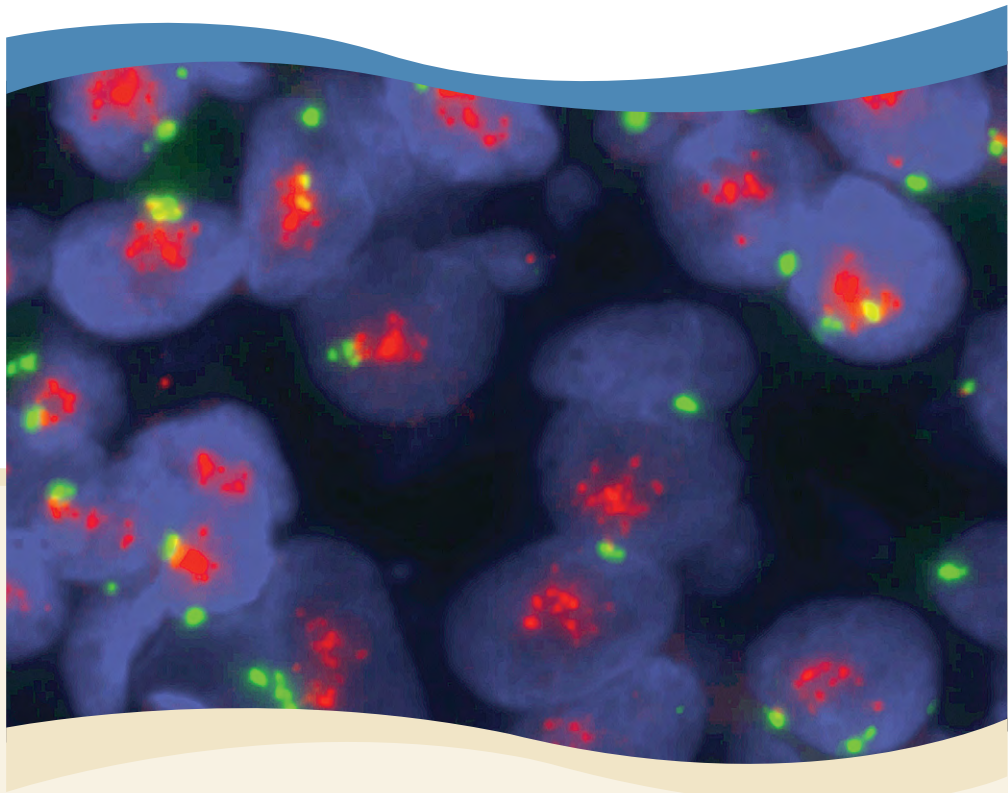


Legacy Cancer Institute Annual Report 2013 Breast malignancies



Legacy Cancer Institute



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Legacy Cancer Institute benefits from the generous participation of individuals and organizations that are also dedicated to finding cures for cancer, helping the less fortunate receive care and improving treatment, equipment and facilities at each of our medical centers. To learn how you can support Legacy Cancer Institute, please contact the Office of Philanthropy at 503-415-4700 or visit www.legacyhealth.org/giving.

Legacy Cancer Institute's Breast Program, Banner Pink and Going Strong

By Nathalie Johnson, M.D., FACS, medical director, Legacy Cancer Institute and Legacy Breast Health Centers

Amid the controversy about screening, Legacy's Breast Health Centers and its extended programs have remained focused. Despite early detection and improved treatments, breast cancer is still the second leading cause of death for women in the United States. In fact it is the leading cause of death for Latina and African American women between the ages of 40 and 65, making it a leading public health concern. An early stage at diagnosis results in the best outcomes and for this reason we have continued to recommend, as a system, screenings to begin at age 40 and continue annually to age 74 for those in good health.



Through a generous gift given to Legacy Health Foundations, we were able to install 3-D tomosynthesis to improve the efficacy of screening. Tomosynthesis allows the radiologist to view the tissue in sections adding clarity. In essence it is like being able to CT scan the breast. The experience being reported nationally is improved detection of cancer and fewer callbacks for false positives. That has been our experience at Legacy. Our cancer detection has gone up, catching more tumors at earlier stages. By the same token, we have caused fewer patients the anxiety of a callback for ultimately benign findings. The 3-D technology is available at all four Legacy Breast Health Centers (Legacy Good Samaritan, Legacy Meridian Park, Legacy Mount Hood and Legacy Salmon Creek) and Legacy Mammography and Outpatient Imaging—Emanuel.

Speaking of all four Legacy Breast Health Centers, I would like to give a shout-out to a banner year for accreditation. All four centers are fully accredited, on their own merit, by the National Accreditation Program for Breast Centers (NAPBC)! Achieving this designation requires a multidisciplinary approach to patient care that is performed at the highest level. The physicians and staff must maintain continuing education in breast care and comply with national

standards. The Legacy Cancer Institute (LCI) overall was reaccredited this year and received the American College of Surgeons' Commission on Cancer Outstanding Achievement Award for achieving commendations in all eight areas of focus, in addition to meeting the remaining 26 standards. This honor places the LCI in the top 17 percent of programs nationally. As you will note in this report, our outcomes are in the top 2 percent nationally in the area of breast. We owe this standing not only to the staff and physicians but also to the support of Legacy's administration and the philanthropic support of our community through the Foundation.

To give an overview of the breadth, depth and excellence of LCI that will be found as you read through the annual report, the following are a few highlights:

- 3-D tomosynthesis — first system to upgrade at all breast health centers, improving detection of cancer and decreasing false positives
- Organized outreach initiative to primary care providers on the new Oregon Dense Breast law and caring for their patients with dense breasts
- Multidisciplinary breast cancer conference and the addition of radiology/pathology correlation conference (a higher level overview of biopsies done in the breast centers that improves accuracy and clinical outcomes)
- Radiation oncology quality metrics and clinical outcomes — published outcomes with partial breast irradiation experience with our first 300 patients. LCI was the first in Oregon to begin offering partial breast irradiation.
- Surgical outcomes — published outcomes on sentinel node-positive patients after mastectomy and currently reviewing outcomes of nipple-sparing mastectomy. LCI was also the early adapter in offering nipple-sparing mastectomy for appropriate patients, which significantly improves cosmetic outcomes.

- Medical oncology and research has continued to expand in offering current protocols and availability of national trials. Several neoadjuvant chemo and endocrine therapy trials are currently open, as well as an exciting breast cancer vaccine trial.
- Breast pathology — LCI has a focused breast pathology team anchored by a top-notch fellowship-trained breast pathologist who has a passion for not only what is seen under the microscope, but also for the clinician's ability to provide appropriate treatment.
- Genetics risk assessment — Our program has kept step with the change in risk assessment offerings and improved panel testing for breast cancer. This includes outreach and education on the now greater than 28 currently known mutations that confer an increased risk for breast cancer.
- Integrative oncology and survivorship — Our program offers a very comprehensive approach for patients, featuring a fantastic nurse practitioner who is able to support patients through chemotherapy and then help them to heal as they go into survivorship. Our team has a stellar dietitian who teaches on the "Power of Yum" and food as medicine. We have a compassionate stress management therapist who assists in relieving anxiety related to treatment and provides counseling to assist in coping with the stressors of cancer. Plus, the team includes social work, nurse navigators, and physical and occupational therapists who address everything from hot flashes and neuropathy to how to get your groove back.
- Community outreach and education — We offer educational and supportive events throughout the year at all our sites, from BRAVE Day and Worship in Pink to screening events for the uninsured or underinsured. In addition, we hold conferences for providers to share current updates on the care of the breast. Our largest is the annual Excellence in Breast and Gynecologic Care conference. We offer both oncology and integrative grand round programs during the year and many of these can now be accessed by providers through CME on

demand. This allows them to hear the presentation again as well as answer questions on the topic to earn self-assessment CME credits and enhance learning.

Hopefully this gives insight to the pages that follow and to the amazing programs and services offered for the care of patients with breast disease and cancer. We hope that you will take the time to read the report and learn about them in more detail. For those able to, we encourage you to donate to help support the work being done and to help lift the Banner of Pink a little higher.

Comprehensive cancer services

For more information about our services, please visit legacyhealth.org/cancer.

Cancer care and treatment

Cancer care conferences/tumor boards
 Cancer Care Unit
 Cancer data management/cancer registry
 Cancer Rehabilitation Services
 Cancer screening and prevention
 Day treatment/Infusion clinics
 Interventional radiology
 Legacy Breast Health Centers
 Legacy Cancer Healing Center
 Legacy Genetics Services
 Legacy Hospice/Legacy Hopewell House Hospice
 Legacy Medical Group—Gastrointestinal Surgery
 Legacy Medical Group—Pulmonary
 Legacy Medical Group—Radiation Oncology
 Legacy Medical Group—Reconstructive Surgery
 Legacy Medical Group—Surgical Oncology
 Legacy Pain Management Centers
 Palliative Care Program
 Pathology
 Wound and ostomy care

Cancer programs and specialty areas

Autologous stem cell transplant program
 Bladder cancer
 Blood cancers
 Brain and central nervous system cancers
 Breast cancer services
 Children's Cancer and Blood Disorders Program
 Colorectal cancer services
 Esophageal cancer
 Gynecologic cancers
 Head and neck cancer
 Hepatobiliary and pancreatic cancer
 Kidney cancer
 Lung cancer
 Prostate cancer
 Stomach cancer

Clinical trials and research

Current clinical trials
 Oncology clinical research
 Tumor bank

Support services — Adult

American Cancer Society gift closet
 Cancer support groups and classes
 Green Gables Guest House
 Oncology nurse navigator/American Cancer Society patient navigator
 Survivorship
 Volunteer program

Support services — Pediatric

Child Life Therapy
 Family Lantern Lounge
 Family Wellness Center
 Music Rx® Program
 Pediatric development and rehabilitation
 Ronald McDonald House
 School program
 Survivorship Services

Legacy Cancer Institute overview: Highlights from 2013

By Brent Evetts, M.D., colorectal surgeon, chair, Integrated Network Cancer Committee, Legacy Cancer Institute

This year Legacy Cancer Institute received the American College of Surgeons Commission on Cancer Outstanding Achievement Award for the second time consecutively.



Legacy Health is the only integrated network program in Oregon to achieve this honor. The Commission on Cancer (CoC) Outstanding Achievement Award (OAA) recognizes cancer programs

that strive for excellence in providing quality care to cancer patients. A facility receives the OAA following an onsite evaluation by a team of surveyors during which the facility demonstrates a commendation level of compliance with eight standards that represent the full scope of the cancer program and receives a compliance rating for the remaining 26 standards.

The eight standards that form the basis of the OAA criteria are drawn from the following five areas of program activity:

- Cancer committee leadership
- Cancer data management
- Cancer conferences
- Clinical management
- Quality improvement

The amount of work and dedication that goes into achieving an award like this is remarkable. The support staff involved deserves far more credit than they will ever receive and should be very proud of this accomplishment. Payors, families and patients look at accreditation/awards as a measure of the quality they can expect when we care for cancer patients at Legacy. Legacy Health also achieved NAPBC accreditation for all four of Legacy's Breast Health Centers. In addition to these achievements, there has been significant work in other areas during 2013.

OHSU Knight–Legacy Health Cancer Collaborative

The overall goal of the collaboration is to consolidate oncology services without duplication. Merging the Legacy Day Treatment/Infusion units with OHSU Knight Cancer Institute Community Oncology at each of our facilities is the first goal for the collaboration. Phase 1 began Sept. 3 and included Legacy Good Samaritan, Legacy Meridian Park and Legacy Mount Hood, with a single infusion clinic at each location. Benefits for the patient include receiving both chemotherapy and non-chemotherapy treatments by experienced RNs. The clinics are owned and operated by OHSU except for Legacy Salmon Creek Infusion Clinic, which will be owned and operated by Legacy Salmon Creek. Phase 2 will include Legacy Salmon Creek and Legacy Emanuel, and is scheduled to open in 2014. A Physician Collaboration Council consisting of physicians from Legacy and OHSU is focused on having a seamless referral process to research clinical trials with better communication and trust across the two organizations. A second goal is for the two Epic medical record systems to have the ability for integration.

Radiation oncology will be owned and operated by each Legacy or OHSU facility, but the Cancer Collaborative allows sharing capital planning and purchasing of equipment.

The Cancer Collaborative has a 50/50 governance board, with three Legacy members (Tony Melaragno, M.D., Mike Newcomb, M.D., and Nathalie Johnson, M.D.), three OHSU members and one independent director from an outside organization (Douglas Blayney, M.D.), who has 17 years of experience in a community setting as a medical oncologist and is now at Stanford, in an academic setting. There are two co-managers, Ann Raish from OHSU and Pam Kilmurray from Legacy. Other committees under the Collaborative include an Oversight Committee and a Quality and Outcomes Committee.

Program goals for 2013

First programmatic goal — Implement nurse navigation at all sites (phase-in 2015 CoC standard).

Navigation continues to be strong at Legacy Good Samaritan and Legacy Meridian Park, navigating more than 1,100 patients at the two sites, with diagnoses of breast, colorectal, lung and prostate cancer as the majority of those navigated. The Legacy Good Samaritan navigators also support the cancer patients at Legacy Emanuel. Navigation started at Legacy Mount Hood in November 2012 with a grant focusing on breast cancer patients; 100 percent of the breast patients were navigated during 2013. The goal will be to expand this service in 2014 on the Legacy Mount Hood campus for all cancer patients. Legacy Salmon Creek hired its first navigator in August 2013, with a primary focus on women with breast cancer, with expansion in 2014 to other diagnoses. The American Cancer Society navigator, Dan Osborn, provides assistance, including financial, lodging, transportation and emotional support to patients at all Legacy sites.

Second programmatic goal — Implement METRIQ, a new Cancer Registry database.

Legacy spent 2013 getting ready to transition to a new registry database software, METRIQ. The new software will support integration with radiation oncology as well as with Epic, streamline patient follow-up capabilities and allow for enhanced reporting functionality.

Third programmatic goal — Implement distress screening (phase-in 2015 CoC standard).

The initial pilot was completed in the Legacy Cancer Healing Center, where cancer patients were screened for distress at pivotal medical visits including time of diagnosis, transitions during treatment and transitions off treatment. Legacy Cancer Healing Center art therapist, social worker, stress management therapist and survivorship/integrative care nurse practitioner currently document results on the flow sheet with interventions and referrals noted in the progress notes. Screening occurs by use of the NCCN Distress Thermometer. Radiation Oncology at Legacy Good Samaritan and Legacy Mount Hood

also implemented the tool, providing it to the patient prior to the physician consult for baseline information, at end of treatment and at follow-up. Patients with a rating over four are referred to the oncology social worker for follow-up. The plan is to expand in 2014 to other Legacy sites and additional points of patient contact, which include Legacy Medical Group–Surgical Oncology, Legacy Medical Group–Radiation Oncology, the inpatient cancer unit and our navigation services.

Clinical goal — Implement “Strong for Surgery” nutritional support pre-op for our colorectal patients.

