1. **Introduction:**

The Cytopathology service at HMC is a comprehensive diagnostic service with no specimen exclusions. It provides routine screening and diagnostic testing for gynecological, non-gynecological and FNA specimens. The service accommodates all relevant cytologic specimens.

2. **Principle:**

The quality of the Cytologic diagnosis depends in equal measure on the excellence of the clinical procedure used to secure the sample and on the laboratory procedures used to process the sample. In general, material for Cytologic examination is obtained either in the form of smears prepared by the examining physician, at the time of the clinical examination, or in the form of liquid based specimens which are forwarded to the laboratory for further processing. Collection of all types of specimens for Cytology Gynecological, Non- Gynecological, and Fine needle aspiration specimens (FNA) either in the form of smeared glass slides or in the form of fluid/Aspiration is acceptable for Cytology study. Any doubt about the identity of the patient or specimen must be resolved by direct communication with the sender before the specimen is processed.

The procedures in this section must be followed in order to ensure a specimen of optimal quality for Cytologic evaluation. Specimens are only accepted from physicians, registered nurses, physician assistants, nurse practitioners, or other persons authorized by law to submit samples to the Cytopathology Laboratory.

3. **The Laboratory Services are Provided to:**

- Inpatient at Hamad Medical Corporation Hospitals.
- Out patient at Hamad Medical Corporation Hospitals.
- Army, QGPC, Primary Health Care and Private Clinics.
- Peripheral institutions in Qatar.
- Some referred private sector patients

4. **Scope of Service Provided:**

4.1 Routine screening and diagnostic testing of cells to:

- Identify abnormal cells and non-cellular elements, including bacteria, fungi, parasites, virally infected cells.

**Note:** Screening test is the routine test that is used for all kinds of specimens received to Cytopathology.

4.2 Others tests can be done in cytology lab as per physician request:

1. Differential cell count in BAL sample will identify the percentage of white blood cells such as (eosinophils, macrophages, polymorph nuclear leukocytes …).
2. Detection of crystals in joint effusions.

4.3 Table below summarizes the most common tests/specimens received by Cytology lab, and the methods of collection/sampling, also type of container should be used.

