THE TAMILNADU DR.MGR MEDICAL UNIVERSITY

PHARMACOLOGY PRACTICAL RECORD

II MBBS

CERTIFICATE

_____MEDICAL COLLEGE

Certified to be the bonafide record of work done by_____ of class II MBBS during the year_____at _____ Medical College, _____

Date

Professor& Head

Department of Pharmacology

Submitted for Practical Examination at _____ Medical College, _____

Date:

Examiners

INDEX

INTRODUCTION

The goal of teaching the 2nd year undergraduate students in Pharmacology is to impart a holistic knowledge of Pharmacology and inculcate a rational and scientific basis of therapeutics. At the end of the course the student shall be able to know:

1. Rational therapeutics: includes art of prescription writing and common prescribing errors,

2. Techniques in drug administration and handling of basic equipments in drug administration

3. Clinically relevant problem based learning exercises

4. How to calculate drug dosage and concepts of pharmacoeconomics

5.CAL [computer assisted learning] for experiments on animals

6. Toxicological aspects in pharmacology

7. Training in communication, motivation and compliance [OSPE]

8. Role of health care professionals in monitoring drug therapy

[Pharmacovigilance]

SPOTTERS -PLANTS

1. Identify the plant
2. Mention its uses

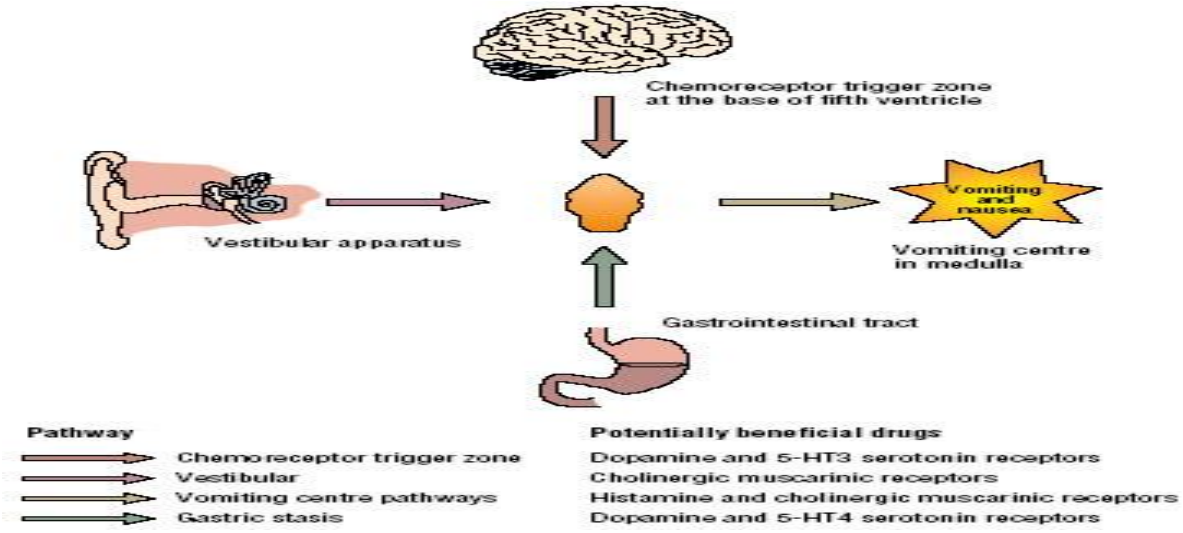
CINCHONA BARK

VINCA ROSEA

SPOTTERS - MECHANISM OF ACTION

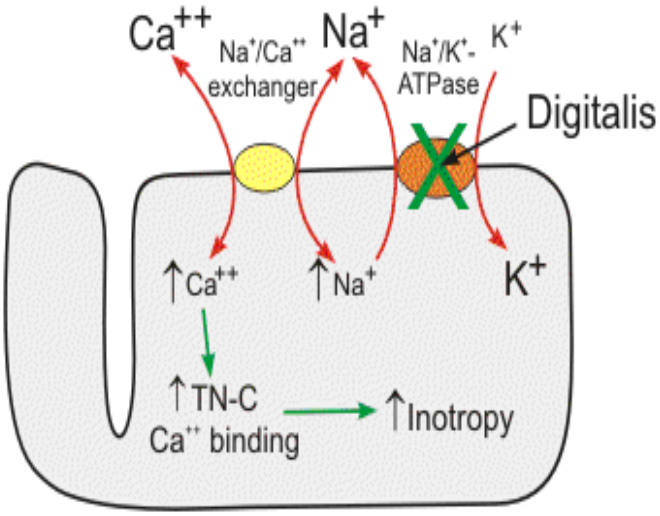
ANTI EMETICS

1. Mention the antiemetics
2. What are the indications?



