Apollo MedSkills
Leading the Skilling Revolution

N·S·D·C
National Skill Development Corporation
Transforming the skill landscape

DIALYSIS TECHNICIAN

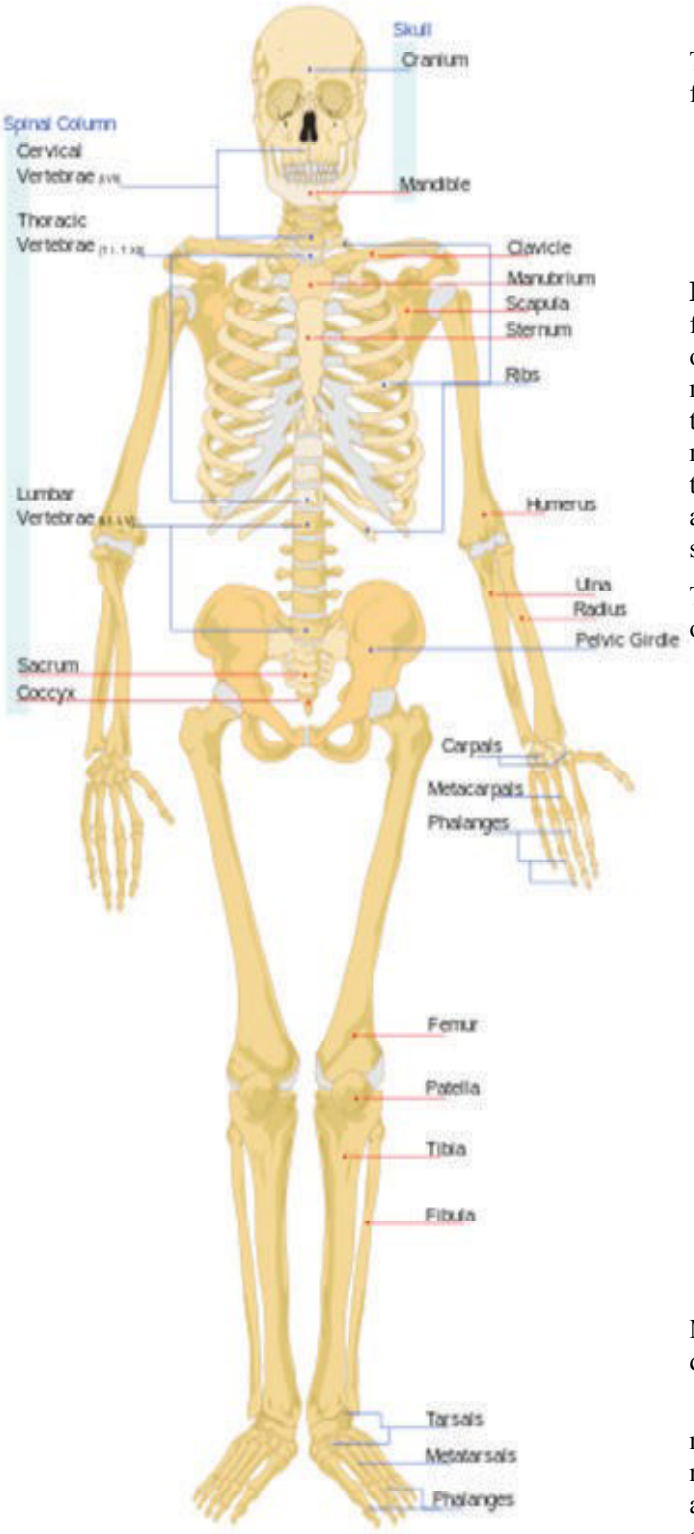
DIALYSIS TECHNICIAN

INDEX

INDEX

Skeletal system:

The skeletal system in an adult body is made up of 206 individual bones. These bones are arranged into two major divisions: the axial skeleton and the appendicular skeleton.



The axial skeleton runs along the body's midline axis and is made up of 80 bones in the following regions:

- Skull
- Hyoid
- Auditory ossicles
- Ribs
- Sternum
- Vertebral column

The appendicular skeleton is made up of 126 bones in the following regions:

- Upper limbs
- Lower limbs
- Pelvic girdle
- Pectoral (shoulder) girdle.

Muscular system: The muscular system is responsible for the movement of the human body. Attached to the bones of the skeletal system are about 700 named muscles that make up roughly half of a person's body weight. Each of these muscles is a discrete organ constructed of skeletal muscle tissue, blood vessels, tendons, and nerves. Muscle tissue is also found inside of the heart, digestive organs, and blood vessels. In these organs, muscles serve to move substances throughout the body.

The muscular system can be broken down into three types of muscles: skeletal, smooth and cardiac.

- Skeletal muscles are the only voluntary muscle tissue in the human body and control every action that a person consciously performs. Most skeletal muscles are attached to two bones across a joint, so the muscle serves to move parts of those bones closer to each other.
- Visceral, or smooth, muscle is found inside of organs such as the stomach, intestines, and blood vessels. The weakest of all muscle tissues, visceral muscles send signals to contract to move substances through the organ. Because visceral muscle is controlled by the unconscious part of the brain, it is known as involuntary muscle as it cannot be con- trolled by the conscious mind.
- Cardiac muscle is responsible for pumping blood throughout the body. The heart's natural pacemaker is made of cardiac muscle that signals other cardiac muscles to contract. Like visceral muscles, cardiac muscle tissue is controlled involuntarily.

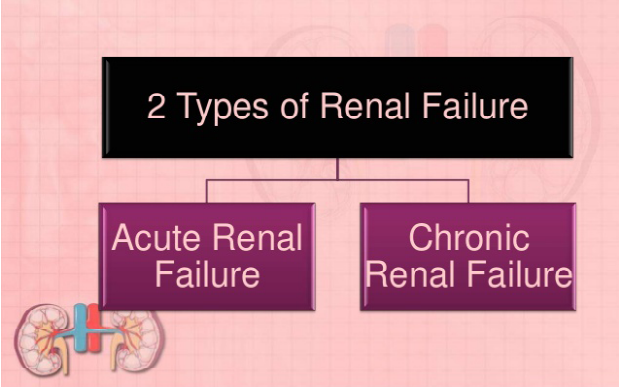
Muscles are further classified by their shape, size and direction.

The deltoids have a triangular shape. The serratus muscle, which originates on the surface of the second to ninth ribs at the side of the chest and runs along the entire anterior length of the scapula, has a distinguishing saw-like shape. The rhomboid major is a diamond shape.

RENAL FAILURE AND MANAGEMENT

Kidney failure, also known as renal failure or renal insufficiency, is a medical condition of impaired kidney function in which the kidneys fail to adequately filter metabolic wastes from the blood.

Renal failure is of basic two types:-



Acute renal failure

DEFINITION

Acute Kidney Injury or Acute renal failure [ARF] is a clinical syndrome characterized by a rapid loss of renal function with progressive azotemia.

Major Causes

Major causes of AKI include:

- Decreased blood flow to the kidneys.
- Direct damage to the kidneys.
- Blockage of the urinary tract.

CLINICAL MANIFESTATIONS

URINARY SYSTEM : Decreased urinary output, proteinuria, casts, decreased specific gravity, decreased osmolality, increased urine sodium.

CARDIOVASCULAR : Volume overload, heart failure, hypotension (early) ,hypertension (after development of fluid overload) , pericarditis, pericardial effusion, dysarrhythmias.

RESPIRATORY : Pulmonary edema, kussmaul respiration , pleural effusions.

GASTROINTESTINAL: Nausea and vomiting, anorexia, stomatitis, bleeding, diarrhea, constipation.

HEMATOLOGIC: Anemia, increased susceptibility to infection, leukocytosis, defect in platelet functioning.

NEUROLOGIC: ethargy, seizures, asterixis, memory impairement.

METABOLIC: Increased blood urea nitrogen, increased creatinine, increased potassium , decreased sodium, decreased pH, decreased bicarbonate, decreased calcium, increased phosphate.

DIAGNOSTIC STUDIES

HISTORY COLLECTION: A thorough history is essential.

URINANALYSIS: It is an important diagnostic test. Urine is assessed for osmolality, sodium content and specific gravity.

RENAL ULTRASOUND: It is useful for evaluating for possible renal disease and obstruction of the urinary collection system.

COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING : It can identify lesions and masses , as well as obstruction and vascular abnormalities.

RENAL BIOPSY : It is useful in the diagnosis of intra renal cause of acute renal failure.

MEDICAL MANAGEMENT

Treatment is focused on removing the cause of the kidney failure.

Other treatments are :

- Correct dehydration: Intravenous fluids, with electrolyte replacement if needed
- Fluid restriction: For those types of kidney failure in which excess fluid is not appropriately eliminated by the kidneys
- Increase blood flow to the kidney: Usually related to improving heart function or increasing blood pressure

History, Types of Dialysis

Introduction

Dialysis is provided by a team that includes technicians, nurses, dieticians, social workers, doctors—and, most important of all, patients.

With good dialysis, many people with CKD can lead full and active lives. For others, having a good quality of life is harder.

