



2021 Statistical Report



Lehigh Valley Topper Cancer Institute Mission

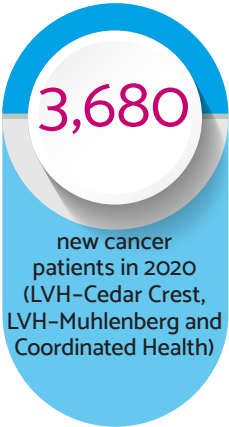
We ease our community's cancer burden by preventing cancer, finding cancer early, providing comprehensive diagnostic, consultative, treatment, support and survivorship services, and by educating health care professionals and residents of the communities we serve about advances in cancer care.

Welcome to Lehigh Valley Topper Cancer Institute's 2021 Annual Report, which features 2020 statistical data and insight into new innovations and programs in cancer care. The ongoing COVID-19 pandemic has continued to impact our entire health care delivery system more notably in how we provide safe services and care to our patients. Over the last year, our cancer program continued to adjust to the changing landscape of cancer care while continuing to provide safe patient access and services.

Lehigh Valley Topper Cancer Institute offers services in prevention, detection, diagnosis, genetics, patient navigation, nutrition, social and psychological support, rehabilitation, clinical trials, multidisciplinary and coordinated care, surgery, radiation therapy, chemotherapy, immunotherapy, hemophilia care, survivorship, palliative care and hospice support.

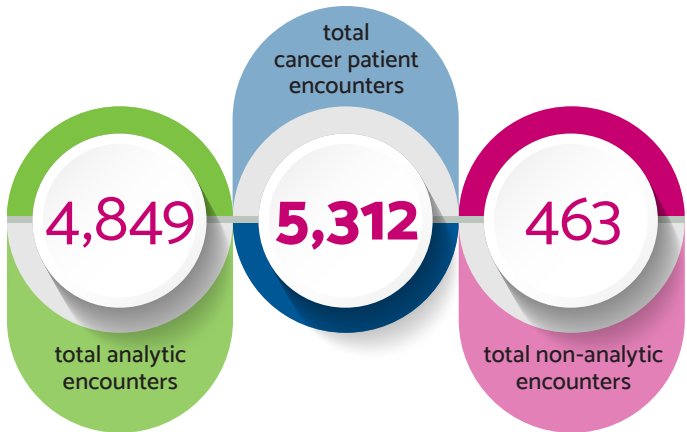
Lehigh Valley Topper Cancer Institute Case Information

Lehigh Valley Topper Cancer Institute offers a wide range of cancer services in convenient and patient-focused locations, namely the John and Dorothy Morgan Cancer Center at Lehigh Valley Hospital (LVH)–Cedar Crest and the Cancer Center at LVH–Muhlenberg and LVH–Hecktown Oaks. Patient care also is provided through Lehigh Valley Physician Group practice offices in Allentown, Bethlehem, Hazleton, Schuylkill and Lehigh. Breast Health Services is offered at 11 locations throughout the region, and now, for greater convenience, is offered through mobile mammography efforts. The faculty of Lehigh Valley Topper Cancer Institute is composed of cancer care specialists who are board certified in their fields. In 2020, 3,680 new cancer patients were seen in LVH–Cedar Crest, LVH–Muhlenberg and Coordinated Health. Meanwhile there were 291 new cancer patients in LVH–Hazleton and 288 in LVH–Schuylkill. Overall, there was a total of 5,312 cancer patient encounters in 2020.



Cancer Data Management

The Cancer Data Management Department of Lehigh Valley Topper Cancer Institute captures a complete summary of demographics, history, diagnosis, treatment and health status for every cancer patient who presents in our facilities. The data is abstracted and stored in a secured cancer registry database, a software information system designed for the collection, management and analysis of data on cancer patients, including those diagnosed with benign brain tumors and survivors. Also, the cancer registry is maintained with timely and accurate data to capture cancer incidence, evaluate treatment efficacy and determine survivorship. In turn, information is utilized by medical providers, as well as local, state and national agencies. This includes the Pennsylvania Cancer Registry (PCR), Department of Health, and Commission on Cancer's Rapid Cancer Reporting System (RCRS). Cancer Registry data provides important information to health care providers, researchers and public health officials looking to enhance and improve cancer treatment monitoring and advancements, research, and cancer screening and prevention programs.



Cancer Staging and Incidence Terminology

Cancer diagnosis, staging, incidence and treatment have a language of their own. Here are some commonly used terms and resources for more information:

AMERICAN JOINT COMMITTEE ON CANCER (AJCC) STAGING

A classification system used for describing the extent of disease progression based on evaluation of the tumor size/invasion (T), nodal status (N) and metastasis (M) at time of diagnosis. AJCC staging is important in determining treatment plans.

ANALYTIC CANCER CASE

Cases for which the facility provided the initial diagnosis of cancer and/or for which the facility contributed to all or part of the first course of treatment.

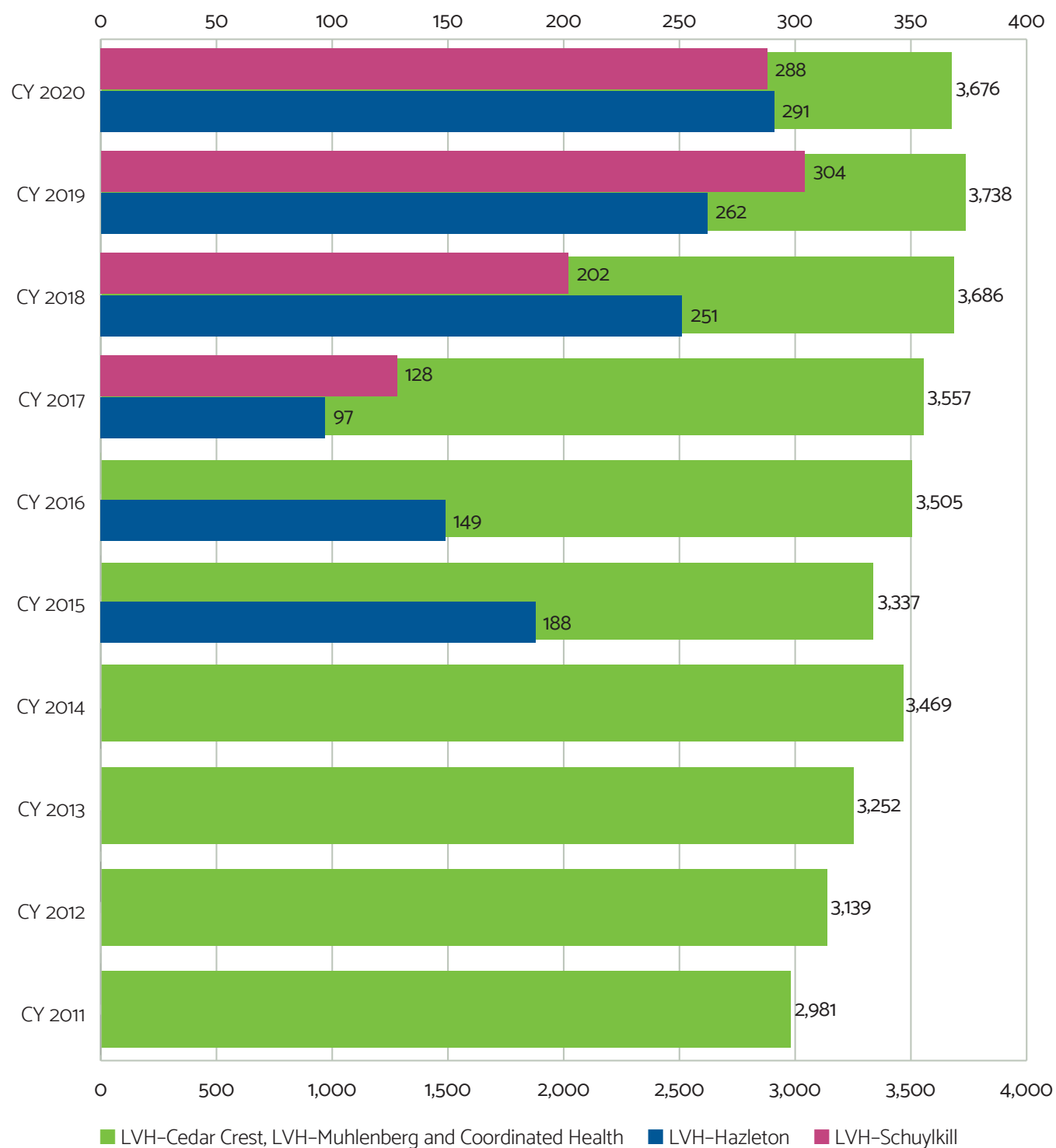
NATIONAL CANCER DATABASE (NCDB)

The NCDB, a joint project of the American Cancer Society and the Commission on Cancer, collects information on cancer cases diagnosed and/or treated at hospitals throughout the country. This non-patient-identified information is used to present scientifically reviewed descriptions of patient diagnosis, treatment and outcomes.

TOP FIVE CANCER PRIMARIES, LVH-CEDAR CREST, LVH-MUHLENBERG AND COORDINATED HEALTH (FIVE-YEAR COMPARISON)

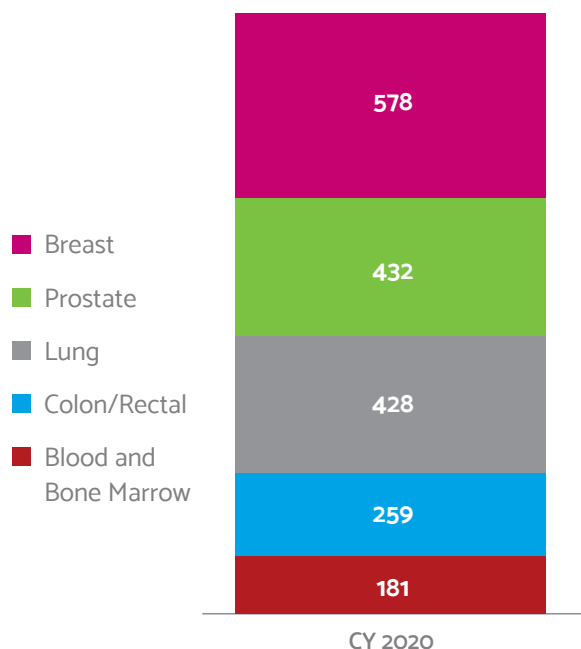
SITE DESCRIPTION	2016	2017	2018	2019	2020
BREAST	426	504	559	568	578
PROSTATE GLAND	274	290	377	410	432
BRONCHUS AND LUNG	411	446	471	479	428
COLORECTAL	300	267	281	266	259
BLOOD AND BONE MARROW	217	226	232	206	181
TOTAL	1,628	1,733	1,920	1,929	1,878

