SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003

Date 8.10.2018

From
Dr. PAMMY SINHA ,
HOD
Pathology
SriLakshmiNarayanaInstituteofMedicalSciences,Puducherry
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
SriLakshmiNarayanaInstituteofMedicalSciences,Puducherry
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Pathology assessment of tumor tissue

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: pathology assessment of tumor tissue Nov 2018- Jan 2019

. We solicit your kind permission for the same.

Kind Regard

Dr. PAMMY SINHA ````

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. PAMMY SINHA

The Expert: Dr. PARTHO PROTIM BARMAN

The committee has discussed about the course and is approved.

Dean
(Sign &Seal)

Subject Expert
(Sign &Seal)

HOD
(Sign &Seal)

PROFESSOR & HEAD, DEPT OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF
MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST,PONDICHERRY - 605003

Circular

15.10.18

Sub: Organising Value-added Course: Pathology assessment of tumor tissue

With reference to the above mentioned subject, it is to bring to your notice that **SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES Bharath Institute of Higher Education and** Research, is organising"**_Pathology assessment of tumor tissue _from Nov 2018-Jan** 2019_____". The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 27.10.2018 . Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Course Proposal

Course title:Pathology assessment of tumor tissue

CourseObjective:

1. To understand the general concepts of pathology assessment of tumor tissue
2. Should know about the initial pathology assessment
3. Should be able to asssit gross examination and staining of histopathological sections

CourseOutcome: Should know about the general concepts of pathological assessment of tumor tissue

Course Audience: IInd year MBBS

Course Coordinator: Dr. partho protim barman

Course Faculties with Qualification and Designation:

1. **Dr.A.Partho Protim barman**
2. **Dr.Pammy Sinha**
3. **Dr. sivaganesh @porko.G**

Course Curriculum/Topics with schedule (Min of 30 hours)

SINo	Date	Topic	Faculty	Time	Hours
1.	3.11.2018	Introduction to pathology assessment of tumor tissue	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
2.	10.11.2018	Types of pathology lab	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
3.	17.11.2018	Members of pathology labs	Dr. sivaganesh @porko.G	1.30-4 pm	2.5 hrs
4.	24.11.2018	Conventional preparations	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
5.	1.12.2018	Specimen preparation	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
6.	8.12.2018	Types of biopsies	Dr. sivaganesh @porko.G	1.30-4 pm	2.5 hrs
7.	15.12.2018	Liquid biopsy	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
8.	22.12.2018	Tissue fixation	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs

		Practical Class	Dr. sivaganesh @porko.G		
9.	29.12.2019	Gross examination	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
10.	5.1.2019	Histology staining	Dr. sivaganesh @porko.G	1.30-4 pm	2.5 hrs
11.	12.1.2019	General concepts about special stain and IHC markers	Dr.Pammy Sinha	1.30-4 pm	2.5 hrs
12	19.1.2019	Assesment and giving feed back	Dr. Partho protim Barman	1.30-4 pm	2.5 hrs
		Total			30 hrs

REFERENCE BOOKS:

1. MANUAL OF SURGICAL PATHOLOGY SUSAN C. LISTER

VALUE ADDED COURSE

1. Name of the programme& Code

Pathology assessment of tumor tissue PA09

2. Duration& Period

30 hrs NOV 2018- JAN 2019

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short notes questions- *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

1 TIME [NOV 2018 - JAN 2019]

8. Year of discontinuation: 2020

9. Summary report of each program year-wise

Value Added Course- NOV 2018- JAN 2019					
Sl. No	**Course Code**	**Course Name**	**Resource Persons**	**Target Students**	**Strength& Year**
1	PA09	PATHOLOGY ASSESSMENT OF TUMOR TISSUE	Dr. PARTHO PROTIM BARMAN	IInd MBBS	NOV 2018- JAN 2019

10. Course Feed Back

Enclosed as Annexure- V

RESOURCE PERSON

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF MEDICAL SCIENCES,
PUDUCHERRY 605 502.