DIGOXIN

1. Mention 4 adverse effects
2. What are the therapeutic uses



SPOTTERS- CLINICAL CONDITIONS

ANAEMIA

1. What are the nutrient deficiencies causing anaemia?
2. Mention the oral iron preparations and its side effects

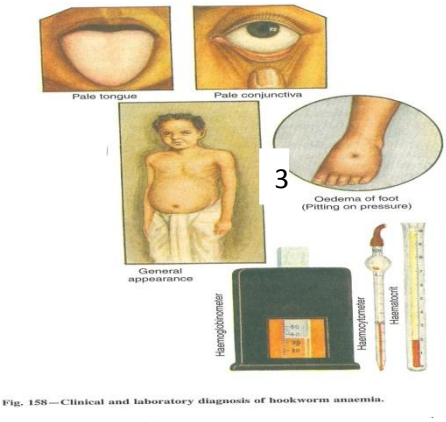


Fig. 158—Clinical and laboratory diagnosis of hookworm anaemia.

RHEUMATOID ARTHRITIS

1. Mention 2 biological agents used in treatment of rheumatoid arthritis
2. Mention 4 adverse effects of Methotrexate

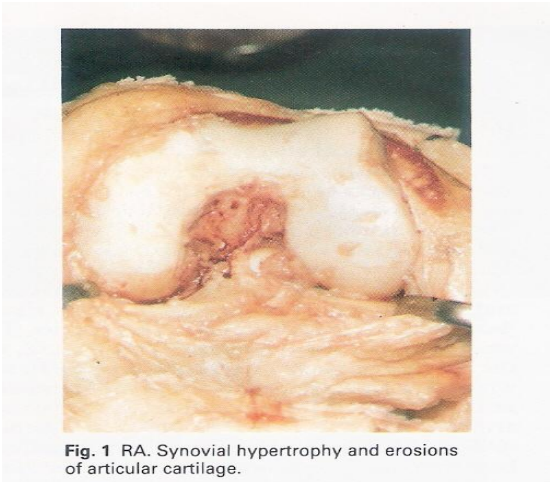


Fig. 1 RA. Synovial hypertrophy and erosions of articular cartilage.

'spindling'.

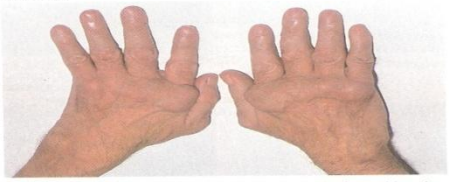


Fig. 4 RA at later stage. Considerable MCP joint thickening, subluxation and ulnar deviation.

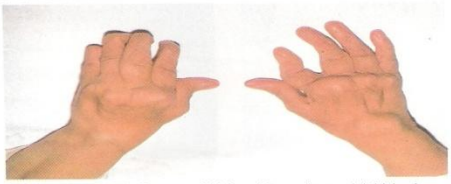


Fig. 5 Advanced RA. 'Swan-neck' deformities and synovial thickening of wrists.

SPOTTERS - ADR

FIXED DRUG ERUPTION

1. Identify the condition

2. Mention the drugs causing this phenomenon



GUM HYPERPLASIA

1. Identify the condition
2. Mention the drugs causing this condition

SPOTTERS- DOSAGE FORMULATIONS

1Oral-.Solid and Liquid formulations
2. Parenteral formulations
3. Topical formulations
4. Newer drug delivery system

PRINCIPLES OF PRESCRIPTION WRITING

A prescription is a written order or communication from a registered medical practitioner or other licensed practitioner to a pharmacist embodying salient instructions regarding the dispensing of prescribed medication for a particular patient.