Total Annual Analytic Cases

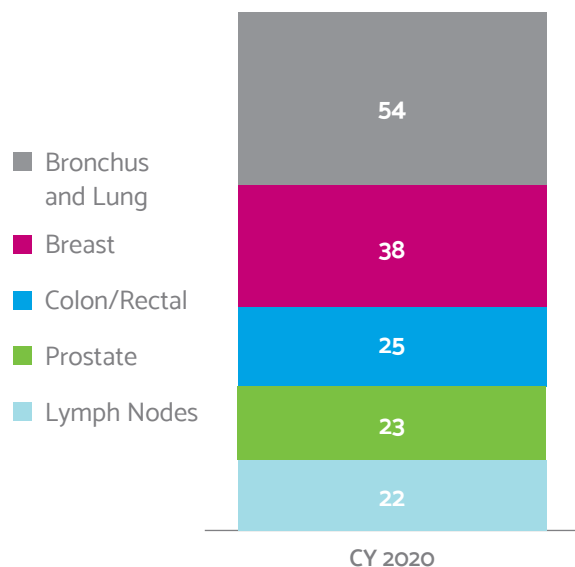


2020 Top Five Most Prevalent Sites of Cancer Treated at Lehigh Valley Health Network Regional Centers, 2020

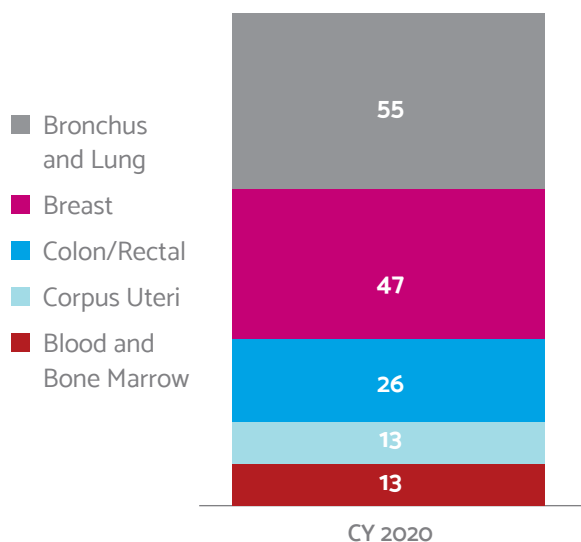
LVH-CEDAR CREST, LVH-MUHLENBERG AND COORDINATED HEALTH



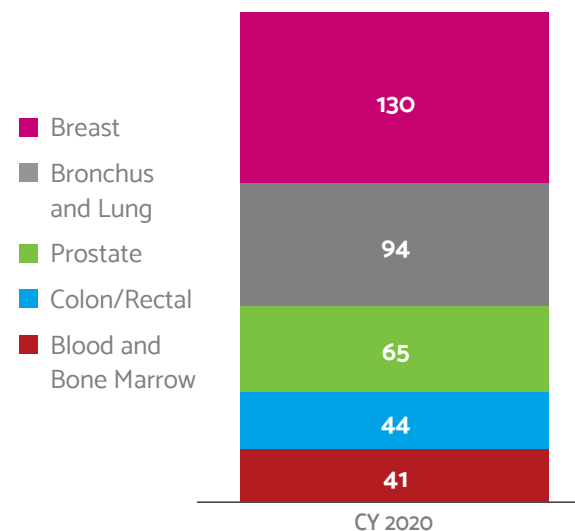
LVH-HAZLETON



LVH-SCHUYLKILL

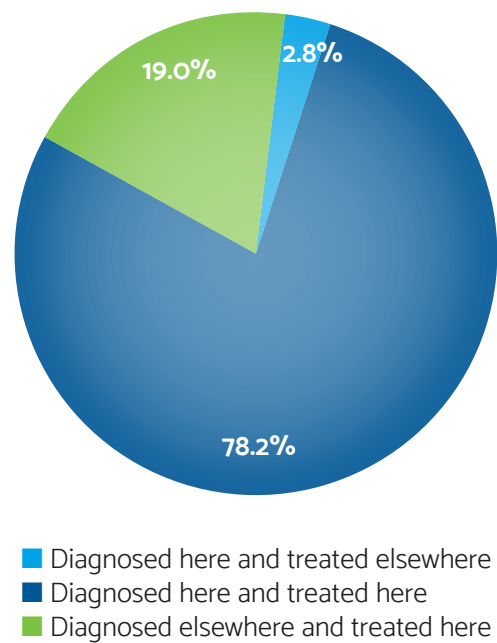


LVH-POCONO

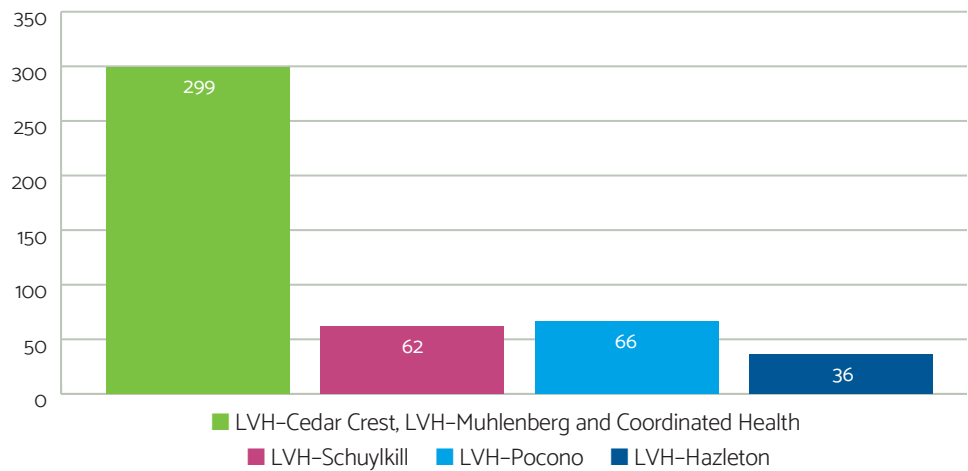


Case Classification Based on Patient Migration Patterns

ANALYTIC CASES, LVH-CEDAR CREST, LVH-MUHLENBERG AND COORDINATED HEALTH 2020



Non-Analytic* Class of Case Volumes by LVHN Facility, 2020



*Non-Analytic cases represent any of the following scenarios: patients who present at LVH after initial diagnosis and/or treatment elsewhere, and patient is referred for consultation, recurrence of cancer, or disease progression; pathology specimen only; Dx'ed and received all first course of treatment in a staff physician's office; or initially diagnosed at autopsy or death certificate.



Analytic Case Incidence by County of Residence Four-Year Comparison

Lehigh Valley Topper Cancer Institute (LVH-Cedar Crest, LVH-Muhlenberg and Coordinated Health) provides cancer care for patients in our community and serves as a tertiary referral center. In 2020, we provided diagnostic care, second opinion recommendations and treatment to more than **3,600** patients from **43** Pennsylvania counties. In addition, **70** patients came to our cancer program from communities across the United States.

COUNTY OF RESIDENCE	2017	2018	2019	2020
ADAMS	0	0	1	0
BEDFORD	0	0	0	1
BERKS	226	277	278	270
BRADFORD	0	3	0	0
BUCKS	45	55	50	44
BUTLER	0	0	1	0
CAMBRIA	1	0	1	0
CARBON	227	186	198	151
CENTRE	1	0	0	0
CHESTER	4	8	7	5
CLINTON	0	1	0	0
COLUMBIA	0	4	6	4
CUMBERLAND	1	1	1	1
DAUPHIN	1	1	0	1
DELAWARE	2	0	1	2
GREENE	0	1	0	0
INDIANA	0	0	1	0
JEFFERSON	0	2	0	0
LACKAWANNA	28	41	42	31
LANCASTER	3	0	1	0
LEBANON	1	0	1	1
LEHIGH	1,566	1,470	1,453	1,479
LUZERNE	133	153	170	177
LYCOMING	2	3	0	0
MONROE	154	151	155	144
MONTGOMERY	83	71	72	57
NORTHAMPTON	764	920	949	992
NORTHUMBERLAND	1	2	1	1
PERRY	0	0	1	0
PHILADELPHIA	3	1	1	1
PIKE	15	24	19	11
POTTER	0	1	0	0
SCHUYLKILL	204	228	269	222
SNYDER	0	0	0	1
SOMERSET	1	0	0	0
SULLIVAN	0	0	0	2
SUSQUEHANNA	2	5	2	2
UNION	0	0	1	0
TIOGA	1	2	0	0
VENANGO	0	1	0	0
WAYNE	10	13	11	7
WYOMING	5	3	3	3
YORK	0	1	0	0
OUT OF STATE	73	57	42	70
TOTAL	3,557	3,686	3,738	3,680

2020 Analytic Cases by Primary Body Site

LVH-CEDAR CREST, LVH-MUHLENBERG AND COORDINATED HEALTH

PRIMARY SITE	TOTAL
HEAD AND NECK	107
DIGESTIVE ORGANS	623
ESOPHAGUS	39
STOMACH	47
SMALL INTESTINE	26
COLON	173
RECTOSIGMOID JUNCTION	21
RECTUM	65
ANUS AND ANAL CANAL	14
LIVER AND BILE DUCTS	80
GALLBLADDER	7
OTHER BILIARY TRACT	13
PANCREAS	138
THORAX	436
BRONCHUS AND LUNG	428
THYMUS	6
HEART MEDIASTINUM PLEURA	2
MUSCULOSKELETAL/SOFT TISSUE SITES	21
BLOOD AND BONE MARROW	181
SKIN	141

PRIMARY SITE	TOTAL
BREAST	578
FEMALE GENITAL ORGANS	263
VULVA	18
VAGINA	3
CERVIX UTERI	22
CORPUS UTERI	174
UTERUS NOS	6
OVARY	36
OTHER FEMALE GENITAL ORGANS	4
MALE GENITAL ORGANS	455
PENIS	4
PROSTATE GLAND	432
TESTIS	19
URINARY TRACT ORGANS	308
KIDNEY	116
KIDNEY, RENAL PELVIS	5
URETER	5
URINARY BLADDER	168
OTHER AND UNSPECIFIED URINARY ORGANS	14

PRIMARY SITE	TOTAL
CENTRAL NERVOUS SYSTEM	167
MENINGES	91
BRAIN	57
OTHER NERVOUS SYSTEM	19
ENDOCRINE GLANDS	165
THYROID GLAND	148
OTHER ENDOCRINE GLANDS	17
OTHER ILL-DEFINED SITES	10
PERIPHERAL NERVES AND AUTONOMIC NERVOUS SYSTEM	1
RETROPERITONEUM AND PERITONEUM	9
LYMPH NODES	165
UNKNOWN PRIMARY	60
TOTAL ANALYTIC CASES	3,680

LVH-HAZLETON

PRIMARY SITE	TOTAL
HEAD AND NECK	6
DIGESTIVE ORGANS	57
BRONCHUS AND LUNG	54
MUSCULOSKELETAL/SOFT TISSUE SITES	7
BLOOD AND BONE MARROW	14
SKIN	2
BREAST	38
FEMALE GENITAL ORGANS	18
MALE GENITAL ORGANS	25
URINARY TRACT ORGANS	28
CENTRAL NERVOUS SYSTEM	9
ENDOCRINE GLANDS	8
LYMPH NODES	22
UNKNOWN PRIMARY	3
TOTAL ANALYTIC CASES	291

LVH-SCHUYLKILL

PRIMARY SITE	TOTAL
HEAD AND NECK	19
DIGESTIVE ORGANS	62
BRONCHUS AND LUNG/THORAX	57
MUSCULOSKELETAL/SOFT TISSUE SITES	3
BLOOD AND BONE MARROW	13
SKIN	5
BREAST	47
FEMALE GENITAL ORGANS	26
PROSTATE GLAND	5
URINARY TRACT ORGANS	18
CENTRAL NERVOUS SYSTEM	8
ENDOCRINE GLANDS	6
LYMPH NODES	10
UNKNOWN PRIMARY	9
TOTAL ANALYTIC CASES	288

#1 Breast Cancer

INCIDENCE OF BREAST CANCER BY AGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

AGE AT DIAGNOSIS	0-29	30-39	40-49	50-59	60-69	70-79	80-89	90-103	TOTAL
(N)	2	29	80	114	153	127	63	10	578

BREAST CANCER TREATMENT BY AJCC STAGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

