

Pharm.D - Year 3

Pharmacology II

Complete subject manual: 29 practicals and activities. Each chapter includes a student observation or work record.

Use the PDF bookmarks to navigate. The table gives each practical's content-page count; the combined manual has continuous page numbers.

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Experimental Models and Animal-care Records

Experiment 1 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To identify common model categories and review an animal-care record.

Principle

Experimental interpretation depends on model suitability, welfare, randomisation, controls and a valid outcome measure. Species, strain and sex can affect findings.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Identify model information

Enter the supplied species/strain, sex, age or weight range and scientific purpose without inventing an experimental animal record.

2. Assess ethical design

Explain replacement, reduction and refinement, the approved review process and the role of a trained supervisor.

3. Read care and handling records

Identify acclimatisation, health and welfare observations recorded in the supplied approved demonstration.

Pharmacology II

4. Evaluate applicability

Explain why a model endpoint may not directly predict a clinical effect in humans.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What are the three Rs?**

Replacement, reduction and refinement.

2. Why record the model details?

They affect interpretation and reproducibility of the endpoint.

Physiological Salt Solutions

Experiment 2 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To explain the roles of physiological-solution components and check a supplied preparation record.

Principle

An isolated-tissue environment must maintain suitable ionic, osmotic and metabolic conditions. The assigned physiological solution is selected for the model and method.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Read the assigned formula

Identify the physiological solution named in the demonstration; do not substitute one tissue formula for another.

2. Classify component roles

Discuss sodium/chloride for ionic environment, potassium and calcium for excitability, buffer for pH control and glucose where present for an energy source.

3. Review checks

Read supplied pH, appearance and preparation/storage records against the assigned method requirements.

Pharmacology II

4. Relate to the trace

Explain how a changed environment could alter a tissue response and confound an assay.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. Why does calcium matter in many tissue preparations?

It participates in excitation-contraction coupling and other cellular processes.

2. Why use a defined solution?

Changing ionic or buffer conditions changes the biological response.

Experimental Pharmacology Appliances

Experiment 3 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To identify experimental apparatus and calculate a response from a calibrated demonstration.

Principle

A recording system converts a biological response into a measured signal. Calibration, stable baseline and the stated scale are essential to interpreting a trace.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Label the apparatus

Identify bath, force transducer or lever, recording system, temperature control and stimulus/event marker in the diagram.

2. Read the calibration

Record the stated conversion from trace height to force or response units.

3. Measure a response

Mark baseline and peak on the supplied trace, subtract baseline and apply calibration.

4. Assess artefacts

Recognise baseline drift, movement artefact and scale changes; retain the raw trace with the calculation.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Response = (peak trace reading – baseline reading) × calibration factor.
- Example: a 20 mm change with 0.05 g-equivalent/mm calibration corresponds to 1.0 g-equivalent on that assigned trace.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the main endpoint?

Identify experimental apparatus and calculate a response from a calibrated demonstration.

2. Does one observed result prove a general conclusion?

No. Controls, repeatability and the limitations of the method must be considered.

Anaesthesia - Demonstration Record Review

Experiment 4 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To review a prepared anaesthesia and recovery record.

Principle

Anaesthetic effects and welfare monitoring must be assessed by trained personnel using an approved protocol. An observer can record depth-related signs and monitoring information without administering anaesthesia.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Identify the record

State the supplied model, procedure purpose and approved monitoring form.

2. Describe recorded observations

List the documented responsiveness, breathing/circulation and other model-specific monitoring signs.

3. Review timing

Place induction, monitored procedure and recovery observations on a timeline using the supplied data.

Pharmacology II

4. Identify a concern

Flag an inadequate or deteriorating recorded observation to the supervisor and explain the need for trained reassessment.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. Why does anaesthesia need monitoring?

Depth and physiological stability can change during a procedure.

2. What is the student role here?

To interpret the supplied observations and explain the monitoring record, not administer an agent.

Acetylcholine Dose-response Curve

Experiment 5 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To plot the supplied acetylcholine concentration-response data and estimate EC50.

Principle

A graded concentration-response curve describes effect as a function of concentration under a defined model. Maximum response and EC50 describe different aspects of the curve.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Prepare the table

Enter supplied concentration, response and baseline-corrected response in the same units.

