14-004.
Azanaz.

DEPARTMENT OF CHEMISTRY

Certified that Mr./Mrs./Miss Azanaz Sardar

of 3RD YEAR (MBBS) *class has carried out the necessary practical work as per courses of studies by* _____

of _____ *for the year* _____ *as shown in the practical schedule of this journal.*

_____

Professor incharge

DEPARTMENT OF CHEMISTRY

Date _____

Head of the Chemistry Department

	Date	Topic	Sign
1.	14-11-2016	Introduction & Terminologies.	Fareeha
2.	28-11-2016	Introduction to Routes of Administration.	Fareeha
3.	05-12-2016	To study intravenous Route of Drug administration	Fareeha
4.	19-12-2016	Intramuscular route of drug administration	Fareeha
5.	26-12-2016	To Subcutaneous route of drug administration	Fareeha
6.	05-03-2017	To demonstrate Intradermal route of drug admin	Fareeha
7.	13-03-2017	To demonstrate use of Inhaler and spacer device	Fareeha
8.	13-03-2017	To study parts and working of IV infusion set	Fareeha
9.	20-03-2017	To study various reflexes of eye.	Fareeha
10	27-03-2017	To study effects of various drugs on rabbit's eye.	Fareeha
11	03-04-2017	Effects of cholinergic drugs on Rabbit's eye.	Fareeha
12.	10-04-2017	Effects of muscarinic drug (Atropine) on Rabbits eye	Fareeha
13.	17-04-2017	Effects of sympathomimetic drug (2% epinephrine)	Fareeha
14	17-04-2017	Effects of local anasthetic (1% lignocain)	Fareeha
15.	24-04-2017	Antagonism b/w cholinergic & anticholinergic drugs	Fareeha
16.	22-05-2017	To study effects of adrenaline on human subject	Fareeha
17.	22-05-2017	To study effect of atropine on human subject	Fareeha
18.	03-07-2017	To study the working of tissue Organ bath	Fareeha
19.	10-07-2017	To study the excretion of various drugs in urine	Fareeha
20.	17-07-2017	To observe the phenomenon of antagonism b/w Histamine and antihistamine on rabbits intestine	Fareeha
21	24-07-2017	To observe effect of cholinergic & anti cholinergic drugs on rabbit's intestine.	Fareeha

Complete & Checked.
Regular student
Extra Ordinary & Out standing Notebook.
Fareeha 31/07/17

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PRACTICAL # 1

INTRODUCTION & TERMINOLOGIES:

Pharmacology:-

It is the study of a substance that interacts with our body system through chemical process either by activating or inhibiting a normal body process.

Pharmacognosy:

It is the study of sources, identification, purification and isolation of drugs from natural sources.

Pharmacy / Pharmaceutics:

It deals with prepration, compounding and dispensing of a drug in a dosage formulation suitable for administration.

Pharmacodynamics:

It deals with biochemical, physiological activity and mechanism of action of a drug.

Pharmacokinetics:

It deals with absorption, distribution, biotransformation and excretion of a drug.

Clinical Pharmacology:

It is the scientific study of drugs on human

Therapeutics:

It deals with dignosis, prevention and treatment of disease by usage of a drug.

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Pharmacogenetics:

It deals with variation in drug and drug responses that are governed by inheritance or genetic variation.

Drug:-

A drug is any substance which when given modifies a physiological process and is used for preventing, treating or investigating a diseased process for the benefit of a patient.

ACCORDING TO W.H.O:

Any substance that is used or is intented to be used to modify or explore a physiological system or pathological state for the benefit of patient is called a drug.

Toxicology:

It deals with the toxic and poisnous effects of a drug and its management.

Affinity:

It is the tendency of a drug to bind with a receptor

Efficacy:

It is the ability of drug once bound to its receptor brings about change leading to its response.

Efficacy = Intrinsic Activity

Agonist:

Drugs that bind with the receptor and activates the receptor to produce a pharmacological response is called agonist

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For example:-

- Salbutamol is beta 2 (β_2) agonist.
- Pilocarpine is muscarinic agonist.

Antagonist:

Drugs that binds with a receptor but has no intrinsic activity and therefore blocks the activity (effect) of agonist drug is called antagonist.

For example:

- Propanalolol is a Beta (β) receptor antagonist.
- Atropine is a muscarinic receptor antagonist.

Synergism:

It is a phenomena of drug interaction in which combined effect of two drugs is greater then the individual drug.

For example:-

Trimethoprim + Sulpmethaxazole > Cotrimaxazol

Partial Agonist:

These are the drugs that bind with a receptor but are capable of activating a small number of receptors and low degree of response

For example:-

Clonidine is a partial α_2 agonist

Pindalole is a partial β - agonist

Potentiation:

(Drugs acts on different receptors)

It is a phenomenon of drug interaction in which one drug increases the activity of other drug

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FOR EXAMPLE.

Salbutamol increases the activity of theophyline in asthma

- **Weakly acidic Drugs:**
  - Aspirine
  - Theophyline
  - Phenobyine
  - Furosimide

- **Weakly Basic Drugs:**
  - Atropine
  - Morphine
  - Chloroquine
  - Diazepam
  - Propanalol

Excellent

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EXPERIMENT # 2

Introduction to Routes of Administration

Drugs can be administered by variety of routes. The choice of appropriate route in a given situation depends both on drug as well as the patient related factors.

Factors governing choice of Route administration:-

1. Physical and chemical properties of drug.
2. Site of desired action (localized or generalized)
3. Rate and extent of absorption of drug from different routes
4. Effect of digestive juices and 1st pass metabolism of the drug.
5. Rapidity with which the response is desired
6. Accuracy of dosage required
7. Condition of patient (unconscious or vomiting)

Types of Routes of Administration of Drugs:

These are divided into

- Enteral route
- Parenteral route.

ENTERAL ROUTE

Administration of drug through GIT is called enteral route. It is subdivided into:

ORAL ROUTE:-

Administration of drug through mouth is called oral route of drug administration. The drugs given through this route are in form of

- Tablets
- Solutions
- Syrups
- Capsules

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SUBLINGUAL:-

In this route, the drug is place under the tongue and absorbed by oral mucosa.

RECTAL ROUTE:-

In this route, the drug is given through rectum in form of enema (liquid) suppositries (tablets)

ADVANTAGES OF ENTERAL ROUTE:

- Most common and convinent route
- Economical
- Less changes of infection
- Self medication is possible
- No specific assistance or help is required, we can use this route.
- When prolonged effect is required.

DISADVANTAGES OF ENTERAL ROUTE:

- 1st pass metabolism can occur.
- Poor patient compliance
- Not emergency route of administration.
- Drug interation with food can occur.
- Drugs can be destroyed by digestive juices.
- Steady state concentrations cannot be achieved by this route.
- Drugs can cause GIT irritation.

Parenteral Route:-

It is the administration of drug through any route other then GIT.

INJECTIONS:-

Here the drug is injected into the patient with help of syringe.

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Various routes included in injections are.

- Intravenous
- Intramuscular
- Intradermal
- Subcutaneous
- Intrathecal
- Intracardiac
- Intraarticular
- Intraperitonial
- Intrapleural.

- **INHALATIONS:**

This route of administration, drug is inhaled into the (drug) lungs and is absorbed by mucosa of respiratory tract to cause systemic effects.

Drugs given through this route are in form of gases, volatile liquids and fine powders.

- **TOPICAL ROUTES:-**

The drug is applied directly to skin to have local effects. Here the drug is given in form of creams, ointments, oils, gels and pastes.

- **TRANSDERMAL ROUTE:-**

Here the drug is applied ~~to~~ skin to have systemic effects. The drug given is in form of patch. Drugs given through this routes are:-

- Scopolamine
- Nitroglycerine.
- Pain killers

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ADVANTAGES OF PARENTERAL ROUTE:

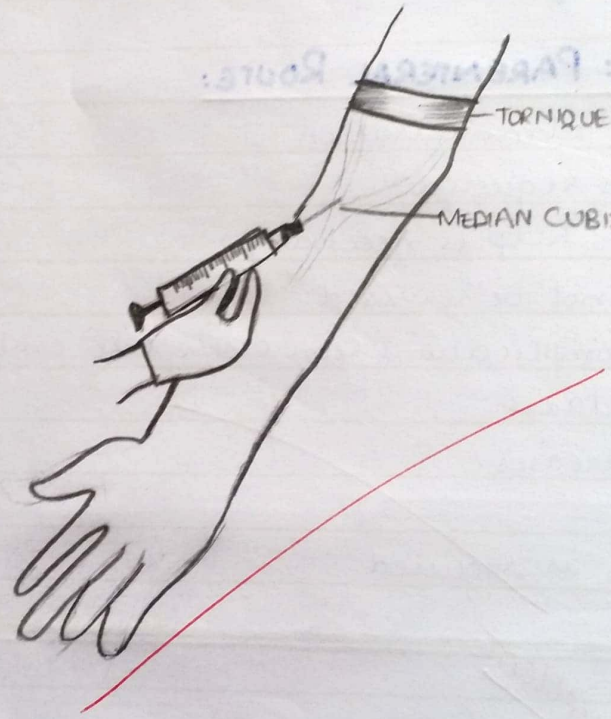
It is the emergency route of administration especially injections
Rapid effect of drug can be achieved
Maximum bioavailibility is obtained
Large amount of drug can be given
Avoid 1st pass effect
Proper tuning of dosage can be achieved

DISADVANTAGES OF PARENTERAL ROUTE:

Expensive route of administration
Special technique is required
Special assistance or help is necessary
Adverse effects can not be reversed
Sometimes serious complications can occur like embolism, thrombosis, anaphylaxis
Risk of infection increases.
Painful route
Patient's co-operation is required

Excellent
Javeria
28/11/16

Intravenous Route Of Drug Administration



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Date 05-12-2016

EXPERIMENT # 3

To study the Intravenous route of Drug Administration

It is the most commonly used route of drug administration. In this route the drug is injected directly in the lumen of vein. The solution for the injection should be clear and sterile. Oily solutions or suspensions cannot be given through this route as they can cause vasculitis or embolism. The powders should be dissolved thoroughly into their relavent solvents before administration.