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Body Site</th>
<th>Type of Test / Specimen</th>
<th>Collection Guidelines and Procedures</th>
<th>Container used</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gynecological specimens: -</td>
<td>Female Genital Tract</td>
<td>Conventional pap smear test</td>
<td>Conventional Pap smear: 1. Smears should be fixed immediately in a 95% ethanol (Alcohol). 2. Avoid taking smear after using lubricant. 3. Avoid air-drying of the smear.</td>
<td>direct smear on a clean slide</td>
<td>For all types of Gyn specimens: Give adequate history: age, LMP, Exogenous, hormones intake and history of radiation.</td>
</tr>
<tr>
<td>Non Gynecological specimens</td>
<td>Respiratory system</td>
<td>Liquid Based Cytology</td>
<td>Liquid Based cytology 1. Obtain a sample in the recommended manner (using CERVIX BROOM). 2. Rinse cells immediately into the sure path vial 3. Cap vial and send to the lab.</td>
<td>Vial containing preservative will be provided by the lab.</td>
<td>LBC vials is also use for HPV-PCR Assay upon requisition either internal or external request.</td>
</tr>
<tr>
<td>Gastro-intestinal tract</td>
<td></td>
<td>Esophagus</td>
<td>1- Sent fresh immediately. 2- Must not contain any additives. 3. It is very important in case of urine specimens type of urine must be clear, e.g.: Voided urine, catheterized urine or bladder wash.max.100ml</td>
<td>Collected in sterile tube/container.</td>
<td>Adequate history (especially the age) and clinical data must accompany the samples.</td>
</tr>
<tr>
<td>Fluids from body cavities</td>
<td></td>
<td>Pleural fluid</td>
<td>a. Must be sent immediately to the lab. Samples from suspected TB. Samples must be sent in a sealed bag and contain note should be written on the form. b. It is very important to specify the type of fluid whether it is fluid/effusion or wash. c. CSF must be sent as soon as possible to the lab. (cyst fluid &amp; effusion max. 100 mL)</td>
<td>-Collected in heparinized tubes (green topped, bead less). -Red top tube is not acceptable because it is affecting the cells morphology.</td>
<td>CSF must be sent immediately to the lab (not more than 3 hours)</td>
</tr>
<tr>
<td>Aspirated Material Fine Needle Aspiration ( FNA )</td>
<td></td>
<td>a. Give adequate history for optimal result b. Inform the exact site of the mass.</td>
<td>All equipments will be provided by cytology staff</td>
<td>Contact cytology staff</td>
<td></td>
</tr>
</tbody>
</table>
4.4 List of Cytopathology specimens/Tests and the Turn around for each specimen/Tests:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Specimen Type</th>
<th>Turn around Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-</td>
<td><strong>Gynecological specimens:</strong></td>
<td></td>
</tr>
<tr>
<td>1-</td>
<td>Conventional pap smear test</td>
<td>10 business Days</td>
</tr>
<tr>
<td>2-</td>
<td>Liquid-based test for Pap smear:</td>
<td></td>
</tr>
<tr>
<td>3-</td>
<td>HPV request</td>
<td>3 business Days</td>
</tr>
<tr>
<td>2-</td>
<td><strong>Non Gynecological specimens:</strong></td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td><strong>Respiratory system</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sputum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bronchial wash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bronchial brush</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bronchial alveolar lavage (BAL)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Endotrachial tube (ETT)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 business Days</td>
</tr>
<tr>
<td></td>
<td><em>Unless cell block requires immunostain or special stain the TAT will be 7 working days</em></td>
<td></td>
</tr>
<tr>
<td>4.6</td>
<td><strong>Urinary system:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voided urine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Catheterized urine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bladder wash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kidney wash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ureter wash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hydrocelele specimen (fluid from the scrotal sac)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 business Days</td>
</tr>
<tr>
<td>C-</td>
<td><strong>Fluids from body cavities</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pleural fluid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pericardial fluid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peritoneal fluid/ wash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Synovial fluid (joints)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C.S.F (cerebrospinal fluid)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CUL – de-Sac fluid</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4 business Days</td>
</tr>
<tr>
<td></td>
<td><em>Unless cell block requires immunostain or special stain the TAT will be 7 working days</em></td>
<td></td>
</tr>
<tr>
<td>d-</td>
<td><strong>Miscellaneous:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fluid from any abscess or wash from any organ or site in the body</td>
<td>4 business Days</td>
</tr>
<tr>
<td></td>
<td>Nipple discharge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scraping from the skin</td>
<td></td>
</tr>
</tbody>
</table>
e- Gastro-intestinal tract:
- Esophagus
- Stomach
- Duodenum, Biliary ducts and pancreas
- Rectum and colon
4 business Days
Unless cell block requires immunostain or special stain the TAT will be 7 working days

<table>
<thead>
<tr>
<th>3-</th>
<th>Fine needle aspiration (FNA):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breast FNA</td>
</tr>
<tr>
<td></td>
<td>Thyroid gland</td>
</tr>
<tr>
<td></td>
<td>Lymph node and spleen</td>
</tr>
<tr>
<td></td>
<td>Salivary gland</td>
</tr>
<tr>
<td></td>
<td>Lung</td>
</tr>
<tr>
<td></td>
<td>Liver</td>
</tr>
<tr>
<td></td>
<td>Kidney</td>
</tr>
<tr>
<td></td>
<td>Soft tissues</td>
</tr>
<tr>
<td></td>
<td>Thymus</td>
</tr>
<tr>
<td></td>
<td>Bone</td>
</tr>
<tr>
<td></td>
<td>Abdominal aspiration.</td>
</tr>
<tr>
<td></td>
<td>Retroperitoneum</td>
</tr>
</tbody>
</table>
5 business Days
Unless cell block requires immunostain or special stain the TAT will be 7 working days

5. **General Instructions of Collection and Submission Cytology Specimens:**

5.1 Submission procedures:

1- Each specimen submitted to the Cytopathology Laboratory must be labeled clearly to avoid the possibility of specimen misidentification. Specimen containers should be labeled with the patient's name and Hospital Number.

2- All specimens **MUST** be:

   2.1- For private clinics, Armed Forces, Police and Qatar Petroleum accompanied by proper requisition form with complete patient demographics.

   2.2 - For HMC and PHCC an electronic order must be entered on the Cerner system.

