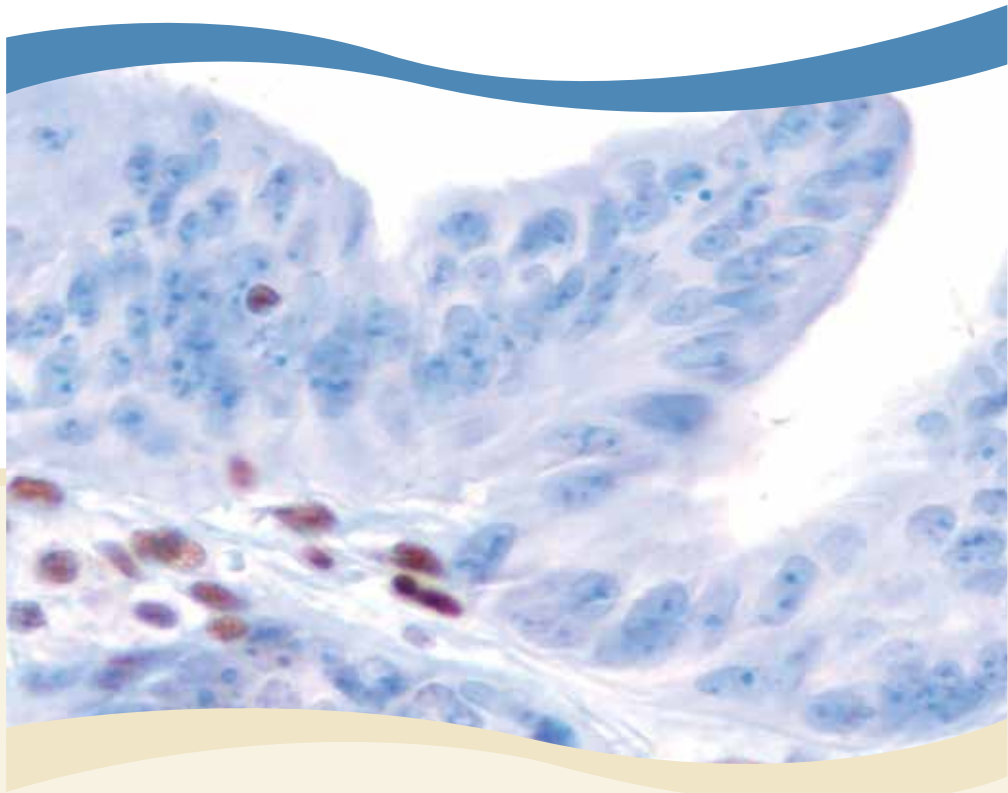


Legacy Cancer Institute Annual Report 2015 Colorectal cancer



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.

Bottoms up! Legacy Cancer Institute's Colorectal Cancer Center

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

You guessed right! This year's annual report is focused on our gastrointestinal program and its work in colorectal cancer.



During a recent visit to China we experienced the custom of toasting. When honoring visitors or others to be celebrated, rounds are poured to toast. With each round there was the cry of "Bottoms up!" meaning to empty the glass in toast.

Well, this year we would like to toast our colorectal and GI teams for the amazing work that they do and their programmatic advances that have been nationally recognized.

We have focused on improving rates of screening and on prevention of cancer in the GI tract. Prevention comes in several forms. We are all familiar with colonoscopy and FIT testing. The program has worked on initiatives with the American Cancer Society and the state to raise awareness and to look at addressing barriers to screening for colorectal cancer. We know that addressing polyps early leads to prevention of colorectal cancer.

On the other side, every colorectal cancer is tested for DNA mismatch repair (MMR). This is often the first clue that there may be an inherited risk for colon cancer (and other types of cancer) in a family. We are working with our genetics program to achieve a goal of > 90 percent of patients with this abnormality being informed, assessed and, if appropriate, tested. If we find a mutation then other family members will be aware, and screening and cancer prevention can help save lives and morbidity of treatment.

Genetics can also be the key to prevention in other GI cancers such as gastric and pancreatic cancer. We have enhanced our ability to give access to this important evaluation for patients at all our hospital sites and Legacy Medical Group practices. There are many poignant stories of early interventions made with awesome results.

Our program also spearheaded ERAS (Enhanced Recovery after Surgery) and Strong for Surgery within Legacy. Both programs have improved the hospital experience and improved postoperative outcomes. ERAS is a combined effort of anesthesia and nursing with surgeons that has led to more rapid recovery of bowel function after surgery and much shorter hospital stays. It has also resulted in fewer infections and less need for postoperative re-admission. Strong for Surgery focuses on pre-operative nutrition, smoking cessation and physical activity that also result in better outcomes.

I could go on and on but will just briefly close with a few other honorable mentions. We currently have open a study looking at the role of vitamin D in outcomes of colorectal cancer patients. This is an in-house study that augments the national trials available. Patients also receive benefit from our integrative oncology program; a recent survey showed that patients taking advantage of these services were more often able to maintain work status at full-time or return to work more quickly and at full capacity. We certainly salute our team.

So as you review this year's annual report, I think you will be happy to join me in a toast, "Bottoms up!"

Most of these are active links. Click to open the relevant page on the Legacy Health website.

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 Inpatient Unit
 Cancer data management/cancer registry
 Cancer Rehabilitation Services
 Cancer screening and prevention
 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—Gynecologic Oncology
 Legacy Medical Group—Pulmonary
 Legacy Medical Group—Radiation Oncology
 Legacy Medical Group—Reconstructive Surgery
 Legacy Medical Group—Surgical Oncology
 Legacy Pain Management Centers
 Legacy Palliative Care Services
 OHSU Knight-Legacy Health Cancer Collaborative
 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
 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
 American Cancer Society patient navigator
 Cancer support groups and classes
 Cancer survivorship
 Expressive arts therapy
 Green Gables Guest House
 Integrative care and symptom management
 Lymphedema management
 Massage therapy
 Nutrition
 Oncology nurse navigators
 Pharmacy navigator
 Social work
 Stress management
 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 and KITE Clinic
 Volunteer program

Legacy Cancer Institute overview: Highlights from 2015

By Kathryn Panwala, M.D., radiation oncologist, chair, Integrated Network Cancer Committee, Legacy Cancer Institute

Legacy Cancer Institute, recipient of two Outstanding Achievement Awards from the Commission on Cancer, maintained its focus on clinical and



programmatic goals to improve patient care in 2015. Many of these goals for the Integrated Network Cancer Program included improvements in patient flow and access to specialty services and care.

Legacy Cancer Institute also demonstrated its commitment to quality standards by obtaining accreditation in radiation oncology and lung cancer screening through the American College of Radiology (ACR) and CAP accreditation for its Tumor Bank program.

One of Legacy's clinical care goals was to develop a pre-habilitation program at Legacy Salmon Creek, Legacy Meridian Park and Legacy Good Samaritan medical centers in 2015. New research has shown that assisting cancer patients to improve their physical condition prior to treatment improves outcomes.

Pre-habilitation is medical care that is given to newly diagnosed cancer patients to help them prepare for upcoming treatments. It involves interventions designed to reduce cancer treatment complications and improve physical and psychological health of patients. It is individualized care, which includes evaluation of a patient's baseline status, allowing for treatment for pre-existing impairments as well as providing education and exercise recommendations (and precautions), improving tolerance of cancer treatment and avoiding complications of therapy.

Legacy Cancer Institute is utilizing the Survivorship Training and Rehab (STAR) model to develop our prehab program, with the current focus being lymphedema prevention.

Legacy Mount Hood Medical Center improved its patient flow for breast wire localization procedure in 2015. Patients initially underwent wire localization procedure in the Breast Health Center and then were transported to the OR in the main hospital.

A new mammography unit was added at Legacy Mount Hood in February of 2015, allowing patients

to be admitted to the Short Stay Unit for ultrasound-guided wire localization, where the Breast Health Center nurse, sonographer, radiologist and mammographer would meet patients for the procedure, enabling all care to be performed in the same building, improving patient care and comfort.

The Breast Health Center–Mount Hood expanded its facility footprint, including a second ultrasound room and increased size of the stereotactic biopsy room and other workspace improvements. It offered free mammographic screening in 2015 to underserved women in conjunction with the Powell Butte and Good News clinics.

Legacy Mount Hood continues to grow its breast program with the addition of Cynthia Aks, D.O., FACS, to the staff. She is a breast-focused dedicated surgeon with a wide range of skills and experience with holistic care. She joined Legacy Medical Group–Surgical Oncology and practices both at Legacy Mount Hood and Legacy Good Samaritan medical centers.

Another Legacy Cancer Institute goal was to develop a hepatobiliary and pancreas cancer program at Legacy Good Samaritan Medical Center. Chet Hammill, M.D., an oncologic surgeon from The Oregon Clinic, was named the medical director of Legacy's Hepatobiliary and Pancreas Program. His areas of clinical interest include minimally invasive surgery (including laparoscopic and robotic procedures); gall bladder and bile duct surgery; liver resections and ablations; adrenal surgery; spleen surgery; pancreatic resections (including Whipple procedures); and treatment of liver, pancreatic and bile duct cancers.

Additionally, Legacy Cancer Institute revisited its process for identifying potential tumor bank specimens in the OR to increase opportunities for banking and now is also able to utilize paraffin-embedded tissues.

The Legacy Tumor Bank received CAP accreditation and celebrated its 10th anniversary as a tumor bank biorepository.

Under the leadership of Jordan Fein, M.D., Legacy Good Samaritan Medical Center was recognized as an American College of Radiology (ACR) Lung

Cancer Screening Center of Excellence in April 2015. The screening program at Legacy Good Samaritan endorses the USPTF recommendation to screen those between the ages of 55 and 80 with an equivalent smoking history of 30 pack-years and are either current smokers or have quit within 15 years.

In 2015, 318 patients were screened with six cancers diagnosed. A 2011 NCI National Lung

Cancer Screening Trial showed that lung cancer screening reduces mortality by 20 percent among current and former heavy smokers.

Additionally, radiation oncology care at Legacy Good Samaritan, Legacy Mount Hood and Legacy Salmon Creek medical centers underwent ACR survey in June 2015 and received three-year accreditation in July 2015.

Legacy Health 2015 site analysis: Colorectal cancer

By Joseph Frankhouse, M.D., FACS, surgeon, medical director, Legacy Good Samaritan Colorectal Cancer Center

Legacy Health diagnosed and/or treated 2,591 cancer cases in 2015 (see Figure 2, page 5). As highlighted in Figure 1 (below), colorectal cancer



is Legacy Health's fourth most-common cancer diagnosed or treated (behind breast, prostate and lung), but nationally is the second leading cause of cancer-related deaths.

Legacy treated 203 colorectal cancer patients in 2015, much in line with prior years. However, Legacy treats a lower percentage of patients who present with metastatic or advanced and incurable disease compared to all other Commission on Cancer (CoC)-accredited programs across the country. This may speak to our efforts to improve education and access regarding colorectal screening. (See Figure 3, Colon,

page 6, and Figure 4, Rectum and rectosigmoid junction, page 7.)

In 2015, the primary histology of colorectal cases diagnosed and/or treated at Legacy was adenocarcinoma (64.5 percent). This is very consistent with all other Commission on Cancer-accredited programs (67.7 percent). Figure 5 (page 7) provides the histology distribution on colorectal cancer cases diagnosed and/or treated at Legacy Health in 2015 compared to all other Commission on Cancer-accredited programs.