Overview of Dialysis

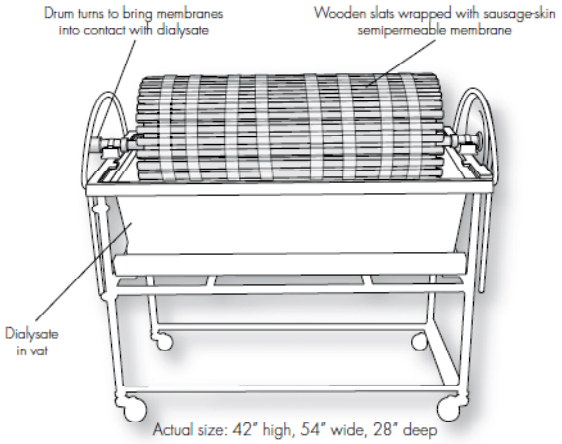
Dialysis is the main treatment for end-stage renal disease (ESRD). It replaces three main kidney tasks: removing wastes from the blood, removing excess fluid from the blood, and keeping electrolytes (electrically charged particles) in balance.

There are two main types of dialysis:

Haemodialysis (HD), and

Peritoneal dialysis (PD). **Invention and the process involved in the evolution of dialysis:**

Dialysis as a treatment for kidney failure was not always the sleek, high-tech process it is today. The first haemodialysis treatment in a patient, using cellulosic membrane, was done in 1943 using a rotating drum artificial kidney developed by a Dutch doctor named Willem Kolff. Before that time, patients with kidney failure had no effective treatment; the disease was always fatal.



Rotating drum device

Kolff's rotating drum device featured a large wooden wheel dialyzer made of slats wrapped with 30–40 meters of sausage casing (the cellophane membrane). To gain access to the blood, a fresh artery and vein had to be used for each treatment and tied off after. Because a patient had limited blood vessels, dialysis could only be used to treat patients whose kidneys were expected to recover.

The science and technology of dialysis made great strides during the Korean War (1950–1953). Dialysis was used to treat soldiers with acute renal failure, improving their chances of survival.

DIALYSIS

People with end stage renal disease can be treated with hemodialysis or peritoneal dialysis.

DEFINITION

Dialysis is a technique in which substance move from the blood through a semi permeable membrane into a dialysis solution.

OBJECTIVES OF DIALYSIS

- To remove the end products of protein metabolism such as urea and creatinine from the blood.
- To maintain a safe concentration of serum electrolytes.
- To correct acidosis and replenish the bicarbonate levels of the blood.
- To remove fluid from blood.

PRINCIPLES OF DIALYSIS

Solutes and water move across the semipermeable membrane from the blood to the dialysate or dialysate to blood in accordance with concentration gradients.

DIFFUSION, OSMOSIS AND ULTRAFILTRATION

Diffusion is the movement of solutes from an area of greater concentration to area of lesser concentration.

- Toxins and wastes in the blood are removed by diffusion.
- The dialysate is a solution made up of all the important electrolytes in their ideal extracellular concentration.
- The electrolyte level in the patients blood can be brought under control by properly adjusting the dialysate bath.
- The semipermeable membrane impedes the diffusion of large molecules such as red blood cells and proteins.

Osmosis is the movement of fluids from an area of lesser to an area of greater concentration of solutes.

- Glucose is added to the dialysate and creates an osmotic gradient across the membrane, pulling excess fluid from the blood.

Ultrafiltration is defined as water moving under high pressure to an area of lower pressure.

PATIENT VITALS AND MONITORING

Patient Report Reading

Data collection:

- Begins when patient begins when patient enters the unit
- Interview patient Interview patient regarding significant inter-dialytic events

Assessment:

Completed by both Patient Data Collection & Assessment

- Pre dialysis purpose:
  - Obtain baseline information for planning the dialysis treatment

History collection

- This will be the key to perceive real "implications of health" associated with decreased kidney function in CKD.
- In a newly diagnosed CKD patient, the history should be focused to differentiate an acute kidney injury / disease from CKD and get clues for duration and chronicity of kidney dysfunction.
- Any previous kidney function tests, urine findings, and imaging studies should be obtained and reviewed. If CKD diagnosis is confirmed, history should be focused to find an underlying cause.
- Patients should be questioned for any sign or symptom of an underlying (causative or contributory) disease(s) for CKD.
- All medications (including current and prior medications, over the- counter and non-prescription medications) should be carefully reviewed and documented.
- Any previous surgical intervention, especially genitourinary interventions, should be reviewed. A detailed family history should be obtained to exclude presence of a familial, hereditary kidney

Physical examination of a CKD patient

In each visit need to determine patient

- Patient's general health,
- nutritional status,
- appetite, and
- weight changes
- Blood pressure and pulse should be assessed both in upright and supine positions for determining orthostatic changes.
- Hypertensive or diabetic changes in the eye should be examined by fundoscopy.
- Patients should be examined for signs of hypovolemia or volume overload.
- Skin should be evaluated for finding an underlying disease and signs of CKD (anemia, pruritus, sallow appearance). A careful evaluation of the cardiovascular system is important.
- The abdomen should be palpated for large kidneys and bladder distention.
- Abdominal bruits should be noted for potential renovascular disease.
- Costovertebral tenderness may be a sign of infection and/or stone disease in kidneys.
- In men, rectal examination is required for determining prostatic enlargement.
- Neurological evaluation should be focused on signs of neuropathy and muscular problems.
- Examination for any sign of a systemic disease causing or contributing to CKD should be carefully sought.

Pre-treatment assessment

It helps to determine patient -

- Fluid status
- Blood pressure
- Pulse
- Respiration information
- Temperature
- Access
- General status

Vascular access – Temporary & permanent

Introduction

Vascular access makes chronic haemodialysis possible because it allows the care team to "access" the patient's blood. An access can be internal (inside the body) or external (outside the body). It must:

- Allow repeat access to the blood
- Handle blood flow rates that will ensure effective treatments
- Be made of materials that are not prone to causing reactions or infections

Types

The three main types of access are

- Fistulae
- grafts, and
- catheters.

To create a fistula, a surgeon sews an artery and a vein together, most often in an arm.

In 4–6 weeks, high-pressure blood flow from the artery thickens the vein wall and makes it dilate (enlarge) so large needles can be used. Because a fistula is below the skin and is the patient's own tissue, it is less prone to infection and clotting than other types of access. A fistula can last for years.

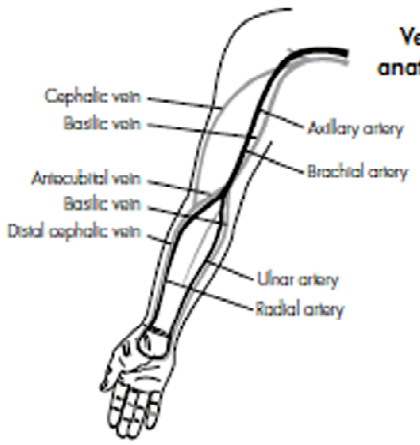


Figure 1: Venous/arterial anatomy of the arm

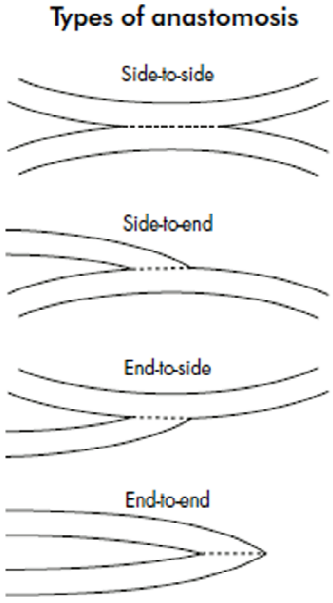
To insert a **graft**, a surgeon links an artery and vein with a piece of artificial blood vessel. Grafts are more prone to stenosis (narrowing of blood vessels), which can cause thrombosis (blood clots). Grafts are also more prone to infection than fistulas, and have a shorter useful lifespan (less than 5 years on average). Grafts are an option for patients who do not have blood vessels suited to create a fistula.

A **catheter** is a plastic, hollow tube placed in a deep central vein in the chest or leg .They allow short-term or long-term access to patients' blood. Deep central veins have a blood flow rate that allows adequate treatment. Catheters are made of plastic that is foreign to the body, and they pass through the skin, creating a portal for bacteria. They are prone to stenosis, blood clots, and infection.

FISTULA PROCEDURE

There are four ways that arteries and veins can be joined to create an AVF (see Figure 4

After the incision is closed, a thrill, or purring vibration, should be present over the new fistula.



PROS AND CONS OF FISTULAE

Pros

The AVF is the "gold standard" for haemodialysis access. In general, it lasts longest and has the fewest problems, including infection. Using the patient's own vessels is always best when it can be done.

