

3. Guidelines for Reporting Cytology

Compilation and editing of this volume:

Introduction, Cytology of Breast, Thyroid and Body fluids by

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3.1 Introduction:

Observation of normal and abnormal human cells either exfoliated or in imprints or scrapes is on record throughout the nineteenth century. The second important era of cytopathology began in 1941 with the publication of an article by Dr George N. Papanicolaou 'The diagnostic value of vaginal smears in carcinoma of the uterus' in the American Journal of Obstetrics and Gynaecology. The era of consolidation (the third era) is signified by the first issue of Acta Cytologica in 1957 and Diagnostic Cytology in 1961, two journals exclusively reserved for articles on cytopathology¹.

The technique of fine needle aspiration cytology, long accepted and practiced in Europe especially in Sweden, became widely adopted world wide in the mid 1980's. Currently the cytological practice is challenged by the impact of new technology with its prospects and limitations and by the expectations of a society that demands a perfect outcome¹.

The cytology practice in Sri Lanka became consolidated and gained popularity among both the pathologists and surgeons during the past 20 years. Currently both gynaecological and non gynaecological cytology practice is widely accepted and practiced in Sri Lanka. The need for consensus reporting for cytology specimens has been a long and widely felt need by both pathologists and their non pathology clinical colleagues. Therefore these guide lines were developed following several guide line consensus meetings with our non pathology clinical colleagues, for cytopathology practice

in Sri Lanka, keeping in mind the limitations that we face daily in our routine cytopathology practice.

It is expected that the cytology specimens will be obtained and reported by pathologists attached to specialist hospitals in the country.

The recommended guide lines are also divided in to three levels taking in to consideration that the availability of resources and facilities are different at different levels of hospitals that come under Ministry of Health in Sri Lanka.

Strongly recommended guidelines (grade X) are very basic and every effort should be made to adhere to them as far possible.

Guidelines marked as grade Y are desirable to adhere to.

Guide lines marked as grade Z are optional.

Strongly recommended.....	Grade X
Desirable	Grade Y
Optional	Grade Z

3.2 Breast Cytology

3.2.1 Introduction

Lumps in the breasts are readily accessible to be sampled by the fine needle aspiration biopsy (FNAB) technique. It is a popular procedure in view of its simplicity, cost effectiveness and the turn around time¹. Palpable breast lumps are frequently sampled by the pathologist as a member of the breast team. Impalpable radiologically detected lesions are sampled by the radiologist and the samples are then referred to the pathologist for diagnosis. The FNAB results contributes to the triple diagnosis (others being clinical and radiological impressions of the lesion) of patients with breast lumps/lesions.

Common breast cytology specimens encountered in clinical practice are FNAB of palpable and impalpable breast lesions, aspirated fluid from breast cysts and nipple secretions. Adopting a common reporting format and diagnostic categories by cytopathologists will ensure better communication among members of the breast team.

3.2.2 Palpable breast lumps

List of necessary equipment - **Category X**

- One 10 cc syringe and two 23G needles
- Number of slides – 3 [2 for smears, 1 as the spreader]
- Jar with the fixative

Procedure - **Category X**

Usually the aspiration technique is used to aspirate breast lumps. Two aspirations are attempted.

The use of an aspiration gun for aspiration is optional. (**Category Z**)

Fixation

The fixative that is recommended for fixation of smears is 95% ethanol. The smears should be immediately fixed in 95% ethanol to prevent any air drying.

