



2016

ANNUAL REPORT

PEDIATRIC

SURGICAL

MEDICAL

RADIATION

RESEARCH

GENETIC TESTING

CLINICAL TRIALS

DIAGNOSTICS

CHEMOTHERAPY

HEMATOLOGY

PALLIATIVE CARE

DA VINCI®



Edwards
Comprehensive
Cancer Center

 **Cabell** Huntington Hospital

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2015 ONCOLOGY COMMITTEE MEMBERSHIP/ALTERNATIVES

SPECIALTY	COMMITTEE MEMBER	DESIGNATED ALTERNATE
Mandatory Representation Physicians		
Chairman Cancer Liaison Physician Surgeon	G. Oakley, MD M. Legenza, MD J. Traylor, MD	A. Arrington, MD-CLP2 A. Arrington, MD F. Cheung, MD T. Pacioles, MD T. Walters, MD G. Dixon, MD D. Griswold, MD/K. Denning, MD
Medical Oncology Diagnostic Radiology Radiation Oncologist Pathology	M. Tirona, MD P. Chirico, MD A. Freeman, MD L. Brown, MD	
Mandatory Representation Non-Physician		
Oncology Nursing Social Worker/Case Manager Cancer Registry (CTR)	M. Brumfield, RN, BSN, MBA, OCN Michael Hanft, MSW Phyllis Edwards, RHIT, CCS, CTR	Dee Murphy, RN Tom Hastie, Pastoral Care Pamela Boyd Shelby Moore, CTR (resigned March 2016) Stephen Williams (2nd Qtr) (as of 06/30/16) Sheila Stephens, RN, DNP, AOCN Debbie Trador, RN
Palliative Care Specialist Genetics Professional	Scott Mitchell, MD Lisa Muto, MSN, WHNP-BC, APGN, OCN	
Coordinators		
Cancer Conference Coordinator Quality Improvement Coordinator	Shelby Moore, CTR/Stephen Williams, CTR (06/30/16) Angela Hayes/Leann Ross	Pamela Boyd, RHIT, CTR Leann Ross RN, OCN, CCRP (as of 06/30/16) Pamela Boyd, RHIT, CTR Barbara Payne, RN R. Russell, RN (as of 6/30/16) Tom Hastie, Pastoral Care
Cancer Registry Quality Coordinator Clinical Research Representative or Coordinator	Phyllis Edwards, CTR Leann Ross, RN, OCN, CCRP/Barb Payne	
Psychosocial Services Coordinator	Michael Hanft, MSW	
Additional Specialty Members: Physicians		
Administration Pediatric Oncology Surgical Oncology GYN Oncology Urology Pulmonary (appointed 2/25/16) Orthopedic Oncology Neurosurgery Survivorship Coordinator Nurse Navigators: Colon Lung Breast Performance Improvement/Quality Management Representative Rehabilitation Representative	G. Oakley, MD, ECCC Medical Director L. Stout, MD A. Arrington, MD G. Oakley, MD (Chairman) J. Jensen, MD Y. Shweihat, MD F. Cheung, MD A. Hoyt, MD (9/29/16) Malinda Hanshaw, RN, OCN Jennifer Brown, RN Margaret Ball, RN Gigi Gerlach, RN Denise Gabel-Comeau, MHA, CPHQ, CBB, CCP-SLP Molly O'Dell, OTR/L, CDT	P. Finch, MD N. Bou Zgheib, MD M. Al-Ourani, MD Marsha Dillow, RN, MSN, CBCN M. Ball, RN Jennifer Brown, RN M. Dillow, RN, MSN, CBCN A. Hayes, MS, CMD Jeff Ashton, Assistant Director Rehab Services
ECCC Radiation Oncology Tissue Procurement Breast Center Clinical Trials Nurse	Angie Hayes, MS, CMD Rebecca Russell, RN Marsha Dillow, RN, MSN, CBCN Teresa Giles, RN	Leann Ross, RN, OCN, CCRP B. Payne, RN (as of 6/30/16)
Home Health Oncology Pharmacy	Andra Hardin, RN Chris Larck, PharmD J. Hapney, PharmD (as of 09/29/16)	
American Cancer Society Registered Dietitian Nutritionist Pastoral Care Representative OCM Quality Manager Medical Oncology Fellows	Mary Lough Susan Hale, RDN, CSO, LD, CDE Tom Hastie Leann Ross, RN, OCN, CCRP (as of 6/30/2016) A. Raufi, MD Y. Khelfa, MD Roma Srivastava, MD A. Elsayed, MD J. Dotson, MD H. Katz, MD Y. Lebowicz, MD M. Jamil, MD (9/29/16)	Terri Francis
Medical Oncology Pathology GYN Onc Palliative Care Nurse Practitioner	K. Denning, MD J. Hanshaw, MD N. Bou Zgheib, MD Megan Shumaker, APRN, FNP-BC	