Strong for Surgery is a pre-surgical care initiative that comes from Washington state. It utilizes checklists and nutritional supplements aimed at improving post-op outcomes. Legacy Good Samaritan was the first hospital in Oregon using Strong for Surgery, implementing the program in April 2013. Pre-op nutrition intervention includes assessment and education, referral to dietitian as appropriate, and nutritional supplement (Impact Advanced Recovery) provided to more than 90 patients at their preadmission surgery visits since April. Patients were asked to drink the supplement three times a day starting five days pre-op. Checklist also assesses select medications, blood sugar control and tobacco use. Outcomes will continue to be monitored through SCOAP, ERAS and infection control data. Legacy Meridian Park and Legacy Salmon Creek medical centers are in the early stages of implementation.

Program updates

In addition to the breast program, there have been some significant improvements in other programs:

Legacy Hospice exceeded national study results for making patients comfortable within 48 hours of admission. National results were 72.2 percent, compared to Legacy pilot study of 88.8 percent.

The Legacy Thoracic Cancer Program initiated the Legacy Lung Cancer Screening Program pilot in November 2013. Six patients had screening CT, five patients having positive nodules necessitating further evaluation. The National Lung Screening Trial demonstrated a 20 percent reduction in

mortality through early detection and lower stage at diagnosis. Reflexive molecular testing of EGFR and ALK began in February 2013. In a review of the NCDB survival data by stage for small cell carcinoma and non-small cell carcinoma, Legacy

Cancer Institute survival data is comparable to national rates for small cell carcinoma. Legacy Cancer Institute survival data for non-small cell carcinoma, stage IV, exceed national rates.

Legacy Health 2013 site analysis: Breast cancer

By Nathalie Johnson, M.D., FACS, medical director, Legacy Cancer Institute and Legacy Breast Health Centers

Cancer has risen to be a major health concern in our nation. Recent data suggest that one in two men will have cancer in their lifetime (this includes skin cancer) and one in three women. Legacy Cancer Institute (LCI) continues to grow and evolve the management to treat the cancer seen in our larger community. As you will see in the tables embedded in this text, our major tumor sites remain breast, prostate, lung, colon/rectum, bladder and kidney/renal pelvis/ureter (see Table 1, Top six cancer sites 2013, below). Nationally, LCI leads the way in management of the care of multiple tumor sites and has been recognized for the outstanding outcomes and coordinated work that occurs through our facilities and reaches out to our communities.



In this report we are focusing on our largest tumor site, breast. In 2013, we had 617 analytic breast cancer cases (see Table 2, Legacy Health primary sites, 2013, all ages, page 7). Please review

Table 10, Five-year survival data, National Cancer Data Base (NCDB) vs. Legacy Health (page 10), to compare our outcomes with other Commission on Cancer (CoC) programs locally and nationally. Our team is very proud of these accomplishments. In every stage our observed outcomes are better than the national and local averages. We believe these outcomes are the result of a dedicated team that has gained top expertise in the management of breast cancer. This includes not only surgery and chemotherapy but the lifestyle, nutrition, integrative and survivorship support that all our patients receive. The focus on exercise and ongoing nutrition improves quality of life and reduces recurrence risk. Focusing and gaining accreditation requires a knowledge base for all care providers and ongoing learning and quality improvement.

The average stage of diagnosis in our breast patient population is early, as you will see in Table 5, AJCC major stage groups 2013 — Breast (page 9). We continually monitor through our breast centers the quality of screening and have been working

TABLE 1 Top six cancer sites 2013

| Primary site | Legacy Emanuel | Legacy Good Samaritan | Legacy Meridian Park | Legacy Mount Hood | Legacy Salmon Creek | Legacy Health | American Cancer Society* |
|---|----------------|-----------------------|----------------------|-------------------|---------------------|---------------|--------------------------|
| Breast | 2 | 365 | 89 | 61 | 100 | 617 | 234,580 |
| Prostate | 51 | 147 | 30 | 17 | 30 | 275 | 238,590 |
| Lung | 16 | 94 | 41 | 31 | 46 | 228 | 228,190 |
| Colon/rectum | 16 | 49 | 39 | 27 | 40 | 171 | 142,820 |
| Bladder | 16 | 30 | 33 | 18 | 28 | 125 | 72,570 |
| Kidney/renal pelvis/ureter | 13 | 56 | 14 | 10 | 22 | 115 | 65,150 |
| Total top six sites | 114 | 741 | 246 | 164 | 266 | 1,531 | 981,900 |
| Percentage of total analytic cases | 5% | 31% | 10% | 7% | 11% | 64% | 59% |

*American Cancer Society 2013 estimated U.S. cancer cases

TABLE 2 Legacy Health primary sites 2013, all ages*

| Primary site | Emanuel | | Good Samaritan | | Meridian Park | | Mount Hood | | Salmon Creek | | Legacy Health | |
|----------------------------------|---------------|---------------------|----------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|---------------|---------------------|
| | Patient count | Percentage of total | Patient count | Percentage of total | Patient count | Percentage of total | Patient count | Percentage of total | Patient count | Percentage of total | Patient count | Percentage of total |
| Anus/anal canal | 1 | 0.3% | 7 | 0.7% | — | — | 4 | 1.5% | 2 | 0.5% | 14 | 0.6% |
| Biliary tract | — | — | 2 | 0.2% | 1 | 0.3% | 2 | 0.7% | — | — | 5 | 0.2% |
| Bladder/urethra | 16 | 5.4% | 30 | 2.9% | 33 | 8.7% | 18 | 6.6% | 28 | 6.8% | 125 | 5.2% |
| Bone/joints/articular cartilage | 2 | 0.7% | 1 | 0.1% | — | — | — | — | 1 | 0.2% | 4 | 0.2% |
| Brain/CNS | 42 | 14.2% | 11 | 1.1% | 6 | 1.6% | 7 | 2.6% | 24 | 5.9% | 90 | 3.7% |
| Breast | 2 | 0.7% | 365 | 35.1% | 89 | 23.4% | 61 | 22.3% | 100 | 24.4% | 617 | 25.7% |
| Cervix | 1 | 0.3% | 9 | 0.9% | 1 | 0.3% | — | — | 4 | 1.0% | 15 | 0.6% |
| Colon | 13 | 4.3% | 29 | 2.8% | 30 | 7.9% | 22 | 8.1% | 29 | 7.1% | 123 | 5.1% |
| Connective tissue | 2 | 0.7% | 5 | 0.5% | 1 | 0.3% | 1 | 0.4% | 1 | 0.2% | 10 | 0.4% |
| Corpus uteri | 8 | 2.7% | 59 | 5.4% | 4 | 1.0% | 6 | 2.2% | 7 | 1.7% | 84 | 3.5% |
| Esophagus | — | — | 8 | 0.8% | 6 | 1.6% | 7 | 2.6% | 2 | 0.5% | 23 | 1.0% |
| Fallopian tube | 1 | 0.3% | 2 | 0.2% | 1 | 0.3% | — | — | — | — | 4 | 0.2% |
| Gallbladder | — | — | 4 | 0.4% | — | — | 2 | 0.7% | — | — | 6 | 0.2% |
| Hodgkin's Lymphoma | 5 | 1.7% | 2 | 0.2% | — | — | 1 | 0.4% | 4 | 1.0% | 12 | 0.5% |
| Kidney/renal pelvis/ureter | 13 | 4.3% | 56 | 5.4% | 14 | 3.7% | 10 | 3.7% | 22 | 5.4% | 115 | 4.8% |
| Leukemia | 19 | 6.4% | 22 | 2.1% | 13 | 3.4% | 11 | 4.0% | 12 | 2.9% | 77 | 3.2% |
| Lip/oral cavity/pharynx | 31 | 10.4% | 5 | 0.5% | 6 | 1.6% | 10 | 3.7% | 7 | 1.7% | 59 | 2.5% |
| Liver/intrahepatic bile ducts | 4 | 1.3% | 7 | 0.7% | 11 | 2.9% | 3 | 1.1% | 5 | 1.2% | 30 | 1.2% |
| Lung | 16 | 5.4% | 94 | 9.0% | 41 | 10.5% | 31 | 11.2% | 46 | 11.4% | 228 | 9.5% |
| Melanoma (in situ and malignant) | — | — | 36 | 3.5% | 8 | 2.1% | 6 | 2.2% | 12 | 2.9% | 62 | 2.6% |
| Mesothelioma | — | — | 1 | 0.1% | — | — | — | — | 1 | 0.2% | 2 | 0.1% |
| Non-Hodgkin's lymphoma | 8 | 2.7% | 23 | 2.2% | 21 | 5.5% | 4 | 1.5% | 16 | 3.9% | 72 | 3.0% |
| Other digestive organs | 1 | 0.3% | — | — | — | — | 2 | 0.7% | 2 | 0.5% | 5 | 0.2% |
| Other respiratory/intrathoracic | 7 | 2.3% | 3 | 0.3% | 2 | 0.5% | 1 | 0.4% | 5 | 1.2% | 18 | 0.7% |
| Ovary | 1 | 0.3% | 19 | 1.8% | 4 | 1.0% | 4 | 1.5% | 1 | 0.2% | 29 | 1.4% |
| Pancreas | 1 | 0.3% | 23 | 2.2% | 19 | 5.0% | 10 | 3.7% | 7 | 1.7% | 60 | 2.5% |
| Penis | 1 | 0.3% | 3 | 0.3% | — | — | 2 | 0.7% | — | — | 6 | 0.2% |
| Prostate gland | 51 | 17.1% | 147 | 14.1% | 30 | 7.9% | 17 | 6.2% | 30 | 7.3% | 275 | 11.4% |
| Rectum/rectosigmoid junction | 3 | 1.0% | 20 | 1.9% | 9 | 2.4% | 5 | 1.8% | 11 | 2.7% | 48 | 2.0% |
| Retroperitoneum/peritoneum | 1 | 0.3% | 4 | 0.4% | — | — | 1 | 0.4% | 1 | 0.2% | 7 | 0.3% |
| Small Intestine | 2 | 0.7% | 4 | 0.4% | 1 | 0.3% | 1 | 0.4% | 3 | 0.7% | 11 | 0.5% |
| Stomach | 1 | 0.3% | 10 | 1.0% | 4 | 1.0% | 6 | 2.2% | 4 | 1.0% | 25 | 1.0% |
| Testis/spermatic cord | 5 | 1.7% | 6 | 0.6% | 4 | 1.0% | 2 | 0.7% | 2 | 0.5% | 19 | 0.8% |
| Thyroid/other endocrine glands | 36 | 12.0% | 6 | 0.6% | 10 | 2.6% | 5 | 1.8% | 14 | 3.4% | 71 | 3.0% |
| Unknown primary site | 4 | 1.3% | 6 | 0.6% | 9 | 2.4% | 8 | 2.9% | 5 | 1.2% | 32 | 1.3% |
| Vulva/vagina | — | — | 6 | 0.6% | — | — | — | — | — | — | 6 | 0.2% |
| Other/ill-defined sites | 1 | 0.3% | 4 | 0.4% | 3 | 0.8% | 3 | 1.1% | 2 | 0.5% | 13 | 0.5% |
| Grand total | 299 | 100% | 1039 | 100% | 381 | 100% | 273 | 100% | 410 | 100% | 2402 | 100% |

* Includes 44 pediatric cases (0–21 years of age).

with our primary care doctors and educating the public on the importance of screening. Amid the current noise, we have continued the message that is associated with better survival, that being “early detection saves lives.”

The majority of breast cancer patients diagnosed and/or treated at Legacy Cancer Institute were between 60 and 69 years of age (29.1 percent), which is consistent with the most recent data available from other CoC accredited programs across the nation (26.7 percent in 2011) (see Table 3, Breast malignancies by age at diagnosis, below). The histologic pattern seen in our patient population parallels that reported nationally with invasive ductal and lobular leading the pack (see Table 8, Histology distribution of breast cancer cases, Legacy Health vs. Commission on Cancer, page 10). The distribution of estrogen positivity and HER2/neu rich tumors is summarized in Table 9, Hormone receptor and HER2/neu status in Legacy breast cancer cases 2013, cancer registry count, page 10. In 2013, the majority of patients treated at Legacy are ER Positive (84.1 percent), PR Positive (77.3 percent) and HER2/neu Negative (66.1 percent). Similar to other CoC accredited programs across the country, the majority or 25.4 percent of the breast cases treated at Legacy are treated with a combination of surgery, radiation and hormone therapy (see Table 6, Breast malignancies 2013 — first course of treatment by stage, page 9).

This is similar to treatment provided by other CoC accredited programs nationally (see Table 7, All Commission on Cancer 2011 breast malignancies — First course of treatment by stage, page 10).

In 2013, almost half of all Legacy analytic breast cases were diagnosed at Legacy and received all or part of first course treatment at Legacy (48 percent), or diagnosed elsewhere and received all or part of first course treatment at Legacy (41 percent) (see Table 4, Total breast analytic cases — Class of case, page 9).

The number of patients on clinical trials or who participated in research projects are also tracked. In 2013, we exceeded the expected enrollment in both our general tumor sites as well as specifically in breast. More information about the cancer clinical trials and research at Legacy Cancer Institute can be found in the “Cancer clinical research” article, page 33.

Our excellent outcomes are a reflection of the attention given to patients to achieve compliance with recommended adjuvant therapies. This is evidenced by our survival data, as shown in Table 10, Five-year survival data, page 10, and by our results reported in the Cancer Program Practice Profile Reports (CP3R) quality measures discussed further in Dr. Alizah Rotramel’s Cancer Liaison Physician (CLP) article, page 27, and on the American College of Surgeons Commission on Cancer website.

