DRUG ADDICTION & MENTAL HEALTH

MENTAL HEALTH

Mental health is important for the maintenance of physiological health, and social effectiveness. Mental illness is characterized by the following symptoms: (i) depression, (ii) insomnia (lack of sleep) or excessive sleeping, (iii) compulsive actions, (iv) feeling of hopelessness (v) Serious thoughts of suicide, (vi) unreasonable phobias, (vii) paritial or complete loss of memory, (viii) self-destructive behaviour, e.g. excessive gambling drinking, drug abuse, over-eating and extreme dieting, (ix) delusion (false beliefs) and hallucinations, and (x) vocational and social dysfunctioning on aday-to-day basis. Hallucination is a subjective disorder of sensory perception, in which one of the senses in involved in the absence of external stimulations.

Types of Mental disorders:

Mental disorders are of many kinds. There are three main types: Psychosis, neurosis or psychoneurosis, and personality and character disorders.

1. **Psychosis :** It is a severe mental disorder. It arises in the mind itself. In involves gross disorganization of a person's mental capacity and effective response. The patient is "insane" (mad) and out of touch with reality. He cannot cope with the ordinary demands of everyday. Life. He does not know is ill and refuses to get treatment. Psychosis may be associated with physical ailments such as in diabetes, high blood pressure, tuberculosis and brain disorders.

   Psychosis are of many types. Some common types are mentioned.

   (i) **Alcohol physhosis :** It is a mental disorder resulting from alcoholism. It involves organic brain damage as in delirium.

   (ii) **Senile Psychosis :** It is a mental disturbance occurring in old age.

   (iii) **Toxic Psychosis :** It is caused by some toxic substances, whether endogenous exogenous.

   (iv) **Traumatic Psychosis :** It results from physical injury or emotional shock.
2. **Neurosis :** It is a mild mental disorder. It arises as a result of environmental factors on the patient, it involves behavioural disorder. The patient is unable to react normally to life situations. There are excessive or prolonged emotional reactions (anxiety, fear, sadness, tension, vague aches) to stresses, A neurotic is not considered "insane" by his associates. He is aware of his problem and seeks help.
3. **Persnality and Character disorders :** These include epilepsy, mental retardation and childhood behavioural problems. These are minor Mental illness.

PSYCHOLOGICAL DISORDERS:

(i) **Anxiey disorders :** Neurotic axiety develops when there is an over-reaction to stressful events. It is associated with a range of unpleasant bodily symptoms, including palpitation sweating , nausea, trembling, dirrhoea and muscular tension. The commonest anxiety states seen in childhood and adolescence are separation anxiety disorder and school phobia.

(ii) **Obsessive- compulsive disorders :** It is Neurotic disorder. Affected persons manifest overwhelming obsessions and compulsions. They are compelled to perform an action or an idea despite their own attempt to resist it (compulsion). The most common obsession are violence. (Self destructive)

(iii) **Attention deficit disorder :** It is a neurotic mental health problem among children. It observed more in boys than in girls. As a result of this disorder, the boys exhibit under achievement, behavioural problems and a tenedency to be disliked by other children.

(iv) **Mood disorders :** These are the occasional bouts of high or low mood, i.e., elevation and depression. Depression is a neurotic mood disorder characterized by sadness, hopelessness, low self-esteem, decline in interest, energy, concentration and changes in sleep pattern and appetite. The cause may be a death in the family, failure in examination or interview, or losing of a job, this disorder, can be bipolar, i.e. depressed mood may alternate with exaggerated arousal and overactivity, like non-stop and quick talking.

(v) Schizophrenia : It is psychotic disorder

(a) Distorted thoughts,

(b) Laughing or crying at completely inappropriate times.

(vi) Borderline personality disorder (BPD) : This disorder is an emotionally unstable personality disorder, which is characterized by impulsivity, unpredictable moods, outbursts of emotion, behavioural explosions, quarrelsome behaviour, and conflicts with others. These individuals are highly reactive, and generally experience episodic depression, anxiety, and irritability. They also have problems with anger and anger expression. Individuals with BPD often attempt to injure, mutilate or kill themselves.