At Legacy Health, we diagnose and treat about 12 percent of colorectal cancers in patients under the age of 50 (see Figure 6, page 7). This represents a population that is not typically offered screening due to the low prevalence of the disease in that age group. Nationwide we are in line with current statistics. Nationally there is discussion of how best to

FIGURE 1 Top six cancer sites 2015

Primary site	Legacy Emanuel	Legacy Good Samaritan	Legacy Meridian Park	Legacy Mount Hood	Legacy Salmon Creek	Legacy Health	American Cancer Society*
Breast	3	340	102	53	85	583	234,190
Prostate	60	137	32	24	38	291	220,800
Lung/bronchus	19	114	46	36	42	257	221,200
Colon/rectum	12	68	41	33	49	203	132,700
Bladder/urethra	15	48	21	25	50	159	74,000
Corpus uteri	4	101	4	4	13	126	54,870
Total top six sites	113	808	246	175	277	1619	937,760
Percentage of total analytic cases	4%	31%	10%	7%	11%	62%	57%

*American Cancer Society 2015 estimated new U.S. cancer cases

FIGURE 2 Legacy Health primary sites 2015, 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	0	0%	3	0.3%	3	0.7%	3	1.1%	0	0%	9	0.3%
Bladder/urethra/other urinary organs	15	4.8%	48	4.2%	21	5.0%	25	8.7%	50	11.2%	159	6.1%
Bone/joints/articular cartilage	1	0.3%	0	0%	0	0%	0	0%	0	0%	1	0%
Brain/other nervous system	38	12.1%	25	2.2%	11	2.6%	8	2.8%	22	4.9%	104	4.0%
Breast	3	1.0%	340	30.1%	102	24.5%	53	18.8%	85	19.0%	583	22.5%
Cervix	1	0.3%	26	2.3%	3	0.7%	2	0.7%	3	0.7%	35	1.4%
Colon	7	2.2%	44	3.9%	27	6.5%	27	9.6%	35	7.8%	140	5.4%
Corpus uteri	4	1.3%	101	8.9%	4	1.0%	4	1.4%	13	2.9%	126	4.9%
Esophagus	2	0.6%	2	0.2%	5	1.2%	5	1.8%	8	1.8%	22	0.8%
Eye/orbit	0	0%	1	0.1%	0	0%	0	0%	0	0%	1	0%
Gallbladder	2	0.6%	1	0.1%	0	0%	2	0.7%	1	0.2%	6	0.2%
Hodgkin's Lymphoma	3	1.0%	2	0.2%	4	1.0%	3	1.1%	2	0.4%	14	0.5%
Kidney/renal pelvis/ureter	17	5.4%	50	4.4%	16	3.8%	11	3.9%	20	4.5%	114	4.4%
Larynx	8	2.5%	1	0.1%	0	0%	4	1.4%	2	0.4%	15	0.6%
Leukemia	18	5.7%	4	0.4%	4	1.0%	7	2.5%	7	1.6%	40	1.5%
Liver/intrahepatic bile duct	13	4.1%	6	0.5%	9	2.2%	3	1.1%	3	0.7%	34	1.3%
Lung/bronchus	19	6.0%	114	10.1%	46	11.1%	36	12.8%	42	9.4%	257	9.9%
Melanoma (in situ and malignant)	4	1.3%	57	5.0%	17	4.1%	1	0.4%	5	1.1%	84	3.2%
Mesothelioma	0	0%	1	0.1%	0	0%	0	0%	0	0%	1	0%
Myeloma	0	0%	5	0.4%	1	0.2%	0	0%	1	0.2%	7	0.3%
Non-Hodgkin's Lymphoma	9	3.0%	17	1.5%	19	4.6%	11	3.9%	15	3.3%	71	2.7%
Nose/nasal cavity/middle ear	0	0.0%	0	0%	0	0%	0	0%	1	0.2%	1	0%
Oral cavity/pharynx	23	7.3%	7	0.6%	14	3.4%	6	2.1%	12	2.7%	62	2.4%
Other biliary	1	0.3%	1	0.1%	3	0.7%	1	0.4%	2	0.4%	8	0.3%
Other digestive organs	1	0.3%	0	0%	0	0%	0	0%	2	0.4%	3	0.1%
Other female genital organs	0	0%	7	0.6%	1	0.2%	1	0.4%	1	0.2%	10	0.4%
Other non-epithelia skin	1	0.3%	0	0%	2	0.5%	0	0%	0	0%	3	0.1%
Ovary	1	0.3%	21	1.9%	2	0.5%	1	0.4%	2	0.4%	27	1.0%
Pancreas	8	2.5%	24	2.1%	25	6.0%	12	4.3%	21	4.7%	90	3.5%
Penis	0	0%	4	0.4%	2	0.5%	1	0.4%	1	0.2%	8	0.3%
Prostate gland	60	19.0%	137	12%	32	7.7%	24	8.5%	38	8.5%	291	11.2%
Rectum/rectosigmoid junction	5	1.6%	24	2.1%	14	3.4%	6	2.1%	14	3.1%	63	2.4%
Retroperitoneum/peritoneum	1	0.3%	3	0.3%	1	0.2%	0	0%	0	0%	5	0.2%
Small intestine	1	0.3%	2	0.2%	2	0.5%	6	2.1%	1	0.2%	12	0.5%
Soft tissue	6	1.9%	3	0.3%	2	0.5%	2	0.7%	3	0.7%	16	0.6%
Stomach	0	0%	6	0.5%	7	1.7%	6	2.1%	6	1.3%	25	1.0%
Testis/spermatic cord	8	2.5%	8	0.7%	1	0.2%	4	1.4%	1	0.2%	22	0.8%
Thyroid/other endocrine glands	27	8.7%	13	1.2%	10	2.4%	3	1.1%	20	4.5%	73	2.8%
Trachea/mediastinum	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Vulva/vagina	0	0%	9	0.8%	1	0.2%	0	0%	2	0.4%	12	0.5%
Other/ill-defined sites	8	2.5%	13	1.2%	5	1.2%	4	1.3%	7	1.6%	37	1.9%
Grand total	315	100%	1,130	100%	416	100%	282	100%	448	100%	2,591	100%

manage this population, but as of yet there is no interest in lowering the screening age of 50, due to the low numbers affected and the fact that nationally we are still trying to improve upon the rates of screening for those 50 years of age and above.

The gender of colorectal cancer patients diagnosed and/or treated at Legacy Health in 2015 was 52.2 percent male compared to 47.8 percent female. As illustrated in Figure 7 (page 8), this is almost identical to all other Commission on Cancer-accredited programs across the country.

We continue to do well attracting and keeping colorectal cancer patients in our system. Overall we “keep” more than 50 percent of the patients diagnosed in our system for their full course of therapy. Almost 38 percent of patients are diagnosed outside of our system and come to us for surgical and subsequent adjuvant therapy if needed. Less than 10 percent of our patients are diagnosed here and then choose to go elsewhere for surgery or other therapy. (See Figure 8, page 8.)

In 2014, Chet Hammill, M.D., FACS, joined Legacy as medical director of our hepatobiliary and pancreatic cancer program. He has been a key addition for us, considering that 20–30 percent of colorectal cancer patients either present with liver metastases or develop them subsequently. Being able to provide expert opinion and treatment options for such unfortunate patients is essential to our success. Many are still curable with appropriate management.

Rectal cancer should be considered differently than colon cancer. Cancers in this portion of the digestive system are much more complex to treat and more difficult to cure stage for stage. Generally both radiation and chemotherapy are needed in addition to surgery. Overall we are seeing fewer

advanced stage rectal cancers here at Legacy compared to national averages.

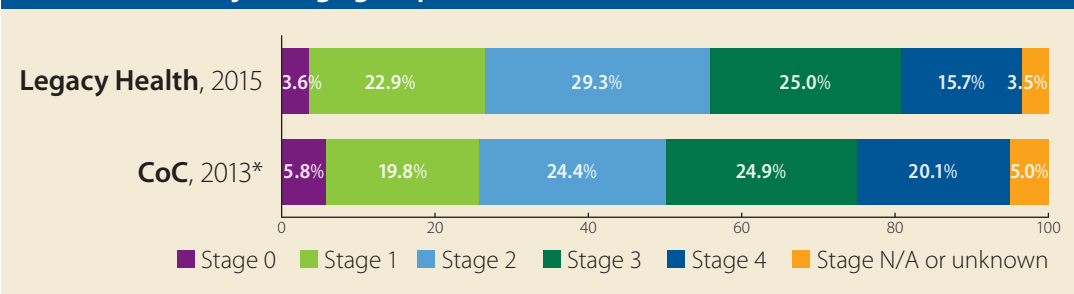
In cooperation with our colleagues at Oregon Health & Science University oncology, we use additional chemotherapy “up front” in managing rectal cancer patients, striving to improve the downstaging and surgical resection margins. Only time will tell if this translates into improved survival and recurrence rates for rectal cancer, but we intend to help lead in this direction.

First course treatment provided to colon and rectal cancer patients by stage in 2015 is detailed in Figure 9 (page 8) and Figure 10 (page 8).

With our use of data such as with the Surgical Care & Outcomes Assessment Program (SCOAP) and our own internal infection team, we are clearly demonstrating exemplary performance with much lower rates of complications and infections for both our colon and rectal cancer patients.

We have a robust multidisciplinary GI oncology patient care conference held twice per month at Legacy Good Samaritan Medical Center, and also a monthly GI-focused conference at Legacy Meridian Park Medical Center. Attendance includes representatives from medical oncology; radiation oncology; colorectal, liver and general surgery; pathology and radiology. We have regular input from our oncology nurse navigators, genetics counselor, research and other support staff. This enables us to discuss and agree upon appropriate management for our patients using principles outlined by the National Comprehensive Cancer Network (NCCN) guidelines. Having so many disciplines present ensures optimal care for our colorectal cancer patients and clearly facilitates communication between care providers.

FIGURE 3 AJCC major stage groups, 2015 — Colon



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

FIGURE 4 AJCC major stage groups, 2015 — Rectum and rectosigmoid junction

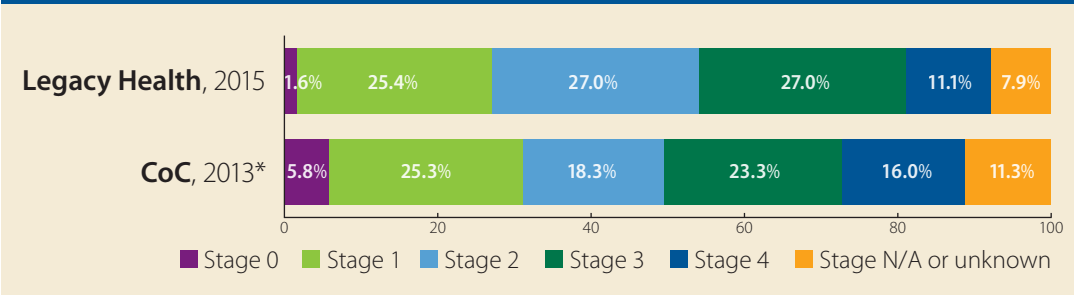
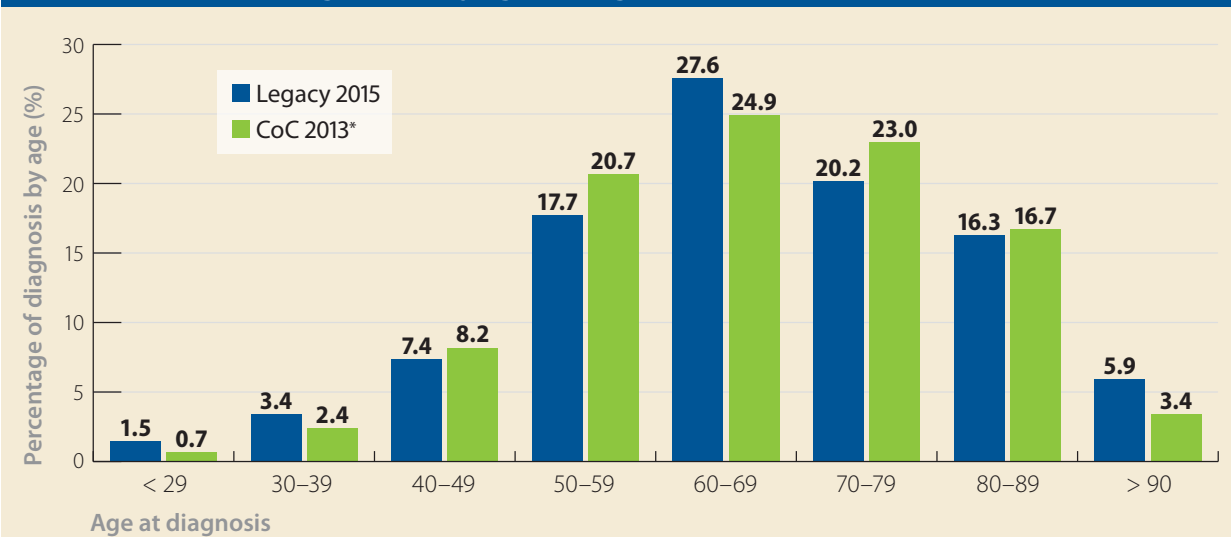