Ensure that the fixative used to fix the smears is of proper strength (95% ethanol) **Category X**

Stains

The most commonly used stain in our setting is the Haematoxylin and Eosin stain in view of its cost effectiveness. - **Category X**

As an option one smear could be air dried. Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears. - **Category Z**

Reporting

To ensure uniformity in reporting of breast FNAB samples, the cytopathologists and the trainee cytopathologists are requested to adhere to the following reporting format. - **Category X**

Reporting Format - **Category X**

- **Specimen :**
FNAB of breast lump (mention site and when provided mammographic findings and clinical impression)
- **Macroscopy:**
Mention the location of the lesion and the number of aspirations attempted.
Describe the nature of the aspirate where relevant.
Mention whether the lump disappeared or not after the procedure. -**Category Y**
- **Microscopy:**
A detailed microscopic description is optional.
Category Z
- **Conclusion:**
Mention the diagnostic category (C1-C5)
- **Comment:**
Mention any other information that you may wish to communicate to the surgeon

Diagnostic categories - **Category X**

To ensure uniformity in reporting of breast FNAB samples the cytopathologists and the trainee cytopathologists are also requested to adhere to the following diagnostic categories.

- C1 Non-diagnostic smears [inadequate / unsatisfactory]
- C2 Benign smears
- C3 Atypical smears, favour benign
- C4 Suspicious smears, favour malignant
- C5 Malignant

Suggested guidelines for further management of patients with breast lumps/ lesions:

Category Y

- i. Management of these patients should be based on triple assessment results of the breast lesion (Clinical impression, radiological impression and the cytological diagnosis).
- ii. Usually for C1 - C3 categories, histological assessment (lumpectomy) of the lesion is suggested.
- iii. C4 category needs urgent histological assessment of the lesion (wide local excision with oriented margins / tru-cut / frozen section)

Please note

Palpable breast lesions do not require ultrasound guidance for aspiration and therefore these lesions should be sampled by a cytopathologist.

3.2.3 Aspiration fluid from breast lesions

Category X

All aspirated fluid from cystic breast lesions should be dispatched immediately to the laboratory. In the event of any anticipated delay, the sample should be refrigerated at 4°C.

On receiving the sample the amount and the colour of the fluid should be noted. The fluid should be centrifuged and smears made from the deposit. These smears should be fixed immediately without delay in 95% ethanol.

Ensure that the fixative used to fix the smears is of proper strength.

The most commonly used stain in our setting is the Haematoxylin and Eosin stain for alcohol fixed smears in view of its cost effectiveness. **Category Z**

One smear could be air dried as an option.

Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears. A cell block could also be prepared from the centrifuged deposit as an optional measure.

Reporting

Reporting Format - Category X

- **Specimen :**
Cyst fluid from breast lesion (mention site)
- **Macroscopy :**
Describe volume /color of fluid received
- **Microscopy :**
A detailed microscopic description is optional
Category Z
- **Diagnosis :**
Mention the diagnostic category (C1-C5)
- **Comment :**
Mention any other information that you may wish to communicate to the surgeon

Diagnostic categories - Category X

To ensure uniformity in reporting of breast aspiration cytology samples, the cytopathologist is requested to adhere to the following diagnostic categories.

- C1 Non-diagnostic smears
[inadequate/unsatisfactory]
- C2 Benign smears
- C3 Atypical smears, favour benign
- C4 Suspicious smears, favour malignant
- C5 Malignant

Category Y

Other suggested guidelines for further management of patients with cystic breast lesions are the same as those for palpable breast lumps.

- i. Management of these patients should be based on triple assessment results of the breast lesion (clinical impression, radiological impression and the cytological diagnosis).
- ii. Usually for C1 - C3 categories histological assessment (lumpectomy) of the lesion is suggested.
- iii. C4 category needs urgent histological assessment of the lesion (wide local excision with oriented margins / tru-cut / frozen section)

3.2.4 Nipple secretions

Procedure - **Category X**

Two smears are made from the nipple secretions.

Fixation - **Category X**

Fixation of smears should be immediate to prevent air drying.

The fixative that is recommended for fixation of smears is 95% ethanol. The smears should be immediately fixed in 95% ethanol to prevent any air drying.

Ensure that the fixative used to fix the smears is of proper strength.