Common sites for IV injections:

- Median cubital vein.
- Superficial veins on the dorsum of hands & feet.
- Long saphenous vein.
- Cephalic and baslic veins.
- Internal and external jugular veins
- Femoral vein.
- Scalp veins. in neonates. using butterfly cannula

Indications for IV injections:

- For medical and surgical emergencies. For example.
  - Hypoglycemia
  - Hypertension.
  - MI
  - Anaphylactic shock
  - Dehydration.
- For blood transfusion. eg.
  - In road traffic accidents (RTAs)
  - Anemic patients during surgery etc.
- To correct electrolyte imbalance.
- Diagnostic purposes like.
  - Blood grouping
  - Sugar and electrolyte analysis.

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For administration of radioactive contrast for
Radioactive iodine for Thyroid.
Thyroid) Radio opaque dye for visualizing GI Tract and genitourinary tract.
Angiography etc.
IV route is also used for bone marrow transplant

Procedure:

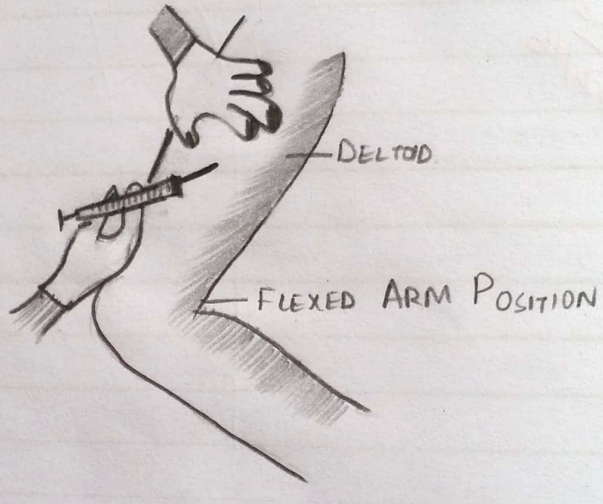
1. Identify the patient.
2. Explain the procedure to the patient and take consent.
3. Choose proper site for injection and expose it.
4. Select a proper vein by inspection and palpation. Commonly used vein is anti-cubital vein
5. Apply tonequett. 3 inches above the site of injection so that the vein becomes prominent.
6. Clean the site of injection with a spirit swab using non-touch technique.
7. Prepare the syringe for injection before opening the syringe and solution for injection check the expiry date
8. Stretch the site of injection between thumb and index finger and insert the needle at angle of 45°.
9. When the needle is inside the vein, release the skin and pull the plunger back to make sure that the needle is inside the blood vessel. (Release the tonequet)
10. Inject the drug slowly and observe the patient while giving the injection for any allergic reaction.
11. After injection, withdraw the needle and press the site for 1-2 minutes with a sterile swab.
12. Dispose off the syringe properly.

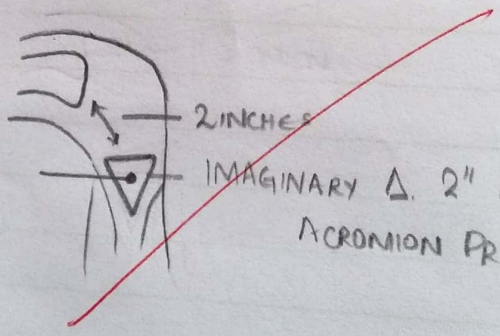
Precautions:

- Use aseptic technique.
- Avoid injecting air.
- Confirm the expiry date of syringe and medicine to be injected.
- Properly dispose off the syringe.

Jaweria
10/12/16

Intramuscular Route Of Drug Administration





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Experiment # 4

To demonstrate Intramuscular routine of drug administration:

In this route of administration, the drug is injected directly into the bulk of muscle.

Common sites for I.M injection are:

Deltoid
Gluteal region
Vastus lateralis

Deltoid region:

This is the most easily accessible I.M site but it cannot be selected if the person is lean and the solution being injected is more then 3ml. The drug is usually given in an imaginary inverted triangle 2 inches below the tip of acromion process. The muscle is relaxed before making the injection by adducting the shoulder joint and flexing the elbow joint.

Gluteal region:

This is another commonly used site for IM injection. Here large quantity of drug can be administered. Usually the upper outer quadrent is selected for injection. If injection is given on medial side, it can cause damage to schiatic nerve.

Vastus lateralis

This site is used for pedatric IM injections. Injection is administered at the junction of upper 1/3rd and lower 2/3rd of thigh.

Gluteal and deltoid regions are not fully developed in children, therefore this site is a better option. This site is also used for self administration of drug

EXAMPLE:

Physostigmine is given in Mystenia gravis.

Advantages:

1. Absorption is more then oral route but less then IV route.
2. It can be used in unconscious and un-co-operative patients.
3. "Depot preparations" (released slowly) can be given by IM injections eg. "Medoxyprogesteron" is given intramuscularly as contraceptive and "Benzathene Penicilline" is also given intramuscularly for prophylaxis of rheumatic heart diseases.

Disadvantages:

1. Injury to axillary nerve can occur when the drug is given in deltoid region and injury to schiatic nerve can occur in gluteal region resulting in foot drop if improper technique is used.
2. Irritant drug can cause local tissue necrosis Forexample:- Anti-cancer drug

Improper technique can cause development of muscle abcess.

Z-technique for IM

This technique is used for irritant and cytotoxic drug. Usually gluteal region is preferred for this technique. Before giving the injection, skin is retracted to one side and is kept retracted to one throughout the procedure. The injection is given into the muscle and once the medicine is injected, the needle is withdrawn and skin is released. This is done to avoid spillage of drug into subcutaneous tissue.

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Procedure for IM injection:-

Select proper site for injection and expose it and make sure this site is different from previous site of drug administration.
Clean the site with spirit swab.
Prepare the syringe for injection by observing non-touch technique
Stretch the skin between thumb and index finger and insert needle at angle of 90°.
Pull back the plunger to see whether the needle is inside the muscle or not. If blood comes in the syringe, withdraw the needle and try another site. If air bubbles comes, it means that needle is in muscle belly.
Now slowly inject the drug. After injecting the drug withdraw the needle and press the site of injection with spirit swab for 1-2 min.
Properly dispose off the syringe.

Precautions:-

Use proper aseptic technique.
Always withdraw the plunger to make sure that needle is not in vessel.
Always check expiry date of syringe and medicine.

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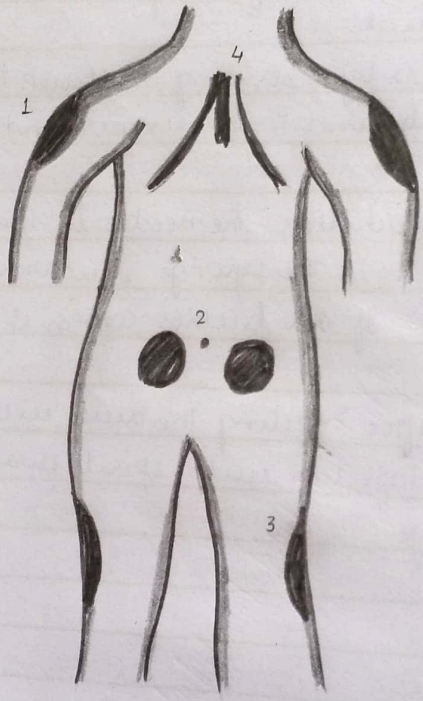
19/12/16

Sites For Subcutaneou Routes



1. Upper Lateral Flexor Surface Of Arm
2. Lower Ant Abdominal Wall
3. Lateral Region Of Thigh
4. Intra Scapular Region

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EXPERIMENT # 5

To demonstrate the subcutaneous route of administration

In this route of drug administration, the drug is injected into the loose areolar tissue beneath the skin. The special syringe which is used for subcutaneous injection is called "insuline syringe." The capacity of this syringe is 1ml or 1cc and it contains 100 units. It has a short needle and the amount given by this syringe is very small. It is also called hypodermic injection. Smallest distance is 0.01 cc.

Common sites of Injection:

- lower anterior abdominal wall.
- Lateral region of thigh
- Flexor surface of upper arm

The volume injected by this route of adminsteration is 1ml.

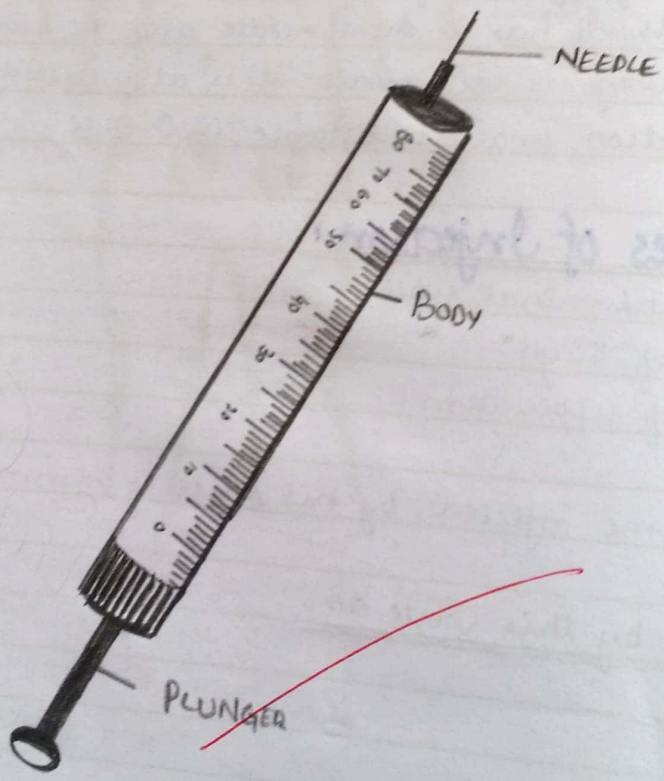
Drugs given by this route are:-

- Adrenaline.
- Insuline.
- Immunoglobulins.
- Heparin.
- Morphine (drug abusers).

