

# Veterinary Pharmacology

## 1. General Pharmacology

- 1.1 Pharmacodynamics- concept of drug receptor, Physicochemical properties and structure of drug molecules, Classification of drug receptors- methods of characterization, identification and isolation of receptors, molecular structure of receptor, Force involved in binding of drugs to receptors, Receptors conformation and configuration and structure-activity relationship; theories of drug-receptors Dose response relationship and molecular mechanism of drug action, G-protein coupled, ligand gated-ion channel and tyrosine kinase-linked receptors, Signal transduction mechanism, G-protein second messengers: phospholipases, phosphokinases, intracellular calcium, protein kinase C, IP3, diacylglycerol and cyclic nucleotides; Signal transduction through protein tyrosine kinases, receptors as pharmaceutical targets
- 1.2 Pharmacokinetics: Routes of drug administration, factors modifying drug delivery and the kinetics of the drugs; Principles of pharmacokinetics, absorption, distribution, biotransformation and elimination. Kinetics following single and multiple dosage; compartmental models of drug distribution, bioavailability, volume of distribution and protein binding of the drugs. Rate of absorption, distribution and elimination, absorption and elimination half-lives and rate of transfer of drugs between compartments. Renal clearance, dosage regimen; non-compartmental pharmacokinetic modeling. Application of pharmacokinetic principles in therapeutics

## 2. Toxicology

- 2.1 Sources and mode of action of poisons
- 2.2 General approach to diagnosis of poisoning and line of treatment of poisoning.
- 2.3 Toxicology of metals and non metals
- 2.4 Toxicology of agrochemicals
- 2.5 Toxicology of commonly used drugs
- 2.6 Toxicology due to plants
- 2.7 Residue toxicology
- 2.8 Qualitative and quantitative aspects of metabolism of toxicants, injuries caused by toxicants, cellular, sub-cellular and molecular target of action, mechanism of action of specific toxicants causing morphological physiological and biochemical changes in the liver kidney lungs, adrenal and CNS, reproductive and haemopoietic systems

### **3. Neuro-pharmacology**

- 3.1 CNS Pharmacology: Anatomical and physiological considerations of central nervous system (CNS); neurohumoral transmission; Pharmacology of neurotransmitters, types of transmitter present in different systems, co-transmitter theory, Pharmacological organization of central nervous system, pre-anaesthetic medication, historical development, theories and stages of general anesthesia, intravenous and other parenteral anaesthetics, inhalation anaesthetics, hypnotics and sedative psychotropic agents, drugs affecting behavior, narcotics and analgesic antagonist, non-narcotic analgesics, neuroleptic and antiepileptics. CNS stimulants, analeptics, opioid agonists and antagonists, non-steroidal anti-inflammatory agents, central and peripheral muscle relaxant, local anaesthetics, euthanizing agents, doping.
- 3.1 Autonomic Pharmacology: Anatomical and physiological considerations of autonomic nervous system, neurohumoral transmission in ANS, synthesis and release mechanism of neurotransmitters of sympathetic and parasympathetic system, Pharmacology of cholinergic agonist and antagonists; Pharmacology of adrenergic agonist and antagonist; pharmacology of non-cholinergic, non-adrenergic nerves; Ganglionic stimulants and blockers; neuromuscular blocking agents.

### **4. Chemotherapy**

- 4.1 General consideration and principles of chemotherapy, classification of chemotherapeutic agents; development of microbial resistance to antimicrobials, combination therapy
- 4.2 Systemic and gut acting sulfonamides, diaminopyrimidines, quinolones sulfones,
- 4.3 Nitrofurans,
- 4.4 Penicillines, cephalosporins,  $\beta$ -lactams antibiotics;
- 4.5 Chloramphenicol,
- 4.6 Tetracyclines, macrolides, polymyxins, polypeptides;
- 4.7 Aminoglycosides and other antibiotics;
- 4.8 Anti-protozoan, anthelmintics, ectoparasiticides;
- 4.9 Antituberculosis,
- 4.10 Antifungal, new advances in anti-viral agents, antineoplastic drugs

### **5. Ethno-pharmacology**

- 5.1 Historical aspects: Traditional Nepalese remedies and regional folklore in disease cure
- 5.2 Classification, identification and chemical constituents of medicinal plants,
- 5.3 Extraction, distillation, evaporation, and other processes used in purification and preparation of active constituents from medicinal plants.

- 5.4 Standardization and clinical validation of bioactive molecules from vegetable sources.
- 5.5 Therapeutic and adverse effects of potential herbal drugs.
- 5.6 Indigenous drugs used as carminatives, antiseptics, antimicrobials, analgesics and anti-inflammatory agents. Alternate system of medicine in animals.

## **6. Endocrine and Autacoids Pharmacology**

- 6.1 Endocrine Pharmacology: General consideration, classification of different hormones in terms of mechanism of action, hormones of pituitary gland and adrenal cortex, hormones affecting reproduction, anabolic steroids, thyroid and antithyroid drugs, parathyroid and calcitonin, insulin and glucagons, hormonal regulation of calcium and phosphorus homeostasis.
- 6.2 Pharmacology of Autacoids: General considerations, histamines and antihistamines, serotonin and anti-serotonins, eicosanoids, bradykinin, angiotensin, kallikrein and other kinins, Purine derivative-AMP, ADP, ATP and their antagonist; cyclic nucleotides-cAMP cGMP; amino acids; glycine, GABA, glutamic acid plasmakinins and other vasoactive agents; Platelet-activating factor, slow reacting substances; putative neurohumoral transmission-purine nucleotides, peptides, amino acids and nitric oxide.

## **7. Cardiovascular and Renal Pharmacology**

- 7.1 Cardiovascular Pharmacology Principles of electro-cardiography, digitalis and other inotropic agents, antiarrhythmic drugs, Vasodilator mechanism and vasodilator drugs, antihyperlipidaemic drugs, endothelial derived factors (EDF), haemostatic and anticoagulant drugs, antianemic adugs,
- 7.2 Renal Pharmacology: Pharmacology of drugs affecting volume and composition of body fluids; water and osmotic diuretics, mercurial diuretics, inhibitors of carbonic anhydrase, thiazides, high ceiling and potassium sparing diuretics; aldosterone antagonists, xanthine derivative and uricosuric diuretics; anti-diuretic hormone and inhibitors of tubular transport.

## **8. Pharmacology of Gastrointestinal tract**

- 8.1 Pharmacology of drugs acting on gastrointestinal tract. Appetite stimulant, emetics and anti-emetics; Purgatives, anti-diarrheals, Antacids and Mechanism of regulating secretion of HCL, Anti-ulcers drugs, modulators of gastric and intestinal motility and secretions;
- 8.2 Gastrointestinal protectants and adsorbents, laxatives and cathartics;

- 8.3 Agents promoting digestive functions; bile acids and pancreatic enzymes, drugs affecting liver; rumen pharmacology.

## **9. Nutritional Pharmacology**

- 9.1 Pharmacology of fat soluble vitamins
- 9.2 Pharmacology of water soluble vitamins
- 9.3 Pharmacology of calcium phosphorus and other macro-elements
- 9.4 Pharmacology of trace elements

## **10. Drugs acting on respiratory system; and skin and mucous membrane**

- 10.1 Drugs acting on respiratory system: Expectorants and antitussives, respiratory stimulants, Bronchodilators and mucolytics
- 10.2 Drugs acting on skin and mucous membranes: Emollients, demulcents and counter irritants,