CLINICAL PATHOLOGY

Course Organiser: J Archer

Lecturers: J Archer, T Williams,

Term: Michaelmas

Aims:

This course aims to:

1. Enable students to use their previous obtained knowledge of basic physiological and pathological processes to understand the scientific basis of clinical pathology, and
2. Give students the necessary practical tools and knowledge to use clinical pathology effectively to help in the diagnosis and monitoring of large and small animal cases in practice.

Objectives:

By the end of this course the student should:

• understand appropriate sampling techniques including blood sampling, sampling for infectious disease, bone marrow aspiration and biopsy, fine needle aspiration of tissues, washes and fluids.
• understand common sources of laboratory error.
• understand and be able to interpret changes in a haematology profile, a biochemistry profile, a urine sample
• understand which blood and urine tests to use to investigate different organ systems and coagulation disorders.
• understand and be able to recognise the cytological features of body cavity effusions, haematology smears and basic common cytology sample smears.
1. Clinical pathology: Introduction

2. Biochemistry profiles
Overview of biochemistry testing in office and extended testing. Formation of biochemistry panels. Initial screening tests. Special tests for organs/systems.

3–7. Haematology

Non-regenerative anaemia due to primary bone marrow disease: leukaemia, myelodysplasia, pancytopenia, myelofibrosis, pure red cell aplasia, FeLV. Non-regenerative anaemia due to chronic inflammatory/systemic disease and renal disease. Techniques for sampling the bone marrow: aspiration and core biopsy


Platelet production. Thrombocytosis and thrombocytopenia.

8–9. Diagnosis of coagulation/haemostasis

10. Plasma Proteins and calcium
total and ionized calcium and effect of albumin concentration and pH.

**11. Fluid electrolytes**

**12. Leukaemias and lymphomas**
Diagnosis of lymphoma and leukaemias plasma cell tumours by use of haematology and blood films, biochemistry changes, cytology of lymph nodes (spleen thymus) and bone marrow. Immunocytochemistry. Immunohistochemistry, Flow cytometry (immunophenotyping). PARR

**13. Introduction to Cytology**
Sampling techniques for cytology. Fine needle aspirates, scrapings, impression smears. Lymph nodes interpretation of cytology criteria of malignancy. Bone marrow sampling for cytology and histology normal bone marrow cytology and histology.

**14-15. Cytology of fluids**
Causes and laboratory assessment of body cavity effusions. Classifications of transudates, modified transudates, exudates, chylous effusion, neoplastic effusion, haemorrhagic effusions. Cytology of these effusions including thoracic and abdominal fluids Joint fluids, CSF and washes (BAL, prostatic)

**16. Testing for infectious diseases**
Optimal sample submission for bacterial and viral culture. Principals of PCR and serology in the clinical setting.

**Practical sessions: 4th year**


2. Haematology: blood film examination – further blood film examination - with focus on relationship between blood film changes and the instrument generated profiles. Including changes in anaemias inflammation and leukaemias. Urine analysis S.G. dipstick chemistry and sediment analysis

3. Fine Needle Aspirates (FNAs) – take and stain. This will be part of the Practical in Principles of Oncology (The practical will be taken by both J Archer and JM Dobson). To include cytology of leukaemias and lymphomas.

4. Cytology of fluids and effusions. Thoracic and abdominal fluids. Joint
fluids, washes prostatic and BAL, CSF. Examination of prepared cytology smears and accompanying cell and protein data.

All laboratories will run as 2-hour sessions for half the class at a time

**NOTE:**
The Clinical Pathology course will continue in 4th and 5th year, with consideration of the clinical pathology of different organ systems integrated/ incorporated into those courses, and further sessions on cytology and interpretation of clinical pathology data in 5th year.