TREATMENT	STAGE 0	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE UNK	LVHN TOTAL*	LVHN %
SURGERY + RADIATION + HORMONE THERAPY	30	142	2	1	1	24	200	38.2%
SURGERY + HORMONE THERAPY	13	40	0	3	0	16	72	13.7%
SURGERY ALONE	18	23	1	2	1	20	65	12.4%
SURGERY + CHEMOTHERAPY + RADIATION + HORMONE	0	22	6	5	0	0	33	6.3%
SURGERY + CHEMOTHERAPY + RADIATION + HORMONE + IMMUNOTHERAPY	0	5	0	0	0	2	7	1.3%
SURGERY + RADIATION	11	10	2	0	0	2	25	4.8%
SURGERY + CHEMOTHERAPY + RADIATION	0	17	0	1	0	0	18	3.4%
SURGERY + CHEMOTHERAPY + RADIATION + IMMUNOTHERAPY	0	2	0	0	0	1	3	0.6%
SURGERY + CHEMOTHERAPY	0	4	4	1	0	1	10	1.9%
SURGERY + CHEMOTHERAPY + HORMONE	0	7	4	2	1	1	15	2.9%
SURGERY + CHEMOTHERAPY + HORMONE + IMMUNOTHERAPY	0	5	0	0	0	0	5	1.0%
HORMONE THERAPY ALONE	0	7	0	0	7	1	15	2.9%
SURGERY + CHEMOTHERAPY + IMMUNOTHERAPY	0	1	3	1	1	0	6	1.1%
CHEMOTHERAPY + HORMONE	0	0	0	0	12	0	12	2.3%
CHEMOTHERAPY ALONE	0	3	0	0	0	0	3	0.6%
CHEMOTHERAPY + IMMUNOTHERAPY	0	0	2	1	4	0	7	1.3%
CHEMOTHERAPY + HORMONE + IMMUNOTHERAPY	1	1	1	1	1	0	5	1.0%
RADIATION + HORMONE	1	0	0	0	1	0	2	0.4%
RADIATION ALONE	0	1	0	0	0	1	2	0.4%
OTHER SPECIFIED THERAPY	0	2	0	0	0	0	2	0.4%
NO FIRST COURSE TREATMENT	1	4	0	3	5	4	17	3.2%
TOTAL	75	296	25	21	34	73	524	100%

*54 cases excluded due to Stage Classification Performed After Initial Multimodality Therapy.

†LVH Facility abbreviations: CC = Cedar Crest; M = Muhlenberg; CH = Coordinated Health

#2 Prostate Cancer

INCIDENCE OF PROSTATE CANCER BY AGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

AGE AT DIAGNOSIS	0-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100	TOTAL
(N)	0	0	4	63	198	137	28	2	432

PROSTATE CANCER TREATMENT BY AJCC STAGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

TREATMENT	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE UNK	LVHN TOTAL	LVHN %
SURGERY ALONE	24	55	37	4	10	130	30.1%
RADIATION + HORMONE THERAPY	0	50	29	9	9	97	22.5%
RADIATION ALONE	7	19	0	0	3	29	6.7%
HORMONE ALONE	0	5	2	14	3	24	5.6%
SURGERY + RADIATION + HORMONE THERAPY	0	2	7	6	0	15	3.5%
SURGERY + HORMONE THERAPY	0	4	3	4	0	11	2.5%
CHEMOTHERAPY + HORMONE THERAPY	0	0	0	3	0	3	0.7%
SURGERY + RADIATION THERAPY	0	0	2	0	0	2	0.5%
OTHER SPECIFIED THERAPY	0	2	1	1	0	4	0.9%
NO FIRST COURSE TREATMENT	55	32	4	3	23	117	27.1%
TOTAL	86	169	85	44	48	432	100%

†LVH Facility abbreviations: CC = Cedar Crest; M = Muhlenberg; CH = Coordinated Health

#3 Lung Cancer

INCIDENCE OF LUNG CANCER BY AGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

AGE AT DIAGNOSIS	0-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100	TOTAL
(N)	1	1	11	56	153	134	61	11	428

LUNG CANCER TREATMENT BY AJCC STAGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

TREATMENT	STAGE 0	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE UNK	STAGE NA	LVHN TOTAL	LVHN %
RADIATION THERAPY ALONE	1	55	2	1	23	3	1	86	20.1%
SURGERY ALONE	1	54	7	3	1	1	0	67	15.7%
CHEMOTHERAPY + RADIATION	0	2	4	39	14	0	1	60	14.0%
CHEMOTHERAPY + RADIATION + IMMUNOTHERAPY	0	2	2	8	18	0	1	31	7.2%
CHEMOTHERAPY + IMMUNOTHERAPY	0	0	0	3	24	1	0	28	6.5%
SURGERY + CHEMOTHERAPY	0	2	9	5	1	0	0	17	4.0%
IMMUNOTHERAPY ONLY	0	2	1	2	10	0	0	15	3.5%
RADIATION + IMMUNOTHERAPY	0	0	0	1	14	0	0	15	3.5%
CHEMOTHERAPY ONLY	0	0	0	4	10	0	0	14	3.3%
SURGERY + CHEMOTHERAPY + RADIATION	0	0	0	3	0	0	0	3	0.7%
HORMONE ALONE	0	0	0	0	3	0	0	3	0.7%
OTHER SPECIFIED THERAPY	1	0	1	0	4	0	0	6	1.4%
NO FIRST COURSE TREATMENT	0	21	5	14	40	3	0	83	19.4%
TOTAL	3	138	31	83	162	8	3	428	100%

†LVH Facility abbreviations: CC = Cedar Crest; M = Muhlenberg; CH = Coordinated Health

#4 Colon Cancer

INCIDENCE OF COLON CANCER BY AGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

AGE AT DIAGNOSIS	0-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100	TOTAL
(N)	0	1	17	39	39	56	36	6	194

COLON CANCER TREATMENT BY AJCC STAGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

TREATMENT	STAGE 0	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE UNK	STAGE NA	LVHN TOTAL	LVHN %
SURGERY ALONE	7	28	39	16	4	6	0	100	51.5%
SURGERY + CHEMOTHERAPY	0	1	4	28	8	0	1	42	21.6%
CHEMOTHERAPY + IMMUNOTHERAPY	0	0	0	0	8	0	0	8	4.1%
CHEMOTHERAPY ALONE	0	1	0	0	5	0	0	6	3.1%
SURGERY + CHEMOTHERAPY + IMMUNOTHERAPY	0	0	0	2	4	0	0	6	3.1%
SURGERY + CHEMOTHERAPY + RADIATION	0	0	1	1	1	0	0	3	1.5%
CHEMOTHERAPY + RADIATION	0	0	0	0	2	0	0	2	1.0%
SURGERY + HORMONE	0	0	0	0	1	0	0	1	0.5%
NO FIRST COURSE TREATMENT	0	3	0	0	13	10	0	26	13.4%
TOTAL	7	33	44	47	46	16	1	194	100%

†LVH Facility abbreviations: CC = Cedar Crest; M = Muhlenberg; CH = Coordinated Health

#4 Rectal Cancer

INCIDENCE OF RECTAL CANCER BY AGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

AGE AT DIAGNOSIS	0-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100	TOTAL
(N)	0	0	6	18	20	15	6	0	65

RECTAL CANCER TREATMENT BY AJCC STAGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

TREATMENT	STAGE 0	STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE UNK	*LVHN TOTAL	LVHN %
SURGERY ALONE	4	13	2	0	0	2	21	38.9%
SURGERY + CHEMOTHERAPY + RADIATION	0	0	5	4	1	0	10	18.5%
CHEMOTHERAPY + RADIATION	0	0	1	6	1	0	8	14.8%
CHEMOTHERAPY ALONE	0	0	0	1	4	0	5	9.3%
CHEMOTHERAPY + IMMUNOTHERAPY	0	0	0	1	4	0	5	9.3%
SURGERY + CHEMOTHERAPY	0	0	0	1	0	0	1	1.9%
SURGERY + RADIATION	0	0	0	1	0	0	1	1.9%
NO FIRST COURSE TREATMENT	0	0	1	2	0	0	3	5.6%
TOTAL	4	13	9	16	10	2	54	100%

*11 cases excluded due to Stage Classification Performed After Initial Multimodality Therapy.

†LVH Facility abbreviations: CC = Cedar Crest; M = Muhlenberg; CH = Coordinated Health

#5 Blood and Bone Marrow Cancer

INCIDENCE OF BLOOD AND BONE MARROW CANCER BY AGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

AGE AT DIAGNOSIS	0-9	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89	90-100	TOTAL
(N)	9	4	3	1	12	19	51	48	29	5	181

BLOOD AND BONE MARROW CANCER TREATMENT BY AJCC STAGE AT DIAGNOSIS: †LVH-CC, LVH-M AND CH 2020

FIRST COURSE	LVHN TOTAL	LVHN %
CHEMOTHERAPY ALONE	71	39.2%
CHEMOTHERAPY + HORMONE + IMMUNOTHERAPY	21	11.6%
CHEMOTHERAPY + IMMUNOTHERAPY	9	5.0%
CHEMOTHERAPY + RADIATION + HORMONE + IMMUNOTHERAPY	7	3.9%
CHEMOTHERAPY + HORMONE	6	3.3%
IMMUNOTHERAPY ALONE	5	2.8%
CHEMOTHERAPY + HORMONE + IMMUNOTHERAPY + STEM CELL TRANSPLANT	2	1.1%
CHEMOTHERAPY + STEM CELL TRANSPLANT	2	1.1%
CHEMOTHERAPY + RADIATION	2	1.1%
HORMONE + IMMUNOTHERAPY	2	1.1%
OTHER	3	1.7%
NO FIRST COURSE TREATMENT	51	28.2%
TOTAL	181	100%

†LVH Facility abbreviations: CC = Cedar Crest; M = Muhlenberg; CH = Coordinated Health



Lehigh Valley Cancer Institute Is Now Lehigh Valley Topper Cancer Institute

The renaming honors Joe and Maureen Topper, who made a generous gift that will be used to bring the most innovative and lifesaving clinical trials to this region.

Their gift also will complement network investments in advanced cancer treatments and technologies, including stem cell transplantation and cellular therapies. In addition, the gift will serve as a permanent source of funding for Lehigh Valley Topper Cancer Institute to attract, recruit and retain the best and brightest physicians, nurses and staff.

Lehigh Valley Topper Cancer Institute is one of only three cancer centers in the country participating in the Memorial Sloan Kettering (MSK) Cancer Alliance, which provides patients with additional lifesaving care options close to home.



Generous Gift Will Help Lehigh Valley Topper Cancer Institute Launch New Treatment Initiative

A generous gift from Tom and Karin Hall will support the launch of a stem cell transplant and cellular therapy program at Lehigh Valley Topper Cancer Institute. This program will be the first of its kind in the region and will allow eligible patients to receive these treatments for the first time in their own community.

The Halls' gift specifically will support the creation of an apheresis unit in the infusion suite, which will be used to collect stem cells from patients for transplants and other cellular therapy regimens. It also will be used to create a stem cell processing lab on-site at Lehigh Valley Hospital–Cedar Crest.

Historically, patients in need of these treatments have traveled outside their communities for care. They soon will be able to stay close to home as they undergo these difficult therapies, which is an immeasurable benefit.

Lehigh Valley Topper Cancer Institute has been a member of the Memorial Sloan Kettering Cancer Alliance since 2016, which has allowed the Cancer Institute to offer even more state-of-the-art treatments and clinical trials right here in the local community. Memorial Sloan Kettering Cancer Center is one of the largest centers for stem cell and bone marrow transplants in the country, and its partnership will provide great support throughout the launch of the stem cell transplant and cellular therapy program.

