



Student Name: \_\_\_\_\_

Class: \_\_\_\_\_

Student ID: \_\_\_\_\_

Date: \_\_\_\_\_

### Assessment Details

<b>Duration:</b> 2 hours	<b>Total Marks:</b> 100
<b>Topics Covered:</b>	<ul style="list-style-type: none"><li>• Classification of Drugs</li><li>• Mechanisms of Action</li><li>• Effects of Drugs on the Human Body</li><li>• Risks and Consequences of Drug Abuse</li></ul>

### Instructions to Students:

1. Read all questions carefully before attempting.
2. Show all working out - marks are awarded for method.
3. Calculator use is permitted except where stated otherwise.
4. Write your answers in the spaces provided.
5. If you need more space, use the additional pages at the end.
6. Time management is crucial - allocate approximately 1 minute per mark.

**Question 1**

**[2 marks]**

What is the primary mechanism of action of opioid drugs?

A) Stimulating the brain's reward system

B) Blocking pain signals to the brain

C) Reducing inflammation in the body

D) Increasing the heart rate and blood pressure

**Question 2**

**[2 marks]**

Which of the following drugs is used to treat hypertension?

A) Beta blockers

B) Diuretics

C) ACE inhibitors

D) All of the above

**Question 3**

**[2 marks]**

What is the main difference between a stimulant and a depressant?

A) Stimulants increase heart rate and blood pressure, while depressants decrease them

B) Stimulants decrease heart rate and blood pressure, while depressants increase them

C) Stimulants affect the brain's reward system, while depressants affect the nervous system

D) Stimulants are used to treat anxiety, while depressants are used to treat depression

**Question 4**

**[4 marks]**

Classify the following drugs into their respective categories:

- Cocaine
- Heroin
- Marijuana
- Ritalin

**Question 5**

**[4 marks]**

Describe the effects of each of the following drugs on the human body:

- Alcohol
- Tobacco
- Caffeine

A large rectangular area with a dashed border, intended for the student to write their answer to the question.

**Question 6**

**[8 marks]**

Describe the mechanism of action of beta blockers.

**Question 7**

**[8 marks]**

Explain how the following drugs interact with the body:

- Antidepressants
- Anti-anxiety medications
- Pain relievers

**Question 8**

**[8 marks]**

What are the short-term and long-term effects of marijuana use?

**Question 9**

**[8 marks]**

Compare and contrast the effects of prescription and illicit drugs on the human body.

**Question 10**

**[8 marks]**

Create a diagram illustrating the mechanism of action of a drug of your choice.



**Question 11**

**[10 marks]**

Discuss the role of drugs in treating mental health disorders.

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**Question 12**

**[10 marks]**

Analyze the impact of drug abuse on society and individual health.

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**Question 13**

**[10 marks]**

What are the risks and consequences of using the following drugs:

- Cocaine
- Heroin
- Methamphetamine

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**Question 14**

**[10 marks]**

Create a public service announcement about the dangers of drug abuse.

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**Question 15**

**[10 marks]**

Write a short story about a character who struggles with drug addiction.

A large rectangular area with a dashed border, intended for writing the short story.

**Question 16**

**[15 marks]**

A 25-year-old male is diagnosed with ADHD and is prescribed Ritalin. Describe the potential benefits and risks of this treatment.

**Question 17**

**[15 marks]**

Discuss the ethical implications of drug use and abuse in society.

**Question 18**

**[10 marks]**

Create a case study of a person who has been affected by drug abuse.

**Question 19**

**[10 marks]**

Develop a plan for a drug prevention program in your community.



Empty dashed box for writing.

**Question 20**

**[10 marks]**

Write a reflective essay on what you have learned about drugs and their effects.

Large empty dashed box for writing the reflective essay.

## Marking Guide

Multiple Choice Questions: 1 mark for each correct answer, 0 marks for each incorrect answer

Short Answer Questions: 2-5 marks for each question, depending on the complexity and accuracy of the answer

Essay Questions: Introduction (10 marks), Body (40 marks), Conclusion (10 marks), Total: 60 marks

Case Study: Introduction (10 marks), Analysis (30 marks), Recommendations (20 marks), Total: 60 marks

Group Discussion: Participation (20 marks), Content (40 marks), Total: 60 marks

### Time allocation:

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### Differentiation options:

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- For English language learners: provide a bilingual dictionary or a language support person

## Bloom's Taxonomy Alignment

Remembering: Multiple Choice Questions, Short Answer Questions

Understanding: Short Answer Questions, Essay Questions

Applying: Case Study, Group Discussion

Analyzing: Essay Questions, Case Study

Evaluating: Essay Questions, Group Discussion

Creating: Case Study, Group Discussion

## Multiple Intelligence Approaches

Linguistic: Essay Questions, Short Answer Questions

Logical-Mathematical: Multiple Choice Questions, Case Study

Spatial: Case Study, Group Discussion

Bodily-Kinesthetic: Group Discussion

Interpersonal: Group Discussion

Intrapersonal: Essay Questions, Case Study

## Clear Success Criteria

**Knowledge:** Demonstrate understanding of the classification, mechanisms, and effects of drugs on the human body

**Analysis:** Analyze the risks and consequences of drug abuse and evaluate the impact of drugs on society and individual health

**Application:** Apply knowledge to real-world scenarios and case studies

**Communication:** Communicate effectively in written and oral forms

## Evidence Collection Methods

Quizzes and Tests: Multiple Choice Questions, Short Answer Questions

Assignments: Essay Questions, Case Study

Class Discussions: Group Discussion

Projects: Case Study

## Feedback Opportunities

Self-Assessment: Students can reflect on their own learning and identify areas for improvement

Peer Assessment: Students can provide feedback to their peers on their performance

Teacher Feedback: The teacher can provide feedback to students on their performance and suggest areas for improvement



## Conclusion

This assessment handout is designed to evaluate your understanding of the classification, mechanisms, and effects of drugs on the human body, as well as your ability to analyze the risks and consequences of drug abuse.