CHAIRMAN'S REPORT 2016



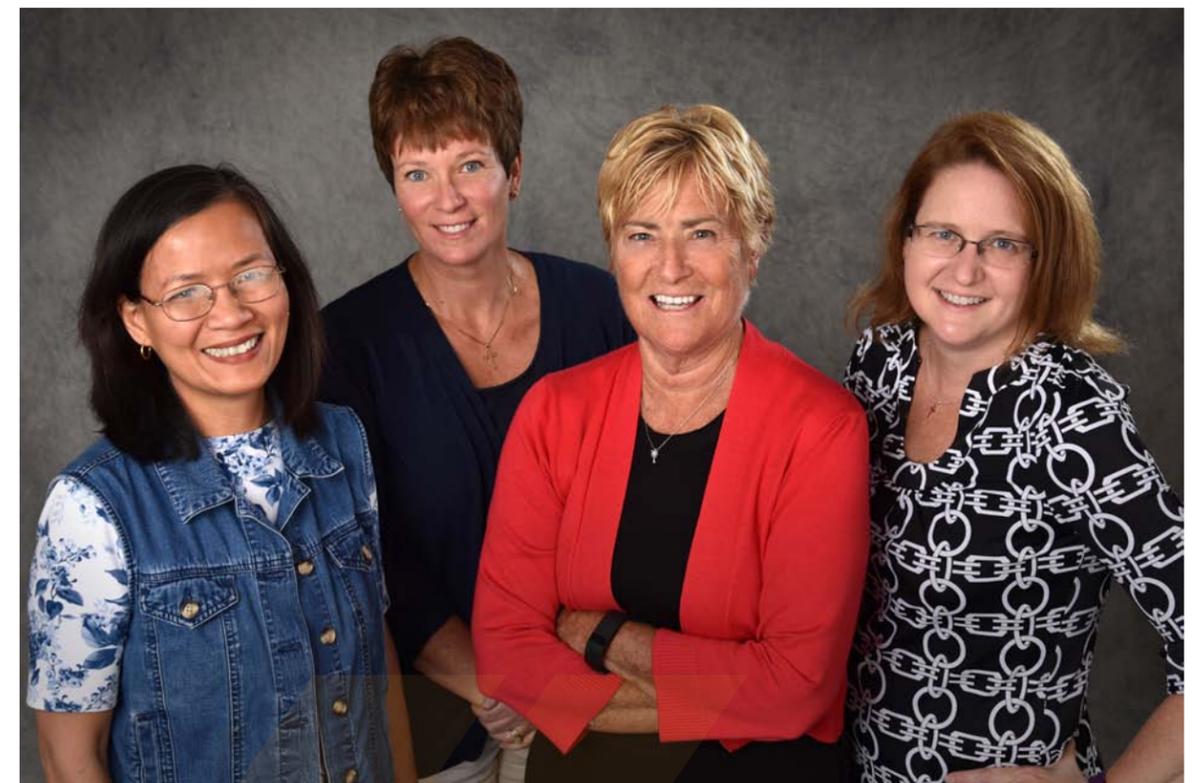
Gerard Oakley MD

The critical element in effective medical treatment is an accurate diagnosis. In the clinical setting of cancer management, that diagnosis is provided by examination of biopsy specimens. By examining tissue obtained at the time of biopsy or surgery, an exact definition of the disease present is possible. The doctor treating the patient needs to be secure in the belief that the diagnosis rendered is accurate and complete. This partnership, between clinician and pathologist, is the basis on which treatment decisions can be made with confidence and effective treatment offered to the patient.

The Pathology Department serves the needs of the Edwards Comprehensive Cancer Center at Cabell Huntington Hospital and has a legacy of providing secure and accurate diagnoses on a wide range of diseases, not the least of which is malignancies. The department is responsible for evaluating specimens from Cabell Huntington Hospital, St. Mary's Medical Center and Pleasant Valley Hospital. In all, over 30,000

surgical specimens and another 15,000 cytology specimens are evaluated and a diagnosis rendered each year. Many of these specimens must undergo specialized test such as immunohistochemical analysis and special stains to more completely refine the diagnosis. The department provides 24-hour, seven days per week coverage for frozen section diagnosis. This is a process whereby tissue samples are examined immediately upon removal from the patient so that a diagnosis can be immediately available to the treating physician or operating surgeon. The pathology department is comprised of specialists in nearly all facets who, provide a wide range of in-house immunohistochemical testing and tissue staining techniques and provide basic molecular biologic testing on site.

With the complexity of pathologic diagnosis, specialization in various fields of the science is critical. Department Chairperson Linda Brown, MD, leads a very diverse and progressive department with wide ranging duties and responsibilities. Dr. Brown completed a fellowship in general surgical pathology at Marshall University and has a special interest in



Teresa Limjico, MD, Doreen Griswold, MD, Linda Brown, MD & Krista Lynn Denning, MD



gynecologic and breast pathology. Prior to becoming a pathologist, she had extensive experience in medical laboratory testing and procedures as a cytotechnician.

Krista Denning, MD, completed a fellowship at Allegheny General Hospital in cytopathology and serves as the director of the School of Cytotechnology at Marshall University Joan C. Edwards School of Medicine, one of only 30 such programs in the country. Dr. Denning is also director of the tissue procurement and banking program which is vital to the support of many ongoing research programs within the medical school.

Doreen Griswold, MD, completed a fellowship in hematopathology, or the study of blood diseases, at The Ohio State University. She, along with Vincent Graffeo, MD, who completed a fellowship at Medical College of Wisconsin, and Jennifer Hawkins, DO, who completed specialty fellowship training at Thomas Jefferson University, are responsible for providing diagnoses on diseases of the blood including leukemia, anemia and other benign processes. Each year they evaluate over 500 bone marrow biopsies and perform over 700 flow cytometry tests for immunophenotyping.

Safe transfusion of blood products and blood is an important part of many treatment regimens for cancer. Thomas Dougherty, MD, fellowship trained in Transfusion Medicine at the Blood Center of Southeastern Wisconsin, specializes in that area. Dr. Dougherty also has extensive experience with diagnosis of soft tissue and bone sarcomas, a particularly difficult area of tissue examination. Teresa Limjoco, MD, completed a fellowship at Marshall University in surgical pathology and has a specialty interest in dermatopathology or disorders of the skin. Saroj Sigdel, MD, is identified as the pulmonary pathology specialist. He completed a fellowship at Case Western Reserve University.

In addition to the clinical responsibilities of tissue and cytological diagnosis, the pathologists at Cabell Huntington Hospital are active in medical education at several levels. The year-long course in pathology for all second year medical students is taught and administered by the Pathology Department under the guidance of Dr. Brown. Clinical rotations in the third and fourth year of medical school are offered and are popular with students. Physicians in the Hematology/Oncology Fellowship Program through the Edwards Comprehensive Cancer Center also do

clinical rotations through the department to further understand the complexities of diagnosis of cancer. The department is active in supporting research as well as performing research. A typical year yields at least five research projects and supports several others in need of pathologic analysis. The efforts result in 10-15 publications in medical literature through the department each year.