LVHN Offers Comprehensive Cancer Care at Lehigh Valley Hospital–Hecktown Oaks

In July 2021, Lehigh Valley Health Network (LVHN) opened its first newly built hospital in almost 50 years: Lehigh Valley Hospital (LVH)–Hecktown Oaks in Lower Nazareth Township, Northampton County.

The hospital campus is one of the newest locations for Lehigh Valley Topper Cancer Institute, which is housed in a dedicated 35,000-square-foot facility. Patients may access a full range of cancer services, including:

- Advanced imaging, such as 3D mammography, automated breast ultrasound, magnetic resonance imaging (MRI), positron emission tomography (PET) and computerized tomography (CT)
- Medical oncology
- Radiation oncology
- Genetic counseling
- Infusion and pharmacy services
- Access to clinical trials through the Memorial Sloan Kettering Cancer Alliance
- Breast surgery
- Multidisciplinary clinics

LVH–Hecktown Oaks was designed to prioritize patient comfort and convenience. In addition to the Cancer Institute, the campus is anchored by a 201,000-square-foot hospital building that features private patient rooms with natural light, state-of-the-art surgical suites and an emergency department with a dedicated pediatric area and separate entrance. A 61,000-square-foot medical office building houses primary care and specialty care services, including cardiac care, orthopedics and rehabilitation. The hospital also offers patients a healing garden, meditation room, market bistro, valet parking and smart car charging stations.

LVH–Hecktown Oaks features optimal safety and infection control measures, including Indigo-Clean lighting, rooftop HVAC units with HEPA filters and UV lights to control and eliminate the creation of bacteria. The campus even features bacteria-resistant flooring.



Site Preparation Started for Lehigh Valley Topper Cancer Institute at Lehigh Valley Hospital–Hazleton

A **new state-of-the-art cancer center** is coming to Lehigh Valley Hospital (LVH)–Hazleton in 2023, bringing more leading-edge cancer care services to the local community.

Demolition has begun on the building that formerly housed Hazleton General Hospital School of Nursing, and an official groundbreaking will take place later this year or early next year. When completed, the new cancer center will have three

floors and include physician practices, an infusion center and radiation oncology services. Currently, infusion services are provided at an off-site medical office, and patients needing radiation treatment must travel to other locations.

The new cancer center will be part of Lehigh Valley Topper Cancer Institute, which offers state-of-the-art cancer treatments and clinical trials to individuals within their own community.

Construction Advances at Lehigh Valley Hospital–Carbon

Construction of Lehigh Valley Hospital (LVH)–Carbon continues to advance, with hospital leaders anticipating a mid-2022 ribbon-cutting.

The 100,000-square-foot facility is now fully under roof, windows have been installed, and some early painting has been completed.

Construction of the \$80 million facility began early in 2021. Crews have been reshaping the landscape and parking areas, making the facility more visible from the adjacent Route 443. When complete, it will serve as Carbon County's newest hospital with state-of-the-art design and technology.

The new hospital will expand upon the services already offered in the area. Some of the services available at the hospital will include surgical care provided by Lehigh Valley Institute for Surgical Excellence, comprehensive heart care

through Lehigh Valley Heart and Vascular Institute and state-of-the-art cancer care through Lehigh Valley Topper Cancer Institute. Other specialized services, including neurology, endocrinology and pulmonology, will be available as well.

LVH–Carbon will feature 18 all-private hospital rooms with the capability of expanding to 36 beds. Additionally, LVH–Carbon will have a 12-bed emergency room (ER), two operating suites and two special procedure rooms.

The 24/7 ER will be staffed by the same physicians who work at LVH–Cedar Crest. LVH–Carbon will adjoin to an all-new medical office building being constructed as part of this hospital project. It will provide further convenience for patients by allowing them to visit their practitioner, have laboratory or imaging studies done, and access other services during the same visit.

Introducing Lehigh Valley Hospital–Dickson City

Lehigh Valley Hospital (LVH)–Dickson City will open in spring 2022 and span more than 100,000 square feet. The hospital is physically connected to the building that serves Coordinated Health Scranton Orthopedics. LVH–Dickson City will have an 18-bay emergency department and 24 private inpatient beds. There is also room for additional beds to be added in the future.

Lehigh Valley Institute for Surgical Excellence and Coordinated Health will bring nationally recognized quality surgical care to the region. Surgical and procedural programs that will be offered at this campus include spine, joint replacement, general orthopedic surgery, hand surgery, general surgery, ENT, urology, bariatric surgery and gastrointestinal surgery.





Delta Medix Joins Lehigh Valley Health Network

Delta Medix, Scranton area's leading specialty practice, became part of Lehigh Valley Physician Group (LVPG) Dec. 28, 2021.

WHAT'S IN STORE

Current Delta Medix patients won't see any substantial changes. They'll still see the same great doctors and medical staff at the same locations at Steamtown Mall and at the Center for Comprehensive Cancer Care on Morgan Highway.

While there won't be major changes, the Delta Medix move to LVPG means that patients will have easier access to:

Lehigh Valley Heart and Vascular Institute: With more than 50 years of heart surgery experience and the most experienced cardiologists and cardiac surgeons in the region, we offer specialized programs in women's heart health, sports cardiology, advanced heart failure technologies, peripheral vascular and venous care, and rhythm disturbance care.

Lehigh Valley Topper Cancer Institute: We offer the latest clinical trials, innovative treatments and advanced technologies provided by an extensive team of cancer care professionals, including more than 40 board-certified and board-eligible surgical, medical and radiation oncologists. This leading-edge cancer care is enhanced by our exclusive membership in the Memorial Sloan Kettering Cancer Alliance.

Lehigh Valley Institute for Surgical Excellence: People who require surgical treatment can be assured that our surgeons have the most experience in the region. Our emphasis on minimally invasive, leading-edge technologies, including robotic surgery, allows our patients to return to their work and regular activities more quickly.

Lehigh Valley Reilly Children's Hospital: With over 30 pediatric specialties, Breidegam Family Children's ER, child-focused cancer care and more, we're better prepared than anyone in the region to take care of kids and meet the rigorous criteria of the Children's Hospital Association.

Children's Hospital Hotline Connects Providers With Lehigh Valley Reilly Children's Hospital Specialists

Making a referral or consulting a specialist at Lehigh Valley Reilly Children's Hospital is now easier than ever with the Children's Hospital Hotline.

"The Children's Hospital Hotline was established in the summer of 2020 in response to the COVID-19 pandemic, when we were getting numerous calls from health care providers about multisystem inflammatory syndrome and related issues in children," says J. Nathan Hagstrom, MD, Physician in Chief, Lehigh Valley Reilly Children's Hospital. "We've kept it in place to give referring providers access to pediatric leaders who know the Lehigh Valley Health Network system and can put them in touch with the appropriate experts, no matter what the issue."

A group of pediatric hospitalists and pediatric intensivists, including Hagstrom, triage the calls.

The Children's Hospital offers more than 100 pediatric subspecialists and more than 30 pediatric specialties, including the following:

- Adolescent medicine
- Allergy and asthma care
- Anesthesia
- Burn care
- Cancer care
- Child-Life Program
- Child protection medicine
- Children's ExpressCARE
- Critical care medicine
- Developmental medicine
- Ear, nose and throat
- Emergency care
- Endocrinology
- Gastroenterology
- General pediatrics
- Hematology
- Hospital medicine
- Infectious diseases
- Neonatology
- Neurology
- Neurosurgery
- Ophthalmology
- Orthopedics
- Plastic and reconstructive surgery
- Psychiatry
- Pulmonology and cystic fibrosis care
- Radiology
- Rehabilitation
- Rheumatology
- School-based health
- Sleep disorders
- Sports medicine
- Surgery
- Urology





LVHN Now Offers State-of-the-Art Colonoscopy Care in Northampton County

At LVHN, we understand that colonoscopy screenings save lives. With the goal of offering our patients greater access to upper and lower endoscopy procedures, LVHN began a joint venture with Eastern Pennsylvania Gastroenterology and Liver Specialists (EPLS) in 2019.

LVHN, in partnership with EPLS, is now providing more convenient colonoscopy care for Northampton County residents at:

Nazareth Endoscopy Center at the Health Center at Easton, 2401 Northampton St., Easton.

LVHN partners with EPLS because its team has expertise in colon cancer screening. EPLS's physicians are fellowship trained and board certified, and along with their experienced support team, they specialize in upper and lower endoscopies, including screening and diagnostic colonoscopies.

In addition to Nazareth Endoscopy Center, EPLS's other location, Eastern Pennsylvania Endoscopy Center (EPEC), located at 1501 N. Cedar Crest Blvd., Allentown, also provides expert colonoscopy care.



LVHN's Commitment to Advancing Health Equity for All

Giving patients and colleagues the experience they expect and deserve begins with modeling LVHN's core values: compassion, integrity, collaboration and excellence. LVHN demonstrates a commitment to advancing health equity for individuals in the lesbian, gay, bisexual, transgender and queer or questioning (LGBTQ) community, and creates an inclusive work environment for all.

That commitment is once again receiving national recognition. In 2020, four LVHN hospitals received national recognition as "LGBTQ Health Care Equality Leaders" on the Human Rights Campaign's Healthcare Equality Index (HEI). This designation recognizes LVHN's commitment to advancing health equity for individuals in the LGBTQ community and creating an inclusive work environment for all colleagues.

We remain committed to providing compassionate, high-quality health care that meets the needs of all patients, including those in the LGBTQ community, by offering respect and inclusion for all orientations and identities.



Cancer Research and Clinical Trials

Cancer research at Lehigh Valley Topper Cancer Institute brings the latest advancements to patients, close to home. We offer a wide range of clinical trials for innovative treatments, and our decades of experience help keep patients safe while they receive promising new care options.

TRIALS	ADULTS	PEDS	TOTAL
Phase I	2	0	2
Phase II	40	7	47
Phase III	30	10	40
Expanded Access	2	0	2
Registry	4	0	4
Quality of Life	2	4	6
Registry/Biology	0	2	2
Biology	4	2	6
Total	84	25	109

LVHN Participated in Published Study That Demonstrates Ability of StrataNGS to Expand Proportion of Testable Tumor Tissue Samples

A newly published study involving hundreds of LVHN patients demonstrates significant progress in the amount of tumor tissue required for comprehensive genomic profiling (CGP).

Strata Oncology Inc., a precision oncology company advancing molecular indications for cancer therapies, announced the publication of the study in which more than double the number of tumor tissue samples met minimum tumor surface area (TSA) for genomic profiling. StrataNGS requires the lowest amount of tumor tissue of any CGP test currently available.

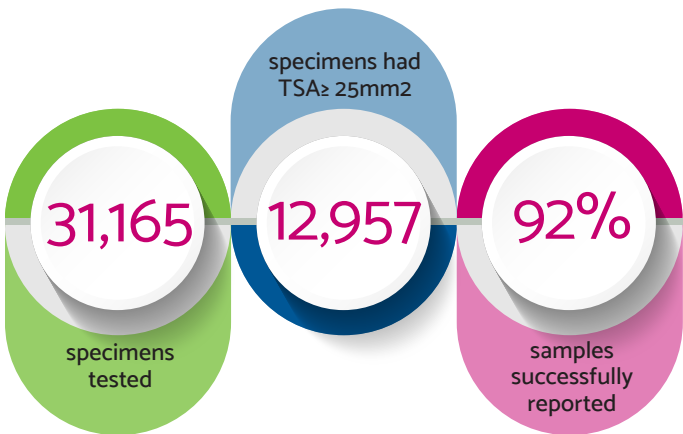
This new study published in JCO Precision Oncology presents an analysis of 32,048 consecutive tumor tissue samples received for StrataNGS testing as part of the Strata trial. The study demonstrates that the multiplex PCR-CGP StrataNGS testing, coupled with an inclusive exception testing policy, can increase patient access to CGP and significantly expand the impact of treatment.