Drug Dependence :

Meaning : Certain drugs are prescribed by physicians for the prevention or treatment of diseases, or for increasing the physical and mental performance and are withdrawn as soon as the desired effect is achieved. Repeated use of certain drugs on a periodic or continuous basis may make the body dependent on them. This is called drug dependence. The term "drug-depenence" is now-a- days preferred to "drug-addiction or drug habituation" (WHO, 1964). Some people start taking drugs without medical advice due to one reason or the other and become drug dependent.

Types : Drug dependence is of two types Psychological and Physical or Physiologcal.

(i) **Psychological dependence :** it refers to the person's belief that the normal state of well being can be attained only with the drug's action.

(ii) **Physical (Physiological) dependence :** It refers to the person's state when intake of a drug becomes essential to maintain physiological equilibrium. In such a case, the nerous system function normally in the presence of the drug only. The physical dependence is, therefore, also called neuroadaptation.

Types of Habituating Drugs : The habituating drugs are grouped into two main caterories: Psychotropic drugs and psychedelic drugs.

1. PSYCHOTROPIC DRUGS:

These drugs act on the brain and alter behaviour, consiousness and capacity of perception Hence, they are also termed mood-altering drugs. The repeated use of the psychotropic drugs makes the body dependent on them. The psychotropic drugs are classified into four groups: transquillisers, sedavatives and hypnotics, opiate narcotics and stimulants.

(1) **Tranquilliers :** The tranquillisers decrease tension and anxiety, and promote calmness and soothing without sedating or depressant affect and do not induce sleep.

Examples : phenothiazines and benzodiazepines.

(2) **Sedatives and Hypnotics :** The sedatives depress ('swith off') the activities of the central nervous system. They reduce excitement and give a feeling of calmness, relaxation or drowsiness. Higher doses induce sleep. The sleep-inducing drugs are also called hypnotics.

Examples : Brbiturates and benzodiazepines.

(3) **Opiate Narcotics:**

Medical use : The opiate narcotics are drugs that suppress brain activity and relieve pain. They are popularly called pain killers. They also have sedative effect. The opiate narcotics are also used for cough relief and for treatment of vomiting and diarrhoea.

Example : The opiate narcotics are briefly called opiates or opioids. They include opium and its derivatives: certain semisynthetic compounds, namely heroin and smack; and some synthetic drugs such as pethidine and methadone.

(4) Stimulants : The stimulants temporarily stimulate the nervous system: make a person more wakeful, alert and active; and cause excitement. The stimulants do not cause physical dependence because no whithdrawal symptoms appear, psychological dependence is very likely to occur as withdrawl causes depression, anxiety and rrestlessness, The stimulants include caffeine, cocaine, crack, beetelnut and amphetamines.

II. PSYCHODELIC DRUGS:

Hallucinougens : The hallucinogens act ainly on CNS and greatly alter one's thoughts, and feelings and perceptions. The are known as psychedelic drugs (G. psycho=mind, soul; deloum = to manifest). They cause optical or auditory hallucination, i.e., illusions, apparent perception of external objects or sounds not actually present. The illusion may be pleasant or unpleasant. The hallucinogens are also called vision-producing drugs.

Examples : The hallucinogens include chemicals such as LSD (lysergic acid diethylamide), mescaline, psilocybin, psilocin, PCP (phencyclidine piperidine), MDMA (methylenedioxy methamphetamine) and other products of hemp plant.

Major Categories of Psychotropic Drugs, their Effects and clinical Uses

Type of drug	Examples	Effects	Clinical Uses
Sedatives and tranquilizers (depressent)	Barbiturates Benzodiazepines (e.g. Valium)	Depress brain activity and produce feelings of calmeness, relaxation, drowsiness and deep sleep, (high doses)	Hypnotic, antianxiety
Opiate narcotics	Opium, mormphine, Heroin, pethndine, mthadone	Suppress brain function, relieve intense pain (physical and mental) producte temporary euphoria	Analgesic
Stimulants	Caffeine (very mild), amphetamines (including dexamphetamine), cocain and its derivative Novacaine	Stimulate brain (function, relive intense pain physical and mental), produce temporary, euphoria	Analgesic
Hallucinogens	LSD, mescaline, psilocybin, charas, hashih marijuana (bhang)	Alter thought, feelings and perceptions; hallucinations	None