TABLE 3 Breast malignancies by age at diagnosis

| Age | Legacy Health, 2013 | | Commission on Cancer, 2011* | |
|--------------|---------------------|---------------------|-----------------------------|---------------------|
| | Breast | Percentage of total | Breast | Percentage of total |
| < 20 | | | 15 | 0.0% |
| 20–29 | 3 | 0.5% | 951 | 0.4% |
| 30–39 | 19 | 3.1% | 8,080 | 3.8% |
| 40–49 | 80 | 13.0% | 35,865 | 16.8% |
| 50–59 | 155 | 25.1% | 52,986 | 24.8% |
| 60–69 | 180 | 29.1% | 56,958 | 26.7% |
| 70–79 | 122 | 19.8% | 37,516 | 17.6% |
| 80–89 | 42 | 6.8% | 18,678 | 8.7% |
| > 90 | 16 | 2.6% | 2,514 | 1.2% |
| Total | 617 | 100% | 213,563 | 100% |

*Last complete year of data available from the Commission on Cancer

TABLE 4 Total breast analytic cases — Class of case

| Class of case (CoC) | Legacy Health, 2013 | | Commission on Cancer, 2011* | |
|---|---------------------|---------------------|-----------------------------|---------------------|
| | Breast | Percentage of total | Breast | Percentage of total |
| CoC 00: Diagnosed at Legacy; all of first course treatment or the decision not to treat was done elsewhere. | 67 | 11% | 9,903 | 4.7% |
| CoC 10–14: Diagnosed at Legacy or in a staff physician's office; all or part of first course treatment or the decision not to treat was done at Legacy. | 298 | 48% | 135,931 | 63.6% |
| CoC 20–22: Diagnosed elsewhere; all or part of first course treatment was done at Legacy. | 252 | 41% | 67,729 | 31.7% |
| Total | 617 | 100% | 213,563 | 100% |

*Last complete year of data available from the Commission on Cancer

TABLE 5 AJCC major stage groups 2013 — Breast

| | Stage 0 | Stage 1 | Stage 2 | Stage 3 | Stage 4 | Stage N/A or unknown | Total |
|---|---------|---------|---------|---------|---------|----------------------|---------|
| Legacy breast cases | 122 | 277 | 167 | 30 | 15 | 6 | 617 |
| Percentage of total breast malignancies | 19.7% | 44.9% | 27.1% | 4.9% | 2.4% | 1.0% | 100% |
| All CoC DX, CY 2011* | 43,240 | 88,287 | 50,921 | 17,708 | 8,305 | 5,102 | 213,563 |
| Percentage of total breast malignancies | 20.3% | 41.3% | 23.8% | 8.3% | 3.9% | 2.4% | 100% |

*Last complete year of data available from the Commission on Cancer; excludes age < 20

TABLE 6 Breast malignancies 2013 — First course of treatment by stage (617 cases)

| Treatment combination | Stage 0 | Stage 1 | Stage 2 | Stage 3 | Stage 4 | Stage N/A or unknown | Total | Percentage of total |
|--|------------|------------|------------|-----------|-----------|----------------------|------------|---------------------|
| Chemotherapy | 0 | 3 | 1 | 0 | 2 | 0 | 6 | 1.0% |
| Hormone | 2 | 2 | 4 | 0 | 2 | 1 | 11 | 1.8% |
| Radiation | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0.2% |
| Radiation + chemotherapy + hormone | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.2% |
| Radiation + hormone | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0.3% |
| Surgery | 56 | 20 | 13 | 0 | 0 | 2 | 91 | 14.6% |
| Surgery + chemotherapy | 0 | 10 | 12 | 6 | 4 | 0 | 32 | 5.2% |
| Surgery + chemotherapy + hormone | 0 | 18 | 24 | 7 | 0 | 0 | 49 | 7.9% |
| Surgery + chemotherapy + radiation | 0 | 13 | 6 | 8 | 0 | 0 | 27 | 4.4% |
| Surgery + chemotherapy + radiation + hormone | 0 | 23 | 32 | 9 | 2 | 0 | 66 | 10.7% |
| Surgery + hormone | 19 | 61 | 39 | 0 | 0 | 0 | 119 | 19.3% |
| Surgery + radiation | 20 | 16 | 1 | 0 | 0 | 1 | 38 | 6.2% |
| Surgery + radiation + hormone | 21 | 102 | 33 | 0 | 1 | 0 | 157 | 25.4% |
| Treated | 118 | 269 | 165 | 30 | 14 | 4 | 600 | 97.2% |
| Not treated | 4 | 8 | 2 | 0 | 1 | 2 | 17 | 2.8% |

TABLE 7 All Commission on Cancer 2011* breast malignancies — First course of treatment by stage (213,563 cases)

| Treatment combination | Total | Percentage of total |
|--|----------------|---------------------|
| Surgery | 39,601 | 18.5% |
| Surgery + chemotherapy | 16,050 | 7.5% |
| Surgery + chemotherapy + hormone | 9,929 | 4.6% |
| Surgery + chemotherapy + radiation | 16,141 | 7.6% |
| Surgery + chemotherapy + radiation + hormone | 22,067 | 10.3% |
| Surgery + hormone | 25,802 | 12.1% |
| Surgery + radiation | 18,550 | 8.7% |
| Surgery + radiation + hormone | 44,255 | 20.7% |
| Other specified treatment | 14,637 | 6.9% |
| Total treated | 207,032 | 96.9% |
| Total not treated | 6,531 | 3.1% |

*Last complete year of data available from the Commission on Cancer; excludes ages < 20

TABLE 8 Histology distribution of breast cancer cases, Legacy Health vs. Commission on Cancer

| Histology | Legacy Health, 2013 | | Commission on Cancer, 2011* | |
|---|---------------------|-------------|-----------------------------|-------------|
| | Total | Percentage | Total | Percentage |
| Infiltrating duct carcinoma | 368 | 59.7% | 142,413 | 66.7% |
| Lobular carcinoma, NOS | 51 | 8.3% | 20,624 | 9.7% |
| Infiltrating duct and lobular carcinoma | 42 | 6.8% | 9,509 | 4.4% |
| Infiltrating duct mixed with other types of carcinoma | 4 | 0.6% | 15,298 | 7.2% |
| Other specified types | 152 | 24.6% | 25,719 | 12.0% |
| Total | 617 | 100% | 213,563 | 100% |

*Last complete year of data available from the Commission on Cancer

TABLE 9 Hormone receptor and HER2/neu status in Legacy breast cancer cases 2013, cancer registry count

| Status | ER | Percentage | PR | Percentage | HER2/neu | Percentage |
|-----------------------------|------------|-------------|------------|-------------|------------|-------------|
| Positive | 519 | 84.1% | 477 | 77.3% | 55 | 8.9% |
| Negative | 80 | 13.0% | 123 | 20.0% | 408 | 66.1% |
| Borderline | 0 | — | 0 | — | 14 | 2.3% |
| Test order, results unknown | 2 | 0.3% | 2 | 0.3% | 4 | 0.7% |
| Test not done | 8 | 1.3% | 8 | 1.3% | 89 | 14.4% |
| Unknown if ordered | 8 | 1.3% | 7 | 1.1% | 47 | 7.6% |
| Total | 617 | 100% | 617 | 100% | 617 | 100% |

TABLE 10 Five-year survival data — National Cancer Data Base (NCDB) vs. Legacy Health

| Observed five-year survival — NCDB data all breast malignancies (2003–06 diagnoses) | | | | | | |
|---|---------|---------|----------|-----------|----------|---------|
| | Stage 0 | Stage I | Stage II | Stage III | Stage IV | Overall |
| Legacy Health | 96.0% | 94.4% | 93.7% | 73.0% | 32.0% | 90.6% |
| Number of cases | 321 | 802 | 438 | 140 | 50 | 1,751 |
| CoC (1,489 facilities) | 95.6% | 92.2% | 85.4% | 66.7% | 21.1% | 85.5% |
| Number of cases | 104,415 | 209,467 | 152,007 | 57,722 | 20,740 | 544,351 |

Cancer data management

By Mindy Ansteth, B.S., CTR, manager, Legacy Cancer Data Management

Since 1985, the Cancer Data Management Department (CDM) cancer registry has served as a repository of valuable cancer data collected for every patient diagnosed and/or receiving first course treatment at a Legacy Health facility. With all patients followed for life, the data are invaluable for cancer treatment, patient outcomes and research studies. Similar to all other cancer registries across the country, the Legacy cancer registry plays an important role in the local, regional and national fight against cancer.

Members of the CDM team are located at all six Legacy Health medical centers. Our team of cancer data experts captures a complete summary of the history, diagnosis, treatment and yearly follow-up status for every patient for life. In 2013, the team accessioned more than 2,400 new cancer cases into the cancer registry database, coordinated and attended more than 300 Legacy cancer care conferences (of which breast cases were presented at over half), maintained a 93 percent successful follow-up rate for all patients in the registry over the past five years and an 89 percent successful follow-up rate for patients in the registry since 1997, and completed more than 225 cancer registry-related data requests for Legacy physicians and administration.

We are very proud to share that Legacy Cancer Institute was awarded Gold Level accreditation with commendations (the highest level of accreditation) from the American College of Surgeons (ACS) Commission on Cancer (CoC) in 2013. As an accredited CoC Integrated Network Cancer Program (INCP), cancer data are required to be reported annually to the National Cancer Data Base (NCDB) to contribute to national studies of cancer incidence, treatment and outcomes. The CDM department submitted all required data error-free, earning Legacy commendation for this CoC accreditation standard. Additional commendations were awarded



Cancer Data Management team 2013, from left: Mindy Ansteth, B.S., CTR, manager, Cancer Data Management; Melania Tolan Hudson, RHIT, cancer registrar, Legacy Good Samaritan Medical Center; Katie Fulcher, RHIT, cancer registrar, Legacy Meridian Park Medical Center; Susan Malone, B.S., office assistant, Legacy Good Samaritan Medical Center; Lorraine Colwell, cancer registrar, Legacy Mount Hood Medical Center; Leslie Griffith, RHIT, cancer registrar, Legacy Emanuel Medical Center; Catherine Gunn, CTR, Legacy Emanuel Medical Center; Dawn Cox, CTR, Legacy Good Samaritan Medical Center. Not pictured: Janel McNally, CTR, Legacy Salmon Creek Medical Center.

for abstracting timeliness and fulfilling the cancer-focused continuing education requirements.

In 2013, the CDM team played an integral role in achieving full accreditation by the National Accreditation Program for Breast Centers (NAPBC) at Legacy Good Samaritan Medical Center, Legacy Meridian Park Medical Center, Legacy Mount Hood Medical Center and Legacy Salmon Creek Medical Center. Other notable accomplishments include certified tumor registrar (CTR) certifications for team members Katie Fulcher, RHIT, and Melania Tolan Hudson, RHIT, which the CoC requires by 2015. Team member Catherine Gunn, CTR, spoke at the 2013 National Cancer Registrars Association (NCRA) Annual Education Conference in San Francisco about Legacy's successful enrollment and integration of the CoC, NCDB Rapid Quality Reporting System (RQRS).

Over the course of the year, the CDM team attended various local, regional and national educational conferences and webinars to stay abreast of the latest advancements in cancer diagnosis and treatment, as well as the strict guidelines of data entry prescribed by the Commission on Cancer (CoC) and the North American Association of Central Cancer Registries (NAACCR).

The benefits of 3-D mammography

By Kari A. Thomas, M.D., diagnostic radiologist

Breast tomosynthesis, or 3-D mammography, was approved by the FDA in February 2011 and marks a tremendous advance in breast imaging and breast



cancer screening. Thanks in large part to the generosity of Legacy Health Foundations and the organization's commitment to women's health, the Legacy Breast Health Center–Good Samaritan was an early adopter of this technology, which is currently offered for clinical mammograms at only 11 percent of breast centers nationwide.

By displaying numerous thin “slices” of breast tissue, rather than a single image of all the overlapping breast tissue, 3-D mammography improves the sensitivity and specificity of digital mammography. In conventional 2-D mammography, the breast is compressed in standard planes, creating superimposed images of the breast tissue, with dense glandular tissue overlapping areas of intramammary fat. In contrast, 3-D mammography takes numerous images of the breast from different projections, allowing the radiologist to view the breast tissue in greater detail.

The concept is similar to looking at individual sheets of paper or pages in a book, as opposed to a stack of paper — far more detail is seen viewing the words of each page separately, rather than superimposed as a whole. 3-D mammography utilizes this concept to help determine whether a dense area on the mammogram represents overlapping tissue or an actual mass. It also allows detection of small tumors, which might otherwise be obscured by surrounding glandular tissue. The result is improved cancer detection and decreased false-positive call-backs from screening exams.

Numerous large-scale, peer-reviewed clinical research studies specifically show that breast cancer screening with 3-D mammography finds

up to 40 percent more invasive cancers than 2-D mammography, and that 3-D mammography can reduce the false-positive recall rates by up to 15 percent.

Although the technology was initially expected to be most useful in imaging patients with extremely dense breast tissue, in our practice we have found it helpful for imaging all breast densities.

Legacy Breast Health Center–Good Samaritan began screening with 3-D mammography in 2012, and we have seen significant clinical results in our population as a result of the implementation of this technology. We have compiled a series of patients from our institution with findings on screening mammograms detected only on the 3-D images — findings that were not identified on the conventional 2-D views or with targeted breast ultrasound, even knowing precisely where to look.

Consistently, these abnormalities — only visible with the new technology — have ultimately turned out to be high-risk lesions, in-situ cancer or early invasive cancers. Impressively, all of the invasive cancers detected in this group were early stage tumors, measuring less than 1 cm, and none had spread to the axillary lymph nodes.

Early detection remains the key to curing breast cancer by making treatment more effective, and 3-D mammography is clearly now a major tool in our fight against this disease.

With new computer reconstruction algorithms being introduced at Legacy Good Samaritan in late 2014, the radiation dose for our 3-D mammograms will be even lower than conventional 2-D mammograms. Also, 3-D mammography significantly reduces the need for repeat mammograms and unnecessary additional testing, reducing costs to the patient and the health care system.

We are extremely pleased and fortunate to offer this valuable cutting-edge technology to all our patients at Legacy Breast Health Centers.

Genetic predisposition for breast cancer

By Paul Dorsey, M.S., genetics counselor, Legacy Genetics Services

The expanse of knowledge regarding the role of genetics in cancer continues to grow at an astonishing rate. It demonstrates the complexity of information regarding the interactions between these genes, the role of specific genes in tumorigenesis and the role of specific genes in familial cancer syndromes.



Some of the most rapid changes affecting testing for familial cancer syndromes have happened in the last year when the Supreme Court ruled that genes could not be patented. This ruling effectively ended the monopoly that several laboratories had on testing of specific genes. This monopoly suppressed not only the number of labs offering testing for familial cancer syndrome, but also the number of genes able to be tested for. Prior to the Supreme Court ruling, and because of the monopolies, most patients when testing for breast would only be tested for BRCA1 and BRCA2. At the time, because no other clinical tests were widely available, many providers believed that testing for BRCA1 and BRCA2 was sufficient.

However, overall we are currently aware of 28 genes that are implicated in hereditary breast cancer syndromes. This means that over a third of individuals with a breast cancer predisposition mutation will have a mutation in a gene other than BRCA1 or BRCA2. The fact that these two genes were patented limited the development and availability of testing for the other 26 genes.

Each of the breast cancer genes when mutated will result in a different spectrum of cancers. Additionally, some result in other physical features that provide us clues as to which gene may be the culprit in a particular family. So, if a patient was negative for a BRCA mutation, we would work to get these patients into research studies that would perform testing on genes that might be implicated in that family because no other clinical tests were available. Unfortunately, some of the genes were

just not available for analysis. This led to the unfortunate situation where many patients tested negative for BRCA1 and BRCA2 testing, but who were still at high risk, were given a false sense of security.

Since the Supreme Court decision, we have seen the rapid growth of gene panels that allow us to test for various sets of genes. This allows us to tailor panels to known cancers in the family and to physical attributes observed in the family. It also allows us to provide more reassurance when test results are negative.

There have been other ramifications of the Supreme Court decision. The cost of testing single genes has dropped significantly. We are now able to test multiple genes for the price of a single gene just a year ago. Last year, the cost of BRCA testing was \$4,500. We can now test a panel of 18 genes implicated in hereditary breast cancer syndromes for \$4,000.

Another consequence of the Supreme Court ruling is that the percentages we have been quoting for years are rapidly being revised. It is important to remember that only about 10 percent of breast cancers are due to a hereditary breast cancer syndrome running through a family. Historically, because of the monopoly, testing was primarily for BRCA1 and BRCA2 only. We now understand that this bias inappropriately skewed the importance of these two genes. As stated previously, historically we estimated that BRCA mutations accounted for 65 percent of those families. Based on the rate of mutations in genes other than BRCA currently being detected by laboratories, it is now estimated that BRCA mutations account for only 40 percent of hereditary breast cancer syndromes. This now means that more than half of individuals with a breast cancer predisposition mutation will have a mutation in a gene other than BRCA1 or BRCA2. Genetics professionals need to review our previous patients and identify those that were at high risk who should be re-evaluated despite a negative BRCA1 and BRCA2 test alone when other potential genes were not considered.