3- To ensure proper specimen identification, evaluation and the expeditious delivery of reports, the following information **MUST** be included:

   1. Patient's name
   2. Hospital number
   3. Ward or clinic
   4. Requesting physician's name/stamp
   5. Adequate clinical data/prior history
   6. Date specimen collected.
   7. Specific site (type) of sample, **Note:** it is very important in case of urine specimens, type of urine must be clear, e. g.: Voided urine (midstream, clean catch), catheterized urine or bladder wash. Also it is very important to specify the type of fluids/effusing or is it wash, in case of abdominal / peritoneal specimens, peritoneal wash is different than peritoneal fluid or Ascetic fluid.
5.2 Collection procedure:

1. Sample should be placed in a clean container with tightly fitting lids to prevent spillage and to maintain adequate moisture during transit to the laboratory.
2. It is essential that all specimens as well as requests, slides, fixative, and bottles to be properly labeled.
3. It is recommended that all slides be marked with the patients name and Medical record number with pencil on the frosted end of the slides.
4. Patient identification matching using complete and formal names, on both the specimen and the laboratory request forms.
5. To safeguard against confusion in matching reports, avoid using nicknames.
6. Leave space on the top edge of slide for accession number.
7. Instructions for the proper collection and handling of Non-Gynecologic specimens such as sputum, body fluids have been written in the Cytopathology laboratory Guide in the HMC intranet.

6. Methods of Specimen Collection and Preparation

6.1 In the form of smears prepared by the examining physicians, gynecologist, surgeons or his/her assistant.
6.2 In the form of fluid specimens or liquid based specimens, which are forwarded to the laboratory for further processing.

7. Diagnostic Cytology is Based on Three Basic Sampling Techniques

7.1 Collection of exfoliated cells: Based on spontaneous shedding of cells derived from the lining of an organ into a cavity, e.g.:
   a. Cervical/Vaginal Cytology (Pap smear) is collected either by direct smearing (conventional smear) or by using liquid based method.
   b. Sputum.

7.2 Collection of cells removed mechanically by brushing or washing:

7.2.1 Flexible Endoscopic Instruments: A flexible endoscopic instrument is used for the inspection of hollow organs; there are two basic technical procedures.

   1) Upon removal of material, smear is immediately prepared by a skilled operation, attempting to concentrate all the cells in a small area of the slide and the smear should be fixed immediately in alcohol using 95% ethanol.
   2) Alternatively, the brush or other scraping instruments may be placed in fixatives such as alcohol and the sample is forwarded to the laboratory for further processing.

7.2.2 Washing and Lavage Technique: Washing techniques were developed as direct off short of rigid endoscopic instruments in which as small amount of normal saline or similar solution were instilled into the target organ under visual control, aspirated and collected in a small container.
7.3 The aspiration biopsy or removal of cells from non-surface bearing tissue by means of needle with or without syringe.

1. Fine needle biopsy (FNA) techniques designed to obtain cells and microscopic tissue fragments directly from a pathological lesion without the need for surgical intension.
2. Modern radiological techniques (Ultrasound, CT & MRT) have made virtually all organs and tissues accessible to FNA.

8. **Examples of the most common Specimens received by Cytology lab:**

8.1 **Gynecological Smears (Pap smear):** The major purpose for collection and preparing smears from the female genital tract is to sample the squamo-columnar junction or transformation zone of the cervix as most preneoplastic lesions arise in this area. The indication of satisfactory sampling of the transformation zone is the presence of endocervical cells or malignant cells in the smear.

8.1.1 Pap Test which is one example of the Collection of exfoliative Cytology that is based on spontaneous shedding of cells derived from the lining of an organ into a cavity.

8.1.2 A Pap smear (also known as the Pap test) is a medical procedure in which a sample of cells from a woman's cervix (the end of the uterus that extends into the vagina) is collected and spread (smeared) on a microscope slide. The cells are examined under a microscope in order to look for pre-malignant (before-cancer) or malignant (cancer) changes.

8.1.3 A Pap test is a simple, quick, and relatively painless screening test. Its specificity - which means its ability to avoid classifying a normal smear as abnormal (a "false positive" result) - while very good, is not perfect. The sensitivity of a Pap smear - which means its ability to detect every single abnormality - while good, is also not perfect, and some "false negative" results (in which abnormalities are present but not detected by the test) will occur.