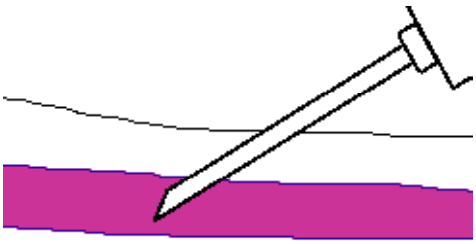
PREPARATION OF THE SITE FOR BLOOD SAMPLING

BLOOD SPECIMEN COLLECTION AND PROCESSING

The first step in acquiring a quality lab test result for any patient is the specimen collection procedure. The venipuncture procedure is complex, requiring both knowledge and skill to perform. Several essential steps are required for every successful collection procedure:

Venipuncture Procedure:

1. The first step to the collection is to positively identify the patient by two forms of identification; ask the patient to state and spell his/her name and give you his/her birth date. Check these against the requisition (paper or electronic).
2. Check the requisition form for requested tests, other patient information and any special draw requirements. Gather the tubes and supplies that you will need for the draw.
3. Position the patient in a chair, or sitting or lying on a bed.
4. Wash your hands.
5. Select a suitable site for venipuncture, by placing the tourniquet 3 to 4 inches above the selected puncture site on the patient.
6. Do not put the tourniquet on too tightly or leave it on the patient longer than 1 minute.
7. Next, put on non-latex gloves, and palpate for a vein.
8. When a vein is selected, cleanse the area in a circular motion, beginning at the site and working outward. Allow the area to air dry. After the area is cleansed, it should not be touched or palpated again. If you find it necessary to reevaluate the site by palpation, the area needs to be re-cleansed before the venipuncture is performed.
9. Ask the patient to make a fist; avoid "pumping the fist." Grasp the patient's arm firmly using your thumb to draw the skin taut and anchor the vein. Swiftly insert the needle through the skin into the lumen of the vein. The needle should form a 15-30 degree angle with the arm surface. Avoid excess probing.



10. When the last tube is filling, remove the tourniquet.
11. Remove the needle from the patient's arm using a swift backward motion.
12. Place gauze immediately on the puncture site. Apply and hold adequate pressure to avoid formation of a hematoma. After holding pressure for 1-2 minutes, tape a fresh piece of gauze or Band-Aid to the puncture site.
13. Dispose of contaminated materials/supplies in designated containers.

Fingerstick Procedure:

1. Wash your hands.
2. The best locations for finger sticks are the 3rd (middle) and 4th (ring) fingers of the non-dominant hand. Do not use the tip of the finger or the center of the finger. Avoid the side of the finger where there is less soft tissue, where vessels and nerves are located, and where the bone is closer to the surface. The 2nd (index) finger tends to have thicker, callused skin. The fifth finger tends to have less soft tissue overlying the bone. Avoid puncturing a finger that is cold or cyanotic, swollen, scarred, or covered with a rash.
3. When a site is selected, put on gloves, and cleanse the selected puncture area.
4. Massage the finger toward the selected site prior to the puncture.
5. Using a sterile safety lancet, make a skin puncture just off the center of the finger pad. The puncture should be made perpendicular to the ridges of the fingerprint so that the drop of blood does not run down the ridges.

Blood Collection Supplies

Tourniquet

- Tourniquets should be placed 8 - 10 cm above the puncture site (exception: pediatric patients and smaller arms).
- Tourniquets should not be left on the patient for more than 1 minute.

Multi-sample Needles

- Sterile, single use, double ended multiple sample needles, Eclipse safety guard, packaged in a plastic case. These needles are used with the Vacutainer system for the majority of collections.
- The higher the gauge number of a needle, the smaller the bore (opening) it has: available in 21G (green) and 22G (black).
- Routinely 21G needles are used for faster tube filling rates, and 22G needles are used on smaller veins.

Butterfly Needles

- Winged infusion sets with a safety device.
- Used for blood culture collections.
- Used on difficult veins such as hand or foot veins.
- May also be used for syringe collection.

Needles (Syringe)

- Sterile, single use needles used with a syringe for blood collection.
- Used for smaller veins that may collapse with Vacutainer collection.
- Samples are transferred from the syringe into blood collection tubes.

Vacutainer Holders

- Single-use holders are used for Vacutainer system collections.
- Larger sizes available for blood culture collections.

Antiseptics

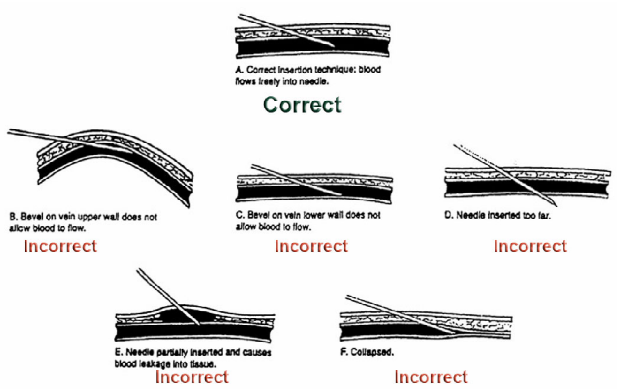
- 70% isopropyl alcohol is used for routine blood collections.
- PVP Iodine is used for blood culture collections in combination with 70% isopropyl alcohol.

Needle Positioning

The angle of insertion of the needle should not fall below or exceed 15 - 30 degrees.

Correct

Incorrect



Areas to Avoid When Choosing a Site for Blood Draw:

Certain areas are to be avoided when choosing a site for blood draw:

- Extensive scars from burns and surgery - it is difficult to puncture the scar tissue and obtain a specimen.
- The upper extremity on the side of a previous mastectomy - test results may be affected because of lymphedema.
- Hematoma - may cause erroneous test results. If another site is not available, collect the specimen distal to the hematoma.

SAMPLE COLLECTION

Preparation of the patient for sample collection

- Introduce yourself to the patient, and ask the patient to state their full name.
- Check that the laboratory form matches the patient's identity (i.e. match the patient's details with the laboratory form, to ensure accurate identification).
- Ask whether the patent has allergies, phobias or has ever fainted during previous injections or blood draws.
- If the patient is anxious or afraid, reassure the person and ask what would make them more comfortable.
- Make the patient comfortable in a supine position (if possible).
- Place a clean paper or towel under the patient's arm.
- Discuss the test to be performed (see Annex F) and obtain verbal consent. The patient has a right to refuse a test at any time before the blood sampling, so it is important to ensure that the patient has understood the procedure.

Perform hand hygiene and put on gloves

- Perform hand hygiene; that is
  - wash hands with soap and water, and dry with single-use towels; or
  - if hands are not visibly contaminated, clean with alcohol rub – use 3 ml of alcohol rub on the palm of the hand, and rub it into fingertips, back of hands and all over the hands until dry.
- After performing hand hygiene, put on well-fitting, non-sterile gloves.

PREPARATION AND TRANSPORT OF THE SPECIMEN

Specimen requirements include information such as

- specimen volume,
- collection
- transport containers
- transport temperature.

Proper Identification Of Specimens

Specimen Labels

All specimens should be labeled at the time of collection with at least two patient identifiers.

1. The patient's name (full last name, then full first name or initial) or a unique ID code is always required.
2. The second patient identifier may be one of the following:
    - Date of birth (month/date/year)
    - Other unique patient identifier that is also on the test requisition, e.g. hospital or office ID code or file number
    - Requisition number or specimen barcode label
    - Other barcode labels can be used if barcode matches the unique identifiers on the printed requisition (the barcode does not need to be human readable)

Each specimen must have a securely affixed label with the following information:

- the patient's name written exactly as it appears on the test requisition
- a second patient identifier as noted above
- date of collection

If the label is hand-written, use a ballpoint pen–do not use a felt tip pen. If glass slides are submitted, use a pencil for labeling the frosted end–two identifiers are preferred although patient's name alone is acceptable.

Test Requisition

Specimens must be accompanied by a paper requisition, prepared either by hand or printed from an electronic ordering system. The requisition, at a minimum should contain the following information:

- Adequate patient identification information (e.g., name, address, telephone number, medical record number
- Patient gender
- Patient date of birth, or age
- Name and address of physician ordering the test
- Test(s) requested
- Date of specimen collection, when appropriate
- Source and type of specimen and time of collection, when appropriate
- Clinical information, when appropriate

Packaging

The following are the minimum specimen packaging guidelines that should be followed when submitting specimens.

1. Ensure that all specimen container caps and lids are properly tightened to prevent leakage.
2. Properly complete the requisition.
3. Collect the specimen(s) and transfer to a proper transport container, if needed. Double check the specimen container to ensure that the device is not beyond its stated expiration date.
4. If using a manual test requisition, remove a -self-stick label from the bottom of the pre-printed paper test requisition and affix this label to the specimen transport container. Place on the container so that the label does not cover the handwritten patient name.
5. Fold the top copy (original) of the test requisition in half widthwise (top to bottom) with the patient's name and bar code facing out. Retain the second copy for your files.
6. The specimen transport bag has two pouches. Place the specimen container(s) in the front pocket. Insert the requisition into the rear pocket with the bar code visible in the bottom corner of the bag.