ADOLESCENCE THEIR PROBLEMS: The transition period between 8-18 years for girls, and 7-19 years for boys is called the adolescence. It is poised between- childhood and adulthood which is characterized by rapid growth, and physical and mental development. This period is marked by attainment of sexual maturity (puberty) and increased production of hormones, including sex hormones. This results in frequent shifts of moods and emotional turbublence. The most common problems of all adolescents of both sexes are:

(i) Acne :

(ii) Hypochondria : Most of them are concerned about their health. The eating disorders are abnormal patterns of handling food for fear of obesity and disfigurement of body. These disorders predominantly affect women. They resort to voluntary food restrictions or dieting and try to loose body weight. This disorder is known as anorexia nervosa which may start other types of body complications due to heavy loss of weight.

(**iii) Neurasthenia :** It is characterized by the inability to concertrate or enjoy things, and my lead to irritability, fatigue, insomnia, depression and headache.

(iv) Post-Traumatic stress disorder : It occurs due to rape. Robbery or premarital sexual intercourse which results in unwanted pregnancies. Prgnant girls often visit illegal abortion clinics to hide their action and put their life in a great risk.

(v) Addiction : Addiction to alcohol, drugs, tobacco smoking and chewing is also common. Advertisements, curiosity, peer-pressure, frustration and depression, feeling of independence, etc, may be some of the reasons for such addictions.

(vi) Phobias : These are intense fear of things or creatures like snakes, or situation like vast open places, closed small champber, crowded plases etc.

Adolescent is a period (12 to 20 years) of rapid physical and psychological changes and they should seek all sorts of help from their parents. The parents specially mothers should take complete care of their sons and daughters. The approach of parents towards their growing up children should be more friendly and they should be able to discus most of the issues which come in the life every young individual.

Combination of drugs :

Some addicts use mixtures of the drugs to have immediate ‘kick’ or ‘charge’ Simultaneous use of drug (hemp derivatives, barbiturates, aspirin or anthihistamines) and alcohol may produce dangerous effects, including death When barbiturates and alcohol are taken together, each doubles the effect of the other. A mixture of cocaine and heroin, called speed ball, gives spontaneous kick of cocaine and prolonged pleasure of heroin.

Interaction of Alcohol and other substances of Abuse with some Common Drugs

Drugs	Effects
Alcohol ant other depressants, e.g, barbiturates	Dramatically increased depressant effect
Alcohol+ Antihistamines	Marked drowsiness (normally little or no sedative effect)
Alcohol+ Benzodiazepines	Rapid increase in sedative effect; often dramatic
Alcohol + Marijuana of Hashish	Decreased coordination, increased reaction time, impaired judgement
Alcohol+ Aspirin	Increased risk of damage to gastric mucosa

SMOKING

(1) Smoking of tobacco dried and cured leaves of plant nicotiana tobacum and N. rustica in the form of cigar, Cigarettes bidies ete. Is very toxic to body.

(2) Smoke of tobacco contian about 300 compounds. The mian corpounds are "Nicontine". CO, HCN, Polycyclic aromatic hydrocarbons, certain other stimulating products.
Nicotine in the blood stimulates the nervous system, relax the muscles, release adrenalin hormone and increase
In pregnant ladies growth of foetus decreases and loss of weight may takes place.

DISEASES AND DISORDERS OF SMOKING

(1) **Lung** cancer
(2) **Bronchitis –** Inflamation in respiratory tract and alveoli.
(3) **Emphysema –** Deposition of mucous in the alveoli causes decrease in oxygen absorption considerably and thus tension in the alveoli causes the coughing and break in the respiratory surface there by reducing exchange of gases.
(4) **Heart disease-** Lumen of blood vessels become narrow which increases the blood pressured (hypertension)
(5) Intestinal ulcer and other irregularities of Gut

ALCOHOL AND ALCOHOLISM

(1) Ethyl alcohol is consumed as fermented beverages with low content of alcohol (beer,wine) and as distilled beverages with a relatively high alcohol percentage (Brandy, Rum, Whisky, Gin).
(2) This alcohol is rapidly absorbed from the wall of stomach and enters the blood stream within minutes of ingestion. In the liver alcohol is converted into a more toxic substance acetaldehyde.