COURSE DETAILS

Particulars	Description
Course Title	Pathology assessment of tumor tissue
Course Code	PA09
Objective	1.Objectives 2. Introduction 3. Types of pathology labs 4. Members of pathology labs 5. Specimen preparation 6. Types of biopsies 7. Liquid biopsy 8. Tissue fixation 9. Initial pathology assessment 10.Gross examination 11. Histology staining 12. Markers
Further learning opportunities	Immunohistochemistry
Key Competencies	On successful completion of the course the students will have knowledge in the assessment of tumor tissue
Target Student	2nd MBBS Students
Duration	30hrs NOV 2018- JAN 2019
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Short answers

This course highlights the importance of pathologic evaluation of tissue in establishing a diagnosis of cancer and provides a basic summary of the processes and tests used in the pathology laboratory culminating in the final pathology report. Topics include the workings of the pathology laboratory; tumor sampling techniques, including liquid biopsies; handling of tissue in the pathology lab; and common laboratory testing methodologies performed on tumors used to establish diagnosis, provide prognostic information, guide therapy and monitor response to therapy.

Objectives

Upon successful completion of this module, participants should demonstrate:

- Improved understanding of the importance of pathologic evaluation of tissue to establish diagnosis and guide therapy for patients.
- Basic understanding of the various types of pathology laboratories and members of the pathology laboratory.
- Improved understanding of the various biopsy techniques used to sample tumors.
- Basic understanding of tissue fixation techniques and the importance of pre-analytical variables in ensuring accurate ancillary testing.
- Improved understanding of how biomarker testing is used in oncology.
- Improved understanding of the methodology and clinical utility of common molecular and immunohistochemical tests used in oncology.

Introduction to the Pathology Laboratory

Health care providers may be unfamiliar with the workings of the pathology laboratory. The delivery of a specimen to the pathology laboratory initiates a complex series of events resulting in a pathologic diagnosis/interpretation. The following section reviews the importance and key objectives in the pathologic evaluation of tissue and provides information on the types and members of the pathology laboratory.

Importance of pathologic examination

The diagnosis of cancer is not conclusively established, nor safely assumed, in the absence of a tissue diagnosis, nor should definitive therapy for cancer, with rare exception, be undertaken. Policies supporting this practice are written into the bylaws of most hospitals and are regularly monitored by hospital tissue committees and accrediting agencies.

The goal of pathology examination of tissue is to provide accurate, specific and sufficiently comprehensive diagnoses to enable the treating physician to develop an optimal plan of treatment. There are hundreds of varieties tumors, most with characteristic biology, that require accurate diagnosis by pathologists. Data on markers with prognostic and predictive significance are also routinely incorporated into pathology reports, allowing individualized treatment plans for patients. It is not only important to obtain sufficient tissue for a specific diagnosis of malignancy, but for many malignancies, additional tissue is required for prognostic and predictive ancillary studies.

While some have postulated that we are moving toward a gene/mutation driven categorization of tumors replacing disease site clinics and treatment planning (e.g., PIK3CA mutated carcinomas instead of "ovarian" cancer or "breast" cancer), data is accumulating that histology, morphology, disease site location and microenvironment in addition to genomic changes are still important factors in understanding the disease biology for treatment planning.

Types of pathology labs

Hospital labs

Almost all hospitals contain a laboratory to support the clinical services offered at the hospital. The specific pathology services would include both anatomic (surgical pathology, cytopathology, autopsy) and clinical (laboratory medicine) pathology at most hospitals. Most, if not all, inpatient and many outpatients seen by hospital-affiliated physicians require tests performed by hospital labs.

Reference labs

Reference labs are usually private, commercial facilities that do both high volume and specialty (high complexity and/or rare) laboratory testing. Most of these tests are referred from physician's offices, hospital facilities and other patient care facilities such as nursing homes. Reference labs, typically located at a site other than the healthcare facilities, are often used for specialized tests that are ordered only occasionally or require special equipment for analysis.

Public health labs

Public health laboratories are typically run by state and local health departments to diagnosis and protect the public from health threats such as outbreaks of infectious disease. These labs perform tests to monitor the prevalence of certain diseases in the community which are a public health concern, such as outbreaks of foodborne or waterborne illnesses or detection of unique infectious agents.