FIGURE 5 Histology distribution of colorectal cancer cases, Legacy Health vs. Commission on Cancer

Histology	Legacy Health, 2015		Commission on Cancer, 2013*	
	Total	Percentage	Total	Percentage
Adenocarcinoma, nos	131	64.5%	67,165	67.7%
Adenocarcinoma in tubulovillous adenoma	7	3.4%	8,748	8.8%
Mucinous adenocarcinoma	10	4.9%	6,793	6.9%
Adenocarcinoma in adenomatous polyp	11	5.4%	7,511	7.6%
Adenocarcinoma in villous adenoma	1	0.5%	1,925	1.9%
Signet ring cell carcinoma	6	3.0%	1,150	1.2%
Carcinoma, nos	2	1.0%	1,352	1.4%
Neuroendocrine carcinoma	2	1.0%	1,217	1.2%
Carcinoid tumor, nos	14	6.9%	1,835	1.9%
Squamous cell carcinoma, nos	2	1.0%	482	0.5%
Other specified types	17	8.4%	962	1.0%
Total	203	100%	99,140	100%

FIGURE 6 Colorectal malignancies by age at diagnosis



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

FIGURE 7 Colorectal malignancies by gender

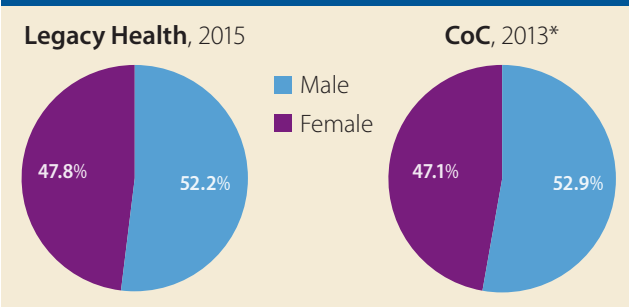


FIGURE 8 Legacy colorectal treatment migration 2015

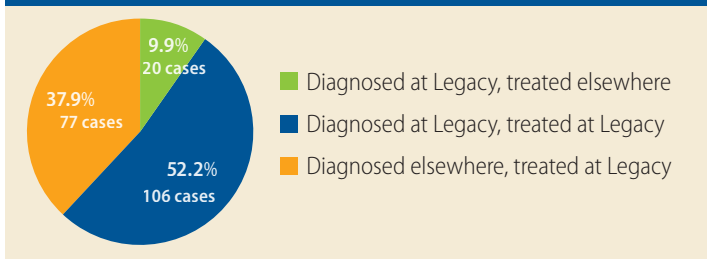


FIGURE 9 Legacy colon malignancies 2015 — First course of treatment by stage vs. all Commission on Cancer-accredited programs 2013*

First course treatment	Stage 0		Stage 1		Stage 2		Stage 3		Stage 4		NA/Unknown		Total		Percentage of total	
	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC
Surgery only	5	3,750	31	13,170	35	14,057	15	5,954	4	2,193	2	1,246	92	40,370	65.7%	57.5%
Surgery and chemotherapy	0	16	0	189	4	2,517	17	10,838	6	3,866	0	232	27	17,658	19.4%	25.2%
Surgery, chemotherapy and radiation	0	7	0	39	1	198	2	278	0	145	0	13	3	680	2.1%	1.0%
Chemotherapy only	0	6	1	35	0	51	0	51	4	2,662	0	175	5	2,980	3.6%	4.3%
Chemotherapy and radiation	0	2	0	7	0	15	0	15	1	153	0	19	1	211	0.7%	0.3%
Radiation only	0	0	0	5	0	10	0	5	1	112	0	10	1	142	0.7%	0.2%
Other specified therapy	0	36	0	127	1	352	0	455	0	1,532	0	192	1	2,694	0.7%	3.8%
No first course treatment	0	277	0	549	0	169	1	125	6	2,704	3	1,610	10	5,434	7.1%	7.7%
Total	5	4,094	32	14,121	41	17,369	35	17,721	22	13,367	5	3,497	140	70,169	100%	100%

FIGURE 10 Legacy rectum and rectosigmoid malignancies 2015 — First course of treatment by stage vs. all Commission on Cancer-accredited programs 2013*

First course treatment	Stage 0		Stage 1		Stage 2		Stage 3		Stage 4		NA/Unknown		Total		Percentage of total	
	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC	LH	CoC
Surgery only	1	1,418	10	5,080	7	1,415	2	951	0	267	2	768	22	9,899	34.9%	32.3%
Surgery and chemotherapy	0	11	1	111	0	395	0	1,404	1	622	0	41	2	2,584	3.2%	8.5%
Surgery and radiation	0	9	0	110	0	143	2	116	0	25	0	20	2	423	3.2%	1.4%
Surgery, chemotherapy and radiation	0	265	2	2,027	7	2,797	8	3,674	1	509	0	192	18	9,464	28.6%	31.0%
Chemotherapy only	0	5	0	35	0	69	0	77	1	1,141	0	102	1	1,429	1.5%	4.7%
Chemotherapy and radiation	0	15	1	229	2	672	3	818	1	675	1	233	8	2,642	12.7%	8.7%
Radiation only	0	5	0	41	0	98	0	89	0	129	0	87	0	449	0.0%	1.5%
Other specified therapy	0	19	2	68	1	62	2	118	1	797	2	122	8	1,186	12.7%	3.9%
No first course treatment	0	111	0	365	0	199	0	167	2	841	0	754	2	2,437	3.2%	8.0%
Total	1	1,858	16	8,066	17	5,850	17	7,414	7	5,006	5	2,319	63	30,513	100%	100%

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

Colorectal cancer screening

By Harald Schoeppner, M.D., Ph.D., FACG, Legacy Medical Group—Gastroenterology, and Jill Hansen, M.D., Legacy Medical Group—Northwest

Colorectal cancer (CRC) remains the second leading cause of cancer-related death in the U.S., with 133,000 expected cases diagnosed in 2015. It can be viewed as a very preventable disease, since it devel-



ops through precursor lesions (polyps) over a long period. Over the past 15 years we have witnessed a decline in the number of annual cases of CRC as well as the risk of dying from it, which can be attributed to mass screening and improved

ways to treat individuals diagnosed with it. CRC occurs over the age of 50 in 90 percent of the cases,



affecting both men and women and all ethnic groups. Screening for CRC is highly successful in preventing this disease and in detecting it at early stages.

Colonoscopy, directly visualizing the entire large intestine via a fiberoptic

instrument, has become our main tool to detect as well as to prevent colon and rectal cancers. By removing colonic polyps at the time of the examination, we can diminish the chance of dying from CRC up to 90 percent. Colonoscopy certainly should be applied to all patients at high risk for developing CRC, e.g., in individuals with a family history of CRC or colon polyps, a personal history of CRC, inflammatory bowel disease or evidence of blood in the stool. However, colonoscopy is invasive, requires a bowel preparation and may not be applicable to all our patients.

A colonoscopy should only be performed by a highly skilled physician who has gone through a rigorous training program, and the procedure should be done in a center that is committed to the highest standard of care and quality control. The adenoma detection rate (number of polyps discovered per screened population) should be measured and reported, as it is closely linked to

the overall quality of the program. Colonoscopies should be safe, comfortable and accessible. Ambulatory centers, like the one at Legacy Mount Hood Medical Center, have open-access policies (no prior clinic appointments are needed) and convenient schedules, including Saturday appointments.

Other CRC screening modalities include the fecal immunochemical test (FIT or HICT) and the fecal DNA test. It has to be emphasized that these tests are mainly cancer detection tests, and they must be applied rigorously and in the required frequency (annually, or every three years in the case of fecal DNA test). Any positive result of a stool test must be followed up with a colonoscopy.

National “80 percent by 2018” campaign

Regrettably, our nationwide rates of CRC screening are only at 60 percent. By 2018, we hope to achieve the 80 percent CRC screening rate for adults older than 50 years, a goal promoted by the National CRC Roundtable and the American Cancer Society; this would reduce the incidence and mortality of CRC by over 20 percent and 33 percent. The Affordable Care Act, covering preventive measures such as screening procedures, together with major media campaigns and a strong push from the entire medical community, will help us achieve this goal.

Legacy Health has signed the pledge to work toward the 80 percent goal and is pursuing a variety of activities in support of that goal. The Roundtable provides a communications guidebook with tested messaging for a variety of population groups.

LMHMC Colorectal Screening and Advanced Stage Diagnosis Study

At Legacy Mount Hood Medical Center (LMHMC), a retrospective analysis looked at whether those diagnosed in 2012–13 with colorectal cancer (CRC) had been up to date on screening tests. Of the patients presenting to LMHMC with CRC, three-quarters of the cases were diagnosed as advanced stage (3 and 4), and most were diagnosed after

they presented to the emergency department with symptoms, primarily of bowel obstruction. These patients, with a mean age of 71, had insufficient prior screening tests.

The LMHMC study findings presented an opportunity for public education about colorectal cancer symptoms and screening options, particularly in the East County area. A variety of TV and print media did stories, including the Portland Business Journal, The Columbian and the Gresham Outlook. A follow-up chart review for 2014–15 indicates that this education effort had an effect: Data revealed a lower (improved) rate of late-stage colorectal cancer diagnoses at LMHMC resulting from an emergent admission. This implies that more patients saw a provider before symptoms required urgent attention.

Additional review of patients at all Legacy sites demonstrated that the two hospitals with active colorectal cancer programs (Legacy Good Samaritan and Legacy Meridian Park) had lower rates of late-stage diagnoses and lower percentages of diagnoses as a result of an ED admit. However, these two sites also see a different population than does LMHMC, where people are less likely to have active contact with a primary care provider.

Overall, in the last four years (2012–15), stage migration toward lower stages at diagnosis has been evident in Legacy colorectal analytic cases. The most dramatic shifts toward earlier diagnoses have occurred at Legacy Emanuel, Legacy Mount Hood and Legacy Salmon Creek medical centers. We assume that increasing awareness, education and screening rates have contributed to these lower stage diagnoses. The efforts of Legacy Medical Group primary care have also likely contributed.

Legacy Medical Group primary care: Colorectal Screening Initiative

Legacy Medical Group (LMG) primary care clinics have tracked colon screening rates and FIT testing vs. colonoscopy since 2013 as part of their medical home model. To promote screening, shared decision-making reminders pop up in the EHR for those patients in the clinic who are eligible for screening. Panel coordinators follow up by phone with those not up to date to provide education

and encouragement and to answer questions. The U.S. Preventative Services Task Force (USPSTF) guidelines are used to determine eligibility.

Screening rate data are collected and tracked monthly by clinic as well as by individual provider. These data are used to promote continuous improvement of screening rates and help identify clinics to target for educational outreach.

All of these measures and actions are having a positive impact. LMG colon cancer screening rates for December 2015 averaged 73 percent across the system, with a range of 50 to 85 percent. This average screening rate is up from 66 percent in June 2014. FIT vs. colonoscopy rates are also tracked, with recent data indicating an increase in the colonoscopy rate.

