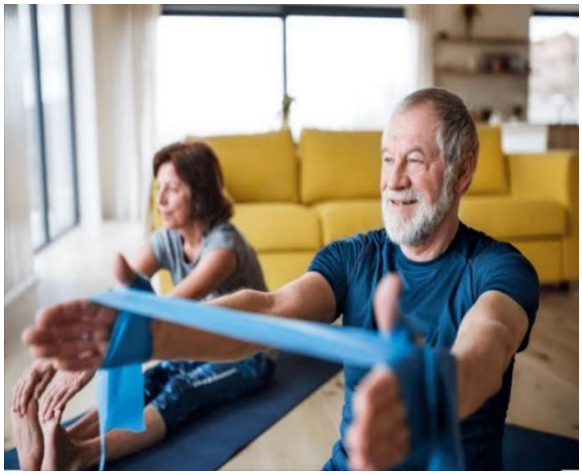


Clinical Physical Therapy and Rehabilitation

For

Internal Medicine and geriatrics

By

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Introduction

Physical therapy plays an important role with major peripheral vascular diseases related to metabolic disorders and provide different techniques in evaluation and management of such disorders.

This practical book promotes the reflective, critical, objective, and analytical practice of physical therapy applied to internal medicine health problems and geriatrics care. All physical therapy students should possess strong foundational knowledge about vascular, metabolic, geriatrics and internal medicine diseases and be able to apply this knowledge to a variety of patients.

Table of contents

Internal medicine Sheet

How to write a sheet

The 1st step is to take history.

It's very important to take history from the patient to be able to make a proper diagnosis.

How to take a good history?

- Personal history
- Complaint
- Present history
- Past history
- Family history

1- <u>Personal history</u>

- Important to be familiar with the patient and to break the ice.
- It's 8 points in males and 9 in females.
  - a- Name: to be familiar with the patient (how to make friends for dell karnigy)
  - b- Age: e.g. anginal pain in old age associated with angina of infarction while in young age may be something else
  - c- Sex: e.g. diseases associated with females: psychic diseases while diseases associated with males: cancer
  - d- Occupation: e.g.
- Surgeons: virus c and varicose veins
- Farmers: bilharzias
  - e- Residence: to be able to guess about endemic diseases
  - f- Marital status:

To be able to guess about sexual transmitted diseases.

Also, it's important to know if the patient have children, how many and how old they are. Because there are many diseases which cause impotence

g- Special habits:

Smoking and alcohol

- Type
- Severity: e.g. smoking index

Number of daily cigarettes * number of years

200: mild

200 to 400: Moderate

More than 400: Severe

Or No special habits of medical importance.

h- Menstrual history.

Present History: NASOMRH

An example of present history:

Ahmed Kaled male pt. 45 years old, farmer, married has 3 offspring's youngest 7 years, born & live in zagazig , moderate ciggerate smoker.

2- <u>Complaint:</u>

It's the core or the base of the sheet.

The cause that makes the patient visit

youSo, you must listen to the patient

Many patients visit doctors not to be checked but to be heard by their doctors

How to write a complain?

It must be short in the patient own words.

For example:

كرشه النفس is written as shortness of breath not dyspnea.

Dyspnea is a medical term.

It's important to write the duration of the complaint.

Example for a patient complaint:

Shortness of breath 2 days duration.

If the patient has 2 complaints, you have 2 options:

- Write them chronologically and it's not preferred.
- Write the main complain 1st and it's more preferred.

3- <u>Present history:</u>

Here we write the details of the complaint which are OCD or onset, courseand duration.

A) Onset:
   - Gradual
   - Sudden

B) Course:
   - Progressive e.ge Cancer
   - Regressive e.g., inflammation
   - Stationary

C) Duration

D) Leading questions:

e.g., for Pain
   - Site
   - Character
   - Radiation
   - Duration
   - What increase it
   - What decrease it

E) Treatment:

What type of treatment did the patient has?

Did he improve on it?

F) Associated symptoms.

Example for HPI:

The patient complaining from pain of sudden onset progressive course, 2 hours duration, started at chest radiated to the left shoulder, arm & forearm, in the fore of heaviness, increase by exertion , decrease by sublingual nitrates , associated with syncope & sweating

Guess what's this type of pain?

4- <u>Past history:</u>

Diseases, Drugs and Operations

A) Diseases:
   - Diabetes
   - Hypertension
   - Bilharziasis
   - TB

B) Drugs

C) Operations

5- <u>Family History</u>

A) Favism

B) Consanguinity

The 1st step is to take history

It's very important to take history from the patient to be able to make a proper diagnosis

How to take a good history?

- Personal history
- Complaint
- Present history
- Past history
- Family history

Vital Signs

- □ Temperature
- □ Pulse
- □ Respirations
- □ Blood pressure
- □ Oxygen saturation

Vital Signs

Taken at each visit and compared to baseline

Because of the importance of these measurements, they are referred to as Vital Signs. They are important indicators of the body's response to physical, environmental, and psychological stressors.

1- Body Temperature

Normal values of body temperature

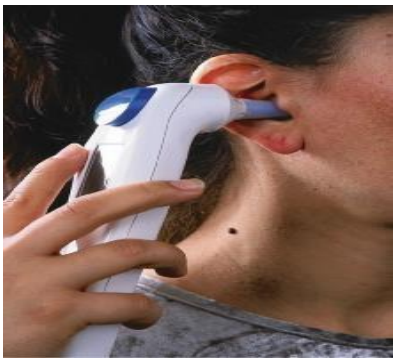
Oral	Axillary	Rectal	Tympanic	Forehead
36.4 – 37.2	35.2 – 36.9	37 – 38.1	35.9 – 37.6	35.8 – 36.9

Thermometers 3- types

Glass mercury – mercury expands or contracts in response to heat.

Electronic – heat sensitive probe, (reads in seconds) there is a probe for oral/axillary use (red) & a probe for rectal use (blue).

Infrared Tympanic (Ear) – sensor probe shaped like an otoscope in external opening of ear canal.



Fever (pyrexia)

It is contraindicated to perform exercises in case of fever.

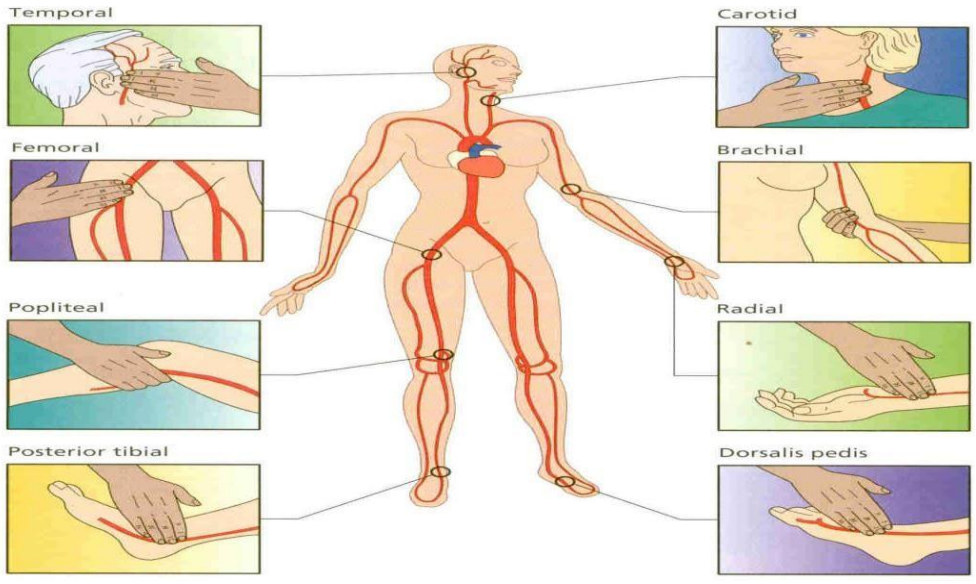
2- Pulse Rate (Heart Rate)

Left ventricle contracts causing a wave of blood to surge through arteries – called a pulse. Felt by palpating artery lightly against underlying bone or muscle.

□ Carotid, brachial, radial, femoral, popliteal, posterior tibial, dorsalis pedis.

Assess: rate, rhythm, strength – can assess by using palpation & auscultation.

Pulse deficit – the difference between the radial pulse and the apical pulse – indicates a decrease in peripheral perfusion from some heart conditions.



Procedure for Assessing Pulses

Peripheral – place 2nd, 3rd & 4th fingers lightly on skin where an artery passes over an underlying bone. Do not use your thumb (feel pulsations of your own radial artery). Count 30 seconds X 2, if irregular – count radial for 1 min. and then apically for full minute.

Apical – beat of the heart at its apex or PMI (point of maximum impulse) – 5th intercostal space, midclavicular line, just below left. nipple –listen for a full minute "Lub-Dub"

□ Lub– close of atrioventricular (AV) values – tricuspid mitral valves

□ Dub– close of semilunar valves – aortic & pulmonic valves

□ Measure HR by stethoscope.

Assess: rate, rhythm, strength & tension

Rate: –

□ Normal – 60-100

□ Tachycardia– greater than 100 bpm

□ Bradycardia – less than 60 bpm

Rhythm – the pattern of the beats (regular or irregular)

Strength or size – or amplitude, the volume of blood pushed against the wall of anartery during the ventricular contraction

□ weak (lacks fullness)

□ Full, bounding (volume higher than normal)

□ Absent (cannot be felt or heard)

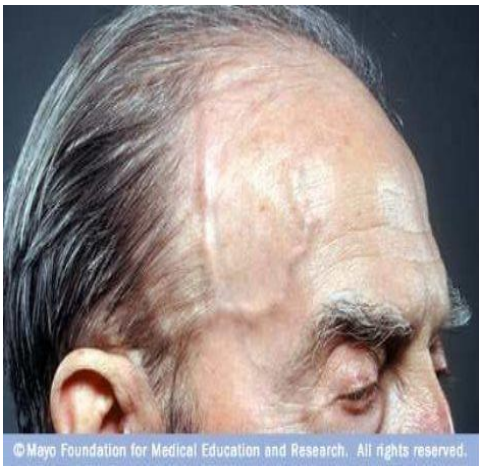
0 ..... 1+ ..... 2+ ..... 4+

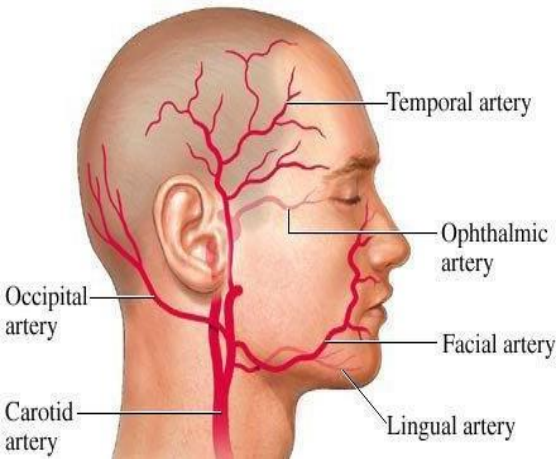
Absent Weak Normal Bounding

Normal Heart Rate

Age	Heart Rate (Beats/min)
Infants	120-160
Toddlers	90-140
Preschoolers	80-110
School agers	75-100
Adolescent	60-90
Adult	60-100

Temporal artery





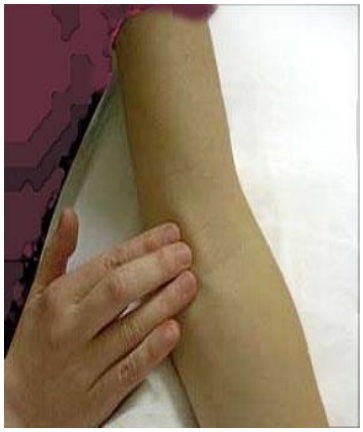
Carotid artery

•Just lateral to upper border of thyroid cartilage

Brachial artery

Radial artery

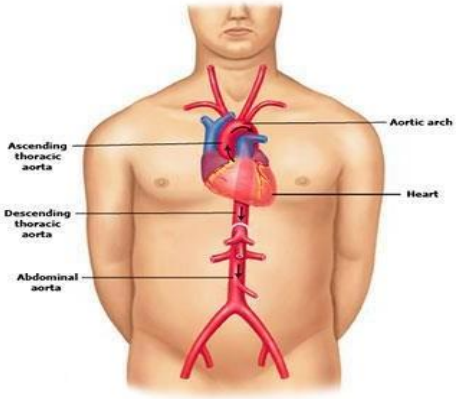
•Cubital fossa, medial to biceps tendon.



Abdominal aorta:

•In midline, at umbilicus pressing into abdomen

You can palpate it in obese patient.



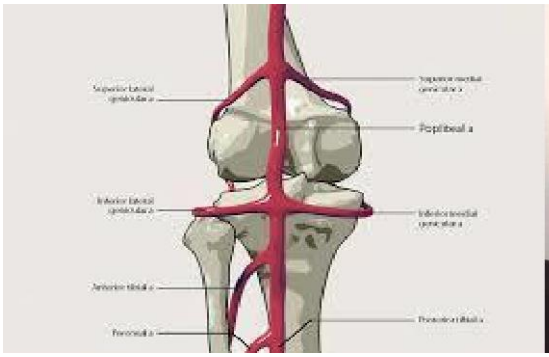
Femoral Artery

Below inguinal ligament, midway between ASIS and pubic symphysis

Popliteal artery

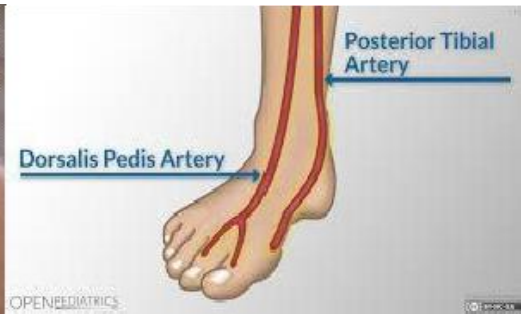
•Flex knee before palpating.

