**MLT 2nd**

**Course Title: GeneralPharmacology I**

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Note:

Attempt all questions

Each question carry equal marks

Pay attention to every point of question

Give to the point answers

Extra detail may leads to marks deduction

1. **What does drug interactions mean and enumerate its various types.**

**Ans**: A drug interaction is a change in the [action](https://en.wikipedia.org/wiki/Efficacy_(pharmacology)) or [side effects](https://en.wikipedia.org/wiki/Side_effect) of a drug caused by [concomitant](https://en.wikipedia.org/wiki/Concomitant_drug) administration with a food, beverage, supplement, or another drug.

There are many causes of drug interactions. For example, one drug may alter the [pharmacokinetics](https://en.wikipedia.org/wiki/Pharmacokinetics) of another. Alternatively, drug interactions may result from competition for a single [receptor](https://en.wikipedia.org/wiki/Receptor_(biochemistry)) or [signaling pathway](https://en.wikipedia.org/wiki/Signaling_pathways).

The risk of a drug-drug interaction increases with the number of drugs used. Over a third (36%) of the elderly in the U.S. regularly use five or more medications or supplements, and 15% are at risk of a significant drug-drug interaction.

1. **Write down a detail note on pharmacodynamic drug interaction.**

**Ans**: This definition quoted  is probably the shortest and best:

Pharmacodynamic interactions occur when one drug modifies the pharmacodynamic response to the same concentration of another.

To clarify, pharmacodynamic drug-drug interactions do not involve any absorption, distribution, metabolism or excretion processes directly. There may still be some sort of indirect effect. For example, one might say that the use of noradrenaline interacts with the pharmacokinetics of orally available medications by decreasing their absorption from the gut, via the mechanism of interfering with the perfusion thereof.

Pharmacodynamic drug-drug interactions can take several forms, and can lead to either enhanced activity (synergism) or decreased activity (antagonism)

1. **Differentiate between hypoglycemic and hyperglycemic agents with examples.**

**Ans**:  the difference between Hypoglycemia and Hyperglycemia in the comparison chart, given below are the substantial points which differentiate them.

1. Hypoglycemia and Hyperglycemia are the two medical condition related to the presence of glucose level in blood, the earlier one is the condition when the level of glucose in blood decrease below 70 mg per deciliter while the latter (Hyperglycemia) is the result of higher level of glucose in the blood which can be more than 130 mg per deciliter.
2. Hypoglycemia arises suddenly while Hyperglycemia arises slowly within days and time. Diagnosis of them is done through the blood test and also by observing signs and symptoms which include high pulse, pale skin, anxiety, confused the state of mind, headache, tantrums in a case of Hypoglycemia. In Hyperglycemia, increased thirst (Polydipsia), more urination than usual (Polyuria), rapid pulse rate, abdomen pain, weight loss is commonly noticed.
3. Hypoglycemia occurs due to an intake of more amount insulin (drugs used in treating Hyperglycemia), fasting, heavy and continues exercising while Hyperglycemia happens due to stress, overeating, an absence of insulin.
4. Diabetic Ketoacidosis is complications may arise due to Hypoglycemia; Hyperosmolar Hyperglycemic Nonketonic Syndrome is the complication due to Hyperglycemia.
5. In Hypoglycemia patient is treated through an infusion of dextrose water or immediate intake of some form carbohydrate is given which will provide instant energy; In Hyperglycemia, treatment is through insulin administration in both type 1 diabetes as well in type2 diabetes.
6. **What is emesis and antiemetic drugs, give examples**
   1. **Emetic**, any agent that produces [nausea](https://www.britannica.com/science/nausea-pathology) and [vomiting](https://www.britannica.com/science/vomiting). The use of emetics is limited to the [treatment](https://www.britannica.com/science/therapeutics) of poisoning with certain toxins that have been swallowed. Although its use is now discouraged, the most commonly used [drug](https://www.britannica.com/science/drug-chemical-agent) for this purpose was [ipecac](https://www.britannica.com/science/ipecac) syrup, prepared from the dried roots.

examples are a strong solution of salt, mustard water, powdered ipecac, and ipecac syrup. Emetics should not be used when lye or other strong alkalis or acids have been swallowed, since vomiting may rupture the already weakened walls of the esophagus.

