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# Haematology Haemoglobin Cell Counts and Differential

Practical 03 / Teaching laboratory

## Aim

Perform an approved simulated haematology count and assess a CBC against the smear and control records.

## Principle

A count is quantitative, while a film reveals cell morphology and artefacts. Agreement between them helps validate interpretation.

## Materials and Requirements

- Simulated analyser output and chamber data
- Prepared smear and microscope
- Instrument flags and QC worksheet

## Procedure

1. Confirm identity, anticoagulant and possible clot or collection problems using the teaching record.
2. Match the teaching tube and request by two identifiers. Review fill, mix, collection time and reported instrument status. Hold results from a flagged or unsuitable specimen in the scenario.
3. Review haemoglobin, RBC, WBC, platelet counts and analyser flags. Calculate or check a supplied chamber count.

Continue with step 4 on the next page.

# Procedure Continued

Haematology Haemoglobin Cell Counts and Differential

4. Note each value with units and age-appropriate interval. For the chamber calculation mark the counted squares and volume, use the stated dilution and compare the result with the supplied duplicate.
5. Select a representative smear zone, identify cells and calculate a differential and relevant absolute count.
6. Scan the feathered area at low power for clumps, then select the monolayer with well-distributed cells. Classify consecutive fields systematically and record unexpected morphology or platelet clumps.
7. Add the white cell tallies, divide each by the total and express the differential as a percentage. Multiply the selected fraction by total WBC to obtain its absolute value.
8. Compare the film with the analyser and flag inconsistent results for qualified review.
9. Reconcile the film description, count and analyser flags. Document possible interference and which item should be repeated, reviewed or urgently reported through the teaching workflow.

## Precautions

- Use prepared or synthetic material and the adopted counting method.
- Do not ignore platelet clumping or a specimen identity discrepancy.

# Observations and Interpretation

Haematology Haemoglobin Cell Counts and Differential

## Observations and Record

| Item | What to record | What it tells you |
|---|---|---|
| CBC | Hb, RBC, WBC and platelets with units | Quantifies cell concentrations |
| Differential | Counted cells and percentages | Derive absolute counts |
| Film | Morphology and clumps or artefact | Checks limitations of automated results |

### Worked Example

A teaching CBC has WBC 12,000/µL and lymphocytes 25%. Absolute lymphocytes are 3,000/µL. Compare that absolute value with the appropriate interval.

## Result and Interpretation

Report an evidence-based CBC impression with the relevant flag, smear check and clinical context.

## Viva Questions and Answers

### Why review a smear when the analyser flags a count?

Morphology, clumps or other artefacts can explain the result.

### How do you get an absolute differential count?

Multiply total WBC by the corresponding decimal fraction.

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