•In midline, on popliteal side of lower end of femur (the most difficult to palpate)



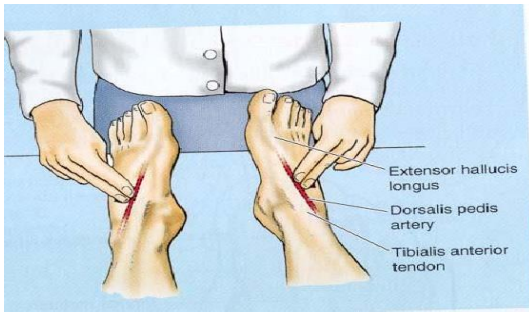
Posterior tibial artery

•Posterior, inferior to medial malleolus, between flexor digitorum longus and flexor hallucis longus



Dorsalis pedis

Lateral to extensor halluces longus, over tarsal bones



3-Respiratory Rate

Assess by observing Rate, Rhythm & Depth

□ Inspiration– inhalation (breathing in)

□ Expiration– exhalation (breathing out)

□ Normal breathing is active & passive

□ Women breathe thoracically, while men & young children breathe diaphragmatically usually

□ Asses after taking pulse, while still holding hand, so patient is unaware you arecounting his respiration

Assessing Respiration

Rate	# of breathing cycles/minute (inhale/exhale-1cycle) N – 12-20 breaths/min – adult - **Eupnea** – normal rate & depth breathing Abnormal increase – **tachypnea** Abnormal decrease – **bradypnea** Absence of breathing – **apnea**
Depth	Amt. of air inhaled/exhaled **normal** (deep & even movements of chest) **shallow** (rise & fall of chest is minimal) **SOB** shortness of breath (shallow & rapid)
Rhythm	Regularity of inhalation/exhalation
Character	**Dyspnea** – difficult or labored breathing **Cheyne-Stokes** – alternating periods of apnea and hyperventilation, gradual increase & decrease in rate & depth of resp. with period of apnea at the end of each cycle.

The normal values of respiratory rate are approximately

30-60 breaths/min for normal new born.

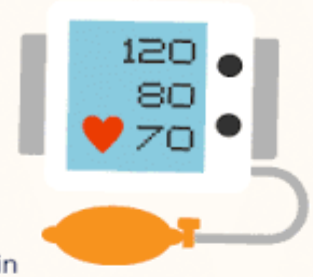
25-35 breaths/min for 1 year old.

20-25 breaths/min for preschool child.

12-20 breaths/min for normal adult.

4-Arterial Blood pressure (ABP)

Classification of Blood Pressure



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Blood Pressure	Systolic (#Upper)	Diastolic (#Lower)
Normal	Under 120	Under 80
Pre-hypertension	120-139	80-89
Hypertension #Stage 1	140-159	90-99
Hypertension #Stage 2	Above 160	Above 100
Hypertensive #Crisis	Above 180	Above 110

Procedure:

1- Wash hands; identify client; explain procedure to client; assist client to a comfortable position with forearm supported at heart level and palm up.

Rationale: Variations in blood pressure can occur with client in different positions. Blood pressure increases when the arm is below heart level and decreases when above heart level.

NB: Diastolic blood pressure may increase 10% if arm is unsupported, secondary to isometric muscle contraction used to support arm.

2- Expose the upper arm completely.

3- Wrap deflated cuff around upper arm with center of bladder over brachial artery. Lower border of cuff should be about 2 cm above antecubital space (nearer the antecubital space on an infant).

Rationale: Placing bladder directly over brachial artery ensures proper compression of artery during cuff inflation. Loose or uneven application can result in falsely high readings.

4- Palpate brachial or radial artery with fingertips. Close valve on pressure bulb and inflate cuff until pulse disappears. Inflate cuff 30 mm Hg higher. Slowly release valve and note reading when pulse reappears.

Rationale: Identify approximate systolic blood pressure reading to prevent underestimating systolic blood pressure should client have an auscultatory gap.

5- Fully deflate cuff, and wait 1 to 2 minutes.

Rationale: A waiting period prevents falsely high readings by allowing blood trapped in the vein to be recirculated.

Contraindications to BP

Do not measure BP

- On arm with lymphedema
- On arm of ipsilateral side of recent mastectomy
- Over open wound
- Dialysis shunt

5-Oxygen Saturation

- Is a term referring to the concentration of oxygen in the blood.
- It can provide important information about cardiopulmonary dysfunction and is considered by many to be a fifth vital sign.
- The measurement can be taken by (pulse-oximetry: Is a method used to measure the concentration of oxygen in the blood, a small device that clips to the body, typically a finger but may be other areas, using a special light to estimate the amount of oxygen in the blood).
- Normal values ranges vary between 95% to 99%.
- Mild hypoxemia: Spo2 91% to 94%.
- Moderate hypoxemia: Spo2 86% to 90%.
- Sever hypoxemia: Spo2 below 85%.

Pulse oximeter

Examination of the Arterial System

1- Upper Extremity

*The most common symptoms suggesting upper extremity arterial insufficiency are Pain, Coldness and Exertional muscle fatigue (arm claudication)

*Inspection:

*Color of fingertips and the hands (Filling time).

*Normally: Pink fingertips with a capillary refill time of less than 3 seconds are a reliable sign of adequate perfusion of the arm and hand.

*Abnormally: Pale, white coloration, diminished or absence of motor function and painful hand.

*Palpation:

* Arterial pulsation: - can be palpated at three locations

➢ The upper medial arm just distal to the axilla and in the groove between the biceps and triceps muscle (Axillary artery).

➢ The antecubital fossa just medial to the biceps tendon (Brachial artery).

➢ At the wrist over the distal radius (Radial artery).

* In arm claudication:

The arm should be exercised for 2-5 minutes and the brachial pressure rechecked. Brachial pressure should be fall if there is severe arterial occlusion

* Skin temperature:

The examiner uses the back of his hand. The level of the skin temperature demarcation in the acutely ischemic arm usually is just distal to the level ofocclusion. *For example: If the extremity is cold to the mid forearm the occlusion is most likely in the brachial artery at the elbow.

2- Lower Extremity

*Inspection:

*Skin changes:

- ❖ Chalky white skin: arterial flow is absent or decreased.
- ❖ Pale and cool: chronic arterial insufficiency.
- ❖ Pigmentation: previous stasis problems.
- ❖ Black gangrene: acute arterial occlusion (24 hours of acute ischemia).

* Palpation:

* Arterial pulsation: - can be palpated at different locations

1. Femoral pulse:
2. Popliteal pulse:
3. Dorsalis pedis pulse:
4. Posterior tibial pulse:

*Skin temperature:

*Palpation is also helpful in the assessment of acute ischemic leg. Extremity skin coldness and the level of temperature can be detected by palpation of ischemic limb with the back of the examiner hand, which are most sensitive to temperature.

*Acute ischemia also may be associated with tenderness and tenses of ischemiccalf muscle, especially the anterior compartment.

*In addition, acute arterial insufficiency may cause sensory nerve damage detected by simple pinprick sensory examination.

3- Special Testes arterial Examination

a) Femoral and radial pulses timing: -

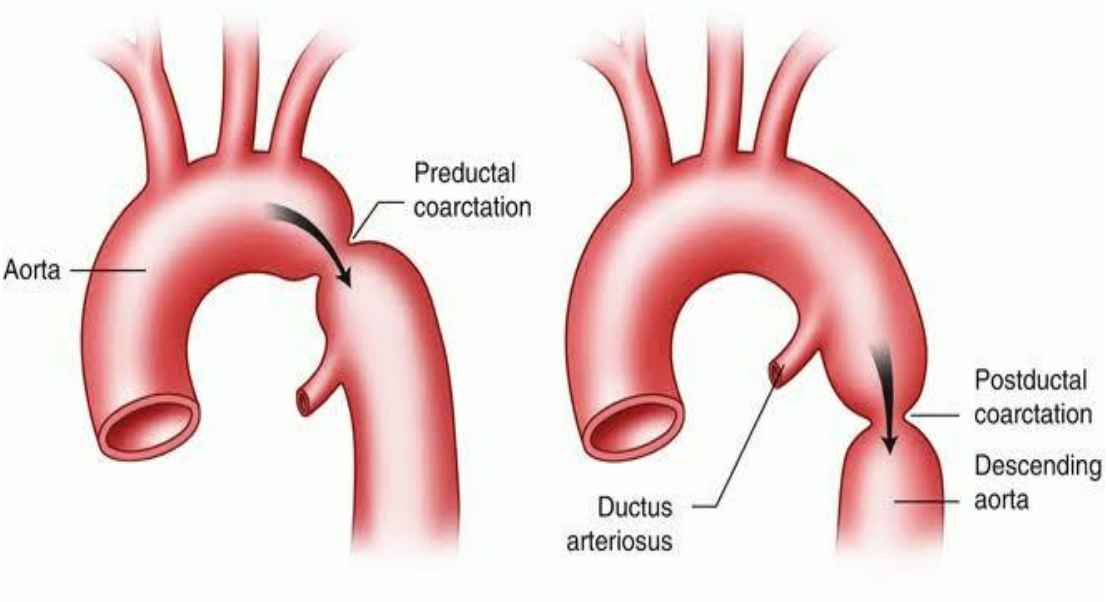
*The timing of femoral and radial pulses is important to **Rule out coarctationof the aorta**.

*Normally these pulses peak either at the same time or with the femoral preceding the radial.

*By placing the hand on the femoral artery and the other hand on the radial artery, the examiner can determine the peak of these pulses.

*This technique performed only on one side.

*Any delay in the femoral pulse is suspicious for coarctation of the aorta especially in hypertensive individuals.



b) Temperature gradient test

*Aim: To detect adequate blood supply to the lower limb.

*Procedure:

-Patient in lying position.

-The back of the practitioner hand should be used to stroke the anterior surface of the patient lower limb beginning from the knee to the toes.

*Interpretation:

-Normally: The proximal part of the leg should feel warm to touch, with gradual cooling as the feet are approached.

-Abnormally: A sharp temperature drop on a comfortably warm day will suggest an inadequate blood supply, with possibly an obstruction occurring at the level of sudden change.

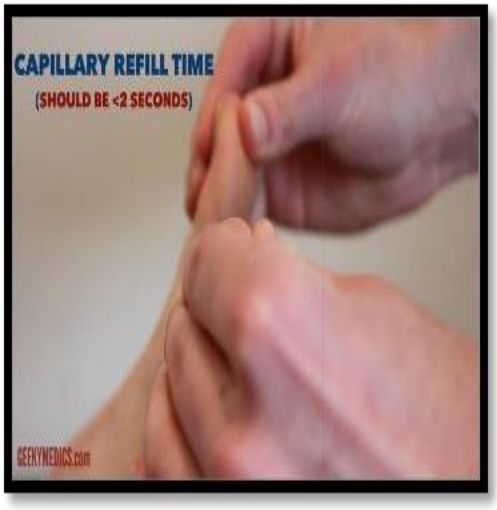
c) Capillary filling test

*Aim: To detect the peripheral blood flow and the color of the upper and lower extremity.

*Procedure:

-Patient in supine lying.

-The examiner using his thumb and should apply sufficient pressure to the apices of the patient toes to blanch the skin.



*Interpretation:

-Normally:

As the practitioner remove the pressure, counting in seconds should begin and the time taken for the normal color to be restored should be noted. Normal color should return within 2-3 seconds on warm day and within 5 seconds on cold day.

-Abnormally:

A delay capillary filling time suggest an inadequate supply through the capillaries producing a compromised microcirculation.

Absence of blanching in a cyanotic foot is a bad sign, since it shows that the tissues are devitalized and gangrenous state is likely to develop.

d) Rubor of Dependency (Burger's test)

***Aim:**

This test is to assess the adequacy of arterial circulation by determining skin color changes that occur with elevation and dependency of the extremity.

*Procedure:

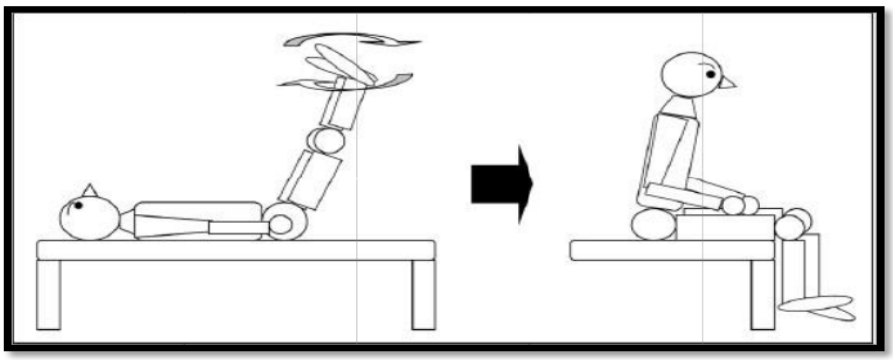
-placing the patient supine and noting the color of the soles of the feet (Normally they will be pinkish in appearance).

-The leg should be elevated and supported, to about 45^{o}and the patient is asked to move his ankle in order to help drain the blood from the venous system, making the color changes more obvious.

-The foot is inspected for pallor, after 30seconds. Mild pallor is normal.

-At this point the patient is asked to sit dangling his feet at the side of the bed.

-The examiner quickly assesses the time for color return.



*Interpretation:

Normally: (in elevation)

-A mild pallor should then be seen within one minute in elevated position.

Abnormal: (in elevation)

-A severe wide spread pallor during elevation suggest arterial insufficiency.