Patient details

Name : _____

Address : _____

Telephone number : _____

Date of Birth : _____

Gender : ☐ Male ☐ Female

Requester details:

Name : _____

Organization : _____

Address : _____

_____

Telephone number : _____

Sample details:

Urgency: ☐ NORMAL ☐ URGENT

☐ Fasting ☐ Non-fasting

Sample takent from patient :

Date: _____ (dd/mm/yyyy)

Time: _____ (hh/mm)

☐ Blood ☐ Urine ☐ Swab ☐ Tissue

☐ Faeces ☐ Sputum ☐ Fluids ☐ Cytology

☐ Other, namely: _____

Relevant clinical information:

Drug therapy: _____ Last dose: _____

Date: _____(dd/mm/yyyy)

Time: _____(hh/mm)

Other relevant clinical information: _____

_____

_____

DIALYSIS MACHINE PREPARATION

Set up the equipment before each treatment and check the dialysate, extracorporeal circuit, dialyzer, and alarms.

Dialysate

Dialysate fluid helps remove wastes from the patient's blood. It can also replace needed substances, such as bicarbonate, to maintain the patient's acid-base balance. Since only a semipermeable membrane keeps the patient's blood apart from the dialysate, the exact make-up of the dialysate is key to your patient's well-being.

Dialyzer and Bloodlines

The extracorporeal circuit includes the:

- Dialyzer
- Bloodlines
- Monitoring lines
- Heparin line
- Transducer protectors

Priming and recirculation

Key Points to Learn about Priming and Recirculation

Learn the correct way to :

- Do priming and recirculation
- Remove air from the bloodlines and dialyzer (air bubbles can blood clotting during the treatment)
- Test to be sure the germicide has been rinsed out of a reprocessed dialyzer

Prepare the bloodlines and dialyzer for the treatment by priming (rinsing and filling the extracorporeal circuit with saline) them with normal saline. Then attach the venous and arterial bloodlines together to form a loop, and recirculate the prime (send it around the loop). Priming removes air and germicide from the bloodlines and dialyzer; recirculation keeps the process going. During recirculation, UF and diffusion help "dialyze off" any germicide that is left. The germicide moves from the blood side of the dialyzer to the dialysate side, then down the drain. Priming also warms the saline so the patient does not get too cool when the treatment begins.

Pre dialysis safety check

Completing this check is vital for patient safety.

Key Points to Learn about Predialysis Alarm Checks

Learn how to

- Complete these extracorporeal alaram checks:
  - **Air detector** (detects air in bloodline after the dialyzer)
  - **Blood leak detector** (detects blood in the dialysate after the dialyzer)
  - **Arterial pressure high/low alarm** (detects pressure in the arterial bloodline that is outside set limits)
  - **Venous pressure high/low alarm** (detects postdialyzer pressure that is outside set limits)

if each of the above alarms is working (1) the blood pump will stop, (2) the venous line should clamp (3) the audio alarm will sound, and (4) the visual alarm message will appear.

- Complete the following dialysate alarm checks:
  - **Conductivity alarm** (detects if dialysate concentration is outside set limits)
  - **Temparature alarm** (detects if dialysate temperature is outside set limits)
  - **Ph alarm** (if present, detects if dialysate temparature is outside set limits)

If each of the above alarms is working, the machine will go into bypass mode (dialysate flow to the dialyzer should stop)

- Completetghe UF check to verigy that the volumetric / fluid removal components of the machine are working
- Complete the negative germicide test to verify that the germicides has been removed from a reprocessed dialyzer

PREPARATION AND POSITIONING OF THE PATIENT FOR DIALYSIS

Positioning of the patient for dialysis

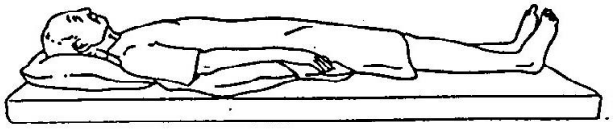
Bed rest is an important part of treatment.

If the patient is unable to move himself, he must be moved and repositioned.

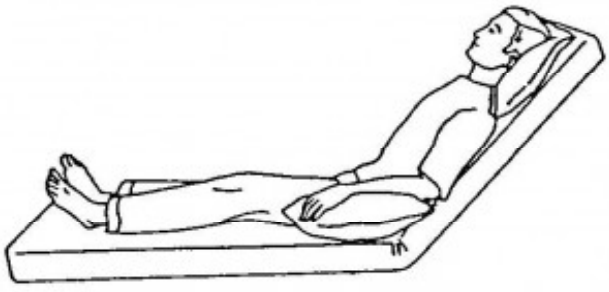
If the patient can move himself, he must be encouraged to do so; also, check to see if his posture is good.

Several positions should be used to provide comfort, support, and good body alignment.

Positions include ***supine (back lying) ,Fowler's position (semi-upright with back and knee rests elevated)*** are suitable during dialysis.



Supine Position



Fowler's Position

Position changes provide alternate weight-bearing surfaces to relieve pressure, improve circulation, and preserve muscle function as different muscle groups contract and relax.

Body Alignment in Bed.

Good body alignment can be achieved in any of the bed rest positions (b above). The following points should be checked.

1 Head should be in midline with the trunk.

2 Back should be straight, with normal body curves (cervical, thoracic, and lumbar) maintained.

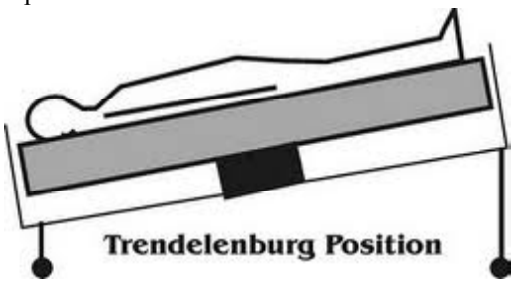
3 Ribs should be elevated to prevent constriction of the chest.

4 Arms and legs should be in a position of function (the position for maximum usefulness of the joints, feet, and hands).

Position used to Treat Hypotension during dialysis

Hemodialysis and ultrafiltration results in fluid removal and possible decrease in intravascular volume. As a result, patients may become hypotensive.

Patients are placed in Trendelenburg position with the belief that it causes increased cardiac filling and increased blood pressure.



Patient privacy during dialysis

- All patients are entitled to have their privacy maintained when receiving medical treatment.
- All medical care providers, those under the supervision of medical care providers, and all other employees in medical facilities must do their utmost to maintain the dignity and privacy of the patients during all stages of medical care and in all situations.
- If it is not possible to treat patients individually, medical care providers must ensure that the patients' beds are concealed by a curtain or divider so that they are not unnecessarily exposed.
- Medical care providers must prevent the disclosure of patients' medical information to others as much as possible, while talking to the patients, in discussions with other medical care providers, and when information is posted in public places.
- The medical facility administration must establish instructions and procedures to guarantee that patients' dignity and privacy are maintained in that facility.

Patient clothing's during dialysis

- Hospital gown as per policies of the hospital
- Mask to patient
- Bed sheet to cover patient body
- Blanket if required

Starting Hemodialysis:

Pre dialysis Treatment Procedures

TREATMENT PLAN

Dialysis is done according to a doctor's prescription. Each patient has a specific treatment plan. It is vital to know where to find these plans and how to carry them out as ordered. The physician continually evaluates each patient and varies the treatment plan, when needed, by writing new orders.

EQUIPMENT PREPARATION

Set up the equipment before each treatment and check the dialysate, extracorporeal circuit, dialyzer, and alarms.

Dialysate

Dialysate fluid helps remove wastes from the patient's blood. It can also replace needed substances, such as bicarbonate, to maintain the patient's acid-base balance. Since only a semipermeable membrane keeps the patient's blood apart from the dialysate, the exact make-up of the dialysate is key to your patient's well-being.

Dialyzer and Bloodlines

The extracorporeal circuit includes the:

- Dialyzer
- Bloodlines
- Monitoring lines
- Heparin line
- Transducer protectors

Priming and recirculation

Priming and recirculation

Key Points to Learn about Priming and Recirculation

Learn the correct way to :

- Do priming and recirculation
- Remove air from the bloodlines and dialyzer (air bubbles can blood clotting during the treatment)
- Test to be sure the germicide has been rinsed out of a reprocessed dialyzer

Pre dialysis safety check

Key Points to Learn about Predialysis Alarm Checks

Learn how to

- Complete these extracorporeal alaram checks:
  - Air detector (detects air in bloodline after the dialyzer)
  - Blood leak detector (detects blood in the d i - alysate after the dialyzer)
  - Arterial pressure high/low alarm (detects pressure in the arterial bloodline that is outside set limits)
  - Venous pressure high/low alarm (detects postdialyzer pressure that is outside set limits)

if each of the above alarms is working (1) the blood pump will stop, (2) the venous line should clamp (3) the audio alarm will sound, and (4) the visual alarm message will appear.

- Complete the following dialysate alarm checks:
  - Conductivity alarm (detects if dialysate concentration is outside set limits)
  - Temparature alarm (detects if dialysate temperature is outside set limits)
  - Ph alarm (if present, detects if dialysate temparature is outside set limits)

If each of the above alarms is working, the machine will go into bypass mode (dialysate flow to the dialyzer should stop)

- Completetghe UF check to verigy that the volumetric / fluid removal components of the machine are working
- Complete the negative germicide test to verify that the germicides has been removed from a reprocessed dialyzer

Completing this check is vital for patient safety.. All alarm checks must be successfully completed before the machine is used for a treatment.