2015 Colorectal cancer screening promotion

Legacy Cancer Institute is engaged in promoting colorectal cancer awareness and screening to the public and to Legacy employees. To that end, we have put on or participated in a variety of activities and events in recent years. These include:

- “Strollin’ Colon” displays at Legacy Mount Hood and Legacy Meridian Park medical centers
- Flu/FIT screening promotion in collaboration with community vaccination event at Legacy Mount Hood
- “One Million Strong: West Coast” event put on by Fight Colorectal Cancer in Pioneer Square
- “Dress in Blue Day” for awareness
- Facebook posts focusing on colorectal cancer risk reduction and screening promotion

Colorectal adenomas and the role of DNA mismatch repair protein immunohistochemistry (MMR-IHC)

By Randall G. Lee, M.D., GI pathologist, director, Cascade Center for GI and Liver Pathology, Cascade Pathology Services

Lynch syndrome is defined by the presence of a deleterious germline mutation in one of the DNA mismatch repair protein genes (MLH1, MSH2, MSH6 and PMS2). It is the most common hereditary form of colorectal carcinoma, but also predisposes to a variety of other malignancies including the endometrium, ovary, stomach, pancreas, ureteropelvic tract and brain. Identification of this syndrome is therefore essential not only for the affected patient, but also for their family members who may also be at risk.



MSH6 and PMS2). It is the most common hereditary form of colorectal carcinoma, but also predisposes to a variety of other malignancies including the endometrium, ovary, stomach, pancreas, ureteropelvic tract and brain. Identification of this

An effective and sensitive means of evaluating colorectal carcinomas for the presence of Lynch syndrome is MMR-IHC. By using antibodies to all four of the MMR proteins, MMR-IHC can identify 95–100 percent of Lynch syndrome-associated colorectal carcinomas.

It carries several advantages over polymerase chain reaction (PCR) for microsatellite instability (MSI) because it does not require having normal patient tissue available and can direct further germline mutation analyses by specifically indicating which of the four MMR genes is the culprit. As a result, several proposed algorithms for screening colorectal carcinomas for Lynch syndrome have adopted MMR-IHC as the initial step.

Given this discussion, a common question posed to the surgical pathologist relates to the utility of MMR-IHC in assessing the major precursor to colorectal carcinoma, namely the colorectal adenoma — can MMR-IHC be used to identify Lynch syndrome among those patients with adenomas (but not carcinoma) who are suspected of being mutation carriers?

Several recent studies have shown that the answer to that question is a qualified yes. Abnormal MMR-IHC is found in most (70–75 percent) adenomas from patients with known MMR germline

mutations, with the lowest rate noted among those with MSH6 alterations. Importantly, however, the prevalence of abnormal MMR-IHC varies depending on the pathologic features of the adenomas.

Those adenomas with a villous component or with high-grade dysplasia are more apt to show MMR-IHC abnormalities than those lacking these findings. In addition, some studies have shown that size is an additional predictive factor, with adenomas ≥ 8 mm being at greater risk, although other studies have not shown this correlation. These findings suggest that selecting advanced adenomas for MMR-IHC may be helpful in identifying Lynch syndrome patients. (It should be noted that these observations apply to conventional adenomas, not to sessile serrated adenomas, which, despite their role as a potential precursor to MSI-high carcinomas, do not show MMR mutations.)

However, a general strategy of screening colorectal adenomas in all younger patients (< 40–45 years) does not appear to be effective — the risk of finding MMR mutations is simply too low. Even when only those in this patient population with advanced adenomas are evaluated, the prevalence of abnormal MMR-IHC in several studies has proven to range from 0 to 2 percent.

In summary, MMR-IHC can be of aid in identifying Lynch syndrome in patients with colorectal adenomas, particularly when the patients and their polyps at particular clinical and pathological risk are selected for evaluation. Accordingly, at Legacy Health we evaluate colorectal adenomas by MMR-IHC only when specifically requested by clinicians with the requisite knowledge of the patient's family history, whereas MMR-IHC is routinely performed in colorectal adenocarcinomas.

Genetics of colorectal cancer

By Therese Tuohy, Ph.D., certified genetics counselor, Legacy Genetics Services

The World Health Organization estimates an increase of 77 percent in the number of newly diagnosed cases of colorectal cancer (CRC) and an



increase of 80 percent in deaths from CRC worldwide by 2030 (www.who.int/mediacentre/factsheets/fs297/en/).

With an estimated 1,610 cases of colorectal cancer and 660 deaths in 2016, Oregon ranks as the sixth lowest state in incidence, but the 17th lowest in death rates annually between 2008 and 2012, the most recent years for which data is available.

It is estimated that about 5 percent of colorectal cancer cases are due primarily to inheritance, and a further 20–25 percent of cases are familial (meaning due to shared inherited and environmental causes), suggesting that approximately 500 new cases of colorectal cases in Oregon arise annually with suspicion for inherited contributions.¹

Although the early onset cases (<50 years) have traditionally been flagged for genetics evaluation, a recent study of the Lynch syndrome mutation rate in a large cohort diagnosed with colorectal cancer between the ages of 30 and 74 years demonstrated that the mutation detection rate among the < 50 cohort was not significantly higher than the mutation detection rate among the 50–59 cohort.²

From a public health perspective, a high number of cancers arise in a low number of families, and increased attention to family history would address a disproportionately significant fraction of the risk. Furthermore, in both Mendelian and familial cases, an inherited predisposition to colorectal cancer is usually associated with a commensurately higher risk of other cancers: endometrial, thyroid, pancreatic and genitourinary being the most notable.

The last four years have seen a remarkable shift in the protocols used to guide genetics testing in these cases. Where previously careful genetics evaluation was used to guide the choice of one or few genes to be tested, with few cases of reflex testing,

now multigene panels of genes associated with tissue-specific risks for colorectal and many other types of cancer have become routine.

Retesting of patients who previously tested negative for one genetic syndrome can now capture undetected inherited predisposition, 7 percent in one recent report. However, multigene panel testing simultaneously leads to the detection of variants of unknown significance (VUS) in over 40 percent of cases.³ The technology has outpaced the science, leading to test results that are ahead of their time, generally to a lack of data to direct interpretation of these results or, in some cases, conflicting data. In such situations, clinical and family history reassume preeminence in guiding patient management.

Mainstream testing of all CRC tumors for MSI or IHC signatures of Lynch syndrome, reflexed to BRAF testing to rule out somatic cases, which has been useful to strategize testing choices in the past, is becoming redundant in cases diagnosed at young ages, or in the context of a strong family history, as panel testing for inherited etiology is becoming the standard of care.

While for both financial and philosophical reasons the traditional approach has been to focus on testing for a small number of genes, an unintended consequence may have been to reinforce an ascertainment bias. Relying on clinical and family history to focus on one or a small number of genes appears to have led to exclusion of consideration of some genes for some cancers, and of some cancers inadvertently ruling out consideration for some genes.

For example, a recent report revealed that 7 percent of cases that met current NCCN criteria for hereditary breast and ovarian cancer (HBOC) testing also met criteria for Lynch syndrome (LS) testing, while 29.5 percent of patients who met criteria for LS testing also met criteria for HBOC testing.⁴ These observations underscore that too narrow a focus in the selection of appropriate testing panels may fail to detect a significant fraction of clinically actionable inherited predisposition to cancer.

Increased use of broad-spectrum genetics testing panels contributes data to the growing body of knowledge that will further characterize the profiles of cancers associated with individual genes, expand the number of genes associated with individual cancers, and possibly provide data that will contribute to our understanding of multigene modifiers of high-risk Mendelian syndromes.⁵

Recent consideration of the quality of patient informed consent highlights a possible middle ground, by offering a tiered approach that prioritizes the “first-line” testing to the most likely gene(s) suggested by genetics evaluation, and reflexing to

a more comprehensive panel in mutation-negative cases, accompanied by customized consenting.^{6,7}

At Legacy Health, patients with a suspicion for inherited predisposition to cancer are referred to Legacy Genetics Services for a comprehensive evaluation of personal and family history, risk assessment for patients and their family members, genetics testing when appropriate, and referral to appropriate specialties for clinical management. For questions regarding these services, contact Legacy Genetics Services, George Anadiotis, D.O., (ganadiot@lhs.org), or Therese Tuohy, Ph.D., CGC, (ttuohy@lhs.org).

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Colorectal surgical treatment and patient care improvement initiatives

By Joseph Frankhouse, M.D., FACS, surgeon, Legacy Medical Group—Gastrointestinal Surgery

Recent advances in colorectal surgical care at Legacy have resulted from focusing on patient care improvements, both pre- and postoperative. (In



addition, system-wide and site-specific initiatives to reduce surgical site infections are having an impact.)

We also participate in national quality programs such as National Surgical Quality Improvement Program (NSQIP)

and the regional Surgical Care Outcomes and Assessment Program (SCOAP). Developed in Washington state, SCOAP is a physician-led system for surgical quality. SCOAP data form the backbone for our quality data review and program improvements. Legacy Good Samaritan Medical Center is currently the only facility in Oregon participating in SCOAP.

Our Enhanced Recovery after Surgery (ERAS) program for colorectal surgery patients was initiated at Legacy Good Samaritan in 2011. ERAS is a combined

effort of surgery, anesthesiology and nursing care. It begins with detailed pre-op education, shorter fasting periods before surgery and improved pre-op nutrition.

Our colleagues in anesthesia help by using more short-acting anesthetics, regional and local anesthesia, and more appropriate fluid administration during surgery (“goal-directed therapy”). Post-op, the nursing staff is trained to provide oral intake to our patients earlier, manage pain with fewer narcotics, and get our patients out of bed and moving, all to promote speedier recovery with fewer complications.

These measures have been shown to reduce the stress response, promote healing and enhance patient well-being. The risk of infection and length of hospital stay are both reduced. Other Legacy hospitals have also adopted ERAS principles and elements.

To assess the impact of the program at Legacy Good Samaritan Medical Center, we identified clinical data points, which were examined at baseline and then yearly after the ERAS protocol was put into place. By year two there were significant decreases in narcotic use, complication rates and length of stay (LOS), without an increase in readmissions. A poster on these results was presented at a regional surgical meeting (Pacific Coast Surgical) and then published in *JAMA Surgery* (July 23, 2014).

Other elements subsequently added to the ERAS program include the use of alvimopan (Entereg) to block narcotic effects on the bowel and of multimodal pain medications, which allow us to treat pain with fewer or no narcotics. An important adjunct to the ERAS protocol has been the “Strong for Surgery” Program, another initiative from Washington state. The quality improvement tools of this program aim for optimization of the health of patients prior to surgery. Pre-op checklists assist physicians in addressing pre-surgical nutritional status, smoking cessation, glycemic control and medications. In late 2015 the American College of Surgeons announced it will adopt this program for nationwide use.

Minimally invasive surgery (MIS) also contributes to more rapid surgical recovery, and about 81 percent of colorectal ERAS surgery cases (cancer and non-cancer) at Legacy Good Samaritan have been done laparoscopically (including robotics) since 2011. MIS can minimize pain, complications and recovery time, and we continue to explore new innovations in MIS.

Our efforts in ERAS and patient care improvement and our outstanding outcomes at Legacy are being recognized regionally, nationally and even internationally.

Colorectal cancer: A medical oncology perspective

By Eric Anderson, M.D., Ph.D., medical oncologist, OHSU Knight Cancer Institute Northwest Portland, part of the OHSU Knight–Legacy Health Cancer Collaborative

Nearly 150,000 Americans were diagnosed with colorectal cancer in 2015, and almost 50,000 died as a result of colorectal cancer that year, making colorectal cancer the third-most common cancer and the second leading cause of cancer-related deaths in the U.S.



Colorectal cancer is one of the few cancers for which effective screening, early detection and treatment of early-stage

disease are available, leading to improved cancer specific survival. Recent advances in screening technologies, including stool immuno-testing, stool DNA testing, virtual colonoscopy (CT colonography), as well as the gold standard of colonoscopy, have greatly improved the ability to detect pre-invasive and early stage colorectal cancers, improving outcomes and curing colorectal cancer.

Despite these advances, there remains a huge unmet need for treatment of later stage, particularly metastatic, colorectal cancer. Although there

are major breakthroughs in targeted therapies in many cancers and exciting data surrounding immunotherapy in cancers such as breast, lung and melanoma, progress in the treatment of locally advanced and metastatic colorectal cancer has been slow in coming.