8.1.4 **Collection and Submission of Conventional PAP smears**

8.1.4.1 The most commonly used sampling conventions are as follows:

- The cervical smears, which comprises a sample of the transformation zone and the endocervical canal.
- The vaginal, cervical, endocervical smear (VCE), which has the transformation zone and the endocervical canal.
- Vault smear: A smear of the vaginal vault is often included in the follow up management in cases of hysterectomy or cervical amputation.

8.1.4.2 Principle:

Cervical and vaginal smears are primarily obtained as a screening procedure for precancerous, cancerous or inflammatory conditions. Ectocervical, endocervical and vaginal pool (posterior fornix) material may be placed on a single side. The Pap test is a screening test for cervical cancer with an inherent small false negative rate.

8.1.4.3 Material needed:

- A. Cytopathology Requisition Form
- B. Glass slides - one end frosted
- C. Diamond point pen or lead pencil
- D. Cervical spatula and cytobrush
- E. Speculum (without lubricant)
- F. Fixative: 95% ethanol
8.1.4.4 Procedure for clinician:

A. Print the patient's last name, first initial and also patient’s number on the frosted end of the glass slide using the diamond point pen or lead pencil.
B. The speculum must be introduced with no lubricant. If necessary, normal saline may be used to moisten the speculum.
C. Rotate cytobrush 360° in endocervical canal, then rotate spatula 360° on ectocervix.
D. Fixation (95% Ethanol):
   a. Unroll brush material on one-half of the glass slide.
   b. Spread spatula material on the other half of the glass slide.
   c. Immediately drop slide into 95% alcohol.

E. Submit to cytology with an accompanying Cytopathology Requisition Form, properly completed to provide the following information in addition to the patient's name and identification number.
   1. Date of collection
   2. Source of specimen
   3. Patient's age
   4. Date of LMP
   5. Any current hormonal therapy
   6. Any previous atypical pap smears and/or cervical biopsies
   7. Any history of malignancy and subsequent surgery, chemotherapy and/or radiation therapy.

8.1.4.5 Instruction for collection of conventional Pap smear: The bottle of fixative should be opened and readily accessible before the specimen is obtained. Cells dry rapidly once they are spread out on a glass slide. The slide must be fixed IMMEDIATELY with Ethanol, 95% - Fix for a minimum of 15 minutes.

8.1.5 Two Types of Liquid Based Cytology Used in Cytopathology Lab:

8.1.5.1 THIN PREP® PAP TEST:

The Thin Prep Process Begins with the patient's gynecologic sample being collected by the clinician using a cervical sampling device, that rather than being smeared on a microscope slide, is immersed and rinsed in a vial filled with PreservCyt Solution.

   a. Principle

The Liquid Based Cytology is intended as a replacement for the conventional method of Pap smear preparation for use in screening for the presence of atypical cells, cervical cancer, or its precursor lesions (Low Grade Squamous Intraepithelial Lesions, High Grade Squamous Intraepithelial Lesions), as well as for all other cytologic lesions as defined by The Bethesda System for Reporting Cervical/Vaginal Cytologic Diagnoses. The Pap test is a screening test for cervical cancer with an inherent small false negative rate.

   b. Procedure for clinician

1- Materials Needed

A. PreservCyt vial
B. Speculum (without lubricant)
C. Sampling Device (Cervical spatula and cytobrush)
D. Patient ID label or permanent marker
2- Procedure

A. Label the PreservCyt vial with the patient ID label or permanent marker prior to sample collection.
B. Insert the speculum, which may be moistened with water or saline if necessary. (No other lubricants should be used.
C. Visually inspect the cervix for abnormalities and identify the transformation zone, if visible, to direct sampling efforts to encompass this area.
D. Collect the sample by **Cervical spatula and cytobrush**
   a. Rotate the spatula 360° about the circumference of the cervix while maintaining firm contact with the epithelial surface. IMMEDIATELY rinse the spatula in the PreservCyt Solution vial by swirling the spatula vigorously in the vial 10 times. Discard the spatula.
   b. Insert the cytobrush into the cervix until only the bottommost fibers are exposed. Slowly rotate ¼ or ½ turn in one direction. IMMEDIATELY rinse the brush in the PreservCyt Solution by rotating the device in the solution while pushing against the vial wall. Swirl the brush vigorously to further release material. Discard the brush.
   c. Tighten the cap so that the torque line on the cap passes the torque line on the vial.
E. Submit to cytology with an accompanying Cytopathology Requisition Form, properly completed to provide all relative clinical history.

