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HUMAN BODY

INTRODUCTION

Human body is made up of many systems comprises of many different organs. An adult human body has 100 trillion cells, 206 bones, 600 muscles and 22 internal organs.

Systems of human body-

Cardiovascular system (heart, blood vessels)

Respiratory system (nose, trachea, lungs)

Nervous system (brain, spinal cord, nerves)

Digestive system (mouth, esophagus, stomach, small intestine, large intestine)

Skeletal system (bones, joints)

Muscular system (muscles, cartilages)

Excretory system (lungs, large intestine, kidney, bladder, skin)

Immune system (blood cells, proteins, organs)

Endocrine system (glands)

Reproductive system
CARDIOVASCULAR SYSTEM

✓ It comprises of heart, arteries, veins, and capillaries

✓ Heart: It is a pumping organ having four quadrants (left upper, left lower, right upper, right lower). Primary function of heart is circulating blood and through blood oxygen and other important nutrients to the other organs and tissues of the body. Left side of heart is in charge for pumping of blood to all parts of the body and right side of heart is in charge for oxygenating and purifying blood.

✓ Arteries: carry blood away from the heart

✓ Veins: carry blood towards the heart

✓ Capillaries: connects arteries to veins

✓ Parts of blood: plasma –
  1) Yellow transparent fluid
  2) Solid part:
     a) Red blood cells (RBC) - contains Hemoglobin
     b) White Blood cells (WBC) – soldiers of the body
     c) platelets – makes blood clot
**RESPIRATORY SYSTEM**

- **Nose**: we inhale and exhale air through the help of two nostrils.
- **Trachea**: it is a tube-like structure that takes air from the nose to the lungs.
- **Larynx**: contains vocal cords also called the voice box through which one can talk.
- **Lungs**: we have a pair of lungs (two) located in the chest area. Lungs are protected by the rib cage, which is made up of 12 sets of ribs. We can feel our lungs with hands. (Put your hands on your chest and take a deep breath in and out, you can feel your chest moving up and down). Blood gets oxygen and other gases in the lungs and waste material from blood (carbon dioxide and other gases) washed off here.
NERVOUS SYSTEM

Brain and Spinal cord are two main components of human nervous system.

Brain: it is most complex living structure in the universe. It weighs around 1300 – 1400 gms. It controls whole body movements and sensations. Brain has different internal parts viz cerebrum, Cerebellum and Medulla.

Cerebrum: It is the largest part of the brain divided into

Frontal lobe: controls planning and thinking
Temporal lobe: controls sound, speech and long term memory
Parietal lobe: controls vision
Occipital lobe: Controls all calculations

Cerebellum: controls all movements of the different parts of the body like moving hand up and down, walking, bending down, picking up things with fingers etc

Medulla: controls breathing, heart movements (heartbeats) and movements in digestive system (like sending messages to stomach and intestine to move to churn the food we eat

Spinal cord: It is a bunch of many nerves (tiny hair like structures) that receives message from brain and sends those messages to different part of the body and in the same way takes sensations from different parts of body and sends to brain.
DIGESTIVE SYSTEM:

We eat food from which we get energy and other essential components which are necessary for the growth of the body. Food undergoes several mechanical and chemical processes to give that energy.

Mouth: we eat food which gets broken into many small particles with the help of teeth and tongue and saliva.

Oesophagus: After swallowing food from mouth it passes through a pipe called oesophagus which connects to stomach.

Stomach: it is a bag like structure present in the abdomen where chewed food gets mix with several chemicals and acids and reaches to intestines.

Liver: it is a gland present below the lung on the right side of abdominal cavity. it releases many enzymes (chemical messengers) which helps in digestion of food.

Pancreas: It is a gland present in the abdominal cavity secrets many enzymes which along with liver enzymes help in digestion of the food.

Small intestine: Small intestine is a long tubular pipe like organ. From stomach food enters the small intestine where mucus (secretions from intestine) and other useful bacteria hes in proper digestion of food. Food gets churn in small intestine. All essential nutrients get absorbed here.

Large intestine: Large intestine is tubular pipe like structure which receives food from small intestine. It is an end organ of the digestive system. With help of movements of large intestine food gets completely digested and remnant gets excreted (stool) through rectum (end part of large intestine) and anus.
**SKELETAL SYSTEM**

Bones and joints make basic structure, framework and shape of body.

Along with muscles and cartilages it provides protection to the body.

It allows freely movements of the body

Produces blood for blood cells

It stores minerals for the body

Human body has 206 different size and shapes of bones. Skeletal system contributes to 18% of total body weight.

Four types of bones:

- Long bones- bones of hands and legs
- Short bones- bones of wrist and ankle
- Flat bones- sternum (present in chest), few bones of pelvis (present below the abdomen)
- Irregular bones- vertebrae (present in back) and few bones of skull

Joints are where two or more bone meets

Three types joints:

- Hinge joints- joints of wrist, ankle and elbow etc (Acts like hinges of doors)
- Ball and socket joints- shoulder and hip joints (one bone is like ball and other has socket like cavity)
- Gliding joints- joints between vertebrae (surfaces of two bones glide on each other)

Cartilage acts as a cushion between bones. It protects bones and joints from injury.
MUSCULAR SYSTEM

Muscles are protectors of the body. They constitute major mass of the body. They are attached to bones with thin fine sheet called as tendons. Muscles contribute to 40% of total body weight.

There are three types of muscles.

1) Skeletal: voluntary muscles (you can control these muscles consciously) e.g. muscles of hands and legs etc
2) Smooth: involuntary muscles (you cannot control these muscles consciously) e.g. Muscles of organs like esophagus, intestines, stomach, bladder etc
3) Cardiac: involuntary muscles but present only in the heart
EXCRETORY SYSTEM

It removes all harmful and waste material from the body

It is sum of urinary system, digestive system and skin

Urinary system includes kidneys, ureters, bladder and urethra

Kidneys are two bean shaped organ present in abdomen on the two sides left and right. Kidney acts like filter removes all waste and extra elements and water from the body. It removes all waste things in the form of urine

From kidneys urine passes through very thin tubes called ureters

Both the ureters open in the bladder which is bag like structure present in the pelvis (lower abdomen). Urine remains in the bladder for some time

Once sufficient amount of urine gets collected in the bladder we feel the urge to pass it and it comes out through urethra (thin tube like structure). Males have longer urethra than females

Digestive system as we discussed above food breaks down into different elements and give us nutrition as well as energy and at the end waste material gets out from body in the form of stools

Respiratory system also as mentioned above removes waste and toxic materials out from body through lungs, trachea and nose

Skin is a largest organ in the body. It has many layers protecting the body. Harmful and waste material gets off from body in the form of sweating
ENDOCRINE SYSTEM:
Glands are organs in the body which produces chemical substances and releases in the blood or on the surface of the body. These substances are called hormones.

Hormones are chemical messenger carried by blood that regulates and balances body functions.

Hormones are produced in very small quantity as they are required in very small quantity and body has no storage for hormones.

Pituitary is a master gland present in the head which regulates all other glands in the body.
REPRODUCTIVE SYSTEM

Around age 10, people begin a journey into adulthood called puberty, which is a time the body becomes able to reproduce to create another human being.

Both male reproductive and female reproductive systems are essential for reproduction.

Female reproductive organs include ovaries, fallopian tubes and uterus.

Ovaries are two in number present in the pelvic cavity (below abdomen), it produces ovum (eggs) and two important hormones called as oestrogen and progesterone.