Yet for all they do, pathologists are the unsung heroes of medicine. They toil endless hours in anonymity to ensure that the diagnosis provided to the treating doctors is clearly stated, concise and, above all, accurate. Without them medicine would grind to a halt, and all treatment would stop. On their backs, they carry with them the responsibility of pinpoint diagnosis and rapid turnaround time from biopsy to diagnosis. Surgeons press them for nearly instantaneous frozen section diagnoses. Oncologists ask them to define the genetic defect that led to the development of cancer. Internists submit samples of blood for testing demanding rapid and accurate results. Patients rely on them to be diligent in their assessments and correct in their diagnosis as if their life depended on it (and so often it does!) The role of the pathologist in medical care is a critical one and one that is often under appreciated. I look forward to one day seeing the bumper sticker saying:

HAVE YOU HUGGED YOUR PATHOLOGIST TODAY?

Gerard Oakley, MD

Medical Director
Edwards Comprehensive Cancer Center

Choosing Wisely[®] aims to promote conversations between clinicians and patients by helping patients choose care that is:

- Supported by scientific evidence
- Not duplicated through unnecessary tests or procedures
- Free from harm
- Truly necessary



Mary Legenza, MD

This campaign is an initiative from the American Board of Internal Medicine (ABIM). In 2013, the Robert Wood Johnson Foundation funded the ABIM for this campaign. The goal is to help physicians and patients engage in conversations aimed at reducing unnecessary tests and procedures.

Physicians are very concerned about the frequency of unnecessary tests or procedures. In a survey by the ABIM in 2014, physicians reported that almost 50% of patients asked for an unnecessary test or procedure. Additionally, the physicians stated that they would order an unnecessary test about 53% of the time if the patient insisted. Many feel pressure from multiple areas that contribute to this. If a patient is unhappy with care, that can impact the physician's practice and if the provider insists a test is not needed, they may fear liability issues. However, the same survey stated that 70% of physicians felt that if they talked to their patients and explained why the test or procedure is unnecessary, that the patient felt more informed and agreed with the physician's suggestions. This is where *Choosing Wisely*[®] can help educate physicians and consumers of health care with decision-making. These recommendations are not to take the place of a discussion with your provider and are not the same for all individuals.

Consumer Reports has now become involved and has developed patient-friendly materials based on the specialty societies' lists of recommendations. These materials are then distributed through partners, such as national medical specialty societies.

All of the *Choosing Wisely*[®] partners have been challenged to identify at least five recommendations for patients to discuss with their providers.

In this Annual Report, we have selected to feature recommendations of five (5) partnering organizations: the American Society of Clinical Oncology, the

American Society for Radiation Oncology, the Society of Surgical Oncology, the American Society for Clinical Pathology, and the American Society of Breast Surgeons.

The American Society of Clinical Oncology (ASCO) is a network of more than 40,000 oncology professionals with dedication to providing the highest-quality resources in education, policy, the pioneering of clinical research, and above all, advancing the care for patients with cancer. ASCO has chosen 10 items for the *Choosing Wisely*[®] campaign:

1. Don't use cancer-directed therapy for solid tumor patients with the following characteristics: low performance status (3 or 4), no benefit from prior evidence-based interventions, not eligible for a clinical trial and no strong evidence supporting the clinical value of further anti-cancer treatment.
2. Don't perform PET, CT and radionuclide bone scans in the staging of early prostate cancer at low risk for metastasis.
3. Don't perform PET, CT, and radionuclide bone scans in the staging of early breast cancer at low risk for metastasis.
4. Don't perform surveillance testing (biomarkers blood tests) or imaging (PET, CT, bone scans) for asymptomatic individuals who have been treated for breast cancer with curative intent.
5. Don't use white cell stimulating factors for primary prevention of febrile neutropenia for patients with less than 20 percent risk for this complication.
6. Don't give patients starting on a chemotherapy regimen that has a low or moderate risk of causing nausea and vomiting any antiemetic drugs intended for use with a regimen that has a high risk of causing nausea and vomiting.
7. Don't use combination chemotherapy (multiple drugs) instead of chemotherapy with one drug when treating an individual for metastatic breast cancer unless the patient needs a rapid response to relieve tumor-related symptoms.
8. Avoid using PET or PET-CT scanning as part of routine follow up care to monitor for a cancer recurrence in asymptomatic patients who have finished initial treatment to eliminate the cancer unless there is a high-level evidence that such imaging will change the outcome.
9. Don't perform PSA testing for prostate cancer screening in men with no symptoms of the disease if they are expected to live less than 10 years.
10. Don't use a targeted therapy intended for use against a specific genetic aberration unless a



patient's tumor cells have a specific biomarker that predicts an effective response to the targeted therapy.

The American Society for Radiation Oncology (ASTRO) is the premier radiation oncology society in the world, with more than 10,000 members who are physicians, nurses, biologist, physicists, radiation therapists, dosimetrists and other healthcare professionals who specialize in treating patients with radiation therapies. ASTRO has suggested that the following five (5) things physicians and patients should question:

1. Don't initiate whole breast radiotherapy as a part of breast conservation therapy in women age 50 or older with early stage invasive breast cancer without considering shorter treatment schedules.
2. Don't initiate management of low-risk prostate cancer without discussing active surveillance.
3. Don't routinely use extended fractionation schemes (>10 fractions) for palliation of bone metastases.
4. Don't routinely recommend proton beam therapy for prostate cancer outside of a prospective clinical trial or registry.
5. Don't routinely use intensity modulated radiotherapy (IMRT) to deliver whole breast radiotherapy as a part of breast conservation therapy.