ABOUT THE STUDY

- LVHN was among 28 U.S. health systems that participated in the clinical trial.
- Investigators characterized the attributes of more than 30,000 real-world tumor samples.

The study found:

- Of the 31,165 tested specimens, **10.7%** had low tumor content and **58.4%** were small.
- Only **41.6%** of samples (12,957 of 31,165) had TSA greater than or equal to 25mm², the minimum TSA requirement for several leading commercial hybrid capture based CGP tests. The results were similar for the testing at Lehigh Valley Topper Cancer Institute.
- **94%** of samples (29,302 of 31,165) were successfully reported by StrataNGS. At LVHN, more than 92% of tissue samples were successfully reported.



Cancer Clinical Trials Advance Fields of Personalized Medicine and Immunotherapy

Patients at Lehigh Valley Topper Cancer Institute have access to one of the largest portfolios of clinical trials available through a community health system.

Under the auspices of the Network Office of Research and Innovation (NORI) at LVHN, the Cancer Institute offers trials in all aspects of cancer care.

STRATA TRIAL

One such research study is the Strata trial, which involves performing advanced molecular profiling of tumor tissue, analyzing hundreds of gene mutations to determine a patient's eligibility for Food and Drug Administration (FDA)-approved therapies or biomarker-selected clinical trials.

Creating a molecular profile of a tumor can help determine whether a particular treatment is working, and in the future,

we may be able to use this tumor signature to develop customized treatments that are targeted to a patient's specific mutation.

The Strata trial is led by Strata Oncology Inc., a precision medicine company that created the Strata Precision Oncology Network, which consists of 18 leading health systems across the country.

MEMORIAL SLOAN KETTERING CANCER ALLIANCE IMMUNOTHERAPY TRIALS

Lehigh Valley Topper Cancer Institute is the only cancer center in the region that is a member of the Memorial Sloan Kettering Cancer Alliance, which gives patients access to a wide range of clinical trials utilizing immunotherapy.

Cancer Risk and Genetic Assessment Program

Lehigh Valley Topper Cancer Institute offers one of few programs in the region with the complete range of cancer genetics services, including cancer risk and genetic assessments. Our genetic counselors provide personalized recommendations to help patients know their risk for various types of cancer. We also partner with patients who have already received a cancer diagnosis to guide treatment decisions.

The Gregory and Lorraine Harper Cancer Risk and Genetic Assessment Program is comprised of three full-time certified licensed genetic counselors, a full-time graduate genetic counselor, a part-time nurse navigator, a nurse practitioner, an outreach coordinator, two clinical assistants and a medical director.

Patients who are interested in cancer risk assessment and genetic testing for hereditary cancer syndromes meet with a counselor for an in-depth evaluation of personal management,

family cancer history, cancer risk assessment and discussion of guidelines to reduce/prevent cancer.

Low- or no-cost testing options are available through testing lab financial assistance or research options. Referrals are received through the Epic electronic health record system or faxed through outside facilities.

Some of our current initiatives include:

- Working with the Network Office of Research and Innovation (NORI) and the Memorial Sloan Kettering Cancer Center Impact Part C study to identify patients with hereditary cancer syndromes using paired germline and somatic tumor testing.
- Expanding services to the new Lehigh Valley Hospital–Hecktown Oaks location.
- Collaborating with Breast Health Services to identify patients at high risk for a hereditary breast cancer syndrome.

FY 2021





Radiation Oncology







Lehigh Valley Topper Cancer Institute's nationally recognized radiation therapy program offers unparalleled expertise and leading-edge treatments. Our radiation oncologists are board certified and have treated thousands of patients, giving you the best chances for successful outcomes. We offer state-of-the-art technology and are focused on precise care, safety, quality of life and innovation.

Services provided:

- Six linear accelerators (LINACs)
- Stereotactic body radiotherapy
- SpaceOAR for prostatic radiotherapy treatment
- LINAC-based single fraction cranial radiosurgery
- Leksell Gamma Knife® Icon™
- Intensity-modulated radiation therapy (IMRT)
- Two large-bore 16-slice computed tomography simulators with the latest technology, including metal artifact reduction software
- High-dose and low-dose brachytherapy
- 3D treatment planning
- Image-guided radiation therapy (IGRT)
- Respiratory gating
- Prone breast radiation therapy
- Dose painting technique
- Pediatric radiation oncology
- Real-time imaging
- Varian Edge with six degrees of freedom tabletop
- Calypso Target Localization System
- Varian Edge Micro Multi-Leaf Collimators (MLC)
- Optical Surface Monitoring System (OSMS)

Breast Health Services at Lehigh Valley Topper Cancer Institute offers prevention-focused imaging technologies and world-class breast cancer care for individuals in all stages of life. As an American College of Radiology Accredited Center of Excellence, we use advanced imaging methods, such as 3D mammography, to detect breast cancer and other conditions in earlier, more treatable stages.

Breast Health Services offers many locations across the region, with some offering walk-in appointments. We also have a mobile mammography coach that travels into the community to provide screening mammograms to women across the region.

19 MAMMOGRAPHY UNITS	
1 MOBILE 3D MAMMOGRAPHY COACH	
7 DEDICATED BREAST ULTRASOUND BIOPSY UNITS	
2 AUTOMATED BREAST ULTRASOUND UNITS	
2 3D STEREOTACTIC BIOPSY UNITS	
11 MAMMOGRAPHY SITES (INCLUDING 1 MOBILE)	

2021

Category	Value
total mammograms	62,455
total 3D mammograms	55,976
total callbacks for all sites (including the mobile coach)	5,703
mobile mammography coach locations served	59
mobile mammography coach total patients screened	1,840





FAST BREAST MRI

A 10-minute breast magnetic resonance imaging (MRI) exam, Fast Breast MRI is now available at LVHN for women at intermediate risk for breast cancer.

Fast Breast MRI is an abbreviated version of a traditional contrast-enhanced breast MRI exam. Fewer images are obtained, resulting in a 10-minute test time (compared with 45 minutes for a traditional breast MRI) and faster interpretation of the results.

Recent studies demonstrate the effectiveness of Fast Breast MRI as a screening tool, particularly for women with dense breasts. Although Fast Breast MRI requires an intravenous injection of contrast agent, it does not involve radiation.

It is an alternative to Automated Breast Ultrasound (ABUS), which is the primary supplemental screening method for detecting breast cancer in dense breast tissue. While ABUS offers multiple planes of view, it also may produce more false positives than Fast Breast MRI.

However, while ABUS is typically covered by insurance, Fast Breast MRI is currently self-pay. Patients should check with their insurance for coverage.

LVHN OFFERS 3D ULTRASOUND MAMMOGRAPHY

Women with dense breast tissue have a new option for ultrasound, as Lehigh Valley Topper Cancer Institute is now offering an advanced 3D imaging technology called Automated Breast Ultrasound System (ABUS) 2.0.

The system is a supplemental screening technology approved by the Food and Drug Administration that is specifically designed to aid in the detection of breast cancer in dense breast tissue.

DENSE BREAST TISSUE

About 40% of women have breasts with a prevalence of fibroglandular tissue, which is denser than fatty breast tissue. Dense tissue is associated with an increased risk for breast cancer and can mask cancer because both fibroglandular areas and breast cancer appear white on scans.

Traditional 3D mammography remains valuable for women with dense breasts, but the ABUS system is a complementary service that provides additional detail for more accurate detection.

FASTER PROCEDURE, INCREASED ACCESS

The ABUS unit has the additional benefit of completing scans of all four quadrants of both breasts in about 15 minutes – much faster than the hour that a handheld ultrasound typically requires to cover the same areas.

The exam itself is relatively comfortable for patients, as the ABUS unit's transducer is easy to position, follows the natural contour of the breast with minimal compression and can be customized using a range of protocols for anatomical variations.

Augmented Reality Transforms Brain Surgery at LVHN

LVHN has acquired the **Surgical Theater XR**, a groundbreaking technology that uses extended reality (XR), virtual reality and augmented reality to support neurosurgeons in explaining surgical plans to patients, simulating multiple surgical approaches and navigating operations more easily.

The Surgical Theater technology involves software that pulls data from a patient's imaging studies to create 3D models of the patient's anatomy and pathology. When patients place the headset over their eyes, they are transported to a virtual replica of their own brain. The experience offers a visual explanation that is often easier to understand than medical terminology.

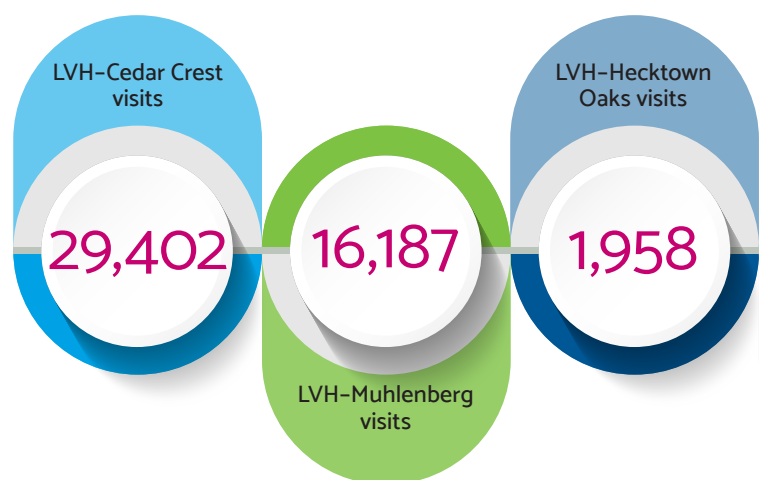
The technology also allows our brain surgeons to develop a detailed surgical plan by simulating different scenarios to find the best approach for upcoming procedures.



Infusion Services

Infusion therapy involves the delivery of fluids and medications into the body through a needle or catheter. At Lehigh Valley Topper Cancer Institute, specially educated nurses and pharmacists provide these services to patients at three convenient locations:

- 12 infusion bays at Lehigh Valley Hospital-Hecktown Oaks
- 24 infusion bays at Lehigh Valley Hospital-Muhlenberg's multipurpose area
- 38 infusion bays at Lehigh Valley Hospital-Cedar Crest's Tom and Karin Hall Center for Infusion and Cellular Therapies at John and Dorothy Morgan Cancer Center



**FY 2021 TOTAL NUMBER OF VISITS=47,547
COMPARED TO FY 2020=44,878**

Multidisciplinary Cancer Case Conferences

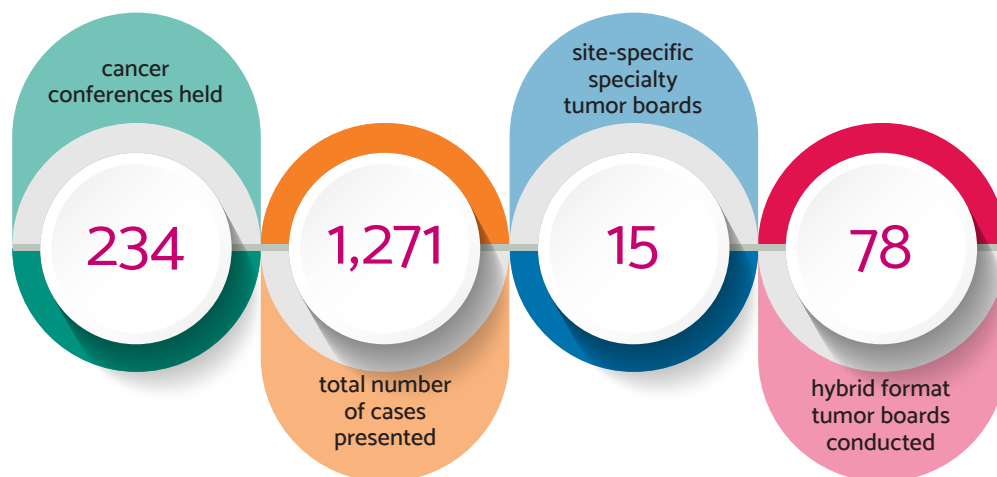
The **Cancer Data Management Department** organizes multidisciplinary cancer case conferences, also known as tumor boards. These are conferences involving multidisciplinary teams of providers and other allied health professionals who discuss and evaluate cancer cases and make treatment decisions and recommendations. This process results in improved clinical decision-making, clinical outcomes and overall patient experience.