* 1. An antiemetic is a [drug](https://en.wikipedia.org/wiki/Medication) that is effective against [vomiting](https://en.wikipedia.org/wiki/Vomiting) and [nausea](https://en.wikipedia.org/wiki/Nausea). Antiemetics are typically used to treat [motion sickness](https://en.wikipedia.org/wiki/Motion_sickness) and the [side effects](https://en.wikipedia.org/wiki/Adverse_effect_(medicine)) of [opioid](https://en.wikipedia.org/wiki/Opioid" \o "Opioid) [analgesics](https://en.wikipedia.org/wiki/Analgesic), [general anaesthetics](https://en.wikipedia.org/wiki/General_anaesthetic), and [chemotherapy](https://en.wikipedia.org/wiki/Chemotherapy) directed against [cancer](https://en.wikipedia.org/wiki/Cancer). They may be used for severe cases of [gastroenteritis](https://en.wikipedia.org/wiki/Gastroenteritis), especially if the patient is dehydrated

1. **What kind of drugs are used for cough and sputum, give examples**

# Ans:

Guaifenesin belongs to a class of drugs known as expectorants. It works by thinning and loosening mucus in the airways, clearing congestion, and making breathing easier. Dextromethorphan belongs to a class of drugs known as cough suppressants. It acts on a part of the brain (cough center) to reduce the urge to cough suppressants..

Example: Antitussives are said to work by reducing the cough reflex. For example, dextromethorphan or pholcodine. Expectorants try to help loosen secretions, so you cough up the excessive mucus - for example, guaifenesin or ipecacuanha. Antihistamines reduce histamine release

1. **Enumerate different targets for antibiotics**

**Ans:** Antibiotic drug–target interactions, and their respective direct effects, are generally well characterized. By contrast, the bacterial responses to antibiotic drug treatments that contribute to cell death are not as well understood and have proven to be complex as they involve many genetic and biochemical pathways. In this Review, we discuss the multilayered effects of drug–target interactions, including the essential cellular processes that are inhibited by bactericidal antibiotics and the associated cellular response mechanisms that contribute to killing. We also discuss new insights into these mechanisms that have been revealed through the study of biological networks, and describe how these insights, together with related developments in synthetic biology, could be exploited to create new antibacterial therapies.

1. **Explain viral replication process in detail**

**Ans:** Viral Replication I. Steps in Viral Replication A. Attachment. This is the first step in viral replication. Surface proteins of the virus interact with specific receptors on the target cell surface. These may be specialized proteins with limited distribution or molecules that are more widely distributed on tissues throughout the body. The presence of a virus-specific receptor is necessary but not sufficient for viruses to infect cells and complete the replicative cycle. B. Penetration. Enveloped viruses (e.g., HIV, influenza virus) penetrate cells through fusion of the viral envelope with the host cell membrane. Non-enveloped viruses penetrate cells by translocation of the virion across the host cell membrane or receptor mediated endocytosis of the virion in clathrin coated pits with accumulation of viruses in cytoplasmic vesicles. C. Uncoating (disassembly). A complex process which differs by taxonomic class and is not fully understood for many agents. This process makes the nucleic acid available for transcription to permit multiplication of the virus. D. Transcription and Translation. The key to understanding the genomic expression of viruses is noting the fact that viruses must use host cellular machinery to replicate and make functional and structural proteins.

1. **Classify antihypertensive drugs with example**

**Ans:** Antihypertensives are a class of [drugs](https://en.wikipedia.org/wiki/Medication) that are used to treat [hypertension](https://en.wikipedia.org/wiki/Hypertension) (high blood pressure).[[1]](https://en.wikipedia.org/wiki/Antihypertensive_drug#cite_note-1) Antihypertensive therapy seeks to prevent the complications of high blood pressure, such as [stroke](https://en.wikipedia.org/wiki/Stroke) and [myocardial infarction](https://en.wikipedia.org/wiki/Myocardial_infarction). Evidence suggests that reduction of the [blood pressure](https://en.wikipedia.org/wiki/Blood_pressure) by 5 mmHg can decrease the risk of stroke by 34%, of [ischaemic heart disease](https://en.wikipedia.org/wiki/Ischaemic_heart_disease" \o "Ischaemic heart disease) by 21%, and reduce the likelihood of [dementia](https://en.wikipedia.org/wiki/Dementia), [heart failure](https://en.wikipedia.org/wiki/Heart_failure), and [mortality](https://en.wikipedia.org/wiki/Death) from [cardiovascular disease](https://en.wikipedia.org/wiki/Cardiovascular_disease).[[2]](https://en.wikipedia.org/wiki/Antihypertensive_drug#cite_note-2) There are many classes of antihypertensives, which lower blood pressure by different means. Among the most important and most widely used medications are [thiazide](https://en.wikipedia.org/wiki/Thiazide" \o "Thiazide) [diuretics](https://en.wikipedia.org/wiki/Diuretic)