In 2015, a new chemotherapy, TAS-102, was approved by the FDA for the treatment of progressive metastatic colorectal cancer — only the second new drug approved for colorectal cancer in the last five years. The use of molecular testing to identify additional mutations in cancers has identified several new encouraging targets in colorectal cancer in the last year. These include the expression of HER2 in approximately 5 percent of metastatic colorectal cancers, which renders them sensitive to targeted therapies previously used in breast and stomach cancer.

There is emerging data to suggest that colorectal cancers that have defects in DNA repair may respond to therapies that harness the power of the immune system to treat cancer. Finally, emerging

data in the management of locally advanced rectal cancer have changed the way in which we treat this disease, and ongoing studies of non-operative treatment of rectal cancer may someday allow many patients with this disease to avoid extensive surgery and potentially avoid permanent colostomies.

Legacy Cancer Institute collaborates with the OHSU Knight Cancer Institute, seeking to advance knowledge in the treatment of colorectal cancer through a number of ongoing clinical trials. These include trials of immunotherapy and metastatic colorectal cancer, as well as the role of vitamin D in improving outcomes for resected colon cancer in patients who received chemotherapy.

Legacy Cancer Institute, with its multidisciplinary approach, state-of-the-art therapies, cross-institutional collaboration and rapidly expanding clinical trial portfolio, provides our patients with the best available diagnostic, treatment and supportive therapy options for early-stage, locally advanced and metastatic colorectal cancers.

Radiation oncology treatment for colorectal cancer

By Misa Lee, M.D., radiation oncologist, Legacy Medical Group—Radiation Oncology

Colorectal cancers are the fourth most common cancer and the second leading cause of cancer mortality in the United States. It is the third most common cancer in men and the second in women in the world with a lifetime probability of 5 percent.



With increased awareness and greater use of screening, overall incidence rate has decreased, especially in the older population. Interestingly, however, the rate has increased by approximately by 2 percent among adults younger than 50 years.

Although surgery remains the main treatment modality in managing colorectal cancer, radiation therapy has also been a vital adjuvant treatment especially in locally advanced rectal cancer.

Publication of GITSG 7175 trial in 1985 demonstrated an improved five-year disease-free survival and overall survival for patients with stage B2–C rectal cancer receiving concurrent chemo-RT postoperatively. Adjuvant chemoradiation therapy became a part of the standard of care in managing locally advanced rectal cancer. Since the GITSG 7175 trial, additional trials have not only validated the importance of treatment but also defined optimal timing of chemoradiation therapy.

The German Rectal Cancer Study Group compared the administration of radiation preoperatively versus postoperatively. It demonstrated that preoperative therapy provided significant reduction in local recurrence and in treatment-related toxicity compared to postoperative therapy despite similar overall survival in a group.

Presumptive advantage of preoperative radiation, as opposed to postoperative radiation, is that it may allow the tumor response leading to preservation of more normal tissue. In managing a distal tumor, reduction of tumor volume facilitates resection and increases the likelihood of a sphincter-sparing procedure.

However, one of the disadvantages of using preoperative radiation therapy is the possibility of over-treating early-stage tumors that may not require adjuvant radiation. Hence, current NCCN guidelines recommend preoperative chemoradiation therapy for patients with stage 2/3 rectal cancer. Postoperative chemoradiation therapy is recommended when stage 1 cancer is upstaged to stage 2 or 3 after pathologic review of the surgical specimen.

Usually, pelvic radiation therapy involves multiple fields that include the tumor or tumor bed, presacral nodes and internal iliac nodes. The external iliac nodes are also included when tumor involves anterior structure or involves anal canal, including anal sphincter. The treatment volumes are customized based on an individual's anatomy seen via

planning CT scan acquired at the time of simulation for radiation therapy.

At Legacy, we use an imaging guidance system to image our patients on a daily basis to ensure an accurate setup and delivery of radiation. Typically, 45–50Gy in 25 to 28 fractions is recommended in the United States. In Europe, there has been strong interest in using a shorter course of preoperative radiation (25Gy over five days) without chemotherapy in hopes of shortening the treatment time and possibly minimizing the side effects.

Recent trials comparing preoperative short-course radiation to conventional preoperative long-course chemoradiation have shown comparable local control as well as overall survival. Therefore, it is an appropriate option for patients with T3N0 or T1-3N1-2 rectal cancer. With the need to consider down-staging as well as toxicity, each patient's case should be discussed at a multidisciplinary meeting.

As we continue to strive to deliver safe and optimal treatments to our patients, it is imperative that we participate in national clinical trials as well as engage in cooperative multidisciplinary discussions to secure quality care.

Monitoring compliance with evidence-based guidelines — stage 2A and 2B colon cancer (Commission on Cancer Standard 4.6)

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

Surgery alone is generally curative for stage 2 colon cancer. However, approximately 20 percent to 30 percent of these patients develop tumor recur-



rence and ultimately die of metastatic disease.

Large randomized trials and meta-analyses have failed to show a significant survival benefit from adjuvant chemotherapy in patients with stage 2 colon cancer.

Chemotherapy can be even more deleterious in patients with Lynch syndrome-related colorectal cancers. They lack DNA mismatch repair (MMR) proteins, tend to be diagnosed at earlier ages (under

age 50), and are at high risk for other cancers including endometrial and renal malignancies.

Despite this, they have been shown to have a better overall prognosis, but poorer outcomes in both disease-free and overall survival in the setting of adjuvant chemotherapy. Identifying Lynch-related cancer is therefore essential for formulating treatment strategies, e.g., avoiding use of current standard chemotherapy, and future management and cancer surveillance.

Our 2015 quality review of patients accessioned in 2014, evaluated rates of immunohistochemistry (IHC) testing for gene expression related to Lynch syndrome; the rate of Lynch-type cancers in our patient population, including appropriate

follow-up confirmatory testing; and rates of chemotherapy treatment among these patients and all patients with stage 2 colon cancer. Our results guided a new reflex pathology testing pathway as well as strategies for improving genetics counseling of younger patients with colorectal cancer.

In 2014, 41 patients were identified with stage 2A or 2B cancer. Of these, 17 were under 70 years old, which was chosen as the age cut-off since patients who present at advanced age are unlikely to have Lynch syndrome. All 17 were IHC-tested for MMR protein expression. Three patients (18 percent) were MMR protein deficient. This is not enough to clearly confirm Lynch syndrome; a second follow-up test for DNA mutations in a methylation gene, BRAF, is necessary.

BRAF mutations can cause random spontaneous methylation of genes halting expression of MMR proteins in a tumor. Patients with BRAF mutations have sporadic MMR deficiency in their tumor, differentiating them from patients with Lynch syndrome who have normal BRAF genes and inherited MMR gene mutations throughout their cells, resulting in very high risk of colon cancer and other tumors.

Follow-up BRAF testing was performed in one of the three MMR-deficient patients and was found to be mutated, consistent with a non-Lynch-type cancer. None of the three patients underwent chemotherapy. All patients 50 or younger (ages 36, 46, 50) were tested and found to have normal MMR protein expression. Only one Lynch-type result (MMR-deficient, BRAF wildtype) was found and was in an older patient (age 82).

Rates of chemotherapy were also assessed among all stage 2 colon cancer patients diagnosed in 2014. Chemotherapy was administered in only

three of the 41 patients, all of whom were confirmed to have non-Lynch-associated cancers: two patients with stage 2A, aged 36 and 50, and one with stage 2B cancer.

We also assessed referrals to genetics counseling for the colon cancer patients diagnosed at age 50 or younger. Records are limited given oncology genetics assessments occurring with affiliated physicians and counselors outside of the Legacy system. One patient had been referred to Legacy but did not choose to participate, and the other two completed their care with affiliated oncology groups that also provide genetics counseling.

Stage 2 colon cancer patients are less likely to benefit from chemotherapy treatment, particularly if they also have Lynch syndrome. Identifying patients with high risk of familial cancers is critical and can be established by pathologic review and age. Of the stage 2 colon cancer cohort for 2014, we confirmed that all stage 2A/2B colon tumors for patients under 70 resected at Legacy are undergoing IHC testing for the MMR gene expression, and no patients suspicious for Lynch-related disease were treated with chemotherapy. Very few patients with stage 2 cancer were treated with chemotherapy, which is appropriate in select cases.

In response to our results, we have modified our testing and screening procedures to identify high-risk patients effectively. Automatic BRAF testing is now performed for any patient under 70 years old with MMR-deficient IHC tests. In addition to referrals by our surgical, oncology and primary care colleagues, review of cancer pathology reports is also being performed by our genetics team, ensuring that colorectal cancer patients under 50 are offered appropriate assessment.

Colorectal cancer quality initiatives

By Amy Carl, CPHQ, quality improvement consultant, Legacy Cancer Institute

Legacy Cancer Institute has adopted robust quality improvement initiatives as part of its colorectal cancer care. Regularly reviewing data and using it to drive action planning has been a cornerstone of the program for many years.

In 2011, Legacy Colorectal Cancer program developed its quality indicator dashboard. Consisting of clinical quality, process and outcome measures, the dashboard indicators have evolved along with the colorectal program. The data are presented by

hospital and in aggregate, and analyzed twice a year. Indicators include:

- Complete TNM staging in the medical record
- Pre-treatment clinical staging documented for colon and rectal cancers
- Total mesorectal envelope intactness
- Patients navigated by an oncology nurse navigator



The Legacy Colorectal Cancer program took interest in how many high-risk patients are referred to Legacy Genetics Services and follow-up with a clinic appointment. As such, a quality study to evaluate Legacy's processes and compliance with evidence-based National Comprehensive Cancer Network (NCCN) guidelines for high-risk colorectal cancer patients was done in 2015.

The study analyzed 438 colorectal cancer patients at Legacy between January 2012 and June 2014 and found that 37 patients were diagnosed with colorectal cancer at 50 years or younger. However, documentation of referrals to the Legacy genetics clinic and follow-up appointments was not consistently found. As a result of the study's findings, a new process to ensure consistent referrals and follow-up to the Legacy genetics clinic was developed for colorectal cancer patients 50 years and younger. Both will be monitored on the quality indicator dashboard.

As a participant in Washington's Surgical Care and Outcomes Assessment Program (SCOAP), the center regularly reviews its compliance with various evidence-based process and outcome measures. Since 2011, the colorectal cancer committee has

reviewed the data in aggregate and by surgeon, comparing it to SCOAP benchmarks. Surgeons with five or more cases every six months receive their individual compliance report as well. Several measures have shown significant improvement, including:

- VTE pharmaceutical prophylaxis within 24 hours of incision — 77.1 percent to 96.2 percent
- VTE pharmaceutical prophylaxis ordered for use after first 24 hours — 86.9 percent to 97.6 percent
- Albumin collected on elective cases — 80.4 percent to 92.1 percent
- Albumin ≥ 3 within six weeks of surgery — 64.4 percent to 100 percent
- Postoperative wound or skin infections — 8.1 percent to 6.3 percent

The Legacy Colorectal Cancer program also tracks surgical site infections. Oregon, Washington and the Centers for Medicare and Medicaid Services require hospitals to report surgical site infections (SSI) for specific procedures. National SSI performance is reported as standardized infection ratios (SIR). This ratio compares the observed number of infections with the United States' baseline experience (dividing observed by expected, based on specific risk factors for each procedure type).

Our center reviews its SIR in aggregate; surgeons with five or more cases every six months also receive their individual SIR. Since 2011, Legacy Colorectal Cancer program has seen its SIR decline, which means patients experience fewer surgical site infections than expected.

Using data to identify and solve problems truly benefits patients and providers. Legacy Colorectal Cancer program looks forward to continuing its strong quality improvement work.

Cancer clinical research

By Madeline Cook, B.A., clinical research coordinator, Legacy Oncology Clinical Research

Legacy Health is proud to offer oncology clinical trials in collaboration with physicians, cooperative groups and the National Cancer Institute. In 2015, colorectal cancer made up 8 percent of cancer cases at Legacy Health.



Legacy offered a colorectal treatment trial in 2015 that compared the addition of Celecoxib (a more potent NSAID) with FOLFOX to placebo and

FOLFOX (CALGB 80702). This trial also looked at a dose reduction to potentially reduce the treatment burden on patients. The study was closed nationally in November 2015 after reaching its target accrual, including three patients from Legacy.