Monitoring During Dialysis

During the treatment, you will monitor the patient and the machine. Patient monitoring includes taking vital signs and assessing the patient's general condition. Machine monitoring includes doing equipment safety checks, monitoring the bloodlines and the machine readings, and checking the alarms when they occur.

Measures to ensure Safe and Relaible Machine Operation

Learn how to :

- Operation the machine and understand all the dials and displays as described in the manual.
- Test all alarms by hand or automatically before each treatment.
- Use only dialysate concentrate that is prescribed for the patient, and have enough ready for the whole treatment.
- Avoid changing the conductivity alarm limits during treatment.

PATIENT MONITORING

Vital Signs

check the patient's vital signs during dialysis to ensure a safe and effective treatment. Check the patient's vital signs every half hour or more often if the patient is having symptoms or is unstable. Report any unusual findings to the nurse.

General Patient Condition

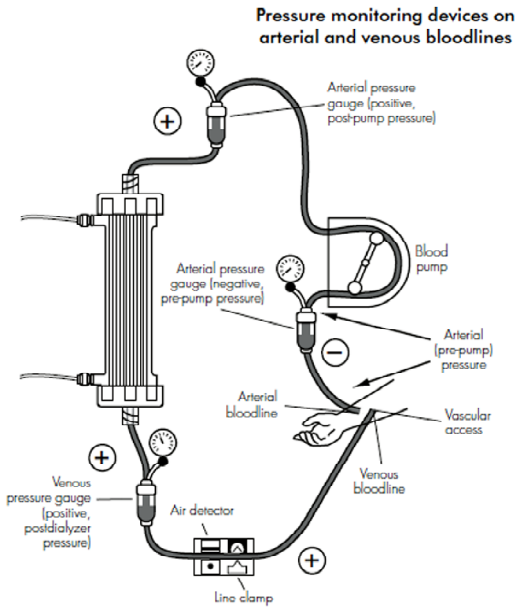
Watch the patient's behaviour, appearance, response, and symptoms. Teach patients to recognize and report symptoms so the care team can take action early. Report any unusual events to the nurse.

Giving Medications

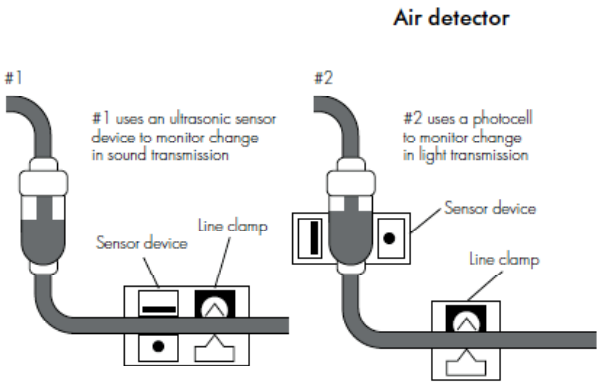
Patients will need some medications before, during, or after a treatment. Drug timing depends on whether a drug will dialyze off, and on centre policy and procedure. For example, patients can't take some blood pressure pills within a few hours before a treatment, because these medications may cause the blood pressure to drop during the treatment. Some drugs—such as volume expanders like hypertonic saline or mannitol— may be given by the nursing staff during a treatment if ordered to help remove fluid or maintain blood pressure. Others, like antibiotics, are given by the nursing staff near the end or after a treatment. This reduces the chance of the drug being removed during dialysis.

TECHNICAL MONITORING

If an alarm sounds or the equipment malfunctions during the treatment, act quickly to find the problem. Monitor the extracorporeal circuit, dialysate circuit, and equipment for problems during each treatment (see Figures 10 and 11). These checks help ensure patient safety. Check all systems very half hour to hour, per centre's policy.



The extracorporeal circuit has gauges to measure venous pressure and arterial pressure.



Procedure to disconnect the patient:

When the treatment is completed the time pad will begin flashing and you will hear an intermittent alarm

- Confirm the end of treatment by pressing the time pad and hold
- Reduce the blood flow to 50-150mls/min depending on the size of the child
- Press the blood pump pad to stop blood flow and widen alarm limits
- Clamp the arterial needle just near the saline side arm on the patient side
- Unclamp the saline line and press the blood pump pad so that fluid flows from the saline bag towards the dialyser washing back the blood cells
- Turn the dialyser blue end up
- Once the required amount of blood has been returned to the patient stop the blood pump and clamp the venous needle and the venous line
- Remove the arterial needle clamp, briefly allowing the saline to flush the arterial access
- Clamp the arterial access and the venous and arterial lines
- Lay a sterile towel under the patient's access site and disconnect the arterial and venous blood lines and join them to their respective transducers
- Remove the venous line from the prime detector (white box with the blue dot)
- Briefly press the heat disinfect pad until the red light on the flow diagram goes out
- Press the bicart pad twice until the message open latch and confirm drain appears on the screen
- Open the latch above the Bicart and confirm the drain by pressing the alighted arrow underneath the screen
- While the Bicart is draining partially apply IV pressure pad to needle insertion site and remove the venous needle in one swift backward motion, applying firm pressure with gauze only after the needle has been removed
- Repeat the above procedure for arterial needle, only after the venous needle site has stopped bleeding
- Once the Bicart has drained remove it and close the latches on the bicart holder
- Place the "A" wand back into the holder
- Press the heat disinfect pad for 3 seconds until the pad is alight
- Remove the blue dialysate port from the dialyser (ensuring that the blue end is up) and wait for the dialysate to drain
- Once the dialyser is drained, make sure that both the red and blue dialysate ports are in their holders
- All lines and dilayser can now be removed and discarded into the yellow infectious bin
- Wash down the machine and chair with warm soapy water

Procedure for removing the cannula:

- Remove one needle at a time
- Withdraw at same angle as insertion
- Apply pressure over vessel (not skin) insertion site
- Amount of pressure matters
    - Too little: prolonged bleeding, hematoma formation
    - Too much: clotted access
- Clean & dress site after bleeding stops

Post dialysis patient evaluation:

After dialysis, you will recheck all the patient's vital signs (blood pressure, pulse, and temperature) and weight. Blood pressure should be the same as it was at the start of treatment, or lower. Take a sitting and a standing blood pressure to check for orthostatic hypotension (a drop in arm blood pressure when the patient stands up) before you take out the needles. If the patient has hypotension, you can give some normal saline, per your centre's policy. The patient should weigh less after a treatment than before. If the patient has a fever, tell the nurse. Check the patient's vascular access and general condition. Tell the nurse about any changes or abnormal findings before the patient leaves the centre.

Dialysis reuse

Introduction

The dialyzer is a feat of engineering: complex enough to do some of the work of a human kidney, yet simple enough to be mass produced, and reliable enough to be used many times. For medical and non-medical reasons, many dialyzers are reprocessed: cleaned and disinfected to be used again by the same patient instead of being thrown out after a single use. This is called reuse.

A reprocessing technician has the immense job of maximizing patient benefits of reuse and reducing the risks. This is done by carefully following all of the guidelines, regulations, and centre procedures.

Why Dialyzers Are Reused

The reasons for dialyzer reuse, both medical and non-medical, have changed over time.

MEDICAL REASONS FOR DIALYZER REUSE

The main medical reason to reuse dialyzers is to reduce hypersensitivity reactions. A patient may have such a reaction in the first 15–30 minutes of treatment with a new dialyzer. Symptoms include anxiety, itching, and trouble breathing, which can lead to respiratory failure. This is also called "first-use syndrome." In rare cases, patients may have an anaphylactic reaction to a new dialyzer; this is a severe, sometimes fatal allergy, which may include hives and respiratory failure.

The most severe hypersensitivity reactions are due to ethylene oxide (ETO). ETO is used to sterilize most new dialyzers in the United States. The chance of a reaction is less with a reused dialyzer because the repeated rinsings can lower the levels of ETO. Rinsing new dialyzers can also reduce reactions. The rinsing done for preprocessing and reprocessing can also remove other noxious substances from the dialyzers.

Some centres reuse dialyzers because they want to remove more middle molecules, such as beta-2- microglobulin (ß2m). Reuse makes it possible for these centres to afford the costly high-flux dialyzers that do a better job of removing middle molecules.

NON-MEDICAL REASONS FOR DIALYZER REUSE

The most common non-medical reason for dialyzer reuse is cost. Reusing a dialyzer can reduce the cost per dialysis treatment, even including the staff time that is used. Another argument for reuse is the environmental impact. Throwing out dialyzers can be a major problem and expense. Reusing them reduces the amount of biohazardous waste.