8.1.5.2 SUREPATH TEST:

The SurePath Process Begins with the patient's gynecologic sample being collected by the clinician using a cervical sampling device Cyto-brush with detachable head (broom-type sampling device) that rather than being smeared on a microscope slide, The head of the sampling devices detach from the hand and are placed into a vial of SurePath preservation fluid.

a. **PROCEDURE FOR CLINICIAN**

1-Materials Needed
A. Vial of SurePath preservation fluid.
B. Speculum (without lubricant)
C. Sampling device Cyto-brush with detachable head (broom-type sampling device)
D. Patient ID label or permanent marker.

2-Procedure
a. Label the vial with the patient ID label or permanent marker prior to sample collection.

b. Insert the speculum, which may be moistened with water or saline if necessary. (No other lubricants should be used.

c. Visually inspect the cervix for abnormalities and identify the transformation zone, if visible, to direct sampling efforts to encompass this area.

d. Collect the sample by **Cervical Cyto-brush with detachable head**
   - Rotate the Cyto-brush with detachable head (broom-type sampling device) around the cervix. IMMEDIATELY place the head of the sampling devices that detach from the hand into a vial of Surepath preservation fluid.

e. Submit to cytology with an accompanying Cytopathology Requisition Form, properly completed to provide all relative clinical history.
**Note:** when using the *cervix brush* please perform the following:

1- Ordinary or traditional one, use it by applying four or five times rotation.
2- The other type is the *cervix –brush Combi* which has middle long part and this type requires 2 Full Turns in Clockwise direction.

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### 8.1.6 Collection and submission of SPUTUM for cytology:

#### 8.1.6.1 Principle:

A. Cytologic diagnosis of pulmonary carcinoma may be made largely on detection of exfoliated carcinoma cells in sputum or bronchial secretions. The procedure has been mainly used in the diagnostic work-up of symptomatic patients or those with an X-ray abnormality of the chest.

B. When a pulmonary lesion is suspected, a complete sputum series should be examined. The COMPLETE SPUTUM SERIES consists of a fresh, unfixed, early morning specimen each day for three days.

#### 8.1.6.2 Material needed:

A. 120-mL size Wide-mouthed specimen container with a tight lid is preferred. (Clean, dry and contain NO fixative)

B. Cytopathology Order Requisition Form

#### 8.1.6.3 Clinical procedure (routine):

A. Give the patient a clean sputum container the night before and instruct the patient not to use until the following morning before breakfast.

B. Instruct the patient that immediately upon waking, thoroughly rinsing his mouth.

C. Ask the patient to cough deeply (from the diaphragm) and expectorate all sputum into the container. Encourage the patient to expectorate deep SPUTUM, not saliva.

D. Submit the properly labeled specimen immediately to the cytology laboratory with an accompanying Cytopathology Requisition Form completed to include all relevant clinical history.

E. Repeat the procedure each day for three consecutive days.

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### 8.1.7 Collection and submission of BRONCHOALVEOLAR LAVAGE (BAL) specimens

#### 7.1.7.1 Principle and instruction:

A. Bronchoalveolar lavage (BAL) is a relatively simple procedure in which a high-volume saline lavage of a lung subsegment is done through a bronchoscope in order to obtain cellular and protein constituents from the pulmonary alveolar spaces.

B. BAL is used for the evaluation of possible neoplastic or infectious/inflammatory disease.
IMMEDIATELY submit the labeled specimen to the cytology laboratory with an accompanying Cytopathology Requisition Form, containing all relevant clinical data.

8.1.8 Collection and submission of BRONCHIAL WASH specimens

8.1.8.1 Principle and instruction.

Specimens may be obtained during bronchoscopy by using saline to wash the suspicious areas.

IMMEDIATELY submit the labeled specimen to the cytology laboratory with an accompanying Cytopathology Requisition Form, containing all relevant clinical data.

8.1.9 Collection and submission of BRONCHOSCOPIC BRUSHINGS:

8.1.9.1 Principle.

Specimens may be obtained during Bronchoscopy by DIRECT BRUSHINGS of suspicious areas.