The Society of Surgical Oncology (SSO) has five recommendations for patients and physicians to consider:

1. Do not routinely use sentinel node biopsy in clinically node-negative women aged 70 years or older who have hormone receptor-positive breast cancer.
2. Do not use breast MRI for breast cancer screening in average-risk women.
3. Do not obtain routine blood work (CBC, Liver Function tests) – other than a carcinoembryonic antigen level during surveillance for colorectal cancer.
4. Do not routinely perform PET-CT in the initial staging of localized colon or rectal cancer, or as part of routine surveillance for patients who have been curatively treated for colon or rectal cancer.
5. Do not routinely order imaging studies for staging purposes on patients newly diagnosed with localized primary cutaneous melanoma unless there is a suspicion for metastatic disease based on history and physical exam.

The American Society of Clinical Pathology (ASCP) is the world's largest professional membership organization for pathologists and laboratory professionals. While they had many more recommendations for the

Choosing Wisely® campaign, the following are two that are directly related to cancer:

1. Do not routinely perform sentinel lymph node biopsy or other diagnostic tests for the evaluation of early, thin melanoma because these tests do not improve survival.
2. Only order Methylated Septin 9 (SEPT9) to screen for colon cancer on patients for whom conventional diagnostics are not possible.

The American Society of Breast Surgeons (ASBS) is the primary leadership organization for general surgeons who treat patients with breast disease. The ASBS is committed to continually improving the practice of breast surgery by serving as an advocate for surgeons who seek excellence in the care of breast patients. The ASBS identified the following five recommendations:

1. Don't routinely order breast MRI in all new cancer patients.
2. Don't routinely excise all lymph nodes beneath the arm in patients having lumpectomy for breast cancer.
3. Don't routinely order specialized tumor gene testing in all new breast cancer patients.
4. Don't routinely re-operate on patients with invasive cancer if the cancer is close to the edge of the excised lumpectomy tissue.
5. Don't routinely perform a double mastectomy in patients who have a single breast with cancer.

All of these recommendations and do not fit every patient. Discussion between the provider and the patient is essential. As you can see, more care is not always better care. There are many situations where avoiding unnecessary testing and non-evidence based treatment results in better care. In 2016, the Breast Program Leadership of the Edwards Comprehensive Cancer Center at Cabell Huntington Hospital reviewed and formally adopted many of the *Choosing Wisely*® measures, particularly those from the American Society for Breast Surgeons. Making this commitment allows our program to track and measure how often these recommendations are routinely adhered to and to create a basis for discussion and documentation of unique circumstances that might prohibit doing so.



An initiative of the ABIM Foundation





5 QUESTIONS to Ask Your Doctor Before You Get Any Test, Treatment, or Procedure

- 1 Do I really need this test or procedure?** Medical tests help you and your doctor or other health provider decide how to treat a problem. And medical procedures help to actually treat it.
- 2 What are the risks?** Will there be side effects? What are the chances of getting results that aren't accurate? Could that lead to more testing or another procedure?
- 3 Are there simpler, safer options?** Sometimes all you need to do is make lifestyle changes, such as eating healthier food or exercising more.
- 4 What happens if I don't do anything?** Ask if your condition might get worse — or better — if you don't have the test or procedure right away.
- 5 How much does it cost?** Ask if there are less-expensive tests, treatments or procedures, what your insurance may cover, and about generic drugs instead of brand-name drugs.

Use these 5 questions to talk to your doctor about which tests, treatments, and procedures you need — and which you don't need.

Some medical tests, treatments, and procedures provide little benefit. And in some cases, they may even cause harm.

Talk to your doctor to make sure you end up with the right amount of care — not too much and not too little.



<http://consumerhealthchoices.org/campaign/choosing-wisely/>

If you are a provider or a patient, we strongly encourage you to feel comfortable discussing these recommendations prior to moving forward with any additional referenced test or treatment.

Mary T. Legenza, MD, FACS

Cancer Liaison, American College of Surgeons
 Commission on Cancer
 Assistant Professor of Surgery
 Breast Surgeon
 Edwards Comprehensive Cancer Center

CABELL HUNTINGTON HOSPITAL/EDWARDS COMPREHENSIVE CANCER CENTER
 Standard 4.6 Monitoring Compliance with Evidence-Based Guidelines
 Pancreatic Cancer Study (NCCN) Clinical Presentation and Workup – 2015 Pancreatic Cancer Cases
 By Dr. Ali Raufi, Medical Oncology Fellow



Ali Raufi, MD

Total Charts Reviewed: 23 Charts
 Eligible for Analysis: 15 Charts
 Excluded from Review: 8 Charts
 Reason for Exclusion: Major workup obtained/treatment received at an outlying facility.

RESULT:

1. Mass on Imaging with no metastatic disease = 9 patients

- a) Resectable: 5 patients
 Appropriate workup was obtained in 3 patients including EUS, LFT, CA19-9, chest imaging, and pathology confirmation prior to surgery. One patient refused surgery though appropriate workup was obtained. One patient did not have chest imaging, CT abdomen per pancreatic protocol or discussed in MDC (this patient had R1 resection). One patient did not have EUS or discussed in MDC (this patient had R1 resection).
- b) Unresectable: 4 patients
 Pathology confirmation (EUS or CT guided biopsy) and LFT were done in all patients. One patient did not have CT abdomen per pancreatic protocol and was not discussed in MDC.

2. Mass on Imaging, with metastatic disease = 6 patients.

All patients had appropriate workup including pathology confirmation and treatment.

CONCLUSION:

- After reviewing 15 eligible charts we found that 12 patients (80%) met the NCCN pancreatic cancer guidelines, while 3 patients (20%) did not meet it.
- Subanalysis revealed that out of 9 patients with no metastatic disease, 6 patients (66.7%) met the NCCN guidelines, while 3 patients (33.3%) did not meet it.