EFFECTS OF ALCOHOL DRINKING-

(1) Lowering of blood sugar level (Hypoglycemia)
(2) Alcohol drinking affects the cerebellum part of brain so control and coordination of the body affected.
(3) **Effects on liver -** The liver is the organ most affectec by alcohol.
Excess alcohol in the blood causes increase in the synthesis of fat which is deposited in the liver cell and bile ducts. This results in "Fatty liver syndrome"
The further stages of this are "Liver cirrhosis" and "Billiary cirrhosis diseases". Liver become fibrous.
(4) **Amenesia -** Loss of memory
(5) **Gastritis -** It causes the inflammation in the wall of stomach. In chronic cases the gastric ulcers usually develop.
(6) **Resistance of the body. –** Body resistance against disease is reduced.
(7) Alcohol psychosis

BLOOD BANK

Due to certain factors when blood flows out of the body of any person, then blood is required for performing the vital activities.
It is essential to provide the blood to this person. This phenomenon is known as blood transfusion.
For different persons the blood of matching blood group is required for this purpose the storage of blood is essential.
The storage of blood of different blood groups in protected places are known as "Blood – band"

(i) Blood is mixed with adenine- supplemented citrate-phosphate dextrose and it is stored at $4^0C(39^0F)$ (1 unit = 350 ml)
(ii) Citrate and oxalate binds with free Ca + ion present in blood and prevent the coagulation of blood.
(iii) In this method stored blood can e stored up to 1 month.

DEVICES

There are three types of devices:-
(i) Implants (ii) External Prosthesis. (iii) Disposables

(i) Implants :-

Implants are devices fitted in various body parts to overcome disorders, e.g., heart valves, joins vascular grafts, cosmetic surgery, The material used in implants is nontoxic and biocompatible. Two common types of implants are artificial heart valves and vascular grafts.

1. Artificial Heart Valves

Heart valves (semilunar, bicuspid, tricuspid) are working round the clock, They may become damaged due to wear and tear, rheumatic fever and other diseases. Such valves require replacement with artificial ones as defective heart valves can lead to heart failure. Artificial valves are of two types:

(i) Mechanical or Metalic Valves : They are made of special biocompatible plastic, metal alloys or ceramics, Mechanical or metallic valves develop tendency of blood coagulation. Hence blood anticoagulants are required.

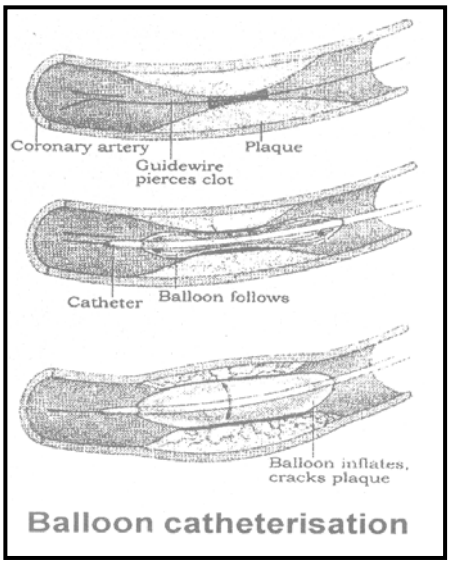
(ii) Tissue valves : They are obtained directly from pigs, cadavers or made from pericardium of animals. The valves have the tendency to calcify with time, especially in young.

2. Vascular Grafts or Artificial Arteries

Parts of blood vessels, especially arteries may become defective the due to blockage, atherosclerosis, disease or aneurysm (dilation like a ballon with changes of rupturing and consequent death) requiring replacement. Artificial arteries or vascular grafts are pliable tubs generally made of fibrous plastic of Dacron (terylene) or Teflon (poly tetra fluoro ethylene) – Saphenous vein or internal mammary artery.