Legacy Genetics Services provides a comprehensive service to help patients navigate the confusing and complex information associated with hereditary cancer syndromes. This includes collecting and analyzing multigenerational family histories, assessing pedigrees and recognizing cancer syndromes, educating patients about genetics, cancer and individualized cancer risk information based on genetic and non-genetic risk factors, presenting the advantages and disadvantages of genetic testing and identifying family members who may be better candidates for testing than the person initially seeking the consultation. The program is essential in ensuring informed consent for genetic testing in compliance with Oregon's Genetic Privacy Act, verifying the correct ordering and interpreting of appropriate DNA tests as well as interpretation of cancer genetic test results. The program provides a secure forum for discussing issues relating to confidentiality, potential insurance discrimination, the Oregon Genetic Privacy Act and Federal Legislation, and individualized cancer screening recommendations and risk management strategies for the patient.

When determining the appropriate gene panel to perform on an individual, it is important to assess several factors. For example, the more genes analyzed the greater the expense and the longer the turnaround time for results. To emphasize the point, there is a test that currently exists that will analyze 45 genes implicated in hereditary cancer syndromes (including, but not limited to breast cancer). The cost is \$8,000 with an expected turnaround time of 12 to 16 weeks. Insurance coverage is also an issue. It is unlikely that an insurance company will pay for this panel unless there is a reasonable explanation to perform such a broad panel. It is important to remember that just because we can test for increasing numbers of genes, it is often not beneficial to do so. Clinical evaluation helps to make critical decisions regarding testing panels.

The most useful test for those families where breast cancer alone is the primary issue is a panel of six genes (BRCA1, BRCA2, PTEN, P-53, STK11 and CDH1). These six genes are estimated to account for 85 percent of hereditary breast cancer syndromes. The cost of this test is \$3,000 with a turnaround time of three weeks. This makes it a viable option

for those needing quick results in order to make treatment decisions.

Historically, when a patient is referred to our program, we contact the patient to discuss the reason for the referral and their concerns regarding cancer risks. As noted above, detailed family, medical and screening history information is critical for informed decision-making. Therefore, forms to start collecting this information are sent to the patient. Once those forms are received in our office, an appointment is scheduled. As genetic test results are increasingly necessary to facilitate surgical and/or radiology decisions, the necessity of finding ways to streamline this process have become critical. In Legacy Genetics Services, we implemented a Risk Assessment Program to help solve this problem.

The Risk Assessment Program allows patients to enter family history and other relevant information using a tablet in the clinic. The software is dynamic in that patient responses determine which questions will be asked. For instance, if after the first few questions the patient does not appear to be a high-risk patient for either a cancer predisposition gene mutation or an increased risk for cancer due to other factors, the program will stop generating questions. On the other hand, if the patient does appear to be at risk, the program will gather a detailed personal and family history on the patient.

Once completed, the program will automatically populate the pedigree and run multiple risk-assessment models on the patient.

These models will give the patient several sets of probabilities. The first is the risk that the patient is a carrier of a hereditary cancer predisposition gene mutation. The second is the patient's lifetime risk to develop certain cancers as well as their five-year risk for specific cancers. If the patient has a risk of greater than 10 percent for carrying a cancer predisposition mutation, they will be referred to Legacy Genetics. If the patient has a greater than 20 percent lifetime risk to develop breast cancer in their lifetime, then they will be informed that they should follow a more aggressive screening protocol.

Currently, the program is in use in the Legacy Medical Group—Surgical Oncology clinics on the Legacy Good Samaritan, Legacy Meridian Park and Legacy Mount Hood campuses.

We are working to upgrade the system, which will provide us with a much more powerful pedigree component. This is necessary because we understand that the algorithms for the models are not foolproof and should not supersede good clinical judgment. The new upgrade will incorporate the NCCN guidelines for testing when assessing the family history.

Once completed, the new version will allow any Legacy provider to order a genetic risk assessment. The order will generate either an email with a dynamic link or a link in MyHealth. The link allows the patient to access the assessment software from their home, or wherever it is convenient, and give them the time to research their family history in the hope of getting the most accurate information as quickly as possible. Once the patient completes the assessment, the pedigree will be populated and the patient can be evaluated for risk.

If the patient is low risk for a mutation and low risk to develop cancer, a letter will be generated informing both the patient and referring provider that no further action is necessary. If the patient is at increased risk, they will be contacted either by Genetics Services for a genetics consult or by a physician to discuss appropriate screening guidelines. All of the information gathered will be uploaded into the patient's electronic medical record.

Once the Risk Assessment Program is in place, it will be easy to use this system to evaluate families for a whole host of diseases beyond cancer. Any risk models can be implemented in the software. Future uses by maternal-fetal medicine, pediatric genetics, cardiology, diabetes or other disciplines are possible. The ultimate goal is to make this model available throughout Legacy and improve the health of our patients.

Current practice of breast pathology at Legacy Health

By Jianzhou Wang, M.D., Ph.D., pathologist, Legacy Laboratory Services

Nearly one in eight women in the U.S. will develop invasive breast cancer during their lifetimes. In 2013, an estimated 232,340 and 2,240 new cases of inva-



sive breast cancer were expected to be diagnosed in women and men in the U.S., respectively. Accurate pathologic diagnoses and assessments of prognostic/predictive tumor makers are the foundations upon which the best available treatment decisions are made.

The practice of surgical pathology has certainly changed over the last decade. I recall when I started my breast pathology sub-specialty training at MD Anderson Cancer Center in early 2000, many people asked me why I was going to spend a whole academic year studying something that every pathologist is capable of doing quite well. With the recent recognition of entities of high-risk precursor breast lesions, advances in molecular diagnostic techniques

and pre-operative treatment regimens (such as neoadjuvant endocrine and chemotherapies), and accurately evaluating neoadjuvant therapy effects, surgical pathology of the breast has increasingly sub-specialized. In addition, patient advocacy groups also play an increasingly important role. We all remember the June 2006 Susan G. Komen for the Cure white paper entitled "Why current breast pathology practices must be evaluated." There is no question that standardizing pathology training and specialization has improved diagnostic accuracy in breast pathology and ultimately improved patient care.

At Legacy Health, with the support of our clinical colleagues, we have made tremendous progress in the area of breast pathology. Joined by my colleagues Kevin Oyama, M.D., and Maryam Farinola, M.D., we have formed a breast pathology sub-specialty group. Drs. Oyama and Farinola are experienced pathologists with strong interests in breast pathology.

In November 2013, all the members of the breast pathology group successfully completed a

College of American Pathology (CAP)-sponsored Advanced Practical Pathology Program (AP3) in breast pathology. The breast AP3 program is a comprehensive course updating the current concepts of and diagnostic challenges in breast pathology, standardization and quality control measures, and participation in multispecialty clinical care teams focused on breast cancer.

For the last few years, we have been working intensely in the following areas:

- To ensure diagnostic accuracy, all breast core biopsies are either diagnosed by a breast pathologist or a breast pathologist serves as a second reviewer. In addition, working closely with our radiology colleagues, radiology pathology correlation conferences are held bi-weekly to ensure the correlation between radiologic features and pathologic findings.
- Standardized breast pathology reporting, including AJCC tumor synoptic summaries, are included in all final pathology reports for breast cancer resection specimens.
- Working with Nathalie Johnson, M.D., we have established a protocol for evaluation of specimens after neoadjuvant chemotherapy to assess therapy effects and a standardized synoptic summary for residual cancer burden (RCB) classification.

- Standardized protocols for handling and grossing breast specimens and tumor banking, including post-treatment specimens. Pre-analytical variables, including specimen formalin fixation time, duration and tumor incision time are in compliance with current CAP guidelines.
- We have re-validated immunohistochemical studies of prognostic and predictive markers including estrogen receptors, progesterone receptors and HER2/neu with FDA-approved protocols and updated ASCO-CAP guidelines. Quantitative analysis of these markers is performed with the FDA-approved computerized Aperio Imaging System. We have participated in all CAP-sponsored quality control survey programs for ER, PR and HER2/neu. These efforts have increased the accuracy and consistency of prognostic studies performed at our laboratory.

In summary, the pathologists at Legacy Health have made significant progress in the ever-changing field of breast pathology. We will continue our efforts to constantly improve and offer the most current and best possible pathology services, including subspecialized breast pathology to all patients and clinicians in the Legacy system. We are pleased to participate in and support the multispecialty breast cancer care teams throughout Legacy. We look forward to your comments and suggestions.

Surgical treatment: Nipple-sparing mastectomy

By Alivia Cetas, M.D., breast surgeon, Legacy Medical Group—Surgical Oncology

Nipple-sparing mastectomy is an option for many patients who elect mastectomy with immediate reconstruction. Nipple-sparing mastectomy can be used for prophylaxis in patients who have a high risk of developing breast cancer during their lifetime as well as therapeutically for a select group of patients undergoing surgical management of breast cancer. Previously, mastectomy has always included the nipple-areolar complex in



the specimen due to the potential for occult nipple involvement and to reduce any future cancers within the ductal elements extending out to the nipple skin.

The terminology and definition of nipple-sparing mastectomy has been confusing. Nipple-sparing mastectomy has also been called total skin-sparing mastectomy and sometimes subcutaneous mastectomy. A (non-total) skin-sparing mastectomy traditionally removes the nipple-areolar complex, breast and skin overlying superficial tumors but preserves the native skin envelope. A subcutaneous

mastectomy conserves the nipple-areolar complex. A total skin-sparing mastectomy or nipple-sparing mastectomy includes removal of the nipple-areolar complex proper but spares the skin overlying the nipple-areolar complex.

Several surgical pioneers argued that nipple-sparing mastectomy is a safe option for many patients. Increasing use of nipple-sparing mastectomy is due to the improved cosmetic and quality of life benefit for patients. Many supporters of nipple-sparing mastectomy argue that breast cancer recurrence will be easily detectable since the residual breast tissue is superficial.

Nipple-sparing mastectomy is used for a select group of patients. Patients undergoing mastectomy for prophylaxis or therapeutic purposes that have significant breast ptosis do not have a good cosmetic outcome with nipple-sparing mastectomy so traditional skin-sparing mastectomy with reconstruction is preferred. Recent studies have demonstrated a low recurrence rate in nipple-sparing mastectomy; however, nipple-sparing mastectomy is generally reserved for patients with an overall low risk of recurrence and a low risk of occult nipple involvement such as breast cancer patients without multicentricity, with circumscribed margins, with a tumor-nipple distance of 2 cm or greater, tumor grade 1 or 2, tumors less than 5 cm, no lymphovascular invasion or lymph node involvement, and HER2/neu Negative status. Nevertheless, a small number of patients with larger tumors, node positivity and HER2/neu Positive status are undergoing nipple-sparing mastectomy. Some nipple-sparing mastectomy patients have undergone post-mastectomy radiation with reduced rates of recurrence but higher rates of nipple necrosis. Anticipation of post-mastectomy radiation is not a contraindication for nipple-sparing mastectomy.

Nipple-sparing mastectomy is technically feasible for most patients through a lateral incision or an inframammary fold incision. If a nodal assessment is necessary, a counter incision in the axilla can be made. Sometimes a sentinel lymph node biopsy or axillary lymph node dissection can be performed through the same incision as for the nipple-sparing mastectomy. There are some institutions using

endoscopic maneuvers to perform nipple-sparing mastectomy. Advances in surgical visibility and tools for hemostasis have addressed the technical challenges of this operation so the length of the operation is usually not longer than a standard skin-sparing mastectomy. A retroareolar biopsy is routinely performed at the time of nipple-sparing mastectomy to avoid occult nipple involvement. If the biopsy demonstrates tumor, then the nipple-areolar complex is excised.

In addition to breast cancer presentation or recurrence, other concerns for preserving the nipple-areolar complex at the time of mastectomy include necrosis of the nipple-areolar complex as well as the change in appearance, function and sensation of the nipple-areolar complex. There has been minimal long-term follow-up for patients who have had a nipple-sparing mastectomy but more often studies with a small series of patients. The American Society of Breast Surgeons has a prospective registry for nipple-sparing mastectomy patients, and a recent study was published reviewing the use of nipple-sparing mastectomy for breast cancer patients at multiple institutions showing an increase in nipple-sparing mastectomy.

Overall, nipple-sparing mastectomy is becoming a more accepted option for women considering surgery for breast cancer prophylaxis and treatment. Nipple-sparing mastectomy is best suited for patients with minimal ptosis, patients undergoing prophylactic mastectomy with reconstruction and breast cancer patients with a low likelihood of breast cancer recurrence and occult nipple involvement.

Reconstruction: DIEP flap vs. TRAM flap

By Shane C. Kim, M.D., reconstructive surgeon, Legacy Medical Group—Reconstructive Surgery, and Hema J. Thakar, M.D., FACS, reconstructive surgeon, Legacy Medical Group—Reconstructive Surgery

Women with the diagnosis of breast cancer are often faced with difficult choices in their care. Methods of breast reconstruction are among those



Dr. Kim

decisions made during the journey of survivorship. Several different methods can make for a daunting decision-making process but can be explained in depth through education and awareness.

Typically, women have a choice of either prosthetic or autologous reconstruction techniques. Prosthetic techniques involve a tissue expander, which is later replaced with a breast implant, saline or silicone, to complete the reconstruction. This method is more common and involves less surgery. Drawbacks to



Dr. Thakar

prosthetic reconstruction include concerns of implant safety, patient satisfaction, implant rupture and other implant-related complications. Newer devices such as cohesive gel silicone implants, also known as “form stable” devices, have improved prosthetic reconstruction outcomes.

Autologous reconstruction techniques involve using a patient’s tissue to create a living breast “implant” to achieve reconstruction. Two of the most common forms of autologous reconstruction are affectionately known as the “tummy tuck flaps” because the abdominal skin and adipose tissue is moved to the breast region. In exchange, the abdominal donor site is closed with results similar to a traditional “tummy tuck.”

One method is the TRAM flap (transverse rectus abdominis myocutaneous flap). This method reliably reconstructs the breast, but it sacrifices the rectus abdominis muscle for each side being reconstructed. In a bilateral reconstruction, this can

potentially reduce the strength and endurance of core muscle function. As a result, this method does not enjoy as much popularity as it once did.

The other method of using the abdominal tissue is the DIEP flap (deep inferior epigastric artery perforator flap). This contemporary method relies on selectively dissecting the skin, adipose tissue, and an artery and vein necessary to perfuse this tissue while minimizing the amount of muscle sacrificed. It is designed to preserve as much core strength as possible, but still involves operating on the abdominal region. It is a more technical surgery and can be more time consuming, but remains less invasive than TRAM flaps, particularly with bilateral reconstruction patients. For patients considering bilateral autologous reconstruction, DIEP flaps are now generally recommended although DIEP flaps can also be performed for unilateral breast reconstructions as well.

The benefits of autologous reconstruction include the absence of any prosthetic implant; therefore, there is no implant to rupture or replace. DIEP flaps can also be considered for those patients who cannot complete prosthetic reconstruction or are not a candidate for prosthetic reconstruction. The drawbacks include a longer surgery and hospital stay. One criticism of autologous breast reconstruction has been the cost to the health care system for this procedure; however, when one considers the lifetime cost of prosthetic reconstruction, including implant replacement or revision versus the larger initial cost of autologous reconstruction with no implant replacement, the cost becomes comparable over lifetime averages.

Ultimately, the patient is their own advocate for reconstruction and plastic surgeons can help to explain and define these techniques in greater detail. We believe that we can offer the community a local resource for DIEP flaps and help that decision-making process with commitment and dedication.