Prescriptions are written in a blank or universally accepted format or may be made in pads. A typical prescription consists of the following parts.

1. **Physician (Prescriber) Information**: Doctor's name, designation and Registration Number.
    a. Address with phone number and e-mail.
    b. Date of issue of prescription.
2. **Patient Information:** The name, address, age and sex of the patient
3. **Superscription:** The superscription which consists of the heading where the symbol Rx an abbreviation for recipe, the Latin for 'take thou' or 'you take' is found.
4. **Inscription:** The inscription (body of prescription) comprises an important part of prescription containing-
    a. Name(s) of drug(s) and their quantities,

b. Instruction regarding dosage form like tablet, capsule, suspension, mixture, etc ,
c. Dose and quantity of prescription

5. **Subscription:**

The subscription gives specific directions for the pharmacist on how to compound the medication.

6. **Transcription or Signatura :**

The signatura which gives instructions to the patient
How, how much, When, and how long the drug is to be taken. These instructions are preceded by abbreviation 'Sig.' from the Latin, meaning 'mark.' The signatura should always be written in English; however, physicians continue to insert Latin abbreviations, e.g.,' 1 cap t.i.d. pc' which the pharmacist translates into English as 'take one capsule three times daily after meals'. It may also contain special instructions, warnings, followed by the signature of the prescriber.

7. Refill: The number of times a prescription is to be repeated is written by the physician under renewal instructions.

8. Signature: Finally the prescription must bear the signature of the prescriber to impart it the legal validity.

PRESCRIPTION WRITING - EXAMPLES

1. Prescribe for a Patient with INSOMNIA

2. Prescribe for a Patient with STATUS ASTHMATICUS

3. Prescribe for a Patient with STATUS EPILEPTICUS

4. Prescribe for a Patient with ACUTE MYOCARDIAL INFARCTION

5. Prescribe for a newly diagnosed Patient with PULMONARY TUBERCULOSIS

PRESCRIPTION AUDIT

The aim of prescription auditing is to assess the compliance with standard prescription format, to encourage rational use of drugs and to identify drug interactions. WHO has defined rational use of drugs as ” patient receiving medications appropriate to their clinical needs, in doses that meet their own requirements, for an adequate period of time and at lowest cost to them and the community”

EXAMPLES

1. A 24 year old pregnant woman came to the hospital with the complaints of swelling of both legs & breathlessness. On examination, she was anaemic and her BP was 150/90 mm/ Hg . Her Hb was 9 gms & and urine showed albuminuria .She was advised to take the following prescription.

- Tab.Losartan 25 mg 1 od.
- Tab. Lasix 40 mg 1od.
- Tab. Ferrous fumarate 1 od.

Audit the prescription

2. A 25 year old man with anaphylactic shock after inj. Procaine penicillin was treated with the following

- Inj. Adrenaline 0.5cc (1/100 solution) iv
- Tab. Pheniramine 250mg orally.

Audit the prescription

3. A 3 year old baby with acute diarrhoeal disorder was prescribed with

- Tab. Loperamide 2 mg tds
- Tab. Norflox 50 mg bd for 3 days

Audit the prescription

4. A 67 year old diabetic comes with complaints of severe pain in and behind the ear. There is purulent discharge from the ear. Gram stain shows gram negative rods. Culture results show pseudomonas and the patient is started with

Tab. Ibuprofen 100mg od

Tab. Cefaclor 500 mg tds

Audit the prescription

5. A 35 year male a known diabetic was already on Tab.Glibenclamide 15mg bd and his recent blood glucose was- fasting 140 mg / dl & postprandial – 240 mg /dl following that

- Tab. Glipizide 5mg bd was added.

Audit the prescription

PROBLEM SOLVING EXERCISE - EXAMPLES

1. After the injection of Succinylcholine to provide muscle relaxation during an operation, the patient developed prolonged apnoea.

a) What do you think the probable reason is?

b) Would you like to give Neostigmine as antidote?

c) What is the line of treatment?

d)Name 4 drugs which potentiate neuromuscular blockers.

e)Name the drug given for d-tubocurarine overdose.