Stains –

The most commonly used stain in our setting is the Haematoxylin and Eosin stain in view of its cost effectiveness. **Category X**

One smear could be air dried as an option. Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears. **Category Z**

Reporting

To ensure uniformity in reporting of breast cytology samples, the cytopathologists and the trainee cytopathologists are requested to adhere to the following reporting format. **Category X**

Reporting format - **Category X**

- **Specimen** :
Nipple discharge (mention side)
- **Macroscopy** :
Colour of the discharge. Mention location of the affected duct if possible
- **Microscopy** :
A detailed microscopic description is optional - **Category Z**
- **Diagnosis** :
Mention the diagnostic category (C1-C5)
- **Comment** :
Mention any other information that you may wish to communicate to the surgeon

Diagnostic categories - **Category X**

To ensure uniformity in reporting of breast aspiration cytology samples the cytopathologists and the trainee cytopathologists are also requested to adhere to the following diagnostic categories.

- C1 non diagnostic smears
[inadequate/unsatisfactory]
- C2 Benign smears
- C3 Atypical smears favour benign
- C4 Suspicious smears favour malignant
- C5 Malignant

3.2.5 Impalpable breast lesions

The FNAB of impalpable breast lesions are usually performed by radiologists under radiological guidance. The laboratory receives either alcohol fixed smears or air dried smears.

Stains - Category X

The most commonly used stain in our setting is the Haematoxylin and Eosin stain in view of its cost effectiveness.

Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears (Category Z)

Reporting - Category X

To ensure uniformity in reporting of breast FNAB samples the cytopathologists and the trainee cytopathologists are requested to adhere to the following reporting format.

Reporting format - Category X

- **Specimen** :
Guided FNAB of breast lesion (mention site)
- **Macroscopy** :
Mention the number of smears received.
Fixed in alcohol / air dried
- **Microscopy** :
A detailed microscopic description is optional –
(Category Z)
- **Diagnosis** :
Mention the diagnostic category (C1-C5)
- **Comment** :
Mention any other information that you may wish to communicate to the surgeon

Diagnostic categories – Category X

To ensure uniformity in reporting of breast aspiration cytology samples the cytopathologists and the trainee cytopathologists are also requested to adhere to the following diagnostic categories.

- C1 non diagnostic smears
[inadequate/unsatisfactory]
- C2 Benign smears
- C3 Atypical smears, favour benign
- C4 Suspicious smears, favour malignant
- C5 Malignant

Radiologists please ensure that the strength of the fixative is 95% ethanol and immediate fixation to prevent air drying.

3.2.6 References:

4. Gray W, McKee GT, Diagnostic Cytopathology , 2nd ed.Churchil Livingston , 2003.
5. Anderson GH. Cytologic screening programmes.In: Bibo M(ed) Comprehensive Cytopathology, 2nd ed. W.B.Saunders;London,1997;pp51-61.

3.3 Thyroid cytology

3.3.1 Introduction

The exact incidence of thyroid diseases in Sri Lanka is unknown. However patients with thyroid nodules are commonly encountered in our cytology practice in Sri Lanka. Most of these patients have solitary nodules, multiple nodules (multi nodular goiter) with or without dominant nodules, or diffusely enlarged glands. In our experience thyroid neoplasms are also encountered fairly commonly in both cytopathology and histopathology practice. Therefore it is advisable to ensure uniformity in reporting of thyroid FNAB samples by both cytopathologists and the trainee cytopathologists.

3.3.2 List of necessary equipment - **Category X**

- One 10 cc syringe and two 23G needles
- Number of slides – 3 [2 for smears, 1 as the spreader]
- Jar with fixative

3.3.3 Procedure - **Category X**

It is our experience that better quality samples with less blood are obtained when the thyroid gland is sampled by the non aspiration technique. Therefore this is the preferred technique and two aspirations have to be attempted.

(The use of the aspiration technique with or without an aspiration gun is optional) (**Category Z**)

Positioning the patient with the neck extended will make the lesion more prominent and the procedure simpler.

This is a rough guideline for the number of aspirations that should be attempted on different thyroid lesions.