The research staff at Legacy Health works closely with medical oncologists, surgeons, radiation oncologists and other physician partners at Legacy and in the community in an effort to give patients an opportunity to participate in clinical trials. Our collaboration with OHSU Knight Cancer Institute has also allowed us to connect to a larger portion of the population.

The research 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. In 2015, 14.2 percent of Legacy's analytic cancer patients were enrolled in clinical trials. The 2015 oncology clinical trial accrual volume by Legacy facility is provided in Figure 11, below.

As we move into 2016, a new colorectal trial funded by Legacy Health foundations will be available. This is a pilot study to evaluate the efficacy of vitamin D supplementation in raising vitamin D serum levels to a standard healthy level during chemotherapy for patients with stage 3 colon and stage 2–3 rectal cancer. It has been reported that higher levels of vitamin D are associated with lower cancer-specific and all-cause mortality in patients with colorectal cancer. These results indicate that raising vitamin D serum levels through supplementation may improve the survival outcome for colorectal cancer patients, but it has yet to be studied.

In 2016, the oncology research team will start a protocol selection group. Meetings will take place once a month and will consist of multidisciplinary reviews of our current open studies and new potential protocols. We are also happy to announce the approval of the use of the Central Institutional Review Board. This board will allow a quicker turnaround on protocol amendments and openings.

FIGURE 11 Clinical trial accrual with Tumor Bank accrual, 2015

	Legacy Health	Legacy Emanuel	Legacy Good Samaritan	Legacy Meridian Park	Legacy Mount Hood	Legacy Salmon Creek
2015 annual analytic caseload	2,591	315	1,130	416	282	448
Number of analytic cases on clinical trials	289	108	129	22	16	14
Number accrued to Tumor Bank	79	6	52	5	5	11
Total (clinical trials and Tumor Bank)	368	114	181	27	21	25
Total percentage accrued to clinical trials/Tumor Bank	14.2%	36.2%	16.0%	6.5%	7.4%	5.6%

Legacy Research Institute Tumor Bank

By Serene Perkins, M.D., FACS, program director, Legacy Tumor Bank, and John Ost, CCRP, research assistant, Legacy Tumor Bank

The continued quest to personalize cancer care depends upon the availability of “appropriately collected, consented, and annotated tissue” (National Dialogue on Cancer, 2002) to develop novel therapies.



The Legacy Tumor Bank was founded in 2006 in order to address this resource gap by storing frozen and paraffin-embedded tumor tissue. Thanks to the outstanding support we have received from surgeons, pathologists and multiple team

members at the Legacy Cancer Institute, our collection has now grown to greater than 1,200 cases, with 7,600 samples for potential research use. We continue to fulfill a significant portion of clinical research enrollment requirements, contributing to the Legacy Cancer Institute’s Commission on Cancer accreditation and recent Outstanding Commendation award. A significant percentage of our

collection is comprised of breast and colorectal cancers, yet our collection represents the spectrum of human solid cancers, which allows for research initiatives to include nearly all major tissue regions.



Long-standing collaborations with the Community Cancer Center in Roseburg and Mid-Columbia Medical Center in The Dalles, Oregon, together with support from The Lions Club of Oregon, make donating tumors for research possible outside of

the Portland metropolitan area. Reaching beyond the Willamette Valley helps us to meet the biorepository project goal of providing high-quality tissue across a broader regional scope to cancer researchers, and models the Legacy Health mission and values in support of our patients, our community, and our world.

Legacy Cancer Data Management

By Lorraine Colwell, certified tumor registrar, Legacy Cancer Data Management

The Legacy Cancer Data Management (CDM) department is a group of professionals who are specially trained to capture timely, accurate and complete data on all types of cancer diagnosed and/or treated at all Legacy facilities. We carefully collect numerous pieces of information on cancer cases, which is in turn used in many useful ways. The data is sent to Oregon and Washington



population-based central cancer registries, where data is maintained on patients within certain geographic areas. Data is used to make important public health decisions that maximize the effectiveness

of limited public health funds, such as screening programs.

The data is widely used to provide essential information to researchers, health care providers and public health officials to better monitor and advance cancer treatments, conduct research, and to improve cancer prevention and cancer screening programs. Analytic patients are followed yearly for life by Legacy Cancer Data Management, thus capturing accurate survival, recurrence and outcomes information.

Legacy Health is nationally accredited as an integrated network cancer program by the Commission on Cancer (COC), adhering to strict standards to ensure high-quality and accurate data reporting.

In 2015, Legacy Cancer Data Management submitted all required cancer data to the CoC National Cancer Data Base (NCDB) on time and error-free to earn commendation for this accreditation standard. The department accessioned more than 2,500 newly diagnosed cancer cases and maintained over a 90 percent yearly follow-up rate for patients diagnosed or treated within the last five years, and over an 80 percent follow-up rate for patients diagnosed or treated since 1997. The Cancer Data Management department also coordinated more than 350 multidisciplinary patient care cancer conferences (tumor boards) over the course of the year.

As a CoC-accredited program, Legacy maintained excellent compliance with the NCDB Rapid Quality Reporting System (RQRS). RQRS is an online database that promotes and facilitates evidence-based cancer care for breast and colon cancer in a real-time environment. Real-time monitoring of RQRS data by Cancer Data Management is an additional tool to assess that all patients receive timely and evidence-based cancer treatment.

Legacy Cancer Data Management is transitioning to a rapid, concurrent case abstracting model, which will provide real-time data for all cancer diagnoses — not just breast and colon cancer.

The cancer data management field is one of constant change and advancement. In 2015, the department completed a large cancer registry database conversion, which provided expanded data reporting capabilities and data automation functionalities.

To stay abreast in this rapidly changing field, the team regularly completes ongoing education in cancer data management and advances in cancer treatment. Certified tumor registrars (CTRs) receive local, state and regional education, as well as that from national conferences such as the National

Cancer Registrar Association (NCRA) annual meeting. The annual NCRA conference provides valuable education and training on a wide variety of topics such as health informatics, big data, accreditation standards, the latest in cancer treatment, genetics research, abstracting coding rules and cancer registry operations.

Members of Legacy Cancer Data Management had significant accomplishments in 2015. Catherine Gunn, CTR, was elected president of the Oregon Cancer Registrars' Association. In her role, Gunn leads the way for our local cancer registrars in a variety of ways, including coordinating an annual workshop in collaboration with the Oregon State Cancer Registry (OSCaR), where outstanding speakers educate registrars on a variety of current topics.

I have been honored to serve as a member of the NCRA Advanced Education Committee, where I have had the opportunity to publish three national Informational Abstracts related to ensuring that quality data are captured and conveyed. My role on the committee has been valuable to Legacy by allowing me to lead the team through important NCRA webinar education offerings on a variety of topics such as rapid quality reporting, American Joint Committee on Cancer (AJCC) staging, and central nervous system (CNS) tumors.

Last but not least, Dawn Cox, CTR, was promoted to a new lead CTR position. In this new role, she has provided an additional and valuable layer of support and leadership to the team.

Additional members of the 2015 Cancer Data Management team are Mindy Ansteth, B.S., CTR, manager, Legacy Cancer Data Management; Katie Fulcher, RHIT, CTR; Susan Malone, B.S., cancer data management tech; Janel McNally, CTR; Veronica Redd, cancer registrar; Melania Tolan-Hudson, RHIT, CTR; and Alyssa Wiseman, cancer data management tech.

Cancer Liaison Physician (CLP) report

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

The Cancer Liaison Physician (CLP) serves a leadership role within Legacy Cancer Institute and is responsible for evaluating, interpreting and reporting our



program's performance, using the National Cancer Database (NCDB) data, to the Legacy Integrated Network Cancer Committee at least four times per 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 Commission on Cancer (CoC) National Cancer Data Base (NCDB). CP³R was designed to promote practice improvement and quality of care at the local level, as well as to permit hospitals to compare their care for patients with that of other CoC-accredited 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 practices, optimize quality and diminish disparities in care across CoC-accredited programs.

CP³R reports system data regarding patient treatment and outcomes for patients with breast, cervical, colon, gastric, lung and rectal cancers. Starting in September 2015, this has been extended to include two additional primary sites, ovary and endometrium, with additional measures to evaluate treatment.

For patients diagnosed in 2013, the latest available data set from NCDB, Legacy continued to meet all benchmarks and exceed national and local rates in all of the breast cancer accountability measures, ranging from 92.9 to 100 percent. See Figure 12 (*page 23*) for the breast-specific measures and Legacy's 2013 performance.

New measures for non-small cell lung cancer patients are being collected since last year; target benchmarks were established at 85 percent. In 2013, 100 percent of lung cancer patients were

considered for chemotherapy, and non-operative treatment was pursued in all N2Mo stage 3 lung cancers. As demonstrated in Figure 13 (*page 23*), we continued to see a similar rate of 71.4 percent of removal and evaluation of at least 10 lymph nodes with the resection specimen, much higher than the 41 percent rate nationally for CoC-accredited programs.

The latest CP³R also measures performance rates for two colon and one rectal measure. We have collected at least 12 lymph nodes with 90 percent of colon specimens, meeting the 85 percent benchmark, similar to all other CoC programs locally and nationwide.

We exceeded the 85 percent benchmark for consideration of chemotherapy with 94.4 percent of stage 3 colon cancer patients and preoperative radiation as well as chemotherapy for 90.9 percent of locally advanced rectal cancers. See Figure 14 (*page 24*) for the colon- and rectum-specific measures and Legacy's performance.

Cervical, ovarian, endometrial and gastric cancer surveillance measures are also now tracked through CP³R; no benchmarks have been established. Legacy regularly reviews all CP³R surveillance measures to assess patient treatment and compare our performance to that of other CoC-accredited programs across the country.

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 CoC-accredited programs. Measures include those captured in the CP³R.

Updated Legacy breast, colon and rectal cancer quality outcomes percentages are consistently higher than average rates across Oregon and the nation. The CQIP data is reviewed yearly by the Legacy Integrated Network Cancer Committee, cancer site-specific program development

committees and Legacy administration.

Legacy Cancer Institute's comprehensive, community-based cancer program combines an integrated team of physicians, nurses, staff and administrators dedicated to serving our patients with high-quality, patient-centered care. We believe

this is reflected in our ability to meet or exceed the cancer care quality benchmarks. Legacy Cancer Institute is dedicated to continually identifying opportunities to optimize patient care through our partnership with the CoC and our multidisciplinary care teams.