Reasons why NCCN guidelines were not met:

Staging workup: out of 15 patients:

- Chest imaging not obtained in one patient (6.6%)
- EUS not performed in one resectable patient (6.6%)
- CT abdomen per pancreatic protocol not performed in 2 patients (13.3%)

Discussion at MDC:

Out of 15 patients, 9 patients were supposed to be discussed. The patients were excluded in this category that had metastatic disease or opted to follow at outside facility. In this category of 9 eligible patients, 6 patients were discussed (66.6%).

RECOMMENDATIONS:

We recommend that all newly diagnosed non metastatic pancreatic cancer patients should be evaluated by multidisciplinary team and have appropriate workup obtained.

EDWARDS COMPREHENSIVE CANCER CENTER AT CABELL HUNTINGTON HOSPITAL
Standard 4.4 Accountability Measures and **Standard 4.5** Quality Improvement Measures
 Cancer Program Practice Profile Reports (CP3R)
 By: Dr. Amanda Arrington, cancer liaison, surgical oncologist



Amanda Arrington, MD

The Commission on Cancer (COC) requires accredited cancer programs to treat cancer patients according to nationally accepted quality improvement measures indicated by the COC quality reporting tool, Cancer Program Practice Profile Reports (CP3R). The Oncology Committee reviews the quality improvement measures quarterly and develops an action plan should the measure fall below the estimated performance rate (EPR).

Upon reviewing the quality improvement measure, 12RLN (at least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer), our estimated performance rate (EPR) was below the required rate of 85%. An action plan was developed by the committee which included informing surgeons and increasing awareness of the CP3R measures and the NCCN guidelines.

The quality improvement measures were presented to the Surgical Department by the Cancer Liaison physicians (Dr. Legenza and Dr. Arrington). This has resulted in an improvement in the number of lymph nodes removed during a colon cancer resection – at least 20% increase in the past four years.

A complete list of the Accountability and Quality Improvement measures are listed to the right.

With the rectum quality improvement measure falling below the COC Standard of 85%, the Oncology Committee will develop an Action Plan which will include reviewing each chart for accuracy. The collected treatment information, AJCC staging accuracy and review of the NCCN guidelines will be performed by the Cancer Registry staff and reported at the next Oncology Committee.

Cabell Huntington Hospital/Edwards Comprehensive Cancer Center Accountability and Quality Improvement Performance Rates (CP ³ R)						
Primary Site	Measure Specifications	COC Standard (Benchmark) %	Estimated Performance Rate %			
			2011	2012	2013	2014
Breast	BCSRT – (Accountability) Radiation is administered within 1 year (365 days) of diagnosis for women under the age of 70 receiving breast conservation surgery for breast cancer	90	100	96.4	100	97.2
	HT – (Accountability) Tamoxifen or third generation aromatase inhibitor is considered or administered with 1 year (365 days) of diagnosis for women with AJCC T1c or Stage II or Stage III hormone receptor positive breast cancer	90	100	100	95.6	100
	nBx – (Quality Improvement) Image or palpation-guided needle biopsy to the primary site is performed to establish diagnosis of breast cancer	80	94.6	96.7	100	98.9
	MAC – (Accountability) Combination chemotherapy is considered or administered within 4 months (120 days) of diagnosis for women under 70 with AJCC T1c or Stage II or III hormonal receptor negative breast cancer	n/a	100	91.7	95.5	94.1
	MASTRT – (Accountability) Radiation therapy is considered or administered following any mastectomy within 1 year (365 days) of diagnosis of breast cancer for women with greater than or equal to four positive regional lymph nodes	90	100	100	100	100
Colon	ACT – (Accountability) Adjuvant chemotherapy is considered or administered with 4 months (120 days) of diagnosis for patients under the age of 80 with AJCC stage III (lymph node positive) colon cancer	n/a	85.7	100	100	100
	12RLN (Quality Improvement): At least 12 regional lymph nodes are removed and pathologically examined for resected colon cancer.	85	72.2	72.7	92.3	91.7
Lung	LCT (Quality Improvement): Systemic chemotherapy is administered within 4 months to day preoperatively or day of surgery to 6 months postoperatively, or it is recommended for surgically resected cases with pathologic lymph node positive (pN1) and (pN2) NSCLC.	85	100	100	100	No data
	LNoSurg (Quality Improvement): Surgery is not the first course of treatment for cN2, M0 lung cases	85	91.7	100	90.9	100
Rectum**	RECRCT (Quality Improvement): Preoperative chemo and radiation are administered for clinical AJCC T3N0, T4N0 or Stage III; or postoperative chemo and radiation are administered within 180 days of diagnosis for clinical AJCC T1-2N0 with pathologic AJCC T3N0, T4N0, or Stage III; or treatment is recommended; for patients under the age of 80 receiving resection for rectal cancer.	85	80	83.3	57.1	62.5

** new measure from COC



Teresa Limjoco, MD

Immunohistochemistry (IHC) is an ancillary technique in surgical pathology that is used to detect specific antigens in tissue sections using polyclonal and monoclonal antibodies. It has been in use in pathology laboratories for various purposes for almost three decades.

One use is for the diagnosis of some cancers because certain antigens are expressed or increased in some tumors. In cases of uncertain diagnoses of primary cancers, or of metastatic cancers from unknown primaries, IHC is used to resolve these diagnostic problems. For instance, GATA-3 positivity suggests that an unknown primary or metastatic tumor can represent a breast or urothelial cancer. In evaluating the nature of a tumor, the choice of which immunohistochemical stains to use is based on correlation with the tumor's appearance on H&E stains, the clinical history, imaging results, and other pertinent information.

IHC is also used to determine prognosis. One example is in gastrointestinal stromal tumors (GISTs) and the use of Ki-67, an antigen detected in growing cells that is used to evaluate tumor proliferative activity. In GISTs, determination of the proliferative index (Ki-67 labeling index) is a standard part of prognostication and is an independent factor noted in assessing a patient's risk for tumor recurrence and metastasis.