Due to the COVID-19 pandemic, multidisciplinary cancer case conferences were shifted to a virtual format from early 2020 to late 2021. However, starting Sept. 15, 2021, these meetings transitioned to a hybrid format, allowing participants to attend virtually or in person. This format improved and increased access to the meetings and enhanced participation and engagement, which benefited our patients even more. As of December 2021, 78 tumor boards were conducted in the hybrid format (out of 234 total tumor boards).

SITE-SPECIFIC SPECIALTY TUMOR BOARDS

- Adolescent
- Breast
- Colon/rectal
- Ear, nose and throat
- Endocrine
- General
- Gynecologic oncology
- Hematology
- Hepatobiliary/upper gastrointestinal
- Neurology
- Pediatric oncology
- Pulmonary
- Rectal
- Skin/soft tissue
- Urology

CALENDAR YEAR 2021



Multidisciplinary Clinics

Multidisciplinary care clinics (MDCs) at Lehigh Valley Topper Cancer Institute allow various cancer specialists, including surgeons, radiation oncologists, medical oncologists and oncology nurse navigators, to bring their expertise together to develop personalized treatment plans for their patients. In addition, these clinics offer same-day diagnostics and screening services.

Over the last year, Lehigh Valley Topper Cancer Institute offered a variety of MDCs and had a total of **704** visits:

113 Thoracic visits

113 Breast visits

40 Genitourinary visits

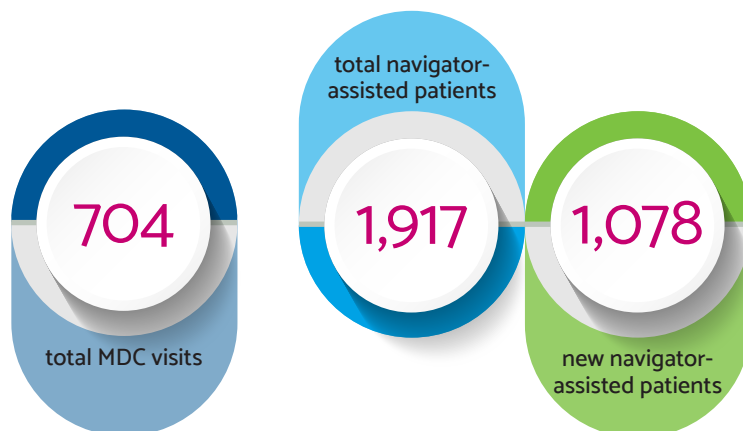
58 Upper gastrointestinal tract visits

48 Skin and soft tissue visits

21 Head and neck visits

32 Survivorship visits

279 Genetics visits



Patient Navigation

TOTAL MDC VISITS FY 2021	393
TOTAL SURVIVOR MDC VISITS FY 2021	32
NUMBER OF NEW NAVIGATED PATIENTS FY 2021	1,078
TOTAL NAVIGATOR-ASSISTED PATIENTS FY 2021	1,917
SOCIAL WORK NEW REFERRALS	808
SOCIAL WORK NEW ENCOUNTERS	2,399
REFERRAL TYPES SPECIFIC TO TRAVEL BARRIERS	371
% OF REFERRAL TYPES SPECIFIC TO TRAVEL BARRIERS	46%
REFERRAL TYPES SPECIFIC TO FINANCIAL BARRIERS (INCOME, MEDICAL INSURANCE, FAP)	389
% OF REFERRAL TYPES SPECIFIC TO FINANCIAL BARRIERS (INCOME, MEDICAL INSURANCE, FAP)	48%
PATIENT REFERRALS NON-NETWORK COMMUNITY-BASED FINANCIAL AID	102
PATIENT REFERRALS NON-NETWORK COMMUNITY-BASED FINANCIAL AID (DOLLAR AMOUNT)	\$51,639
PATIENT REFERRALS CANCER CENTER GRANT FUNDS	244
PATIENT REFERRALS CANCER CENTER GRANT FUNDS (DOLLAR AMOUNT)	\$62,461.45



Comprehensive Treatment Approach Targets Urologic Cancers

When patients present with possible signs of a urologic malignancy, such as an elevated prostate-specific antigen (PSA) level after routine prostate screening or a renal, bladder or testicular mass on imaging (with or without symptoms), the urologic cancer specialists at LVHN can offer a full complement of diagnostic and treatment options.

Through the comprehensive collaboration among Lehigh Valley Physician Group (LVPG) Urology, Lehigh Valley Topper Cancer Institute, and the Memorial Sloan Kettering Cancer Alliance, our patients receive high-quality care without having to travel far from home.

ADVANCED TREATMENT OPTIONS

An elevated PSA after routine prostate cancer screening is one of the most common reasons patients may require urologic oncology treatment.

Patients with an elevated PSA referred to LVPG Urology will undergo a physical exam, which may include a repeat PSA test or further risk stratification to determine whether an MRI/ultrasound fusion biopsy is needed. If a lesion is detected through advanced imaging, treatment is tailored based on the aggressiveness of the disease, which may include androgen deprivation therapy prior to radiation treatment, if necessary. However, a vast majority of men with nonaggressive prostate cancer will be recommended for active surveillance with PSA checks, imaging and subsequent biopsies instead of active treatment.

MULTIDISCIPLINARY APPROACH

Patients with aggressive or complex urologic cancer may be referred to the multidisciplinary team at Lehigh Valley Topper Cancer Institute, which includes urologic oncologists, radiation oncologists, medical oncologists, oncology nurse navigators, radiologists and pathologists who work together to develop individualized treatment plans for patients. They come to a consensus on treatment recommendations based on patients' ages, comorbidities, risk factors and risk for death from their cancer.

When treatment is needed, we offer the latest medical advancements, including neoadjuvant immunotherapy prior to surgery as well as cryoablation, robotic-assisted and laparoscopic minimally invasive surgical techniques and access to a wide network of clinical trials.



Advanced Visualizing System Enhances Robotic Surgery

Lehigh Valley Institute for Surgical Excellence has further enhanced its advanced robotic surgical technologies by becoming one of only three sites worldwide to be equipped with the IRIS anatomical visualization system. IRIS provides vivid 3D imaging of a patient's anatomy and can interface with LVHN's suite of da Vinci surgical system technologies.

COLOR-CODED IMAGES

The IRIS system is used at Lehigh Valley Hospital (LVH)–Cedar Crest for patients who need a partial nephrectomy (surgical removal of part of a kidney). Multidimensional, color-coded images from IRIS clearly define renal masses, blood vessels and structures of the kidney's collecting system – a stark difference from more typical black-and-white computed tomography (CT) scans.

IRIS also helps surgeons minimize warm ischemia time (WIT) as they temporarily “clamp” off blood supply to the kidney to reduce blood loss during the procedure. This is important, as minimizing WIT increases the chances that the remainder of the kidney will continue functioning.

PROCEDURE PLANNING AND PATIENT EDUCATION

IRIS allows images taken before the procedure to be rotated 360 degrees, which helps surgeons both plan the procedure and explain it to patients.

During surgery, a feature called Tilepro allows the presurgical image to appear picture-in-picture within the da Vinci system's live console view. IRIS promises to enhance surgical precision and reduce complications by helping surgeons avoid unnecessary cuts to blood vessels and collecting-system structures.



Next-Gen Robotic Bronchoscopy Platform Comes to LVHN

LVHN has acquired the Auris Monarch™ Robotic Bronchoscopy Platform, which makes it possible for specialists to biopsy lung nodules found incidentally or through screening, allowing earlier diagnosis and treatment.

LVHN is the first hospital network in the region to offer the advanced endoscopic technology.

GPS TECHNOLOGY TARGETS TUMORS

The Auris Monarch™ robotic platform uses a bronchoscope with a robotic navigational tip to localize any nodule in the lung for greater precision.

It allows lung specialists to biopsy lung nodules without watching and waiting, and risking the chance a malignancy will advance, which ultimately fast-tracks patients to diagnosis and treatment.

With this technology, clinicians also are able to biopsy any suspicious lymph nodes during the procedure, allowing them to not only diagnose lung cancer, but also stage it at the same time.

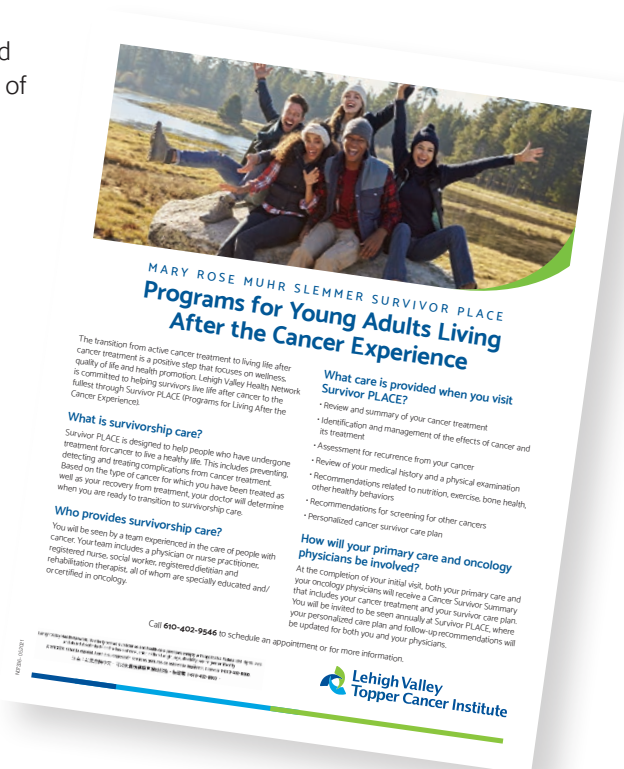
Cancer Program Annual Goal

Each calendar year, the Cancer Committee is required to establish and implement one clinical or programmatic goal to meet the requirement of the American College of Surgeons Commission on Cancer standards.

For 2021, our cancer goal was to establish the development of an adolescent and young adult (AYA) survivorship program, which resulted in the creation of Lehigh Valley Topper Cancer Institute's AYA Survivorship Clinic for patients age 18 to 39. The purpose of this program is to support adolescents and young adults through their cancer diagnosis and treatment journey. The specific services offered through the clinic include:

- Annual follow-up care
- Cancer risk and genetic assessment
- Counseling
- Financial coordination
- Nutrition services
- Physical rehabilitation
- Healthy You Program, which offers yoga, mindfulness, nutrition and other LVHN offerings that foster health and health awareness
- Connection to local cancer support communities and support groups

The first clinic was successfully conducted March 17, 2021, and as of September 2021, eight patients have been seen as part of the clinic. A website for the clinic was established to give patients easy access to various resources.



