

MBCHB III
Haemostasis-Laboratory
Aspects

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Part of haemostasis tests

- Haemostatic mechanism is an elaborate process
 - produces an impervious seal that spontaneously arrests bleeding.
 - Dissolves thrombus
- Involves mutually dependent reactions within the various components of vascular response, platelets and activation of blood coagulation mechanism.

The routine laboratory.

- **Purpose:** To illustrate the basic requirements and functions of a diagnostic and service laboratory.
- **Scope:** State the requirements and rationale for such a laboratory
- **Reference:** Kenyatta National Hospital haematology and blood transfusion laboratory.

Routine 'Tests'

- Laboratory assessment that are carried out in the majority of patients.
Such tests may be done in nearly all except in very extreme emergencies.
- No test should be done that does not assist the 'doctor' offer service (s) to the patient.
Any test must attest to its relevance to the patient.

Types of tests

General categorization:

Haematological tests are usually grouped to reflect the composition of blood

- Cells and plasma
- Quantitative and Qualitative assessment
- Cellular, plasma haemostasis and special laboratory tests

General points.

Collection of blood from patients

- Venous blood is preferred for most haematological tests

Venous blood

Sites: Antecubital vein

Needles: Not too fine or too long

SWG 19 or 21 are suitable

Avoid: Stasis, frothing or too slow

Self protection: wear gloves and attention to protective instructions with the laboratory

Anticoagulants

- **EDTA**: Ethylene diamine tetra-acetic acid (Sequestrene). For blood counts and film preparation. Also for bone marrow when desired.
- **Sodium citrate**: Coagulation test

Platelet counts

- Visual method on whole blood
- Platelet identification in peripheral blood

Staining blood film

- Romanowsky stains used
- Films should be stained as soon as they have been air-dried
- Among the Romanowsky stains: MGG, Jenner's Leishman's, Giemsa's and Wright's, however combinations are commonly preferred for example May Grunwald Giemsa (MGG) stain.

Staining methods

- Preferred at the Kenyatta National Hospital is, May-Grunwald-Giemsa's stain, Leishman and Giemsa are also in use in some sections.

Morphology of the cells in the blood film

- Examination of stained blood film is an essential part of a haematological investigation
- Several slides with normal RBC be demonstrated.

Morphology of platelets

- Demonstrate: Normal slide and Essential thrombocythaemia

White blood cells

- Note on demonstration of the key features in the Morphology: Normal and Abnormal films for example.

Investigations of the haemostatic mechanism:

Screening tests of haemostasis:

- Screening tests are non-specific designed to assess the overall haemostatic function and are useful for deciding whether a defect exists

The Sequence is:

- Bleeding time, Partial Thromboplastin Time with Kaolin, one stage Prothrombin Time, Thrombin Time, platelets count and examination of a stained blood film.

The bleeding time.

Explanation of principle

- Standardized template method
- Ivy's method
- Dukes method

Coagulation techniques

- Collection of blood – preferably patient should come to the laboratory or when this is not practicable, samples should be brought to the laboratory as soon as possible. Except for fibrinolysis, samples should be immersed in ice
- Blood be withdrawn with no stasis and without frothing
- Venepuncture must be a clean one

Sample of blood is divided into two:

1. Citrate: 9 (nine) volumes of blood to 1 volume of citrate
 2. An appropriate amount of blood into a tube containing dried EDTA – blood count particularly platelets and also for blood films
- Control blood samples: obtained from normal subject

Equipment

- Water baths set at $37\text{C} \pm 5\text{C}$
- Instruments which record automatically the end points illustrated

Tests

- Prothrombin time by the Quick one-stage method
- Activated Partial thromboplastin time (APTT), Kaolin Cephalin Clotting Time (KCCT)
- Thrombin time
- Platelet aggregation test: principle

Stages of investigation in haemostasis

- Screening
- Identification of factor/ protein
- Determination of actual level and quality of affected factor or protein