Another use is in predicting a tumor's response to certain therapies. Estrogen receptor (ER), for example, is expressed in certain breast cancers that are under growth regulation by estrogen. IHC can detect ER expression on the cancerous cells, and anti-estrogen agents can be given to patients with such cancers to down-regulate their growth. In melanomas, determining expression of BRAF V600E provides information as to whether a targeted therapy will be helpful. In a similar way, ALK mutation positivity in non-small cell lung carcinomas determines whether an ALK-targeted inhibitor will be an effective part of therapy.

Screening for a patient's inherited risk for developing certain cancers as in Lynch syndrome (hereditary non-polyposis colorectal cancer syndrome) is another use of IHC. This consists of screening a patient's tumor tissue for microsatellite instability (MSI) using antibodies to DNA mismatch repair genes MLH1, MSH2, PMS2 and MSH6. MSI testing by IHC detects the presence or absence of protein products of these mismatch repair genes, i.e., representing an abnormal number of microsatellite repeats, indicating that the cancer more likely was derived from cells with defective mismatch repair genes. An "MSI-high" result means that a high number of microsatellite repeats was detected. Patients with unstable colorectal tumors appear to fare better than those with MSI-stable ones. They are also at risk for having Lynch syndrome. The interpretation of test results is complex. Depending on the IHC results (and possible genetic testing, if applicable), the patient and his or her family may or may not have Lynch syndrome and if so, may receive genetic counseling.

In summary, the use of IHC is just one additional method available to pathologists to help the oncology team diagnose neoplasms, assess prognosis of patients, determine the effectiveness of targeted therapies in cancer, and evaluate patients' risks of developing certain cancers.

Teresa I. Limjoco, MD
Pathologist

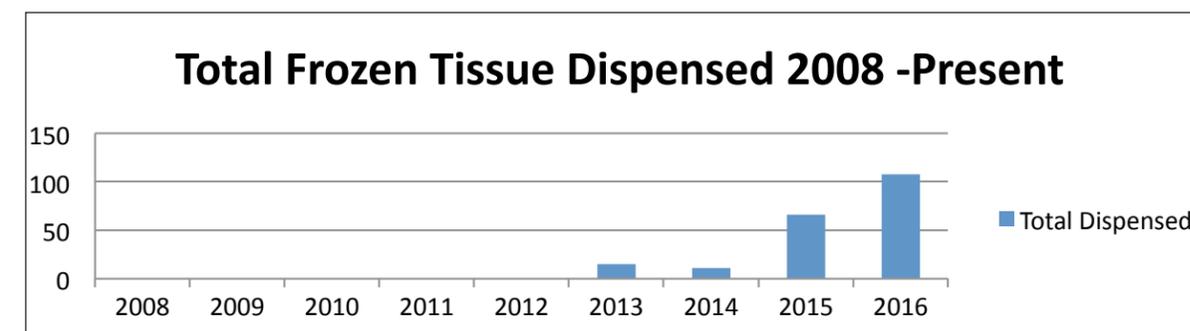
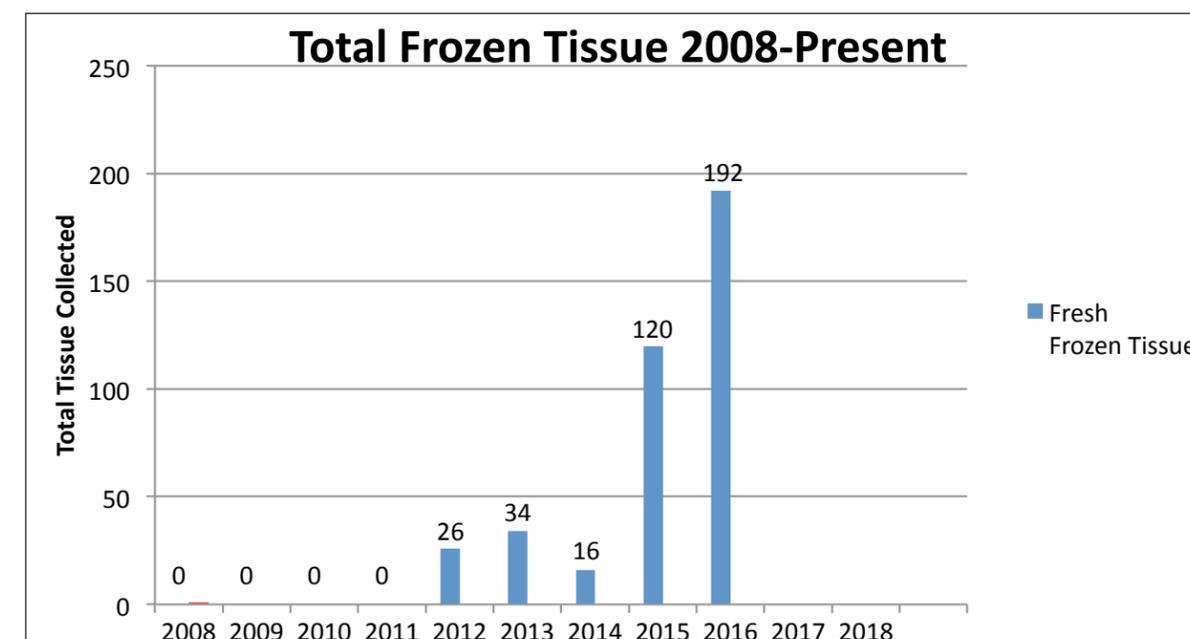


Krista Denning, MD

The Edwards Comprehensive Cancer Center Tissue Procurement Program began collecting tissue for cancer research in 2008. Since its inception the tissue bank has grown each year and is now providing much needed tissue to researchers who use that tissue to learn more about the biology of cancers and develop new ways to diagnose and treat. When a patient signs a consent form allowing the tissue bank to bank their tissue, their treatment is not affected in any way. Remnant or "left over" tissue is collected for the tissue bank. The patient's privacy is protected and the patient is not contacted following collection. Participation is voluntary and the participant may change their mind and pull the tissue from the bank. The only exception would be if the tissue has already been sent to a researcher. The tissue is frozen in the bank until a researcher requests a specific type of sample. The tissue may remain in the bank from several weeks to several years.

