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Therapeutic Drug Monitoring - Digoxin

Practical 20 - Clinical pharmacy case practical

Aim

To interpret a drug concentration using dose timing and clinical context.

Principle

Therapeutic drug monitoring links a valid measurement to timing, exposure, organ function, response and toxicity. A concentration without a reliable dose and sample history can be misleading.

Materials and Requirements

- Fictional or approved de-identified case, medicine chart and laboratory record
- Current local policy, relevant product information and clinical guidance
- Pharmaceutical-care and communication worksheet
- Approved method or teaching-data pack and a dated record sheet

Procedure

1. Define the preparation or dataset, study question and method version. Record identities, units and the criteria to be used before examining the outcome.
2. Identify the question, patient-specific information and missing data. Use the supplied fictional record; do not create a prescription or administer a preparation.
3. Verify indication, exact formulation, doses, administration times, sample time, clinical state and kidney/liver trend.
4. Check assay units, timing suitability and steady-state or model assumptions.
5. Compare with the indication-specific target only after assessing clinical response, toxicity and interactions.
6. Prepare an interpretation and clinician review request; do not change treatment from an isolated number.
7. Document the assessment, evidence, proposed action, responsible clinician and follow-up. Separate a student recommendation from an authorised treatment decision.
8. Retain the original observations and calculations. State deviations, missing information and the limits of the conclusion; do not replace measured values with expected results.

Observations and Record

Enter actual measurements or the supplied teaching data. Record the method, material identity, conditions and units.

Problem / evidence	Goal / priority	Proposed action / owner	Monitoring / follow-up
Safety or urgent issue	Define	Escalate appropriately	Specify
Effectiveness / adherence	Define	Discuss with team	Specify
Information gap	State	Obtain evidence	Review

Worked Example

Use the assigned drug-specific timing and interpretation exercise below.

Drug-specific TDM record

- Record the last dose and draw time. Routine concentration interpretation generally uses a sample at least 6 hours after the dose, ideally 8-12 hours under the relevant guidance.

• Illustrative a sample 2 hours after dosing is unsuitable for routine post-distribution interpretation. Review symptoms, renal function, potassium and interacting medicines; targets depend on indication and clinical context.

Result and Interpretation

• Deliver a timing diagram, qualified interpretation and monitoring recommendation for authorised review.

Precautions

• Protect confidentiality and use actual units and timing.
• Check allergy, indication, organ function, interactions and the complete medicine list.
• Urgent clinical findings need timely clinical assessment; teaching notes do not replace care.

Viva Questions and Answers

Why record sample time?

Distribution and elimination change concentration over time.

Does a target-range result exclude toxicity?

Clinical state and individual susceptibility remain important.

Why verify units?

Different concentration units can cause dangerous misinterpretation.

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