

# ANATOMIC PATHOLOGY LABORATORY WORKFLOW

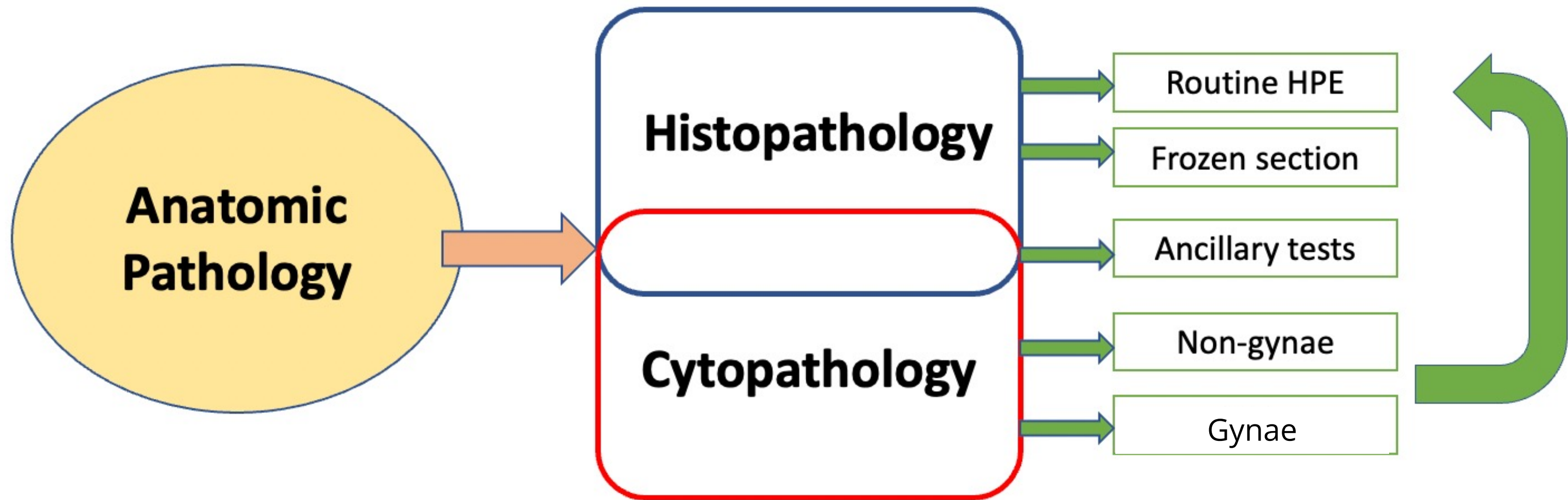
**CUSTOMER EDUCATION SERIES 2-2023**

**18<sup>TH</sup> AUGUST 2023**

# OUTLINE:

- Components of AP service
- Overview of laboratory processes in Anatomic Pathology (AP) laboratory
- Common pre-analytical errors in AP laboratory
- Rectification criteria
- General guide for optimal specimen preparation and test request
- Turnaround time (TAT)
- Critical notification