Accelerated partial breast irradiation

By Mark Schray, M.D., radiation oncologist, medical director, Legacy Medical Group—Radiation Oncology



For several decades, breast-preserving treatment in the management of early stage breast cancer has been established by multiple randomized clinical trials to be the equal of mastectomy. Breast conserving treatment consists of tumor excision (lumpectomy) to achieve negative surgical margins and axillary surgery for staging (and possible therapeutic benefit) to determine the need for and nature of systemic therapy. Such limited surgery has been routinely supplemented by adjuvant external radiation therapy to the entire breast (and possibly regional lymph nodes). The value of adjuvant radiation has been repeatedly confirmed except in small, biologically favorable cancers in older women where the prognosis is favorable enough that the benefit of adding radiation therapy to hormone therapy is limited.

Impediments to the routine use of breast preservation therapy in appropriate patients have included limited access to radiation treatment facilities for rural residents, the inconvenience of daily treatment over 4 to 6.5 weeks, and patient concerns over real and/or imagined risk of radiation to the breast and/or surrounding critical tissues.

It was in answer to these concerns that the concept of accelerated partial breast irradiation (APBI) was developed. This approach uses adjuvant irradiation to only the breast tissue immediately surrounding the tumor bed and is accomplished in one week (or less). This approach was developed in the early 1990s but didn't come into widespread use until the last decade.

Early techniques were primarily limited to interstitial multicatheter brachytherapy and wider use awaited the development of MammoSite and other single-entry brachytherapy applicators. Brachytherapy is the discipline within radiation oncology that places radioactive material directly into the tumor bed (or tumor itself) to allow more intense and localized treatment of the target while

sparing surrounding tissues.

Also within the last decade, multiple alternative techniques of APBI have been developed using 3-D conformal, intensity modulated, or proton beam external radiation, intraoperative techniques with electron beam or kilovoltage applicators simulating brachytherapy, and others. At this time, there are at least eight ongoing (or recently completed) randomized trials comparing various techniques of APBI to adjuvant whole breast irradiation. These studies will answer many of the questions about this concept in the coming decade.

The rationale for this approach can be found in older studies that compared external radiation treatment as adjuvant treatment following lumpectomy surgery to lumpectomy alone. These data showed that the vast majority of breast recurrences occurred at or near the surgical (tumor) site and the risk of cancer at other locations in the breast was not significantly reduced by adding radiation therapy. As a consequence, successful treatment of the tumor bed should provide virtually all of the benefits of adjuvant irradiation, while minimizing treatment of the breast and surrounding tissues, thereby improving the long-term cosmetic appearance of the breast and minimizing consequences to heart, lung and chest wall.

Legacy Health was the first in the region to develop a program of APBI in 2003. Our experience to date includes more than 400 patients and has focused on brachytherapy technology. We use mostly single entry applicators, but are still the only program in the region to offer multicatheter brachytherapy. Features of this program include its integration to the lumpectomy surgery with 10 treatments administered twice daily over five days after pathologic review; the entire process is typically complete within nine days. This process required a highly coordinated team of surgeons, diagnostic radiologists, pathologists, and radiation oncology staff and physicians to maximize success, efficiency and safety for our patients. Please see this year's publication of our experience with our first 294 patients in the

American Journal of Surgery, which documents our favorable outcomes with a breast recurrence rate of 2 percent at five years' mean follow-up.¹

The quality and quantity of retrospective data about outcomes of APBI with brachytherapy are such that this approach is routinely offered to our patients with favorable features of age over 60, hormone receptor positivity, negative surgical margins and negative axillary sentinel lymph nodes. Patients with less-favorable features have been much less extensively studied and require a more detailed discussion of risk and benefit before using this approach in a non-study setting. All of our patients have additional breast imaging with either MRI or breast-specific gamma imaging to confirm their suitability for this technique.

Additional questions remain about the limits of this treatment concept with respect to tumor biology and characteristics, the target volume to be treated, and the ideal technique to deliver the radiation treatment. Some answers will come from the ongoing worldwide randomized trials, while others will remain. For now, we plan to continue our program employing a one-week course of brachytherapy, which has a published in-house track record of success as well as the greatest volume of literature experience (both patient numbers and length of follow-up) to support its use. APBI is an established piece of the integrated and comprehensive program of breast cancer care available to the patients of Legacy Cancer Institute.

Medical oncology treatment

By Robert Raish, M.D., medical oncologist

Approximately 250,000 women will be diagnosed with breast cancer this year in the United States, and 40,000 of them will die of the disease. Although our



understanding of the cause of breast cancer is incomplete, there are several well-established risk factors. The strongest is age, in that most women diagnosed with breast cancer are over the age of 65. Family history is also important. Having affected

family members increases a woman's risk of getting the disease. Lifestyle also plays a role. For example, it is well established that exercise significantly reduces the risk of developing breast cancer and other cancers, as well.

Although the incidence of breast cancer has been increasing, since the late 1980s, mortality rates from breast cancer have been steadily decreasing. This improvement in outcome is attributed to better treatments, and to screening.

Although there has been controversy about mammograms, they are the only screening tool that has been shown to improve breast cancer survival.

Legacy Health has continually updated breast imaging services and now provides digital mammography with computer-assisted detection, 3-D tomosynthesis, ultrasound, MRI and breast specific gamma imaging. This array of state-of-the-art radiology tests provides the latest and best breast imaging both for screening and for the person who has been diagnosed with breast cancer.

In addition to better screening, the treatment of breast cancer has significantly improved in all areas of breast cancer therapy. There have been improvements in surgery. At Legacy Health patients routinely undergo sentinel node biopsy rather than being subjected to complete removal of lymph nodes under the arm. This allows the great majority of women to be spared the older, more toxic treatment without any bad effect on outcome.

Similarly, women undergoing mastectomy are referred and routinely seen by a plastic and recon-

¹Pasko, J., et al., Experience with partial breast irradiation for treatment of breast cancer at a community-based cancer center. *The American Journal of Surgery*, 2013, 207, pp. 682–685.

structive surgery specialist and have the option of an immediate reconstruction procedure.

Advancements in radiation oncology also benefit patients at Legacy Health. Women undergoing radiation for breast cancer have computer-assisted treatment planning that allows a full dose of radiation to the breast or chest wall, with minimal exposure to normal tissue. Many women are also candidates for partial breast irradiation, which is completed in a significantly shorter time frame. These and other radiation oncology advancements provide maximum benefit with less toxicity.

The past few years have seen many improvements in medications used to treat breast cancer. New drugs are being designed based on an understanding of the molecular features of breast cancer. This cancer research has also led to the realization that breast cancer is not just one disease. There are many subtypes, each with their own behavior and response to treatment. This molecular testing is routine at Legacy Health, and is included in all of the decision making in breast cancer treatment.

Given the complexity of breast cancer treatment

in each of the areas of therapy, an organized, team approach is essential. Newly diagnosed cases of breast cancer at Legacy Health are reviewed in our weekly Tumor Board. This conference is attended by surgery, plastic and reconstructive surgery, radiation oncology, medical oncology, pathology, radiology, nurse navigators, integrative oncology and medical genetics. These experts in breast cancer care work as a team to develop the best plan for each patient with the goals of providing the best outcome and the least toxicity.

Legacy Health also has an active clinical trials program offering the latest treatments for cancer. In breast cancer, studies are available offering new chemotherapy, hormone and radiation treatments, and these clinical trials are reviewed at the Tumor Board as well.

Modern treatment of breast cancer requires a team approach. The well-organized, cooperative, multidisciplinary program at Legacy Health brings providers together so that each patient is offered the best care to ensure the best outcome with the least toxicity.

Reverse mapping and lymphedema treatment

By Jennifer Garreau, M.D., surgical oncologist, Legacy Medical Group—Surgical Oncology

Lymphedema is one of the most well-recognized and feared complications for women undergoing an axillary lymph node dissection (ALND). Lymphedema is thought to be caused by disruption of the lymphatic tracts that drain the arm. Although the use of the sentinel lymph node biopsy technique (SNB) has helped decrease the incidence of lymphedema by minimizing the dissection of the axilla, even this has been associated with lymphedema. It is estimated that lymphedema affects 6–50 percent of patients undergoing an ALND and 2–7 percent of patients undergoing SNB.

Axillary reverse lymphatic mapping (ARM) was first described by Thompson, et. al., in 2007 as a



method of isolating the arm lymphatics from the breast lymphatics, thereby decreasing the risk of lymphedema for women undergoing axillary node surgery. In this technique, a blue dye is injected in the inner space of the upper medial arm. The theory is that the dye will get taken up by the lymphatic tracts draining the arm, not the breast, allowing the surgeon to preserve these lymphatic tracts, thereby decreasing the risk of lymphedema. Many studies have since shown this to be an effective means of decreasing lymphedema for women undergoing ALND. We brought this technique to Legacy Health in 2009 in an attempt to improve outcomes and decrease the incidence of lymphedema in women undergoing ALND.

Because Legacy has an established tumor registry, we were able to use this database to identify

patients who had an ALND (described as ≥ 10 lymph nodes removed) with or without reverse axillary lymphatic mapping. A survey study was performed. Patients were contacted via mail with questionnaires asking the patient whether they identified themselves as suffering from lymphedema, if they had required treatment or therapy for this, and if so, what kind of treatment. Surveys were sent out to 112 patients. Of these, 46 were returned for a response rate of 41 percent. Among these women, 39 percent reported they experienced or still had lymphedema. This incidence was higher among women who had traditional ALND without ARM as compared to women who had ALND plus the addition of ARM (50 percent versus 27 percent) (see Table).

| | ARM | Traditional |
|---------------------|------------|-------------|
| Lymphedema present | 6/22 (27%) | 12/24 (50%) |
| Required arm sleeve | 4/22 (18%) | 11/24 (46%) |

Perhaps even more important was that only 18 percent of women in the ARM group reported use

of a sleeve as treatment for lymphedema versus 46 percent of women who underwent ALND only.

Studies have shown that breast cancer patients can have significant emotional and physical disability from lymphedema that affects their daily life. The goal of starting ARM at our institution was to decrease the morbidity of ALND and the occurrence of lymphedema. We were able to demonstrate that the rate of lymphedema was decreased significantly with the use of axillary reverse lymphatic mapping. Also, fewer women in this group required use of arm sleeve compression devices for medical management of lymphedema. We thus were able to conclude that axillary reverse lymphatic mapping is a beneficial procedure for patients undergoing ALND.

This is just one of many ways that we at Legacy provide the best and most up-to-date care for our patients. Once we identify a potential procedure that could be beneficial to our patients, we not only implement this procedure, but we objectively evaluate it to be sure that it truly improves patient outcomes.

Breast cancer and lymphedema

By Laura Evans, P.T., CLT-LANA, physical therapist, Legacy Rehabilitation Services

Lymphedema is one of the most significant survivorship issues after the treatment of breast cancer. Patients who have lymphedema often have significant physical, functional, economic and quality of life consequences. The incidence of breast cancer-related lymphedema varies depending on the study parameters and on the treatment the person has received. The incidence of lymphedema after axillary node dissection and radiation to the axilla and chest wall is between 30 and 50 percent; after sentinel node biopsy and radiation, the incidence is between 15 and 20 percent; and after sentinel node biopsy alone the incidence is 2 to 7 percent.



To understand lymphedema, we must look at normal circulation. As the heart pumps blood

through the arteries to the capillaries, oxygen, protein, food molecules and water are transported and pushed out to the local tissue. Most of the components are transferred back into the vein capillaries. However, protein molecules, white blood cells and cell debris are too large to fit into the vein capillary openings. Very small lymphatic capillaries pick up these components, transporting them through larger and larger lymph vessels to their corresponding lymph nodes. The lymph nodes filter out the protein and water, which are transported into the venous circulation at the subclavian veins.

Lymphedema is swelling. It occurs when the amount of lymph fluid to be removed from an area of the body exceeds the ability of the lymphatic vessels and nodes to move and process that fluid. Surgical scarring that develops after lymph node removal and the loss of lymph nodes can slow down the processing and transport of lymph.

Radiation can also injure the lymph vessels and lymph nodes, reducing the ability of the lymph system in that region to process fluid. Other factors that increase risk of lymphedema are obesity, infections to the involved area, axillary cording and poor upper body range of motion and strength.

With breast cancer treatment, lymphedema can affect the arm, breast, chest wall, lateral chest wall and/or the axilla or all of the above. It can range from very minimal, transient swelling to obvious, disfiguring swelling. Pain can range from very significant to none. Since this edema is a very protein-rich edema, the risk of getting an infection in the skin (cellulitis) is increased and each infection can increase the visible swelling as well.

Rehabilitation for lymphedema includes:

- Manual lymph drainage, which is a light manual therapy technique that facilitates the movement of lymph fluid through the lymph vessels
- Compression bandaging and the use of compression garments to increase tissue pressure, reducing the amount of fluid leaving the capillaries and increasing absorption of tissue fluids into the venous and lymphatic capillaries. Compression bandaging and garments also support the skin so as the muscles are working against the compression, lymph and venous return are improved.
- Remedial exercise, including restoring normal range of motion and normal strength to the involved area. This is done in a slow progressive manner to avoid exacerbation of lymphedema. The work of the muscles is what helps move

venous and lymph fluid out of the arm, and efficient muscles will improve the work of this muscle pump.

- Skin care — Many people after cancer treatment have an alteration in how their bodies work, including their skin. It may be much drier than it used to be and swelling can increase that problem. There may be areas of fibrosis where the lymphedema has become dense and scar tissue has started to build up. Learning how to care for the skin and prevent infections is very important.

It is impossible to know which patients with high risk of lymphedema will actually develop it. For those patients without signs or symptoms of lymphedema, they are instructed about their risks and ways to reduce their risks following the National Lymphedema Network guidelines. Those patients with lymphedema are treated with the above strategies with the goal of reducing at least 50 percent of the excess swelling out of their limb. They typically need to wear compression garments daily to prevent re-accumulation of lymph fluid in their limb.

Legacy cancer rehabilitation and lymphedema services help patients restore normal mobility after breast cancer treatment. We teach patients how to reduce their risk of developing lymphedema and how to manage this condition if they do develop it. Our lymphedema support group meets monthly allowing patients from all over the metro area a place to learn, share and vent about lymphedema.

Legacy Cancer Healing Center

By Selma Annala, R.T., CLC, coordinator, Legacy Cancer Healing Center

The Legacy Cancer Healing Center at Legacy Good Samaritan Medical Center is the umbrella under which support services reside for cancer patients and their families. Diagnosis of cancer may affect many aspects of one's life and the vision of the Legacy Cancer Healing Center is that life is meant to be lived to the fullest.

To support the state-of-the-art cancer treatment offered at Legacy, the Cancer Healing Center addresses the physical, emotional and spiritual issues that arise from a cancer diagnosis and treatment. To that aim, the Legacy Cancer Healing Center provides a comprehensive menu of classes and groups as well as the individual services of

cancer-trained and experienced practitioners. Those with a breast cancer diagnosis constitute the majority of patients receiving services from the Legacy Cancer Healing Center.