Members of the pathology lab

The staff of most clinical laboratories is diverse. A non-comprehensive summary of the major types of individuals found in these laboratories is provided below.

Anatomic pathology which encompasses surgical pathology, cytopathology and autopsy pathology includes the following:

- **Pathologists:** Physicians with special training in the diagnosis and detection of disease. Practicing pathologists may be subspecialty or general pathologists, depending on the types of cases they review on a daily basis. Some pathologists may perform a subspecialty fellowship in a specific area of pathology such as cytopathology, hematopathology, dermatopathology, nephropathology, neuropathology, etc.
- **Pathologists' assistants (PAs):** These individuals assist with the gross description and dissection of surgical cases and biopsies, working closely with supervising pathologists. PAs may also assist in the technical aspects of intraoperative assessment such as frozen section and selection of tissue for research and clinical trials (tissue procurement).
- **Cytotechnologists:** These individuals assist in screening specimens that are composed of small samples of cells rather than whole sections of tissue, e.g., Pap smear specimens. After screening and marking diagnostic cells in slides, a cytotechnologist refers cases with abnormal cells to pathologists for review. Other common cytologic specimens include fine needle aspirations (FNAs), washings or scrapings of cells and other body fluids.
- **Histotechnologists:** These individuals manage the processing of tissue in the laboratory and perform the technical components of making slides from tissue for evaluation by a pathologist. These components include the process of fixing the tissue, embedding it in paraffin, sectioning tissue onto slides and staining of the tissue on slides.

Clinical pathology which encompasses laboratory medicine includes the following:

- **Pathologists/PhD scientists:** These professionals provide direction of clinical labs to ensure accurate and timely reporting of lab tests and serve as a resource for result interpretation to clinicians. Individuals often have specific training in one or more of the following areas: clinical chemistry, microbiology, molecular pathology, hematology, immunology and blood banking
- **Medical laboratory technicians:** These health care professionals perform laboratory testing and analysis on body fluids and other specimens to help determine the presence or absence of disease.

- Phlebotomists: These health care professionals are trained to draw blood from a patient for testing, transfusions, donations or research.

Specimen Preparation

Obtaining sufficient tissue and practicing proper specimen handling (which begins even before the specimen arrives in the pathology laboratory) are essential components for accurate pathologic diagnoses. The following section reviews the various types of biopsies, including liquid biopsies, used to sample tumors and important aspects of tissue fixation.

Tumor sampling

Although many types of tests may be used to make assessments that are *suggestive* of cancer, only a biopsy can be used to *confirm* a cancer diagnosis.

Tissue biopsy

A biopsy is the removal of a small amount of tissue for pathology assessment. The goal of tissue biopsy is to obtain diagnostic tissue while minimizing morbidity, limiting potential tumor spread and avoiding interference with future treatments.

Needle biopsies

- If the tumor is palpable near the surface, the needle is guided by palpation.
- If the tumor is deeper in the body, then the needle is guided by imaging (typically ultrasound or CT scan)

Core needle biopsy

- Uses a hollow needle that is slightly larger than the one used in FNA.
- Removes a small cylinder of tissue (about 1/16 inch in diameter and about 1/2 inch in length).
- Less invasive than surgery, but often requires local anesthesia.
- Advantages: In most cases, more tissue is obtained as compared to FNA, allowing more detailed ancillary studies to be performed. Histologic architecture is preserved as compared to FNA.
- Limitations: Limited sampling and inaccessibility of some masses (secondary to size, depth, density or location).

Surgical biopsies

- Either local or general anesthesia is required.
- More invasive than needle biopsies.
- Recovery time is required, increased morbidity and cost as compared to needle biopsy.

Incisional biopsy

- A portion of a large tumor is removed.
- Typically only performed if the tumor is too large or too invasive to be removed in its entirety, or attempts at needle biopsy were non-diagnostic.
- *Excisional biopsy* - The entire tumor or suspicious area is removed.