Coronary Artery Bypass Grafting (CABG):

It is a way of increasing the blood supply to the heart. In this surgical procedure. A blood vessel from another part of the body is used to bypass the blocked region of a coronary artery. The two vessels used most often are the saphenous vein from the leg, and the internal mammary artery from the chest.



Balloon catheterisation

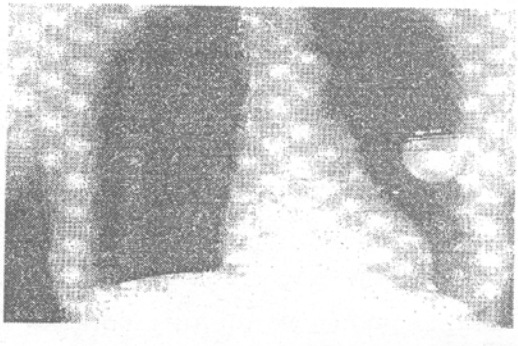
P.T.C.A. (Percutaneous translumianl coronary angioplasty):

It is a technique for unblocking coronary arteries that have atherosclerotic plaque. A ballon catheter is inserted into an aretery of the arm of thigh and gently guided through the arterial system under X-ray observation artery. Then. While dye is being released, angiograms are taken to localize the plaques. Next, the catherter is advanced to the point of obstruction and a ballon-like deveice is inflated with air to squash the plaques against the blood vessel wall, there by clearing the channel for the blood even in cases where it had previously been partially blocked.

(ii) Prosthetic Cardiac Pacemaker :-

Cardiac pacemaker replaces the natural electrical stimulation of heart by a small electronic circuitry inserted within the body subcutaneously Lithium composite battery provides power for about 10 years. It transmits repetitive electrical impulses to the heart in such a manner that the

Heart rate is maintained at a suitable level. It the heart operats normally, the mechanical pacemaker is inhibited.


X-Ray showing Pace Maker in position

In the patients having the symptoms of ventricular escape (strokes-Adams syndrome), in which the atrial impulse suddenly fails to be transmitted to the ventricle, which may last for tew seconds to few hours even, the artificial pacemaker is connected to the right ventricle for controlling its rhythm. The artificial pacemaker consists of a pulse-generator containing cell (Lithum composite battery) to produce electrical impulse, the lead in the form of a wire, which transmits the impulse and an electrode, which is connected to the portion of the heart where impulse is to be transmitted.

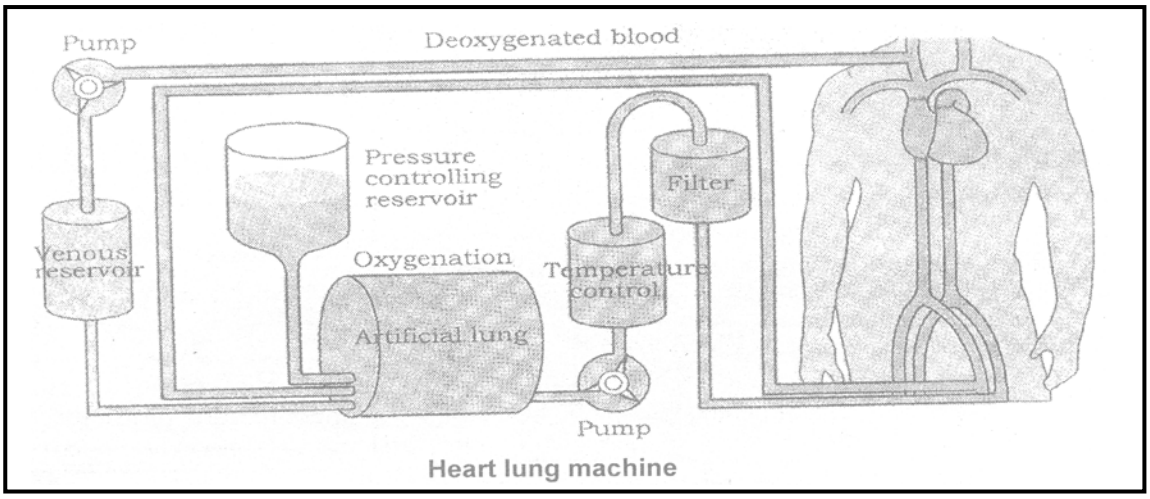
External prosthesis

It is a device which ca be attached to body for overmcoming a person who has undergon amputation e.g., artificial hand/arm, foot, leg, denture (artificial teeth), etc, P.K.Sethi of jaipur has developed a highly sophisticated light weight solid rubber wood aluminium foot which can be rotated and bent just like a natural foot. It is popularly known as jaipur foot. Artificial arms are equally successful. A myoelectric arm has also been developed which can move prosthetic wrist and fingers to hold objects.