Evidence-Based Study

As a Commission on Cancer-accredited facility, Lehigh Valley Topper Cancer Institute complies with program standards and conducts an in-depth retrospective study of the diagnostic evaluation and treatment of patients to determine consistency with evidence-based guidelines.

For 2021, our evidence-based study focused on patients diagnosed with pancreatic adenocarcinomas in 2019 and reviewed consistency with the National Comprehensive Cancer Network's 2021 guidelines for work-up and treatment.

CASES REVIEWED	112
Cases met study requirements	86
Cases excluded due to treatments done elsewhere and different histology aside from adenocarcinoma	26

Recent Emergency and Intensive Care Department Renovations at Lehigh Valley Reilly Children's Hospital

When LVHN opened our original Children's Hospital in 2012 at Lehigh Valley Hospital-Cedar Crest, it was the first pediatric hospital in the region.

Numerous philanthropic gifts, including a major donation in 2018 from local business owners J.B. and Kathleen Reilly, have allowed us to renovate our facilities and offer additional services, which in turn has allowed us to provide the best possible care for children in our community. Some of our latest renovations include:

EXPANDED EMERGENCY ROOM

The Breidegam Family Children's ER treats nearly 22,000 children annually, almost double the number of patients as when it first opened. Highlights of the ER's recent renovation, made possible by the generous support of the Breidegam family, include:

- A dedicated entrance and waiting area, which includes a play area and family-friendly amenities.
- More treatment rooms (increased from 12 to 27), including a nine-bed fast-track area, 12-bed pediatric observation area, three resuscitation bays, behavioral health rooms and a dedicated resuscitation and procedure room.
- Dedicated pediatric-specific services, including X-ray, ultrasound and pediatric pharmacy support.
- Expanded physician and nursing staff, including multiple board-certified pediatric emergency physicians, who provide 24/7 coverage along with pediatric nurses and nurse practitioners.

LEADING-EDGE CRITICAL CARE SERVICES

As a Level II pediatric trauma center and a pediatric-verified regional burn center, Lehigh Valley Reilly Children's Hospital cares for more than 1,000 critically ill and injured patients annually. With philanthropic support from Jeffrey Paul and Grace Kathryn Feather, our expanded pediatric intensive care unit (PICU) enhances the hospital's ability to serve these patients.

The new PICU offers:

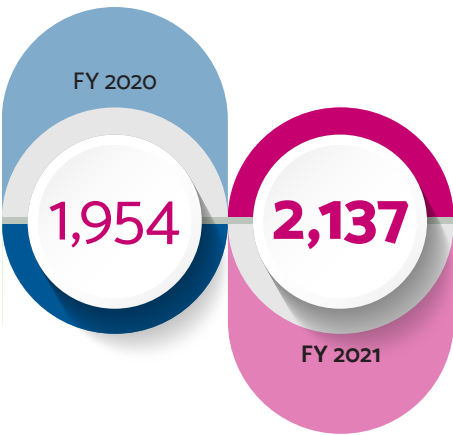
- 12 patient care rooms, including two negative pressure rooms, a bariatric-compliant room and rooms with expanded capability for dialysis treatment.
- A dedicated lounge/waiting area, which serves as a private space for families and visitors.
- Expanded staff (pediatric critical care physicians, nurses, respiratory care therapists and pediatric pharmacists) who provide in-house 24/7 coverage.



Counseling Services

Our licensed professional counselors, some of whom are bilingual (Spanish/English), support patients and families by assisting with identifying goals and potential solutions to problems related to cancer diagnoses.

COUNSELING VISITS WITH LICENSED COUNSELORS

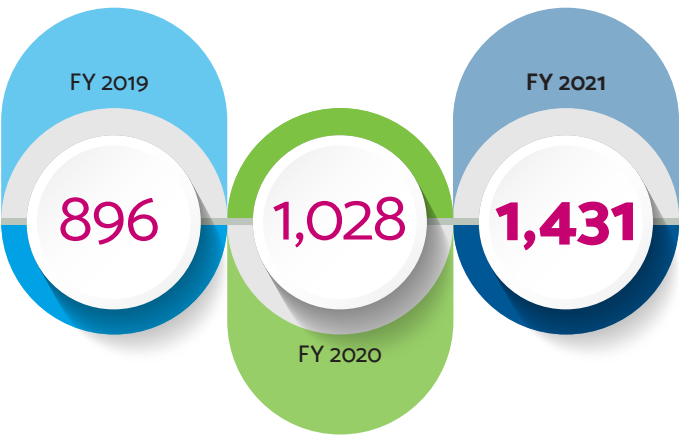


This is a 9% increase from FY 2020 to FY 2021. Our social workers have continued to adjust their schedules accordingly to meet and accommodate the demand of counseling services needed. Due to continued concerns related to COVID-19, counseling visits continue to be conducted via telephone and virtual platforms. The monthly average for FY 2021 was 178 visits.

SUPPORT GROUP ATTENDANCE:

YEAR	SOS BREAST CANCER SURVIVORS	METASTATIC BREAST	PROSTATE
FY 2021	8	11	71
FY 2020	45	18	91
PERCENT DECREASE IN FY 2021	82%	39%	22%

LYMPHEDEMA REFERRALS



Cancer Rehabilitation Services

Cancer rehabilitation programs can often improve function, reduce pain and improve the overall well-being of patients who are experiencing the challenges of a cancer-related diagnosis. LVHN Rehabilitation Services offers comprehensive care to patients in our community throughout their cancer journey.

Services are available to patients through the continuum of care, beginning at the time of diagnosis and continuing throughout treatment and surveillance, or through end of life.

Services are available in eight counties. Preventive, restorative, supportive and palliative interventions through multiple levels of care are offered. A seamless model of care is offered from any provider at any level of care with the continuum from bedside, fall prevention and home safety. Services are available seven days a week, 365 days a year.

Our hours have been expanded to provide proper distancing during the ongoing COVID-19 pandemic. Video and home visits are also available.

Palliative Care Services

Palliative care is specialized medical support for people living with a serious illness. This type of care is focused on providing relief from the symptoms and stress of a serious illness. The goal is to improve quality of life for both patients and their family members.


Care is provided by a specially educated team of doctors, nurses and other specialists who work together with a patient's other doctors to provide an extra layer of support.

Palliative care is based on the needs of the patient, not on the patient's prognosis. It is also appropriate at any age and at any stage of a serious illness, and it can be provided along with curative treatment.

OACIS/Palliative Medicine can assist with:

- Medical collaboration and management across the care continuum
- Clarification of care and treatment goals
- Advance care planning
- Self-management goals
- Complex symptom management
- Complex communication
- Preventive care planning
- Communication and collaboration with oncologists and primary care physicians
- Exploring psychosocial and spiritual needs

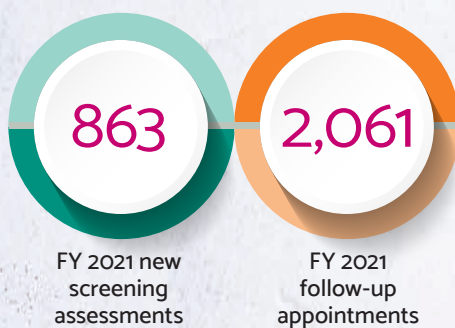
Our services are provided in a hospital setting, the cancer center or at home. We are there to help coordinate with your physician and members of your health care team to determine the kind of care you want.



Nutrition Counseling

Lehigh Valley Topper Cancer Institute offers patients access to registered dietitian nutritionists (RDNs), who are uniquely trained to assist patients and their families in managing treatment-related nutrition concerns. They can address patient needs and goals as well as provide strategies to achieve them before, during and after treatment.

Our RDNs provide screening assessment for risk and diagnosis of malnutrition, nutrition-related problems and obesity, as well as offer medical nutrition therapy, nutrition counseling, nutrition education and management, and coordination of enteral and parental nutrition. They also offer their expertise to community outreach programs through presentations, cooking demonstrations and participation in health fairs for survivorship, health promotion and disease prevention.



Financial Coordination

There are eight financial coordinators who assist patients at LVH–Cedar Crest and LVH–Muhlenberg in reducing financial barriers to care. Financial coordinators assist with precertification requirements, health insurance and medical bills, as well as help patients navigate the complexities of health insurance and community resources. Our financial coordinators also help patients receive free or reduced-cost services from supporting agencies.

FISCAL YEAR	ORAL MEDICATIONS ASSISTANCE OBTAINED	PATIENTS HELPED ORAL MEDICATIONS	FAP PATIENTS HELPED CHARITY	PATHS PATIENTS REFERRED
2012	\$3,590,246	257	666	294
2013	\$4,366,205	202	749	294
2014	\$3,388,420	152	725	237
2015	\$3,058,370	109	655	221
2016	\$4,380,076	155	590	223
2017	\$5,419,690	176	577	220
2018	\$5,114,294	296	615	214
2019	\$7,805,256	299	616	130
2020	\$13,188,581	344	562	144
2021	\$17,559,634	311	626	122

Oncology Social Work

Social workers are an integral part of the cancer care team, providing assistance to patients who need support and access to resources. Oncology social workers provide individual counseling and assistance locating other services. Social workers are also able to advocate on behalf of their patients through multiple grant-funded programs.

2021 Statistics Lehigh Valley Topper Cancer Institute Grants and Funds

SOURCE	AMOUNT	NUMBER OF INDIVIDUALS SERVED
FALLBACK GRANT (W5K)	\$3,110.82	14 WOMEN
TRAVEL (W5K)	\$511.43	10 WOMEN
PRAGER FUND	\$30,927.35	141 INDIVIDUALS
PINK RIBBON FUND	\$21,047.02	51 WOMEN, 1 MAN
COURTNEY FUND	\$6,022.38	17 INDIVIDUALS (COLON/RECTAL)
CANCER FUND	\$786.45	6 INDIVIDUALS
BUS PASSES	\$56.00	4 INDIVIDUALS
TOTAL	\$62,461.45	244

Cancer Awareness and Educational Events

Each year, Lehigh Valley Topper Cancer Institute hosts events regarding cancer prevention and screening.

PINK OUT AT LEHIGH VALLEY HOSPITAL-HECKTOWN OAKS

Oct. 21, 2021

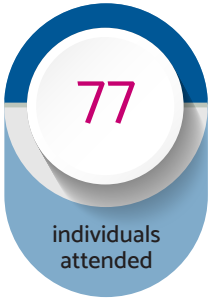
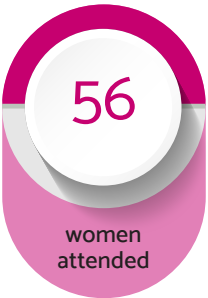
Providers from Lehigh Valley Topper Cancer Institute and LVHN shared important information regarding breast cancer and overall breast/women's health. Fifty-six attendees had the opportunity to visit multiple resource tables for information on nutrition, genetics, cardio-oncology, breast health services, clinical trials and sexual health. Various physicians also presented on the latest updates in their specialties. The mobile mammography coach offered walk-in mammograms on-site, and three women were screened.



COLON-RECTAL CANCER VIRTUAL COMMUNITY FORUM

March 20, 2021

Lehigh Valley Topper Cancer Institute held this event to educate community members on cancer risks, behavioral changes that can reduce their risk and screening opportunities. Various clinicians presented on a variety of topics, including screening (specifically colonoscopies), prevention and nutrition. There was also a question-and-answer panel after the presentations. In total, 77 individuals attended the event.