Mature eggs are transferred from ovary to uterus via fallopian tubes (tube like structure attached to uterus).

Uterus is a bag present in the lower pelvis where baby develops during pregnancy (if female egg meets to male sperm).

When meeting of a woman’s egg and a man’s sperm occur, an embryo (baby) forms and grows in the woman’s abdomen, and a baby is born within about 40 weeks.

If egg doesn’t meet sperm uterine lining falls along with egg through vagina (end part of uterus) called as menstruation (periods) which occurs on an average every month.

Male reproductive organs include testes, seminal & prostate glands and penis.

Testes are oval shaped gland (two in numbers) present below the penis Sperms are produced in the testes. It produces hormone called testosterone which is very important hormone for male reproductive (sexual) health.

Secretions from seminal gland and prostate gland nourishes sperm.
IMMUNE SYSTEM

Immunity means protection against something. Different parts of our body work together to protect us from all the problems. Our body is like a palace (castle) and immunity is like an army who protects our body all the time from all the enemies that are bacteria, viruses, parasites etc. Everybody has its own inbuilt immune system which protects it from all diseases and germs. Every day we are exposed to millions of germs and bacteria still we don’t get affected by them because of our immune system. Every time we are attacked by germs and fall sick your immune system works more vigorously to get rid of it and then immune system remembers how to fight the infection if the same germs come again.

- Skin is the first line of defence organ present in the body
- How we wrap leftover food with plastic to keep it fresh and safe same way skin protects our body from many outside germs and bacteria
- The mucus membrane sticky membrane) in the mouth, throat, lungs and intestine act as a defence same like a skin
- Saliva in the mouth and tears which wash your eyes have special chemicals which destroys many bacteria and germs
- Acid in the stomach kills many harmful bacteria
- Lymph is clear fluid like a blood plasma which carries white blood cells
- Lymph flows through the all parts of the body
- It carries white blood cells to the places where needed
- Lymph nodes are the glands where all lymph gets filtered
- Some bacteria or viruses that have entered the body are collected by the lymph and passed to the lymph nodes where are filtered and destroyed
- In blood we have red blood cells and white blood cells out of these white blood cells are the soldiers of the body which protect us by fighting with harmful and unwanted bacteria, germs and viruses etc.
HYPERTENSION

ASK

- Do you have any one in family suffering from high blood pressure?
- Any one in your family has got heart attack?
- How many things from below list you consume on daily basis?

(High-fat meats, skin on poultry, chips, sausages, luncheon meats, crackers, whole milk, all fried foods, refried beans, cheeses, pastries, cookies. Fats Added to Foods: Butter, margarine, cream cheese, cream, half & half, salad dressings, oil, gravies, cream sauces, sour cream)

- How many times a week you have outside food?
- Do you add salt in food after it has been served in the plate? (Table salt)

(Hypertension is not a contagious disease (disease which spread through contact/touch), it cannot spread through contact. So, one cannot get hypertension through the contact of other person having hypertension. But it runs in the family so if one person is having a hypertension chances of getting hypertension to his blood relations increases)

What is cholesterol?

Cholesterol is a fat which is produced by liver. It is important for all body functions. It is present in all the cells of the body. It plays important role in the production of sex hormones

http://www.slo-niacin.com/cholesterol-basics
If cholesterol level is high in the blood it sticks in the walls of blood vessels (arteries, veins, nerves) so lumen of these vessels decreases and causes friction to the blood to pass from that vessels. For example we have pipeline in the house if some waste things (kachara) get accumulated in that pipe water flow becomes slow because there is resistance in the pipe. So water has to run with more force and with more pressure. Same way if cholesterol is more in the blood it sticks in the walls of blood vessels so blood has to pass with more force and more pressure.

**What is blood pressure?**

Our heart continuously pumps the blood; it passes through arteries to reach to different parts of the body. While passing blood throw pressure on the walls of the arteries. This pressure is called as blood pressure.

While pumping heart does two actions contracting and relaxing. When heart contracts we get systolic pressure and when heart relaxes we get diastolic pressure.

So if person’s diastolic pressure is high it means heart is not relaxing properly and that is very serious problem

When we measure any ones pressure we take both the pressure systolic and diastolic.

Average blood pressure for an adult is 120/80 mmhg (120 is systolic and 80 is diastolic)
What is hypertension?

Elevated blood pressure 140/90 mmhg or more for sustainable time is called as high blood pressure or hypertension.

<table>
<thead>
<tr>
<th>BLOOD PRESSURE CATEGORY</th>
<th>SYSTOLIC (UPPER) mmhg</th>
<th>DIASTOLIC (LOWER) Mmhg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Less than 120</td>
<td>And 80</td>
</tr>
<tr>
<td>Prehypertension</td>
<td>120-139</td>
<td>or 80-89</td>
</tr>
<tr>
<td>High blood pressure (hypertension) stage 1</td>
<td>140-159</td>
<td>or 90-99</td>
</tr>
<tr>
<td>High blood pressure (hypertension) stage 2</td>
<td>160 or higher</td>
<td>Or 100 or higher</td>
</tr>
<tr>
<td>Hypertension crisis (9emergency care needed)</td>
<td>Higher than 180</td>
<td>Or Higher than 110</td>
</tr>
</tbody>
</table>

What are the causes of hypertension?

- **Age**: it is more common in adults average above 40 years (but now a days it is diagnosed in young adults also)
- **Heredity**: if any family member maternal or paternal side have hypertension then your chances to get hypertension increases
- **Stress**: mental stress, depression, anxiety are the major reasons to get hypertension
- **Obesity**: over weight increases your chances to get high blood pressure. As if you are overweight your fat levels are which increases your blood pressure
- **Sedentary life style**: no physical activity causes any usage off or cholesterol so it increases pressure of blood to flow
- **Smoking**: smoking increases your chances of getting high blood pressure
- **Alcohol**: excess of alcohol consumption increases your chances to get high blood pressure
- **Drugs**: caffeine and its products increases blood pressure
- **Hormonal abuse**: imbalance of sexual hormones that is testosterone, oestrogen and progesterone increase the pressure of the blood
- **Excess of salt intake increases load on heart hence contributes in high blood pressure**
- **Medicine induced**: many medicines taken on longer term increases blood pressure
How will you come to know that you have high blood pressure?

Many people having hypertension don’t have any signs and symptoms so they tend to ignore it. That’s why hypertension is called as silent killer.

If you have any of the following signs or symptoms you should go to a doctor and measure your blood pressure.

- Mild continuous headache
- Nausea – sense of unease and discomfort in stomach and feeling like vomiting
- Vomiting
- Dizziness- lightheadedness, unsteadiness, feeling like s/he will fall down
- Blurred vision- unclear vision
- Bleeding from nose
- Palpitations- forceful beating of heart
- Breathlessness on doing least work
- Easy tiredness
- Irritability
- Pain in calf muscles

Complications of hypertension:

- If you don’t pay attention to hypertension at early stages you may have to face adverse effects of it
- **Heart failure**- if blood pressure remains high for long time or if cholesterol levels are constantly high it produces more problems for blood to pass though blood vessels and difficult to reach till organs and if heart doesn’t get blood it fails to work and a person gets heart attack and he may die
- **Stroke**: as mentioned in previous point if brain doesn’t get blood brain stops functioning and person may get stroke (brain attack) or paralysis (body stops functioning) or coma and death
- **Eye complication**- if blood pressure remains high for longer time it affects the eye sight and vision. Person may have to suffer from partial or complete blindness
- **Kidney complications**- due to high blood pressure load on heart increases and it causes more burdens on kidneys also. In long term kidneys stop working.
- Having high blood pressure increases your chances to get diabetes also. And both diseases together cause more damage to the body and life span of person decreases
How can you confirm that you have high blood pressure?