(iii) Disposable devices:-

Oxygenators or Heart lung machine (Bubble oxygenators-most common)

Heart lung bypass is resorted to during open heart or lung surgery. Function of heart is performed by roller pump while that of lung is taken over by oxygenator. Oxygenator is a disposable device or artificial lung for oxygenation for blood.

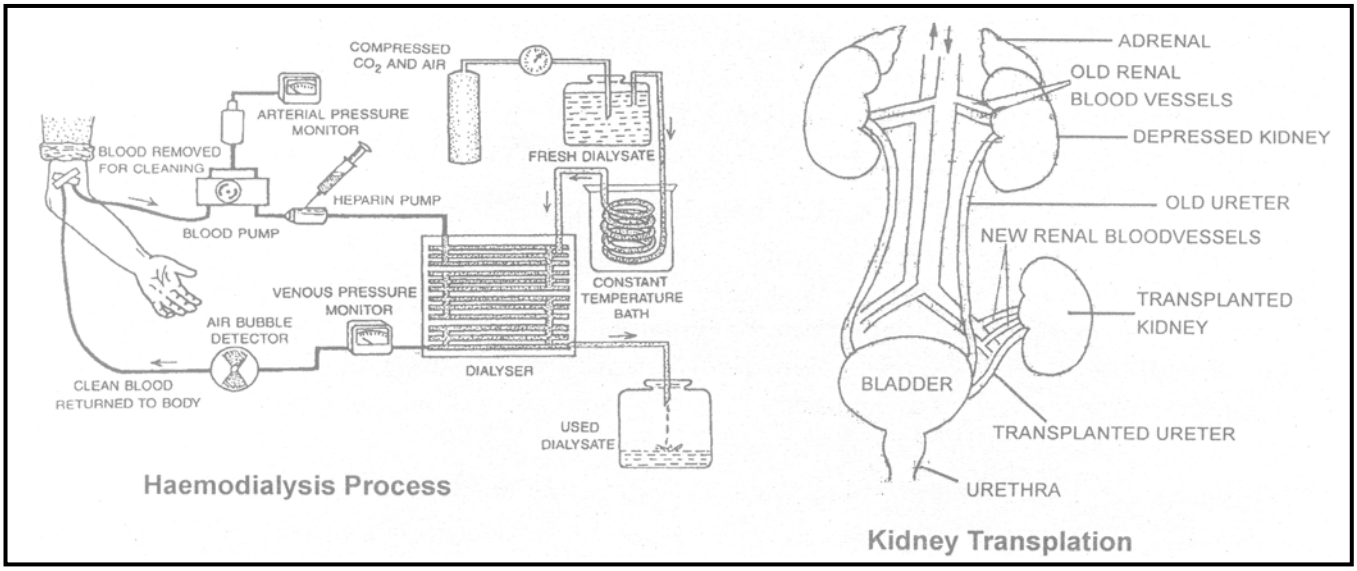


Heart lung machine

Blood Dialyser/Haemodalyser or Artificial Kidney:

