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# Therapeutic Drug Monitoring - Lithium

Practical 21 - 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 exact formulation and schedule; a standard monitoring comparison generally uses a level 12 hours after the last dose.

• Illustrative a 6-hour sample cannot be compared uncritically with a 12-hour target. Review renal function, hydration, sodium balance, symptoms and interactions; use the individual treatment target.

## 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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