Normally: (in dependency)

-The time taken for the planter surface to return to the pinkish colour is from 10 seconds : 15 seconds for the superficial veins to fill.

Abnormal (in dependency):

-A delayed time of 20 seconds or more suggest that blood supply is in adequate.

-With Severe ischemia the delay is 40 seconds or more.

e) Allen's test

*Aim: This test is used to determine whether arterial insufficiency exists in the upper and lower extremities.

*Procedure: (For the hands)

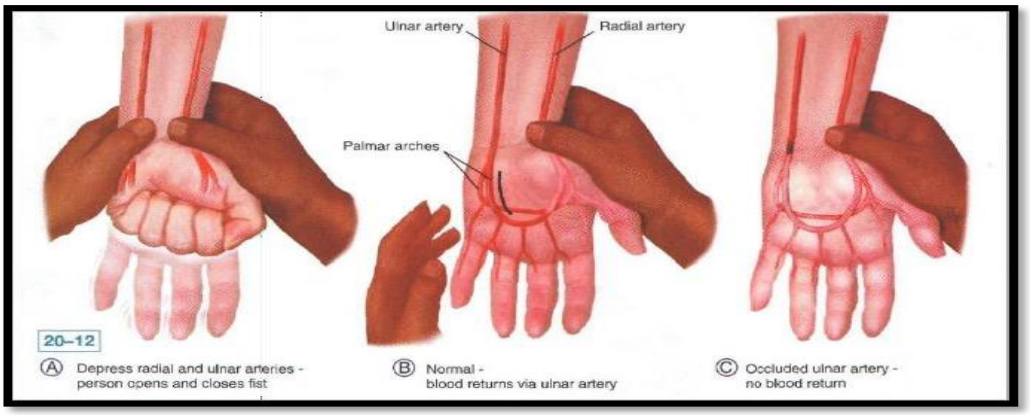
*For the patency of the radial and ulnar arteries

*The patient is asked to clinch his fist tightly.

*the radial and the ulnar arteries are first occluded by the examiner thumbs applying firm pressure over them.

-*The patient is asked to open his fist and the colour of the palm is observed.

-*The test is repeated with occlusion of the ulnar artery then the radial.



***Interpretation:**

Normally: the color of the hand must return when the patient open his fist

Abnormally: Pallor of the palm during compression of one artery indicates occlusion of the other.

(For the feet)

*This test can be used to detect occlusion distal to the ankle.

*One leg of the patient is elevated and the dorsalis pedis artery is compressed with the practitioner thumb.

*Maintaining the pressure on the artery.

*The leg is lowered into dependency.

***Interpretation:**

*Normally:

If the tibialis posterior artery is patent the foot should return normally to its normal color.

The patency of the dorsalis pedis can be tested in similar manner by compressing the tibialis posterior artery.

*Abnormally:

Delaying of recoloration of the foot or diminished colour indicates partial or complete occlusion.

f) Immersion test

*Aim: This test is used to determine skin temperature and coloration of the hand in Raynaud's Phenomenon.

***Procedure:**

The patient immerses his hands in ice water for 30 seconds, then elevate his hands out of the water.

Raynaud's disease

***Interpretation:**

-Normally:

The pre-immersion skin temperature of the digits recovers in 5-10 minutes.

-Abnormally:

With Raynaud's Phenomenon The pre-immersion digital skin temperature requires 15 – 30 minutes to recover.

g) Claudication Distance Test

*Claudication: is pain and/or cramping in the lower leg due to inadequate blood flow to the muscles. The pain usually causes the person to limp.

*Aim: This test is used to test.

- Claudication pain distance (CPD).
- Claudication pain time (CPT)
- Maximum pain distance (MPD)
- Maximum pain time (MPT)

***Procedure:**

The patient walks in constant walking speed of 2 mile/hour at 0% inclination with gradual increase in grade of inclination 2% every 2 minutes.

Claudication pain distance (CPD): is the distance at which the patient first experience claudication pain on walking.

Maximum pain distance (MPD): is the point at which pain requires patient to stop walking after CPD.

Claudication pain time (CPT): is the time at which the patient first experience claudication pain during walking.

Maximum pain time (MPT): is the moment at which pain requires patient to stop walking immediately after CPT.

h) Heal Raising Exercise Test

*Aim: This test is for a patient unable to perform exercise on cycle or treadmill test for any reason.

***Procedure:**

The patient performs heel raising exercise up to the claudication pain which is forced patient to stop the exercise while therapist counts the number of repetitions.

i) Van Gelderen bicycle test:

***Aim:**

This test designed to differentiate between neurogenic and vascular claudication. As patients with spinal canal stenosis sometimes experience pain and claudication in lower limb due to compression on spinal cord and nerve inflammation.

***Procedure:**

The patient was instructed to cycle at a moderate pace (90 rpm) for 5 minutes or until she felt the onset of her symptoms. Lumbar flexion (high seat height with low handle bars) was used to help minimize any effect from a neurogenic claudication, which would be exacerbated in lumbar extension and relieved by lumbar flexion.

***Interpretation:**

A positive test is indicated by a reproduction of some or all of the patient's symptoms in the same extremity that demonstrates a decrease in the pulse amplitude of a particular arterial branch. The test reproduced the patient's symptoms, and his legs collapsed as he stepped off the bicycle after 5 minutes and dorsalis pedis pulse on the left side was temporarily abolished.

j) Ankle-Brachial Pressure index (ABPI)

Procedure:

•The patient in supine lying.

•The examiner measures systolic pressure of brachial artery and posterior tibial artery then divide both readings which are expressed in ratio.

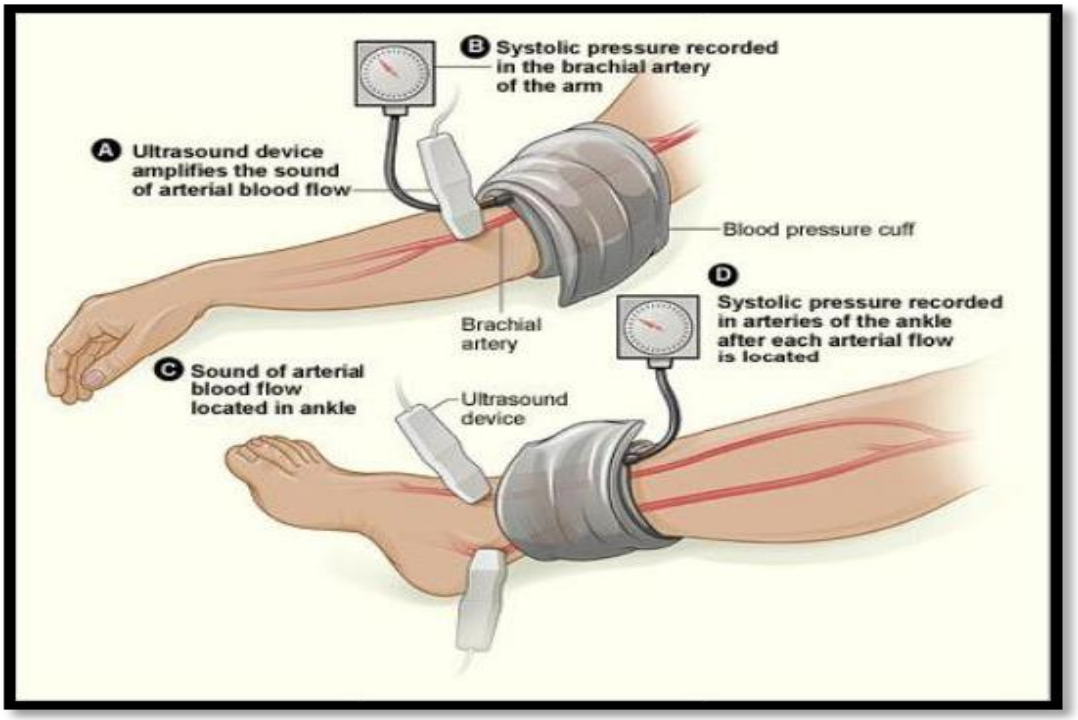
•Normal ratio in supine and sitting range (1: 1.3)

•Any values below 1 should be checked again.

•Values less than 0.8 some obstruction in the more proximal part of the artery to the LL.

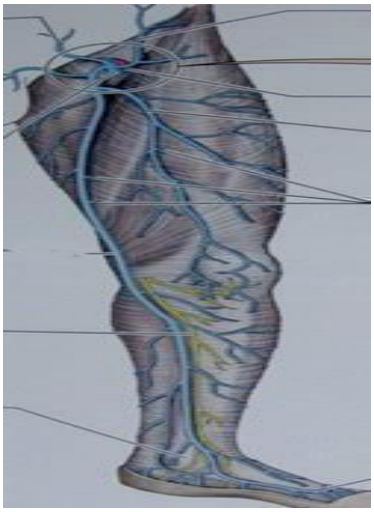
•Value below 0.5 indicate a pregangrenous state and ischemia may present

NB: the examiner may auscultate blood flow using Doppler.



Examination of the Venous System

Anatomy of the Lower Limb Veins



1- **Superficial Veins**
2- **Deep Veins**

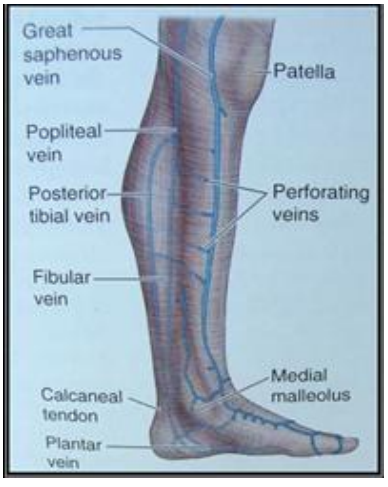
Superficial Veins

1- Long & short saphenous veins and their tributaries.
2- Lie in the subcutaneous tissue superficial to the muscle fascia.
3- They have their own, well-developed muscle coat.

Deep Veins

1- Accompany axial arteries.
2- Run within the muscles deep to the muscle fascia.

Communicating Veins "Perforators"

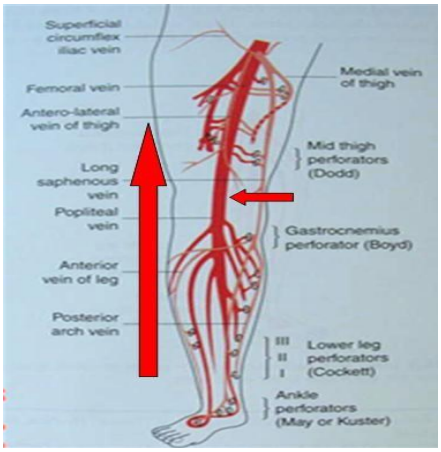


Perforate the fascia connecting the superficial & deep veins at certain points.

All lower limb veins have valves to direct venous return in <u>one direction only.</u>

From below upwards, and from superficial to deep.

Lower Extremities Evaluation



Physical Examination is the primary method of evaluating varicose veins and post-phlebitis syndrome.

Such evaluation should include the following:

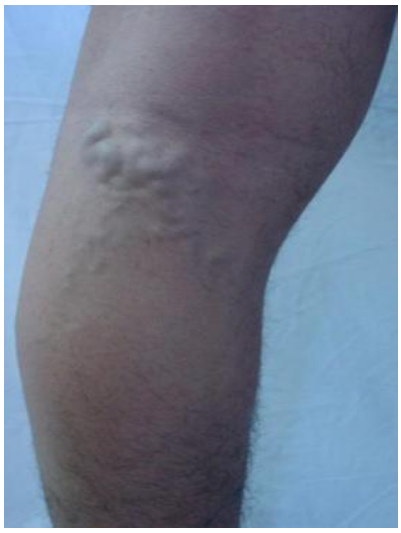
1. Inspection

2. Palpation

1. Inspection

- Inspection should be done with both legs completely exposed from the groin to the feet.
- Important findings may be recognized by comparison of the normal and abnormal extremities.
- The patient should stand so that superficial veins fill.
- It is preferable that the patient stand on a short stool while the examiner sits on a chair or a stool.
- The examiner position provides a better view of the legs.

Clinical Examination: - The patient should be standing.


Colour:

A. Atrophie blanche

- White patches on the skin around the ankle occur due to strangled microcirculation and leads to fibrotic and sclerotic changes in the skin.

B. Telngiectasis

- Dilatation of the capillaries around the medial malleolus can indicate poor drainage.

C. Haemosiderosis

- Iron deposition in the skin is occurred as a result of the back-pressure in the veins giving the brown skin coloration at the lower third of theleg.

Tissue Vitality:

Poor drainage results in accumulation of waste products. As a result, tissue viability is adversely affected. The skin may eventually become indurated. Atrophy, **venous eczema**, and **venous ulcers** may result.

Gravitational Eczema:

- Signs of discoloration and pigmentation.
- The area can be very itchy.
- Scratching may lead to the development of ulcers.
- Patients with gravitational eczema often find that they become sensitized to topical antibiotics and to preservative in other topical medicaments and bandages.

Venous Ulcers:

- Commonly found around the malleoli, particular the medial one.
- Associated with gravitational eczema.
- Shallow with irregular borders, and have either a healthy or slightly sloughy base, unless infected.
- They become painful if infected.
- Pain can be alleviated by leg elevation.

Edema:

- The edema due to deep <u>venous thrombosis</u> usually demonstrates <u>pitting</u>, edema may result in ischemia around the ankle, in severe cases leading to moist gangrene

Leg shape

- Patients with chronic venous ulceration and edema may develop characteristic "**champagne legs**", also known as inverted legs.

2. Palpation

- Palpation provides useful information in the evaluation of varicose veins and acute venous thrombosis.
- Deep venous thrombosis may cause tenderness of calf or thigh muscles.