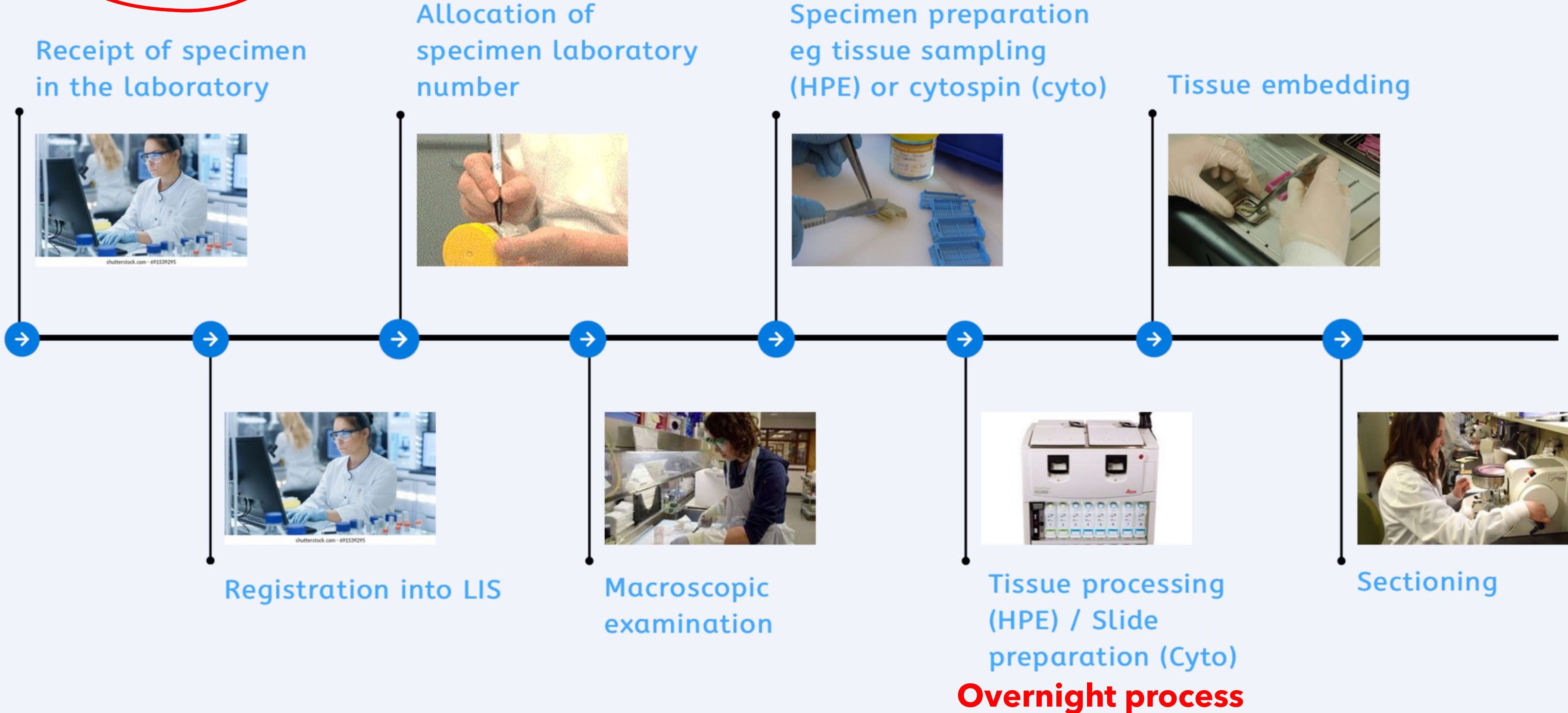
# COMPONENTS OF AN AP SERVICE





**Rectification**  
↑

# PROCESSES IN ANATOMIC PATHOLOGY (2)



# PROCESSES IN ANATOMIC PATHOLOGY (3)





# RECTIFICATION CRITERIA

## Specimens

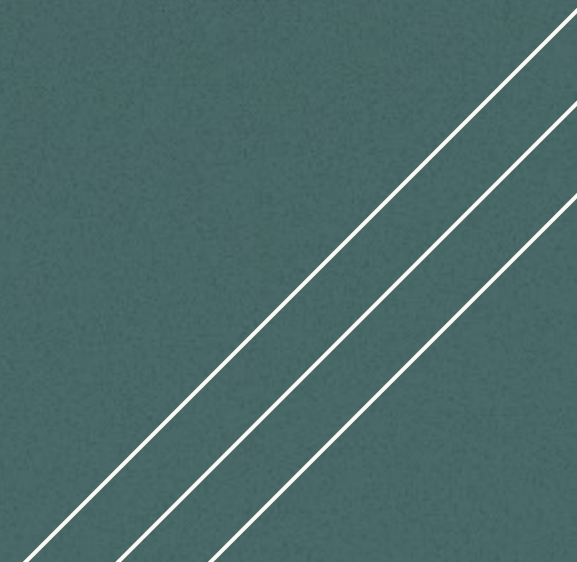
1. No specimen(s) received
2. Wrong specimen(s) received
3. Incorrect number of specimens received
4. Inappropriate specimen container
5. Lack of, or wrong labelling of specimen(s)
6. Leaking specimen container
7. Specimen(s) do not tally with request form

## Request Form

1. No request form received
2. Wrong request form received
3. Request form torn / damaged / contaminated
4. Incomplete request form (demographic details, requester's name etc)



# REQUEST FOR TESTS



## **ROUTINE HPE**

- Diagnostic
- Small biopsies, small and large resections and excisions
- Tissue pieces obtained from cytology
- Cell blocks from cytology
- Residual tissue from frozen section specimens
- Formalin-fixed

## **FROZEN SECTION**

- For intraoperative consultation requiring rapid communication
- Certain ancillary - eg immunofluorescence
- Fresh tissue
- NOT for primary dx!