Excisional biopsy

- The entire tumor or suspicious area is removed.
- Typically some of the surrounding normal tissue is removed as well (termed the surgical margin).
- If an excisional biopsy specimen is found to be cancerous, the pathologist will examine the surgical margin to ensure that the tumor was removed in its entirety. This is determined based on whether there is a wide enough rim of normal tissue around the tumor.

Other types of biopsies

Scrape or brush cytology

- A small spatula or brush is used to scrape cells from the tissue being tested.
- Most common example is a Pap test.
- Other tissues commonly sampled in this way include the esophagus, the stomach, the bronchi, and the mouth.

Endoscopic biopsy

- An endoscope is a thin, flexible, lighted tube that has a lens or camera on the end.
- Forceps may also be attached to the end of the tube and used to remove a small tissue sample of a suspicious area identified via the camera.
- An endoscope is used to visualize and biopsy different parts of the body, including the nose, sinuses, throat, esophagus, stomach and upper intestine.
- Some endoscopes are called a different name when they are used on a particular anatomic area. A bronchoscope is used to visualize and biopsy the lungs and bronchi. A colonoscope is used to visualize and biopsy the colon and rectum. A laparascope is used to visualize and biopsy the interior of the abdomen.

Bone marrow aspiration and biopsy

- Used to diagnose hematologic cancers including lymphoma, leukemia and multiple myeloma.
- Typically performed at the same time to examine the bone marrow.
- Bone marrow aspiration is used to sample a small amount of the liquid component of bone marrow. Bone marrow biopsy is used to remove a small amount of the solid tissue component of bone marrow.
- A wide needle is pushed into the bone. A sample of the liquid portion is removed using a syringe attached to the needle. The needle is then rotated to remove a sample of the bone.
- Most frequently performed on the pelvic bone.

Sentinel lymph node mapping and biopsy

- Termed *sentinel* lymph nodes because they "stand watch" over the tumor. They are lymph nodes that drain lymph fluid from the tumor tissue. A sentinel lymph node is defined as the first node or group of nodes to which cancer cells are most likely to spread from a primary tumor. Sentinel lymph node biopsy is most commonly used to help stage breast cancer and malignant melanoma, but it has been used for a variety of cancer types.
- Mapping involves using a colored dye and/or a radioactive material to trace the routes of lymph drainage from the tumor to identify the sentinel node(s).
- The sentinel node(s) are then removed and examined microscopically to determine if they contain cancerous cells. A negative sentinel lymph node biopsy result suggests that the cancer has not spread to regional lymph nodes or other organs. If the sentinel lymph node(s) are negative, then no additional regional lymph nodes are removed at surgery because the tumor has not yet metastasized to the lymph nodes. If cancerous cells are found, then the remaining lymph nodes in the area may be removed in a process termed *lymph node dissection.*

Liquid Biopsy

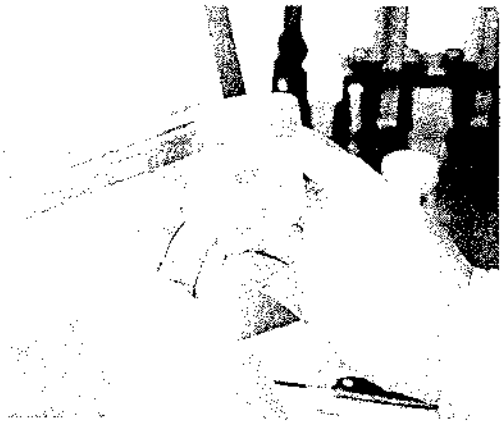
Liquid biopsy technology is a rapidly emerging field. The terminology liquid biopsy came about because we are rapidly moving to an era where some of the traditional assessments done with a tissue biopsy (e.g., molecular marker testing) can now be done in blood, urine or other bodily fluid that is less invasive than a tissue biopsy. Currently, about 40 companies have developed assays to detect cell-free circulating DNA (cfDNA), circulating tumor DNA (ctDNA), or circulating tumor cells (CTCs).