8.1.9.2 Instruction

The brush is dropped preferably in or 95% or alternatively in Saline ethanol and promptly delivered to the laboratory accompanied by a Cytopathology Requisition Form.

8.1.10 Collection and submission of VOIDED AND INSTRUMENTED URINE:

8.1.10.1 Principle:

Carcinomas arising from the epithelium surfacing the urinary tract (the urothelium) desquamate readily into the urinary stream. Cytology of the urine sediment is most useful in the diagnosis of carcinoma of the bladder, renal pelvis, ureter and urethra. It is primarily an aid in differential diagnosis of patients who are symptomatic.

8.1.10.2 Material needed:
A. Cytopathology Requisition Form
B. Urine specimen clean container.
C. Max 100 mL.

8.1.10.3 Procedure:

A. Voided urine specimens
   1. Patient should be instructed in clean urine container technique by nursing staff or clinician.
   2. Do not add fixative to specimen.
3. Refrigerate the specimen until it can be delivered to the laboratory.

B. instrumented urine specimens
1. Instrumented urine specimens should be collected in electrolyte balanced solution only.
2. Refrigerate the specimen until it can be delivered to the laboratory. Ideally, specimen should be sent to the cytology laboratory within an hour of collection.

8.1.11 Collection and submission of BODY CAVITY FLUIDS:

8.1.11.1 Principle:

The primary purpose of Cytologic examination of fluids is to rule out metastatic or primary cancer. Occasionally, other diagnostic conclusions can be reached. **Pleural, pericardial, peritoneal and joint fluid should be submitted fresh and unfixed, heparinized or non-heparinized, but with out any additives.** These recommendations are made in order to provide well-preserved, representative diagnostic material. If clotting occurs, diagnostic material may be trapped within the fibrin network and be unavailable for satisfactory evaluation. This can be overcome, however, by submitting clots for cell block preparation. Fixation interferes with technical processing.

8.1.11.2 Material needed:
A. Cytopathology Requisition Form
B. Sterile container.

8.1.11.3 Procedure:

A. Ideally specimen should be sent immediately to the laboratory.
B. Specimen should be refrigerated until time to be delivered to the laboratory.

8.1.11.4 NOTES
a- The recommended volume of fluids for cytological testing is 100 mL in sterile container. Any amount of specimen exceeding 100 mL should submit is additional container for the safety reason.

8.1.12 Collection and submission of CEREBROSPINAL FLUID

8.1.12.1 Principle

Cytologic evaluation of CSFs are performed to detect malignant lesions and inflammation as well as to report ancillary findings on Patients with symptoms of CNS (Central Nervous System) disease or candidates for CNS involvement by metastatic neoplasm.

8.1.12.2 Material Needed

A. Cytopathology Requisition Form
B. Spinal collection tubes
C. Spinal needle

8.1.12.3 Procedure:
Perform tap, and IMMEDIATELY submit properly labeled tube to the cytology laboratory with an accompanying Cytopathology Requisition Form, properly completed to provide all relevant clinical data.

8.1.12.4 Notes

- Refrigerate specimen if unable to deliver it to cytology laboratory in a timely manner, or in any circumstance in which processing will be delayed (i.e., submitted after normal working hours).
- If bacteriologic studies are also indicated, a separate specimen must be submitted to microbiology with the proper request sheet.
- CSF must be sent as soon as possible to the lab.

8.1.13 Collection and submission of MISCELLANEOUS FLUIDS (CYST FLUIDS, JOINT FLUIDS)

8.1.13.1 Principle

Fluids aspirated from breast or other cysts, joints or fluids obtained by other means, should be submitted for Cytologic evaluation to rule out the possibility of malignancy, either primary or metastatic or infectious etiology.

8.1.13.2 Material

A. Cytopathology Requisition Form
B. Syringe
C. Specimen container

8.1.13.3 Procedure

A. Collect as much fluid as possible with the syringe.
B. Transfer the fluid to a specimen container labeled with the patient’s name and ID#.
C. Immediately submit the unfixed specimen to the cytology laboratory, accompanied by a Cytopathology Requisition Form properly completed to include all relevant clinical history.

8.1.14 Collection and submission of NIPPLE DISCHARGE SPECIMENS:

8.1.14.1 Principle

Any breast secretion, except normal milk, is abnormal. Cytologic evaluation of breast secretion is simple and the accuracy is high.