Individualized support services

- Cancer survivorship and integrative care offers individual consultation with a nurse practitioner. For more information see “Integrative care and survivorship” on page 26.
- Expressive arts therapy uses various artistic media to allow patients to express themselves and offers individual and group counseling to adults with cancer and their children.
- Massage therapy is offered at Legacy Good Samaritan Medical Center. The oncology-certified massage therapist sees women post-stereotactic breast biopsy, in Radiation Oncology and on the Cancer Care Unit, as well as at the Women’s Wellness Center.
- Music thanatology is available across Legacy. Trained musicians help alleviate fear, anxiety and discomfort at the hospital bedside through harp and voice.
- A Legacy dietitian, a certified specialist in oncology nutrition, offers individual consultations in nutritional counseling before, during and after cancer treatment.
- A licensed clinical social worker, certified in oncology social work, addresses the emotional, social and financial concerns of the individual and family, and coordinates community services and resources.
- Spiritual care addresses the spiritual concerns of patient and family in both inpatient and outpatient settings.
- We offer stress management instruction and guidance in behavior modalities, to help patients cope with the stress of a cancer diagnosis and provide support and comfort during difficult procedures.



Legacy Cancer Healing Center staff members, from left: Katherine Leonard, psychologist; Wendy Talbot, oncology social worker; Margaret Hartsook, art therapist; Selma Annala, stress management therapist; Marci Reed, oncology dietitian; Kelly Doherty, manager; Martha Lundberg, Pilates instructor; and Eileen Dolan, oncology massage therapist. Not pictured: Reza Antoszewski, nurse practitioner; Kathleen Perkins, yoga instructor; and Rae Waterman, volunteer coordinator.

Cancer education and movement classes

- In 2013 the Cancer Healing Center offered a series on exercise and nutrition for cancer survivors, three healthy eating food preparation classes for the Legacy community and the community at large, monthly gardening workshops and nature walks, weekly classes in Nia, Pilates and yoga.
- Dance for Couples was offered to couples where one individual was a cancer survivor, to explore the impact of couples dance on intimacy. Evaluations were strongly positive from the participants at the conclusion of each six-week series.
- The Living with Uncertainty and Change series addressed the issues faced by individuals with advanced disease.
- Meditation classes provided an avenue for cancer survivors to come together to learn meditation skills in a supportive environment.
- Expressions of Healing classes at Legacy Good Samaritan and Legacy Salmon Creek medical centers offer cancer survivors the opportunity to create community and explore their cancer journey via the arts.
- Ongoing support groups for women with breast cancer are held monthly at Legacy Good Samaritan, Legacy Mount Hood and Legacy Meridian Park medical centers, facilitated by oncology-experienced clinicians.

The Legacy Cancer Healing Center works closely with the patient, their family and all members of the patient's cancer treatment team to support them along the entire continuum of cancer care. It

is our goal to be available to our patients and families and to meet their needs with individualized caring support and education.

Oncology nurse and patient navigation

By Richard Lex, M.S., R.N., manager, Legacy Cancer Institute

Central to Legacy Health's integrated support services, oncology nurse navigators support cancer patients and families from diagnosis to end of treatment and ensure a smooth handoff to our program support colleagues. Established in 2008 as the area's first full-service navigation program, we have grown to be a leader in navigation services.

Recognizing that having cancer can be an overwhelming experience, our oncology nurse navigators are registered nurses trained in cancer care, who serve as a personal guide through diagnosis and treatment. Legacy Cancer Institute oncology nurse navigators provide educational, emotional, and social support to patients receiving cancer care and treatment at Legacy Good Samaritan, Legacy Meridian Park, Legacy Mount Hood, Legacy Emanuel and Legacy Salmon Creek campuses. Our nurse navigators work closely with Legacy Cancer Institute staff and physicians to provide coordinated care and services.

Working closely with our breast cancer care team, our breast health centers seamlessly refer breast patients to our navigators, focusing on transition from screening to diagnosis. Through this handoff, our navigators are able to quickly establish contact with providers and patients to align navigation services with physician and patient goals.

Through our collaboration with the American Cancer Society (ACS), our nurse navigators work closely with an ACS patient navigator, Dan Osborn, BSW. Dan works with our nurse navigators to help connect patients with Legacy and American Cancer Society resources. Support includes financial arrangements, transportation arrangements, help with job-related and family concerns, and lodging for those coming from outside Portland. In

addition, information is provided on community support, such as therapy, classes and support groups, Legacy's cancer support services and medically approved literature about cancer.

As Ellie Beard, R.N., OCN, oncology nurse navigator at Legacy Good Samaritan Medical Center, explains, "Nurse navigation is a unique and vital part of patient care and ideally we connect with each patient at the time of their diagnosis. A cancer diagnosis can be very frightening and stressful and navigating through the complexities of the health care system can greatly add to that stress. As navigators, we can help guide patients through the often complex maze of appointments, procedures, tests, decision-making steps and actual treatment. Navigators can help ensure continuity of care and coordination of that care. Navigation helps to identify any barriers to care such as insurance issues, transportation concerns or difficulty in understanding the treatment plan and then help to eliminate these barriers, which ultimately can have a positive effect on patient outcomes."

Becky Price, R.N., oncology nurse navigator, Legacy Salmon Creek Medical Center, adds, "The best part of being an oncology nurse navigator is having the ability to have a positive impact on a person's life when they need it most. We don't just navigate patients — we support their loved ones as well. Having access to an oncology nurse navigator gives patients a consistent resource throughout all phases of care. When I tell new patients that the phone number on my business card is my direct line, most of them get a profound look of relief on their faces. If the support I provide makes a person's cancer journey a little easier, less scary and more positive, then I have done my job."

Integrative care and survivorship

By Reza Antoszewska, NP-C, adult nurse practitioner, Legacy Integrative Medicine and Survivorship Services

As a nurse practitioner, I take a holistic approach to patient care within the Survivorship and Integrative Care Clinic. Care includes evaluating physical,



emotional, mental, existential and spiritual needs of each patient, and providing a plan of care that is individually tailored to the unique needs of the patient during that time. This plan can include exercise, diet, supplements and mind/

body elements for symptom management and risk reduction of cancer and other chronicities. Recommendations for services such as expressive art therapy or yoga, offered through the Legacy Cancer Healing Center, chaplain services, or referral to an acupuncturist or other integrative provider in the community may also be part of the plan of care.

Integrative cancer care is a unique feature of Legacy's Integrative Medicine and Survivorship Services. We assess patients for medical needs that lifestyle, supplements or referrals to integrative care practitioners, in Legacy or in the larger community, may help reduce or prevent symptoms associated with cancer and its treatment during any phase of care. The supplements recommended are those for which evidence exists to support use and that have been reviewed for safety during treatment. Reputable suppliers of these supplements are recommended to ensure the quality of supplements our patients are using. Integrative service recommendations are made to community providers who have been evaluated for their competence and ability to communicate with the team.

Patients often are already seeing a complementary/alternative care provider, prior to or during their cancer care, who has recommended herbals or other supplements. We work with these patients to help them understand which supplements may be beneficial and which may be harmful or interfere with treatment. This information is also conveyed to the providers involved in the patient's care. We also serve as a resource for providers on topics of integrative care, supplements and referrals

within the Legacy Cancer Institute.

Patients may also need help navigating the vast information available on the Internet regarding supplements and "cures," which patients often self-prescribe. Education is provided, giving patients an avenue of contact to get questions answered regarding these products and claims. The clinic also provides a venue to discuss the realities and data available regarding care with patients who are considering "natural" ways to treat and cure their cancer — providing the evidence in ways that patients can understand, thus allowing for a perspective of receiving the state-of-the-art cancer care that Legacy offers combined with integrative clinic care such as mind/body medicine and acupuncture that can make a big difference in the patient's experience and symptoms during treatment.

Patients often comment that they are relieved to find a place where they can discuss the complementary/alternative care they are receiving and get answers to their questions and help untangling the information available. They also are grateful to understand how Legacy Cancer Institute's excellent care can be safely paired with integrative methods.

The Cancer Survivorship Clinic at Legacy Good Samaritan is available for cancer patients through all aspects of their care, providing symptom management, lifestyle medicine and cancer risk-reduction strategies.

The clinic opened in July 2009. The clinic is fee-for-service and is covered by most insurance. Clinic referrals are provided by physicians, allied health or patient self-referral. In the past year we have had more than 250 referrals, more than 50 percent from surgical and medical oncology. Patients seen are predominantly female, with a diagnosis of breast cancer, and often in the early phases of diagnosis and treatment. Patients schedule clinic visits periodically during care and after treatment has finished. The clinic sees patients with all types of cancers as well as sharing palliative patients on an outpatient basis.

The service provides a unique opportunity for the one-on-one creation of an individualized plan

of care to reduce incidence of cancer and other chronic illnesses and manage symptoms during treatment that includes direct care of symptoms and issues within the clinic on an ongoing basis or may include referral to providers at Legacy and the larger community. Symptoms successfully managed can include menopausal issues, sleep disturbance, sedentary lifestyle, weight management, pain issues, sexual dysfunction and anxiety.

As part of the clinic visit, NCCN guidelines are given and discussed with patients when applicable.

NCCN Guidelines for survivorship care are incorporated into the visit, as are the American Institute of Cancer Research guidelines for risk reduction lifestyle. The clinic provides an essential ingredient for patients to improve health and self-efficacy.

Our patients and providers find this service to be of value in helping patients through treatment and move on with their lives more successfully. Patients will often comment on how much the clinic services have helped them to successfully traverse treatment and get back to enjoying their lives.

Cancer Liaison Physician report

By Alizah Rotramel, M.D., colorectal surgeon, Legacy Medical Group—Gastrointestinal Surgery

The Cancer Liaison Physician (CLP) serves a leadership role within the Legacy Cancer Program and is responsible for evaluating, interpreting, and reporting our program's performance



using the National Cancer Database (NCDB) data to the Legacy Cancer Committee at least four times per year. This year, I have the privilege of serving Legacy as CLP and Quality Improvement Coordinator.

Cancer Program Practice Profile Reports (CP3R) are reporting tools released annually by the American College of Surgeons Committee on Cancer (CoC). The CP3R was designed to promote practice improvement and quality of care at the local level, as well as permit hospitals to compare their care for patients with that of other institutions. The goal of the program is to unify the staff, clinicians and administrators in a collaborative effort to identify opportunities for improvement in care, implement best practice, optimize quality and diminish disparities in care across CoC-accredited programs.

The latest CP3R measures performance rates for three breast, two colon and one rectal select measures (see Table 11, page 28). Legacy Health continues to outperform other CoC programs in Oregon, the Pacific Northwest Region and the nation. For patients diagnosed in 2011, Legacy exceeded the

local and regional rates in all of the six benchmarks, ranging from 94.7–100 percent, up from 91.5–100 percent the year prior. Of particular note is improvement in the breast cancer radiation therapy benchmark. Radiation therapy administered within one year of diagnosis for women under age 70 receiving breast-conserving surgery for breast cancer increased from 91.8 percent to 98.1 percent, compared to 94 percent across Oregon and only 87.8 percent nationwide.

Starting in August 2013, three additional breast cancer measures were added to the CP3R: rate of breast-conserving surgery for AJCC stage 0, I or II breast cancers, rate of consideration/administration of radiation treatment within one year of diagnosis for women undergoing mastectomy with $\geq 4+$ lymph nodes, and rate of performance of needle biopsy prior to surgical treatment of breast cancer. Additional measures have been added to start in 2014 to evaluate non-small cell lung cancer, esophagus, gastro-esophageal junction and gastric cancers.

The NCDB also provides information for the ACS' Cancer Quality Improvement Program (CQIP). CQIP is a data-driven, process and outcomes-based cancer quality improvement initiative that confidentially reports to 1,500 individual CoC-accredited hospitals their data as entered in NCDB, including comparisons with national data from all

TABLE 11 American College of Surgeons Commission on Cancer Cancer Program Practice Profile Reports (CP3R) 2009–11* — Breast and colorectal measures

| | Select measures | CoC Standard | Legacy Health estimated performance rates | | | All CoC-approved programs estimated performance rates |
|-------------------------|--|--------------|---|-------|-------|---|
| | | | 2009 | 2010 | 2011 | 2011 |
| Breast | Breast conservation surgery rate for women with AJCC clinical stage 0, I, or II breast cancer. | NA | 56.0% | 56.5% | 54.0% | 64.0% |
| | Needle biopsy to establish diagnosis for cancer precedes surgical excision/resection. | NA | 85.6% | 86.1% | 91.3% | 82.9% |
| | Radiation therapy is considered or administered following any mastectomy within one year (365 days) of diagnosis of breast cancer for women with ≥4 positive regional lymph nodes. | NA | 90.5% | 81.8% | 82.4% | 77.2% |
| | Radiation therapy is administered within 1 year (365 days) of diagnosis for women under age 70 receiving breast conservation surgery for breast cancer. | 90% | 95.7% | 87.3% | 99.0% | 92.3% |
| | Combination chemo is considered or administered within four months (120 days) of diagnosis for women under 70 with AJCC T1cN0, or stage 1B-III hormone receptor negative breast cancer. | 90% | 100% | 100% | 95.2% | 92.7% |
| | Tamoxifen or third generation aromatase inhibitor is considered or administered within one year (365 days) of diagnosis for women with AJCC T1c or stage IB-III hormone receptor positive breast cancer. | 90% | 98.0% | 97.8% | 100% | 91.0% |
| Colon and rectum | Adjuvant chemotherapy is considered or administered within 4 months (120 days) of diagnosis for patients under the age of 80 with AJCC Stage III (lymph node positive) colon cancer. | 90% | 100% | 90.5% | 100% | 91.2% |
| | At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer. | 80% | 87.4% | 93.2% | 94.7% | 87.8% |
| | Radiation therapy is considered or administered within 6 months (180 days) of diagnosis for patients under the age of 80 with clinical or pathologic AJCC T4N0M0 or Stage III receiving resection for rectal cancer. | NA | 100% | 100% | 100% | 92.6% |

*Most recent data available from the American College of Surgeons Commission on Cancer Datalinks website

CoC-accredited programs. Measures include those captured in the CP3R, but also one of the most important measures of quality — survival. Stage by stage, Legacy patient survival is equal or better than the overall CoC rate for breast, colon, non-small cell lung and prostate cancers.

I am pleased to report that Legacy Health meets or exceeds the quality benchmarks identified by

the CoC as above. The success of our comprehensive, community-based cancer program reflects the tireless work of an integrated team of physicians, staff and administrators. With new benchmarks and quality measures on the horizon, we will continue to work with the CoC to provide the highest level of care for our patients.

Paravertebral block quality study

By Jennifer Garreau, M.D., surgical oncologist, Legacy Medical Group—Surgical Oncology

Pain control can sometimes be one of the most challenging aspects of post-surgical care. In an effort to decrease the amount of narcotics needed



by our post-mastectomy patients, we started using local anesthetic delivery systems (LADS), such as the On-Q pain pump. We objectively evaluated the impact that LADS had on narcotic usage in our post-mastectomy patients and found

that narcotic use decreased by about 40 percent in patients who underwent a mastectomy without reconstruction, but did not significantly impact narcotic use in patients who did have reconstruction.

As part of our quality improvement program, the anesthesia department began offering paravertebral blocks (PVB) to patients undergoing reconstruction as an alternative means to improve pain control in this population. We reviewed patient experience after PVB to measure its impact on narcotic use in immediately reconstructed patients.