Tumors shed cells (CTCs) into the bloodstream, which can be isolated for analysis. The challenge is that there are very few tumor cells, but there are a number of advantages in isolating them for analysis. The most obvious advantage is that the patient would not need to undergo an invasive biopsy procedure and only would have a blood sample drawn. This permits easier serial analysis over time to monitor a tumor's changes to better guide therapy changes as the tumor progresses. Additionally, tumors are heterogeneous, making it challenging to obtain a molecular representation of the tumor from a small biopsy sample (such as those from fine needle aspiration or core needle biopsy). Treating a patient with a tumor based on the analysis of a small biopsy may result in only a portion of the cells being effectively targeted. Using CTCs, the heterogeneity of a tumor is better represented, as the cells can come from multiple locations within a tumor as well as from multiple tumors in the case of metastatic disease. Research has shown that the number of CTCs reflects the state of disease — having more CTCs corresponds with more disease. Circulating tumor cells that have been isolated can also be sequenced individually or as a group to identify actionable targets for treatment. Several companies, e.g, CellSearch, Biocept, etc., have commercialized CTC analysis. A challenge in utilizing CTCs for diagnostics is the low numbers found in the blood at any time. While the numbers increase with metastatic state, they are still few compared to the number of red and white blood cells. Companies have developed proprietary collection methods to stabilize the CTCS in the samples sent to them overnight for isolation upon arrival in the lab. Further research is needed to improve this approach.

Dying cells release DNA into the bloodstream (cfDNA). Tumor cells do this as well (ctDNA), but typically, only a small portion of the total DNA is found in the blood. The amount of tumor DNA found in the blood typically correlates with stage, increasing with stage and number of metastases. Multiple approaches are used by different companies to analyze the ctDNA molecularly, but the most common utilize polymerase chain reaction or next-generation sequencing to identify molecular alterations in the DNA. The same advantages of isolating CTCs for analysis vs. biopsies apply to ctDNA, but it is often possible to obtain higher quantities of ctDNA than CTCs.

Currently, a few companies are expanding the concept of liquid biopsies, by using other bodily fluids, such as urine and cerebral spinal fluid (for brain tumors and metastases). Urine provides an interesting option if proven successful because the sample can be collected at home and shipped by the patient, providing the most convenient and least invasive option of all. For more information, see the section "Liquid Biopsies."

Tissue fixation



Tissue fixation serves several purposes during the pathologic evaluation of specimens. Fixation preserves tissue by preventing autolysis by cellular enzymes, helps prevent decomposition of tissue by bacteria and molds, hardens tissue to facilitate sectioning, inactivates infectious agents and enhances tissue avidity for dyes. Fixation also has undesirable effects on tissue such as alteration of protein structure (loss of antigenicity), loss of soluble tissue components and degradation of DNA and RNA.

Types of fixatives

- Formalin: The standard fixative used in the pathology laboratory is 10% phosphate-buffered formalin. It fixes most tissues well and is compatible with most ancillary testing such as immunohistochemistry and molecular tests.

- Bouin solution **(picric acid, formaldehyde and acetic acid):** Fixation in Bouin solution results in sharp hematoxylin and eosin staining and is preferred by some pathologists. Disadvantages include decreased sensitivity of immunohistochemical tests and increased degradation of DNA and RNA by picric acid.
- B5 **(mercuric chloride, sodium acetate and formalin):** B5 is often used for routine fixation of lymph nodes, spleens and other tissue if a lymphoproliferative process is suspected. B5 provides rapid fixation with excellent cytologic details and antigen preservation for lymphoid markers. Tissue may become brittle if over-fixation occurs with B5, and special procedures for disposal are needed due to the presence of mercury.
- Glutaraldehyde: The fixative glutaraldehyde is used for tissue that is to be evaluated by electron microscopy.

Creation of formalin-fixed paraffin-embedded tissue blocks
After appropriate fixation, tissue, in blocks, is placed into a processor that dehydrates tissue through a series of graded alcohol baths and infiltrates the tissue with paraffin wax, resulting in a formalin-fixed paraffin-embedded tissue block. Tissue from these blocks is then sectioned thinly (0.4 µm to 0.[illegible] µm) using a microtome and placed onto a glass slide. Tissue on the slides is stained with hematoxylin and eosin and covered with a coverslip before examination by a pathologist.