If you have any of the above mentioned symptoms you should visit your doctor as soon as possible.

Doctor will measure your blood pressure and give you readings.

Your doctor will likely take two to three blood pressure readings each at two or more separate appointments before diagnosing you with high blood pressure. This is because blood pressure normally changes throughout the day — and sometimes specifically during visits to the doctor.

Simple blood tests to know the causative factor and effect of high blood pressure are:

- Cholesterol level
- Complete blood count to know haemoglobin and other elements of blood.
- Urine analysis to know whether kidneys have been affected by high blood pressure or not.
- Liver function tests - tells whether liver is functioning properly or not.

When to check blood pressure?

Blood pressure should be measured when the heart is functioning at its normal pace.

Check if:

- The individual has been at rest for the past half an hour.
- The individual is lying down on his back and is relaxed or is comfortably seated with his legs uncrossed and his back and arms supported.
- There is no anxiety in his/her behavior.
- The environment is calm and there are no loud noises around.
- The individual has not consumed alcohol/ tea or coffee at least in the past 3 hours.

Hypertension and HIV

*If a person is diagnosed as HIV and taking medicines for it since long it increases the blood pressure as a complimentary effect of the medicine. So HIV person should regularly check their blood pressure.*
How can you prevent hypertension and its complications?

- If you have any of the above mentioned symptoms get your blood pressure checked as early as possible
- Once you are diagnosed as hypertensive get it regularly checked
- Include at least 1 hour of physical activity every day
- Reduce intake of fried foods and ghee, cream, oil and butter
- Reduce or stop smoking
- Reduce your alcohol intake to no more than 1 drink per day for men and half a drink for women and light weight people
- Practice meditation or laugh with your dear ones to reduce stress
- Sleep for at least 7 hours per day
- Pursue a hobby (anything you like dancing/ singing/ reading/ writing)
- Have friends/ social life
- Lifestyle modifications + dietary changes help reduce blood pressure without or with the minimal amount of drugs possible
Sample diet for hypertension

<table>
<thead>
<tr>
<th>Food group</th>
<th>Serving for sedentary women per day</th>
<th>Serving for sedentary male per day</th>
<th>Example of 1 serving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains (mainly whole grains)</td>
<td>6 a day</td>
<td>6 to 8 a day</td>
<td>1 slice whole-wheat bread 1 small bowl dry cereal 1 big chapatti / 2 small phulkas 1/2 cup cooked rice or pasta</td>
</tr>
<tr>
<td>Vegetables (Raw)</td>
<td>3 to 4 a day</td>
<td>4 to 5 a day</td>
<td>1/2 cup vegetable juice 1 cup raw leafy green vegetables 1/2 cup cut-up raw or cooked vegetables</td>
</tr>
<tr>
<td>Fruits (uncooked)</td>
<td>4 a day</td>
<td>4 to 5 a day</td>
<td>1/2 cup 100% fruit juice 1 medium fruit./ 50- 75 gms.</td>
</tr>
<tr>
<td>Low-fat or fat free milk and milk products</td>
<td>2 to 3 a day</td>
<td>2 to 3 a day</td>
<td>1 cup skim milk 1 cup yogurt 30gms. cheese</td>
</tr>
<tr>
<td>Lean meats, poultry and fish</td>
<td>1/ nil day</td>
<td>1/nil day</td>
<td>30 gms fish/ chicken 1 egg/ 2 egg whites</td>
</tr>
<tr>
<td>Nuts, seeds, pulses and legumes</td>
<td>3 to 4 a week</td>
<td>4 to 5 a week</td>
<td>2 table spoons seeds 15 gms of nuts 1 vati of uncooked Pulses</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>2-3 a day</td>
<td>to 3 a day</td>
<td>1 tsp vegetable oil/ghee/butter 1 tbsp low fat mayo</td>
</tr>
<tr>
<td>Sweets and added sugar</td>
<td>3 or fewer a week</td>
<td>5 or fewer a week</td>
<td>1 tablespoon sugar/jam/honey</td>
</tr>
</tbody>
</table>
SMOKING

ASK

- Do you consume Tobacco?
- If yes, in what form? (Smoke/ chew)
- Since when are you taking tobacco? How old were you when you tried a cigarette, even a single puff?
- How many cigarettes a day do you smoke?
- At any time in your life, have you smoked 1 or more cigarettes per day for 30 days straight?
- Do you smoke more frequently during the first hours after waking than during the rest of the day?
- While smoking have you ever felt that it can be injurious to your health?
- Do you feel you are addicted to tobacco?
- Why did you become addicted to tobacco?
- Have you ever considered cutting down your tobacco consumption?
- If yes, how long were you successful?
- How was the experience of quitting tobacco?

What is smoking?

A practice in which a substance, most commonly tobacco is burned and the smoke is tasted or inhaled

What are the different types of smoking?

Common method of smoking is through CIGARETTE SMOKING (Cigarette is dried shredded tobacco wrapped in paper)
Other methods of Smoking:

- Paan
- Gutka and maawa
- Beedi
- Cigar (Cigar is dried and rolled tobacco leaves)
- Hookah
- Pipe
- Smokeless tobacco (Smokeless tobacco is chewed or snorted but not smoked)

What are the different types of smokers and smoke?

- First hand smoker and smoke - Who inhales the smoke in to his/her own lungs
- Second hand smoker also known as “Passive smokers” - Who inhales smoke that is inhaled and exhaled by a smoker
- Third hand smoker - Contamination by tobacco smoke that remains behind the snuffing of a cigarette

Various chemicals within tobacco with their some common use

- Acetone- to remove nail polish
- Nicotine – used as an insecticide (to kill insects)
- Ammonia- used to clean windows and bathrooms
- Formaldehyde- used to preserve dead bodies
- Carbon monoxide- found in car exhaust

How nicotine enters in the body and travels whole body?

- When you inhale smoke, nicotine is carried deep into your lungs
- There it is quickly absorbed into the bloodstream and carried throughout your body
- nicotine inhaled in cigarette smoke reaches the brain faster than drugs that enter the body through a vein
- Nicotine affects many parts of your body, including your heart and blood vessels, your hormones, the way your body uses food (your metabolism), and your brain
- Nicotine can be found in breast milk of a female smoker
- During pregnancy if female smokes new-born also have nicotine his blood
- Different factors affect how long it takes the body to remove nicotine and its by-products
Is Smoking Addictive?

- Yes, it is. Nicotine, a drug that is present in the tobacco
- Primarily responsible for a person’s addiction
- During smoking, nicotine enters the lungs and is absorbed quickly into the bloodstream and travels to the brain in 7 seconds
- It’s as addictive as heroin or cocaine. Over the time, a person becomes physically dependent on and emotionally habituated to nicotine

How person gets addicted to nicotine?