Procedure:-

- Expose the proper site of injection after selection. Make sure the site is different from previous site.
- Explain the procedure to the patient
- Clean the site of injection by a cotton swab in circular motion

Insuline Syringes



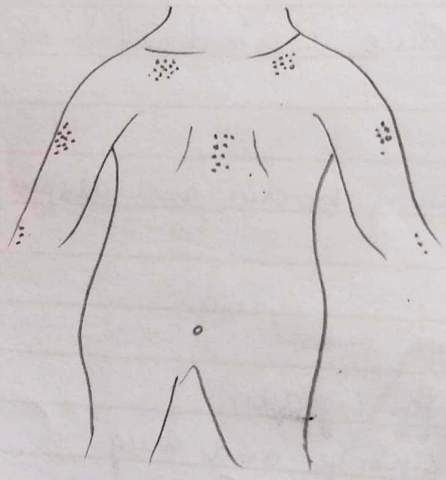
Prepare the insuline syringe for injection.
Pinch
Stretch the skin between thumb and index finger and insert the needle at an angle of 90° and 45° when patient is thin and lean.
- Pull the plunger back to make sure it is not inside the blood vessel.
- Now slowly inject the drug.
- Take out the needle after releasing the skin and dispose off the syringe properly.

Precautions:-

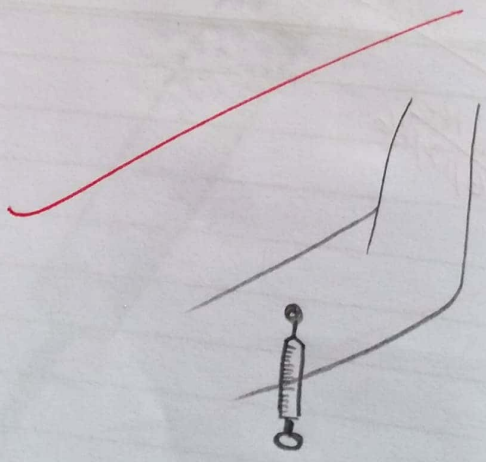
- Use proper aseptic technique for injection.
- Confirm the expiry date of syringe and drug.
- Dispose off the syringe properly.

Javeria
26/12/16

To demostrate Intradermal route of drug administration



1. SUBCLAVICULAR REGION
2. INTERSCAPULAR REGION
3. EXTENSOR SURFACE OF ARM
4. VENTRAL FOREARM



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EXPERIMENT #6

To demonstrate Intradermal route of drug admininstration

In this route of drug adminstration, drug is injected in dermis of skin with help of insuline syringe.

This route is commonly used for allergy testing. By this route all the drugs known to have hypersensitivity reaction are given before actual dose of drug. Allergy testing is done to diagnose various hypersensitivity reactions from several antigens eg asthma. Dignostic testing is also done by this route for tuberculosis. The test is called Montous test. In this test the antigen called PPD (Purified protein derivative) is injected intradermally. If the enduration occurs for more then 5mm of diameter then the test is said to be positive.

PROCEDURE:

Select the proper site for injection.; commonly used sites are

- Upper part of chest.
- Ventral fore arm.
- Extenson surface of arm.
- Interscapular region.

In these areas of skin there is less pigmentation, thin keratin and less hair. Therefore, the reaction is determined easily.

- Take a small quantity of drug in insuline syringe in dose ranging from .01 - .02 ml.
- Clean the site of injection with spirit swab

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- Now insert the needle at an angle of 10-15° from surface of skin
- Now inject the drug slowly and withdraw the needle.
- Mark the site of injection with pen and make a circle of diameter 2cm around it.
- Write down the name of drug and time at which the injection was given.
- Interpret the site of injection for any hypersensitivity reaction after half an hour and for PPD after 24-72 hrs.

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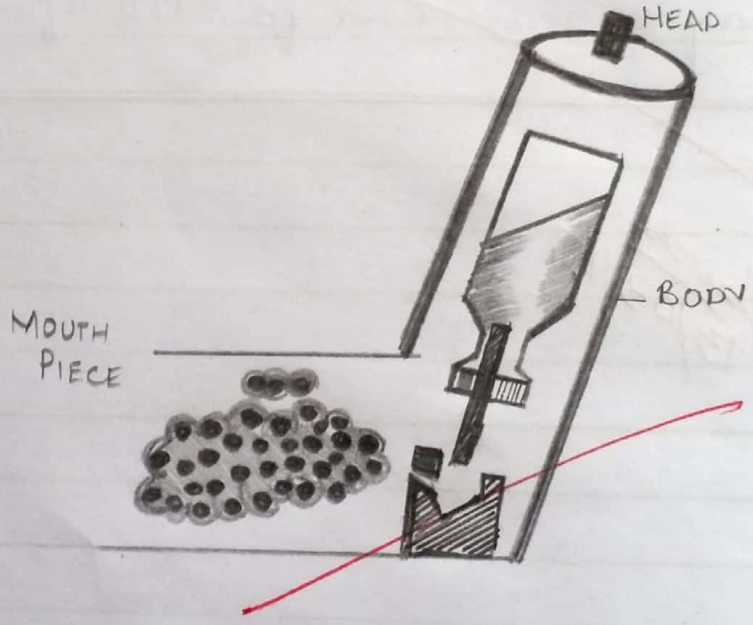
13/03/17

INHALER.



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EXPERIMENT # 7

To demonstrate the use of Inhaler & spacer device.

Inhaler:-

It is a medical device used for delivery of medication into the systemic circulation through the respiratory tract

Types of Inhaler:

Meter dose Inhaler
Dry powder Inhaler
Nebulizer.

Meter Dose Inhaler:

It is the most common type of Inhaler. In Meter dose Inhaler medication is mostly stored in pressurized canester that contains a propallent. though the drug may be in form of suspension

Dry Powder Inhaler:

This device releases a metered or measured amount of powdered medication that is inhaled through device

Nebulizer:

It supplies medication as an aerosol created from an aqueous formulation.

Indications for use of Inhaler:

1. For treatment of
   - Asthma.
   - COPD.
2. To deliver inhalational steroids
3. Nebulizer is indicated in children with acute bronchitis

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4. To treat Influenza in some patients.

Spacer Device:

(Meter dose Inhalers)

Sometimes MDIs are used with complementry device for holding the chamber device (Inhaler). It is indicated for children

- Also used in elderly patients who cannot use inhalers properly.

Contraindications:-

- In patients with hypersensativity reactions.
- Should not be used in patients with lip and mouth injury
- Steroid inhaler should not be used in patients with active pulmonary tuberculosis and in patients with raised intracranial pressure.
- Avoid use of bronchodilators in patients with serious heart disease.

Procedure:-

- Hold the inhaler upright. Shake the inhaler before use.
- Tilt the head back and slowly breathe out completly for 3-5 seconds
- Attach the inhaler with your mouth and simaltaneously breathe in slowly through the mouth and press down the
- on the inhaler, at the same time to release the medication.
- Stop breathing for few seconds and then exhale out through the nose.
- Repeat the puff process if more than one puff is prescribed.

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Drugs given through Inhaler:-

- β_2 agonist
- Inhalational steroids.

Precautions:-

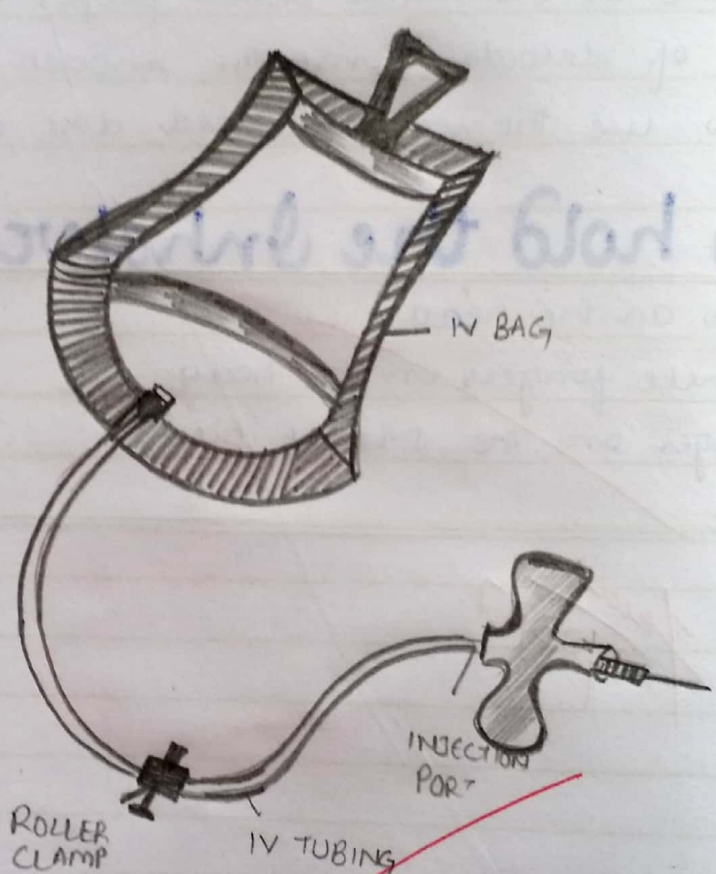
- Patient should be educated about proper use of inhaler.
- After the use of steroids, rinse the mouth thoroughly.
- Be careful to use the recommended dose only.

How to hold the Inhaler:

1. (Com) Thumb on the head.
2. Middle three fingers on the body.
3. Little finger on the Mouth piece.