## **CYTOLOGY**

- Diagnostic
- Material for ancillary tests
- ROSE

## **REFERRED MATERIAL**

- Second opinion
- MDT/CPC
- Stained / unstained slides or paraffin block

## **ANCILLARY**

- Special stains, immunohistochemical stains, molecular tests etc
- To supplement morphological interpretation
- Subtyping of tissue / tumour
- Predict response to therapy

# REQUEST FORM

- The required test
- **Patient details & identifiers**
- **Relevant clinical history**
- Differential / working diagnosis
- Any specific queries
- The (surgical) procedure performed
- **Type of specimen removed**
- Tissue orientation\* including laterality
- Name of requester & location
- **Urgent vs routine**
- Contact number of PIC (especially for urgent requests or frozen section)
- ?Specific hazard eg infectious\* (not accepted if fresh)
- Previous pathology reports
- Imaging reports / details: eg one vs multiple nodules, location, size, relationship to structures etc
- Prior discussion with the pathologist would be most welcome
- Beware of service hours (eg FS)

*\*Sutures, text descriptions, images or personally orientating the specimen to the pathologist*



**ANATOMIC PATHOLOGY REQUEST FORM**

UiTM/FPR/CPDRL/QP-11  
/IF-03  
438099519A ✓  
FOR LAB USE ONLY

Name	: [REDACTED]	Clinic / Ward	: HUITM - Daycare
MRN	: [REDACTED]	Phone No	: 0192293766
I/C No	: [REDACTED]	Date of Admission / Clinic Appointment	: [REDACTED]
DOB	: [REDACTED]	Requested By	: DR. [REDACTED]
Age	: 69y 11m 22d	Ordered Date/Time	: 24-05-2022 11:39
Race	: Chinese	Consultant in Charge	: [REDACTED]
Gender	: FEMALE		
App.Date (Specimen)	: N/A		
Remark	:		

**Clinical History :**

69 year old, NCNC anaemia. Small oesophageal polypoid lesion, likely papilloma @ 25cm from incisor - labelled as "oesophagus polyp". Heterotropic gastric mucosa @ 15cm from incisor - labelled as "oesophagus". Biopsied for confirmation.

**Diagnosis :**

69 year old, NCNC anaemia. Small oesophageal polypoid lesion, likely papilloma @ 25cm from incisor -

**Test Request :**

HPE - Diagnostic Biopsy

**Specimen :**

OESOPHAGUS ✓

**Site :**

N/A

**Specimen Collection :**

Specimen Collection : 24-05-2022 11:45:28

Sample Taken by / Printed by : [REDACTED]

Sample Taken at : HUITM - Phlebotomy Daycare

TERIMA 22 MAY 22 8:30AM

**URGENT**

**URGENT**

**ANATOMIC PATHOLOGY REQUEST FORM**



HUITM-CLD-CDL(AP)-F-012-02  
459319219  
FOR LAB USE ONLY

HP-23-1442 A

Name	: [REDACTED]	Clinic / Ward	: HUITM - Daycare
MRN	: [REDACTED]	Phone No	: 0192345480
I/C No	: [REDACTED]	Date of Admission / Clinic Appointment	: [REDACTED]
DOB	: [REDACTED]	Requested By	: DR. [REDACTED]
Age	: [REDACTED]	Ordered Date/Time	: 09-08-2023 12:04
Race	: Malay	Consultant in Charge	: [REDACTED]
Gender	: FEMALE		
App.Date (Specimen)	: N/A		
Remark	:		

**Clinical History :**

P/w lower abd pain x3/52, a/w PR bleeding and diarrhea (diarrhea resolved). Has FHx of malignancy (late brother dx with pancreatic CA). Colonoscopy 9/8/23: - Ulcer at anorectal junction (biopsied and sent for HPE) with proctitis at distal rectum. - Appendiceal opening and surrounding mucosa raised and abnormal looking (biopsied and sent for HPE). \*\* requesting to look for M. tuberculosis in this HPE if possible as sample already inserted into Formalin solution. - Terminal ileum mildly erythem