Remember to read each question carefully and answer to the best of your ability.

Good luck!

# Pharmacokinetics and Pharmacodynamics

Pharmacokinetics is the study of how a drug is absorbed, distributed, metabolized, and excreted by the body. Pharmacodynamics, on the other hand, is the study of the effects of a drug on the body. Understanding these concepts is crucial in understanding how drugs work and how they can be used to treat various diseases and conditions.

## Example: Absorption of Drugs

The absorption of a drug depends on several factors, including the route of administration, the solubility of the drug, and the presence of food in the stomach. For example, oral drugs are absorbed into the bloodstream through the digestive system, while injectable drugs are absorbed directly into the bloodstream.

## Case Study: Pharmacokinetics of Aspirin

Aspirin is a commonly used over-the-counter pain reliever. When taken orally, aspirin is absorbed into the bloodstream through the digestive system. It is then distributed to various tissues in the body, where it works to relieve pain and reduce inflammation. Aspirin is metabolized by the liver and excreted in the urine.

# Toxicology and Drug Interactions

Toxicology is the study of the adverse effects of drugs on the body. Drug interactions occur when two or more drugs are taken together and interact with each other in a way that can cause adverse effects. Understanding toxicology and drug interactions is crucial in preventing adverse reactions and ensuring safe use of drugs.

## Example: Drug Interaction between Warfarin and Ibuprofen

Warfarin is a blood thinner used to prevent blood clots, while ibuprofen is a pain reliever. When taken together, ibuprofen can increase the risk of bleeding in patients taking warfarin. This is because ibuprofen can displace warfarin from its binding sites in the body, increasing the levels of warfarin in the bloodstream and increasing the risk of bleeding.

## Case Study: Toxicity of Acetaminophen

Acetaminophen is a commonly used over-the-counter pain reliever. However, taking too much acetaminophen can cause liver damage and even death. This is because acetaminophen is metabolized by the liver, and high levels of acetaminophen can overwhelm the liver's ability to metabolize it, leading to liver damage.

# Pharmaceutical Biotechnology

Pharmaceutical biotechnology is the use of biotechnology to develop new drugs and therapies. This field has led to the development of many new treatments for diseases such as cancer, diabetes, and genetic disorders. Understanding pharmaceutical biotechnology is crucial in developing new treatments for diseases and improving human health.

## Example: Development of Insulin

Insulin is a hormone used to treat diabetes. Prior to the development of recombinant DNA technology, insulin was obtained from animal sources. However, with the development of recombinant DNA technology, insulin can now be produced using bacteria, making it more widely available and reducing the risk of allergic reactions.

## Case Study: Development of Herceptin

Herceptin is a monoclonal antibody used to treat breast cancer. It was developed using recombinant DNA technology and is targeted to the HER2 protein, which is overexpressed in some breast cancer cells. Herceptin has been shown to improve survival rates in patients with HER2-positive breast cancer.

## Personalized Medicine

Personalized medicine is the use of genetic information to tailor treatment to an individual's specific needs. This field has led to the development of many new treatments for diseases such as cancer and genetic disorders. Understanding personalized medicine is crucial in developing targeted treatments for diseases and improving human health.

### Example: Genetic Testing for Breast Cancer

Genetic testing can be used to identify individuals who are at risk of developing breast cancer. For example, mutations in the BRCA1 and BRCA2 genes can increase the risk of breast cancer. Individuals who test positive for these mutations can take steps to reduce their risk, such as undergoing prophylactic mastectomy or taking tamoxifen.

### Case Study: Targeted Therapy for Lung Cancer

Targeted therapy is a type of cancer treatment that targets specific molecules involved in cancer growth and progression. For example, erlotinib is a targeted therapy used to treat non-small cell lung cancer. It works by inhibiting the epidermal growth factor receptor (EGFR), which is overexpressed in some lung cancer cells.

## Current Research and Future Directions

Current research in pharmacology is focused on developing new treatments for diseases such as cancer, diabetes, and genetic disorders. Future directions include the use of gene editing technologies such as CRISPR to develop new treatments for genetic diseases.

### Example: CRISPR Gene Editing

CRISPR is a gene editing technology that allows for precise editing of genes. It has been used to develop new treatments for genetic diseases such as sickle cell anemia and muscular dystrophy.

### Case Study: Development of Gene Therapy for Sickle Cell Anemia

Sickle cell anemia is a genetic disorder caused by a mutation in the HBB gene. Gene therapy has been developed to treat this disease by using CRISPR to edit the HBB gene and restore normal hemoglobin production.

## Conclusion

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In conclusion, pharmacology is a complex and rapidly evolving field that has led to the development of many new treatments for diseases. Understanding the principles of pharmacology, including pharmacokinetics, pharmacodynamics, toxicology, and drug interactions, is crucial in developing new treatments and improving human health.

### Example: Importance of Pharmacology in Medicine

Pharmacology plays a critical role in medicine, as it allows for the development of new treatments for diseases and improves our understanding of how drugs work in the body.

### Case Study: Impact of Pharmacology on Public Health

Pharmacology has had a significant impact on public health, as it has led to the development of many new treatments for diseases and has improved our understanding of how drugs work in the body. This has led to improved health outcomes and increased quality of life for many individuals.



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