Saeeha
13/03/17.

INFUSION SETUP



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EXPERIMENT # 8

To study the parts and working of I/V infusion sets

Infusion set is a device which is used for the delivery of medicines directly into the vein. IV administration is faster acting then any other method of administration.

Indications:-

- When continuous delivery of drug is required. In conditions like DVT, uncontrollable Diabettes Mellitus or Diabetic Ketoacidosis.
- Administration of large volume of fluids like in conditions like hypovolumia and shock.
- In dilution of medicine in a fluid to make its correct strength or prevent it from causing irritant effects e.g
  Some of antimicrobial and cytotoxic drugs.
- Blood transfusion
- Delivery of total parental nutrition. (side effect → Hyperglycemia)
- Dilaysis

Basic I/V setup:-

Infusions are most often administered by bags of fluid that comes pre mixed (mixed). The standard sizes of these bags ranges from 50ml – 1000 ml. The bag is hung from an IV pole or stand and IV tubing is attached to it at bottom of the bag. IV tubing contains

1) Drip chamber
2) Roller clamp.
3) Slide clamp.
4) Injection port.

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Drip Chamber:

It is located just below the IV bag. Inside the chamber we can see the fluid dripping down from the bag into the IV tubing. This is where we measure the speed of manual IV setput: We look at the chamber and count the number of drops we see per minute. eg If we want 25 drops in 60 seconds we say the flow rate is 25 drops/min. The drip chamber should be half filled so that we can count the number of drop.

Roller Clamp:

It is used to control the rate at which IV fluids are administered. If we roll it one way it (his tightly shuts the flow of tubing and if we roll it the other way it loosens the IV tubing making the tubing less narrow.

I/V tubing:

These are tubes made up of rubber connecting the drip chamber to (con) the injection port. Roller clamp is present in between the drip chamber and Injection port.

Slide Clamp:

It is used to completly stop the IV flow. This is handy if you want to stop the IV flow for a moment.

Injection Port:

It is used to inject the medicine during IV flow if Needed.

Volume control Burette:

If the amount of fluid is small or we are dealing with an infant or small child we need

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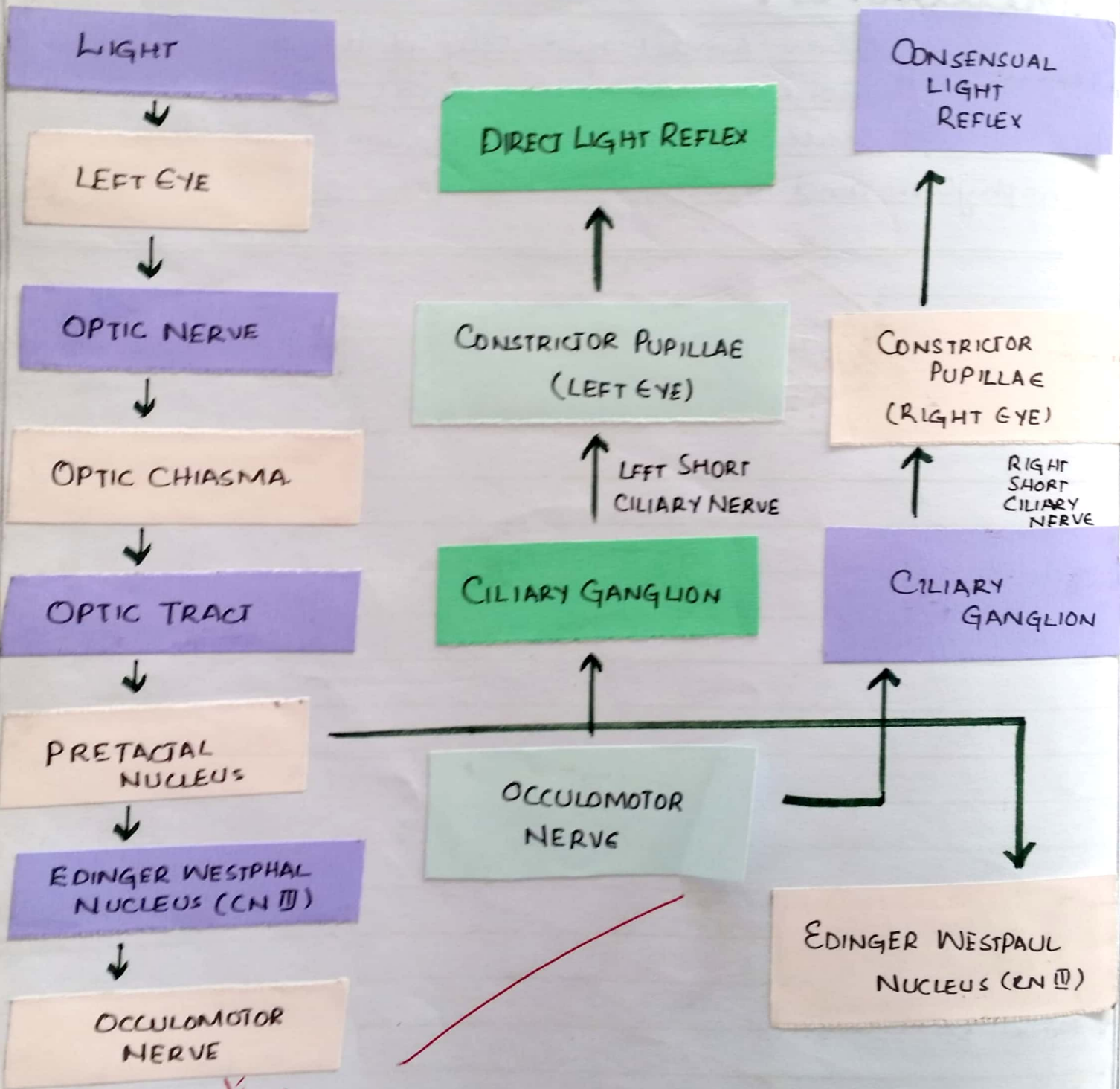
a way to measure it. In this case we use volume control burette.

Indications:

- It is used to deliver small quantity of drugs and fluids
- To deliver continuous infusions of fluids like Dopamine, Dobutamine, Nitrates, Streptokinase, Sodium valproate, Aminophylin and Insuline.

Javeda
13/03/17

Pupillary Light Reflex



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PRACTICAL # 9

To study various reflexes of eye

Light Reflex

It is the reflex which controls diameter of pupil in response to intensity of light which falls on retina of eye. When eye light is through into eye the pupil constricts. This is called light reflex.

Types:-

There are two types of light reflexes.

- Direct light reflex.
- Indirect light reflex.

"Direct light" reflex is the one in which pupil of same eye constricts upon exposure to light.

In the eye other then the one that is exposed to the light there is constriction of pupil, this is known as "indirect light reflex." It is also known as "consensual light reflex."

Pathways of light reflexes

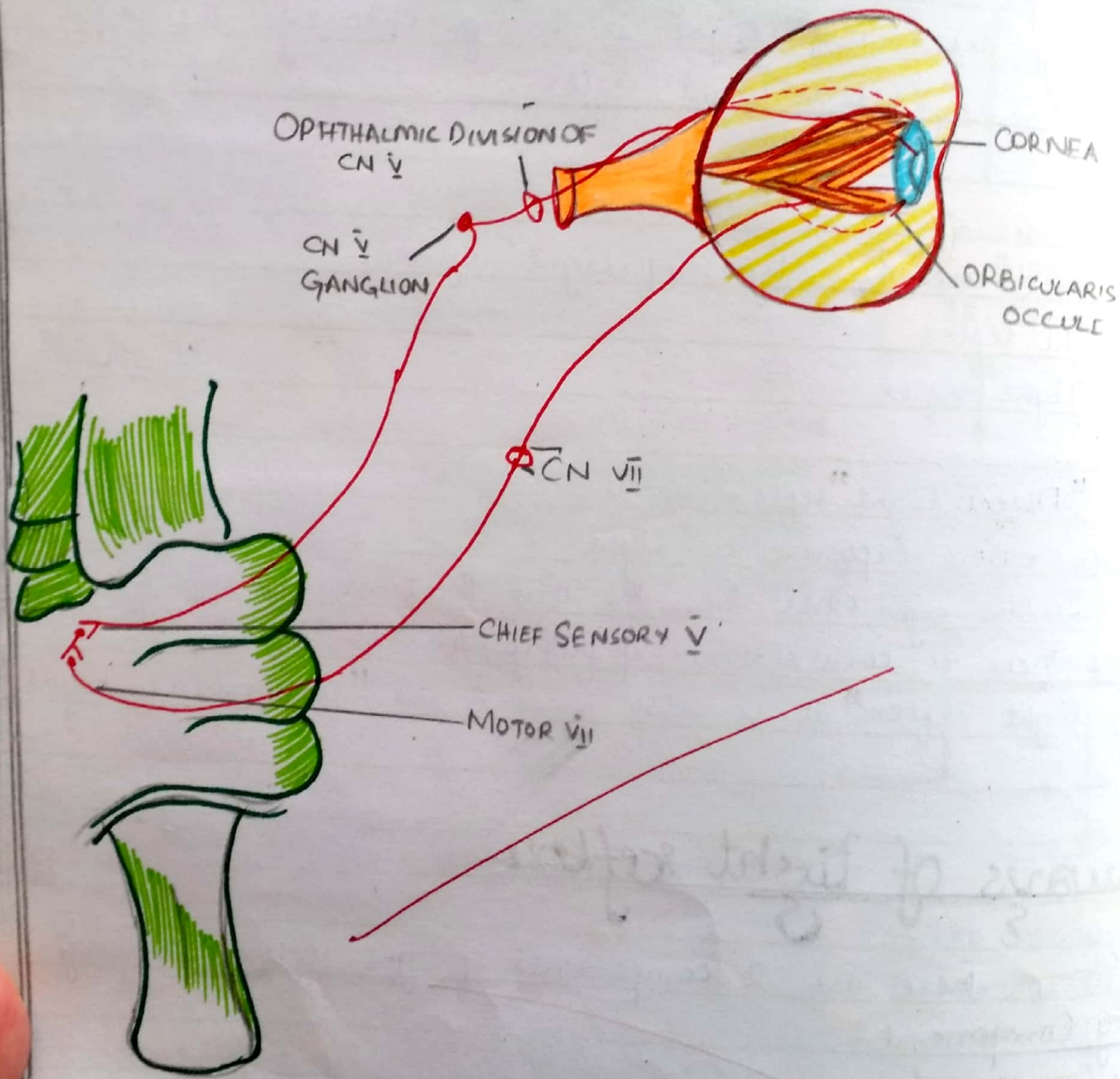
There are 2 components of light reflex pathway.