**Diagnosis :**

? Appendiceal mass

**Test Request :**

HPE - Diagnostic Biopsy

**Specimen :**

COLON OTHER

**Site :**

N/A

**Specimen Collection :**

Specimen Collection : 09-08-2023 12:20:53

Sample Taken by / Printed by : SITI NORLELA IBRAHIM

Sample Taken at : HUITM - Phlebotomy Daycare

TERIMA 9AUG'23 2:56PM

**For multiple specimens, please select multiple specimens during order entry in UniMEDS**

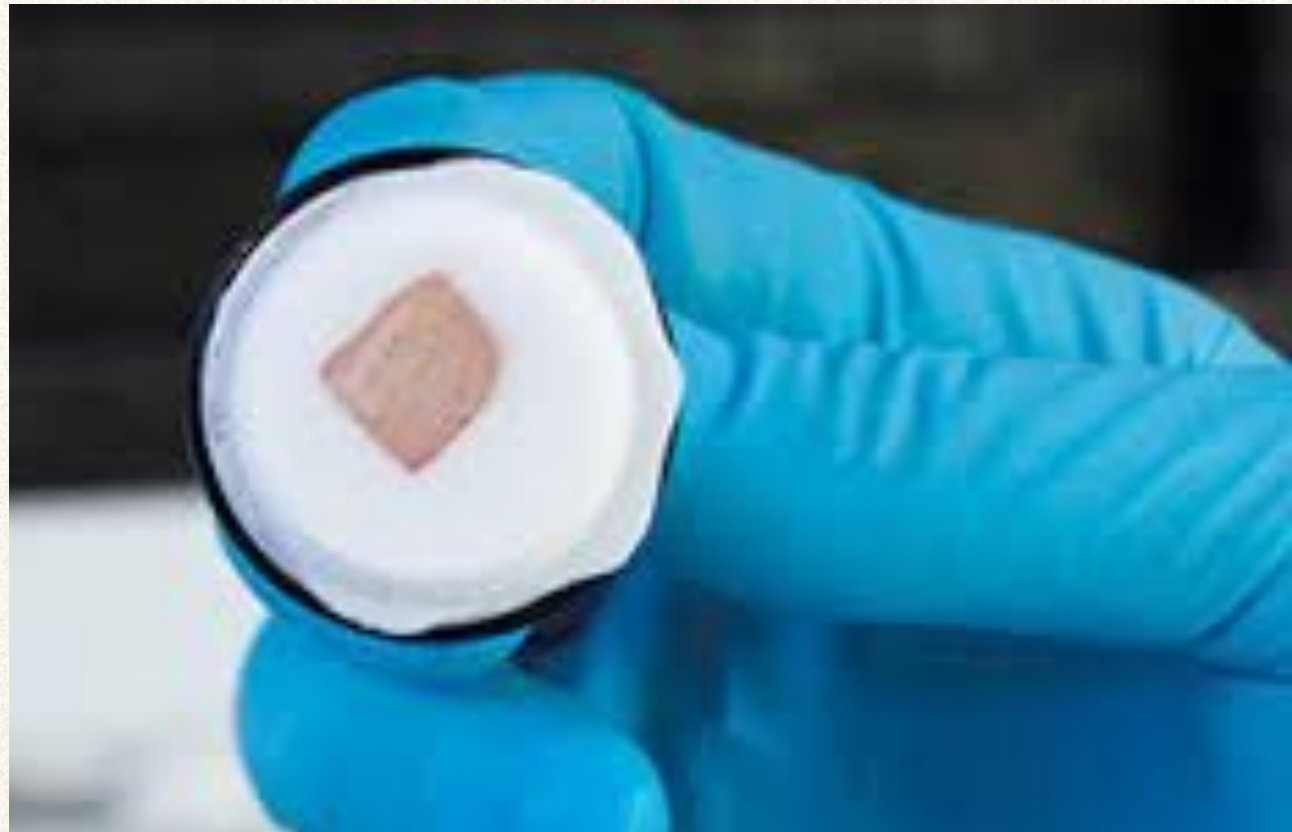
# SPECIMEN

- Identify the type of specimen suitable for the requested test
- Orientate the specimen (eg with sutures) – to be detailed in the form
- Place specimen in appropriate fixative (or send fresh)
- Appropriate container - size, sealable, leakproof
- Label the container - at least name and one other unique identifier and specimen type
- Close and seal
- ?Any particular hazard



