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Case Studies in Pathophysiology

Experiment 17 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To connect selected clinical presentations with basic mechanisms and identify appropriate information and referral needs.

Principle

A case study separates observations, possible explanations and confirmed findings. The cases below are fictional learning exercises covering anaemia, thalassemia, haemophilia, leprosy, gout, hypertension and ischemic heart disease. They do not describe real patients or provide individual prescriptions.

Requirements

- Fictional case sheets, the supplied laboratory intervals and relevant anatomy charts.
- Discussion worksheet with no patient identifiers.

Procedure

1. Extract facts

List stated symptoms, measurements and confirmed diagnoses. Do not add unreported results.

2. Explain mechanism

Connect the findings to a relevant physiological process without claiming certainty from an isolated finding.

3. Consider alternatives

Name information or investigations the clinician may need to distinguish possible causes.

4. Identify urgency

Separate a routine learning discussion from signs requiring urgent clinical assessment.

5. Summarise

Write a brief mechanism, a relevant next information need and a respectful communication point for each case.

Fictional Cases and Discussion

Anaemia

Case: A fictional adult reports fatigue; Hb is 9.5 g/dL, MCV 70 fL and the laboratory report identifies low ferritin.

Pathophysiology: Reduced Hb can reduce oxygen delivery. Low MCV indicates microcytosis. Low ferritin supports iron depletion in this teaching context, but inflammation and the broader history affect interpretation.

Discussion: Identify relevant CBC values; discuss dietary intake, blood loss and other possible causes with the instructor. The clinician determines the cause and treatment. Do not assume that all anaemia is iron deficiency.

Thalassemia

Case: A fictional student has longstanding microcytosis, a family history of a haemoglobin disorder and a clinician-requested haemoglobin analysis.

Pathophysiology: Thalassemia is inherited impaired globin-chain production. Severity ranges from mild trait to serious anaemia. Small cells can resemble other causes of microcytosis; CBC alone does not establish the subtype.

Discussion: Discuss family history, CBC, specialised haemoglobin testing and, when indicated, genetic assessment. Do not assume iron deficiency or recommend iron solely because MCV is low.

Haemophilia

Case: A fictional child has recurrent joint bleeding and a documented specialist diagnosis of factor VIII deficiency.

Pathophysiology: Haemophilia A involves factor VIII deficiency; haemophilia B involves factor IX. Impaired coagulation can cause prolonged bleeding and joint or muscle bleeds. Platelet count need not be low.

Discussion: Relate the deficient factor to secondary haemostasis. Discuss specialist coagulation assessment and the established care plan. New severe bleeding requires urgent clinical attention; the learner does not prescribe factor replacement.

Leprosy

Case: A fictional adult has a pale skin patch with reduced sensation and has been referred for assessment of possible Hansen's disease.

Pathophysiology: Leprosy can affect skin and peripheral nerves, producing sensory loss and weakness. Loss of protective sensation can lead to unnoticed injuries. The described signs require clinical assessment rather than a diagnosis from colour alone.

Discussion: Discuss respectful history-taking, sensory and nerve assessment by trained clinicians and timely specialist care. Use non-stigmatising language. No collection, culture or handling of infectious material is part of this case exercise.

Gout

Case: A fictional adult has a sudden painful swollen first-toe joint. The clinician considers gout and other causes of acute arthritis.

Pathophysiology: Monosodium urate crystals can trigger inflammation. An elevated serum urate alone does not prove gout, and acute joint symptoms may have other causes, including infection.

Discussion: Identify the joint pattern and need for clinician-led assessment. Discuss serum urate, selected imaging and joint-fluid crystal examination where clinically indicated. Do not delay urgent assessment of a hot swollen joint with systemic symptoms.

Hypertension

Case: A fictional adult has elevated readings at several properly conducted appointments. The clinician requests a structured BP record.

Pathophysiology: Persistently raised arterial pressure increases cardiovascular risk, but diagnosis depends on appropriate repeated assessment and the applicable clinical criteria. Technique, stress and timing can affect a reading.

Discussion: Check cuff fit, rest, arm position and recording method. Discuss ongoing clinician follow-up and the existing treatment plan. Do not alter medicines or diagnose from one classroom reading.

Ischemic Heart Disease

Case: A fictional adult reports exertional chest discomfort and has been referred for cardiovascular evaluation. A second scenario introduces new ongoing chest pain at rest.

Pathophysiology: Reduced coronary blood supply relative to myocardial oxygen demand can cause ischaemia. Symptoms, ECG and relevant tests are assessed together; a normal-looking teaching trace does not rule out disease.

Discussion: Distinguish a planned assessment case from new potentially urgent symptoms. Ongoing chest pain, severe breathlessness or collapse requires immediate emergency escalation, not a classroom calculation. Do not make medication or dose decisions from the scenario.

Observations and Record

Case	Mechanism / key observation	Information or next-care need
Anaemia	_____	_____
Thalassemia	_____	_____
Haemophilia	_____	_____
Leprosy	_____	_____
Gout	_____	_____
Hypertension	_____	_____
Ischemic Heart Disease	_____	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Illustrative anaemia index check: with Hb 9.5 g/dL and additionally assumed Hct 28% and RBC 4.0 million/µL, MCV = 28 × 10 ÷ 4.0 = 70 fL, matching the microcytic pattern in the first fictional case.
- A calculated index helps classify a pattern; it does not establish its cause.

Result

For all seven fictional cases, the stated findings, likely mechanism, missing information and appropriate care pathway were discussed.

Precautions

- Use fictional or fully authorised anonymised material only.
- Do not diagnose or recommend starting, stopping or changing treatment from a classroom case.
- Respond promptly to urgent symptoms and avoid stigmatising language.

Viva Questions and Answers

1. Why distinguish a finding from a diagnosis?

One finding may have multiple causes and needs contextual assessment.

2. Why can thalassemia resemble iron deficiency on a CBC?

Both may cause microcytosis; specialised assessment can distinguish them.

3. Why is a raised serum urate insufficient to diagnose gout?

Many people with raised urate do not have gout, and joint symptoms require evaluation.

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