- Sensory Component
- Motor Component

- **SENSORY COMPONENT:-**

The sensory arch of this component originates

Corneal Reflex



in retina goes to optic chiasma through optic nerve. Then optic tract and superior colliculus and tectum of midbrain. From here it goes to Edinger-Westpaul nucleus on the ipsilateral and Contralateral side.

- **MOTOR COMPONENT:**

It starts from Edinger West paul nucleus. The nerve fibers go through ciliary ganglions and then through short ciliary nerves to sphincter papillae muscles.

Corneal Reflex

When corneoscleral junction (limbus) is gently touched with a cotton swab, there is blinking of eyes. It is called Corneal Reflex.

The evolutionary purpose of this reflex is to protect eye from foreign bodies.

Pathway:-

- **Sensory Component:-**

Sensory fibers run from cornea through opthalmic division of trigeminal nerve and goes to nucleus of 5th cranial nerve.

From here the fibers go to medial longitudinal fasciculus.

- **Motor Component:-**

It runs from medial longitudinal fascicals to 7th cranial nerve to orbicularis oculi muscle. leading to blinking of eye.

Optic Pathway Diagram
with Next Practical :-

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Accomodation Reflex:

When the light eye is directed from distance to near objects there are some changes in the eye including convergence, constriction of pupil and curvature of lens changes. These changes constitute accomdation reflex.

Pathway:-

- **Sensory Component:**

It originates in retina close to optic disc, goes to optic chiasma and optic tract, then goes to lateral geniculate body. From there optic radiations reach the visual cortex.

- **Motor Component:**

It originates in visual cortex goes to frontal eye field in frontal lobe and then in parasympathetic nucleus of 3rd nerve. then to ciliary ganglion from short ciliary nerves. From here it goes to sphincter pupillae muscle. and medial rectus muscle of eye ball. The ciliary body contracts, the suspensory ligaments relax and hence the lens becomes more convex and accomodated.

Clinical Note

ARGYLL-ROBERTSON PUPIL:

It is an abnormal pupil that responds to accomodation but doesnot constrict when light is thrown into eye i.e

- Light reflex is Absent.
- Accomodation reflex is Present.

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HORNER'S SYNDROME:-

In this condition there is ptosis, Anhydrosis and Miosis on the affected side. It is caused by interruption of sympathetic supply on same side of face.

Causes of Miosis:-

- Pilocarpine administration into eye.
- Pontine hemorrhage.
- Opiods poisoning.
- Corneal Ulcers.
- Iricus. (Inflammation of iris

Causes of Midriasis:

- 3rd cranial nerve palsy
- Increased ocular pressure.
- Trauma.
- Optic nerve atrophy
- Anxiety or fear
- Atropine administration

Saeeha
27/03/17

Effects of various Druss on Rabbit's eye.

Time (min)	Size of Pupil (mm) R	Size of Pupil (mm) L	Light Reflex R	Light Reflex L	Corneal Reflex R	Corneal Reflex L	Colour of Conjunctiva R	Colour of Conjunctiva L
0 min	6mm	6mm	+ive	+ive	+ive	+ive	Pink	Pink
5min		6mm		+ive		+ive		Pink
10min		6mm		+ive		+ive		Pink
15 min		6mm		+ive		+ive		Pink
20min		6mm		+ive		+ive		Pink

Right eye : Test eye

Left eye : Control eye.

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EXPERIMENT # 10

To study the effect of various drugs on rabbit's eye

Requirements:-

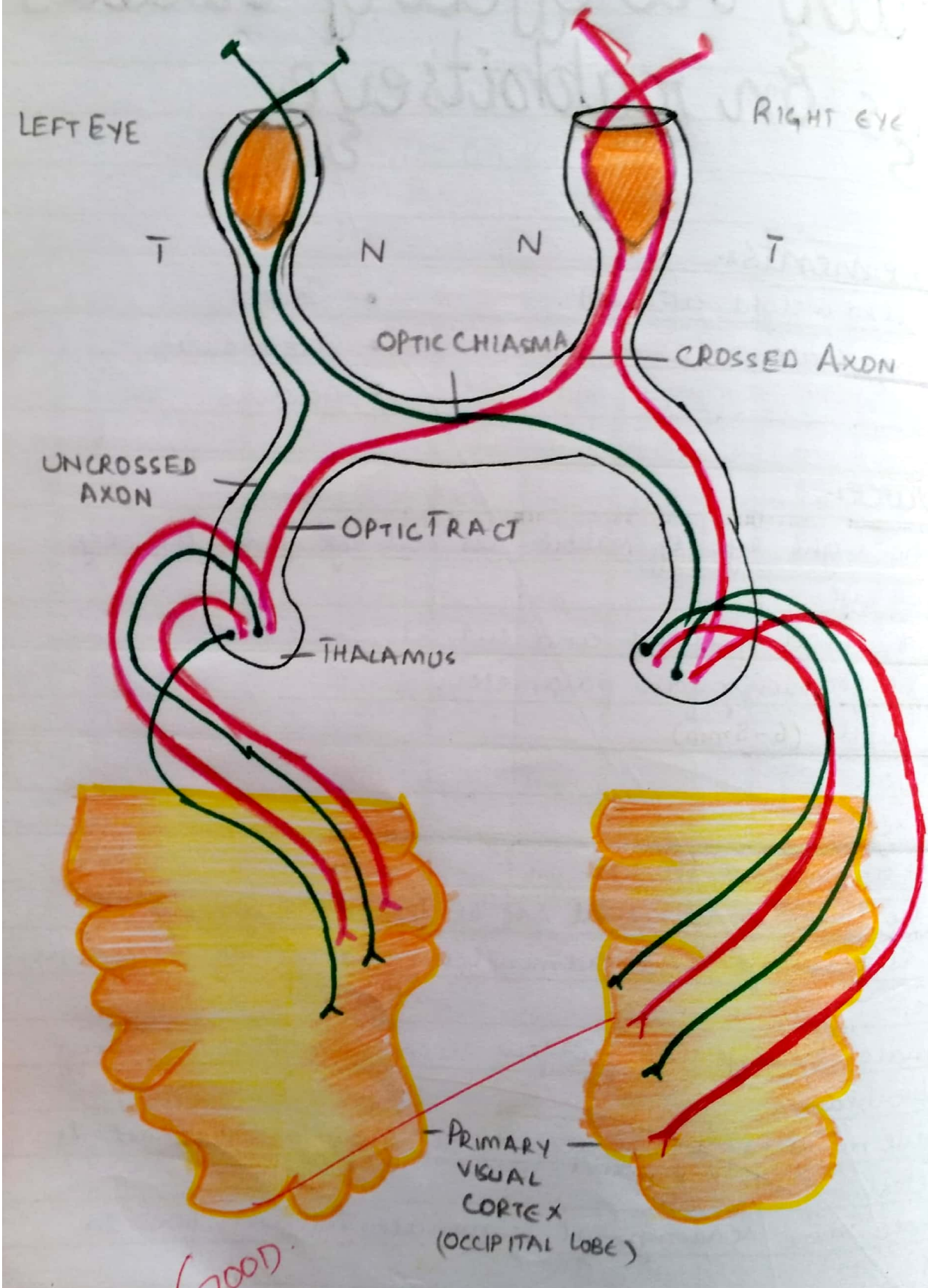
- Rabbit (1 kg weight atleast)
- Measuring scale
- Drugs
- Torch
- Cotton swab
- Scissors.

Procedure:-

1. Label the right eye of rabbit as test eye and left eye as control eye.
2. Stablize the head of rabbit and cut its eyelashes.
3. Record the following four parameters.
   - Size of pupil (6-8mm)
   - Light reflex
   - Corneal reflex
   - Colour of conjunctiva (Pink)
4. Expose the lower conjunctival sac of rabbit's right eye which is test eye and administer 1-2 drops of drug into the test eye.
5. Approximate the eye lids for few seconds so that the drug gets absorbed
6. After five minutes again record the above mentioned 4 parameters.
7. Take three more readings at 5 minutes interval for 20 minutes
8. Write down the readings in a tabulated form.
9. Four groups of drugs are commonly tested on rabbit's eye

galaxy

Optic Pathway



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Date

Parasymathomimetic (Pilocarpine)
Sympathomimetic (Ephidrene)
Parasympatholytic (Atropine)
Local anesthetic (Lignocain)

Effects of Parasympathomimetic Drugs:

- SIZE OF PUPIL : Constriction of pupil.
- LIGHT REFLEX : No change
- CORNEAL REFLEX : Present
- COLOUR OF CONJUNCTIVA: Red

Effects of Parasympatholytic Drugs:

- SIZE OF PUPIL : Dilation of pupil
- LIGHT REFLEX : Loss of reflex
- CORNEAL REFLEX : Presence
- COLOUR OF CONJUNCTIVA: No change.