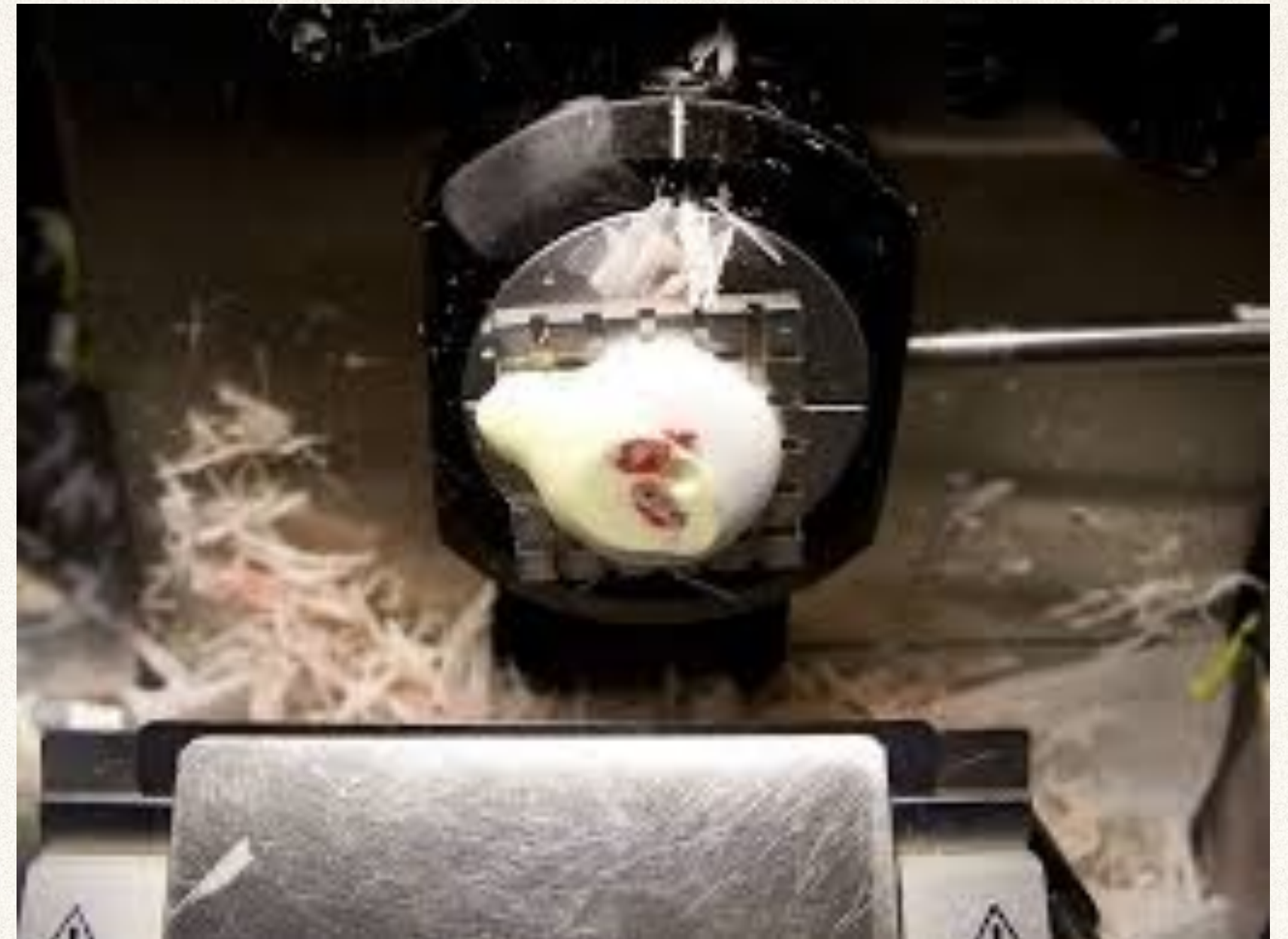
**HPE**

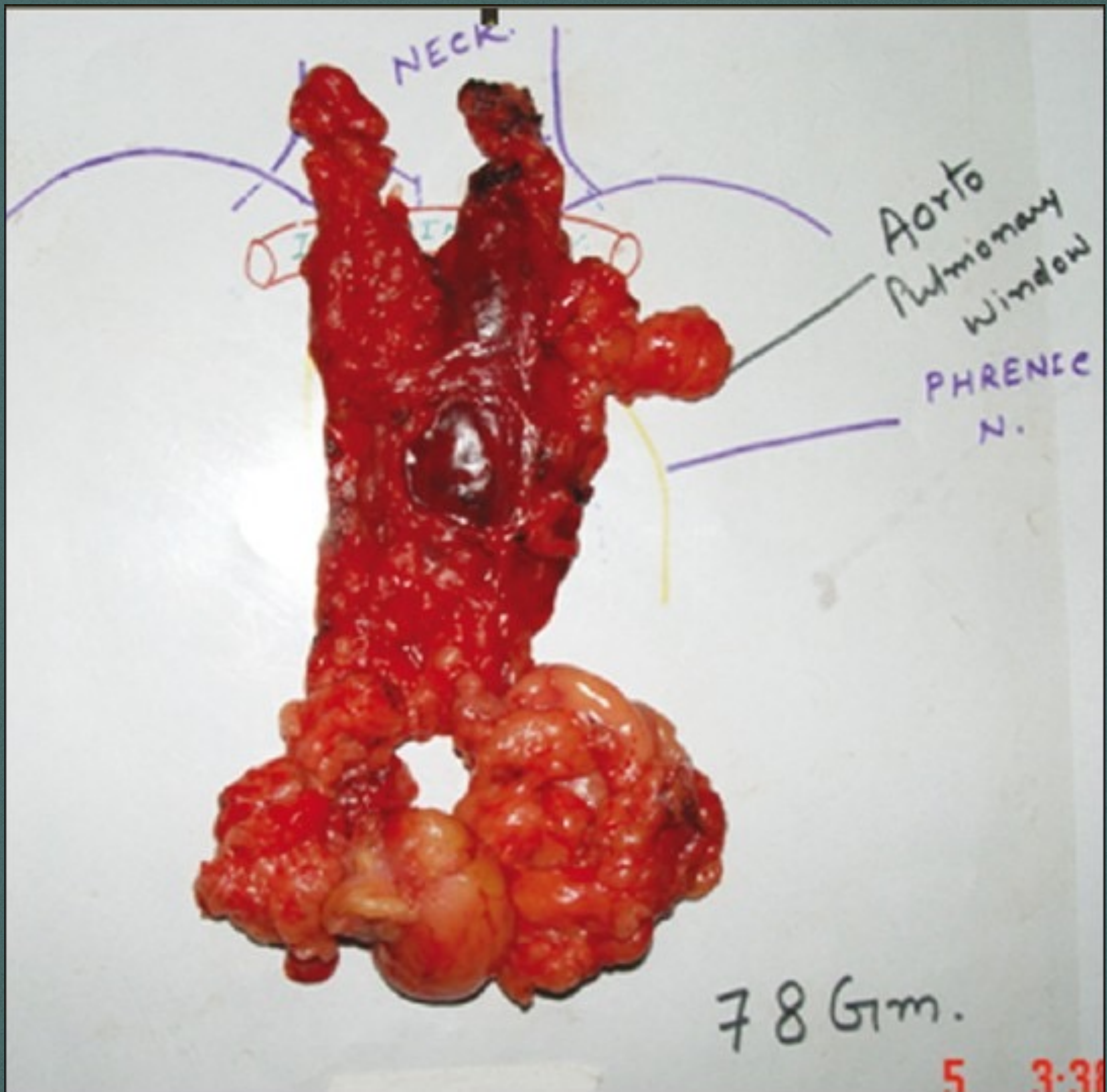
IN FORMALIN



- Fresh tissue, without preservative, in a closed container
- Small size
- Must be pre-booked
- Must have contact number provided
- DO NOT send infectious material!
- Best to schedule the op first on the list

## FROZEN SECTION





NECK

Aorto  
Pulmonary  
Window

PHRENIC  
N.

78 Gm.

5 3-31



# CYTOLOGY – GENERAL PRINCIPLES

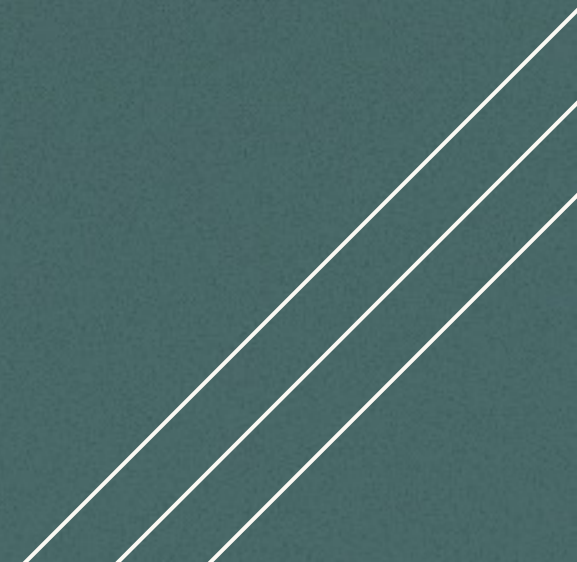
- Sterile containers
- Prepare as fresh as possible
- Optimal amount of effusion is 25mls
- Can include tissue pieces (will be extracted for examination)
- Brushings can be either alcohol-fixed smears or in liquid-based medium. Rinse brush in normal saline to maximize cell yield
- Cyst - submit entire content
- Sputum - first thing in the morning (before brushing the teeth or breakfast)
- Scrapings should be spread onto glass slides and fixed
- Separate specimens meant for other disciplines (eg microb testing, clinical chemistry etc)