Effect of time on fixation
Several factors related to tissue fixation may affect the results of ancillary studies such as immunohistochemical and molecular testing. Autolysis begins immediately after tissue is removed from the patient. Although autolysis can be reduced by refrigeration, delays before fixation may adversely affect the diagnostic quality of tissue. The time between when a specimen is removed from a patient to when it is in contact with formalin is called the cold ischemic time. Extended cold ischemic times (greater than 1 hour) may result in false-negative testing for markers such as estrogen receptor, progesterone receptor and HER-2. It is important that specimens are transported to the lab in a timely fashion to avoid extended cold ischemic times. An adequate amount of fixative in the specimen container is usually considered to be 15 to 20 times the volume of the tissue. However, even in this short time, changes in phosphorylation of important proteins occur (both increase and decrease at specific sites has been noted).

The process of fixation is a chemical reaction that usually requires a minimum of 6 hours (even for small biopsy specimens) to reach sufficient tissue fixation. Certain tissue types, such as those containing a high content of adipose tissue, and larger specimens require longer fixation times. Large surgical resections may also require opening up to enable the fixative to enter all areas for even fixation. Both under-fixation and over-fixation of tissue may result in loss of antigenicity and degradation of RNA and DNA. Specific ASCO/College of American Pathologists guidelines for fixation of breast specimens exist to preserve antigenicity of tissue for hormone receptor and HER-2 testing. Breast specimens are to be fixed for a minimum of 6 hours and no longer than 72 hours in 10% neutral buffered formalin. These guidelines may be applied to other tissue types in an attempt to standardize pre-analytical variables for ancillary testing.

[illegible]thology Assessment

Visual inspection of the gross specimen and tissue staining are two important aspects of assessment in the pathology lab and are briefly summarized in the following section.

Gross examination

Gross examination is the visual macroscopic inspection of the tumor, without the use of a microscope. The anatomic structures present, and the tissue specimen's size, color and consistency are recorded. Gross examination helps the pathologist determine the size of the specimen to sample and assess. Histologic sections that best demonstrate the features seen at gross examination including assessment of margins (if applicable) are taken during gross examination. Inking of margins also is performed at gross examination. The process provides important prognostic information used for staging and prognosis, and a picture may be taken as part of the process.

Grossing is an art

A lot of tissue that needs be taken for microscopic study is important for prognosis.

Tissue staining

Hist · microscopic appearance of stained cell and tissue structures of a specimen. The
clin 'stology of cells/tissue is used to identify all of the pathologic processes involving
and

Com l histologic stains include:

xylin (nuclei) and eosin (cytoplasm) staining (H&E)
H&E is the standard stain performed for routine examination of tissue under the microscope to form the cornerstone of pathologic diagnoses. Hematoxylin is a dark blue or violet stain that binds to DNA and RNA in the nucleus of cells. Eosin s a red or pink stain that binds to cytoplasmic proteins.
variety of special stains are available to evaluate pathologic processes, a few of re quickly summarized below:
Alcian blue

- Identification of acid mucins within cells (may be used to facilitate identification of Barrett's mucosa in biopsy specimens).

Congo red

- Detection of amyloid within tissue.

Mucicarmine

- Detection of mucin within neoplasms, supporting classification as adenocarcinoma (e.g. non-small cell lung carcinomas).

Periodic acid-Schiff

- Detection of glycogen or mucin within neoplasms.

Trichome stain

- Primarily used to demonstrate collagen and muscle in normal tissue (e.g. detection of increased fibrosis in the liver).

ncer genetics is focused on the evaluation of important risk markers and inherited well-known are markers such as *BRCA1* and *BRCA2* for inherited risk of cancer. Other examples include markers for Lynch syndrome (hereditary olorectal cancer) and Li-Fraumeni syndrome. Individuals with Lynch syndrome s in genes typically involved in repair of DNA (*MLH1*, *MSH2*, *MLH3*, *MSH6*, nd *TGFBR2*) giving them a much higher likelihood of developing colon cancer as ancers (eg, endometrial, ovarian, pancreatic) at an earlier age. Mutations in the or gene *TP53* and *CHEK2* may indicate the patient has Li-Fraumeni syndrome, cts children or young adults and leads to development of multiple types of lifetime.