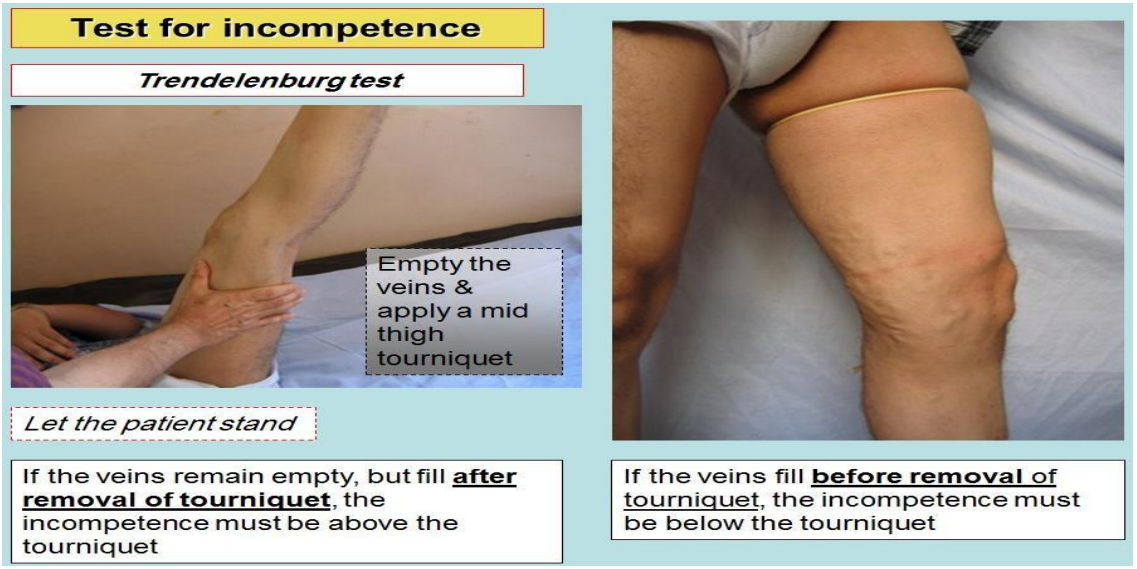
1. Varicosities (varicose veins)

A. Percussion Test

- **Aim:**
- This test is designed to assess the competence of thegreater saphenous vein.
- **Procedures:**
- Having the patient stand so that the varicosities presentwill fill with blood.
- A segment of the vein below the knee is palpated, whilethe vein above the knee is percussed simultaneously.
- Detect the fluid wave under the palpating finger.
- **Interpretation:**
- **Normally**:
- If the valves were competent, the fluid wave would have been damped.
- **Abnormally:**
- Detecting a fluid wave under the palpating finger indicates that the valves are incompetent and that an essentially continuous column of blood is present.

B. Trendelenburg's test

- **Aim:**
- This test is used to determine valves incompetent of great saphenous, deep and communicating veins.
- **Procedures:**
- The patient lies supine and the leg is elevated 90^0 for 15:30 seconds to empty all varicosities.
- A soft rubber tourniquet is applied to the leg just below the knee, than the patient stands.



Interpretation:

- **Normally**:
- The saphenous vein should fill slowly from below in about 30seconds, with the tourniquet in place.
- **Abnormally:**

  Filling from above indicates retrograde flow. After 30 seconds.
- The tourniquet is released, any sudden filling indicates incompetent of great saphenous vein valves.
- Immediate filling of the varicosities despite a tourniquet above them indicates incompetent deep and communicating veins.

C. Perthes Test

- **Aim:**
- This test is designed to assess the competence of the communicating and deep venous system.
- **Procedures:**
- Having the patient stand, a soft tourniquet applied around the upper calf.
- The patient repeatedly planter flexes the foot or walk for 5 minutes.
- The exe causes flow from superficial to the deep venous system and results in partial emptying of the superficial veins.
- **Interpretation:**
- If the superficial veins are remaining and distended, this indicates that the communicating and deep venous valves are incompetent.
- With the same position, an occlusion cuff is inflated at mid-thigh level so the superficial veins will become prominent as they fill. The patient is then asked to walk for 5 minutes.
- If the veins are healthy, the prominence will reduce due to drainage into the deep veins.
- If, the superficial veins are incompetent, prominence will remain.

2. Deep vein thrombosis.

A. Homan's test

- **Aim:**
- This test is used to check deep vein thrombophlebitis.
- **Procedure:**
- Patient is in supine lying position.
- The examiner should squeeze the gastrocnemius while forcefully dorsiflexing the patient ankle.
- **Interpretation:**
- **Normally**: There is no pain during the test
- **Abnormally**: In acute thrombophlebitis, there is great pain in calf muscle. This reported as positive Homan's sign.

B. Pressure cuff test

- **Procedure:**
- Patient is in supine lying position.
- The examiner applies blood pressure cuff around the calf muscle and to record how high the cuff can be inflated.
- **Interpretation:**
- **Normally:**
- Person can tolerate up to 120mmHG and 50mmHG more without feeling pain or tenderness.
- **Abnormally:**
- In case of deep vein thrombosis cannot tolerate pressure greater than 40mmHG.

C. Calf tender test

- **Procedure:**
- Grasp the bulk of the calf with your hand and press it against the posterior surface of the tibial bone.
- **Interpretation:**
- Patient with DVT does not tolerate the slight pressure due to sever irritation of the nociceptors which become stimulated from the accumulated wastes and the inflammatory process.

Burger-exercises

It is a system of exercises for venous & arterial insufficiency of lower limbs, consisting of legs elevation, followed by dependency of the legs, and finally horizontal position of legs for rest.

It is consisting of 5 progressions each progression consists of 3 steps; we can turn to the next progression when we can achieve 3 successful sessions of the previous one.

1st progression

Step 1:

Patient supine with leg elevated with 45-60 degree and maintain it till blanching occurs (normally 1-3 min)

Aim:

- Help venous return
- Judge powerful of arterial system to overcome gravity

Step 2:

Patient sit up with leg dependent until skin color is bright red (rubor)

Normally 10 sec for rubor to occur for arterial filling &15 sec for superficial veins to fill

Aims:

- Improve blood rushing to extremities
- Improve the collaterals

Step 3

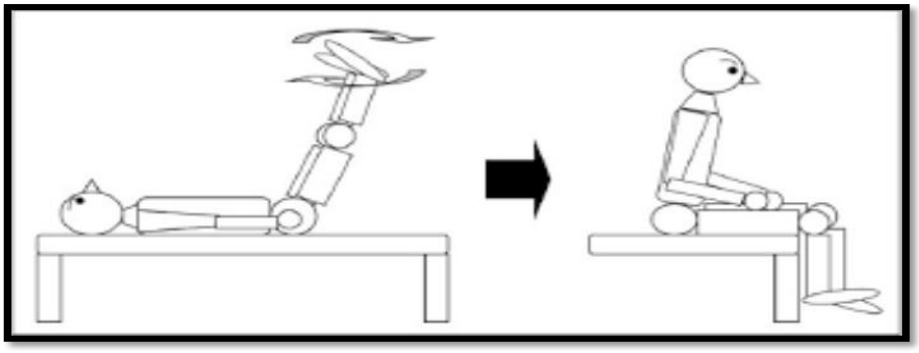
Patient return to supine but with leg horizontal until skin color returns to normal (pinky)

- Normally:

It takes 5 min to become pink &warm of skin

Aims:

- Judge the rapidity of fluid exchange between capillary wall and extravascular tissue.
- Judge about time needed for feeling of rest.



Indication for improvement:

↑time for appearance of blanching

↓time for rubor and feeling for superficial veins

↓time for normal coloration and warmth

2nd progression

Can be done after 3 successful sessions of the first one.

Step 1:

Patient supine with leg elevated with 45-60 degree and apply effleurage massage hand over hand stroke.

And maintain it till blanching occur (normally 1-3 min)

Aim:

- Help venous return.
- Stimulate Histamine like substance release for its effect in dilatation of skin capillaries.

Step 2:

Patient sit up with leg dependent until skin color is bright red (rubor)

Normally 10 sec for rubor to occur for arterial filling &15 sec for superficial veins to fill.

Aims:

Improve blood rushing to extremities without resistance from the capillaries wall due to the effect of Histamine-like substance.

Step 3

Patient return to supine but with leg horizontal until skin color returns to normal (pinky)

Normally:

It takes 5 min to become pink &warm of skin.

Aims:

To ensure that Histamine released increases capillary permeability in skin and muscular tissue to face further activities.

Inc. time for appearance of blanching.

Dec time for rubor and feeling for superficial veins.

Dec time for normal coloration and warmth.

Must be done after 3 successful sessions of the second one.

3rd progression

Step 1:

- Patient supine with leg elevated with 45-60 degree.
- And maintain it till blanching occur (normally 1-3 min)
- Apply tourniquet at the lower third of the thigh (because the femoral artery here is more superficially at the medial surface)

Aim:

- Obstruct arterial supply and venous return resulting changes in O2 tension, Ph and CO2 tension.
- Lead to:

- The ↓of O2 tension and Ph tension cause relaxation of smooth muscles of arterioles and pre-capillary sphincter
- A rise in CO2 also dilates the vessels.

Step 2:

- Patient sit up with leg dependent for a while
- Then release the tourniquet and notice the blood rushing in the peripheries especially the foot and toes and record the actual time for rubor and re-appearance of superficial veins.

Aims:

To increase the pressure of blood flow after sudden release of the tourniquet in the arterial system, so improve the perfusion process for metabolism, this leads to increase in heating of active tissue and adding more capillary dilatation.

Step 3

Patient lies with legs Horizontal (Supine)

Normally:

It takes 5 min to become pink &warm of skin

Aims:

To ensure that the blood flow in this position is available for enhancing tissues metabolism and to judge the vitality of the tissues (muscles and skin) to act more for the next progression.

- Must be done after 3 successful sessions of the third one

4th progression

Step 1:

- Patient supine with as before
- Apply Ratschow's exercise (dorsi, planter, eversion, inversion, circumduction)

- This position is maintained for 1-3 minutes or until blanching or feeling of pain

Aim:

To increase the rate of blood flow (venous return)

Step 2:

- Patient sit up with leg dependent as before
- He actively does the previous exercises of the feet for 3 minutes or rubor.

Aims:

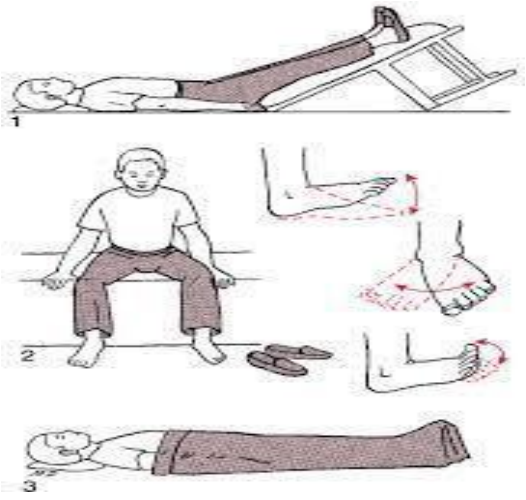
To augment the blood flow to open more capillaries through, the muscular action and the effect of the gravity on drawing more blood.

Step 3

Patient lies with legs Horizontal (Supine) and legs covered with blanket for 5 mins.

Aims:

To maintain the heat produced by the muscular action to promote the dilatation of the capillaries.



5th progression

Must be done after 3 successful sessions of the fourth one.

Step 1:

- Patient supine with legs elevated and supported as before
- This position is maintained for 1-3 minutes or until blanching or feeling of pain
- Apply dorsi, planter flexion against resistance.

Aim:

To encourage venous return and to increase blood flow through medium sized arteries and capillaries due to muscular contraction and give a chance to blood flow to overcome the effect of the gravity.

Step 2:

- Patient sit up with leg dependent as before
- He actively does the dorsi and planter flexion and circumduction of the feet for 3 minutes or rubor.

Aims:

To accelerate the flow of the blood through the dilated capillaries with the effect of gravity

Step 3

Patient lies with legs Horizontal (Supine) and legs covered with blanket for 5 mins.

Aims:

To maintain the heat produced by the muscular action and use it for more dilatation.

FUNCTIONAL ASSESSMENT OF THE ELDERLY

The ultimate goal of all physical therapy interventions with the elderly is to restore or maintain the highest level of function possible for the individual, particularly function associated with movement. In general, we know that the ability to function independently declines with age and that this decline is influenced by a host of biological, psychological, and social factors.

Functional assessment measures the individual's abilities to perform tasks that are personally meaningful to the individual.

COMPONENTS OF PHYSICAL FUNCTIONAL ASSESSMENT: -

- On the individual level, a functional assessment can be used as a quick screen to identify the need for more extensive evaluation by a physical therapist or other practitioners.
- If an elder who has functional deficits becomes a patient, these data determine the overall goals of physical therapy treatment.

1-Mobility: -

- Ambulation
- Level surfaces
- Stair climbing
- Uneven terrain
- Walking for longer distance

2-Basic ADL: -

Fundamental tasks and activities necessary for survival

- Eating

- Bathing
- Grooming (personal care)
- Dressing
- Bed mobility
- Transfers
- Reach in appropriate time period, move safely on and off the receptacle. And to perform self hygiene tasks.

3-Instrumental ADL:

Addresses multiple areas that are essential to living independently

- Cooking
- Shopping
- Washing
- House keeping
- Ability to use public transportation
- Driving the car

4-Work

The ability to work may be investigated in two ways. One approach is to consider the conditions of work itself.