<b>Histopathology</b>			
<b>Specimen type</b>	<b>Container</b>	<b>Sample Volume / size</b>	<b>Remarks</b>
<b>Routine HPE examination</b>	Appropriate-sized, leak-proof container. Place in 10% formalin (at least 10x volume of sample).	-	This is to ensure proper fixation of the specimen.
<b>Frozen section</b>	Clean, empty air-tight container.	-	Despatch immediately.
<b>Renal biopsy for IF</b>	Clean, empty air-tight container or in Phosphate Buffer Solution (PBS).	At least 3mm core.	Despatch immediately. Otherwise, transport in ice/gel-ice.
<b>Skin biopsy for IF</b>	Tissue in saline or PBS in a clean, air-tight container.	-	Please submit a separate piece of tissue in formalin for light microscopy.
<b>Cytopathology</b>			
<b>Gynae</b>			
<b>Specimen type</b>	<b>Container</b>	<b>Sample Volume / size</b>	<b>Remarks</b>
<b>Gynae smears (Conventional)</b>	Smear onto labelled slides. Spray-fix immediately.	As collected.	Despatch immediately.
<b>Gynae smears (liquid-based)</b>	Collection vial containing fixative (can be collected from the lab).		
<b>FNAC</b>			
<b>Specimen type</b>	<b>Container</b>	<b>Sample Volume /size</b>	<b>Remarks</b>
<b>FNAC of any site (smears)</b>	Smear onto labelled slides. For alcohol fixation (wet-fixed), fix immediately by either immersing in 95% alcohol or spray-fix. For air-dried slide, leave to air-dry.	The minimum number of slides to be submitted depends on sample types; as outlined below.	Despatch immediately.
<b>FNAC of any site – (for cell block)</b>	Place aspirated material and needle washing in cytolyt-containing tube.	As collected.	Despatch immediately.

<b>FNAC sample requirements</b>	<b>Sample types</b>	<b>Needle washings to be provided?</b>	<b>Minimum number of slides/smears to be submitted</b>
	Breast	Yes	2 air-dried & 2 wet-fixed
	Thyroid	Yes	2 air-dried & 2 wet-fixed
	Nipple discharge	No	1 air-dried & 1 wet-fixed
	Cyst aspirates	No	1 air-dried & 1 wet-fixed
	Lung	Yes	2 air-dried & 2 wet-fixed
	Lymph node	Yes	2 air-dried & 2 wet-fixed
	Solid lump	Yes	2 air-dried & 2 wet-fixed
	Salivary gland	Yes	2 air-dried & 2 wet-fixed
	Liver/pancreas	Yes	2 air-dried & 2 wet-fixed

Specimen type	Container	Sample Volume / size	Remarks
<b>Bronchoalveolar lavage (BAL)</b>	Sterile specimen container (in saline).	Minimum 5mls. The optimal volume is 20mls.	Keep fresh specimen in saline at 4°C. Despatch immediately (on the same day) with ice packing during transportation.
<b>Brushing (e.g. EBUS, EUS) - smears</b>	Smear onto labelled slides. For alcohol fixation, fix immediately by either immersing in 95% alcohol or spray-fix. For air-dried slide, leave to air-dry.	As collected.	ROSE service is provided for optimal sampling. Despatch immediately.
<b>Brushing (e.g. EBUS, EUS) – for cellblock</b>	Place in cytolyt-containing tube.	As collected.	Despatch immediately.
<b>Serous fluid (eg Pericardial, Peritoneal, Pleural)</b>	Sterile specimen container.	The minimum volume of 75mls (for large volume collection and washings)	As much fluid as possible should be sent for evaluation.
<b>Sputum</b>	Sterile specimen container.	As collected. The entire amount of expectorated sample should be submitted. Multiple samples (x3) may be needed, but they should be taken on 3 separate days.	Should only be taken where patients are unfit for bronchoscopy. For best results obtain sputum following chest physiotherapy, with an early morning sample before the patient has eaten or brushed teeth.

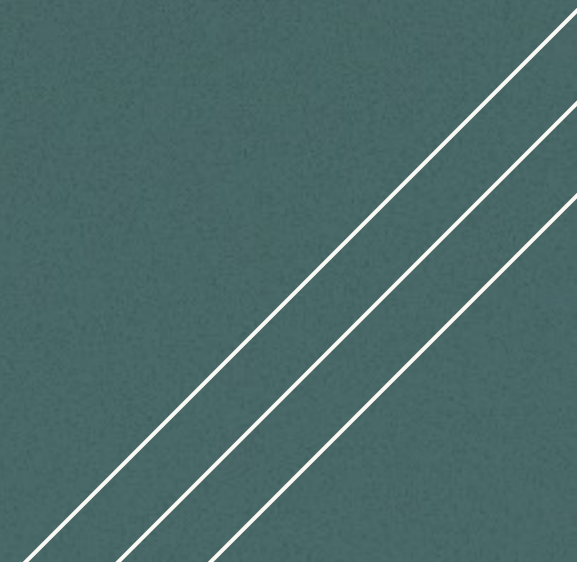
# STORAGE AND TRANSPORT



# GENERAL PRINCIPLES

- Transport ASAP especially fresh and cytology specimens
- **If delay is expected (for fresh/cyto specimens), keep in fridge\*.**
- Specimens in fixative will be stable
- Safe transport (eg manual; not using pneumatic tube)
- Proper packaging
- Record of despatch and receipt in lab
- Sender/requester to be contactable if required (*for rectification if there are errors*)
- Refer handbook