Effects of Symathetic Drugs

- SIZE OF PUPIL : Dilation of pupil
- LIGHT REFLEX : Present
- CORNEAL REFLEX : Present
- COLOUR OF CONJUNCTIVA : Pale

Tareeha 27/03/17

Effects of Local Anasthetic:

- SIZE OF PUPIL : No change
- LIGHT REFLEX : No change (Present)
- CORNEAL REFLEX : Absent
- COLOUR OF CONJUNCTIVA: Pale with Cocaine
  Otherwise No change

galaxy

Calculations

1% PILOCARPIN SOLUTION

1 gm = 100ml

~~100~~mg = ~~100~~ml

10mg = 1ml.

1ml = 20 drops

10mg = 20 drops

1mg = 2drops

TIME IN MINUTES	SIZE OF PUPIL		LIGHT REFLEX		CORNEAL REFLEX		COLOUR	
	R	L	R	L	R	L	R	L
0	8	8	+	+	+	+	PINK	PINK
5	8	8	+	+	+	+	PINK	PINK
10	6	8	+	+	+	+	PINK	PINK
15	4	8	+	+	+	+	RED	PINK
20	4	8	+	+	+	+	RED	PINK

Javeeha
10/04/17

To demonstrate the effects of cholinergic drugs on rabbit's eye

Requirements :-

- Torch
- Cotton swabs
- 1% pilocarpine solution
- Scissors
- Rabbit

Procedure :-

1. Select a rabit and label its right eye as a test eye and left eye as control eye.
2. Stabalize the head of rabbit and cut the eye lashes of both eyes.
3. Before administration of drugs, record the following four parameters
   - Size of pupil
   - Light reflex
   - Corneal reflex
   - Color.
4. Expose the lower conjunctival sac of right eye and instill 1-2 drops of 1% pilocarpine solution and approximate the eyelid for 2 seconds that the drug gets absorbed.
5. Wait for 5 minutes.
6. Again record the above mentioned four parameters.
7. Take 3 more readings at 5 minutes interval upto 20 minutes
8. Tabulate the recordings in form of observation table.

Effects of cholinergic drugs on Rabbit's eye

- SIZE OF PUPIL : Constriction of pupil
- LIGHT REFLEX : No change
- CORNEAL REFLEX : No change
- COLOUR : Red

TIME (MIN	SIZE OF PUPIL (mm)		LIGHT REFLEX		CORNEAL REFLEX		COLOUR OF CONJUNCTIVA	
	R	L	R	L	R	L	R	L
0 min	8	8	+	+	+	+	PINK	PINK
5 min	10	8	−	+	+	+	PINK	PINK
10 min	10	8	−	+	+	+	PINK	PINK
15 min	11	8	−	+	+	+	PINK	PINK
20 min	12	8	−	+	+	+	PINK	PINK

0.5% ATROPINE MEANS

0.5g in 100ml

0.5g = 100ml

500mg = 100ml

5mg = 1ml.

1 ml CONTAINS 20 DROPS

1 DROP = 5/20

= 0.25mg

2 DROPS = 0.5mg.

Fareeha 17/04/17

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EXPERIMENT # 12

To demonstrate the effects of Anti-muscarinic drugs ie Atropine on rabbits eye

Requirements:

- Rabbit (1kg)
- Cotton swab
- .5% Atropine solution
- Torch
- Pair of scissors
- Measuring scale.

Procedure:

1. Select a rabbit and label its right eye as test eye and left eye as control eye.
2. Cut the eye lashes of both eyes.
3. Before administration of drug, Record the following 4 parameters
   - Size of pupil
   - Colour of conjunctiva
   - Light reflex
   - Corneal Reflex
4. Pull the lower conjunctival sac of test eye and instill 2 drops of .5% Atropine solution.
5. Close the eye lids so that the drugs gets absorbed.
6. Wait for 5 minutes and then record the above mentioned 4 parameters in both eyes.
7. Take 3 more readings at 5 mins interval for 20 minutes.

Results:

Size of pupil	Dilation (Mydriasis)
Light reflex	Not present
Corneal reflex	Present
Colour of Conjunctiva	No change

	TIME (MIN)	SIZE OF PUPIL		LIGHT REFLEX		CORNEAL REFLEX		COLOUR OF CON	
		R	L	R	L	R	L	R	L
1.	0	6	6	+	+	+	+	PINK	PINK
2.	5	18	6	+	+	+	+	PALE	PINK
3.	10	8	6	+	+	+	+	PALE	PINK
4.	15	10	6	+	+	+	+	PALE	PINK
5.	20	10	6	+	+	+	+	PALE	PINK

2% EPHEDRINE MEANS

2g in 100 ml

2g = 100ml

2000mg = 100 ml

20mg = 1 ml

1 ml CONTAINS = 20 DROPS

20 mg = 20 DROPS

2mg = 2 DROPS

Jawecha
17/04/17

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EXPERIMENT # 13

To demonstrate the effects of symathomimetic drugs i.e 2-/ ephidrine on rabbits eye

Requirements:

- Rabbit (1kg)
- A pair of scissors
- Measuring scale.
- Cotton swab.
- Torch
- 2-/. ephidrine

Procedure:

1. Select a rabbit and test its right eye as test eye and left eye as control eye.
2. Cut the eye lashes of both eyes
3. Before administration of drug, record following "4" parameters in both eyes.
   - Size of pupil
   - Light reflex
   - Corneal reflex
   - Colour of conjunctiva.
4. Expose the lower conjunctival sac of test eye and instill 2 drops of 2-/. ephidrine.
5. Approximate the eyelids so drug gets absorbed.
6. Wait for 5 minutes and Then record the above mentioned 4 parameters in both eye.
7. Take 3 more readings at interval of 5 minutes fupto 20 minutes

Results:

SIZE OF PUPIL : Dilation

LIGHT REFLEX : No change

CORNEAL REFLEX: : No change

COLOUR ON CONJUNCTIVA: Pale

galaxy

TIME	SIZE OF PUPIL		CORNEAL REFLEX		LIGHT REFLEX		COLOUR OF CON	
	R	L	R	L	R	L	R	L
0	6	6	+	+	+	+	PINK	PINK
5	6	6	+	+	+	+	PINK	PINK
10	6	6	-	+	+	+	PINK	PINK
15	6	6	-	+	+	+	PINK	PINK
20	6	6	-	+	+	+	PINK	PINK

1% LIGNOCAIN MEANS

1g IN 100 ml

1000mg IN 100 ml

10mg IN 1 ml

1ML CONTAINS 20 DROPS

10mg = 20 drops

1 mg = 2drops

Faeeha
17/04/17.

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EXPERIMENT # 14

To demonstrate the effects of local anasthetic (1-1. LIGNOCAIN) on rabbit's eye

Requirements:

- Rabbit (1kg)
- Pair of scissors
- Measuring tape
- Torch
- Cotton
- 1% Lignocain solution

Procedure:-

1. Select a rabbit and label its right eye as test eye and left eye as control eye
2. Cut the eye lashes of both eyes.
3. Before administration of drug, record the following 4 parameters
   - Size of pupil
   - Light reflex
   - Corneal reflex
   - Colour of Conjunctiva
4. Expose the lower conjunctival sac of test eye and instill 2 drops of 1% lignocain
5. Approximate the eye lids ~~for few seconds~~ so that drugs gets absorbed
6. Wait for 5 minutes and then record the above mentioned parameters. in both eyes
7. Take 3 more readings at interval of 5 minutes for 20 ~~seconds~~ minutes.

Results:

- SIZE OF PUPIL — NO CHANGE
- LIGHT REFLEX — NO CHANGE
- CORNEAL REFLEX — LOST
- COLOUR OF CONJUNCTIVA — NO CHANGE

COCCAIN CHANGES COLOUR OF CONJUNCTIVA → PALE

galaxy

TIME	HEART RATE	SIZE OF PUPIL	LACRIMATION	SALVATION	MICURATION	DEFACATION
0min	190	8mm	–	–	–	–
AFTER 1·/· PILOCARPINE						
5min	160	7mm	+	+	+	+
10mun	150	6 mm	+	+	+	+
ATER 0·5·/· ATROPINE						
5min	177	9mm	–	–	–	–
10mun	217	10mm	–	–	–	–

CALCULATIONS

1·/· PILOCARPINE

100ml = 1gm

100ml = 1000mg

1ml = 10mg

1 ml OF 1·/· PILOCARPINE SHOULD BE ADMINISTERED

0·5·/· ATROPINE

100 ml = 0·5 gm

100ml = 500 gm

1ml = 5gm

1ml OF 0·5·/· ATROPINE SHOULD BE ADMINISTERED

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EXPERIMENT # 15

To demonstrate antagonism b/w cholinergic and anti-cholinergic drugs on a rabbit

Requirements:-

- Torch
- Spirit swab
- Stethoscope
- 0.5% Atropine solution
- Scissors
- Measuring scale
- 1% pilocarpine solution
- Rabbit weighing 1 kg

Procedure:-

Select the rabbit and record the following 6 parameters.

- **Heart rate:-**

This is done by putting the chest piece of stethoscope between the front paws of the rabbit slightly towards the left. Count the heart rate for 1 minute. Normal heart rate of rabbit is 160-180 /min.

- Size of pupil:-
- Salivation
- Lacrimation
- Micturation
- Defecation

Now palpate the maximum bulky portion of rabbits thigh and remove the hair with help of scissors This is done to expose the skin of rabbit. Now clean the skin with a spirit swab and inject 1% pilocarpine in a dose of 10 mg /kg. Wait for 5 minutes and again record the above mentioned parameters. Take 2 readings at 5 minute interval and arrange them in a tabulated

form. Now inject 0.5 Atropine in a dose of 5mg/kg with a separate disposable syringe Wait for 5 minutes again and record above mentioned 6 parameters. Take 2 readings at 5 minutes interval.