Patients who graciously consent to release their tissue are providing a special gift and are providing the tools necessary for researchers to help advance cancer care and treatment for future generations.

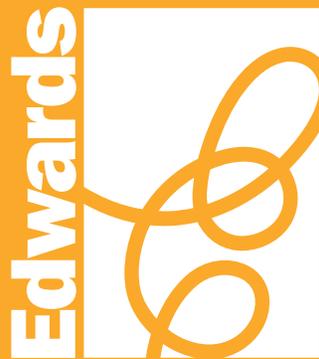
Krista Denning, MD and Rebecca Russell, RN





2015 CANCER REGISTRY SUMMARY BY BODY SYSTEM, SEX, CLASS, STATUS AND BEST CS/AJCC STAGE REPORT

Primary Site	Total (%)	Sex		Class of Case		Status		Stage Distribution - Analytic Cases Only						88	Unk	Blank/Inv
		M	F	Analy	NA	Alive	Exp	Stg 0	Stg I	Stg II	Stg III	Stg IV				
ORAL CAVITY & PHARYNX	16 (1.1%)	11	5	12	4	14	2	0	1	1	1	9	0	0	0	
Lip	1 (0.1%)	0	1	1	0	1	0	0	1	0	0	0	0	0	0	
Tongue	5 (0.3%)	5	0	5	0	5	0	0	0	0	1	4	0	0	0	
Gum & Other Mouth	1 (0.1%)	0	1	0	1	1	0	0	0	0	0	0	0	0	0	
Nasopharynx	2 (0.1%)	2	0	1	1	1	1	0	0	1	0	0	0	0	0	
Tonsil	3 (0.2%)	2	1	3	0	3	0	0	0	0	0	3	0	0	0	
Oropharynx	2 (0.1%)	1	1	2	0	2	0	0	0	0	0	2	0	0	0	
Hypopharynx	1 (0.1%)	0	1	0	1	0	1	0	0	0	0	0	0	0	0	
Other Oral Cavity & Pharynx	1 (0.1%)	1	0	0	1	1	0	0	0	0	0	0	0	0	0	
DIGESTIVE SYSTEM	206 (13.5%)	112	94	149	57	137	69	12	29	30	32	36	2	8	0	
Esophagus	16 (1.1%)	14	2	8	8	7	9	0	1	3	1	3	0	0	0	
Stomach	16 (1.1%)	11	5	9	7	7	9	1	3	1	1	1	0	2	0	
Small Intestine	6 (0.4%)	4	2	3	3	6	0	0	0	0	2	0	1	0	0	
Colon Excluding Rectum	84 (5.5%)	41	43	63	21	71	13	10	11	16	11	12	0	3	0	
Cecum	8	4	4	5	3	8	0	1	1	1	1	0	0	1	0	
Appendix	4	0	4	4	0	4	0	0	1	1	0	2	0	0	0	
Ascending Colon	14	9	5	13	1	10	4	3	2	1	2	4	0	1	0	
Hepatic Flexure	7	1	6	6	1	6	1	0	0	3	1	1	0	1	0	
Transverse Colon	10	4	6	8	2	8	2	1	2	2	1	2	0	0	0	
Splenic Flexure	1	0	1	1	0	0	1	0	0	0	1	0	0	0	0	
Descending Colon	3	3	0	1	2	3	0	0	0	1	0	0	0	0	0	
Sigmoid Colon	26	15	11	23	3	24	2	4	5	7	5	2	0	0	0	
Large Intestine, NOS	11	5	6	2	9	8	3	1	0	0	0	1	0	0	0	
Rectum & Rectosigmoid	27 (1.8%)	12	15	15	12	24	3	1	3	3	5	2	0	1	0	
Rectosigmoid Junction	6	3	3	1	5	5	1	0	0	1	0	0	0	0	0	
Rectum	21	9	12	14	7	19	2	1	3	2	5	2	0	1	0	
Anus, Anal Canal & Anorectum	2 (0.1%)	0	2	2	0	2	0	0	1	0	0	0	0	1	0	
Liver & Intrahepatic Bile Duct	23 (1.5%)	16	7	20	3	9	14	0	8	1	5	5	1	0	0	
Liver	21	15	6	18	3	9	12	0	8	0	5	4	1	0	0	
Intrahepatic Bile Duct	2	1	1	2	0	0	2	0	0	1	0	0	0	0	0	
Gallbladder	1 (0.1%)	0	1	1	0	0	1	0	0	1	0	0	0	0	0	
Other Biliary	2 (0.1%)	0	2	2	0	2	0	0	1	0	0	1	0	0	0	
Pancreas	26 (1.7%)	14	12	23	3	7	19	0	1	5	4	12	0	1	0	
Retroperitoneum	1 (0.1%)	0	1	1	0	1	0	0	0	0	1	0	0	0	0	
Peritoneum, Omentum & Mesenteries	2 (0.1%)	0	2	2	0	1	1	0	0	0	2	0	0	0	0	
RESPIRATORY SYSTEM	248 (16.3%)	154	94	196	52	117	131	0	43	11	48	91	0	3	0	
Nose, Nasal Cavity & Middle Ear	1 (0.1%)	1	0	0	1	0	1	0	0	0	0	0	0	0	0	
Larynx	11 (0.7%)	11	0	9	2	7	4	0	3	1	3	2	0	0	0	
Lung & Bronchus	236 (15.5%)	142	94	187	49	110	126	0	40	10	45	89	0	3	0	
BONES & JOINTS	3 (0.2%)	2	1	3	0	2	1	0	1	0	0	1	0	1	0	
Bones & Joints	3 (0.2%)	2	1	3	0	2	1	0	1	0	0	1	0	1	0	
SOFT TISSUE	18 (1.2%)	11	7	13	5	16	2	0	5	5	1	2	0	0	0	
Soft Tissue (including Heart)	18 (1.2%)	11	7	13	5	16	2	0	5	5	1	2	0	0	0	