2. Normalise

Express each response as a percentage of the maximum where the dataset supports a plateau.

3. Plot

Plot response against log10 concentration and mark the response range and plateau.

4. Estimate EC50

Locate the concentration at 50% of the fitted maximum. State whether the observed range supports the estimate.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Response (%) = response / fitted maximum × 100. EC50 is the concentration producing 50% of the fitted maximum.
- Illustration: a fitted maximum of 40 units gives a 50% response of 20 units. The corresponding concentration is read from the supplied fitted curve, not assumed from the maximum.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What does EC50 describe?

Potency within the stated response model.

2. What does Emax describe?

The maximum response supported by that model and dataset.

Acetylcholine Interpolation Bioassay

Experiment 6 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To estimate acetylcholine activity from a supplied calibration dataset.

Principle

A test response is compared with reference responses under a common valid assay design. The calibration relationship and response range must be appropriate.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Read the assay design

Identify standard concentrations, test dilution and replicates. For the three-point exercise, identify low-standard, high-standard and test responses in the supplied balanced design.

2. Check the bracket

Confirm that the test response is within the applicable standard-response range and that the assigned assay validity criteria are satisfied.

3. Estimate

Use the fitted standard curve or the prescribed local log-concentration relation to calculate the test equivalent.

4. Correct and report

Apply the recorded dilution factor and state the assay units, uncertainty and validity limitation.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- For a local linear response versus log₁₀ concentration: $\log_{10}(C_u) = \log_{10}(C_1) + (R_u - R_1)/(R_2 - R_1) \times \log_{10}(C_2/C_1)$. This illustrative interpolation does not replace the prescribed full statistical assay analysis.
- Example: $C_1 = 1$, $C_2 = 10$ units/mL, $R_1 = 10$, $R_2 = 30$ and $R_u = 20$ give $C_u = 10^{0.5} = 3.16$ units/mL before dilution correction.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. Why bracket the test response?

Extrapolation outside the validated standard range can give unreliable activity estimates.

2. Does an interpolated number prove assay validity?

No. Replicate variation, response model and assigned statistical validity checks must also be assessed.

Acetylcholine Three-point Bioassay

Experiment 7 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To estimate acetylcholine activity from a supplied two-standard/one-test dataset.

Principle

A test response is compared with reference responses under a common valid assay design. The calibration relationship and response range must be appropriate.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Read the assay design

Identify standard concentrations, test dilution and replicates. For the three-point exercise, identify low-standard, high-standard and test responses in the supplied balanced design.

2. Check the bracket

Confirm that the test response is within the applicable standard-response range and that the assigned assay validity criteria are satisfied.

3. Estimate

Use the fitted standard curve or the prescribed local log-concentration relation to calculate the test equivalent.

4. Correct and report

Apply the recorded dilution factor and state the assay units, uncertainty and validity limitation.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- For a local linear response versus log₁₀ concentration: $\log_{10}(C_u) = \log_{10}(C_1) + (R_u - R_1)/(R_2 - R_1) \times \log_{10}(C_2/C_1)$. This illustrative interpolation does not replace the prescribed full statistical assay analysis.
- Example: $C_1 = 1$, $C_2 = 10$ units/mL, $R_1 = 10$, $R_2 = 30$ and $R_u = 20$ give $C_u = 10^{0.5} = 3.16$ units/mL before dilution correction.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. Why bracket the test response?

Extrapolation outside the validated standard range can give unreliable activity estimates.

2. Does an interpolated number prove assay validity?

No. Replicate variation, response model and assigned statistical validity checks must also be assessed.

Histamine Dose-response Curve

Experiment 8 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To plot the supplied histamine concentration-response data and estimate EC50.

Principle

A graded concentration-response curve describes effect as a function of concentration under a defined model. Maximum response and EC50 describe different aspects of the curve.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Prepare the table

Enter supplied concentration, response and baseline-corrected response in the same units.

2. Normalise

Express each response as a percentage of the maximum where the dataset supports a plateau.

3. Plot

Plot response against log10 concentration and mark the response range and plateau.