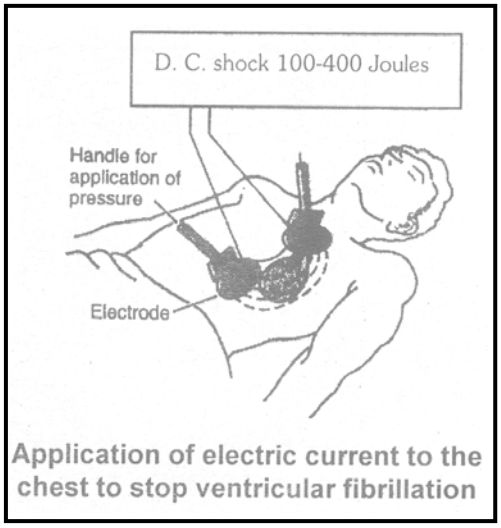
The blood urea level rises abnormally (uremia) in patients suffering from failures. An artificial kidney is used for removing excess urea from the blood of the patient by a process called hem dialysis. Blood is taken out form an artery of the patient, cooled to 0^0C, mixed with an anticoagulant, such as heparin, and then pumped into the apparatus called the artificial kidney. In this apparatus, blood flows through channels or tubes bounded by cellophane membrane. The membrane is impermeable to macromolecules, such as plasma proteins, but permeable to small solutes, such as urea, uric acid, creatinine and mineral ions. The membrane. Separated the blood flowing inside the channels or tubes from a dialyzing fluid flowing outside the membrane. The dialyzing fluid conatins some small solutes and mineral ions, but does not contain nitrogenous waste products, such as urea, uric acid and creatinine. So, these wastes diffuse from the blood to the dialyzing fluid across the cellophane membrane, following the concentration gradeient. Thus, the blood is considerable cleared of nitrogenous waste products without losing plasma proteins. Such a process of separating small solutes from macromolecular colloids with the help of a selectively permeable membrane is called dialysis. The blood coming out of the artificial kidney is warmed to body temperature, mixed with an antiheparin to restore its normal coagulability, and returent to a vien of the patient. Hemodialysis saves and prolongs the life of many uremic patients.

If the kidney failure cannot be treated, by drug of dialysis, the patients are advised for kidney transplantations.



Defibrillator –

Fibrillation is abnormal and asynchronous contractions of the heart muscles so that the effectiveness of heart pumping is reduced or completely lost. Atrial fibrillation may occur in myocardial infarction, and in rheumatic heart disease. A strong electrical current passed across the chest for the short period of time can stop ventricular fibrillation; this is called defibrillation. It is achieved by a defibrillator that gives the electric shock through large-paddle shared electrodes pressed against the skin of the chest. Now battery operated implantable devices are available for patients suffering from arrhythmic disorder.



Endoscopy (Endo= Within, Scope = View)

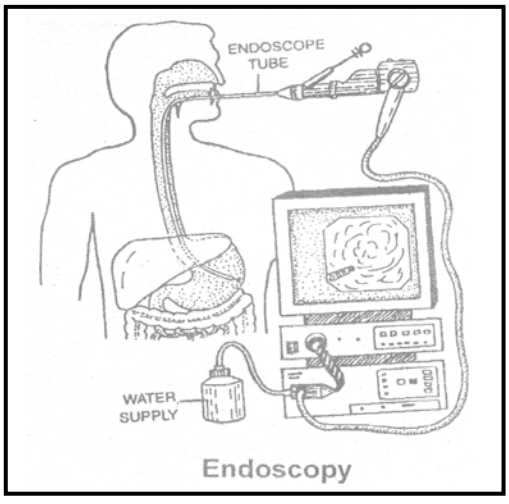
The endo-scope consist of long flexible tube attached to a handset. The tube is inserted through an opening into the body. This tube have many channel.

(1) One channel for electric cable the electric signal from the camera (tip of tube) is sent up the
tube along this electric cable and feed into a videomonitor where a magnified image is seen.

(2) One channel for transmit light to the tip contain bundles of optical fibres inside the endoscope.

(3) One channer in the endoscope carries air and water making it possible to wash and dry the surgical site.

(4) One channel is for miniature surgical instruments such as forceps at the tip that are controlled by a cable running through a parallel channel. Can also be taken to the site where surgery is
needed. A wide variety of instrument can be fitted to the endoscope; toothed biopsy forceps allow samples of tissue to be removed for analysis:
Metal snares carry high frequency electric current that can coagulate blood vessels.



Types of Endoscopes:

(Named afther the part of the body they are desined to view)

(1) **Gastroscope :** This is used to examine the stomach for gastric ulcer.

(2) **Laproscope :** (Lapro= abdomen) This is used to examine the cyst or infection of the uterus, fallopian tube and ovaries.