1. **What are the causes and drug therapy of various kinds of angina pectoris.**

**Ans:** Chronic stable angina pectoris refers to the predictable, reproducible occurrence of pressure or a choking sensation in the chest or adjacent areas caused by myocardial ischemia in association with physical or emotional stress, and cessation of exertion and or sublingual nitroglycerin invariably relieves the discomfort. It is a common presenting symptom of severe narrowing of one or more coronary arteries, non-obstructive coronary arteries, or even when the coronary arteries are angiographically normal. Patients often avoid activities which precipitate symptoms and have impaired quality of life. Most patients with angina pectoris can be managed with lifestyle changes, especially abstinence from smoking and regular exercise, and anti-anginal drugs. However, the choice of initial or combination antianginals as recommended in the guidelines is not evidence based. In addition, patients with stable angina due to coronary artery disease should also receive aspirin and a statin. Treatment of patients with angina and normal coronary arteries remains to be established. The aim of this article is to provide the readers not only with a guideline-based approach, which varies from one country to another, but also an individual-based approach, which takes into consideration circulatory status and the presence or absence of comorbidities in the treatment decision-making process. This manuscript primarily deals with drug therapy of stable angina pectoris and not coronary artery revascularization, which also provides angina relief but is usually reserved for patients who fail to respond to adequate drug therapy.

1. **Differentiate between general and local anesthetics, explain various stages of general anesthesia**

**Ans:** General anesthesia causes a person to 'fall asleep' while the medical procedure takes place, while local anesthesia is applied to a specific region in the body where the procedure will be performed

Stage I (stage of analgesia or disorientation): from beginning of induction of general anesthesia to loss of consciousness.

Stage II (stage of excitement or delirium): from loss of consciousness to onset of automatic breathing. Eyelash reflex disappear but other reflexes remain intact and coughing, vomiting and struggling may occur; respiration can be irregular with breath-holding.

Stage III (stage of surgical anesthesia): from onset of automatic respiration to respiratory paralysis. It is divided into four planes:

*Plane I* - from onset of automatic respiration to cessation of eyeball movements. Eyelid reflex is lost, swallowing reflex disappears, marked eyeball movement may occur but conjunctival reflex is lost at the bottom of the plane

1. Write down the mechanism of action of narcotic and non-narcotic analgesics

Ans:

1. Narcotics and Non- Narcotics Analgesics
2. Ziconotide¬ Flupirtine ¬ Acetaminophen/ PCM ¬ NSAIDs ¬ Opioids ¬Analgesics An analgesic, or painkiller, is any member of the group of drugs used to achieve analgesia — relief from pain. Major classes of Analgesic Drugs include:
3. [.](https://image.slidesharecdn.com/narcoticsandnon-narcoticsanalgesics-141218151744-conversion-gate01/95/narcotics-and-non-narcotics-analgesics-3-638.jpg?cb=1418937575)Narcotics Analgesic/Opioids Narcotic analgesics are drugs that relieve pain, by binding to opioid receptors, which are present in the central and peripheral nervous system, can cause numbness and induce a state of unconsciousness.
4. [.](https://image.slidesharecdn.com/narcoticsandnon-narcoticsanalgesics-141218151744-conversion-gate01/95/narcotics-and-non-narcotics-analgesics-4-638.jpg?cb=1418937575)Classified into: Natural Compounds: Morphine, Codeine, Papaverine Semi-Synthetic: Diacetylmorphine (Heroin), benzylmorphine and ethylmorphine Synthetic Derivatives: Fentanyl, Pethidine, Methadone, Tramadol and Propoxyphene Loperamide, an opiate that does not enter the brain and therefore lacks analgesic activity.
5. Reducing presynaptic Ca++ influx thus inhibits neuronal activity.¬ Postsynaptic hyperpolarization (increasing K+ efflux) ¬Mechanism of Action All opioid receptors are G-protein coupled receptors and inhibit adenylate cyclase. They are also involved in
6. Κ receptor¬ δ receptor ¬ σ receptor ¬ μ receptor ¬Opioid Receptors All opioid receptors are linked through G-proteins to inhibition of adenylate cyclase. They also facilitate opening of potassium channels (causing hyperpolarisation) and inhibit opening of calcium channels (inhibiting transmitter release). They are of 4 types:
7. [.](https://image.slidesharecdn.com/narcoticsandnon-narcoticsanalgesics-141218151744-conversion-gate01/95/narcotics-and-non-narcotics-analgesics-7-638.jpg?cb=1418937575)μ-Receptors are thought to be responsible for most of the analgesic effects of opioids, and for some major unwanted effects. Most of the analgesic opioids are μ-receptor agonists.
8. σ-Receptors are not true opioid receptors and it is unclear that what delta actually responsible for but may regulate mu receptor activity.¬ δ-Receptors are probably more important in the periphery and may also contribute to analgesia. ¬ κ-Receptors contribute to analgesia at the spinal level and may elicit sedation and dysphoria, but produce relatively few unwanted effects and do not contribute to dependence. ¬
9. Agonist and Antagonist Opiates vary not only in their receptor specificity but also in their efficacy at the different types of receptor. Thus some agents act as agonists on one type of receptor, and antagonists or partial agonists at another, producing a very complicated pharmacological picture.