SKIN EXCLUDING BASAL & SQU/48	3 (0.2%)	21	27	33	15	44	4	3	16	8	3	2	0	1	0	
Melanoma - Skin	45 (3.0%)	21	24	31	14	42	3	3	16	6	3	2	0	1	0	
Other Non-Epithelial Skin	3 (0.2%)	0	3	2	1	2	1	0	0	2	0	0	0	0	0	
BREAST	307 (20.2%)	2	305	253	54	288	19	20	94	101	25	11	0	2	0	
Breast	307 (20.2%)	2	305	253	54	288	19	20	94	101	25	11	0	2	0	
FEMALE GENITAL SYSTEM	190 (12.5%)	0	190	163	27	168	22	1	109	17	18	14	0	4	0	
Cervix Uteri	27 (1.8%)	0	27	23	4	22	5	0	10	7	3	3	0	0	0	
Corpus & Uterus, NOS	109 (7.2%)	0	109	100	9	102	7	0	80	4	8	5	0	3	0	
Corpus Uteri	108	0	108	99	9	101	7	0	80	4	8	4	0	3	0	
Uterus, NOS	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	
Ovary	27 (1.8%)	0	27	23	4	20	7	0	8	4	4	6	0	1	0	
Vagina	3 (0.2%)	0	3	2	1	3	0	0	0	2	0	0	0	0	0	
Vulva	22 (1.4%)	0	22	13	9	19	3	1	10	0	2	0	0	0	0	
Other Female Genital Organs	2 (0.1%)	0	2	2	0	2	0	0	1	0	1	0	0	0	0	
MALE GENITAL SYSTEM	122 (8.0%)	122	0	75	47	113	9	0	18	44	5	6	1	1	0	
Prostate	117 (7.7%)	117	0	73	44	110	7	0	17	44	5	6	0	1	0	
Testis	2 (0.1%)	2	0	0	2	1	1	0	0	0	0	0	0	0	0	
Penis	2 (0.1%)	2	0	1	1	1	1	0	1	0	0	0	0	0	0	
Other Male Genital Organs	1 (0.1%)	1	0	1	0	1	0	0	0	0	0	0	0	1	0	
URINARY SYSTEM	118 (7.8%)	72	46	96	22	104	14	8	47	13	10	14	3	1	0	
Urinary Bladder	41 (2.7%)	28	13	30	11	35	6	7	7	7	3	6	0	0	0	
Kidney & Renal Pelvis	77 (5.1%)	44	33	66	11	69	8	1	40	6	7	8	3	1	0	
EYE & ORBIT	3 (0.2%)	3	0	2	1	3	0	0	0	0	0	0	2	0	0	
Eye & Orbit	3 (0.2%)	3	0	2	1	3	0	0	0	0	0	0	2	0	0	
BRAIN & OTHER NERVOUS SYSTEMS	152 (3.4%)	21	31	37	15	42	10	0	0	0	0	0	37	0	0	
Brain	26 (1.7%)	13	13	18	8	18	8	0	0	0	0	0	18	0	0	
Cranial Nerves Other Nervous Syst	26 (1.7%)	8	18	19	7	24	2	0	0	0	0	0	19	0	0	
ENDOCRINE SYSTEM	71 (4.7%)	24	47	30	41	70	1	0	13	3	1	1	12	0	0	
Thyroid	45 (3.0%)	11	34	17	28	45	0	0	13	3	1	0	0	0	0	
Other Endocrine including Thymus	26 (1.7%)	13	13	13	13	25	1	0	0	0	0	1	12	0	0	
LYMPHOMA	43 (2.8%)	23	20	34	9	35	8	0	8	5	12	8	1	0	0	
Hodgkin Lymphoma	6 (0.4%)	1	5	4	2	4	2	0	0	1	2	1	0	0	0	
Non-Hodgkin Lymphoma	37 (2.4%)	22	15	30	7	31	6	0	8	4	10	7	1	0	0	
NHL - Nodal	26	17	9	21	5	22	4	0	4	2	10	5	0	0	0	
NHL - Extranodal	11	5	6	9	2	9	2	0	4	2	0	2	1	0	0	
MYELOMA	13 (0.9%)	8	5	8	5	10	3	0	0	0	0	0	8	0	0	
Myeloma	13 (0.9%)	8	5	8	5	10	3	0	0	0	0	0	8	0	0	
LEUKEMIA	38 (2.5%)	23	15	31	7	31	7	0	0	0	0	0	31	0	0	
Lymphocytic Leukemia	25 (1.6%)	16	9	20	5	24	1	0	0	0	0	0	20	0	0	
Acute Lymphocytic Leukemia	11	7	4	10	1	11	0	0	0	0	0	0	10	0	0	
Chronic Lymphocytic Leukemia	11	7	4	8	3	10	1	0	0	0	0	0	8	0	0	
Other Lymphocytic Leukemia	3	2	1	2	1	3	0	0	0	0	0	0	2	0	0	
Myeloid & Monocytic Leukemia	11 (0.7%)	5	6	10	1	6	5	0	0	0	0	0	10	0	0	
Acute Myeloid Leukemia	4	2	2	4	0	1	3	0	0	0	0	0	4	0	0	
Acute Monocytic Leukemia	1	0	1	1	0	1	0	0	0	0	0	0	1	0	0	
Chronic Myeloid Leukemia	6	3	3	5	1	4	2	0	0	0	0	0	5	0	0	
Other Leukemia	2 (0.1%)	2	0	1	1	1	1	0	0	0	0	0	1	0	0	
MESOTHELIOMA	1 (0.1%)	1	0	1	0	1	0	0	1	0	0	0	0	0	0	
Mesothelioma	1 (0.1%)	1	0	1	0	1										



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