4. Estimate EC50

Locate the concentration at 50% of the fitted maximum. State whether the observed range supports the estimate.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Response (%) = response / fitted maximum × 100. EC50 is the concentration producing 50% of the fitted maximum.
- Illustration: a fitted maximum of 40 units gives a 50% response of 20 units. The corresponding concentration is read from the supplied fitted curve, not assumed from the maximum.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What does EC50 describe?

Potency within the stated response model.

2. What does Emax describe?

The maximum response supported by that model and dataset.

Agonist and Antagonist Response Comparison

Experiment 9 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To compare supplied agonist curves with and without an antagonist.

Principle

An antagonist can change an agonist concentration-response curve. A parallel shift without loss of maximum may be consistent with surmountable antagonism in the stated model, but mechanism requires adequate evidence.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Plot matched datasets

Use common axes, units and response basis for control and antagonist datasets.

2. Compare potency

Estimate EC50 for each dataset and compute a concentration ratio.

3. Compare maximum

Check whether the maximum response and slope remain comparable.

4. Conclude cautiously

Describe the observed pattern and model limitations; do not assign mechanism from an incomplete curve.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Concentration ratio = EC50 with antagonist / EC50 without antagonist.
- Illustration: $8 / 2 = 4$; the curve needs four times the agonist concentration for the compared 50% response.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What does a rightward shift indicate?

More agonist is needed for the compared effect in that dataset.

2. Why inspect Emax as well?

A changed maximum can indicate a different response pattern or limitation.

Histamine Interpolation Bioassay

Experiment 10 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To estimate histamine activity from a supplied calibration dataset.

Principle

A test response is compared with reference responses under a common valid assay design. The calibration relationship and response range must be appropriate.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Read the assay design

Identify standard concentrations, test dilution and replicates. For the three-point exercise, identify low-standard, high-standard and test responses in the supplied balanced design.

2. Check the bracket

Confirm that the test response is within the applicable standard-response range and that the assigned assay validity criteria are satisfied.

3. Estimate

Use the fitted standard curve or the prescribed local log-concentration relation to calculate the test equivalent.

4. Correct and report

Apply the recorded dilution factor and state the assay units, uncertainty and validity limitation.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- For a local linear response versus log₁₀ concentration: $\log_{10}(C_u) = \log_{10}(C_1) + (R_u - R_1)/(R_2 - R_1) \times \log_{10}(C_2/C_1)$. This illustrative interpolation does not replace the prescribed full statistical assay analysis.
- Example: $C_1 = 1$, $C_2 = 10$ units/mL, $R_1 = 10$, $R_2 = 30$ and $R_u = 20$ give $C_u = 10^{0.5} = 3.16$ units/mL before dilution correction.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. Why bracket the test response?

Extrapolation outside the validated standard range can give unreliable activity estimates.

2. Does an interpolated number prove assay validity?

No. Replicate variation, response model and assigned statistical validity checks must also be assessed.

Histamine Three-point Bioassay

Experiment 11 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To estimate histamine activity from a supplied two-standard/one-test dataset.

Principle

A test response is compared with reference responses under a common valid assay design. The calibration relationship and response range must be appropriate.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Read the assay design

Identify standard concentrations, test dilution and replicates. For the three-point exercise, identify low-standard, high-standard and test responses in the supplied balanced design.

2. Check the bracket

Confirm that the test response is within the applicable standard-response range and that the assigned assay validity criteria are satisfied.

3. Estimate

Use the fitted standard curve or the prescribed local log-concentration relation to calculate the test equivalent.

4. Correct and report

Apply the recorded dilution factor and state the assay units, uncertainty and validity limitation.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- For a local linear response versus log₁₀ concentration: $\log_{10}(C_u) = \log_{10}(C_1) + (R_u - R_1)/(R_2 - R_1) \times \log_{10}(C_2/C_1)$. This illustrative interpolation does not replace the prescribed full statistical assay analysis.
- Example: $C_1 = 1$, $C_2 = 10$ units/mL, $R_1 = 10$, $R_2 = 30$ and $R_u = 20$ give $C_u = 10^{0.5} = 3.16$ units/mL before dilution correction.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. Why bracket the test response?

