CYTOLOGY:

What every general practitioner should know
(… and every future specialist)

16 April 2014
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Department of Anatomical Pathology
What is cytology?

• Study of single cells
  – Pap smears
  – Sputum
  – Fluids (pleural, pericardial, ascitis and urine)
  – FNA/FNAB of preferably solid lesions
  – Please **not** blood, bone marrow aspirates or trephines
  – Please **not** chunks of tissue

• Histology
  – This is where chunks of tissue belong
Why cytology?

SAFE

• Simple
• Accurate
• Fast
• Economic
How (method in detail)

Technique of fine needle aspiration (FNA)
• The skin is cleaned with antiseptic
• The sterile 22G needle with an attached 10 or 20ml syringe is inserted into the lesion with the dominant hand while the mass is stabilised with the non-dominant hand.
• The syringe is retracted to produce and maintain a negative pressure of about 5ml.
• The needle is moved in various directions to sample cells from different areas of the mass while maintaining a negative pressure.
• When only the nub of the syringe is filled with aspirate material, the needle is withdrawn while maintaining a negative pressure until the subcutaneous tissue is reached. The piston of the syringe is then released to equalize the pressure.
• The needle is withdrawn and then completely disconnected from the syringe.
• The syringe is filled with air and reconnected to the needle.
• The material is then expressed at the frosted end of the glass slide.
Fixing the specimen on the slide

• A second glass slide is placed face down parallel to the bottom slide and both slides pulled apart in separate directions.

• One of the slides is fixed immediately using spray fixative the other slide is left to air dry. The slides should be clearly marked as to which is fixed and which is air dried.

• Please label all slides in pencil with the patient's name and hospital number.

• The aerosol spray fixative must be held 17-22cm from the glass slide.

• The glass slide should be held horizontally while spraying with fixative. (If the slide is held at an angle, the material may be sprayed off the slide).

• The expiry date on the bottle of spray should be checked regularly.
Method of FNA

Press slides firmly together to spread material to edges.

Hold bottom slide here
Move top slide in horizontal direction.
Types of specimens

- Pap smear
- FNAB/FNA

- Fluids
The request form

- Junk in, junk out ….  
- Patient details
  - Name, surname, sex, age, hospital number  
- Clinician details
  - Name, surname, MP number, telephone number  
- Correct date  
- Complete clinical history
  - Please keep it relevant  
- Topography – where was the specimen taken from  
- Any urgent specimens – please arrange with laboratory
**National Health Laboratory Service**

**Cytology**

### Patient Information:
- **Patient ID Number:** [Redacted]
- **Hospital/Clinic:** [Redacted]
- **Ward:** [Redacted]
- **Cost Centre:** [Redacted]
- **NHLS Account Code:** [Redacted]

- **Patient:** [Redacted]
- **Surname:** [Redacted]
- **First Name:** [Redacted]
- **Address:** [Redacted]
- **Tel./Cell:** [Redacted]
- **D.O.B.:** [Redacted]

### Requester's Contact Details:
- **Clinician (Print full name):** [Redacted]
- **Practice No.:** [Redacted]
- **Cell No.:** [Redacted] (Beep)
- **Tel:(D):** [Redacted]

### Previous Cytology:
- **Date:** [Redacted]
- **Cytology No.:** [Redacted]
- **Cytology Diagnosis:** [Redacted]

### Previous Surgery:
- **Date:** [Redacted]
- **Hosp/Clinic:** [Redacted]
- **Type of Operation:** [Redacted]

### Previous Pathology:
- **Pathology No.:** [Redacted]
- **Specimen Type:** [Redacted]

### Radiation:
- **Area:** [Redacted]
- **Chemotherapy:** [Redacted]

### Gynaecological:
- **LMP Date:** 03/01/14
- **Contraception/Hormones:** [Redacted]
- **Type:** [Redacted]
- **Pregnant Weeks:** [Redacted]
- **Post Partum Weeks:** [Redacted]
- **Postmenopausal:** [Redacted]
- **Period of bleeding:** [Redacted]

### Condition of Cervix:
- **Healthy:** [Redacted]
- **Inflammatory:** [Redacted]
- **Suspected CA:** [Redacted]

### Smear Taken With:
- **Surface smear:** [Redacted]
- **Endocervix:** [Redacted]
- **Endovaginal:** [Redacted]

### General Cytology:
- **Origin of Specimen/Organ:** [Redacted]
- **Head and Neck:** [Redacted]
- **Gastrointestinal:** [Redacted]
- **Respiratory:** [Redacted]
- **Fluid:** [Redacted]
- **Other (Please Specify):** [Redacted]

### Type of Specimen:
- **A1: Sputum**
- **A2: Urine (non-catheter)**
- **A3: Urine (catheter)**

### Clinical Details and Sketch of Lesion:
- [Redacted]
Labelling the specimen

• Please do not put any stickers on the slides!
• Patient name, surname and hospital number or date of birth in **pencil** on the slide – “frosted area”
• Fluids – on the side on the tube / container
• Tubes:
  – Red top or specific smaller container - most fluids
  – Purple top (EDTA) – CSF
  – **No** fluids in gel (yellow) tops
Pap smears