We performed a retrospective review of prospectively collected data on patients undergoing mastectomy with or without reconstruction in the six-month period after introduction of PVB analgesia. Pre-operatively, patients received a paravertebral block with bupivacaine 0.5 percent and epinephrine 1:200,000 (7.5ml per injection) at T2-3

and T5-6. Patients who had a bilateral mastectomy with reconstruction received bilateral paravertebral nerve blocks at the same locations. Narcotic doses were converted to morphine equivalents (MSE) to allow for comparison.

During the time period evaluated, we had 102 patients who underwent a mastectomy, of which 91 were evaluable. Fifty-one had no reconstruction (NR) with average MSE use of 37.9. Forty patients had mastectomy with reconstruction, and 33 of these had a paravertebral block (PVB). Average MSE for the 33 who had a PVB was 42.6, compared to 71.1 for the group that did not have a PVB. There were no complications reported for PVB.

Placement of paravertebral blocks for patients undergoing mastectomy with reconstruction was associated with a lower average MSE use. This is important because there are many side effects associated with narcotics, such as hallucinations, itching, delirium and constipation. Furthermore, there are studies that have demonstrated that effective pain control decreases the amount of stress-related hormones released, which has been translated to improved cancer survival outcomes. Finally, when patients feel good, they are able to heal and recover in a timely manner.

This is just another example of how we are always trying to improve patient care and outcomes at Legacy.

Radiation oncology quality studies

By Kathy Panwala, M.D., radiation oncologist, Legacy Medical Group—Radiation Oncology

During the last year there were two quality studies reviewed by Legacy Radiation Oncology. Both of these studies focused on patients undergoing



breast conserving surgery (BCS) for breast cancer treatment.

The first study sought to identify factors during radiation treatment delivery that could influence rates of skin toxicity and the second study was an evaluation of local regional

control (LRC) rates after breast-conserving surgery and radiation.

The skin toxicity study investigated the incidence and severity of skin reaction in patients undergoing radiation therapy after breast-conserving surgery. This analysis sought to identify skin care regimens, treatment techniques and dosimetric parameters that are predicted for skin toxicity. This study included patients from Legacy Good Samaritan, Legacy Mount Hood and Legacy Salmon Creek to evaluate for differences across facilities. Patients' skin reactions were evaluated prospectively by nurses and physicians during their weekly treatment visits.

Some 1,213 patients were evaluated over 12 months, without significant skin toxicity differences identified across the Legacy facilities. There were differences seen in breast size between facilities, with patients at Legacy Mount Hood and Legacy Salmon Creek having larger breast volumes than Legacy Good Samaritan patients, which may reflect a greater use of reduction mammoplasty at Legacy Good Samaritan.

Utilizing common terminology criteria for adverse events (CTCAE) grading for radiation dermatitis, this study demonstrated that the Legacy patients compared favorably to available published literature for skin toxicity. The rates of skin toxicity were: G0 53 percent, G1 43 percent, G2 4 percent, with G3 40 percent. The rate of moist desquamation was 18 percent (13.5–50 percent in published literature). Factors found to be predictive of moist

desquamation on logistic regression analysis included breast volume as a continuous variable, $p < 0.001$ (the larger breast volume equated to higher risk of skin toxicity), the percentage of the breast volume that received >107 percent of the prescription dose >7 percent $p = 0.0455$, and the maximum dose to the skin rind (dose to skin surface to 5 mm depth within the treatment volume) >50 Gy, $p = 0.0108$. Given the wide variety and frequency of skin care lotion application, no skin care product was proven to be superior in preventing skin reaction. Additionally, patients undergoing nodal therapy or receiving prior chemotherapy did not experience a statistically significant increase in acute skin toxicity.

A follow-up study is planned to determine whether modification in the dosimetric parameters by limiting the skin rind maximum dose to ≤ 50 Gy and limiting dose inhomogeneity within the breast volume to ≤ 7 percent PTV receiving >107 percent of the prescription dose will lower skin toxicity.

Another option to consider in reducing skin toxicity and potentially improving breast long-term cosmesis after radiation therapy is reduction mammoplasty in appropriate patient candidates. This reduces the breast volume (the greatest predictor of skin toxicity) and tends to minimize skin folds within the treatment volume, which typically are the location of the most severe skin reactions. Also, patients may undergo an intercurrent boost in which the lumpectomy bed treatment is given prior to the completion of the whole breast radiation. This has been shown to reduce skin toxicity in studies without an adverse effect on local control as the high-risk volume (lumpectomy bed) does not receive a treatment break. In the current study, 5 percent of Legacy patients underwent an intercurrent boost for skin toxicity management during their treatment.

The next study was a review of treatment outcomes utilizing the Legacy tumor registry database from 2002–11 for patients undergoing breast-conserving surgery. Outcomes analyzed

included ipsilateral breast tumor recurrence (IBTR) rates and cause-specific survival for patients based on stage of disease and delivery of radiation. This analysis identified 3,166 patients who had undergone breast-conserving surgery in treatment of DCIS or stage I-III breast cancer. The goal of the analysis was to compare Legacy's experience with BCS at each radiation oncology facility and determine how our IBTR outcome and cause-specific survival compare to national averages and/or published medical literature.

The distribution of patients' stages was slightly earlier within the Legacy system compared to the AJCC 7th edition stage distribution:

| Stage | Legacy | AJCC 7th edition |
|-----------|--------|------------------|
| DCIS | 21.2% | 15% |
| Stage I | 53.2% | 42% |
| Stage II | 22.5% | 30% |
| Stage III | 3.1% | 12.5% |

No significant differences were seen in IBTR rate between institutions with a median follow-up time of 60.2 months. There were statistically significant differences in IBTR rates noted between patients receiving or not receiving radiation:

| Stage | 5 y IBTR with RT | 5 y IBTR no RT | p value |
|-----------|------------------|----------------|---------|
| DCIS | 0.9% | 6.5% | 0.0037 |
| Stage I | 0.9% | 8.1% | <0.001 |
| Stage II | 2.6% | 4.6% | 0.117 |
| Stage III | 3% | 16.7% | 0.159 |

These rates of IBTR for patients undergoing radiation therapy compare favorably to historical studies (5–10.4 percent for DCIS and 4.3–11.8 percent for stage I/II breast cancer), including NSABP B17, B24, B06, EORTC 10853, 10801 and NCI. These low five-year IBTR rates appear to be consistent with more modern series (0–2 percent DCIS and 1–5 percent stage I/II breast cancer) seen in RTOG 9804, MA20 and contemporary reviews from Yale, William Beaumont and Dana-Farber Cancer Institute. William Beaumont reported on its pattern of disease recurrence in patients treated with BCS over time (1981–96). Investigators found the rate of five-year IBTR fell from 8 percent to 1 percent over that time period. Investigators attributed this improvement in LRC to be

multifactorial associated with improvements in screening mammography and substantial changes in surgical, pathologic, radiation and systemic treatment techniques in accordance with best-practice guidelines.

The five-year cause-specific survival was determined by patient stage with and without adjuvant radiation therapy. This was compared to national averages from the American Cancer Society (ACS) website and compares favorably, especially for stage II and III disease:

| Stage | No RT | + RT | p value | National average |
|-----------|-------|-------|---------|------------------|
| DCIS | 100% | 100% | NA | 100% |
| Stage I | 97% | 98.5% | 0.00797 | 100% |
| Stage II | 92% | 97.6% | 0.146 | 93% |
| Stage III | 64.8% | 84.6% | 0.0381 | 72% |

Future quality studies will include a comparison of outcomes for patients undergoing mastectomy with or without radiation therapy based on stage of disease.

Legacy Research Institute Tumor Bank

By Serene Perkins, M.D., FACS, program director, Tumor Bank

In 2002, the National Dialogue on Cancer identified limited access to “appropriately collected, consented, and annotated tissue” as a critical barrier to developing new cancer therapies. The need for large quantities of high-quality tumor tissue is even more important in today’s pursuit of cutting-edge techniques in personalized medicine.



The Legacy Research Institute (LRI) Tumor Bank remains the only statewide, high-quality biorepository. It is also an ethical program seeking to develop personalized medicine in Oregon. The LRI Tumor Bank was established nearly a decade ago to address this critical need. While the LRI Tumor Bank actively collects tissue specimens of all cancer types, both adult and pediatric, breast cancer tissue comprises 39 percent of our nearly 1,000 banked tumor types, which represent the broad geographic and ethnic diversity of cancer patients in Oregon. Samples of tumor and matched normal tissue are distributed to scientists throughout the country for only the cost of shipping. To date, we have collected more than 6,700 vials of tissue.

Legacy Cancer Institute is a major cancer center in our community with multiple accolades. A tumor bank with an active research program is a key element in this effort. The LRI Tumor Bank fulfills a significant portion of the requirement for study enrollment, and in this way contributes to the ability of the Legacy Cancer Institute to maintain

Commission on Cancer accreditation. In 2013, Tumor Bank accruals accounted for 4.3 percent of all Legacy research accruals and 5.8 percent of Legacy breast-specific accruals (see Table 12, Tumor Bank accruals, below).

We also provide high-quality samples with matched clinical information, which is highly sought after by cancer researchers. We accomplish this with the highest standards by: allowing patients to make a fully informed decisions about whether to donate their tumor tissue; maintaining rigorous standards for handling, transporting, processing and storing tumor tissue; and assuring quality by evaluating RNA quality from stored samples at regular intervals.

In addition, our partnership with the Treva Hoffman Foundation to collect tumors at multiple institutions throughout Oregon is innovative and has expanded Legacy Health’s presence in Roseburg and The Dalles. Through this collaboration, we have developed community partnerships with The Lions Club International, which provides volunteers to drive tissue specimens across the state to the LRI Tumor Bank. We continue to expand Legacy Health’s presence as we partner with other hospitals throughout Oregon and we are setting the standard for ethical, high-quality tumor banking. The tissue we provide for research allows our clinicians and scientists to establish collaborative research opportunities with scientists across the country, which will increase visibility and sustainability for Legacy Health as a whole.

TABLE 12 Tumor Bank accruals

| LRI Tumor Bank | Legacy Health | Legacy Emanuel | Legacy Good Samaritan | Legacy Meridian Park | Legacy Mount Hood | Legacy Salmon Creek |
|---|---------------|----------------|-----------------------|----------------------|-------------------|---------------------|
| 2013 annual analytic caseload | 2,402 | 299 | 1,039 | 381 | 273 | 410 |
| Number accrued to Tumor Bank | 104 | 22 | 73 | 0 | 3 | 6 |
| Total percentage accrued to Tumor Bank | 4.3% | 7.4% | 7.0% | 0.0% | 1.1% | 1.5% |
| 2013 annual analytic breast cases | 617 | 2 | 365 | 89 | 61 | 100 |
| Number of breast tumors accrued to Tumor Bank | 36 | — | 36 | — | — | — |
| Total breast percentage accrued to Tumor Bank | 5.8% | 0.0% | 9.9% | 0.0% | 0.0% | 0.0% |

Cancer clinical research

By Leslie Sorenson, CCRP, manager, Legacy Cancer Clinical Research

Legacy Cancer Clinical Research welcomed the consolidation of the nine former adult cooperative groups down to four groups. The new groups — SWOG, NRG Oncology (RTOG, NSABP and GOG), ECOG-ACRIN Cancer Research Group, and The Alliance for Clinical Trials in Oncology (CALGB, NCCTG, ACOSOG) — have been working to streamline processes. That, in turn, has allowed Legacy Health the opportunity to offer a greater selection of trials to our patients and the community.

Enrollments in breast cancer trials for 2013 across our entire system were 13.3 percent, and with breast Tumor Bank accruals, 19.1 percent (see Table 13, Clinical trial accrual with and without Tumor Bank accrual, below). That was an overall increase of 5 percent from 2012, with each NAPBC-accredited facility meeting or exceeding the 2 percent minimum requirement.

Numerous breast cancer studies are offered to our patients that may involve chemotherapy, radiation therapy, hormone therapy or other treatments, such as acupuncture to alleviate symptoms associated with the use of aromatase inhibitors. With the support of Legacy Health Foundations, the research team, along with a group of dedicated physicians, developed a study for breast cancer patients who have received radiation therapy. We studied



Cancer clinical research staff members are, from left: Aaron White, CRC-II, Lisa Hansen, R.N., M.S., AOCN, Leslie Sorenson, manager, Erin Davis, CRC-II, Cindy Werhane, R.N., BSN, OCN, Samantha Hancock, R.N., BSN, and Crystal Turner, CRC-II.

whether the use of pentoxifylline (Trental) and vitamin E would decrease the incidence of capsular contractures associated with breast implant reconstruction. We hope to have final results of this study in the fall of 2014.

The research staff works closely with surgeons, medical oncologists and radiation oncologists at Legacy and in the community in an effort to give patients an opportunity to participate in a clinical trial. The nurses and coordinators ensure that patients have a good understanding of the study process and are available to address questions or concerns that might come up along the way.

As we move into 2014, several new breast cancer trials will be available at Legacy, which include surgical trials as well as studies using immunotherapies.

TABLE 13 Clinical trial accrual with and without Tumor Bank accrual

| | Legacy Health | Legacy Emanuel | Legacy Good Samaritan | Legacy Meridian Park | Legacy Mount Hood | Legacy Salmon Creek |
|--|---------------|----------------|-----------------------|----------------------|-------------------|---------------------|
| Clinical trials and LRI Tumor Bank | | | | | | |
| 2013 annual analytic caseload | 2,402 | 299 | 1,039 | 381 | 273 | 410 |
| Number of analytic cases on clinical trials | 327 | 121 | 126 | 45 | 19 | 16 |
| Number accrued to Tumor Bank | 104 | 22 | 73 | 0 | 3 | 6 |
| Total (clinical trials and Tumor Bank) | 431 | 143 | 199 | 45 | 22 | 22 |
| Total percentage accrued to clinical trials/Tumor Bank | 17.9% | 47.8% | 19.2% | 11.8% | 8.1% | 5.4% |
| Breast clinical trials and LRI Tumor Bank | | | | | | |
| 2013 annual analytic breast cases | 617 | 2 | 365 | 89 | 61 | 100 |
| Breast analytic cases on clinical trials | 82 | 1 | 71 | 4 | 3 | 3 |
| Breast analytic cases accrued to Tumor Bank | 36 | 0 | 36 | 0 | 0 | 0 |
| Total (clinical trials and Tumor Bank) | 118 | 1 | 107 | 4 | 3 | 3 |
| Breast total percentage (clinical trials and Tumor Bank) | 19.1% | 50.0% | 29.3% | 4.5% | 4.9% | 3.0% |

Community involvement 2013

BRAVE Day

BRAVE Day (Breast Reconstruction Advocacy Education) is dedicated to educating women about all of their options after breast surgery, including that the law mandates that if insurance pays for their breast surgery, then the insurance is required to pay for reconstruction. BRAVE Day was held at Legacy Meridian Park Medical Center this year, with Elisa Burgess, M.D., and Emily Hu, M.D., working with the staff at Legacy Breast Health Center—Meridian Park to make it a very successful, high-energy event. There were more than 100 attendees who enjoyed multiple vendor tables, raffles and speakers. This event was held again in 2014.