2. Mr. X suffering from schizophrenia was given

T. Chlorpromazine 100mg. After 10 days he developed muscle rigidity & tremor. The patient was assured & advised to take T.Levodopa 250 mg twice daily.

1)What are his recent symptoms suggestive of?

2)Mention the drugs which can induce Parkinsonism.

3)Is Levodopa indicated to this patient?

4)Outline the management & the rationale for the drug chosen?

5)Mention anti-histamines that can be used in this condition.

3. A 23 year old woman suffering from bronchial asthma was using Tab.Salbutamol (2 mg) tds for 30 days. She came for review and complains of tremor and palpitation.

1. What is the mechanism of action of salbutamol.

2. What are all the various routes of administration for salbutamol ?

3. Name the longest acting β2 agonist

4. Mention the Adverse effects of salbutamol

5. What are the drugs used as prophylaxis in seasonal bronchial asthma

6. Name the other uses of Mast cell stabilizers

4. A 56 year old hypertensive patient on Tab.Atenolol 50 mg OD complained of chest pain, following any sustained exercise. He was diagnosed as atherosclerotic angina and prescribed sublingual Nitroglycerine for treatment of acute chest pain.

1.How does nitroglycerine has relieve chest pain?

2.Mention four adverse effects of nitrates.

3.Can you add Diltiazem or Verapamil to this patient? Justify.

4.What are the other drugs prescribed for chronic angina?

5.Mention two drugs used in patients with refractory angina to standard anti anginal therapy.

5. A 58 year old woman was being treated for chronic suppression of ventricular arrythmias. After 2 months of therapy she complains of feeling tired all the time. Examination reveals resting heart rate 10 beats per minute lower than the previous rate. Her skin is cold and clammy. Lab test showed low thyroxine and elevated TSH.

1.Which anti arrythmic drug is the cause of the symptoms and how?

2.What are the other drugs used in ventricular arrythmias?

3.What is torsades de pointes?

4.Mention the drugs which precipitate torsades de pointes.

5.Mention the drugs used in paroxysmal supraventricular tachycardia.

DOSAGE CALCULATION - EXAMPLES

1. In a 70 kg adult male patient with severe hypotension, dopamine is infused. The following data are provided for calculation purposes.

Dopamine Hydrochloride:Available as 40 mg./ml in 5 ml Ampoule

Adult dose is 2 to 50 mcg/kg/min, as infusion

Dopamine is dissolved in 495 ml of 5% Dextrose solution.

Infusion rate desired is 4 mcg/kg/min.

1 ml = 20 drops.

Questions:

1. If 5 ml Ampoule of Dopamine is dissolved in 495 ml of 5% Dextrose, then calculate the concentration of Dopamine present in one drop.

2. Calculate the number of drops per minute to be infused?

2.Calculate the creatinine clearance with the following data:

Age:50 years Weight: 62 kg

Serum creatinine = 0.7

(Normal serum creatinine level is 0.6 – 1.2 mg per dl)

3. A 60 kg old male admitted with complaints of breathlessness, lethargy and was extremely pale on examination. Investigations were suggestive of iron deficiency anemia with hemoglobin of 9gms%

DATA:

Iron Dextran (Complex of Ferric oxide with LMW dextran which contains 50 mg of elemental iron /ml) is given in a daily inj. of 2ml (Test dose 0.25ml deep IM).

Iron requirement (mg) = 4.4 × body weight(kg) × Hb deficit (g/dl)

Questions:

1. Calculate the total iron to be given to the patient.

2. If the iron is to be given by IM (Each ml of Iron Dextran contains 50 mg and each ampoule contains 2 ml and each day 2 ml is given), calculate the duration of treatment?

4. Calculate the oral dose of paracetamol for a child aged 8 years using YOUNG'S formula.

Adult dose of paracetamol is 500 mg/8^{th} hrly

5.Calculate the oral dose of Rifampicin for a 20 kg child diagnosed as primary complex using CLARKE's formula.

Adult dose of Rifampicin – 10 mg /kg /day

PHARMACOECONOMICS

Pharmacoeconomics focuses on the costs and benefits of drug therapy and pharmacoeconomic evaluations provide a basis for resource allocation and utilization. It is increasingly becoming important for health policy.