FIGURE 12 Commission on Cancer (CoC) Cancer Program Practice Profile Report (CP³R), Legacy Health, Breast Performance Measures

Select measures	CoC standard	CoC benchmark	Legacy 2013* performance
Radiation is administered within one year (365 days) of diagnosis for women under the age of 70 receiving breast conservation surgery for breast cancer (Accountability)	4.4	90%	95.8%
Tamoxifen or third generation aromatase inhibitor is recommended or administered within one year (365 days) of diagnosis for women with AJCC T1c or stage 1B-3 hormone receptor positive breast cancer (Accountability)	4.4	90%	100%
Radiation therapy is recommended or administered following any mastectomy within one year (365 days) of diagnosis of breast cancer for women with ≥ 4 positive regional lymph nodes (Accountability)	4.4	90%	92.9%
Image or palpation-guided needle biopsy to the primary site is performed to establish diagnosis of breast cancer (Quality Improvement)	4.5	80%	99.2%
Breast conservation surgery rate for women with AJCC clinical stage 0, 1 or 2 breast cancer (Surveillance)	†	†	56.3%
Combination chemotherapy is recommended or administered within four months (120 days) of diagnosis for women under 70 with AJCC T1cN0 or stage 1B-3 hormone receptor negative breast cancer (Accountability)	4.4	†	100%

FIGURE 13 Commission on Cancer (CoC) Cancer Program Practice Profile Report (CP³R), Legacy Health, Lung Performance Measures

Select measures	CoC standard	CoC benchmark	Legacy 2013* performance
Systemic chemotherapy is administered within four months to day preoperatively or day-of-surgery to six months postoperatively, or it is recommended for surgically resected cases with pathologic lymph node-positive (pN1) and (pN2) NSCLC (Quality Improvement)	4.5	85%	100%
Surgery is not the first course of treatment for cN2, M0 lung cases (Quality Improvement)	4.5	85%	100%
At least 10 regional lymph nodes are removed and pathologically examined for AJCC stage 1A, 1B, 2A and 2B resected NSCLC (Surveillance)	†	†	71.40%

* Most recent data available from the Commission on Cancer

† No CoC benchmark established at this time

FIGURE 14 Commission on Cancer (CoC) Cancer Program Practice Profile Report (CP³R), Legacy Health, Colon and Rectum Performance Measures

Select measures	CoC standard	CoC benchmark	Legacy 2013* performance
At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer (Quality Improvement)	4.5	85%	90.4%
Adjuvant chemotherapy is recommended or administered within four months (120 days) of diagnosis for patients under the age of 80 with AJCC stage 3 (lymph node positive) colon cancer (Accountability)	4	Not applicable	94.4%
Preoperative chemo and radiation are administered for clinical AJCC T3N0, T4N0 or stage 3; or postoperative chemo and radiation are administered within 180 days of diagnosis for clinical AJCC T1-2N0 with pathologic AJCC T3N0, T4N0 or stage 3; or treatment is recommended; for patients under the age of 80 receiving resection for rectal cancer (Quality Improvement)	4.5	85%	90.9%

Support services for colorectal cancer patients

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 throughout Legacy. Diagnosis of cancer may affect many aspects of one's life and the vision of the Legacy Cancer Health Center is that life is meant to be lived to the fullest.

To support the state-of-the-art cancer treatment offered at Legacy Health, 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.

Individualized support services

- Cancer survivorship and integrative care offers individual consultation with a nurse practitioner. For more information, see "Integrative care and symptom management" on page 25.
- 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.



Legacy Cancer Healing Center staff members, from left: Margaret Hartsook, art therapist; Kelly Doherty, manager; Fang Zhang, qigong instructor; Josh Casey, massage therapist; Rae Waterman, volunteer coordinator; Marci Reed, dietitian; Dena Wellington, social worker; Selma Annala, coordinator and stress management therapist. Not pictured, Kate Leonard, psychologist; Martha Lundberg, Pilates instructor; and Kathleen Perkins, yoga instructor.

- Massage therapy is offered at Legacy Good Samaritan Medical Center. The massage therapist sees patients in radiation oncology and on the Cancer Care Unit. In addition the fee-for-service practice is located at the Women's Wellness Center and is open to men and women.
- Music thanatology is available across Legacy. Trained musicians help alleviate fear, anxiety and discomfort at the hospital bedside through harp and voice.
- Our Legacy Health oncology dietitian — a certified specialist in oncology nutrition — offers

individual consultations in nutritional counseling before, during and after cancer treatment.

- A licensed clinical social worker 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 a patient and family in both inpatient and outpatient settings.
- Stress management instruction and guidance in behavior modalities helps patients cope with the stress of cancer diagnosis and provides support and comfort during difficult procedures.

Cancer education and movement classes

- In 2015, the Legacy Cancer Healing Center offered Step into Fitness (a series on exercise and nutrition for cancer survivors); a healthy eating food preparation class for the Legacy community and the community at large; monthly gardening workshops and nature walks; and weekly classes in Nia, Pilates, qigong and yoga.

- Meditation classes provide 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.
- An ongoing support group for caregivers is held monthly at Legacy Good Samaritan Medical Center, facilitated by oncology-experienced clinicians.
- Green Gables Guest House on the campus of Legacy Good Samaritan Medical Center provides lodging for patients and families from out of the area receiving medical care at Legacy.

A variety of other cancer support groups are offered on a regular basis. See list on page 29.

The Legacy Cancer Healing Center works closely with the patient, his or her family and all members of the patient's cancer treatment team, offering support along the entire continuum of cancer care. It is our goal to be available to meet patient needs with individualized caring support and education.

Support services for colorectal cancer patients

Integrative care and symptom management

By Reza Antoszewska, NP-C, survivorship, integrative care and Legacy Cancer Healing Center, Legacy Cancer Institute

Legacy Health's integrative care clinic opened at Legacy Good Samaritan Medical Center in 2009.

Our patients find help with symptom management and prevention based on the expanding field of lifestyle medicine, as well as other evidence-informed integrative care services. We provide care to a diverse oncology- and prevention-based population.



The clinic takes a holistic or global view of our patients. Assessments include the physical, emotional, social, existential, environmental and spiritual issues that often emerge from cancer diagnosis and treatment.

Referrals to the clinic are predominantly through oncology physicians. Referrals are also received through primary care physicians, nurse navigators, allied health professionals or via self-referral. Services span preventive care for high-risk patients through care for patients with any stage of cancer, including metastatic disease. Our clinic services can begin during any phase of care.

Helping patients improve sleep, exercise, diet and emotional resilience can help improve outcomes and quality of life regardless of cancer site or stage. Our clinic supports lifestyle medicine care, including the Strong for Surgery program adopted by our colorectal surgeons.

A typical plan of care may include recommendations for diet, exercise, sleep, hygiene and mind/body practices, along with referrals to services such as acupuncture, physical therapy or specialty services. Legacy offers a wide variety of free classes. Services such as social work, art therapy, pharmacy navigation, yoga or meditation are also often included in the plan.

Post-treatment clinical care often includes continued symptom management for late effects as well as patient education regarding the evidence-based knowledge of lifestyle modification that can diminish the risk of future cancers and other chronic illnesses.

Acupuncture is available for inpatients by physician referral. Vetted referrals to acupuncture and other evidence-based integrative care in the community are offered.

Patients are often confused by the enormous range of information or misinformation that is available through the media and the natural medicine community. Reviewing the patient's current supplements and natural medicine products for interactions with medications or side effects, as well as educating patients about resources that can help them make safe choices, helps to ensure our patients' health and well-being.

Patients often experience grief, depression and/or anxiety. Mind-body medicine techniques, meditation and heart rate variability biofeedback are available to the patient as part of his or her clinic visit, along with appropriate referral to counselors, psychiatry, chaplaincy, social work and other services that can best help a particular patient through the emotional challenges of treatment.

Patients appreciate the ability to turn their attention to actions to help themselves to improve

symptoms and overall health. The integrative care clinic also serves as a resource for providers on topics of integrative care, supplements and additional services within the Legacy Cancer Healing Center and larger community. Education and information about current integrative research, quality product lines and integrative care services within the community are also offered. This model of care, developed at Legacy Cancer Institute, is receiving national attention and was presented at Harvard Medical School's Conference on Lifestyle Medicine in June 2015 with positive reception.

Plans are underway to expand this service to other medical centers within Legacy. A grant allowed for training of Legacy Salmon Creek Medical Center staff in mind/body medicine skills to help improve staff resilience and allow these skills to be used with patients to decrease distress and stress-related symptoms.

Our patients love this service. One patient said, "Helping to connect my issues, then sort through them and reorganize my life, was a challenge. There is a *huge* need for your service in after-care that is not the same as support groups ... individual plan sheets tailored to the cancer patient's needs. Changing my plan as we progress in after-care. Breaking down grief, diet, stress, time management, exercise and wellness recovery or not from this disease. Helping to tap into the source of energy that each person has to give to themselves to be able to focus instead of drifting away from what is important to their recovery now. Human side not the medical side that we tend to focus on. Giving an anchor to women who are trying to understand the rippling effects of living with this disease daily."

Support services for colorectal cancer patients

Oncology navigation program

By Julianna Paradisi, R.N., OCN, Legacy oncology nurse navigator

The oncology nurse navigator's (ONN) role is to identify and remove barriers preventing patient access to timely and effective cancer treatment.



Early referral to the Legacy oncology navigation program includes a needs assessment and personalized plan of support. ONN support specific to colorectal and GI cancers for a typical patient may include reinforcement of the Strong for

Surgery program, transportation assistance, help obtaining lodging during treatment for patients not living in Portland, and providing referrals to appropriate hospital and community resources.

Typically, informal bonds are developed between ONNs and our patients, as we provide education in home symptom management and an extra layer of emotional support. For patients lacking family support, we are available by appointment to attend consults as an "extra set of ears" to take notes and explain the treatment plan to patients too overwhelmed to take in the complex information that comes with a diagnosis of colorectal or GI cancer.

At Legacy Health, our oncology nurse navigators have extensive years of experience in oncology nursing, and hold national certification. We meet mandatory continuing education requirements by

attending national, regional and local conferences, while keeping up with ONN best practices and NCCN guidelines. We attend tumor conferences as part of the multidisciplinary patient care team.

The Legacy oncology navigation program is fortunate to collaborate with the American Cancer Society (ACS) to provide our patients with an ACS navigator. The ACS navigator works alongside the Legacy oncology nurse navigators to help connect patients with American Cancer Society resources for financial arrangements, transportation, job-related and family concerns, lodging, support services and medically approved literature. In addition, Legacy's oncology navigator program includes an oncology pharmacy navigator who is available to answer patient medication-related questions and concerns. The oncology pharmacy navigator is available by phone or in person to assist patients with understanding medications, medication schedules and potential side effects, as well as cancer treatment symptom management.

While we are unable to change the cancer journeys of our patients, oncology nurse navigators can remove some of the bumps on the road they may encounter.

Navigation services are available to all Legacy patients with a cancer diagnosis.

OHSU Knight-Legacy Health Cancer Collaborative

By Pamela Kilmurray, director, Legacy Cancer Service Line, Legacy Breast Health Centers, Legacy Hospice and Legacy Good Samaritan Medical Center Rehabilitation Services

The OHSU Knight-Legacy Health Cancer Collaborative, launched in 2013, is an integrated community cancer program for adults, encompassing radiation oncology, medical oncology and infusion services. It leverages mutual strengths to improve access to advanced cancer care throughout the region. Services are delivered through five locations serving patients from Multnomah, Washington, Clackamas, Columbia and Clark counties.



Washington, Clackamas, Columbia and Clark counties.

“The driving force behind this collaboration is the desire to enhance and expand the level of cancer care available in our communities and provide it in a seamless, compassionate and efficient manner,” said Nathalie Johnson, M.D., medical director of Legacy Cancer Institute.

Benefits for our patients include:

• Treatment provided in multiple locations, which often means staying closer to home for care

- Legacy Cancer Institute and OHSU Knight Cancer Institute physicians working together to coordinate cancer treatment
- Access to a large number of cutting-edge clinical trials, through both cancer institutes
- Personalized cancer medicine including access to OHSU Knight Cancer Institute’s specialized diagnostic tests and Legacy’s specialized pathology and research

The OHSU Knight-Legacy Health Cancer Collaborative provides the most advanced cancer care throughout the community, in these locations:

- Legacy Comprehensive Cancer Center–Good Samaritan Medical Center (Northwest Portland)
- Legacy Mount Hood Medical Center (Gresham)
- Legacy Meridian Park Medical Center (Tualatin)
- OHSU Knight Cancer Institute Beaverton
- OHSU Knight Cancer Institute Radiation Medicine (Marquam Hill)

Community involvement 2015

Community events

March

Be the Match screening and registry (National Marrow Donor Program)

Breast Cancer Issues (Komen)

May

St. Baldrick's Day (pediatric cancer awareness)

June

Cancer Survivors Day (city-wide event)

July

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

October

"Making Strides" Walk (American Cancer Society)

"Worship in Pink" breast cancer awareness and screening promotion (Komen)

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

Prevention and screening education and activities

March

Colorectal cancer awareness and screening promotion activities for employees/visitors at Legacy Meridian Park, Legacy Good Samaritan and Legacy Mount Hood medical centers

Nutrition and Cancer (for breast cancer survivors)

May

Breast cancer risk reduction and screening awareness at Washington Square Mall

"Be a Natural Beauty" mother-daughter brunch (nutrition, environment and cancer)

October

Breast cancer awareness activities and education for employees and visitors at Legacy Meridian Park, Legacy Good Samaritan, Legacy Mount Hood and Legacy Salmon Creek medical centers

Ongoing

Lung cancer screening program for high-risk individuals

Free screening mammograms for uninsured or under-insured low-income women, through Oregon's Screenwise program (previously BCCP), at Legacy Good Samaritan, Legacy Emanuel, Legacy Meridian Park and Legacy Mount Hood medical centers

Grant-funded mammograms for underserved women, at Legacy Mount Hood and Legacy Salmon Creek medical centers

Ongoing groups and classes for cancer patients

Support groups

Brain Tumor Support Group

Breast Cancer Support Groups

Family Caregiver Support Group

Grief Support Groups

Gynecological Cancer Support Group

Head and Neck Cancer Support Group

Lymphedema Support Group

Prostate Cancer Support Group

Educational classes

Expressions of Healing

Felting Workshop

Gardening Workshop for Individuals with Cancer

Meditation for Cancer Patients

Words of Healing

Movement classes

Nia Mind/Body Exercise

Pilates for Individuals with Cancer

Qigong for Individuals with Cancer

Step into Fitness: Healthy lifestyle program

Yoga for Individuals with Cancer

Community outreach via social media

Legacy Health's Marketing and Community Relations department supports Legacy Cancer Institute community outreach by using digital tools such as social media channels and the Legacy Health website to engage and motivate readers toward healthy behaviors. For example, during a cancer awareness month, Facebook is used to provide prevention and wellness tips, screening promotion, treatment options and/or information about survivorship and support programs.