Extrapolation outside the validated standard range can give unreliable activity estimates.

2. Does an interpolated number prove assay validity?

No. Replicate variation, response model and assigned statistical validity checks must also be assessed.

Routes of Administration - Model Comparison

Experiment 12 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data. No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To compare supplied route diagrams and exposure data.

Principle

The administration route affects absorption, onset, exposure and practical risks. Route differences must be assessed in the same medicine and model context.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Identify routes

Label oral, intravenous, intramuscular, subcutaneous and other assigned route diagrams; no injection is performed.

2. Compare exposure curves

Read supplied onset, peak and overall exposure information on common scales.

3. Explain route factors

Discuss absorption barrier, first-pass effect where relevant, formulation and practical route limitations.

Pharmacology II

4. Record

Present a comparison table and state why a route result cannot be transferred to an unrelated medicine.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. Does intravenous administration require absorption into the systemic circulation?**

The medicine is introduced directly into that circulation.

2. Why can oral exposure differ?

Absorption and presystemic processes can reduce or delay systemic availability.

Analgesic Activity - Supplied Data

Experiment 13 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To compare a supplied control and treated response dataset

Principle

Analgesic-model endpoints describe a response to a defined test; motor impairment or sedation can confound interpretation.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record latency, response threshold or other assigned endpoint and its units or scale definition.

2. Read and compare

Compare baseline and later readings; identify confounding changes in movement or alertness.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Change = later value – baseline value.
- Example: latency changes from 4 to 7 arbitrary time units, an increase of 3; this does not alone prove a clinical analgesic effect.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Latency, response threshold or other assigned endpoint.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Anti-inflammatory Activity - Supplied Data

Experiment 14 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To calculate an endpoint reduction from supplied data

Principle

A defined swelling or inflammatory endpoint can compare groups, with baseline correction and common measurement conditions.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record baseline-corrected swelling or assigned inflammatory measure and its units or scale definition.

2. Read and compare

Use the matched endpoint and time; distinguish reduction in the model from a general safety or efficacy claim.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Inhibition (%) = (control change – treated change) / control change × 100.
- Example: control change 0.8 mL-equivalent and treated change 0.4 give 50% inhibition in that dataset.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Baseline-corrected swelling or assigned inflammatory measure.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Anticonvulsant Activity - Supplied Data

Experiment 15 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To interpret supplied seizure-endpoint records

Principle

A seizure-model dataset can assess a defined endpoint, but a model-specific result is not a treatment recommendation.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record assigned event occurrence, latency or duration and its units or scale definition.

2. Read and compare

Read the predefined endpoint and group allocation; compare efficacy evidence and recorded behavioural confounders.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Endpoint occurrence (%) = number meeting endpoint / number assessed × 100.
- Example: 6 of 10 records meet the predefined protection endpoint, giving 60% for that teaching dataset.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Assigned event occurrence, latency or duration.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Antidepressant Activity - Supplied Data

Experiment 16 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To compare a supplied behavioural-screen result

Principle

Behavioural-screen endpoints are indirect and can be confounded by general activity; they cannot establish a clinical diagnosis or response by themselves.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record assigned immobility or behavioural score and its units or scale definition.

2. Read and compare

Compare the predefined score and separate locomotor findings; discuss model limitations.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Difference in group mean = treated mean – control mean.
- Example: means of 80 and 100 assigned score units give a difference of –20 units, with uncertainty still requiring assessment.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Assigned immobility or behavioural score.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Locomotor Activity and Rotarod - Supplied Data

Experiment 17 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To compare movement and coordination datasets

Principle

Locomotor counts and coordination performance measure different aspects of behaviour and can help identify confounding effects.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record activity counts and time on the rotating-rod dataset and its units or scale definition.

2. Read and compare

Analyse each endpoint separately and compare baseline, control and treated records; do not equate lower activity with one specific mechanism.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Pharmacology II

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- Change (%) = (later – baseline) / baseline × 100.
- Example: activity falls from 200 to 150 counts, a –25% change.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What is the measured endpoint?**

Activity counts and time on the rotating-rod dataset.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Cardiotonic Activity - Supplied Traces

Experiment 18 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To measure force and rate from supplied cardiac traces

Principle

Cardiac force and rate are different endpoints. A force change must be interpreted alongside rhythm, baseline and the recording conditions.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record contraction amplitude, rate and rhythm and its units or scale definition.