- Nicotine produces pleasant feelings and distracts unpleasant feelings
- This makes smoker to smoke again and again
- Nicotine acts as an anti-depressant (removes depressing feelings) by interfering between nerve cells
- After some point nervous system adapts to nicotine intake so to keep stimulate body person keeps on taking nicotine
- In long run smoker develops nicotine tolerance i.e. it takes more quantity to get the same effect that smoker used to get through small quantities
- When a person finishes a cigarette, the nicotine level in the body starts to drop, going lower and lower
- The pleasant feelings wear off, and the smoker notices wanting a smoke
- If smoking is postponed, the smoker may start to feel irritated and edgy
- When the person smokes a cigarette, the unpleasant feelings fade, and the cycle continues

When you smoke following changes occur in your body due to NICOTINE

- Heart rate Increases
- Pulse rate Increases
- Blood pressure Increases
- Poor blood circulation
- Lung function Reduces
- Carbon mono oxide levels increases in the blood
- Oxygen level in blood goes down

Signs and symptoms of smoking

- Irritating morning cough
- Shortness of breath
• Wheezing (breathless)
• Frequent respiratory problems
• Headaches
• Bad breath
• Loss of taste in mouth
• Mouth ulcers
• Increased fatigue
• Irritability
• Cold hands and feet
• Wrinkles and early aging
• Yellow stains in hands and around nails
• Palpitations

**Why smoking is harmful?**

Smoking affects all the organs and systems of the body. Smoking affects human beings irrespective of their age and gender.

- **Ageing** - Develop wrinkles faster than non-smokers. Long-term smokers’ skin can be prematurely aged by up to 20 years
- **Lungs** - Smoke is first inhaled so it affects lungs very badly. It causes asthma, recurrent cough, cold etc. Smoking is one of the leading cause of lung cancers and it spreads very fast
- **Affects brain, liver and bone**
- **Cancers of the breast, cervix and vulva** – smoking increases Chances of having breast cancer by 25 %, vulvar cancer by 40 % and cervical cancer by as high as 75 %
- **Smoking affects female reproductive system causing irregularities in periods and conceiving (infertility)**
- **Bone** – Due to tobacco bones becomes weak and causes osteoporosis (weakness of bones) and bones break easily as calcium doesn’t get absorb properly due to smoking
- **Smoking during pregnancy causes defects in new-born**
- **Circulatory system** - nicotine absorbs in the blood and affects blood vessels (arteries, veins, capillaries) then heart. Person is at high risk to get high blood pressure and heart failure
- **Brain** – As mentioned above it takes only 7 seconds to reach to brain after entering in the body. Nicotine prevents oxygen absorption so brain gets
less oxygen and gradually brain cells dies. Smoking causes mild to heavy headache, forgetfulness, memory loss, stroke, paralysis, brain failure (coma)

- Digestive system- tobacco increases appetite and thus person tends to eat more and weight gain. Nicotine prevents absorption of many important nutrients (vitamins/ proteins/ minerals/ fibres) and causes constipation (indigestion) also. Smoking is one of leading causes for cancer of mouth, throat, stomach and intestines.
- Diabetes- nicotine in blood affects the pancreas also and reduces its capacity to produce insulin hormone so chances of getting diabetes increases
- Defects in eyes, increases risk of glaucoma (increased pressure in the eyes) and early cataract ( degeneration of cells of eyes)
- Oxygen is unable to flow adequately in skin, which may lead to pale and yellow skin
- Persistent stale smell of cigarettes in hair, on clothes and even from the spores of skin
- Reduction in physical fitness and an increased chance of injury
- Tobacco makes person mentally also dependent on it and in long turn it causes irritability, temper problems, suicidal thoughts and even attempts to suicides
- Smoking reduces body’s immunity (fighting capacity) and hence body can easily attract other infections like TB, HIV, Hepatitis B, Malaria, Dengue etc.

Health of others

- Smoking not only harms your health but it hurts the health of those around you.
- As we mentioned above the different types of smokers ( first hand/ second hand/ third hand); smoking affects second hand and third hand smokers also in the same way and in the same intensity infect it affects them more than first hand smokers
- Studies have shown that second hand smoke causes thousands of deaths each year from lung cancer in healthy non-smokers
- If a mother smokes, there is a higher risk of her baby developing asthma in childhood, especially if she smoked while she was pregnant
Causes for smoking

There are no particular or fixed causes for smoking/ tobacco addiction

You may also be more likely to abuse alcohol or become dependent if you:

- Have any kind of stress, depression, anxiety, fear etc.
- Coping with the stress is the main cause of smoking
- Have easy access to tobacco (cigarettes/ cigar/ chewing gum etc.)
- Having a company (friends/ relatives) who smokes
- Have low self-esteem
- Have problems with relationships
- Live a stressful lifestyle
- To try to lose weight
- As a sign of protest, rebellion, or to defy authority
- Live in a culture smoking is more common and accepted

How to confirm whether someone is addicted to tobacco or not?

Tobacco addiction is mainly confirmed by a health care provider (doctor/ counselor/ social worker) through case history taking and with few questionnaires which includes questions related to type of tobacco, pattern of consumption, frequency of consumption and effect of smoking

Tests that may be done include:

- Blood nicotine level (this can tell nicotine saturation of the blood)
- Complete blood count (CBC)
- Lung functions test (these tests tell us about how lungs are functioning, how much oxygen they are taking and what is carbon dioxides levels etc.)

What you will do if you know some is addicted to alcohol

- First and foremost ask them about their type of tobacco intake
- Their reason of starting and getting addicted to it
- Ask them whether they have ever tried stopping it and if yes what made them do so and were they successful doing it
- What problems they faced while quitting
- Try to explain them the effects of smoking on all aspects of their life
- Never force any rules on them
- Make them ready to quits smoking on their own
• Refer them to doctors/counsellors for further treatment
• People who already have stopped help them maintain that state by praising them and reinforcing bad effects of smoking
• Help them rehabilitate themselves after quitting smoking
• Make different groups of smokers and discuss their issues and try to help them by motivating to stop smoking

Why quitting smoking very difficult?

• When smokers try to cut back or quit, the lack of nicotine leads to withdrawal symptoms
• Withdrawal is both physical and mental. Physically, the body reacts to the absence of nicotine Mentally, the smoker is faced with giving up a habit, which calls for a major change in behavior
• Those who have smoked regularly for a few weeks or longer will have withdrawal symptoms if they suddenly stop using tobacco or greatly reduce the amount they smoke
• Symptoms usually start within a few hours of the last cigarette and peak about 2 to 3 days
• Withdrawal symptoms can last for a few days to up to several weeks. They will get better every day that you stay smoke-free

Withdrawal symptoms can include any of the following: These symptoms can make the smoker start smoking again to boost blood levels of Nicotine until the symptoms go away

• Dizziness (which may only last 1 to 2 days after quitting)
• Depression
• Feelings of frustration, impatience, and anger
• Anxiety
• Irritability
• Sleep disturbances, including having trouble falling asleep and staying asleep, and having bad dreams or even nightmares
• Trouble concentrating
• Restlessness or boredom
• Headaches
• Tiredness
• Increased appetite
• Weight gain
• Constipation and gas
• Cough, dry mouth, sore throat, and nasal drip
- Chest tightness
- Slower heart rate

**Why quit now?**

- No matter how old you are or how long you’ve smoked, quitting can help you live longer and be healthier
- People who stop smoking before age 50 cut their risk of dying in the next 15 years in half compared with those who keep smoking
- Ex-smokers enjoy a higher quality of life
- They have fewer illnesses like colds and the flu, lower rates of bronchitis and pneumonia, and feel healthier than people who still smoke
- Quitting smoking has major and immediate health benefits for men and women of all ages. These benefits apply to people who already have smoking-related diseases and those who don’t
- Ex-smokers live longer than people who keep smoking