rkers

ogy and morphology are important to determine if a tumor is benign or cancerous, ers can help confirm diagnosis. An example of this is the use of *BCR-ABL* fusion m the diagnosis of leukemia. This marker is also useful for the prediction of ments and to monitor disease. The CA-125 marker is often used to help ass in the ovaries is potentially cancerous.

rkers

ers are used to help a physician assess the potential outcome for a patient atment. They can help assess the aggressiveness of disease. An example of a er is CA19-9 in pancreatic cancer, which can help assess the operability of the insight into potential survival. The expression of CD44 is often associated osis in bladder cancer, whereas expression of cyclin D1 is associated with a with lower odds of recurrence.

kers

rs are used to determine potential for response to a specific treatment. Targeted companion diagnostics to direct treatment decisions. These tests use identify which drugs may provide a favorable response for a patient. *EML4-ALK* fusion gene for treatment with crizotinib (Xalkori, Pfizer) in ng cancer and *BRAF* V600E mutation for treatment of melanoma with lboraf, Genentech).

ers

are often considered the same as predictive markers. However, with the ating tumor DNA tests, it is now possible to monitor response over time, ent.

VALUE ADDED COURSE

PATHOLOGY ASSSSMENT OF TUMOR TISSUE , PA09

List of Students Enrolled NOV 2018- JAN 2019

2nd Year MBBS Student			Signature
Sl. No	Name of the Student	Roll No	
1	DISHAL K P	U17MB291	
2	DIVYA PRIYA K	U17MB292	
3	DIVYANSHI SINGH	U17MB293	
4	ELAKIYA BALA	U17MB294	
5	FEMI SREE.R.A.	U17MB295	
6	GANJI KARTHIK	U17MB296	
7	GAUTHAMAN.M	U17MB297	
8	GOKULAVAANI G K	U17MB298	
9	GOWTHAM BJ	U17MB299	
10	GRANDHI KARISHMA	U17MB300	
11	GREESHMA SHAJI .K	U17MB301	
12	GUDDATI KOTA SATYA SAI NAGA S RAMESH	U17MB302	
13	GURUNATHAN S	U17MB303	
14	HARSH BHARTI	U17MB304	
15	HENRITTA.I	U17MB305	
16	HIYA SAIKIA	U17MB306	
17	HRITHICK MANICKAM R	U17MB307	
18	JAYASHREE SAIKIA	U17MB308	
19	JITHU MOHAN	U17MB309	
20	KAILA PRASANTH KUMAR	U17MB310	

RESOURCE PERSON

COORDINATOR

S[illegible]HMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Course Code: PA09

PATH[illegible] ASSESSMENT OF TUMOR TISSUE

SHORT ANSWERS 6X3= 30

I. ANS[illegible] LL THE QUESTIONS

[illegible]AT ARE THE KEY OBJECTIVES OF THIS COURSE

[illegible]ME THE TYPES OF PATHOLOGY LABS

[illegible]RITE IN SHORT ABOUT SPECIMEN COLLECTION AND PREPARATION

[illegible]ST THE TYPES OF BIOPSIES

[illegible]RITE IN SHORT ABOUT TISSUE FIXATION AND GROSSING TECHNIQUES

[illegible]AT ARE THE STAINING METHODS

Gurunathan. S
U17MB303 Pathology Assessment of Tumour tissue

1) Key objectives for Tumor Tissue patients.

→ Improved understanding of the importance of pathologic evaluation of tissue to establish diagnosis and guid therapy for patients

→ Basic understanding of the various type of pathology laboratories and Member the pathology laboratory.

→ Improved understanding of various biopsy techniques used to sample tumors.