2. Read and compare

Measure several representative beats with the given scale; compare force and rate separately and identify irregularity.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Pharmacology II

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- Rate (beats/min) = counted beats / recorded duration in seconds $\times$ 60.
- Example: 12 beats in 10 seconds gives 72 beats/min.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What is the measured endpoint?**

Contraction amplitude, rate and rhythm.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Intestinal Motility - Frog Oesophagus Data

Experiment 19 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To interpret the supplied oesophageal motility demonstration

Principle

The assigned motility record represents a defined smooth-muscle or transport endpoint. Movement rate and contractile force are not the same quantity.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record transit distance/time or assigned trace amplitude and its units or scale definition.

2. Read and compare

Measure the endpoint named in the supplied record, compare control and treatment, and state model limitations.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Pharmacology II

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- Transport rate = distance / time.
- Example: 12 mm in 4 minutes gives 3 mm/min in the assigned teaching record.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What is the measured endpoint?**

Transit distance/time or assigned trace amplitude.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Rat Uterus - Response-trace Interpretation

Experiment 20 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To analyse the supplied uterine contraction trace

Principle

Smooth-muscle response depends on tissue state and the defined experimental environment. Baseline and maximum response must be stated.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record baseline, amplitude and frequency and its units or scale definition.

2. Read and compare

Use event markers and calibration to compare amplitude and frequency across the supplied trace segments.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Pharmacology II

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- Amplitude change = peak – local baseline.
- Example: a calibrated peak of 6 units and baseline of 2 units gives an amplitude of 4 units.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What is the measured endpoint?**

Baseline, amplitude and frequency.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Antihistamine and Anaphylaxis - Conceptual Data Review

Experiment 21 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To interpret the supplied antihistamine comparison without a live challenge

Principle

A histamine-mediated endpoint can support a model comparison, but anaphylaxis is a complex systemic reaction and requires a separate clinical assessment.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record predefined response score and control outcomes and its units or scale definition.

2. Read and compare

Compare the supplied histamine-response endpoint and the explanatory model limitations. No sensitisation or challenge is performed.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Reduction (%) = (control endpoint – test endpoint) / control endpoint × 100.
- Example: scores of 8 and 4 give a 50% reduction in that supplied endpoint.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Predefined response score and control outcomes.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Apomorphine-induced Stereotypy - Supplied Scores

Experiment 22 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To interpret supplied stereotypy-score records

Principle

An assigned stereotypy score is a behavioural-model endpoint with an ordinal scale and specified observation period.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record predefined stereotypy rating and timing and its units or scale definition.

2. Read and compare

Read the scale anchors, compare distributions and discuss whether sedation or altered movement confounds the rating.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Report the assigned descriptive statistics and score distribution; an ordinal scale is not automatically an interval measurement.
- Illustration: the median of scores 1, 1, 2, 3, 3 is 2.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Predefined stereotypy rating and timing.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Anxiolytic Activity - Mirrored-chamber Data

Experiment 23 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To compare supplied mirrored-chamber behavioural records

Principle

Exploration-based behaviour depends on anxiety-related factors and general movement. The assigned model measures behaviour rather than a human anxiety diagnosis.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record latency, entries and time in the assigned zone and its units or scale definition.

2. Read and compare

Read the predefined variables and compare them with general movement data to identify confounding.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Time fraction (%) = time in specified zone / total observation time × 100.
- Example: 30 seconds of a supplied 120-second record gives 25%.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Latency, entries and time in the assigned zone.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Blood Pressure and Respiration - Demonstration Traces

Experiment 24 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To read supplied anaesthetised-model demonstration traces

Principle

Blood-pressure and respiratory changes must be related to event timing, baseline and the supplied physiological context.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record systolic/diastolic or mean pressure, breathing rate and event markers and its units or scale definition.