Effects of Pilocarpine :-

Heart Rate	Decreases
Size of pupil	Decreases
Salivation	Increases
Lacrimation	Increases
Micturation	Occurs
Defacation	Occurs

Effects of Atropine

Heart Rate :-	First Bradycardia Then reflex tachycardia
Size of Pupil :-	Increases
Salivation :-	Decreases
Lacrimation :-	Decreases
Micturation :-	Does not occur
Defacation :-	Does not occur.

Teacher's 24/04/19

S.NO	TIME IN MINUTES	PULSE RATE BEATS/MIN	BLOOD PRESSURE mmHg	SIZE OF PUPIL mm	SKIN TEMP OF	SWEATING	TREMORS
1	0	66	110/70	4	NORNAL	-	-
2	5	74	120/65	5	↓	+	+
3	10	80	125/65	6	↓	+	+
4	15	86	130/60	7	↓	+	+
5	20	90	140/55	8	↓	+	+

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EXPERIMENT # 16

To demonstrate the effect of adrenaline on human subject.

Requirements:

Disposable Syringe
Torch
Adrenaline
Human subject

- Spirit swab
- Measuring scale.
- B.P apparatus

Procedure:

Take a detailed history of subject to exclude the presence of ischemic heart disease, angina pectoris and thyrotoxicosis. Before starting the practical record the following 6 parameters

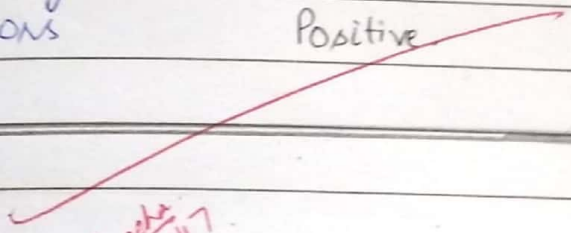
- Pulse rate
- Blood pressure
- Size of pupil
- Skin temperature
- Sweating
- Tremors.

Now inject 0.25 ml of adrenaline (1:1000 dilution) intramuscula using aseptic technique
Wait for 5 minutes and record the above mentioned parameters. at 5 minute interval for 20 minutes.
Tabulate your readings in the form of observation table.

Results:

Pulse rate / Heart rate	Increases
Blood pressure	Systolic B.P Increases Distolic B.P decreases.

Size of pupil	Increases
Skin temperature	Decreases.
Sweating	Increases
Tremors	Positive



Lavesh
29/05/17

S.NO	TIME	PULSE RATE BEATS/MIN	B.P	LIGHT REFLEX	ACCOMODATION REFLEX	SIZE OF PUPIL	SALIVATION
1	0	68	120/80	+	+	2	PRESENT
2	5	64	120/80	-	-	2-3	↓
3	10	69	120/80	-	-	2.5	↓
4	15	75	120/80	-	-	3	↓
5	20	80	120/80	-	-	3-5	↓

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EXPERIMENT # 17

To demonstrate the effect of Atropine on human subject

Requirements:

Spirit swab
B.P apparatus
Torch
Human subject
Disposable syringe
Measuring scale
Atropine solution

Procedure:

Select a human subject for experiment.
Before drug administration, record following parameters.

- Pulse rate
- Blood pressure
- Light reflex
- Accomodation reflex
- Size of pupil
- Salivation

Now inject 1ml of Atropine solution (intravenously) after taking proper aseptic measures.
Wait for 5 minutes and then record the above mentioned parameters.
Take 5 readings at 5 minute interval upto 20 minutes.
Tabulate your readings in form of observation table.

Results:

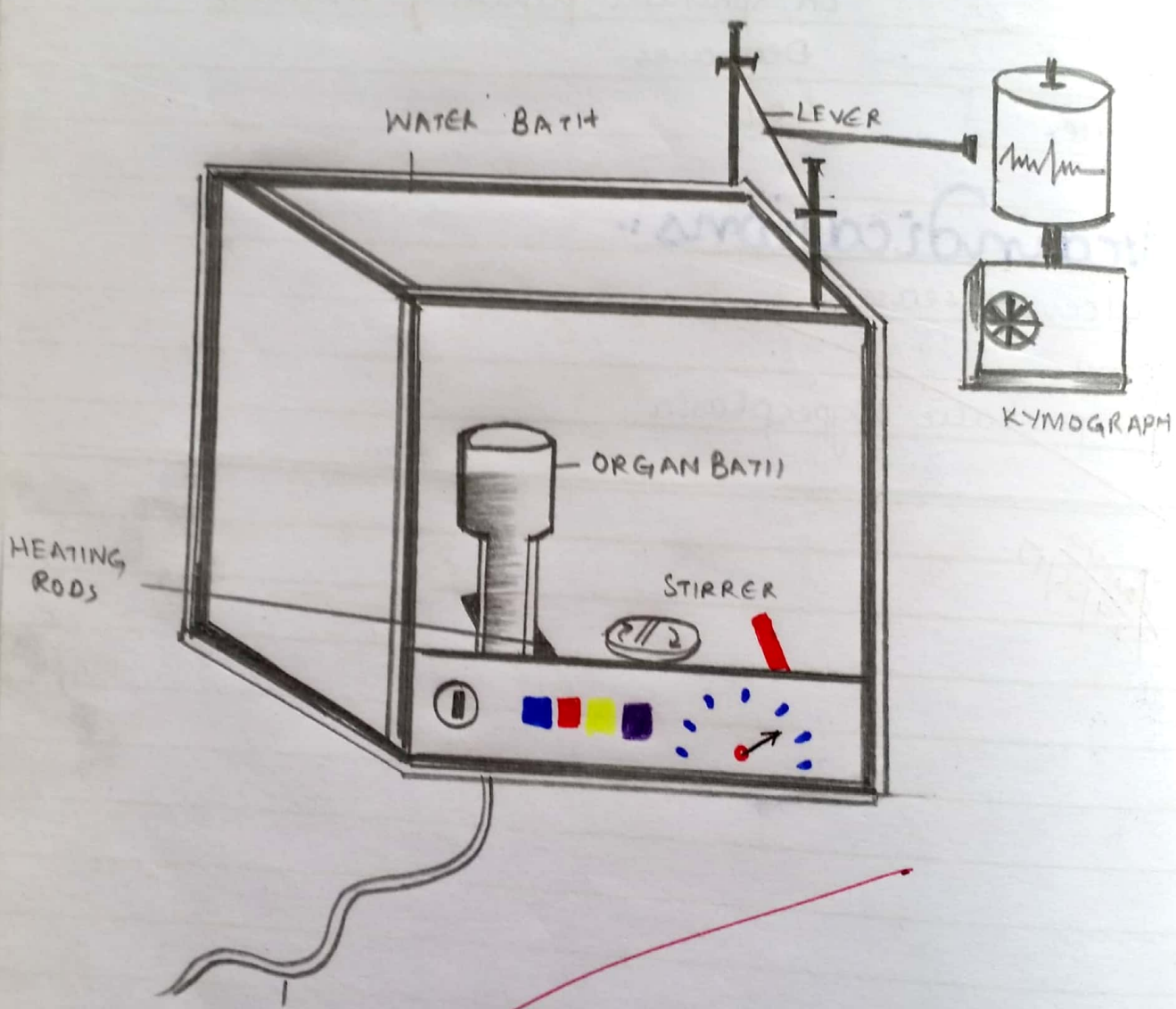
Pulse rate — In lower doses initially bradycardia due to blockage of presynaptic M1 receptors. Later it causes tachycardia (Blocking vagal effect on SA node)

Blood pressure	No effect.
Accomodation reflex	Lost (due to blockage of M_3 receptors on ciliary muscles of eye) CYCLOPLEGIA.
Size of pupil	Increases. Mydriasis occurs. (M_3 receptors blockage on sphincter pupillary muscles)
Salivation	Decreases.
Light reflex	Lost.

Contraindications:-

- Peptic ulcer disease
- Glaucoma.
- Benign prostatic hyperplasia.

Jaweeha
29/05/17.


WATER BATH
LEVER
KYMOGRAPH
ORGAN BATH
HEATING RODS
STIRRER
TISSUE BATH DRAINAGE PIPE

Excellent.

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EXPERIMENT # 18

To study the working of tissue organ's bath

Introduction:-

It is a device to study the effects of various drugs on a living tissue. It consist of two major compartments

- Water bath
- Isolated tissue bath

Water bath:

This is a four walled rectangular chamber made up of plastic or glass. It is open at the top and connected to the exterior at the lower end by means of a rubber tube which acts as a drain. There are 2 metallic rods inside the water bath for heating purposes. Water bath also contains a stirrer at the bottom which keeps the water in continuous motion so that there is even distribution of temperature in the water bath.

A thermostat mechanism is also present which helps to keep temperature between 15 - 45°C.

Tissue Bath:

It is a jar like apparatus inside the water bath. It is open at the top and connected to exterior by means of a rubber tube which acts as a drain. During the experiment, it is filled with "TYRODE'S SOLUTION" and an oxygen delivery tube is placed in tissue baths for oxygenation.

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Procedure:

- Set the temperature of water bath at 37°C
- Take a rabbit's intestinal piece 1-2 cm in length
- Place it in a petri dish which contains tyrode's solution and oxygen
- Tie a thread at both ends of jintestinal piece in such a way that 3-4 mm of distance is left at both ends.
- Transfer the intestinal piece into the tissue bath.
- Tie one end of thread with oxygen delivery tube before transferring into the tissue bath.
- Tie another end to the lever with the help of plasticine.
- A writing device is attached to other end of lever.
- Make necessary adjustments so that every movement of intestine is recorded on kymograph.
- Introduce the drug with help of disposable syringe inside or near the lumen of intestine
- The effect of the drug can be demolished by washing the tissue bath with Tyroids solution.

This can be done by overflowing the Tyroids solution into the tissue bath.

Precautions

- Temperature of tissue bath should be kept at 37°C.
- Minimum handling of the tissue should be done.

While handling and transporting tissue, Tyrodes solution and oxygen should be available.