→ Basic understanding tissue fixation techniques and the importance of pre-analytic variables in ensuring accurate ancillary testing

2) Names of the types of PATHOLOGY LAB

1) hospital labs
2) Reference labs
3) Public health labs

3) Specimen collection and Preparation:

1) Collection

i) Preparation of the patients
ii) Collection of Specimen
iii) Processing the specimen
iv) Staining and for diagnosing the specimen

4) types of Biopsy

1) Image guided
2) fine needle
3) core needle
4) excisional
5) Shave.
6) Punch
7) Endoscopic

6) staining Method

1) oil staining
2) acid fast staining
3) gram staining
4) gel staining
5) water soluble staining

7) staining procedure of hematoxine

- deparaffinization
- dehydration
- hematoxylin
- differentiation
- Rhinsing
- eosin
- dehydration
- clearing
- mounting

PATHOLOGY ASSESSMENT OF TUMOR TISSUE

Jayashree

UIS MB 308

1) * Improved understanding of importance of pathologic evaluation of tissue to establish diagnosis and guide therapy for patient

* Basic understanding of the various types of pathology laboratories and members of pathology laboratory

* Improved understanding of various biopsy techniques used to sample tumors

* Improved understanding of how biomarker testing is used in oncology

* Improved understanding of the methodology and clinical utility of common molecular and immunohistochemical tests used in oncology

2) * Types of pathology labs

* Hospital labs

* Reference labs

* public health labs

A

3. Specimen collection / preparation

1. separate serum from red cells within two hours of venipuncture

2. Mix specimen with additive immediately after collection.

3. Allow specimens collected in a clot tube (eg. red top or gel barrier tube) to clot before centrifugation.

4. Draw the tubes in the proper sequence.

5. Avoid patient identification errors

4. Types of Biopsies

* Image guided Biopsy
* Fine needle aspiration biopsy
* core needle biopsy
* vacuum - assisted biopsy
* Excisional Biopsy
* Shave biopsy
* punch biopsy
* Endoscopic biopsy

5. Tissue fixation.

In the fields of histology, pathology and cell biology fixation is the preservation of biological tissue from decay due to autolysis or putrefaction. It terminates any ongoing biochemical reaction and may also increase the treated tissue, mechanical strength or stability

Student Feedback Form

Course Name: **PATHOLOGY ASSESSMENT OF TUMOR TISSUE**

Subject Code: **PA09**

Name of Student: Nishad K P Roll No.: U1TMB2911

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective					✓
6	Instructors encourage interaction and were helpful					
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

None

Signature

Date:

Student Feedback Form

Course Name: **PATHOLOGY ASSESSMENT OF TUMOR TISSUE**

Subject Code: **PA09**

Name of Student: J Thu . Muthu Roll No.: U17MB309

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear					✓
2	Course contents met with your expectations					✓
3	Lecturer sequence was well planned					✓
4	Lectures were clear and easy to understand					✓
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course					✓
8	Overall rating of the course	1	2	3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

NONE

Signature

Date:

Sri Lakshmi Narayana Institute of Medical Sciences

CERTIFICATE OF PARTICIPATION

This is to certify that KAILA PRASANTH KUMAR has actively participated in the Value Added Course on PATHOLOGY ASSESSMENT OF TUMOR TISSUE held during NOV 2018- JAN 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Partho protim barman
RESOURCE PERSON

Dr. Pammy Sinha
COORDINATOR
PROFESSOR & HEAD OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF MEDICAL SCIENCES,
PUDUCHERRY - 605 502.

Sri Lakshmi Narayana Institute of Medical Sciences

CERTIFICATE OF MERIT

This is to certify that GAUTHAMAN. M has actively participated in the Value Added Course on PATHOLOGY ASSESSMENT OF TUMOR TISSUE held during NOV 2018- JAN 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Partho protim barman
RESOURCE PERSON

Dr. Pammy Sinha
COORDINATOR

19.1.2019

FROM

Dr.Pammy sinha
Professor and Head,
Department of pathology
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Pathology assessment of tumor tissue

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: : FNAC technique and staining procedure in IInd MBBSNOV 2018- JAN 2019 for 20 students . We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,

Dr.PAMMY SINHA

PROFESSOR & HEAD, DEPT OF PATHOLOGY
SRI LAKSHMI NARAYAN INSTITUTE OF MEDICAL SCIENCES

Enclosure: **Certificates**

Photographs