1- Whether an individual is working the anticipated number of hours each week; and whether the quantity or quality of work

2-Another Approach to assessing work is to examine the ability to perform 10 particular physical tasks,

a. Walk up 10 steps (located above the ground without elevator).
b. Walking a quarter of a mile (mile equal 1600 meters)
c. Sitting for 2 hours
d. Standing for 2 hours
e. Stooping (bend the body forward and down) or kneeling
f. Reaching up over head
g. Reaching out to shake hands
h. Grasping with fingers

i. Lifting or carrying 10 pounds

j. Lifting or carrying 25 ponds

5-Recreation

- Maintain a sense of well-being
- Interests in recreational sports
- Not limited to sports
- Dancing and gardening
- Balance flexibility and strength

Sedentary activities

- Stamp collecting
- Playing chess
- Use of upper extremity

MODES OF ASSESSMENT:

There are three primary methods to measuring functional status

1- By observing.

2- By asking the subject to perform a function under a specific set of conditions, or gathered from

3-A self-report or interviewer-administered questionnaire

Instruments for Geriatric Functional Assessment: -

1. Katz Index of Activities of Daily Living
2. Functional Independence Measure
3. Minimum Data Sheet of nursing home resident Assessment and Care Screening
4. The Outcome and Assessment Information Set

1-Katz Index of Activities of Daily Living

Six categories index

1. Bathing
2. Dressing
3. Toileting
4. Transfers
5. Continence (urine - stool)
6. Feeding

Katz Index of Independence in Activities of Daily Living Patient Name:_____ Date:_____ Patient ID_____		
Activities Points (1 or 0)	Independence (1 Point) NO supervision, direction or personal assistance.	Dependence (0 Points) WITH supervision, direction, personal assistance or total care.
BATHING Points: _____	(1 POINT) Bathes self completely or needs help in bathing only a single part of the body such as the back, genital area or disabled extremity.	(0 POINTS) Need help with bathing more than one part of the body, getting in or out of the tub or shower. Requires total bathing
DRESSING Points: _____	(1 POINT) Get clothes from closets and drawers and puts on clothes and outer garments complete with fasteners. May have help tying shoes.	(0 POINTS) Needs help with dressing self or needs to be completely dressed.
TOILETING Points: _____	(1 POINT) Goes to toilet, gets on and off, arranges clothes, cleans genital area without help.	(0 POINTS) Needs help transferring to the toilet, cleaning self or uses bedpan or commode.
TRANSFERRING Points: _____	(1 POINT) Moves in and out of bed or chair	(0 POINTS) Needs help in moving from bed to

	unassisted. Mechanical transfer aids are acceptable	chair or requires a complete transfer.
CONTINENCE Points:	(1 POINT) Exercises complete self control over urination and defecation.	(0 POINTS) Is partially or totally incontinent of bowel or bladder
FEEDING Points: _____	(1 POINT) Gets food from plate into mouth without help. Preparation of food may be done by another person.	(0 POINTS) Needs partial or total help with feeding or requires parenteral feeding.
TOTAL POINTS: _____ SCORING: 6 = High (patient independent), 3-5 = (partial dependent), 2- 0 = Low (patient very dependent		

2. Functional Independence Measure:

FIM is comprised of 18 items, grouped into 2 subscales - motor and cognition.

The motor subscale includes

1. Feeding
2. Grooming
3. Bathing
4. Upper body dressing
5. Lower body dressing
6. Bladder management
7. Bowel management
8. Transfers - bed/chair/wheelchair
9. transfers and Toileting
10. Transfers - bath/shower
11. Walking
12. wheelchair
13. Staring

The cognition subscale includes:

14. Comprehension
15. Expression
16. Social interaction
17. Problem solving
18. Memory

Each item is scored on a 7 point ordinal scale, ranging from a score of 1 to a score of 7. The higher the score, the more independent the patient is in performing the task associated with that item.

1 - Total assistance with helper

2 - Maximal assistance with helper

3 - Moderate assistance with helper

4 - Minimal assistance with helper

5 - Supervision or setup with helper

6 - Modified independence with no helper

7 - Complete independence with no helper

The sum of the individual motor subscale items will be a value between 13 x7 = 91.

The sum of the individual cognition subscale items) will be a value between 5 x7 = 35.

The total individual items will be 126.

Fall and Balance in Elderly

*Assessment of Balance and Falls in elderly

1. Etiological Assessment
2. Functional Assessment
3. Environmental Assessment

1. Etiological Assessment

➢Sensory Assessment: - Visual, Vestibular, Proprioceptive.

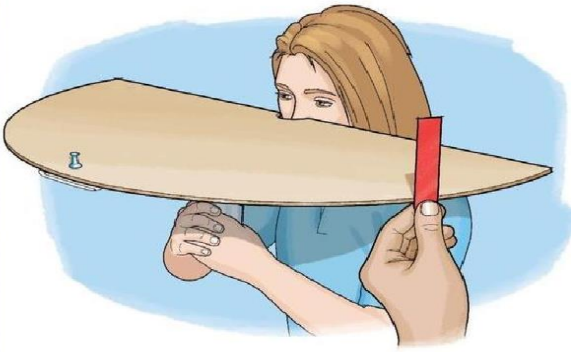
➢Musculoskeletal Assessment: - Ms Power, Endurance, ROM.

➢Central Processing: - Feed forward, Feedback.

➢ Sensory Assessment: -

a. Visual: -

1. Acuity of vision by optometrist
2. Colour contrast (Colour blindness test)
3. Peripheral field assessment (Ability to see from side while looking see-ahead)
4. Depth perception (Ability to distinguish distance)



b. Vestibular: -

1. Presence of tinnitus
2. Rotation of head then sudden stop (inner ear inflammation)

3. Apply hot tube or tunning fork behind ear (may stimulate motion sickness)
4. Reading book while walking (can't maintain eyes on book)
5. Marching in place while eyes closed (deviate from initial position)

c. Proprioceptive: -

1. Sense of position (move a digit in finger or toe first with patient looking then with eyes closed)

2. Sense of motion (tactile movement tests the patient ability to detect the direction of a 2-3 cm cutaneous stimulus)
3. Sense of Vibration (by using a tuning fork over a bony prominence – compare left/right – distal/proximal)

4. Romberg's Test

-Subject stands erect (head on trunk), feet together (exclude vestibular system), eyes open, hands by sides.

-Then Subject closes his eyes (exclude vision), and examiner observes for a full minute

-Test is positive if:

-Patient sways forward or backward

-Falls while eyes closed

-Open eyes

-Step forward or backward

➢ Musculoskeletal Assessment: -

a) Muscle power

(Assess muscle which have large displacement and fast forceful movementas quadriceps, hamstrings, dorsiflexors, and planter flexors)

b) Endurance

(10 repetition maximum)

c) ROM Assessment

(Mainly cervical, trunk, hip, knee and ankle)

➢ Central Processing: -

1. Feed Forward (Static Balance)

(Ability of the subject to maintain balance in response to unexpected event, ex: being pushed)

2. **Feedback (Dynamic Balance)**

(Ability of the subject to maintain balance during movement ex: catching aball, simply raising arms)

2- Functional Assessment

➢Berg Balance Scale

➢Functional Reach Test

➢Timed up & go test

➢Reaction time test

➢Tinetti Performance Oriented Mobility Assessment (POMA)

➢Berg Balance Scale

- 14 - Item scale (tasks) designed to measure balance of the older adult in a clinical setting.
- In each task the therapist evaluates the performance of the subject asfollowing:

4=best performance,

3=mild dependent

2= moderate dependent

1= severe dependent

0= no activity

-Interpretation:

41-65=independent

21-40= walking with assistance0-

20= wheelchair bound

➢ Functional Reach Test

A- Measures forward and lateral balance

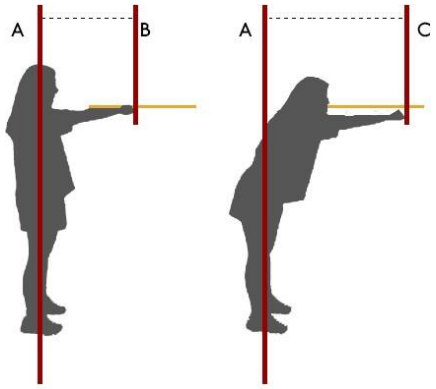
B- Subject to change over time

C- Simple to administer

D- Arm extension with 90 degrees of shoulder flexion wjile patient isupright and leaning forward or sideways

E- Results: if < 6 inches related to falls

Minimal fall risk if > 10 inches of reach



➢ Timed up and go test

Technique:

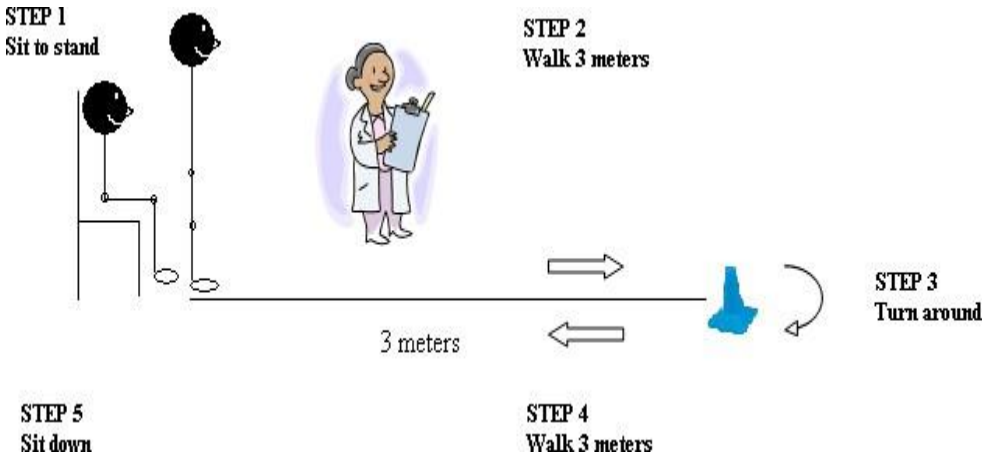
Direct patient to do the following:1-

rise from sitting position

2- walk 10 feet

3- Turn around

4- Return to chair and sit down



Interpretation:

1- Normal time within 10 seconds

2- Patient takes < 20 seconds = mildly dependent transfers and mobility

3- Patient requires > 30 seconds to complete test

= higher dependence and risk of falls

➢ Reaction time test

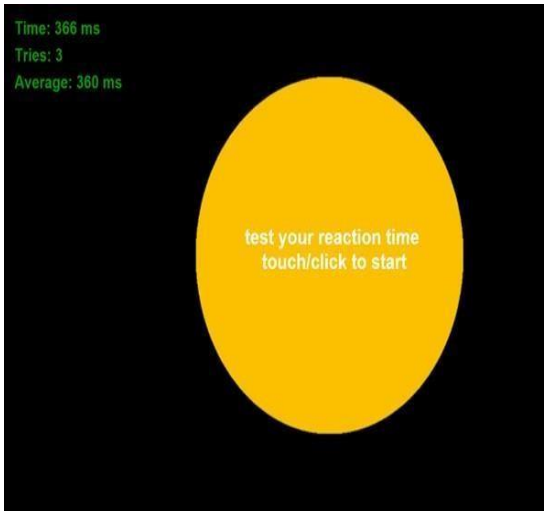
It is the ability to respond quickly to a stimulus

Examples:

Test measures the time taken for patient to press the stop button after the background color changes

Select color, press start, background will change within 20 seconds, click stopas quickly as possible and release button

Time taken is displayed and recorded



➢ Tinetti Performance Oriented Mobility Assessment (POMA):

Description:

The Tinetti assessment tool is an easily administered task-oriented test that measures an older adult's gait and balance abilities.

Equipment needed: Hard armless chair

Stopwatch or wristwatch
15 ft walkway

Completion:

Time: 10-15 minutes

Scoring: A three-point ordinal scale, ranging from 0-2. "0" indicates the highest level of impairment and "2" the individuals independence.

Total Balance Score = 16
Total Gait Score = 12
Total Test Score = 28

Interpretation:

25-28 = low fall risk

19-24 = medium fall risk

< 19 = high fall risk

- Balance Tests -

Initial instructions: Subject is seated in hard, armless chair. The following maneuvers are tested.