• Papanicalou smear
• Currently in use to stain these smears
• Useful in diagnosis of:
  – Infections (HPV, HSV, CMV, Candida, TB…)
  – In situ malignancy (LSIL and HSIL)
  – Invasive malignancy (Squamous cell carcinoma)
• Please don’t wipe vigorously before taken the smear
• First pap smear then biopsy (if necessary)
• Please don’t put in the sun to dry
• Immediate fixation (spraycyte)
• Please don’t cover with another slide
• Only representative when endocervical cells present or lesion noted
Sputums

- Please ask your friendly physiotherapist for help (take after morning physio)
- Please take before breakfast
- Often multiple sputums required before final diagnosis (minimum 5)
- Please differentiate between bronchial washings and sputum
- Indications:
  - Malignancy
  - Infective conditions (Tuberculosis)
Fluids

- Ascitis, Pleural and Pericardial
- Indicate topography
- Please send immediately and mark separately for cytology
- Malignancy vs Reactive conditions
Urine

- Midstream if possible
- Catheter if known patient with cervix carcinoma
- Fresh specimen
- Indications:
  - Cystitis
  - Malignancy
  - Bilharzia
CSF

- **Indication:**
  - Malignancy only!!! (ALL and SRBCT/Germ cell tumours in children)
  - No cases of meningitis – microbiology/virology welcomes them with open arms!

- Separate tube (please not 5ml, 1ml is enough)
- Within 1 hour after obtaining the specimen
- Please contact the laboratory and arrange that this specimen is received and prepared in time
FNA/FNAB

- Spread evenly
- Spray immediately
- Maximum 4 slides
  - Two spray fixed
  - Two air dried
- Please don’t cover the slides
- Two sites:
  - Two separate forms (4 slides / site)
  - Breast (left and right)
  - Axilla and inguinal area
Important sites

- **Salivary gland**
  - Benign vs. Malignant
  - Inflammatory conditions
- **Breast**
  - Benign vs. Malignant
- **Thyroid**
  - MNG, Hyperplastic nodules, reactive conditions and lesions – benign and malignant
- **Lymph node**
  - Reactive, TB, malignancy (lymphoma and metastatic carcinoma)
Good sites for FNA

- Breast
- Lung
- Thyroid
- Lymph nodes
- Salivary glands
Bad sites for FNA

- Soft tissue
- Intra-abdominal organs
Ugly sites for FNA

- Skin
- Bone
- Cartilage
What happens to the specimen

- Transport
- Registration
- Prepared – laboratory technician
- Screened – cytotegnologist
- Rescreened/Reviewed – pathologist
- Diagnosis entered
- Authorized
- Available on Labtrak
FULL FINAL LABORATORY REPORT

PATIENT:
20/03/83 (31y) Sex F
P O BOX 1502
Marble Hall
Limpopo
Limpopo

COLLECTED: 10/04/2014 13:30
RECEIVED: 11/04/2014 11:40
PRINTED: 15/04/2014 14:30

REPORT TO:
Dr M.S. SANGAMELA
SUDE General Surgery Clinic
Steve Biko Academic Hospital
Private Bag X169
Pretoria
Gauteng
0001

Patient Location: Steve Biko Academic Hospital, SUDE General Surgery Clinic
Hospital Number: GP5424968

FOR ENQUIRIES AND FOLLOW-UP TESTS, PLEASE QUOTE PATIENT’S MRN NUMBER MNU31936297

DEPARTMENT OF ANATOMICAL PATHOLOGY
Tel: 012 319 3333, Fax: 012 319 2458

SPECIMEN RECEIVED: Parotid mass aspiration, right (Parotid area, right)
TESTS REQUESTED: Fine needle aspiration

CYTOPATHOLOGY REPORT

CYTOLYTIC NUMBER: MU14-24870-A

CLINICAL HISTORY:
A 31 year old patient presented with bilateral parotid enlargement of which the right side is cystic.

FINAL DIAGNOSIS:
A monomorphic pattern of lymphocytes present. A lymphoproliferative lesion cannot be excluded. Recommend biopsy if clinically indicated.

ADDITIONAL FINDINGS:
A monomorphic pattern of lymphocytes, ductal epithelial cells and blood present.

RECOMMENDATION:
Recommend biopsy if clinically indicated.

REPORTED BY:
Mliswa Muku

AUTHORISED ON BEHALF OF:
Dr Paula Ryal

Authorised by: N Reunis (Medical Technologist) Fine needle aspiration

-- End of Laboratory Report --
Poor quality

- No cells
- Only blood
- Degenerated
- Crush artifact
- Too thick
- The lesion was missed
Figure 1: Cryptococcus neoformans in a lymph node
Figure 2: Cryptococcus neoformans on CSF
Figure 3: Squamous cell carcinoma on sputum
Figure 4: Dominent nodule in a multinodular goitre
Figure 5: Pleomorphic adenoma of the parotid gland
Liquid based cytology
Cell blocks