**Immediate rewards of quitting**

- Breath smells better
- Stained teeth get whiter
- Bad smelling clothes and hair go away
- Yellow fingers and fingernails disappear
- Food tastes better
- Sense of smell returns to normal
- Everyday activities (such as climbing stairs or light housework) no longer leave them out of breath

**Long term effects of quitting**

<table>
<thead>
<tr>
<th>Time After Quitting</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 minutes after quitting</td>
<td>Your heart rate and blood pressure drop</td>
</tr>
<tr>
<td>12 hours after quitting</td>
<td>The carbon monoxide level in your blood drops to normal.</td>
</tr>
<tr>
<td>2 weeks to 3 months after quitting</td>
<td>Your circulation improves and your lung function increases</td>
</tr>
<tr>
<td>1 to 9 months after quitting</td>
<td>Coughing and shortness of breath decrease and reduce the risk of infection.</td>
</tr>
<tr>
<td>Time After Quitting</td>
<td>Health Benefits</td>
</tr>
<tr>
<td>--------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>1 year after quitting</td>
<td>The excess risk of heart disease is half that of a continuing smoker’s.</td>
</tr>
<tr>
<td>5 years after quitting</td>
<td>Risk of cancer of the mouth, throat, oesophagus, and bladder are cut in half. Cervical cancer risk falls to that of a non-smoker. Stroke risk can fall to that of a non-smoker after 2-5 years.</td>
</tr>
<tr>
<td>10 years after quitting</td>
<td>The risk of dying from lung cancer is about half that of a person who is still smoking. The risk of cancer of the larynx (voice box) and pancreas decreases.</td>
</tr>
<tr>
<td>15 years after quitting</td>
<td>The risk of heart disease is that of a non-smoker’s.</td>
</tr>
</tbody>
</table>

**How can you help yourself/others to reduce or stop smoking?**

- Change brands: Change to a brand that is low in tar and nicotine a couple of weeks before your target date.
- Smoke only half of each cigarette.
- Each day, postpone the lighting of your first cigarette 1 hour.
- Decide beforehand how many cigarettes you’ll smoke during the day.
- Seek help of medical/psychological health professionals.
- Medications can double your success if used correctly.
- Go for counselling and therapy.
- Just before Stopping Practice going without cigarettes.
- Think of stopping for the next hour, the next day.
- Tell yourself you won’t smoke today and then, don’t.
- On the day you stop.
- Throw away all your cigarettes and matches.
- Hide your lighters and ashtrays.
STRESS

Let’s start with myths and clichés about stress

- Stress is not a workplace health and safety hazard.
- A little bit of stress is healthy.
- Stress is good for you; it makes you more productive at your job.
- Stress comes from your home life, not the job.
- All we need to do is learn to cope with our stress.
- To deal with stress, all workers need to do is take a stress management course.
- Stress can be solved with exercise, breathing deeply and learning to relax more.

What is stress?

Stress is the combination of physical and psychological reactions to events that challenge or threaten us.

Causes of stress?

- Inability to cope with a life crisis
- Changes in brain structure
- Genetic predisposition
- Low serotonin levels
- Social Interaction: Traumatic family events
- Alcohol, tobacco and other drugs
- Physical Environment
- Organizational
- Major Life events
- Daily Hassles
- Lifestyle choices
- Negative self-talk
- Mind traps
**Types of stress:**

**Normal stress:**

In normal circumstances, the stress response is a powerful protective mechanism that allows us to deal with sudden changes, dangers or immediate demands.

- With normal stress we can fight or flee. The response occurs fairly quickly and then the stress ends. The three phases of normal stress are:
  - Stress comes (facing an immediate threat/demand).
  - Stress goes (dealing with the stress).
  - Stress is over (the body relaxes, no longer feeling stressed).

**Abnormal Stress**

In abnormal (i.e., highly stressful and/or prolonged stress) circumstances, stress overwhelms our protective mechanisms, leading to serious negative health outcomes.

**Toxic stress**

- Unlike normal stress that comes and goes, toxic stress stays with you, building up the harmful effects. The three phases of toxic stress are:
  - Stress comes (facing a demand or threat that does not stop).
  - Stress stays with you (you have no way of dealing with the stress).
  - Stress builds up (you can never relax and the stress is not eliminated).
Body’s response to stress
Effect on hormonal system

Stress and Obesity

Endocrine System in Stress

The Hypothalamus:
- releases CRH to stimulate the pituitary gland, which
- releases ACTH to stimulate the adrenal cortex, which
- releases glucocorticoids like cortisol, which
  - Suppress immune response
  - Make omentum (fat on abs) insulin resistant
  - Increase hunger
  - Help omentum store fat

More fat & inflammatory chemicals stored in omentum (abs) and liver

Fat cells become full

Omentum, liver, & muscle become insulin resistant

More heavy eating (sweets & fats!)

Hunger increases

More insulin released by pancreas

GLUCOSE, FAT, and LDL CHOLESTEROL CIRCULATE, READY TO FORM PLAQUE

ADULT-ONSET DIABETES
Symptoms of stress:

- Sleep disruption and disorders
- Fatigue, apathy, lack of energy
- Chronic aches and pains in the chest, shoulders, back, neck and elsewhere in the body
- Depression and a general decrease in enjoyment of life.
- Changes in sexual activity.
- Conflict with family, friends, and co-workers
- Weight gain or weight loss.
- Greater susceptibility to injury or involvement in road traffic accidents.
- Immune system depression, greater vulnerability to illness and disease.
- Other stress-related health problems, such as, ulcers, heart disease, headaches, irritable bowel syndrome, diabetes, and menstrual disorders.
- Overeating
- Dependence on drugs, alcohol, tobacco
- Gambling, TV, Sex Addiction
**Physical symptoms**

- Changes in sleep patterns
- Fatigue
- Digestion changes
- Loss of sexual drive
- Changes in appetite
- Irrational fear

**Behavioral**

- Eating disorders
- Nail biting
- Restlessness
- Increase in caffeine and nicotine intake
- Hypochondriasis

**Emotional**

- Bouts of Depression
- Impatience
- Fits of rage
- Tearfulness
- Deterioration of personal hygiene and appearance

**Cognitive**

- Negative self-talk: “There is just no way I can do this.”
- Low self-confidence
- Losing self-belief
- Difficulty concentrating
- Forgetfulness
- Decision making
- Disorientation

**Lifestyle disorders due to stress**

- Cardiovascular- Hypertension
- Diabetes
- Headaches migraines
- Pre Menstrual Syndrome
- Irritable Bowel Syndrome
- Polycystic Ovarian Syndrome
- Spondylosis
- Backaches

**Stress Reduction**

- Relaxation exercises
- 30 seconds: 3 goals
- Goal setting (SMART)
- Unhelpful Thinking patterns
- Thought Diary
- Affirmations
- Sleep Hygiene
NUTRITION

Do you eat to live or live to eat?

What is nutrition?

Nutrition is the supply of materials – food required by body and cells to stay alive and work efficiently. Nutrition also focuses on how diseases and illness can be prevented or lessened with a healthy diet.

Nutrition also involves identifying how certain diseases, conditions or problems may be caused by dietary factors such as poor diet (malnutrition), metabolic disease etc.

What do you think why nutrition is so very important? And how health and nutrition are connected?

Our body is like a car and food is like fuel. The way elegantly tuned car require good kind of fuel to have its optimum average and speed our body also require good nutritious food to have sound health and to function properly. If we don’t put right kind of fuel in car if you don’t use it regularly car won’t give its maximum average or performance. Same way without proper nutrients body doesn’t work properly and falls sick often.