1. **Sitting Balance** Leans or slides in chair =0
   Steady, safe =1 _____

2. **Arises** Unable without help =0
   Able, uses arms to help =1
   Able without using arms =2 _____

3. **Attempts to Arise** Unable without help =0
   Able, requires > 1 attempt =1
   Able to rise, 1 attempt =2 _____

4. **Immediate Standing Balance** (first 5 seconds)

Unsteady (swaggers, moves feet, trunk sway) =0
Steady but uses walker or other support =1
Steady without walker or other support =2 _____

5. **Standing Balance**

Unsteady =0
Steady but wide stance (medial heals > 4 inches apart) and uses cane or other support =1
Narrow stance without support =2 _____

6. **Nudged** (subject at maximum position with feet as close together as possible, examiner pushes lightly on subject's sternum with palm of hand 3 times)

Begins to fall =0
Staggers, grabs, catches self =1
Steady =2 _____

7. **Eyes Closed** (at maximum position of item 6)

Unsteady =0
Steady =1 _____

8. **Turing 360 Degrees**

Discontinuous steps	=0	
Continuous steps	=1	_____
Unsteady (grabs, staggers)	=0	
Steady	=1	_____

9. **Sitting Down**

Unsafe (misjudged distance, falls into chair)	=0	
Uses arms or not a smooth motion	=1	
Safe, smooth motion	=2	_____

BALANCE SCORE: _____/16

- Gait Tests -

Initial Instructions: Subject stands with examiner, walks down hallway or across room, first at "usual" pace, then back at "rapid, but safe" pace (using usual walking aids)

10. **Initiation of Gait** (immediately after told to "go"

Any hesitancy or multiple attempts to start	=0	
No hesitancy	=1	_____

11. **Step Length and Height**

Right swing foot

Does not pass left stance foot with step	=0	
Passes left stance foot	=1	_____
Right foot does not clear floor completely With step	=0	
Right foot completely clears floor	=1	_____

Left swing foot

Does not pass right stance foot with step	=0	
Passes right stance foot	=1	_____
Left foot does not clear floor completely With step	=0	
Left foot completely clears floor	=1	_____

12. **Step Symmetry**

Right and left step length not equal (estimate)	=0	
Right and left step length appear equal	=1	_____

13. **Step Continuity**

Stopping or discontinuity between steps	=0	
Steps appear continuous	=1	_____

14. **Path** (estimated in relation to floor tiles, 12-inch diameter; observe excursion of 1 foot over about 10 ft. of the course)

Marked deviation	=0

15.	**Trunk**	Mild/moderate deviation or uses walking aid	=1	
		Straight without walking aid	=2	_____
		Marked sway or uses walking aid	=0	
		No sway but flexion of knees or back or Spreads arms out while walking	=1	
		No sway, no flexion, no use of arms, and no Use of walking aid	=2	_____

16. Walking Stance

Heels apart	=0	
Heels almost touching while walking	=1	_____

GAIT SCORE = /12

BALANCE SCORE =_____/16

TOTAL SCORE (Gait + Balance) = _____/28

{< 19 high fall risk, 19-24 medium fall risk, 25-28 low fall risk}

Geriatric Assessment **Tool Kit. Patient name: ……**

Tinetti Performance Oriented Mobility Assessment (POMA)	Date	Date	Date	Date
Balance Tests: Subject is seated on hard, armless chair				
SITTING BALANCE Leans or slides in chair =0, Steady, safe =1				
ARISES Unable without help =0; Able, uses arms =1, Able without using arms = 2				
ATTEMPTS TO RISE: Unable w/o help=0; Able, requires > 1 attempt =1; Able in 1 attempt =2				
IMMEDIATE STANDING BALANCE (first 5 seconds) Unsteady (sway/stagger/feet move)=0; Steady, w/ support =1;Steady w/o support =2				
STANDING BALANCE Unsteady =0; Steady, stance > 4 inch BOS & requires support =1;Narrow stance, w/o support =2				
STERNAL NUDGE (feet close together) Begins to fall =0; Staggers, grabs, catches self =1; Steady =2				
EYES CLOSED (feet close together) Unsteady =0; Steady =1				
TURNING 360 DEGREES Discontinuous steps =0; Continuous steps =1				
TURNING 360 DEGREES Unsteady (staggers, grabs) =0;Steady =1				
SITTING DOWN Unsafe (misjudges distance, falls) =0;Uses arms, or not a smooth motion =1; Safe, smooth motion =2				
BALANCE SCORE TOTAL	/16	/16	/16	/16
GAIT INITATION (immediate after told "go) Any hesitancy, multiple attempts to start =0; No hesitancy =1				
STEP LENGTH R swing foot passes L stance leg =1; L swing foot passes R =1				
FOOT CLEARANCE R foot completely clears floor =1; L foot completely clears floor =1				
STEP SYMMETRY R and L step length unequal =0; R and L step length equal=1				
STEP CONTINUITY Stop/discontinuity between steps =0; Steps appear continuous =1				
PATH (excursion) Marked deviation =0; Mild/moderate deviation or use of aid =1; Straight withoutdevice=2				
TRUNK Marked sway or uses device =0; No sway but knee or trunk flexion or spread arms whilewalking =1; None of the above deviations=2				
BASE OF SUPPORT Heels apart =0; Heels close while walking =1				

GAIT SCORE TOTAL	/12	/12	/12	/12
ASSISTIVE DEVICE				
TOTAL SCORE (BALANCE + GAIT)	/28	/28	/28	/28
FALL RISK				
(minimal >23, Mod. 19-23, High < 19)				
Therapist initials				

3- Environmental Assessment

1- Assessment of bedroom and living room

- Suitable bed height
- No cross wires
- Good furniture position
- Light beside bed Rails in the wall Avoid loose rages

2- Assessment of bathroom

- Avoid slippery surface
- Rubber matrix under foot during taking shower
- Rails to catch during walking
- Arm seat over toilet

3- Assessment of stairs and outdoors

- Suitable height (12-15 cm)
- Suitable width (30 cm)
- Good light
- Not Slippery
- Parallel rails

* Treatment of Balance and Falls in elderly

a) IN GENERAL

Exercises Grading components from easiest to hardest:

Centre of mass *Aim to increase number of body segments involved*	**Base of support** *Aim to reduce size of base provided by feet*	**Arm support** *Aim to reduce support*
Reaching within arm's length- unilateral	Feet more than shoulder width apart, externally rotated	Grasping support bilaterally
Reaching within arm's length- bilateral	Feet together shoulder width apart	Grasping support unilaterally
Reaching beyond arm's length- unilateral	Feet together	Resting hand on support bilaterally
Reaching beyond arm's length- bilateral	Step stance (1 foot in front)	Resting hand on support unilaterally

Reaching above shoulder height-unilateral	Standing on one leg	Resting two fingers on support bilaterally
Reaching above shoulder height-bilateral	Pivoting on 1 leg	Resting two fingers on support unilaterally
Reach beyond arm's length above shoulder height unilaterally by rising onto toes		Resting one finger on support bilaterally
Reach beyond arm's length above shoulder height bilaterally by rising onto toes		Resting one finger on support unilaterally
Reaching down to floor-unilateral		Hovering hand/fingers above support
Reaching down to floor-bilateral		

b) Exercises

1- Warming Up

2- Balance Exercises

3- Strength and Balance Ex.

4- Endurance Exercises

5- Other Exercises

1- Warming Up

➢ High stepping on the spot

*Aims: warm-up, enhance co-ordination, endurance

*Making it harder:

•Step higher

•Step for longer

*Making it easier:

•place a table beside the person for hand support

*To enhance Balance and endurance

•Minimize hand support

•Aim to increase time without using hand support

2- Balance Exercises

A- Standing with a decreased base

B- Graded reaching in standing

C- Stepping in different directions

D- Walking practice

A- Standing with a decreased base

*Aims: enhance balance

*Making it harder:

- •Feet together and level
- •Semi-tandem stance
- •Tandem stance
- •Stand on one leg
- •Maintain position for longer

•Close eyes

•Stand on different surfaces e.g. foam rubber mat

•Minimize hand support & Aim to increase time without hand support

*Making it easier:

•Place a table beside the person for hand support

B- Graded reaching in standing

*Aims: enhance balance

*Making it harder:

•Feet placement- narrower, step standing

•Reaching further

•Reaching in different directions

•Reaching down to a stool or the floor

•Reaching for heavier objects

•Reaching for a full cup of water

•Standing on a softer surface eg foam rubber mat

•Stepping while reaching

*Making it easier:

•Place a table beside the person for hand support

•Give feedback to enable the task to be successfully completed (e.g., keep yourhips forward)

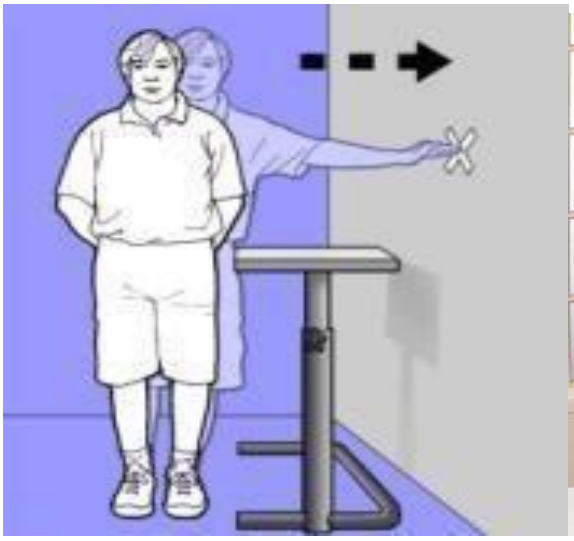
•Structure the environment to enhance performance e.g. markers on floor to showfoot position, an object to move hips towards

•Tip. If you have a sway-meter, people may enjoy tracing different size “race track” paths with this.

*To enhance balance

•Minimize hand support

•Aim for as long as possible without hand support



C- Stepping in different directions

Aims: enhance balance

*Making it harder:

•Narrow foot position

•Longer steps

•Faster steps

•Step over objects

•Choice component e.g. step forward with left foot

•Incorporate pivoting on the non-stepping foot

•Use different colors, numbers of letters or a clock face or coins as targets forvariety

*Making it easier:

•place a table beside the person for hand support

*To enhance balance

•Minimize hand support

•Aim for as long as possible without hand support

D- Walking Practice

Aims: enhance co-ordination and endurance

*Making it harder:

•Decrease base of support i.e. progress to tandem walk

•Increased step size

•Increase speed

•Change direction

•Walk on different surfaces

•Walk sideways, backwards

•Obstacles to step over and walk around

*Making it easier:

•Use a bar, wall or walking aid for hand support

*To enhance balance

- •Minimize hand support
- •Aim for as long as possible without hand support

3- Strength and Balance Ex.

A- Sit-to-stand

B- Heel raises

C- Forward step-up

D- Lateral step-up

E- Half- squats sliding down a wall

A- Sit-to-stand

Aims: enhance balance, strength and endurance

*Making it harder:

- •Lowering the height
- •Don't use hands to push off, cross arms across chest
- •Changing the nature of the surface (e.g. Softer chair)

•Ask the person to stand up with most weight on one leg- the other leg can be placed in front or on a stool to ensure this

•Adding weight (either vest or belt)

*Making it easier:

•Place a table in front of or beside the person for hand support

•Give feedback to enable the task to be successfully completed (e.g. Feet backbehind your knees, move your shoulders forward)

•Structure the environment to assist performance e.g. Markers on floor to show footposition

Tip. Height can be adjusted by using an electric plinth, using different chairs or stools and by placing large stable block/s under the feet.

*To enhance Balance and endurance

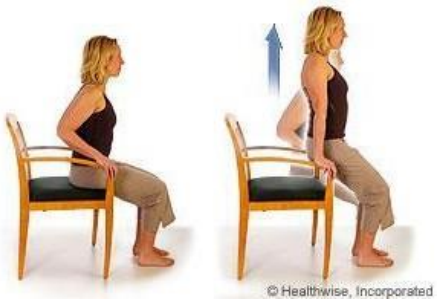
•Aim for as many repetitions as possible, the height should be such that it is easy for the subject to complete multiple repetitions

•Minimize hand support

•Increase speed e.g. count repetitions done in one minute

*To enhance strength

•Aim for a chair height and amount of added weight for which the person can just do 2 sets of 10-15 repetitions (i.e. 10-15 RM).



B- Heel raises

Aims: enhance balance, ms strength and endurance

*Making it harder:

•Decrease hand support

•Hold the raise for longer

•One leg at a time

•Adding weight (either vest or belt)

•Use a wedge to increase the range of motion

*Making it easier:

•Place a table on one or both sides of the person for hand support or use theirwalking aid

*To enhance balance and endurance

•Minimize hand support

•Do as many repetitions as possible

To enhance strength

•Aim for an amount of added weight for which the person can just do 2 sets of 10-15 repetitions (i.e. 10-15 RM

C- Forward step-up

Aims: enhance balance, strength and endurance

*Making it harder

•increasing step height

•adding weight (either vest or belt)

•decrease hand support

•step up and over block

*Making it easier:

••place a table on one or both sides of the person for hand support or use their walking aid

Tip. Make sure the person lowers the leg in a controlled manner when stepping over the block

*To enhance balance and endurance

•Aim for as many repetitions as possible, the height should be such that it is easy for the subject to complete multiple repetitions

•Minimize hand support

*To enhance strength

•Aim for a block height and amount of added weight for which the person can just do 2 sets of 10-15 repetitions (i.e. 10-15 RM).

D- Lateral step-up

Aims: enhance balance, strength and endurance

*Making it harder:

•increasing block height

•adding weight (either vest or belt)

*Making it easier:

•place a table on one or both sides of the person for hand support or use their walking aid

Tip. Make sure the person doesn't push off by plantar flexing ankle of foot on floor instead of extending leg on block

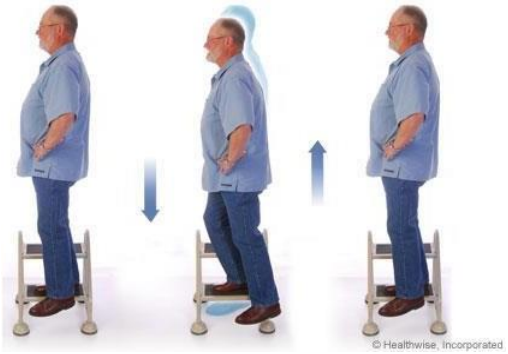
*To enhance balance and endurance

•Aim for as many repetitions as possible, the height should be such that it is easy for the subject to complete multiple repetitions

•Minimize hand support

*To enhance strength

•Aim for a block height and amount of added weight for which the person can just do 2 sets of 10-15 repetitions (i.e. 10-15 RM).



E- Half- squats sliding down a wall

Aims: enhance balance, and ms endurance

*Making it harder:

•decrease hand support •hold the squat for longer

•move a short distance away from the wall

•adding weight (either vest or belt)

•one leg at a time

*Making it easier:

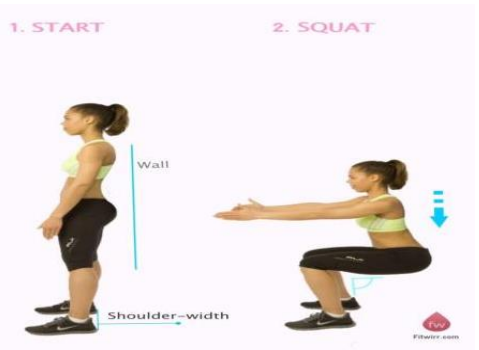
•place a table on one or both sides of the person for hand support or use their walking aid

*To enhance balance

•Minimize hand support

*To enhance muscle endurance

•Aim to hold the position for as long as possible



4- Endurance Exercises

Bike, treadmill walk, over ground walk or sit-to-stand

•Chose an activity which the person can perform safely according to the prescription principles

•Examples of activities include:

- Exercise bike (recumbent bike may be safer)
- Treadmill walk (ensure available treadmill can go slowly enough)
- Over ground walk (up and down an indoor area or outdoors if safe)
- Sit-to stand (from a height that is easy for the person).