8.1.14.2 Material Needed

A. Cytopathology Requisition Form
B. lead pencil
C. Glass slides (one end frosted)
D. Fixative - 95% ethanol.
E. Cardboard slide holder or coplin jar

8.1.14.3 Procedure
A. The procedure and the preparation can be done in outpatient clinics or any other area of the hospital, also the physician can send the patient’s direct to Cytology lab.
B. Cytology staff will receive a call from the physician in order to prepare the smears.
C. Physician will explain the aim and the procedure for the patient.
D. Cytology staff can take care about collecting the specimen and giving the below instruction to the patient.
E. If the patient will come to cytology lab, cytology staff will make sure to collect the specimen in clean, secure room.

F. Label the slides on the frosted end with the patient's name, first initial, and patient’s number using the lead pencil.
G. If using 95% ethanol as fixative open the bottle and have the patient hold it near the breast.
H. Gently express only the nipple and subareolar area for any secretions which may be lying in the collecting ducts. If no secretion appears at the nipple with this gentle compression, DO NOT manipulate further.
I. Immobilize the breast and, using the nipple, smear the material across a glass slide.
J. IMMEDIATELY drop the slide into the fixative. Time is of the essence here.
K. Make as many smears as the amount of material allows.

**NOTE: DO NOT massage or squeeze the breast. Too vigorous manipulation may dislodge and spread malignant cells.**

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### 8.1.15 Collection and submission of FINE NEEDLE ASPIRATION SPECIMENS (FNA):

#### 8.1.15.1 Principle

8.2 Fine needle aspiration can be defined as a method of collection cells, using a fine needle from a mass for diagnostic purposes.

8.3 With the introduction of various imaging modalities, such as computed tomography and ultrasound, the scope of diagnostic aspirates became virtually unlimited, and it may now be stated that nearly all space-occupying lesions in the human body are accessible to sampling by aspiration.

8.4 Fine needle aspiration cytology has become a highly respected and widely used diagnostic tool at the National Institutes of Health. In many instances, needle aspirations provide the sole means for establishing a patient's therapeutic course. The initial steps of this procedure, including localization of the lesion, insertion of the needle into the field, and mechanical aspiration of the sample, require the medical expertise of a practiced clinician. The actual preparation of the Cytologic smears, however, demands the knowledge and acumen of a competent cytotechnologist. The following guidelines describe the Cytopreparation steps necessary for obtaining quality diagnostic samples. The recommended methods produce Cytomorphology that can be reproduced, recognized and interpreted by qualified personnel. The purpose of an FNA is to gather maximum information prior to surgery or in inoperable cases before treatment. However, the definitive diagnosis must still be based on histological examination of tissue removed and surgically.

8.5 F.N.A. is mainly used to investigate suspected neoplastic disease, but is also of value in the diagnosis of non-neoplastic conditions such as cysts, tissue hyperplasia, inflammatory processes and more metabolic and degenerative disorders.

#### 8.1.15.2 The instructions included the preferred method of collection for FNA.

A. Call Cytology (44393031 or 3061) to request a cytotechnologist to assist with the procedure.

B. The physician will explain the procedure, including its risks and its benefits to the patient, and obtain oral consent from the patient.

C. Cleanse the area with the alcohol prep pad and allow it to dry.

D. Cytology staff must apply patient’s identification policy by asking the patient about his/her name and compare it to the request/order form.
E. Cytology staff must confirm about the site/specimen type of FNA with the physician and also to make sure it is written clearly on the request form.

F. The cytotechnologist will label the glass slide on the frosted end with unique lab number and at least one patient’s identifiers to be on the prepared slides, and also any specimen container at the time of the procedure.