Having a good balanced diet can:

- Gives you energy to perform all day to day work very efficiently
- It helps you to maintain your ideal weight for body
- It enhances your defense mechanism (immune system)
- Delays the effect of aging
- Keeps you very fit for later age of life
- Helps you fight with tiredness and fatigue
- Increases concentration and memory
- Helps brain to work skillfully and efficiently
- Strengthens bones
- Protects against many serious illness such as heart problems, kidney problems and certain cancers etc.
- Once diagnosed disease at primary level we can take care of it with alteration in food and life style

There are seven major classes of nutrients

- Carbohydrates
- Fats
What are macronutrients?

Macronutrients are the ones which we require relatively in large amount which includes Carbohydrates, Fats, Proteins, Fibers and Water.

What are micronutrients?

Micronutrients are the ones which we require relatively in small amount which includes vitamins and minerals.

Basics of healthy eating:

- Low fat- 9 k cal / gm
  Cutting down on all fats which includes oil, butter, ghee, cheese, cream, fried food etc. is the healthier way to make modern day food balanced and less harmful.
- High fiber- high fiber diet helps in digestion of food, to lower the cholesterol, prevent gall stones and bowel cancer. Whole grain bread, cereals, vegetables, fruits are good source of fiber.
- High protein- 4 K cal / gm
  Proteins are the main building blocks of the body. Proteins give energy, strength to muscles; many enzymes and hormones are made up of proteins. Each cell of the body requires proteins for their growth and functions. It helps growth of body and muscles get strength from protein. It helps in recovery after any major surgery or accidents. Milk, milk products, egg, pulses, vegetables etc. are good sources of proteins.
- Carbohydrates/ starch- 4 K cal / gm
  Starch is second big source of energy. It provides energy to perform our day to day work. Wheat, rice, potato, bread, roti etc are good sources of carbohydrates and starch.
- Vitamins and minerals- vitamins and minerals to carry out many day to day activities. They provide nutrition to cells of the body and organs. They are required to carry out functions of starch, proteins and fats etc. all kinds of
vegetables, fruits, salts, spices, liver, water etc are good sources of vitamins and minerals

<table>
<thead>
<tr>
<th>Mineral component</th>
<th>Function in the body</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium</td>
<td>Carrier of energy cells</td>
<td>Banana, coconut water, vegetables, fruits, etc</td>
</tr>
<tr>
<td>Chloride</td>
<td>Important for production of gastric juice</td>
<td>Salt, vegetables, pulses, fruits etc.</td>
</tr>
<tr>
<td>Sodium</td>
<td>Important for regulation of energy</td>
<td>Salt, vegetables, fruits etc</td>
</tr>
<tr>
<td>Calcium</td>
<td>Important for muscles, bones, joints, heart, brain, digestive system etc.</td>
<td>Milk, milk products, egg, fish, cashew nut, ragi, nachni etc</td>
</tr>
<tr>
<td>Phosphorus, magnesium, zinc, copper, manganese</td>
<td>Required for bone growth, teeth and to produce enzymes and hormones</td>
<td>Vegetables</td>
</tr>
<tr>
<td>Iron</td>
<td>Required for production of enzymes and proteins specially hemoglobin</td>
<td>Liver, meat, fish Cereals, nuts, jiggery, green leafy vegetables</td>
</tr>
<tr>
<td>Iodine</td>
<td>Required for synthesis of thyroxin (thyroid hormone)</td>
<td>Sea fish, sea salt, cod liver oil, milk, meat, vegetables, cereals etc.</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>Important for eye</td>
<td>Liver, egg, butter, cheese, milk, green- yellow fruits and vegetables, papaya, mango, pumpkin, carrots etc</td>
</tr>
<tr>
<td>Vitamin B</td>
<td>Important for digestion, bones, nerves, brain and skin</td>
<td>Wheat, rice, almonds, ground nut, cow’s milk, mutton, liver, sheep, cereals, pulses, leafy vegetables etc</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>Important for muscles, gums and digestion</td>
<td>Amla, guava, lime, orange, tomato</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Must for absorption of calcium and required for nerves</td>
<td>Sunlight is the only natural source Liver, egg yolk, butter and cheese etc</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>Required for hair/ skin</td>
<td>Vegetable oil, cotton seeds, sunflower seed, egg yolk and butter</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>Required for blood clotting mechanism</td>
<td>Produced by friendly bacterial flora at birth</td>
</tr>
</tbody>
</table>
- Water - our body 70% is made up of water. So two to three liters (8-10 glasses) of water is required to keep body hydrated and the kidneys to work efficiently. It helps food for digestion, skin to glow. Many harmful chemicals of the body get dissolve in water and gets out from the body in the form of urine. In hot weather more water is required to keep body hydrated as we lose water in the form of sweat also. Alcohol / coffee are not counted as liquid as they act as diuretic (removes water from the body) and forces kidneys to remove more fluid than required
- Moderate sugar and salt - moderate amount of sugar and salt adds flavor to food, makes it palatable and digestible. It gives starch and minerals which are required for digestion. It gives energy to cells to perform their day to day work. Excess of salt and sugar acts as toxins to body and they increases load on heart and kidneys
- Different sources - bread, pasta, biscuits, rava, and brown bread all taste different but all are made up of wheat only. Use different types of sources so that if you don’t get some nutrients from one you get it from other
- Variety - include all kinds of food components to your foods and meals i.e. cereals, pulses, vegetables, salads, little ghee/oil etc. so that you are giving all kind of nutrition to your body which is required
- Apart from preparing proper meals and food eating it on correct time and at regular interval is equally important

Eating well by itself is no guarantee of good nutrition. Food must pass through six stages

- Diet - eating healthy food
- Digestion - when food enters mouth mechanically chewing and breaking the food in small particles and it enters stomach where churning of food happens
- Absorption - after digestion nutrients from intestine gets absorbed into blood
- Circulation - after absorption essential nutrients (carbohydrates, fats, proteins, vitamins, minerals) are carried via blood to cells
- Assimilation – merging of nutrients into cells
- Elimination - removal of waste material after all process is removed out from the body

Only when all of these challenges are successfully met our food provide our bodily requirement of nutrition
You are what you eat
Nutrition affects your health both today and tomorrow.
ALCOHOL

Ask:

- Do you drink Alcohol?
- Since when are you drinking alcohol?
- How many drinks a week? How many pegs in one go?
- As a result of drinking have you ever felt overly hot or feverish?
- Do you panic because you fear you may not have a drink when you need it?
- Do you do binge drinking?
- Have you ever felt you should cut down your drinking?
- Have people annoyed you by criticizing you drinking?
- Have you ever felt bad or Guilty about your drinking?
- Have you ever had drink first thing in the morning to steady your nerves or to get rid of a hangover?

What is alcohol?

Alcohol is a depressant drug that
- slows down the activity of the brain
- contains absolutely no nutrients
- does not help relieve tension, induce sleep or solve problems
- needs no digestion and is rapidly absorbed in blood stream
- only liver can remove effect of alcohol and liver takes about an hour to break the alcohol

Who can be called as an alcoholic?

An alcoholic is one who’s drinking causes continuing problems in any area of his life (family relationships, job, financial status, health etc.) and he continuous drinking despite such problems. **The alcoholic is dependent on alcohol.**

What is this dependence?

If a person is drinking since long time s/he develops physical and psychological dependence on the alcohol.