5- Other Exercises

Getting off the floor training:

This is not an exercise and just a way of helping you to get down onto the floor.

If you know you have difficulty getting up from the floor you should not attempt this or any of the following exercises without seeking advice.

You will need:

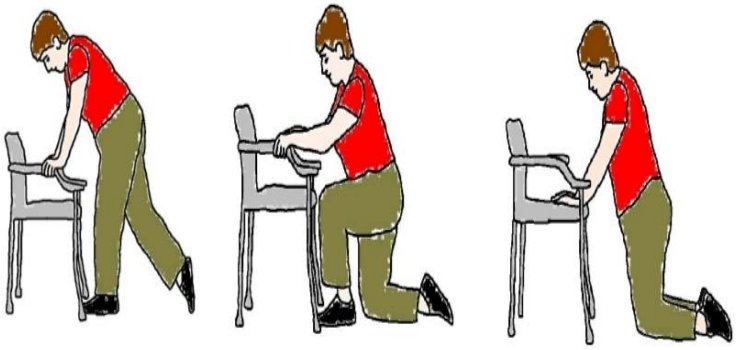
• A sturdy chair, preferably with arms – placed on a carpet with enough space to lie down.

• You may need several cushions or pillows placed on the floor until you feel more confident and for comfort.

1. Turn to face the chair, using the arms or seat for support if necessary.

2. Slowly lower yourself onto your knees, one leg at a time.

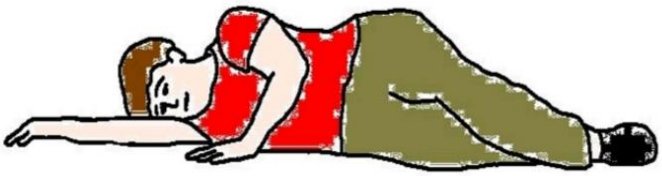
This can be achieved more easily using pillows on the floor across the front of the chair and taking them away one at a time as you become more confident.



3. Slide your hands off the chair and onto the floor

4. With your hands in front of you, slowly lower your bottom onto the floor, legs to one side

5. Slowly lower yourself onto your side



6. From here you can roll onto your back or front

When getting back up simply reverse the instructions.

However it is common to feel a little dizzy when getting back up onto your feet so for comfort and safety

1. Turn side to the chair whilst holding on for support

2. Then turn and move back towards the chair until you feel the chair on the back of both legs

Then simply sit back and relax for a few minutes.

Safety advices for exercise participants

General advice to patients

- Wear walking shoes or joggers. Do not wear open shoes of any kind, such as thongs and sandals, high-heeled shoes, slippers or ill-fitting shoes

-Clothing should be comfortable and cool. Do not wear flowing clothing, such as ties, scarves, flowing trousers or sleeves

-Please ask the other people in your household not to distract you when you are concentrating on your exercises

-Make sure you replenish your fluids by having a drink of water after your exercise session

Warnings to patient

Do not perform your exercise session if:

- You are feeling unwell, due to a temporary illness such as a cold or flu

-You have not taken your regular medications as scheduled

Indication to terminate an exercise and seek medical advice:

These indications to terminate exercise and seek medical advice apply to all participants (regardless of whether you have recognized cardiovascular disease or not)

- Squeezing, discomfort or typical pain in the centre of the chest or behind the breastbone ± spreading to the shoulders, neck, jaw and/or arms; or symptoms reminiscent of previous myocardial ischaemia
-Dizziness, light headedness or feeling faint
-Difficulty breathing
-Nausea
-Uncharacteristic excessive sweating
-Palpitations associated with feeling unwell
- Undue fatigue
- Leg ache that curtails function
- Physical inability to continue
-For people with diabetes: shakiness, tingling lips, hunger, weakness, and palpitations

Indications to stop a particular exercise and rest for a couple of minutes before proceeding:

-Severe local muscle fatigue (mild fatigue is expected).

Safe practice guidelines for physiotherapists

1- ANYONE who develops chest pain, collapse, faintness, or severe breathlessness during exercise should go directly to hospital (via ambulance). In the case of chest pain, lie the patient down and administer 1 sublingual anginine (if the patient has them), and call an ambulance. In the case of cardiac arrest, commence CPR and call an ambulance.

2- Always carry details of patients' medical background, and have information to be able to contact their local doctor if necessary.

3-Take extra care when individuals are on warfarin they are more likely to bruise and bleed.

4- Anyone with a known heart murmur who develops a cut or graze will need antibiotics – inform their local doctor if a cut/graze occurs. Apply antiseptic immediately.

5- Some exercise participants will have osteoarthritis/rheumatoid arthritis – only exercise in the pain free range of motion.

6- Check and adhere to any special precautions for individuals who have had a total hip replacement.

7- Individuals with respiratory disease should have their puffers/nebulisers nearby, and may need to take the exercises slowly.

8- Individuals who report dizziness or fainting should see their local doctor.

9- Individuals with diabetes should be encouraged to test their blood sugar level after exercise.

10- Individuals on diuretics, or with bladder irritability should be encouraged to void prior to the commencement of exercise.

11- Ensure appropriate breathing with resistance training – inhale before a lift, exhale during the lift and inhale as weight is lowered to the starting position.

12- Never force a patient to perform an exercise they are not keen to do.

Tips for running the program in a group setting:

_Some group activities can be introduced to help participants get to know each other and to enhance variety and enjoyment. For example, throwing or kicking a large ball or balloon (can use rice in it to make it heavier) to each other in sitting or standing, walking relays.

_A circuit class design can facilitate individual prescription if participants have different levels of ability.

_To enhance variety the exercises and/or stations chosen can be varied each class of after several weeks

_It is useful to have a social aspects to the class too, e.g,. meeting for morning tea prior to or after the class.

_Home exercises can be individually prescribed by asking several participants to come early or stay later each class.

_Laminated numbered station cards are a useful way to ensure participants move from one exercise station to the next in the correct order.

_When a program first starts 2-2.5 minutes per station may be all that participants can manage but this can be progressed to 4 minutes.

_Games can be incorporated into exercise stations to enhance interest e.g. finding pairs in playing cards which can be temporarily fixed to a wall for standing tasks, magnetic darts or quoits, mini-golf.

EXERCISE AND PHYSICAL ACTIVITY FOR OLDER ADULTS

Introduction

Exercise is the single most efficacious intervention for older adults used by physical therapists. Exercise is known to simultaneously impact and mediate chronic disease, many impairments, functional deficits, quality of life, and cognition and prevent the negative sequelae associated with sedentary lifestyles. This chapter discusses the role of physical activity and exercise, effects of sedentary lifestyle, elements of an effective exercise prescription, and the different types of exercise applications for older adults.

Role of physical activity

Physical activity is defined as any bodily movement that involves skeletal muscle contraction and that substantially increases energy expenditure. The Centers for Disease Control and Prevention (CDC) has established specific physical activity recommendations for older adults to achieve important health benefits. The CDC also recommends muscle strengthening exercise on 2 or more days per week that address all the major muscle groups of the body.

Common chronic conditions and the impact of physical inactivity:

Physical inactivity is a significant risk factor for the development of many chronic health conditions:

- Heart disease
- Cancer: breast, colon, prostate, and pancreas.

- Congestive heart disease
- Depression
- Hypertension
- Cognitive disease
- Type 2 diabetes
- Obesity
- Osteoporosis
- Peripheral vascular disease
- Physical frailty
- Sleep apnea
- Osteoarthritis
- Stroke
- Balance problems and fall

Physical inactivity increases the risk of disability in individualswith various chronic health conditions including:

- Chronic back pain
- Balance problems and falls
- Stroke
- Arthritis
- Frailty
- Debilitating illness
- Long-term chemotherapy
- Total joint arthroplasties
- Lower extremity fracture

- Parkinson's disease

The slippery slope of aging

Systems decline at approximately the rate. These include cardiac and respiratory systems, the hepatic and renal systems and the cognitive and sensory system (vision and hearing)

The functional category represents those who are at risk for mobility disability or have some degree of mobility disability.

Elements of an exercise prescription

An exercise prescription should incorporate all necessary parameters to promote the desired change to a system.

Parameters:

- The type of exercise
- Intensity
- Duration
- Frequency
- Type of contraction
- Speed of contraction

Assessment of Overload Stimulus

- Determining the appropriate overload stimulus to achieve adaptive response requires knowledge of thresholds for adaptation for the aerobic and muscular systems.

The aerobic stimulus that is required to achieve a conditioning response is determined by percentage of a Vo2 max and can be calculated using a variety of methods.

- Other useful ways of assessing overload are the Borg Scale of Perceived Exertion (RPE).

Functional training

- In long recognized that functional activity is complex neuromuscular event.
- Or activity Functional training refers to overloading the movement.
- Progression of functional exercise program is obtained Moving from:
    - Simple movement to more complex *
    - Normal speed to either quicker or slower movement *
    - Stable surfaces to unstable *
    - Eyes open or eyes closed *

    Physical therapists have long recognized that any functional activity complex neuromuscular event that incorporates multiple system.

Progression of a functional exercise program is obtained by moving from

1-simple movements to more complex movements

2-normal speed to either quicker or slower movements

3-stable surfaces to unstable or compliant surfaces

4-eyes open to eyes closed and

5-an emphasis on from to an emphasis on intensity and the working over from base of support to working outside the base of support

Speed and power

Power is defined as the time rate of force development. The more powerful a muscle contraction the more rapidly the muscle can produce a given level of force.

Speed is a necessary component of certain functional movements such as: -

- Crossing a street with a timed traffic signal, getting to the bathroom in time and walking with pedestrian traffic.
- Training for speed is an application of specificity and necessary component functional activities.

Functional movements, key muscle groups and sample exercises

- Functional movements\transfers and squats. Key muscle\gluteus maximums, medius, and obturator externus, piriformis, quadriceps. Exercises\sit to stand, squats with knees abducted and hips externally rotated, leg press, wall slides.
- Functional movement\ambulation and stair climbing. Key muscles (Abdominals, erector spinae, gluteus maximus and medius, obturator externus, piriformis, quadriceps, and anterior tibialis and gastro-soleus).

TYPES OF EXERCISES FOR OLDER ADULTS

- **Aerobic exercise**
- **Aquatic exercise**
- **Strengthening exercise**
- **Stretching exercise**
- **Plyometrics**
- **Tai Chi**

1-Aerobic exercises: -

Measurement:

Target heart rate is the most clinically applicable measure to determine aerobic exercise intensity.

Tests to for measurement:

- Exercise stress test.
- Six-minute walk test.

Indications for aerobic exercise:

— Patients who lack the ability to sustain activity for a desired period of time.

— Patients have complaints of fatigue.

— Aerobic exercise increases the body's capacity to absorb, deliver, and utilize oxygen.

Contraindications and safety:

- Resting heart rate greater than 100 bpm.
- Systolic blood pressure higher than 200 mmHg.
- Diastolic blood pressure higher than 120 mmHg.
- Unstable cardiac conditions or risk signs for cardiac disease.
- Monitoring of blood pressure and heart rates should be routinely performed.

Equipment and opportunities:

- Indoor equipment: treadmill, elliptical trainer, stair stepper, rower, stationary bike, and recumbent-type bikes.

- Outdoor activities: walking or hiking, cross-country skiing, skating, jogging, and cycling.

Conclusion

— Aerobic exercise may be one aspect of a complete exercise program for an older adult.

— Considerations as to patient physical impairments, functional deficits, and patient goals need to be considered.

2-Aquatic exercises: -

— Aquatic exercise allows the application of the physical stress theory for individuals who cannot tolerate the stresses of land-based exercises.

— Measurements: Target heart rate can be determined using the same formulas as for land-based exercise.

Indications for aquatic exercise:

- Support to the upright position.
- Painful joints in weight bearing.
- Osteoarthritis.
- Overweight.
- Recently undergone surgery.
- Significant balance disorders.
- Fear of falling.

Contraindications and safety:

- Patients need to be monitored walking over wet slippery surfaces, going up and down ladders or steps when entering or leaving the pool and while in the water.

- Otherwise, the same contraindications and safety monitoring as aerobic exercise apply to aquatic exercise.

Equipment:

- There are many types of flotation devices to either provide support or resistance while exercising.
- Devices to promote ambulation in the pool underwater treadmill systems.
- Access to the pool can consist of ramps, hydraulic lifts, stairs, or ladders.

Conclusion:

— The use of aquatic exercise allows a patient, who may otherwise be unable to exercise because of pain or instability, the ability to be more physically active and to gain initial levels of strength to permit land-based exercise.

3-Strengthening Exercise

— Older adults gain strength the same way that younger people gain strength.

— Loss of strength can be associated with loss of function in older adults.

Measurement.

Strength testing using traditional manual muscle testing can be very subjective with substantial ceiling effects.

Indications:

- Strength has been implicated in most functional movements.
- Provide a protective effect.
- There are no absolute contraindications for strengthening exercises.