Dialyzer Reprocessing Procedure

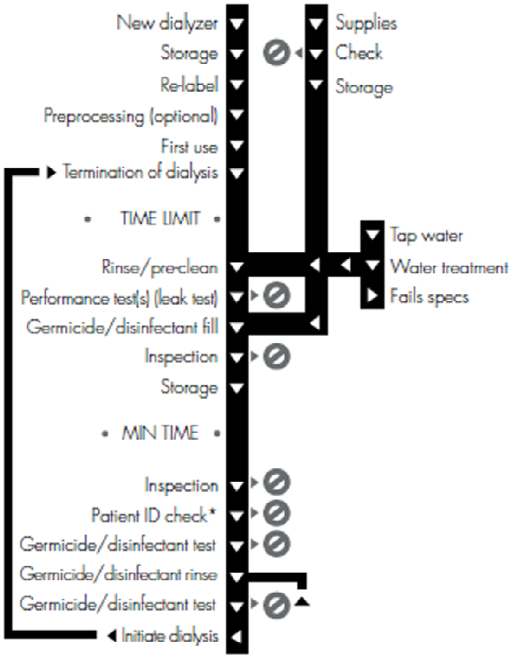
The AAMI guidelines cover equipment, cleaning and disinfecting, labelling, record keeping, supplies, environmental safety, staff qualifications, training, and quality assurance (see Figure 2). All water used for reprocessing must meet AAMI standards.

TYPES OF DIALYZERS

Each dialyzer must be labelled for "single" or "multiple" use. Companies who sell dialyzers to centres that reuse them must give instructions for safe and effective reuse. The label must have at least one recommended way to reprocess the dialyzer and scientific documentation that it is safe and effective. Not all dialyzers are approved for use with all germicides used in reprocessing. Only dialyzers that can be reused can be labelled for "multiple use." Before start to prepare a dialyzer for reprocessing, check the label for "multiple use."

Figure 2: Systems diagram for reprocessing dialyzers

Drawing adapted with permission from AAMI



* This step may be done later but must precede initiation of dialysis.
REJECT DIALYZER – REMOVE FROM SERVICE

Water treatment – pre-treatment, deionizer, reverse osmosis

Introduction

Dialysate is a fluid used to help remove wastes from patients' blood. Water is used to make dialysate, mix concentrate, and to flush out and reprocess dialyzers. If dialysis water has contaminants (harmful substances), they may enter the blood through the dialyzer and cause disease, injury, or even death to a patient. To be safe, water to be used for dialysis must pass through a water treatment system—a series of devices, each of which takes out certain contaminants.

Water Supply

Calcium carbonate is the most common impurity in tap water. Sodium, chloride, fluoride, nitrate salts, and pesticides also dissolve in water.

There are two types of water sources: ground water and surface water.

1. Ground water comes from wells and springs. It is often higher in ions (e.g., iron, calcium, magnesium), but lower in microorganisms (e.g., bacteria, viruses, endotoxin).

2. Surface water comes from lakes, ponds, rivers, and reservoirs. Surface water may be high in pesticides, industrial waste, sewage, and microorganisms.

For people on dialysis, water is more than just a beverage. People with working kidneys may drink 10–14 litres of water per week; most patients are exposed to 270 to 576 liters of water per week as dialysate. Since substances could cross the dialyzer membrane into the patient's blood, water must be free of contaminants. To be safe for patients, water must go through a water treatment system. The purpose of water treatment is to prevent harm to the patient and to water treatment equipment.

Components of a Water Treatment System

Feed water (from outside the dialysis center) begins upstream and moves downstream. A component that is upstream would come before one that is downstream.

Water must always be kept moving in a water treatment system, because still water allows bacteria to grow. After the last point of use for the water in most centres, a return loop carries the water back through the system. This prevents stagnant spots and reduces the amount of feed water a centre needs. Most water treatment systems will have some or all of the components listed in Figure. Each centre must tailor its system to remove the contaminants in its feed water. They must also consider seasonal changes in local water supply and treatment. One centre might have feed water contaminated with bacteria, while another may have feed water with high levels of chloramines and few bacteria.

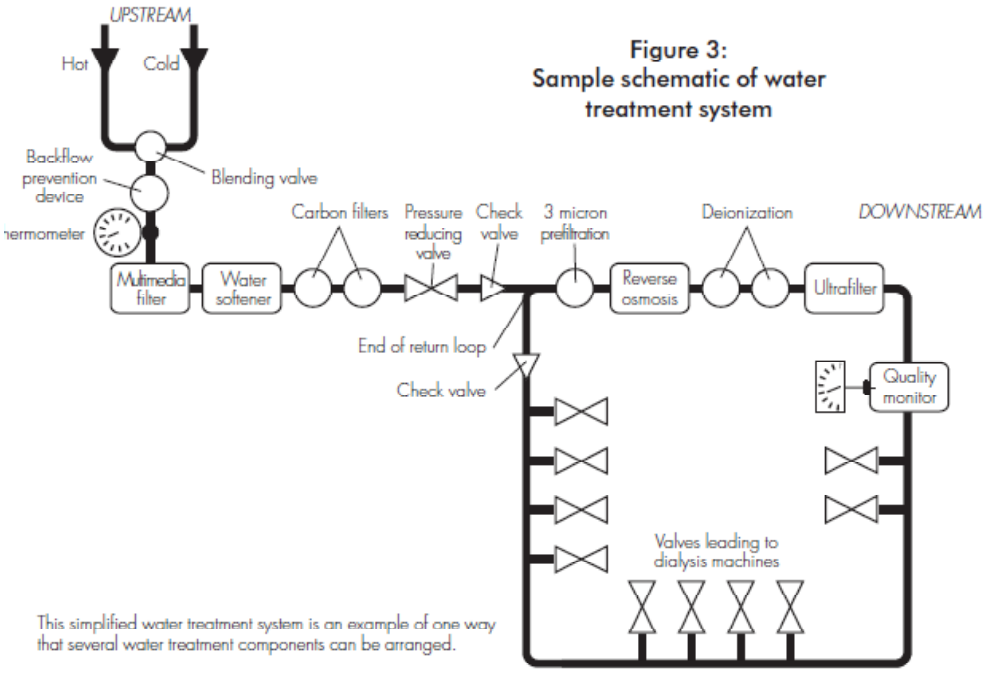


Figure 3:
Sample schematic of water treatment system

This simplified water treatment system is an example of one way that several water treatment components can be arranged.

Dialysis team – rights – responsibilities – patient doctor relationship

Members of the Dialysis Health Care Team

Nephrologists

- A nephrologist is a physician who has completed three years of internal medicine training and an additional two to three years of specialized training in nephrology (kidney diseases).
- The nephrologist provides ongoing care for all kidney-related problems and general medical problems for all chronic dialysis patients.
- A nephrologist visits the dialysis unit on a regular basis to review patients' medical problems and test results.
- A nephrologist also sees each patient annually for a comprehensive examination and review of problems.

Dialysis Nurses and Patient Care Technicians

- Dialysis nurses are registered nurses who have received additional training regarding the unique medical needs of chronic dialysis patients.
- They help provide hemodialysis in the center; train patients for self-care hemodialysis, home hemodialysis and peritoneal dialysis; visit with patients at each hemodialysis treatment; and provide ongoing care, along with the nephrologist and nurse practitioner.
- The nurses are actively involved in teaching patients about their kidney disease, medical problems and chronic dialysis.
- Patient care technicians help the nurses with inserting needles into the hemodialysis access and monitor the hemodialysis equipment for patient safety.
- Nurses and patient care technicians provide emotional and psychological support and work with patients to help them adapt to chronic kidney failure.

Renal Dietitian

- A registered dietitian trained to care for patients with kidney disease is an integral part of our health care team.
- The dietitian sees all patients regularly.
- Patients with chronic kidney failure have special nutritional needs and require ongoing education about how many calories and how much protein, fluids, sodium, potassium and phosphorus they can take in.

Social Worker

- A medical condition such as kidney failure places a great deal of emotional stress on the patient and her or his family.
- Mayo Clinic social workers help provide this emotional support.
- They also are knowledgeable about the financial implications of chronic kidney failure and are excellent resources for financial questions, delivery of in-home services, job retraining, physical therapy and rehabilitation.

Dialysis Technical Staff

- Dialysis technicians provide preventive maintenance and repair hemodialysis equipment.
- They also are responsible for dialyzer (artificial kidney) re sterilization and help maintain the safety and purity of the water that is used for hemodialysis.
- Members of this staff also help peritoneal dialysis and home hemodialysis patients obtain the proper equipment and supplies.

Responsibilities of a technologist, nurse, and doctor in the dialysis setting:

Technologist:

The list below is general, and may vary based on different state laws and facility policies.

- Assembles necessary supplies
- Prepares dialysate according to established procedures and the dialysis prescription
- Assembles and prepares the dialysis extracorporeal circuit according to protocol and dialysis prescription.
- Verifies absence of residual sterilants.

Definition and meaning:

American Society of Training Directors: Communication is the interchange of thought or information to bring about mutual understanding and confidence or global human relation.

Behind Brown: Communication is the transmission and interchange of facts, ideas, feelings or course of action.

Alien Louis A.: Communication is the sum of all the things one person does when he wants to create understanding in the mind of another. It involves a systematic and continuous process of telling, listening and understanding.