His/ her body is so much habituated with alcohol and its timing that if a person stops drinking or even changes the timing s/he feels problems like tremors (shivering of hands), vomiting, sleep disturbance, headaches, etc. this is called as **physical dependence.**
Same way our mind also gets habituated with the alcohol. Our thoughts, memory, feelings, emotions all get dependent on the alcohol. And if we don’t get our mind continuously thinks that only how and when we will get alcohol? This is called as psychological dependence.

How much you drink can influence your chances of becoming dependent. Those at risk for developing alcoholism include:

a. Men who have 15 or more drinks a week
b. Women who have 12 or more drinks a week
c. Anyone who has five or more drinks per occasion at least once a week
(1 drinks of alcohol means 30 ml of whisky/ rum, 60 ml of wine, 350 ml of beer)

Effects of alcohol addiction

Alcohol addiction has both short-term and long-term effects.

Short term effect includes

- **Violence** – when person is drunk s/he becomes more short tempered and invites fights verbally or physically
- **Injuries** – after drinking one loses self-control and falls down and have injuries
- **Accidents** - drunkard person loses his control while driving and tend to have more accidents
- **Unprotected sexual activities** which can lead to many long term effects like having sexually transmitted diseases like HIV, Herpes, hepatitis B (strong jaundice), HPV (human papilloma virus) which causes genital cancers.
- **Social problems** - fights with partner, with family and friends, hitting children etc
- **Financial problems** - fulfilling this habit or addiction costs quiet some money so it creates financial worries for person and its family

Long term effects

- **Relationship problems** - everyday drinking for long term creates problems in all relations
- **Problems at workplace** - over drinking and its hangover effect or irritability affects your productivity at work also and it spoils relations at work place also
• **Legal problems**- you lose your conscious control over mind after drinking and tend to break laws and rules which can invites more problems for you

• **Emotional issues**- person becomes more irritable, short tempered and violent with drinking

• **Insomnia**- after having alcohol in larger quantities or for longer duration sleeps gets disturbed and gives you sleepless nights

**Physical effects of drinking**

• **Effect on blood**- alcohol in blood puts you at high risk for high blood pressure as it damages blood vessel walls (artery and veins)

• **Effect on liver** – liver is the only organ which breaks down alcohol so it is affected primarily. Alcohol affects liver causing fatty liver, cirrhosis of liver (cells of liver dies) in long term liver functions gets affected badly and it causes ascites (accumulation of water in abdomen) and person dies. Alcohol is one of the leading cause for liver cancer

• **Effect on pancreas**- it affects the cells of pancreas and thus affects hormones produced by pancreas that is insulin and increases your chances to get diabetes.

• **Effect on brain**- alcohol grossly affects nervous system. It causes anxiety, irritation, loss of memory and at some point brain cells dies causing paralysis and coma also.

• **Digestive system**- it weaken digestion causing acidity (burning, nausea (uneasy feeling in stomach) and vomiting. It increases the chances of stomach cancer

• It causes constant mild to severe headaches

• Alcohol affects nutritional status of the body. It prevents absorption of many important nutrients like vitamins and proteins etc.

• **Sexual problems**- alcohol causes erectile dysfunctions and impotency in males and infertility in females

**Causes of alcohol addiction**

There are no particular or fixed causes for alcohol addiction. You have an increased risk for alcohol abuse and dependence if you have a parent with alcoholism.

You may also be more likely to abuse alcohol or become dependent if you:

• Are a young adult under peer pressure

• Have any kind of stress, depression, anxiety, fear etc.

• Have easy access to alcohol

• Have low self-esteem
Universal Access To Public Health

- Have problems with relationships
- Live a stressful lifestyle
- Live in a culture alcohol use is more common and accepted

How to confirm whether someone is addicted to alcohol or not?
Alcohol addiction is mainly confirmed by a health care provider (doctor/ counselor/ social worker) through case history taking and with few questionnaires which includes questions related to type of drinking, pattern of drinking, quantity of alcohol and effect of drinking.

Tests that may be done include:

a. Blood alcohol level (this can tell whether someone has recently been drinking alcohol, but it does not necessarily confirm alcoholism)
b. Complete blood count (CBC)
c. Liver function tests

What you will do if you know someone is addicted to alcohol

- First and foremost ask them about their pattern of drinking
- Their reason of starting and getting addicted to it
- Ask them whether they have ever tried stopping it and if yes what made them do so and were they successful doing it
- What problems they faced while quitting
- Try to explain them the effects of alcohol on all aspects of their life
- Never force any rules on them
- Make them ready to quit alcohol on their own
- Refer them to doctors/counsellors for further treatment
- People who already have stopped help them maintain that state by praising them and reinforcing bad effects of alcohol
- Help them rehabilitate themselves after quitting alcohol
- Make different groups of alcoholics and discuss their issues and try to help them by motivating to stop drinking

Many people with alcohol problems do not recognize when their drinking gets out of hand. The ideal approach to treatment is to help the person realize how much their alcohol use is harming their life and those around them.

Alcohol recovery or support programs can help people stop drinking completely. These programs usually offer:

1. Counselling and therapy to discuss alcoholism and its effects and how to control your thoughts and behaviours
2. Mental health support
3. Medical care
HORMONAL ABUSE

What are hormones?

- Hormones are chemical substances which act as messenger particles of the body.
- They are produced by many different organs and glands in the body.
- From there they are transported through blood to different parts of the body.
- Hormones control how cells and organs work.
- For example, insulin is a hormone produced by the pancreas and it controls absorption and usage of sugar in our body.
- Estrogen and progesterone are female sex hormones which are produced by the ovaries and testosterone is a male sex hormone produced by the testes.
- Men also have a small amount of female hormone because some testosterone is converted into oestrogen.
- In both men and women, the adrenal glands, which sit on top of the kidneys, produce small quantities of testosterone.
- So all men and women naturally produce both testosterone and oestrogen.
- Testosterone has masculinising effects, and oestrogen has feminising effects.
- Along with genetic factors, sex hormones affect the development of the reproductive system, the brain and physical characteristics such as height and build, the way fat is distributed in your body and your muscle bulk.
What is puberty?

- It is the name of the time when we become adult from kid and body starts changing
- Hormones are primarily responsible for this change
- Usually, puberty starts between ages 8 and 13 in girls and ages 9 and 15 in boys
- Secondary sexual characteristics starts from this age

What are the secondary sexual characteristics?

Secondary sexual characteristics are features that distinguish the male and female, but they are not directly part of the reproductive system

**Male secondary sexual characteristics**

- Growth of hair including abdomen, chest, underarms and pubic hair
- Loss of hair on scalp (head) (male type baldness)
- Increase in mass of thigh muscles in front of femur bone (bone in thighs)
- Enlargement of Adam’s apple and deepening of voice (what is Adam’s apple - when you see any adult male drinking water from bottle; you can see something in neck moving front and back. That prominent part is called as Adam’s apple)
- Growth of facial hair
- Heavier bone structure
- Increased muscle mass (males are stronger than female)
- Larger hands, feet, and nose than female
- Chest is wider than waist (but larger waist than female)
- Broadening of shoulders
- Increases secretions of oil and sweat causing acne and body odor
- Enlargement of penis
Female secondary sexual characteristics

- Enlargement of breasts and erection of nipples
- Growth of body hair mainly underarm and pubic hair
- Increase in mass of thigh muscles in back of femur bone (bone in thighs)
- Widening of hips
- Smaller hands and feet than male
- Elbows that spread further than 180 degrees
- Smaller waist than men
- Fat deposits, mainly around the buttocks, thighs, and hips
- Starting of periods (menarche)
- Vagina (female sexual organ) grows longer and its outer lips (labia) become more pronounced

What is the aim of hormone therapy for trans people?