G. Insert syringe into appropriate syringe holder and attach needle. Cytotechnologist uncaps fixative at this time.

H. The procedure of FNA is done by physician.

I. Uncap needle and perform the aspiration either by aspiration or non-aspiration techniques as follows:

1.) Aspiration:
   A. Immobilize the nodule between two fingers and quickly insert the needle into the lesion with the plunger in the resting state.
   B. Retract the plunger, creating suction in the needle.
   C. Use backward and forward movements under constant suction, keeping the needle tip in the lesion.
   D. Release the plunger to prevent aspiration of the sample into the syringe BEFORE removing the needle from the lesion.
   E. Withdraw the needle from the lesion.
   F. Apply pressure to the lesion with a sterile gauze pad to avoid hematoma.
   G. The cytotechnologist will distribute material thinly and evenly between two slides and IMMEDIATELY immerse one slide in fixative and allow the other slide to air dry.
   H. Cytotechnologist can use one slide as spreader to spread the material on the other smear; the spreader smear can be kept as air dry smear.
   I. Rinse the needle with 50% ethanol. The rinsing is used to prepare cell block filter, and/or cytospin preparations in the laboratory.
   J. Repeat steps C through H as needed.
   K. The cytotechnologist will return to the laboratory with the smears and needle rinsing for further processing.

2.) Non-aspiration: (good for vascular lesions such as thyroid).
   A- Immobilize the nodule and insert the needle, using a needle and syringe in which the suction in the syringe is broken before insertion of needle into lesion.
   B- Use a quick back and forth motion to move the needle in the lesion.
   C- Remove the needle from the lesion and apply pressure to the lesion.

8.1.15.3 Important information about FNA services:

A. In order to maintain an efficient and timely service to clinicians utilizing FNA procedures, the Cytopathology Department requests that procedures be scheduled daily to be performed between the hours of 8:30 am and 11:00 am. Cytotechnologists are available only until 11:00 am. For outpatient departments.

B. After 11:00 am the cytotechnologist is servicing the inpatients and patients needed FNA under Computed Tomography Guided (CT Scan) and also under endoscopy guided.
C. Three days per week (Sunday, Monday and Tuesday) the Cytotechnologist servicing the patients needed FNA under Ultrasound Guided (CT Scan). This is ESSENTIAL for optimal diagnostic evaluation.

8.1.15.4 The following informations are important to be included with the clinical history:

1. Site of aspirated lesion
2. Known primary malignancy - site and differentiation
3. Previous radiation and/or chemotherapy
4. Any other pertinent history
5. Imaging and clinical characteristics of lesion, particularly breast.

9. Specimen acceptance:

9.1 Cytology lab has defined a procedure for specimen acceptance, specimen rejection and actions when received unacceptable Cytopathology specimens.

9.2 Specimens or slides may be rejected if not adequately identified.

9.3 Verifying patient identification must be performed by checking complete formal names on both the specimen and request form for paper based order request. Electronic order request should be verified electronically for complete patient identifiers.

9.4 The requisition should include patient name and HC/file/medical record number (unique identifier), specimen source, pertinent clinical information, requesting physician or other authorized person, name, and date of specimen collection. For gynecological specimens, the date of last menstrual period should be included as well as age or date of birth and pertinent history of previous abnormal reports, treatment or biopsy.

9.5 Rejection of specimen or slides will be done under the following circumstances:
   a. Unlabeled specimen or slides.
   b. Labeling on the specimen does not correspond with the labeling on the Cytopathology requisition.
   c. Slides broken beyond repair.
   d. Specimen received without requisition or wrong requisition or the order not clear.
   e. Excessive amount of body fluids (effusion and urine), volumes greater than one liter will not be accepted by the lab.
   f. Requisition forms with incomplete patient information (name and file number) clinical data (authorized physician stamps).
   g. Specimen collected in wrong container or tubes that affecting cell morphology.
   h. Spoiled specimen in the plastic bag or dirty request forms with specimen material.

10. Packaging & Transporting Specimens To The Laboratory:

10.1 All specimens must be handled according to the health and safety procedures and policies established for standard precautions in HMC.

10.2 Specimens should be placed in a waterproof or the special plastic bag with the request in its separate pouch (request form should not be wrapped around the specimen).

10.3 It is preferable to have secondary container or plastic container that will protect the specimen and be as a barrier between specimen and the environment.
10.4 As a part of specimen tracking protocol, list of specimens written in original requester log book show the HC number and patient’s name for each specimen is necessary for documenting the receiving process.

11. **IN CASE OF EMERGENCY OR EXTREME DIFFICULTY CONTACT THE FOLLOWING:**

   Consultant Pathologist 44396969  
   Consultant Pathologist 44391284  
   Cytopathology Supervisor 44393164  
   Technical staff area 44393031, 44393061

   You can also be transferred when necessary to any of the above by calling 44393032