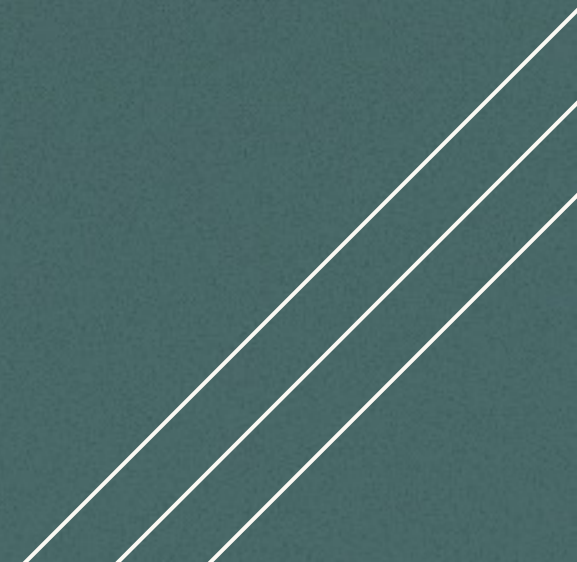
# SPECIMEN RECEPTION



# WHERE & WHEN TO SEND AP SPECIMENS?

- Lab is currently fully in HASA, 1<sup>st</sup> floor
- Specimens in PPUiTM Sg Buloh to be sent to Main Specimen Reception (MSR), Level 1 CTC → will be transported to HASA
- AP reception operates **8am – 5pm Monday – Friday (excluding public holidays)**
  - Particularly important for cytology/fresh specimens (refer to previous slide)

# ADDITIONAL REQUESTS





# WHAT REQUESTS?

- Ancillary tests
- Discussions
- MDT/CPC
- Diagnostic material for referrals to other institutions

# WHY AND WHEN?

- Initiated by pathologist or clinician
- Diagnostic vs prognostic vs predictive
- Applicable to HPE & cyto specimens

# HOW?

- Refer handbook / guidebook
- Discuss on case-by-case basis
- Specific request form to be completed

# TURNAROUND TIME

CATEGORIES	TAT
Uncomplicated urgent biopsies	5 working days
Complicated urgent biopsies and routine surgical specimen	14 working days
Frozen section	30 minutes (per specimen) from time of arrival to the lab to verbal reporting
Renal / Skin biopsy with immunofluorescence	14 working days
Gynaecological / Non - Gynaecological cytology:	14 working days

# CRITICAL RESULTS NOTIFICATION

Cases with immediate clinical significance that require urgent action or unexpected diagnoses

## Examples:

- Unexpected malignancy\*
- Wrong organ removed
- Fat in endometrial curettage or colon biopsy
- Infection in unusual sites
- Crescents in >50% of glomeruli in a renal biopsy

# SUMMARY

- Components of AP service
- Overview of laboratory processes in Anatomic Pathology (AP) laboratory
- Common pre-analytical errors in AP laboratory
- Rectification criteria
- General guide for optimal specimen preparation and test request
- Turnaround time (TAT)
- Critical result notification

# QUESTION 1

Pre-analytical steps in Anatomic Pathology processes include:

<b>A.</b>	<b>Ordering of tests.</b>
<b>B.</b>	<b>Grossing of specimen.</b>
<b>C.</b>	<b>Microscopic examination of slides.</b>
<b>D.</b>	<b>Specimen disposal.</b>

# QUESTION 2

The following non-conformances will require rectification by the requester, EXCEPT:

<b>A.</b>	<b>Absence of a label on the specimen container.</b>
<b>B.</b>	<b>Incomplete request form.</b>
<b>C.</b>	<b>Lack of requester's name on request form.</b>
<b>D.</b>	<b>Typographical error in histopathology report.</b>

# **CUSTOMER EDUCATION SERIES (CES 2/2023)**



**18 August 2023**

**10.00 am – 12.00 pm**

**Bilik Persidangan 2, Level 2**

**THANK  
YOU**

***DEPARTMENT OF CLINICAL DIAGNOSTIC LABORATORY, HASA***