- The aim of hormone therapy is to make you feel more at ease with yourself, both physically and psychologically.
- You may be experiencing discomfort because you are not happy with your male or female appearance
- Maybe you are not comfortable in your gender role as a man or as a woman
- Perhaps both these factors – your appearance and your gender role – are in conflict with your inner sense of being a man or women (your gender identity).
- You may have lived with this conflict for many years and be desperate to get some help.
- Yes, hormonal therapy (testosterone if you are a trans man, and oestrogen if you are a trans woman) may help to overcome your distress

What changes come with the hormone therapy

In Trans women oestrogen effects in following way:

- Fat may be distributed on the hips
- The size of the penis and testicles may be slightly reduced.
- Some trans women find that erections are harder to achieve
- Some trans women find that erections
- Breasts may feel tender and lumpy and may sometimes increase modestly in size.
- The growth of facial and body hair may become weaker.
• Male pattern baldness may be slowed or stopped, but is not necessarily reversed.

In Trans men testosterone effects in following way:

• It promotes beard and body hair growth
• Male pattern baldness may develop
• The clitoris increases slightly in size
• Libido may be intensified
• Muscle bulk increases
• The voice deepens, but not usually to the pitch of other men
• Periods will stop, although there may be some breakthrough bleeding (in between bleeding) requiring adjustment of dosage
• Some individuals develop acne

The way you respond to hormone treatment will help you and your doctor decide if it is right for you.

What happens if these hormones are taken in over doses?

• Hormone therapy is very sensitive and delicate therapy. So it has to be under doctor’s supervision. If someone takes these hormone doses on its own it can be very fatal and life threatening
• As we know hormones are produced in the body as per the need of the body and functions of the body
• Hormones are produced in very minute quantity as per the need and released in the blood from where they reaches up to their target organs
• Before taking any hormones we need to measure body hormones levels
• Body doesn’t store hormones (that’s why they are produced in required quantity only)
• So when we take external hormones for any reason we need to monitor those doses very carefully

Effects of over doses of hormonal intake

• It can cause thrombosis (blood cells accumulate and make plaque)
• Once thrombosis has been made it can get fix in any artery or vein or capillary (e.g. we drink juice through straw and if some particle gets stuck in that straw)
• It can obscure partial or complete blood flow to that respective part and that part may stops functioning
So if it happens with heart or brain or kidney these organs stops functioning
Excess of hormones makes bone weaker and chances of joint complaints and/or fractures increases
Excess of hormones also increases chances of getting diabetes and blood pressure at very early age
Excess of hormones lowers your body defense mechanism so you are more prone to get HIV, TB, Hepatitis and other infections
Person starts loosing hair at early age and hair becomes thin
Excess of hormones increases the chances of getting cancers to great an extent
More quantity of hormones than required affects sexual activities to the considerable amount
Skin loses its texture
It causes early aging
Nails become brittle

What precautions we can take to avoid such harmful consequences

- Never take hormones on your own, always take it under doctors guidance
- Visit doctor regularly to monitor your doses
- Healthy life style that is regular exercise, walk, proper diet is necessary people taking external hormones
- Person taking hormones have to eat all kinds of vegetables, fruits, cereals, pulses etc.
- Before going for any surgery always inform your doctor about this hormone therapy
DIABETES

- Do you feel your clothes are getting tight or loose since few days
- Do you all know your current weight and height?
- If not let’s check your weight and height
- What should be your ideal weight?
- Do you know anyone from your family having diabetes

What is metabolism?
We get energy from food we eat. But when we eat food it is complex mixture of many vitamins, fats, proteins etc. body can not use these elements in its complex forms. To make these elements in its simple form different organs of the body produces different Juices called as enzymes. These enzymes break down complex food material into simple form which are important for the growth of the body and to bet energy. This process is called as metabolism.

What is diabetes?
Diabetes is a metabolic disorder. It affects all the organs of the body. Blood sugar level increases as a result of less or absence of hormone called as insulin. Insulin is produced by pancreas, in diabetes pancreas gets affected hence there is less or no production of insulin. Insulin plays major role controlling the blood sugar levels in the blood. Insufficiency or absence of insulin results in increase levels of sugar in the blood.

How many types of diabetes are there?

- Diabetes type 1 - no insulin is produced in the body. It is called as insulin dependent diabetes
- Diabetes type 2. - less amount of insulin is produced in the body. It is called non insulin dependent diabetes
- Gestational diabetes - occurs during pregnancy and disappears as soon as baby is delivered.
- Type 2 diabetes is very common. 90% of diabetic patients have type 2 diabetes.

Who can get Diabetes?

- A person over an age of 45 years is more prone to get diabetes ( less than 45 years can also get diabetes)
• If any one has some family member maternal or paternal side having diabetes is more likely to get diabetes
• Over weight - if a person is over weight than required weight s/he is more likely to get diabetes
• Smoking - tobacco increases the chances of getting diabetes at early age
• Alcohol - alcohol consumption affects liver and pancreas hence it affects the production of insulin and thus affects the blood sugar levels
• Aerated drinks - one glass of soda ( non diet ) every day or so increases the chances to get diabetes
• Stress - stress is the major cause of diabetes. Any kind of stress affects the master gland of the body which affects insulin secretion and hence increases your chances to get diabetes
• Hormonal abuse - over use of external hormones ( injections or tablets) affects the master gland in the body which affects the pancreas
• Decrease in testosterone levels ( male sex hormone) increases chances of getting diabetes

What are the signs and symptoms of the diseases
• person feels more hungry than usual
• person feels more thirsty than before
• urge to pass urine increases
• if person has got any injury, it doesn't get heal fast
• person might complaint of having cold and cough or stomach infection quite often

How can we confirm whether person has diabetes or not / what tests you will ask a person to do to confirm the disease

1. blood sugar levels - fasting and post food
2. HbA1c
3. urine analysis

If you don't pay proper attention to the disease you may have to suffer from its complications
• Eyes- Long term of diabetes affect eyes and one can suffer from vision loss
• Ears - it affects ears causing hearing loss
Kidneys - diabetes affects kidneys and if it is not in control kidney stops functioning and may lead to death

Brain- if sugar level increase too high it affects cells of brain and it stop functioning can lead to paralysis (cant move) or coma and death

High level of sugar affects blood circulation and creates load on the heart causing high blood pressure and heart failure in long term

High sugar level causes erectile dysfunction and impotency in males

foot - as mentioned before due to delayed wound healing ulcer in the foot gets worse and may cause gangrene (sever form of infection) and have to cut that part of foot

Prevention and treatment

- Do some physical exercise regularly
- Reduce or stop smoking and drinking alcohol
- Pay attention to your weight and reduce weight if you are over weight
- Don't take toxic hormonal doses
- If you are at risk (if you have any of above mentioned risk factors) keep an eye on blood sugar levels
- if you are diagnosed as diabetic visit a doctor and follow all instructions given by him so that you don't have to face its complications
- Once you are on medicine never stop it without asking your doctor
- Lower down your sugar and fat intake
- stress is the primary cause of getting diabetes so use some relaxation techniques if you are stressed

Diabetes and HIV

Both the diseases are interrelated

If one is suffering from diabetes s/he is having more chances to get any kind of other infection, so chances of getting HIV are very high

If person is having HIV and he is taking treatment for HIV or for its complications those medicines increase blood sugar levels causing diabetes