Patient and Family Advisory Council

The Patient and Family Advisory Council (PFAC)'s goal is to advise, guide and collaborate with Lehigh Valley Topper Cancer Institute leadership to develop, improve and maintain high-quality patient- and family-centered care. The group is comprised of patients, family members of cancer patients (who have met LVHN Volunteer Services qualifications) as well as Cancer Institute staff and physicians.

FY 2021 ACHIEVEMENTS

In 2021, PFAC:

- Continued participating in the design of the healing garden at the new Lehigh Valley Hospital-Hecktown Oaks campus
- Participated in the Patient Education Committee
- Designed and instituted a cancer patient guide for new patients
- Streamlined a new patient education folder
- Participated in a review of the nurse navigation role and the future referral process



Hackerman-Patz House Celebrates 10 Years

For the past decade, Hackerman-Patz House has been a home away from home for patients and families receiving care at LVHN.

TEN YEARS OF COMFORT

Hackerman-Patz House opened its doors July 18, 2011. Located on the campus of Lehigh Valley Hospital (LVH)-Cedar Crest, the family lodging center offers patients and families a convenient, inexpensive place to rest.

The nightly rate of just \$45 per room has not changed in six years. The building has 20 private rooms, a shared kitchen, laundry facilities, an outdoor garden space, a playroom for children and a great room for relaxing and making friends. Toiletries and pantry items are all donated.

A GIFT TO THE COMMUNITY

This "home away from home" was made possible by a \$2 million gift from the late Willard Hackerman, president and CEO of Baltimore's Whiting-Turner Contracting Company. While managing the construction of the Kasych Family Pavilion, Willard and his wife, Lillian Patz-Hackerman, admired the health network's warm and welcoming spirit. Therefore, they decided to build a Hackerman-Patz House here, the first outside the Baltimore area.

SUPPORT FOR ANYONE, FROM ANYWHERE

In its first year of operation, Hackerman-Patz House served 1,300 guests. Since then, more than 100,000 guests from all over the United States and the world have visited. Some guests have loved ones hospitalized in critical care units. Others are awaiting an adopted child to be born or undergoing chemotherapy and radiation treatments.

When Hackerman-Patz House opened, it was exclusively for people who lived more than 30 miles away. But the distance requirement has since been dropped. Today, rooms are in demand. The house is filled to capacity nearly 75% of the time. Throughout the pandemic, rooms also have been made available to hospital staff.



2021 PUBLICATIONS

PHYSICIAN SUBMISSIONS

Roberto Fratomico, MD

2021 ASCO Gastrointestinal Cancers Symposium Abstract Submission

Abstract 322527: Evaluating the Clinical Impact of Primary Tumor Location in Pancreatic Adenocarcinoma.

Authors: Randi Zukas, Ida Micaily, Roberto Stefan Fratomico, Constantine Daskalakis, Sophia Lam, Steven J. Cohen, Atrayee Basu Mallick; Thomas Jefferson University Hospital, Philadelphia, Pa.; Thomas Jefferson University, Philadelphia, Pa.; Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, Pa.; Jefferson Health System/ Abington Memorial Hospital, Abington, Pa.; NSABP Foundation and Thomas Jefferson University Hospital, Philadelphia, Pa.

Ranju Gupta, MD

Kalter JA, Gupta R, Greenberg MR, Miller AJ, Allen J. Hyperhemolysis Syndrome in a Patient with Sickle Cell Disease: A Case Report. Clin Pract Cases Emerg Med. 2021 Feb;5(1):101-104. doi: 10.5811/cpcem.2020.12.50349. Clin Pract Cases Emerg Med. 2021. PMID: 33560964

Rachel Kinney, MD

Kinney R, Khalil M. Neoadjuvant immunotherapy in microsatellite-unstable non-metastatic colorectal cancer: A single-institute experience and review of the literature. Clinical Colorectal Cancer (Accepted, pending publication).

Kinney R, Decker R, Rizvi M, et al. Neuroendocrine tumor with cardiac metastasis: Case report and review of the literature. Front Cardiovasc Med/Cario-Oncology (Accepted, pending publication).

Skutnik E, Kinney R, Lopes R, Siu C, Magdaleno A, Perilli G. The Difficulty of Post-Operative Surveillance of Calcitonin Negative Medullary Thyroid Cancer. J Endocr Soc. 2021;5 (Suppl 1):A901. Published 2021 May 3. doi:10.1210/jendso/bvab048.1839

Bradley Lash, MD

Ortiz-Otero N, Marshall JR, Lash BW, King MR. (2020). Platelet mediated TRAIL delivery for efficiently targeting circulating tumor cells. Nanoscale Advances. 2.10.1039/D0NA00271B.

Ortiz-Otero N, Marshall JR, Lash B, King MR. Chemotherapy-induced release of circulating-tumor cells into the bloodstream in collective migration units with cancer-associated fibroblasts in metastatic cancer patients. BMC Cancer. 2020 Sep 11;20(1):873. doi: 10.1186/s12885-020-07376-1. PMID: 32917154; PMCID: PMC7488506.

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Zafar MU, Tarar Z, Ghous G, Farooq U, Lash BW. Effect of acute kidney injury on hospital-based outcomes in patients with multiple myeloma. DOI:10.1200/JCO.2021.39.15. suppl 320006 – published online before print May 28, 2021.

Jafarizade M, Goli K, D'Agati V, Dulaimi E, Daniel K, Lash B, Maynard S. Light chain cast nephropathy caused by plasmablastic lymphoma of the bladder. Clin Nephrol Case Stud. 2021 Jul 1;9:72-80. doi: 10.5414/CNCS110339. PMID: 34235044; PMCID: PMC8259465.

Siu CT, Wolfe Z, DelaTorre M, Rehim E, Decker R, Zaffiri K, Lash B. Evaluation of thrombophilia testing in the inpatient setting: A single institution retrospective review. PLoS One. 2021 Sep 20;16(9):e0257687. doi: 10.1371/journal.pone.0257687. PMID: 34543355; PMCID: PMC8452015.

Ahmed Nadeem, DO

Aleem A, Nadeem AJ. Coronavirus (COVID-19) Vaccine-Induced Immune Thrombotic Thrombocytopenia (VITT) [Updated 2021 Jul 18]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK570605/>

Suresh Nair, MD

Sinicope FA, Shi Q, Smyrk TC, Goldberg RM, Cohen SJ, Gill S, Kahlenberg MS, Nair S, Shield AF, Jahagirdar BN, Jacobson SB, Foster NR, Pollak MN, Alberts SR. Association of adiponectin and vitamin D with tumor infiltrating lymphocytes and survival in stage III colon cancer. *JNCI Cancer Spectr.* 2021 Jul 23;5(5):pkab070. doi: 10.1093/jncics/pkab070. PMID: 34485815; PMCID: PMC841014.

Wang S, Zhou Y, Qin X, Nair S, Huang X, Lui Y. Label-free detection of rare circulating tumor cells by image analysis and machine learning. *Sci Rep.* 2020 Jul 22;10(1):12226. Doi: 10.1038/s41598-020-69056. PMID: 32699281; PMCID: PMC7376046.

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Usman Shah, MD

Heinz-Josef Lenz, Sara Lonardi, Vittorina Zagonel, Eric Van Cutsem, M. Luisa Limon, Mark Wong, Alain Hendlitz, Massimo Aglietta, Pilar Garcia-Alfonso, Bart Neyns, Fabio Gelsomino, Dana Backlund Cardin, Tomislav Dragovich, Usman Shah, Jing Yang, Jean-Marie Ledezine, and Michael J. Overman. Nivolumab (NIVO) + low-dose ipilimumab (IPI) as first-line (1L) therapy in microsatellite instability-high/mismatch repair-deficient (MSI-H/dMMR) metastatic colorectal cancer (mCRC): Two-year clinical update. *Journal of Clinical Oncology* 2020 38:15_suppl, 4040-4040. DOI: 10.1200/JCO.2020.38.15_suppl.4040

Zachary Wolfe, MD

Siu CT, Wolfe Z, DeLaTorre M, Rehim E, Decker R, et al. (2021) Evaluation of thrombophilia testing in the inpatient setting: A single institution retrospective review. *PLOS ONE* 16(9): e0257687. <https://doi.org/10.1371/journal.pone.0257687>

NURSING SUBMISSIONS

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Colabroy D. Adolescent and young adult cancer survivors: Development of an interprofessional survivorship clinic (April 2021). *Clinical Journal of Oncology Nursing*, 25(2), 133-136.

Lehigh Valley Topper Cancer Institute Locations

Lehigh Valley Topper Cancer Institute offers a range of services in convenient, patient-focused locations.

Lehigh Valley Physician Group (LVPG) practices provide services in Allentown, Bangor, Bethlehem, East Stroudsburg, Hazleton, Lehighton and Pottsville.

LEHIGH VALLEY TOPPER CANCER INSTITUTE

- John and Dorothy Morgan Cancer Center at Lehigh Valley Hospital–Cedar Crest
- LVHN Cancer Center at Lehigh Valley Hospital–Muhlenberg
- LVHN Cancer Center–Hazleton
- LVHN Cancer Center–Hecktown Oaks
- LVHN Cancer Center–Schuylkill
- Dale and Frances Hughes Cancer Center at Lehigh Valley Hospital–Pocono
- Health Center at Bangor
- LVPG Hematology Oncology–Lehighton

BREAST HEALTH SERVICES

- Lehigh Valley Health Network–Delta Medix
- Lehigh Valley Hospital–17th Street
- Lehigh Valley Hospital–Cedar Crest
- Lehigh Valley Hospital–Hecktown Oaks
- Lehigh Valley Hospital–Muhlenberg
- Health Center at Bangor
- Health Center at Bartonsville
- Health Center at Bath
- Health Center at Bethlehem Township
- Health Center at Moselem Springs
- Health Center at Trexlertown
- Health & Wellness Center at Hazleton
- Lehigh Valley Hospital–Pocono
- Lehigh Valley Hospital–Schuylkill
- LVHN Imaging Center
- Carbon Plaza Mall
- LVHN–Coordinated Health Breast Care–1405 N. Cedar Crest



Lehigh Valley Health Network Cancer Program Affiliations

- American College of Surgeons' Commission on Cancer Accreditation (ACoS CoC)
- Member, Memorial Sloan Kettering Cancer Alliance
- Member, Michigan Cancer Research Consortium National Community Oncology Research Program (NCORP)
- Rapid Cancer Reporting System (RCRS)
- American College of Radiology (ACR) Radiation Oncology Practice Accreditation since 2012
- American College of Radiology (ACR) Breast Health Services Accreditation
- American College of Radiology (ACR) Breast Imaging Center of Excellence Designation (BICOE)
- American College of Radiology (ACR) Lung Cancer Screening Center
- National Accreditation Program for Breast Centers (NAPBC) Breast Health Service Accreditation
- National Quality Measures for Breast Centers (NQMCB) Certified Quality Breast Center of Excellence – Breast Health Services
- Quality Oncology Practice Initiative (QOPI) LVPG Hematology Oncology – certified since 2011
- U.S. News and World Report 2014-2015 High Performer – Cancer
- NCI Community Cancer Center Program Selected (NCCCP) April 2010–June 2014 (one of 21)
- National Committee Quality Assurance (NCQA) Patient-Centered Specialty Practice Level 2 Recognition – LVPG Hematology Oncology March 20, 2014–March 2017