Need and importance of communication:

- Coordination
- Smooth Working
- Effective Decision-Making
- Managerial Efficiency
- Co-operation
- Effective Leadership
- Job Satisfaction
- Increase Productivity
- Morale Building
- Achieving Managerial Roles

Classification:

Communication is the process of exchanging information in the form of messages, symbols, thoughts, signs, and opinions. There are mainly four types of communication,

Verbal communication:

Verbal communication includes sounds, words, language, and speech. Speaking is an effective way of communicating and helps in expressing our emotions in words. This form of communication is further classified into four types, which are:

1. Intrapersonal Communication:

   This form of communication is extremely private and restricted to us. It includes the silent conversations we have with ourselves, wherein we juggle roles between the sender and receiver who are processing our thoughts and actions. This process of communication when analyzed can either be conveyed verbally to someone or stay confined as thoughts.

2. Interpersonal Communication:

   This form of communication takes place between two individuals and is thus a one-on-one conversation. Here, the two individuals involved will swap their roles of sender and receiver in order to communicate in a clearer manner.

3. Small Group Communication:

   This type of communication can take place only when there are more than two people involved. Here the number of people will be small enough to allow each participant to interact and converse with the rest. Press conferences, board meetings, and team meetings are examples of group communication. Unless a specific issue is being discussed, small group discussions can become chaotic and difficult to interpret by everybody. This lag in understanding information completely can result in miscommunication.

   1. Public Communication:

      This type of communication takes place when one individual addresses a large gathering of people. Election campaigns and public speeches are example of this type of communication. In such cases, there is usually a single sender of information and several receivers who are being addressed.

Non-verbal communication:

Nonverbal communication manages to convey the sender's message without having to use words.

- This form of communication supersedes all other forms because of its usage and effectiveness. Nonverbal communication involves the use of physical ways of communication, such as tone of the voice, touch, and expressions.
- Symbols and sign language are also included in nonverbal communication. Body posture and language convey a lot of nonverbal messages when communicating verbally with someone.
- Folded arms and crossed legs are some of the defensive nonverbal signals conveyed by people. Shaking hands, patting and touching, express feelings of intimacy. Facial expressions, gestures and

Medical inventory

Definition

A medical equipment inventory provides a technical assessment of the technology on hand, giving details of the type and quantity of equipment and the current operating status.

- The inventory provides the basis for effective asset management, including facilitating scheduling of preventive maintenance and tracking of maintenance, repairs, alerts and recalls
- Accurate and current stock records are essential to good inventory management.
- They are the source of information used to calculate needs, and inaccurate records produce inaccurate needs estimations (and problems with stock outs and expiry).
- Each inventory system should monitor performance with indicators and produce regular reports on inventory and order status, operating costs, and consumption patterns.

Tools used in stock management

The primary reason for holding stock in a medical system is to ensure availability of essential items almost all the time.

The selection of items to stock should be based on their value to public health and on the regularity and volume of consumption.

- VEN (vital, essential, nonessential) and ABC analyses are useful tools for defining which items on the formulary list must be held in stock

VED analysis

VED Analysis attempts to classify the items used into three broad categories, namely Vital, Essential, and Desirable. The analysis classifies items on the basis of their criticality for the industry or company.

- Vital: Vital category items are those items without which the production activities or any other activity of the company, would come to a halt, or at least be drastically affected.
- Essential: Essential items are those items whose stock – out cost is very high for the company.
- Desirable: Desirable items are those items whose stock-out or shortage causes only a minor disruption for a short duration in the production schedule. The cost incurred is very nominal.

ABC analysis

Although ABC analyses are often based on the value of the medicines, for inventory management, ABC analyses based on order frequency and volume are also important.

The ABC approach states that, when reviewing inventory, a company should rate items from A to C, basing its ratings on the following rules:

- A-items are goods which annual consumption value is the highest. The top 70-80% of the annual consumption value of the company typically accounts for only 10-20% of total inventory items.
- C-items are, on the contrary, items with the lowest consumption value. The lower 5% of the annual consumption value typically accounts for 50% of total inventory items.
- B-items are the interclass items, with a medium consumption value. Those 15-25% of annual consumption value typically accounts for 30% of total inventory items.

Inventory Model

The ideal inventory model is the optimal stock movement pattern, in which inventory levels are as low as possible (without risking stockouts) and optimized, consumption patterns are consistent, and suppliers always deliver on time - but this model is rarely achieved in practice.The three common inventory models used in medical supply systems are defined by how often regular orders are placed with suppliers -

- Annual purchasing (one regular order per year)
- Scheduled purchasing (periodic orders at set times during the year)
- Perpetual purchasing (orders are placed whenever stock becomes low, or when stock levels reach predetermined reorder levels)

Average inventory levels (and holding costs) are expected to decrease with more frequent orders.

The basic formulas for calculating order quantity are relatively simple; two useful formulas are minimum, maximum and consumption based. Both incorporate several essential factors -

- Average monthly consumption
- Supplier/warehouse lead time
- Safety stock
- Stock on order
- Stock in inventory
- Stock back-ordered to lower levels

BIOMEDICAL WASTE MANAGEMENT

DEFINITIONS:

According to biomedical management and handling rules 1998 of India, Biomedical means any waste which is generated during the diagnosis, treatment, or immunization of human beings or animals, or in research activities pertaining to or in the population or testing of biological.

Classification:

In India, MoEF, GoI (1998) has notified Bio-medical Waste (management & Handling) Rules -1998, which describes ten categories viz.,

1. Human Anatomical Waste
2. Animal Waste
3. Microbiology Waste
4. Biotechnology Waste
5. Waste Sharps
6. Discarded Medicines
7. Cytotoxic Drugs
8. Solid Waste
9. Liquid Waste
10. Incineration Ash and Chemical Waste

Many regulatory definitions of regulated medical waste are based on ten broad categories defined in a 1986 EPA guide on infectious waste management. The ten categories are:

1. Cultures and Stocks
2. Anatomical Wastes (or Human Pathological Wastes)
3. Human Blood and Blood Products
4. Other Bodily Fluids
5. Sharps
6. Animal Wastes
7. Isolation Wastes
8. Contaminated Medical Equipment
9. Surgery Wastes
10. Laboratory Wastes and Dialysis Wastes (HCWH, 2001).

Segregation:

Biomedical waste from the hospitals needs to be segregated prior to disposal.

Color indication:

Black bag:

This bag is used for collecting dry waste material which is not infectious. Materials like paper, plastics, cardboard boxes, and other dry waste generated in hospital office or in the wards are disposed in this bag. **This is not biomedical waste.**

Red bag:

This bag is used for the disposal of plastics collected from OTs, ICUs and wards.

Yellow Bag:

This bag is used for highly infectious items like pathological waste, human anatomical waste such as body parts, amputated parts/organs, tumors, placentas, aborted or dead fetuses, blood soaked cotton bandages, animal tissues, organs, carcasses etc.

Blue or White Opaque Bag:

This bag is used for collecting the segregated metal sharps such as needles, blades, saws, scalpels and glass pieces.

- These bags must be puncture proof.
- A metal box or a plastic canister should be used for collecting the metal sharps
- It is strongly recommend that even metal sharps and broken glass articles should be segregated.
- Broken glass sharps should be collected in blue/ white bags.

MAINTENANCE OF A SAFE, HEALTHY, AND SECURE WORKING ENVIRONMENT

Hazard

A hazard is a situation that poses a level of threat to life, health, property, or environment. Hazards can be dormant or potential, with only a theoretical risk of harm.

Occupational Hazard

A risk accepted as a consequence of a particular occupation.

TYPES OF OCCUPATIONAL HAZARDS

- Infections
- Slips/Falls
- N S I
- Latex Allergy
- B M W
- Chemical Exposure
- Repetitive Strain Injury
- Stress
- Fire Hazard
- Hazardous Spill
- Radiation
- Work Place Violence

Measures To Avoid Occupational hazards

Infections

- Hand wash a must
- Cover cuts with bandages and wear gloves for added protect ion (cuts are very vulnerable to infections).
- Artificial nails and chipped nail polish have been associated with an increase in the number of bacteria on the fingernails. Be sure to clean the nails properly
- Keep your hands away from your eyes, nose or mouth.
- Assume that contact with any human body fluids is infectious
- Use the Liquid soap in disposable containers . If using reusable containers, they should be washed and dried before refilling.

Slips/Falls

- Well Illuminated Floors, platforms, and walkways reasonably free of oil, grease, or water.
- Anti Skid Mats, Grates, or other methods that provide equivalent protection to be used on slippery surfaces.
- Slip-resistant floor coatings to be used in areas that are likely to get wet or subject to frequent spills.
- Guardrails on all open sides of unenclosed elevated locations.

Needle Stick Injury/Sharps Injury

- Do not recap needles
- Place a sharps disposal container close to the procedure area.
- Limit interruptions during procedures
- Explain the procedure to patients to gain their cooperation and avoid potential movement during the procedure
- Eliminate the use of sharps where safe and effective alternatives are available.
- Dispose them immediately into appropriate PPC.
- Plan for safe handling and disposal before beginning any procedure using sharps.

Latex allergy

- When wearing latex gloves, do not use oil-based hand creams or lotions (which can cause glove deterioration).
- After removing latex gloves, wash hands with a mild soap and dry thoroughly.
- Practice good housekeeping: frequently clean areas and equipment contaminated with latex-containing dust.