Four techniques are used for economic evaluation, namely, cost-minimization analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis.

EXAMPLES:

1. In acute musculoskeletal disorders (tendinitis, bursitis, painful post operative conditions, rheumatoid arthritis), one among the following drugs is used. The cost per unit of each drug is provided.

Drug name	cost(Rs)/ Unit(mg)	Dose(mg)/Frequency
Acetaminophen	0.50 / 500	1000 / QID
Aspirin	0.25 / 350	1050 /TID
Ibuprofen	1.00/ 600	600/TID
Indomethacin	1.00 / 25	25/TID
Diclofenac	0.75 / 50	50/TID

Questions:

1.To which group does the above mentioned drugs belong?

2.Work out the cost for each drug.

3. Which drug causes the least gastrointestinal adverse effect as anti-inflammatory agent

2. Mr. X is suffering from uncomplicated chlamydial urethritis. The cost of various regimen is given below

Schedule A: C.Doxycycline 100mg bd × 7 days

Schedule B: T. Azithromycin 1gm single dose × 3 days

Schedule C: C. Amoxycilllin 500 mg tds × 7days

Price: C.Doxycycline 100mg - Rs 4.00

T. Azithromycin 500 mg - Rs 17.50

C. Amoxycilllin 500 mg - Rs 6.50

Questions:

1. Work out the cost for each schedule

2. Which therapy will you suggest? Why?

3. If a Pregnant woman is suffering from uncomplicated Chlamydial urethritis which therapy will you select? Why?

3.A 60yr old diabetic male came to skin OPD with itchy patches in abdomen. He was diagnosed as tinea corporis & was started on antifungal drugs.

SCHEDULE A: T.Griseofulvin 250mg BD for 4 weeks

SCHEDULE B: T.Fluconazole 150 mg OD once a week for 4 weeks

SCHEDULE C: T.Terbinafine 250mg OD for 4 weeks

Price : T.Griseofulvin 250mg – RS 2.60 / 250 mg tab

T.Fluconazole 150 mg – RS 28.00 / 150 mg tab

T.Terbinafine 250mg – RS. 20.00 / 250 mg tab

Questions :

1. Work out the cost for each schedule.

2. Which schedule is economical?

3. Among the the schedule drugs which is not effective against T.Versicolor?

4. 60 year old male a known case of cirrhotic liver with pedal edema & ascites was planned to be treated with diuretics.

SCHEDULE A: T.Frusemide 40 mg OD / morning for 5 days

SCHEDULE B: T.Torsemide 20 mg OD / morning for 5 days

SCHEDULE C: T. Frusemide 20 mg + T.Spironolactone 50mg BD for 5 days

Price ; T.Frusemide 40 mg ; RS 2.00 / unit

T.Torsemide 20 mg ; RS 3.75 / unit

T. Frusemide 20 mg + T.Spironolactone 50mg; RS 4.00 / unit

Questions :

1. Work out the cost for each schedule.
2. Which schedule is economical?
3. Which schedule is suitable to this patient. Justify

5. An adolescent boy attending Medicine OPD with complaints of running nose and sneezing for 3 days.He was diagnosed to have allergic rhinitis. Select an appropriate regimen for management.

Regimen A – Tab. Astemizole 10 mg od x 5 days

Regimen B- Tab. Chlorpheniramine 25 mg od x 5 days

Regimen C- Tab. Cetrizine 10 mg od x 5 days

Cost of drugs:

Tab. Astemizole 10 mg Rs. 10.50/10 tab

Tab. Chlorpheniramine 25mg Rs. 4.50/10 tab

Tab. Cetrizine 10 mgRs.25.00/10 tab

OSPE - EXAMPLES

A) TO DEMONSTRATE:

1.Metered dose inhaler

2.Rotahaler

3.Intravenous injection

4. Intramuscular injection

5. Subcutaneous injection

6. Installation of eye drops

B) To prepare a test dose for administration- penicillin/ adrenaline

C) To pick up the drugs from a drug tray for a particular disease and its action

CLINICAL PHARMACOLOGY CHARTS

1.Hepatic drug conjugation with age

2.Concentration of drugs in plasma

3.Blood level curves of three formulations of same drug

4.Drug potency and efficacy

5.Concentration of drug after repeated administration

6.Drug responses on Blood pressure of Anaesthetized dog

7. Drug responses on isolated perfused heart of frog

8. Drug responses on isolated intestine of rabbit

9.Tachyphylaxis –Effect of tyramine on Blood pressure of Anaesthetized dog after repeated administration

10. Potentiation / Synergism

TOXICOLOGY - EXAMPLES

1. A Farmer with history of handling insecticides is brought to the hospital with convulsions,sweating & laboured breathing.