- Solitary nodule- minimum of two aspirates
- Diffuse goiter - both lobes should be sampled adequately
- Multi nodular goiter - Sample the nodules as indicated by the referring physician.

(It is preferable for the physician to indicate the nodule/nodules to be sampled)

3.3.4 Fixation - **Category X**

The fixative that is recommended for fixation of smears is 95% ethanol. The smears should be immediately fixed in 95% ethanol to prevent any air drying.

Ensure that the fixative used to fix the smears is of proper strength.

3.3.5 Stains - **Category X**

The most commonly used stain in our setting is the Haematoxylin and Eosin stain in view of its cost effectiveness.

As an option one smear could be air dried. Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears. **(Category Z)**

3.3.6 Reporting - **Category X**

To ensure uniformity in reporting of Thyroid FNAB samples the cytopathologists and the trainee cytopathologists are requested to adhere to the following reporting format.

Reporting Format - **Category X**

- **Specimen:**
FNAB of thyroid nodule
diffuse goiter
multi nodular goiter
- **Macroscopy:**
Mention the site/lesion aspirated
Number of aspirations attempted
Amount and type of material aspirated
(colloid/blood/scanty/abundant)
- **Microscopy:**
Category Z - A detailed microscopic description is optional
- **Diagnosis:**
Mention diagnostic category
- **Comment:**
Mention any other information that you may wish to communicate to the surgeon

3.3.7 Diagnostic categories - **Category X**

To ensure uniformity in reporting of thyroid aspiration cytology samples the cytopathologists and the trainee cytopathologists are requested to adhere to the following diagnostic categories

- Thy 1 – Inadequate.
- Thy 2 – Benign (colloid storing nodule, thyroiditis and toxic goiters)
- Thy 3 – A follicular proliferation (hyperplastic nodule, hurthle cell neoplasms, Follicular neoplasms, Medullary carcinoma)
- Thy 4 – suspicious for malignancy Eg. When full house cellular features of papillary carcinoma is absent.
- Thy 5 – Papillary / medullary / anaplastic carcinoma

3.3.8 Recommendations: **Category Y**

- Thy 1 - An adequate specimen needs to have at least 6 clusters of 20cells each.
- Thy 3 - In this category, if possible mention the process that is favoured. (hyperplastic vs neoplastic)

- Thy3 and Thy4 - For these two categories urgent histological evaluation is recommended.

3.3.9 References:

1. Gray W, McKee GT, Diagnostic Cytopathology , 2nd ed.Churchil Livingston , 2003.
2. Anderson GH. Cytologic screening programmes.In: Bibo M(ed) Comprehensive Cytopathology, 2nd ed. W.B.Saunders;London,1997;pp51-61.

3.4 Body Fluids (Exfoliative Cytology)

Pleural and ascitic fluids are the most commonly encountered body fluids in cytology practice in Sri Lanka.

3.4.1 Sample handling: **Category X**

Preferably all aspirated fluid should be dispatched immediately to the laboratory. In the event of any anticipated delay the sample should be refrigerated at 4°C.

However if the sample is too large it may be allowed to stand for 1-2 hours preferably at 4°C and a smaller sample including the sediment should be dispatched to the laboratory (optional). **(Category Z)**

On receiving the sample the amount and the colour of the fluid should be noted down. The fluid should be centrifuged and smears should be made from the deposit. These smears should be fixed immediately without a delay in 95% ethanol.

Ensure that the fixative used to fix the smears is of proper strength.

The most commonly used stain in our setting is the Haematoxylin and Eosin stain for alcohol fixed smears in view of its cost effectiveness.

One smear could be air dried as an option. Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears. A cell block sample could also be prepared from the centrifuged deposit. **(Category Z)**

3.4.2 Reporting - **Category X**

To ensure uniformity in reporting of exfoliative cytology samples from body fluids the cytopathologists and the trainee cytopathologists are requested to adhere to the following reporting format.