Biomedical waste

- Segregation of different types of (categories) of waste by sorting at the point of generation

Infection - It is defined as Invasion and multiplication of microorganisms in body tissues.

Pathogens - Microorganisms that cause infection .E.g., Bacteria, virus, fungi etc.,

Medical Asepsis

Medical asepsis, or clean technique, refers to practices designed to reduce the number of pathogenic microorganisms and limit their growth and transmission in the patient's environment.

Mode of transmission

CONTACT

AIRBORNE TRANSMISSION

FEACO-ORALTRANSMISSION

BLOOD/BODY FLUIDS TRANSMISSION

Definition

In its broadest definition, an antibacterial is an agent that interferes with the growth and reproduction of bacteria. While antibiotics and antibacterials both attack bacteria, these terms have evolved over the years to mean two different things.

Antibacterial are now most commonly described as agents used to disinfect surfaces and eliminate potentially harmful bacteria.

Common Antibacterials

Antibacterials may be divided into two groups according to their speed of action and residue production:

The first group contains those that act rapidly to destroy bacteria, but quickly disappear (by evaporation or breakdown) and leave no active residue behind (referred to as non-residue-producing). Examples of this type are the alcohols, chlorine, peroxides, and aldehydes.

The second group consists mostly of newer compounds that leave long-acting residues on the surface to be disinfected and thus have a prolonged action (referred to as residue-producing). Common examples of this group are triclosan, triclocarban, and benzalkonium chloride

List of antibacterial agents

Non-residue-producing antibacterials

Substance Group	Substance
Alcohols	ethanol isopropanol
Aldehydes	glutaraldehyde formaldehyde
halogen-releasing compounds	chlorine compounds iodine compounds
Peroxides	hydrogen peroxide ozone peracetic acid
gaseous substances	ethylene oxide formaldehyde

Residue-producing antibacterials

Substance Group	Substance
Anilides Biguanides	triclocarban chlorhexidine alexidine polymeric biguanides
Bisphenols	triclosan hexachlorophene
Halophenols heavy metals mercury compounds	PCMX (p-chloro-m-xylenol) silver compounds
phenols and cresols	phenol cresol
quaternary ammonium compounds	cetrimide benzalkonium chloride cetylpyridinium chloride

MANAGE WORK TO MEET REQUIREMENTS

This can be achieved by proper time management proper recording of the data, act with in the limit,

Utilize time effectively

- Time Management refers to managing time effectively so that the right time is allocated to the right activity.
- Effective time management allows individuals to assign specific time slots to activities as per their importance.
- Time Management refers to making the best use of time as time is always limited.
- Ask yourself which activity is more important and how much time should be allocated to the same? Know which work should be done earlier and which can be done a little later.
- Time Management plays a very important role not only in organizations but also in our personal lives.

Time Management includes:

- Effective Planning
- Setting goals and objectives
- Setting deadlines
- Delegation of responsibilities
- Prioritizing activities as per their importance
- Spending the right time on the right activity

Effective Planning

Plan your day well in advance. Prepare a To Do List or a "TASK PLAN". Jot down the important activities that need to be done in a single day against the time that should be allocated to each activity. High Priority work should come on top followed by those which do not need much of your importance at the moment. Complete pending tasks one by one. Do not begin fresh work unless you have finished your previous task. Tick the ones you have already completed. Ensure you finish the tasks within the stipulated time frame.

Setting Goals and Objectives

Working without goals and targets in an organization would be similar to a situation where the captain of the ship loses his way in the sea. Yes, you would be lost. Set targets for yourself and make sure they are realistic ones and achievable.

Setting Deadlines

Set deadlines for yourself and strive hard to complete tasks ahead of the deadlines. Do not wait for your superiors to ask you everytime. Learn to take ownership of work. One person who can best set the deadlines is you yourself. Ask yourself how much time needs to be devoted to a particular task and for how many days. Use a planner to mark the important dates against the set deadlines.

Delegation of Responsibilities

Learn to say "NO" at workplace. Don't do everything on your own. There are other people as well. One should not accept something which he knows is difficult for him. The roles and responsibilities must be delegated as per interest and specialization of employees for them to finish tasks within deadlines. A person who does not have knowledge about something needs more time than someone who knows the work well.

Prioritizing Tasks

Prioritize the tasks as per their importance and urgency. Know the difference between important and urgent work. Identify which tasks should be done within a day, which all should be done within a month and so on. Tasks which are most important should be done earlier.

Spending the right time on right activity

Develop the habit of doing the right thing at the right time. Work done at the wrong time is not of much use. Don't waste a complete day on something which can be done in an hour or so. Also keep some time separate for your personal calls or checking updates on Facebook or Twitter. After all human being is not a machine.

For Effective Time Management one needs to be:

Organized - Avoid keeping stacks of file and heaps of paper at your workstation. Throw what all you don't need. Put important documents in folders. Keep the files in their re-

QUALITY ASSURANCE

Quality:

Quality is defined as the extent of resemblance between the purpose of health care and the truly granted care.

Safety:

Safety is the condition of being protected from or unlikely to cause danger, risk, or injury.

JCI Recommendations:

JCI:

- A division of the joint commission
- Mission is to improve the quality of health care
- Accreditation is a voluntary process in which an agency assess a health care organization to improve quality of care
- Provides a visible commitment towards improving quality of patient care ensuring a safe environment and reducing risk to staff

Access to care & continuity of care:

- 5 focus areas:
  - Admission into the organization
  - Continuity of care
  - Discharge, referral, follow up
  - Transfer of patients
  - Transportation
- Reduction of barriers to care (Language, cultural, religious, physical)
- Discharge & transfer process
- Continuity of care
- Safety during transportation
- Informing patients regarding proposed care, expected outcomes and expected costs
- On pass policy
- Color coding in triage:
  - **Red: Most urgent**
  - **Yellow: Urgent**
  - **Green: Non urgent**
  - **Black: Dead**

Triage category	Priority	Color	Conditions
Immediate	1	RED	Chest wounds, shock, open fractures, 2-3 burns
Delayed	2	YELLOW	Stable abdominal wound, eye and CNS injuries
Minimal	3	GREEN	Minor burns, minor fractures, minor bleeding
Expectant	4	BLACK	Unresponsive, high spinal cord injury

- Discharge planning form:
  - D/C planning is done at the time of admission so that a patient's needs even after discharge can be planned well ahead in time
  - This improves quality of patient care and decreases readmissions due to lack of availability of vital equipment at home, after discharge

CODE OF CONDUCT OF HEALTH CARE PROVIDER

1. Be accountable

1. be honest with yourself and others about what you can do, recognize your abilities and the limitations of your competence and only carry out or delegate those tasks agreed in your job description and for which you are competent.
2. always behave and present yourself in a way that does not call into question your suitability to work in a health and social care environment.
3. be able to justify and be accountable for your actions or your omissions – what you fail to do.
4. always ask your supervisor or employer for guidance if you do not feel able or adequately prepared to carry out any aspect of your work, or if you are unsure how to effectively deliver a task.
5. tell your supervisor or employer about any issues that might affect your ability to do your job competently and safely. If you do not feel competent to carry out an activity, you must report this.
6. establish and maintain clear and appropriate professional boundaries in your relationships with people who use health and care services, carers and colleagues at all times.
7. never accept any offers of loans, gifts, benefits or hospitality from anyone you are supporting or anyone close to them which may be seen to compromise your position.
8. comply with your employers' agreed ways of working.
9. report any actions or omissions by yourself or colleagues that you feel may compromise thesafety or care of people who use health and care services and, if necessary use whistleblowing

procedures to report any suspected wrongdoing

1. Promote and uphold the privacy, dignity, rights, health and wellbeing of people who use health and care services and their careers at all times

1. always act in the best interests of people who use health and care services.
2. always treat people with respect and compassion.
3. put the needs, goals and aspirations of people who use health and care services first, helping them to be in control and to choose the healthcare, care and support they receive.
4. promote people's independence and ability to self-care, assisting those who use health and care services to exercise their rights and make informed choices.
5. always gain valid consent before providing healthcare, care and support. You must also respect a person's right to refuse to receive healthcare, care and support if they are capable of doing so.
6. always maintain the privacy and dignity of people who use health and care services, their carers and others.
7. be alert to any changes that could affect a person's needs or progress and report your observations in line with your employer's agreed ways of working.
8. always make sure that your actions or omissions do not harm an individual's health or wellbeing. Never abuse, neglect, harm or exploit those who use health and care services, their carers or your colleagues.
9. challenge and report dangerous, abusive, discriminatory or exploitative behaviour or practice.
10. always take comments and complaints seriously, respond to them in line with agreed ways of working and inform a senior member of staff.

2. Work in collaboration with your colleagues to ensure the delivery of high quality, safe and compassionate healthcare, care and support

1. understand and value your contribution and the vital part you play in your team.
2. recognise and respect the roles and expertise of your colleagues both in the team and from other agencies and disciplines, and work in partnership with them.
3. work openly and co-operatively with colleagues including those from other disciplines and agencies, and treat them with respect.
4. work openly and co-operatively with people who use health and care services and their families or carers and treat them with respect.