On examination he had pinpoint pupils, profuse salivation, pulse 50 / min, rapid breathing, rales & rhonchi all over the lungs.

1.What is the probable diagnosis ?
2.Outline the management & the rationale for the drug chosen.

2. Patients were admitted to the hospital with symptoms of vertigo, abdominal pain, blurring of vision , motor restlessness after consumption of illicit liquor.

Outline the management & Give the rationale for the same.

3. A patient was admitted to the emergency ward with history of abdominal pain, nausea, vomiting & anorexia. After a few hours the patient developed jaundice with liver tenderness.

On careful elicitation of history, the patient revealed of having consumed about 25 – 30 tablets of a pain relieving drug, which the patient used to take frequently for the relief of headache.

1.What drug the patient has consumed in overdose?
2.How do you explain the above toxic manifestations and what is the dose at which serious toxicity occurs?
3. What is the line of management?

4. In a mass casualty caused by a chemical agent, patients declared as brought dead with H/O exposure of large challenges of gas agent cyanide & died within minutes of exposure.

1.What is the mechanism of action of cyanide poisoning?
2. What are the clinical features of cyanide poisoning?
3. What is the antidote & its mechanism of action ?
4. What is the difference between cyanide poisoning & nerve agent poisoning?

5. A 27 year male brought to the hospital with history of snake bite over his left foot and he had the complaints of headache , nausea, vomiting & drooping of both eyelids .

On examination patient had mild tachycardia , hypotension & ptosis of both eyes.

1.What is the type of toxicity developed in this patient?
2. What are the types of systemic effects caused by venomous animals (snake, scorpion, bees, wasps)?
3. What is the pre Hospital first aid & treatment of the envenomation?
4. What is antivenom?
5. What is the role of antivenom to reverse the toxicity?

COMPUTER ASSISTED LEARNING (CAL)

Simulation of animal experiments

Ex: Rabbit eye, general anaesthesia, analgesic action on mice/rats

PHARMACOVIGILANCE -Using WHO ADR forms

Pharmacovigilance has been defined by the WHO as the science and activities relating to detection, assessment, understanding and prevention of adverse effects or any other drug related problems

PHARMACOVIGILANCE CENTER- DEPT. OF PHARMACOLOGY
---------- MEDICAL COLLEGE

Email ID :

Patient name: **Age**: **Sex**: **Weight**:

OP/IP No: **Ward**: **Department**:

Describe the reaction or Problem:

Reaction start date: **Date of recovery**:

Suspected Medication(s):

S.No	Drug name	Dose used	Route used	Frequency	Therapy dates		Reason for use
					Date started	Date stopped	

Concomitant drugs with dose and dates:

Medical History:

Investigations:

Drug stopped: ☐Yes ☐No **Drug restarted**: ☐Yes ☐ NO

If Yes **If Yes,**

☐ Definite improvement ☐No improvement ☐ Reaction recurrence ☐ No reaction recurrence

Fate of the suspected drug: ☐Drug withdrawn ☐ Dose altered ☐No Change

Treatment given for the reaction: ☐Yes ☐No ☐Unknown **If Yes, Specify**_____

Outcome: ☐Recovered ☐ Recovering ☐Continuing ☐Fatal ☐Permanent harm ☐Unknown

WHO Causality assessment scale: ☐Certain ☐Probable ☐Possible ☐Unlikely
☐ Conditional/Unclassified ☐ Unassessable/Unclassifiable

Reporter's Name:

Signature with date:

FRAMING ANTIBIOTIC POLICY - Using culture & sensitivity reports from Microbiology dept