Professional education activities 2015

Conferences and courses

April

Stem Cell Transplantation — Biennial Conference (with OHSU)
 NW Tribal Clinician's Cancer Update (with NW Portland area Indian Health Board)
 Chemotherapy and Biotherapy Course for Pediatrics (APHON)
 Lung cancer: New approaches to screening and diagnosis (with OHSU)

May

32nd Annual Seminar for Radiation Oncology Professionals

October

Keith Hansen Visiting Professorship: Chronic liver disease
 11th Annual Pacific NW Excellence in Breast and Gynecologic Care

Grand Rounds (CME) topics

Legacy Good Samaritan oncology

Colorectal Cancer Screening 2015
 Surgical Treatment for Colorectal Cancer Liver Mets
 Renal Cell Carcinoma: An old malignancy
 Immunotherapy in Cancer: So much more than melanoma
 Neuro-Oncology Update
 Hodgkin Lymphoma — New Treatments
 A Melanoma Potpourri
 What's New in Head and Neck Oncology?
 Evolving Understanding of Ovarian Cancer
 Genomics in Medicine
 Thoracic Oncology 2015 — Musings of a surgeon
 Updates in Management of Gliomas

Legacy Good Samaritan integrative oncology

Refined Carbohydrates, Insulin Resistance, Nutritional Strategies
 Talking with Patients about Goals of Care
 Mindfulness in Health Care

Legacy Emanuel OB/GYN education

Cervical Cancer Screening in Resource-limited Settings
 I Thought We Cured Cervical Cancer!
 What Do You Mean, It's Not Ovarian? How Did it Get There?
 When Cells Go Flat — Squamous Cell Lesions

Legacy Meridian Park primary care

Hematology Update
 Lung Cancer in the Post-Genome Era
 Mind-Body Medicine: Applications in Oncology

Randall Children's Hospital pediatric emergency medicine

Recognizing Childhood Cancer: What are the red flags?

Legacy Salmon Creek Medical Center

Mind-Body Medicine: Applications in Oncology

CME on-demand modules

Thirteen past CME presentations were available "on demand" in 2015, covering a variety of oncology topics and with credits ranging from .5 to 1.25 CME credits per module.

Cancer patient care conferences (tumor boards)

Brain/CNS tumors (Legacy Emanuel)
 Breast care (Legacy Good Samaritan, Legacy Meridian Park, Legacy Mount Hood, Legacy Salmon Creek)
 Breast cancer radiology/pathology correlation (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)
 Pediatric oncology (Randall Children's Hospital)
 Thoracic tumors (Legacy Good Samaritan)
 Urologic/prostate tumors (Legacy Good Samaritan)

Publications 2015

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Glissmeyer, C.A., Johnson, W.E., Sherman, B., Glissmeyer, M., Garreau, J., Johnson, N. Effect of Paravertebral Nerve Blocks on Narcotic Use After Mastectomy with Reconstruction. *The American Journal of Surgery*, May 2015; 209(5): 881-883.

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Legacy Cancer Institute Network Cancer Committee members 2015

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

Kristin Burdick, M.D., palliative care, Legacy Palliative Care Medicine

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

Andrew Cox, M.D., interventional and diagnostic radiologist

Samir Desai, M.D., medical oncologist

Rick Freeman, chaplain, Legacy Good Samaritan Medical Center

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

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

Pamela Kilmurray, director, Legacy Cancer service line, Breast Health Centers, Legacy Hospice and Legacy Good Samaritan Medical Center Rehabilitation Services

Katherine Leonard, Ph.D., psychologist

Anthony Melaragno, M.D., vice president, Behavioral Health and Oncology, Legacy Health

Gail Mueller, BSN, R.N., CHPN, manager, Portland Hospice, Legacy Hospice

Dan Osborn, BSW, American Cancer Society patient navigator, Legacy Cancer Institute

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

Marci Reed, R.D., L.D., CSO, dietitian, Legacy Cancer Healing Center, Legacy Good Samaritan and Mount Hood medical centers

Kelly Rice, PharmD, oncology pharmacy navigator, Legacy Good Samaritan Medical Center

Alizah Rotramel, M.D., colorectal surgeon, Legacy Medical Group—Gastrointestinal Surgery, Legacy Good Samaritan Medical Center

Leslie Sorenson, CCRP, manager, Legacy Cancer Clinical Research and Genetics Services, Legacy Cancer Institute

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

Therese Tuohy, Ph.D., CGC, certified genetics counselor, Legacy Genetics Services

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

Gail Weisgerber, P.T., manager, Rehabilitation Services, Legacy Good Samaritan Medical Center

Dena Wellington, CSWA, social worker, Legacy Cancer Healing Center, Legacy Good Samaritan and Legacy Mount Hood medical centers

Joan Wendel, R.N., MSN, CBCN, AOCNS, oncology nurse navigator, Legacy Good Samaritan Medical Center

Charlyn Wilson, BSN, R.N., program coordinator, Legacy Cancer Services

Subcommittees of the Integrated Network Cancer Committee

Cancer Data Management Quality Committee
 Cancer Quality Advisory Council
 Cancer/Public Professional Education Council

Cancer Program and Quality Committees

Breast Program Leadership Committees at Legacy Good Samaritan, Legacy Meridian Park, Legacy Mount Hood and Legacy Salmon Creek medical centers

Cancer Healing Center Integrative Cancer Quality Committee

Cancer Marketing

Center for Colorectal Cancer at Legacy Good Samaritan Medical Center

Colorectal Cancer System-wide Quality and Operations Meeting

Head and Neck Program Development

Hospice Quality (QAPI)

Lung Cancer Screening Meeting

Radiation Oncology Quality Committee

Thoracic Program Development

Honors and accreditations 2015



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. The Commission also awarded Legacy's cancer program its Outstanding Achievement Award in the last two accreditation surveys.

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. Patients can receive the same award-winning care at any of our campuses, 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 Medical Group—Radiation Oncology at Legacy Good Samaritan, Legacy Mount Hood and Legacy Salmon Creek medical centers is accredited by the American College of Radiology (ACR) Radiation Oncology Practice Accreditation (ROPA) program. Legacy Health's radiation oncology staff, equipment, treatment-planning and treatment records, as well as patient-safety policies and quality control/quality assessment activities are assessed to maintain ROPA accreditation. ACR accreditation provides Legacy's radiation oncologists with valuable third-party, impartial peer review and evaluation of patient care.

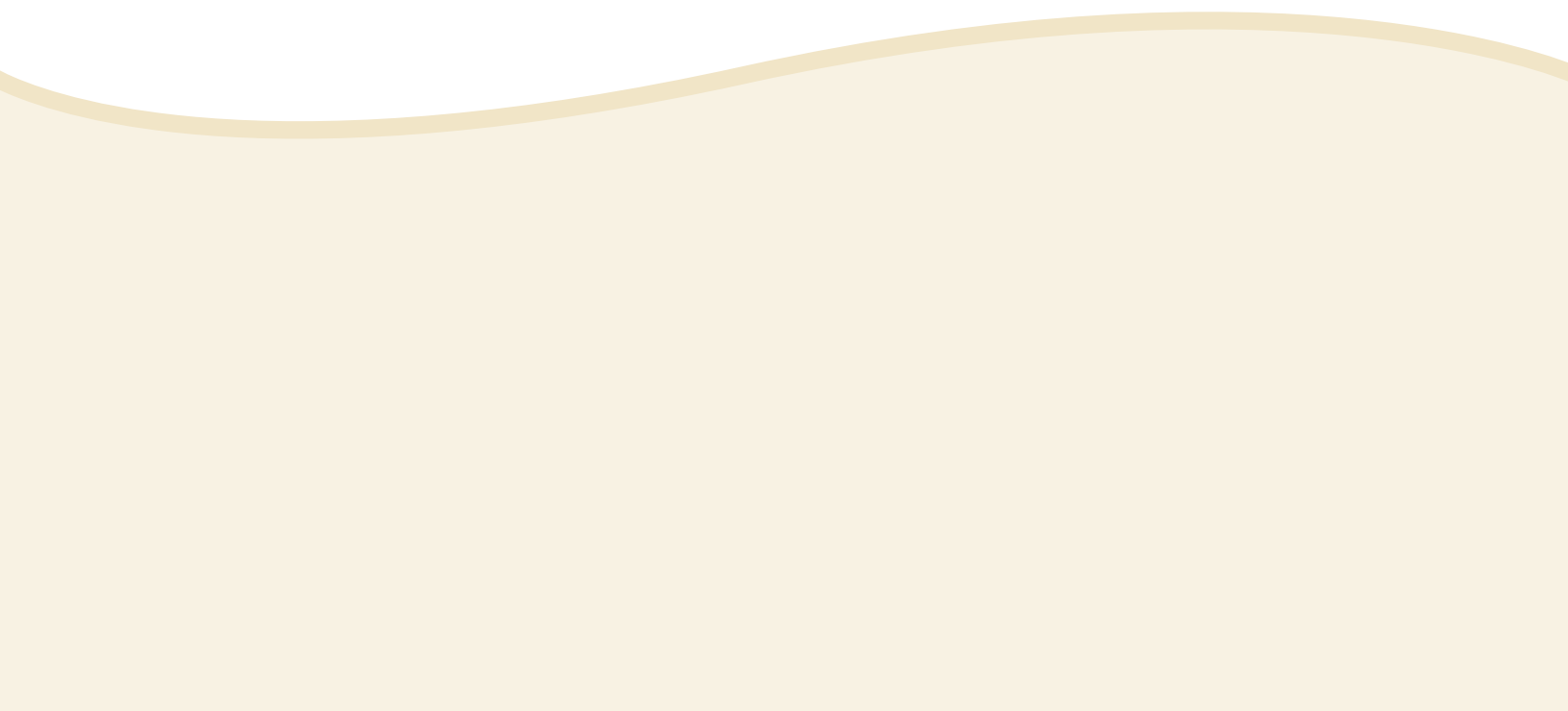


The Legacy Lung Cancer Screening Program at Legacy Good Samaritan Medical Center is accredited by the American College of Radiology (ACR) as an ACR Designated Lung Cancer Screening Center. To achieve this designation, the Legacy Lung Cancer Screening Program must maintain active ACR CT Accreditation in the ACR Chest Module and meet very specific requirements related to the screening population, staff qualifications, the ACR Lung Reporting and Data System (Lung-RADS), patient smoking cessation, CT equipment, quality control and imaging protocol.



Legacy laboratories and Legacy Tumor Bank have achieved College of American Pathologists (CAP) accreditation, which assures high standards for quality and consistency in collecting, processing and storing tumor specimens.

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

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www.legacyhealth.org/cancer



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