Reporting format - Category X

- **Specimen:**
Mention type
- **Macroscopy:**
Mention colour, amount, blood stained or not
- **Microscopy:**
A detailed microscopic description is optional
(Category Z)
- **Diagnosis:**
 1. Positive for malignant cells
or
 2. Negative for malignant cells
- **Comment:**
 1. Presence or absence of mesothelial cells
 2. Presence or absence of lymphocytes
 3. Mention any other information that you may wish to communicate to the surgeon

3.4.3 References:

1. Gray W, McKee GT, Diagnostic Cytopathology , 2nd ed.Churchil Livingston , 2003.
2. Anderson GH. Cytologic screening programmes.In: Bibo M(ed) Comprehensive Cytopathology, 2nd ed. W.B.Saunders;London,1997;pp51-61.

3.5 Lymph node cytology

3.5.1 Introduction

Lymphadenopathy is seen in a wide spectrum of diseases, including infections and primary and secondary malignancies. It is a common finding in clinical practice in Sri Lanka. Management of such cases is facilitated by the lymph node pathology which can be studied either by histology or cytology. For a cytological diagnosis, material is collected by aspirating the node using a fine needle (FNA). A conclusive FNA diagnosis may be helpful in preventing excision biopsy/removal of the affected node .Adapting a uniform reporting format for reporting lymph node cytology by cytopathologists is desirable.

Palpable lymph nodes sampled directly using the aspiration technique yields adequate samples in most cases. These direct aspirations are performed by pathologists. Deep seated lymph nodes with in the abdominal cavity and the thorax are sampled under image guidance usually by radiologists.

3.5.2 List of necessary equipment - **Category X**

- 1) One 10cc syringe and two 23G needles.
- 2) Number of slides – 3 (2 for smears + 1 as spreader)
- 3) Jar with fixative.

3.5.3 Procedure - **Category X**

Palpable lymph nodes are sampled by the aspiration technique. Two aspirations have to be attempted.

3.5.4 Fixation - **Category X**

The smears should be immediately fixed in 95 % ethanol to prevent air drying.

Ensure that the fixative used to fix the smears is of proper strength

3.5.5 Stains - **Category X**

The most commonly used stain in our setting is the Haematoxylin and Eosin stain in view of its cost effectiveness.

As an option one smear could be air dried. Other stains that could be used are the pap stain for alcohol fixed smears and the Giemsa stain for air dried smears. **(Category Z)**

3.5.6 Reporting - **Category X**

To ensure uniformity in reporting of Thyroid FNAB samples the cytopathologists and the trainee cytopathologists are requested to adhere to the following reporting format.

Reporting Format (**Category X**)

- **Specimen :**
FNAB of lymph node Mention the site
- **Macroscopy :**
Mention number of aspirations attempted and the amount, type and colour of aspirate
- **Microscopic description :**
A detailed microscopic description is optional **(Category Z)**
- **Diagnosis :**
mention diagnostic category
- **Comment :**
Mention any other information that you may wish to communicate to the surgeon.

3.5.7 Diagnostic categories – **Category X**

1. Non diagnostic
2. A reactive lymphoid proliferation
3. A Monomorphic lymphoid population
 - Favour Non Hodgkins lymphoma
 - If possible mention sub type

4. Diagnostic/Favour/Suspicious for Hodgkins lymphoma
5. Granulomatous lymphadenitis
 - Without necrosis
 - With necrosis/ caseous type favouring a Mycobacterial infection
6. Secondary deposits
 - Not other wise specified
 - favour squamous or adeno carcinoma
 - favour small cell carcinoma
 - favour malignant melanoma
 - Favour any other type
7. Any other process

3.5.8 References:

1. Das KD, Cytopathology of lymph node. In Bibbo M(ed) Comprehensive Cytopathology 2nd Edition W.B.Saunders;London,1997,pp703-729.
2. Carter TR, Feldman PS, Jnnes DJ..The role of fine needle aspiration cytology in the diagnosis of lymphoma. Acta Cytologica 30:848-853, 1986.