Worship in Pink

Worship in Pink is a health program promoting breast cancer awareness in our community. It provides information about risk factors and the critical role of early detection in saving lives. Congregations of all faiths, community organizations and local hair salons are engaged to share education and promote awareness for those in their networks. The primary activities of inspiration, education and hope take place during Worship in Pink Weekend in October. Legacy Health and Susan G. Komen® Oregon and SW Washington partner to present Worship in Pink in the Portland metropolitan area.

In 2013, our third year, the program reached more than 10,000 people through breast health messaging, education and activities. In addition, multiple radio spots and a TV news segment shared the message that early detection saves lives. More information is available at worshipinpinkpdx.org.

Community events

March

BRAVE Day (breast restoration rights)
Breast Cancer Issues (Susan G. Komen® Oregon and SW Washington)

May

Making Strides Walk (American Cancer Society)

June

Cancer Survivors Day (city-wide event)
St. Baldrick's Day (pediatric cancer awareness)

July

Be the Match Walk/Run (National Marrow Donor Program)

October

"Light the Night" Walk (Leukemia & Lymphoma Society)

Prevention and screening activities

February

Community screening (with Familias en Acción)

April

Colorectal screening and risk reduction talks at local churches
What's Getting Into You? (environment and cancer)

May

Skin cancer screening (with Providence and OHSU) at OHSU

August

Legacy Emanuel's Healthy Living Celebration (nutrition, risk reduction)

September and October

Meals that Heal (with Moda Health)

October

Worship in Pink (breast health and screening promotion with Susan G. Komen® Oregon and SW Washington)

Ongoing

- Foundation grant-funded mammograms for underserved women, at Legacy Meridian Park and Legacy Mount Hood
- Low-cost screening mammograms in conjunction with the Oregon Breast and Cervical Cancer Program (BCCP) at Legacy Good Samaritan, Legacy Emanuel, Legacy Meridian Park and Legacy Mount Hood medical centers. BCCP is a collaborative effort between the Centers for Disease Control and Prevention and Susan G. Komen for the Cure, Oregon and SW Washington Affiliate, in partnership with the American Cancer Society.
- Lung cancer screening pilot program

Ongoing groups and classes

Support groups

Brain Tumor Support Group
Breast Cancer Support Groups
Grief Support Groups
Gynecological Cancer Support Group
Head and Neck Cancer Support Group
Lung Cancer Support Group
Lymphedema Support Group
Prostate Cancer Support Group

Educational classes

Expressions of Healing
Felting Workshop
Gardening Workshop for Individuals with Cancer
Living with Uncertainty and Change
Meditation for Cancer Patients

Movement classes

Exercise and Nutrition
Latin Dance for Couples
Nia Mind/Body Exercise
Pilates for Individuals with Cancer
Yoga for Individuals with Cancer

Oregon Partnership for Cancer Control (OPCC)

The Oregon Partnership for Cancer Control is a statewide collaboration of individuals and organizations with a commitment to reducing the burden of cancer in our state. Legacy Cancer Institute continues to be involved, represented by Selma Annala, Reza Antoszewska, Terry Wagie and Charlyn Wilson, in Survivorship and Colorectal Health Task Forces.

Professional education activities 2013

Ninth Annual Pacific Northwest Excellence in Breast and Gynecologic Care

The Legacy-sponsored Excellence in Breast and Gynecologic Care conference is an annual event for medical and allied health care professionals that addresses prevention, diagnosis, treatment and survivorship for patients with a family or personal history of female malignancy. Local and national speakers address topics based on current research to ensure that medical and allied health care professionals are providing evidenced-based care to patients in the Pacific Northwest. In 2013 more than 180 professionals attended, with over 88 percent of attendees reporting that they would use their new knowledge/skills to improve their clinical or professional competency, and over 75 percent stating that knowledge obtained from this conference would improve their patients' outcomes.

Conferences and courses

March

Annual Seminar for Radiation Oncology Professionals
Breast Cancer Issues (Susan G. Komen Oregon and SW Washington)

April

Cancer Survivorship statewide webinar (with OPCC)
Chemotherapy and Biotherapy Course for Pediatrics (APHON)
Stem Cell Transplantation — Achieving Best Outcomes for Our Patients (with NWMTP)

June

Keith Hansen Visiting Professorship: Presentations on Molecular Genetics

October

Head and Neck Cancer Fall Conference/Dinner (with OHSU and Providence)

November

Dinner presentation: Gamma Knife for Intracranial Tumors, Functional Disorders and Vascular Malformations
Ninth Annual Pacific Northwest Excellence in Breast and Gynecologic Care

Quarterly

Oncology Nursing Society Chemotherapy and Biotherapy Course

Grand Rounds (CME) topics

Legacy Good Samaritan oncology

Bladder Cancer
Breast-Specific Gamma Imaging, 3-D Mammography and MRI: What to Order When
Cancer Survivorship: Links and Bridges
Management of Periampullary Tumors
Melanoma Prevention and Treatment
Microvascular Free Flap Reconstruction for Oral/Head/Neck Cancer
Molecular Markers Significance in Brain Cancers
Molecular Profiling in Lung Cancer
Ovarian Cancer Pathogenesis and Prevention
Point-of-Care and Do-it-Yourself CME Services
Serious Late Effects after Hodgkin Lymphoma Treatment

Legacy Good Samaritan integrative oncology

Case Reports and Evidence-based Medicine
Integrating Natural Supplements with Anticancer Therapy
Strategies to Promote Resilience in Health Professionals

Legacy Emanuel OB/GYN education

Breast Cancer Screening: Translating Controversy to Practice
GYN Pathology: Seriously Serous and Unexpected. Is the Fallopian Tube the Source of Ovarian Cancer? More Serous than You Think
New Pathology Terminology for Squamous Lesions
Ovarian Carcinogenesis — Early Detection and Prevention

Legacy Meridian Park primary care

Lung Cancer 2013: Screening to Treating
New Adjuncts in Brain Cancer Treatment
Update on the Chronic Leukemia

Legacy Mount Hood primary care

Melanoma Treatment and Prevention

Legacy Salmon Creek medical

Breast Cancer Treatment — Neoadjuvant Therapy to Nipple Sparing
Is the Fallopian Tube the Source of Ovarian Cancer?
Melanoma Treatment and Prevention

Legacy Salmon Creek OB/GYN

Fallopian Tube Removal as Prevention for Ovarian Cancer

On Demand

Cancer Survivorship: Links and Bridges
Case Reports and Evidence-based Medicine
Integrating Natural Therapies with Chemotherapy
Ovarian Cancer: Pathogenesis and Prevention
Solid Tumor Genotyping with Next-Gen Sequencing Technology
Strategies to Promote Resilience in Health Professionals
Testicular Cancer

Cancer patient care conferences (tumor boards)

Brain/CNS Tumors (Legacy Emanuel)
Breast Cancer Radiology/Pathology Correlation (Legacy Good Samaritan)
Breast Care (Legacy Good Samaritan, Legacy Meridian Park)
Gastrointestinal Tumors (Legacy Good Samaritan, Legacy Meridian Park)
General Cancer Conference (Legacy Salmon Creek, Legacy Meridian Park, Legacy Mount Hood)
Gynecological Cancers (Legacy Good Samaritan)
Head and Neck Tumors (Legacy Emanuel)
Metastatic Breast Care (Legacy Good Samaritan)
Mid-Columbia Medical Center Tumor Board (joint sponsorship)
Pediatric Oncology (Randall Children's Hospital)
Thoracic Tumors (Legacy Good Samaritan, Legacy Meridian Park)
Urologic/Prostate Tumors (Legacy Good Samaritan)

Publications 2013

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Honors and accreditations 2013



Legacy Health ranks among the nation's best cancer programs, according to the American College of Surgeons' (ACS) Commission on Cancer, a respected authority on cancer care. For the second year in a row, the Commission also awarded Legacy's cancer program its Outstanding Achievement Award, the only Integrated Network Cancer Program in Oregon to be so honored.

Legacy Cancer Institute was the first in the United States to receive Network Cancer Program accreditation from the ACS, and we are still Oregon's only accredited network cancer program. This means you'll receive the same award-winning care at any of our campuses, so you can stay closer to home.



The breast health centers at Legacy Good Samaritan, Legacy Meridian Park, Legacy Mount Hood and Legacy Salmon Creek have earned the prestigious accreditation for excellence in the care of patients with breast cancer and benign breast disease from The American College of Surgeons' National Accreditation Program for Breast Centers (NAPBC).



In addition, the Legacy Breast Health Centers at Legacy Good Samaritan, Meridian Park, Mount Hood and Salmon Creek medical centers are designated Breast Imaging Centers of Excellence by the American College of Radiology. To achieve this distinction, a facility's imaging services must be fully ACR-accredited in mammography, stereotactic breast biopsy, breast ultrasound and ultrasound-guided breast biopsy.



Legacy Cancer Institute is one of only three nationally accredited blood and bone marrow transplant providers in Oregon. Learn more about FACT, the Foundation for the Accreditation of Cellular Therapy, which evaluates programs nationwide.

Legacy Cancer Institute is also designated a BlueCross BlueShield Distinction Center for Complex and Rare Cancers, for excellence in treating eight types of cancer.

Legacy Cancer Institute Integrated Network Cancer Committee Members 2013

Mindy Ansteth, B.S., CTR, manager, Legacy Cancer Data Management

Deanna Bower, D.O., hospice and palliative medicine, Legacy Health

Amy Carl, CPHQ, quality improvement consultant, Legacy Cancer Institute and Legacy Hospice

Andrew Cox, M.D., diagnostic radiologist

Paul Dorsey, M.S., genetics counselor, Legacy Cancer Institute

Brent Evetts, M.D., FACS, colorectal surgeon, Network Cancer Committee Chair

Leah Grotzinger, Pharm.D., pharmacist, Legacy Emanuel Medical Center and Legacy Good Samaritan Medical Center

Nathalie Johnson, M.D., FACS, breast surgeon, medical director, Legacy Cancer Institute and Breast Health Centers

Pamela Kilmurray, director, Legacy Cancer Institute, Legacy Rehabilitation Services, Legacy Breast Health Centers and Legacy Hospice

Anthony Melaragno, M.D., Chief Administrative Officer, Legacy Good Samaritan Medical Center

Marci Reed, R.D., dietitian, Legacy Cancer Institute

Alizah Rotramel, M.D., colorectal surgeon, Cancer Liaison Physician

Mark Schray, M.D., radiation oncologist, medical director, Legacy Radiation Oncology

Ann Smith-Sehdev, M.D., pathologist, medical director, pathology, Legacy Health

Leslie Sorenson, Legacy Cancer Clinical Research

Wendy Talbot, LCSW, OSW-C, social worker, Legacy Cancer Healing Center

Jacqueline Vuky, M.D., medical oncologist

Terry Wagie, M.S, R.N., clinical nurse specialist, Legacy Cancer Institute

Carol Webster, R.N., OCN, Legacy Cancer Institute Day Treatment/Infusion Unit

Gail Weisgerber, manager, Rehabilitation Services, Legacy Good Samaritan Medical Center

Charlyn Wilson, R.N., program coordinator, Legacy Cancer Institute

Subcommittees of the Integrated Network Cancer Committee

Breast Health Center Meeting (Legacy Meridian Park Medical Center)

Breast Health Steering Committee (Legacy Health)

Breast Program Leadership Group (Legacy Good Samaritan Medical Center)

Breast Program Steering Committee (Legacy Mount Hood Medical Center)

Breast Program Steering Committee (Legacy Salmon Creek Medical Center)

Cancer Data Management Quality Committee

Cancer Healing Center Integrative Cancer Quality Committee

Center for Colorectal Cancer at Legacy Good Samaritan Medical Center

Center for Colorectal Cancer System-wide Quality and Operations Meeting

Hospice Quality (QAPI)

Integrative Care Quality Committee

Legacy Cancer Institute Quality Advisory Council

Lung Cancer Screening Meeting

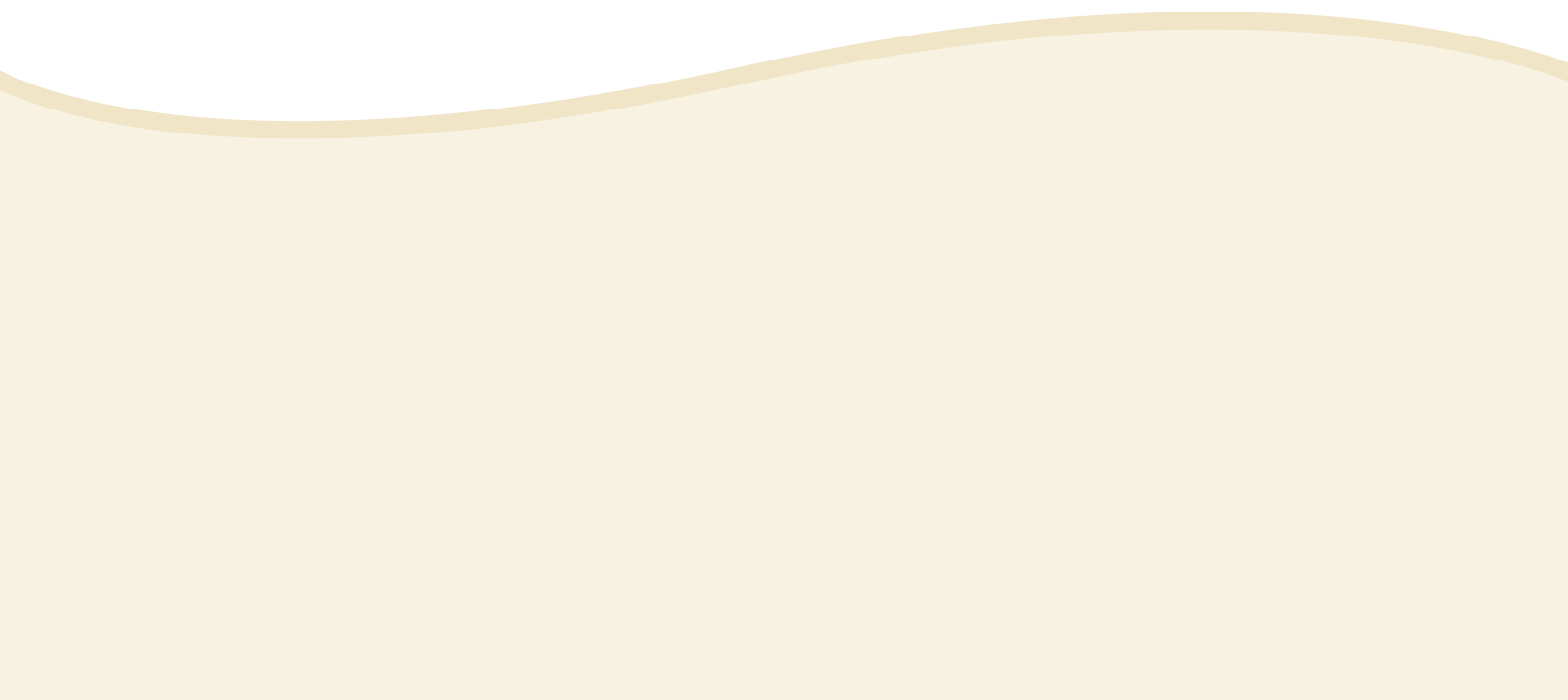
Oncology Clinical Research Meeting

Prostate Program Development

Public/Professional Education Council

Radiation Oncology Quality Committee

Thoracic Program Development



Legacy Cancer Institute

503-413-8050

www.legacyhealth.org/cancer



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