Composition of Tyrodes Solution:

Tyrodes solution is used to maintain optium requirement of the tissue in order to keep it alive.

For 1 litre of Tyrodes solution the components a

Glucose	1 gram
NaCl	8 grams
KCl	200 mg.
$MgCl_2$	100 mg
$CaCl_2$	200 mg.
Na_2CO_3	1g.
Sodium biphosphate	50mg
Distilled water	1 liter.

Faeeha
17/07/17

S.NO	Experiment	Observation	Inference
1.	**Test for KI:** **Detection Test:-** Take 1ml of Urine in a test tube and add few drops of Starch solution	Purple discolouration is seen	KI is detected
	Confirmatory Test Take 1ml of Urine + 1 ml $NaNO_3$ add concentrated H_2SO_4 drop wise slowly.	Cherry Red discolouration is seen	KI confirmed
	Tests for Aspirin **Detection Test:-** Take 5ml Benedict Reagent, add Urine drop wise (8 drops) Boil it on spirit lamp for 15-20min.	Green, Yellow, finally Red discolouration	Aspirin detected
	Confirmatory Test Take 1ml of Urine + few drops of Ferric Chloride Solution	Pink discolouration	Aspirin confirmed
	Test for Na_2CO_3 **Detection Test:-** Take 1ml of Urine in a test tube and dip Red litmus paper in it.	Red litmus turns blue.	$NaHCO_3$ detected
	Confirmatory Test:- Take 1ml of urine + add 10% HCl drop wise until bubbling. Dip blue litmus in it	Blue litmus turns Red	$NaHCO_3$ confirmed

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EXPERIMENT # 19

To study the excretion of various drugs in urine

Requirements:

- Test tube
- Spirit lamp
- Pipettes
- Droppers
- Litmus paper
- Urine samples.

Chemicals:-

Concentrated Sulphuric acid
Potassium Iodide.
Sodium Bicarbonate
Starch solution

Procedure:

Collect early morning urine sample from patient and then perform various tests on it for the detection of Potassium Iodide, Aspirin and sodium bicarbonate in the urine.

Explanation:-

Most of the drugs are excreted after metabolism through kidneys in urine depending upon half life of drug. The time of excretion of each drug varies therefore urine sample is collected after 12 hours of drug administration.

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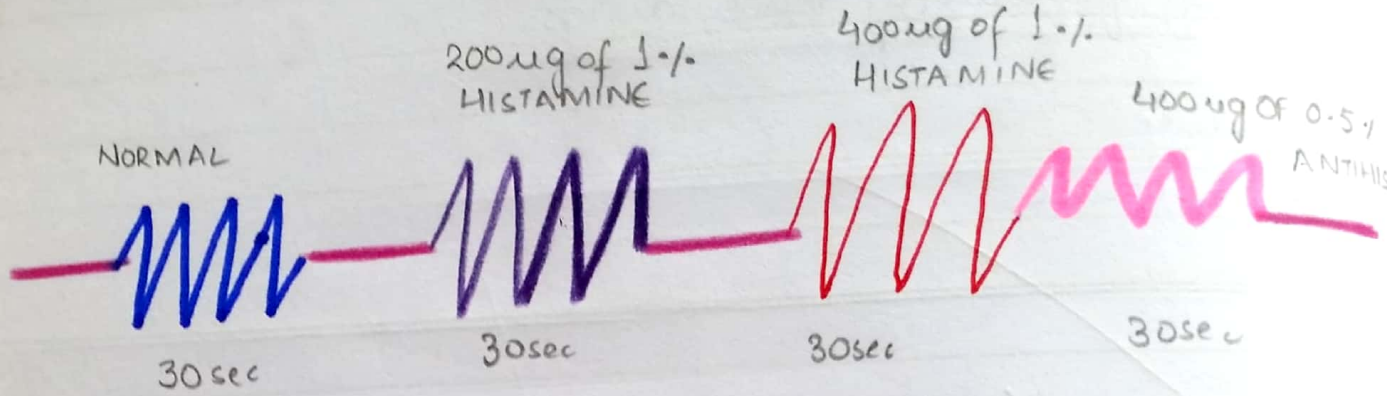
Various chemical tests are performed to detect the presence of following three drugs.

Aspirin

Potassium Iodide

Sodium Bicarbonate.

Taveeche
17/07/17



Dose Calculation.

for 1-/. Histamine

1-/. means.

1gm = 100ml

1000mg = 100ml

10mg = 1ml

10 x 1000ug = 1ml

10,000ug = 1ml

$1ug = \frac{1}{10,000}$

1ug = 0.0001ml

For 200ug

200 x 0-0001

= 0.02ml

for 400ug

400 x 0.0001

= 0.04ml

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EXPERIMENT # 20

To observe the phenomenon of Antagonism between Histamine & Anti-Histamine drug on rabbit's intestine

Requirements:

- Organ bath
- Tyrodes solution
- Petri dish
- Oxygen supply
- Piece of rabbits intestine
- Forceps
- Kymograph
- Disposable syringe

Chemicals:

- 1% histamine solution
- 0.5% antihistamine solution,

Procedure:

Take an isolated piece of rabbit's intestine in a petridish filled with warm Tyrodes solution and having an oxygen delivery tube in it.

With the help of needle and thread tie one end of intestinal piece to oxygen delivery tube.

Shift the intestinal piece in tissue bath and tie the outer end of intestinal piece with a lever.

Adjust it such that any movement of intestine is recorded on the kymograph.

Start the kymograph and take many readings for 30 seconds.

Stop the kymograph and inject 20ug of 1% histamine

for 0.5% Anti-Histamine

0.5gm = 100ml
500mg = 100ml
5mg = 1ml
5 x 1000ug = 1ml

5000ug = 1ml
1ml = 1/5000

1ug = 0.0002ml

for 400ug

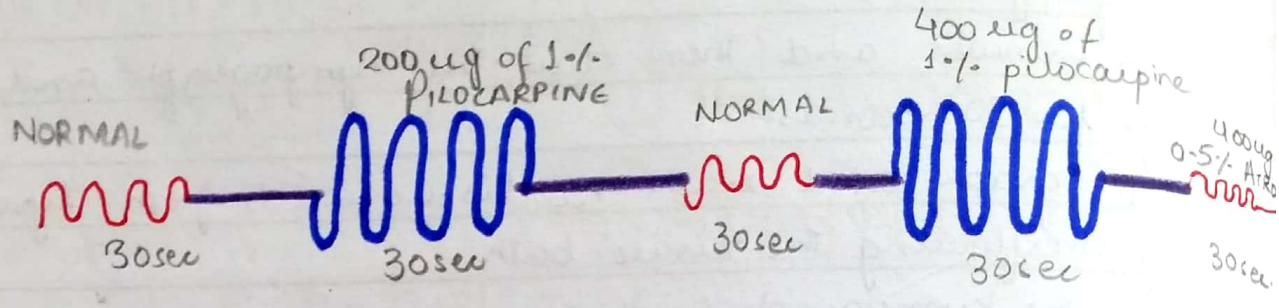
0.0002 x 400 = 0.08ml

solution into or near the lumen of intestines with the help of disposable syringe
Wait for 2 minutes and Then start the kympograph and take the readings for 30 seconds.
Stop the kymograph and wash the tissue with fresh tyrodes solution by overflowing the tissue bath.
Again start the kymograph and take readings for 30 seconds.
Now stop the kymograph and inject 400 ug of 1% anti histamine solution into or near the lumen of intestine. Wait for few seconds and take the readings for 30 seconds

Precautions:

Temperature of organ bath should be maintained by 37°C.
Minimal handling of tissue should be done.
Continuous oxygen supply should be present all the time during the procedure.
Separate disposable syringes should be used for different drugs.

Jaweria
17/07/17



Dose Calculation for 1% Pilocarpine

100ml = 1gm
100ml = 1000 mg
1ml = 10mg or 10,000 ug
1ug = 1/10,000
200ug = 0.02 ml
400ug = 0.04ml

for 0.5 Atropine

100ml = 0.5g
100ml = 500mg
1ml = 5mg = 5000 mg
1ug = 1/5000
400ug = 400/5000
= 0.08ml

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EXPERIMENT # 21

To demonstrate antagonism b/w cholinergic and anti-cholinergic drugs on rabbit's intestinal piece.

Requirements:

Organ bath
Tyrodes solution
Forceps
Needle and thread.
Oxygen supply
Rabbit's intestinal piece

Chemicals:

1% pilocarpine solution
0.5% atropine solution

Procedure:

Set the organ bath of temperature at 37°C.
Take 2-3 cm long piece of rabbit's intestine in a petri dish filled with tyrodes solution and with oxygen supply.
Tie both ends of the intestine having with the help of thread and needle
Fill the tissue bath with fresh tyrodes solution
Tie one end of intestine with oxygen delivery tube and Shift the piece of intestine along with oxygen tube in a tissue bath.
Tie another end of thread with lever.
Adjust the length of thread so that an intestinal contraction is recorded on kymograph
Switch on kymograph and take recordings for 30 seconds

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Now stop the kymograph and inject 200ug of 1% pilocarpine solution into or near the lumen of intestine.
Switch on the kymograph and take readings for 30 seconds.
Now switch off the kymograph and wash intestinal piece with fresh tyrodes solution either by over flowing or refilling the water bath.
Now take readings for 30 seconds.
Inject 400 ug of 1% pilocarpine into or near the lumen of indestine with the help of disposable syringe.
Wait for 1 min and turn on the kymograph.
Take readings for 30 seconds.
Now inject 400 ug of 0.5% Atropine solution and wait for few seconds and take readings for 30 seconds.

Precautions:

Temperature of organ bath should be maintained at 37°c
Minimum handling of tissue should be done.
Separate disposable syringes should be used for every drug
Warm tyrodes solution should be used.
Oxygen supply should be present all time during the procedure.

Saeeda
17/07/17