2. Read and compare

Use the stated scale and event markers; describe direction and duration of change without prescribing model dosing.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Pharmacology II

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- Change = post-event reading – baseline reading, with the original units.
- Example: an assigned mean pressure changes from 90 to 75 mmHg, a –15 mmHg change.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What is the measured endpoint?**

Systolic/diastolic or mean pressure, breathing rate and event markers.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Anthelmintic Activity - Earthworm Dataset

Experiment 25 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To evaluate an assigned earthworm-screen data table

Principle

A supplied earthworm-screen endpoint is a model observation; it does not establish activity or safety against all human parasites.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record predefined movement/response endpoint and recorded time and its units or scale definition.

2. Read and compare

Compare the stated endpoint and controls, distinguish reduced movement from the method-defined terminal endpoint and discuss model limitations.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Summarise the observed times with units and variation; do not invent a missing endpoint time.
- Example: times 8, 10 and 12 minutes have a mean of 10 minutes in the supplied record.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Predefined movement/response endpoint and recorded time.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Chlorpromazine - Behavioural Demonstration Data

Experiment 26 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To assess supplied behavioural records labelled as a taming demonstration

Principle

A behavioural change can reflect sedation, altered reactivity or movement impairment. A descriptive endpoint must be interpreted within its model.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record predefined reactivity and movement scores and its units or scale definition.

2. Read and compare

Read scale definitions and compare reactivity with movement/coordination observations; no live interaction challenge is performed.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- State score distributions and baseline-to-later differences using the defined scale.
- Illustration: a lower reactivity score accompanied by impaired movement requires a confounding assessment.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Predefined reactivity and movement scores.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Vas Deferens - Response-trace Interpretation

Experiment 27 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To measure and compare supplied vas-deferens traces

Principle

An isolated smooth-muscle response depends on the assigned receptor/nerve context and experimental conditions.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record baseline-corrected response amplitude and its units or scale definition.

2. Read and compare

Locate event markers, measure responses with the calibration and compare control and intervention segments.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Pharmacology II

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

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

- Response ratio = test amplitude / matched control amplitude.
- Example: $6 / 10 = 0.60$, or 60% of the matched control response.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers**1. What is the measured endpoint?**

Baseline-corrected response amplitude.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Pesticide Toxicity - Teaching-record Interpretation

Experiment 28 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To evaluate supplied pesticide-toxicity data without generating an exposure

Principle

Toxicological observations depend on substance identity, exposure context and measured endpoint.
Hazard is distinct from the risk in a specific exposure scenario.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record assigned clinical/laboratory endpoint and time and its units or scale definition.

2. Read and compare

Read only supplied exposure context and outcomes; compare controls, identify confounding and explain when urgent specialist assessment is necessary.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Use the assigned endpoint summary; do not derive a new exposure or dosing protocol.
- Illustration: a time-linked change supports an association to investigate, not proof of causation.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Assigned clinical/laboratory endpoint and time.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

Heavy-metal Toxicity - Teaching-record Interpretation

Experiment 29 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Teaching mode: use approved simulation, prepared demonstration records or supplied experimental data.
No live-animal dosing, surgery or challenge is prescribed in these notes.

Aim

To assess supplied heavy-metal toxicology records

Principle

A measured metal concentration and a clinical finding require method, specimen, timing and exposure context to interpret.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Define the endpoint

Record specimen-specific analytical result and associated findings and its units or scale definition.

2. Read and compare

Check method/unit, collection context and the stated comparison; avoid applying a limit for one metal or specimen to another.

3. Present the evidence

Create a labelled table or graph with all supplied groups and time points; preserve replicate values.

4. Assess the conclusion

State the direction/magnitude of the observed change, variation and the limitation of the model.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Pharmacology II

Worked Example

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

- Unit conversions must preserve the specimen basis; 1 mg/L = 1000 micrograms/L.
- Example: a supplied value of 0.020 mg/L equals 20 micrograms/L; interpretation still needs the correct substance and specimen context.

Result

The recorded finding is ____; the supporting observation or calculation is _____. The main limitation is _____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the measured endpoint?

Specimen-specific analytical result and associated findings.

2. What prevents an overstatement?

Use the defined model, valid controls, variation and known confounders; do not generalise beyond the supplied evidence.

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