Equipment:

BOX 5-5 Equipment That Can Be Used for Strength Training

- Body weight in a variety of positions with or without climbing ropes, fixed straps, or chin up bars
- External weights such as a pulley system, weight machine, dumbbells and barbells, kettlebells, weight bars, weighted balls, and power bags
- Compliant surfaces (foam pads, air bladders, wobble boards)
- Elastic bands and tubing such as Theraband
- Inflated balls or stability balls
- Variable resistance (isokinetic) exercise machines (Cybex, BTE, etc.)
- Flexible rods (BodyBlade) (Figure 5–11)
- Immovable surfaces for isometric contractions
- Punching bags
- Weight sleds
- Steps
- Pilates table

4-Stretching Exercises:

- Older adults adopt certain movement patterns and positioning as they age.
- Acquired postures result in muscles and other soft tissue that is continuously held in a shortened or lengthened position.
- Stretching is indicated to promote adaptation of shortened muscles to a more lengthened position to achieve better posture and movement patterns.

Measurement, Indications and Contraindications:

— **Measurement**: Age-based normal ranges of motion have been recorded in a variety of publications.

— **Indications.** Joint range of motion limitations can lead to pain syndromes, painful postures, abnormal movement patterns, and loss of function.

— **Contraindications:** the only absolute contraindication to stretching exercises is the presence of joint instability.

5-Plyometrics:

- Plyometric exercise is an attempt to use the stretch reflex of the muscle spindle and the elastic energy .
- Plyometrics usually consists of an eccentric (lengthening) contraction followed by a concentric (shortening) contraction of the same muscles.

Measurement:

- Testing for muscle power on an isokinetic dynamometer or similar device is a method of determining the effectiveness of this exercise approach.
- Alternately, any functional testing done by measuring the time taken to complete a task, that is, gait speed, floor transfer, or stair climbing, would also be a measure of improvement.

Indication and Application:

— **Indications:** loss of power and a lot of falls.

— **Application:**

1. Speed of contraction should be used as a method of overload.
2. Quick reciprocal movements performed functionally, to achieve increased speed of muscle contraction.
3. Initially, have the patient jump in place.
4. Then increases the challenge as the patients improve.

FIGURE 5-16 Plyometric exercise jumping onto and off of a step.

FIGURE 5-18 Plyometrics, jumping from foot to foot.

6-Tai Chi:

— Tai Chi involves learning multiple poses that are linked together with slow movements that emphasize control and balance.


Indications

- Arthritis.
- Cancer.
- Cardiovascular disease.
- Diabetes.
- Stress.
- Depression.
- Decreased balance and fitness.
- Increased falls

Resources, Exercises and Equipment

There appears to be some benefit of learning Tai Chi from experienced teachers who appreciate the skill, balance, coordination, mental application, and rigor that is necessary to obtain optimal benefit from this discipline.

SUMMARY

- Exercise is the most powerful intervention for maintaining well-being, the remediation of impairment, and the promotion of function in all age groups.
- For older adults, exercise is a robust application for the prevention and treatment of chronic diseases and mobility disability and maintaining quality of life.

Constipation

Constipation is considered when hard stool is passed with difficulty every three days that persist for two weeks.

Causes

A. Organic

- Structural: anal stenosis, anal fissure.
- Neuromuscular: spina bifida, pseudo-obstruction.
- Metabolic: hypokalemia, hypercalcemia, hypothyroidism, diabetes mellitus.
- Drugs: Narcotics, anticholinergic, lead
- Intestinal: inflammatory bowel disease, cystic fibrosis, tumors.

B. Functional

In an otherwise healthy child constipation may result simply from an episode of painful defecation, difficulties during the period of toilet training, inattention to the urge to defecate because of involvement in other activities or discomfort with toilet facilities in school

Clinical features

A detailed history of pattern of defecation may reveal stool-withholding behavior like contracting the gluteal muscles by stiffening the legs while lying down or holding on furniture while standing, some children will squat, push and cry which may be misinterpreted as an attempt to defecate.

Accompanying symptoms include abdominal pain, abdominal distention and flatulence.

Sometimes rectal bleeding, poor appetite, enuresis and history of UTI are associated. Encopresis (an overflow incontinence of liquid stool) can be present in long standing cases.

Physical examination of the abdomen may reveal distention or palpable fecal masses.

Digital examination of the rectum is needed to evaluate the sphincter and ampulla.

Diagnosis

When no underlying cause is identified by history and physical examination a favorable response to treatment support the diagnosis of functional constipation.

In refractory cases appropriate radiographic and laboratory tests are needed to rule out the organic causes. Barium enema and anorectal manometry are most helpful.

Therapy

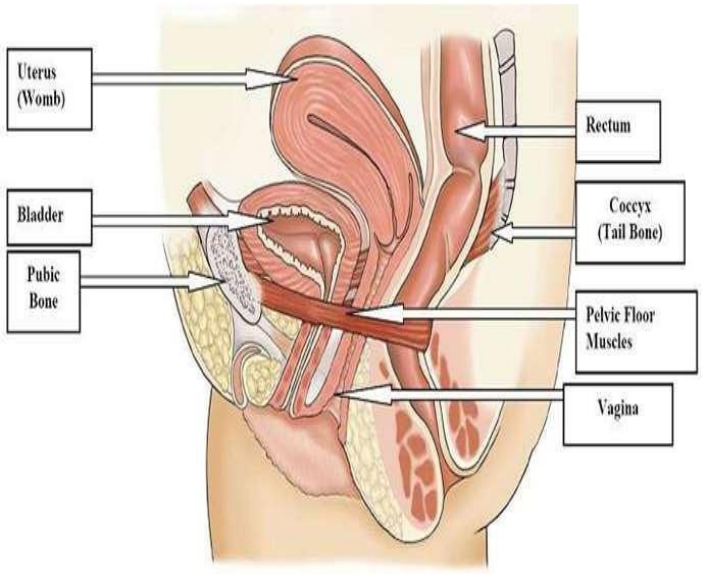
For functional constipation include:

1. Patient education, a regular bowel training program including sitting on toilet for 5-10 minutes after each meal is often helpful in establishing a regular bowel habits.
2. Relief of impaction can be achieved by enema or polyethylene glycol.
3. Softening of stool by lactulose, high fiber diet, or mineral oil must be continued until regular bowel pattern has been established for several months.

Biofeedback training may be beneficial in difficult cases.

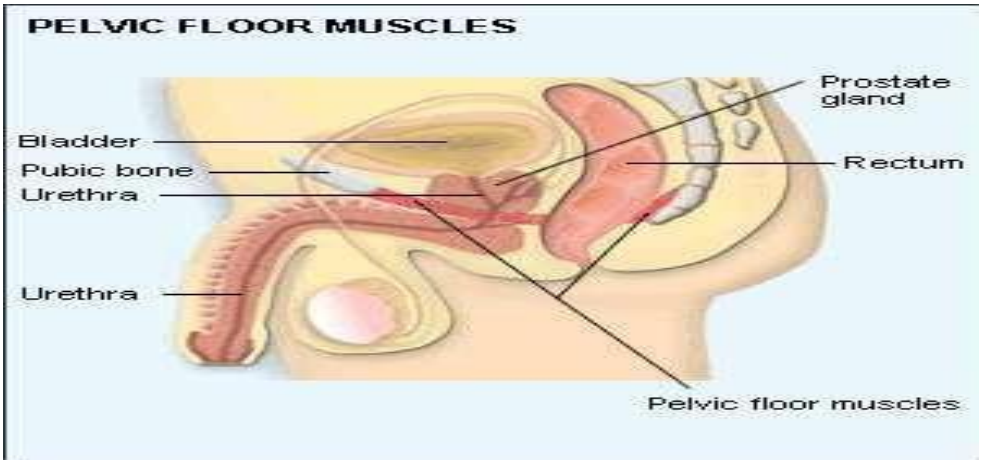
PT for Constipation

- Diet
- Pelvic floor relaxation
- Abdominal massage
- Toilet position



Female Pelvic Floor Muscles

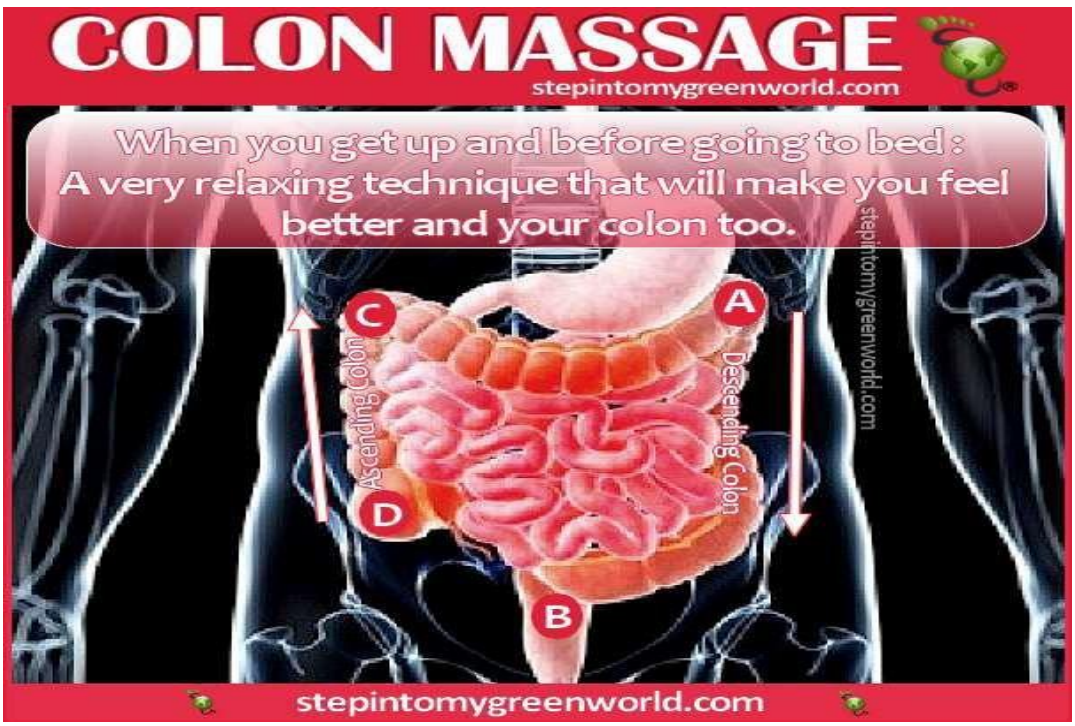
Male Pelvic Floor Muscles



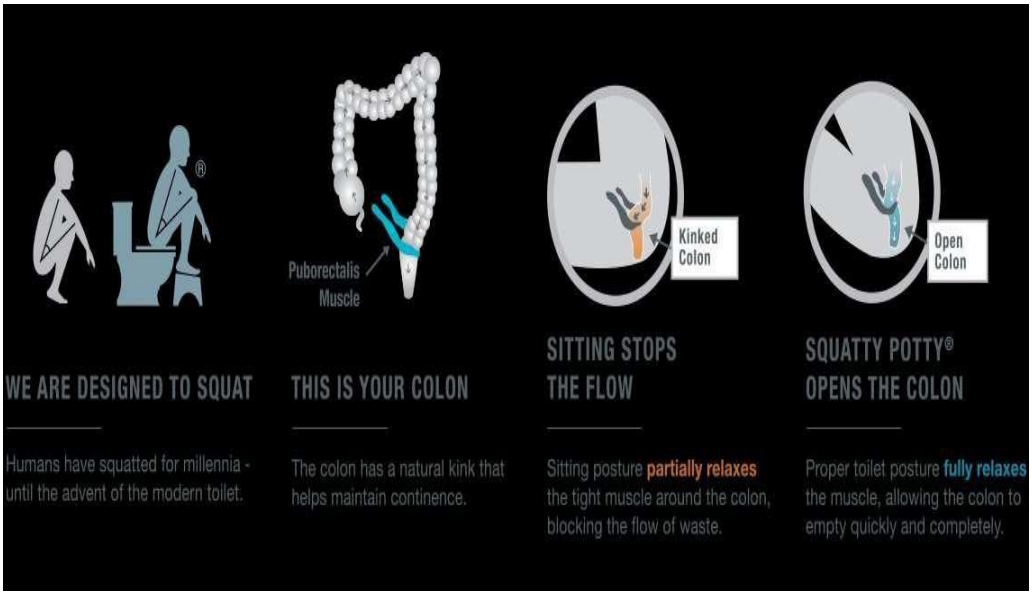
Relax Pelvic Floor

- Breath training: calm, long, smooth breaths
- Body awareness of tight and painful area

Abdominal massage



Toilet posture



Biofeedback Therapy for Chronic Constipation

We have always believed in the best and practiced the best at Healing Hands Clinic and to add on to this, we introduce Pune's first biofeedback machine (sphinctometer) for obstructed defecation syndrome (OSD) (a form of chronic constipation), stress urinary incontinence, pelvic organ prolapse and pelvic floor dyssynergia.

Biofeedback

is the process of gaining greater awareness of your pelvic floor muscles, their strengths, functions and at the same time it provides you with the information on the activity of your muscles with a goal of manipulating them at will.

Pelvic floor muscles are which stretch between your pubic bone and tail bone, cradling your bladder, bowel, uterus, urethera, helping you to control your urine bowel movements and also sexual functioning.

Damage to pelvic floor not only contributes to urinary incontinence but can lead to pelvic organ prolapse. In females, the muscles can be damaged in pregnancy/childbirth/hysterectomy.

Studies show that up to 50% of patients with chronic constipation have pelvic

floor dysfunction or dyssynergia, this condition is characterized by impaired coordination between pelvic floor relaxation and abdominal wall motion, which is necessary for normal defecation. Biofeedback helps in strengthening of Pelvic Floor Muscles and thus curing and preventing stress urinary incontinence and pelvic organ prolapse .

Goals of therapy:

- Improve symptoms and bowel function
- Accelerate colonic transit
- Stimulate gut motility
- Facilitate defection

Several different relaxation exercises are used in biofeedback therapy, including:

- Deep breathing
- Progressive muscle relaxation : alternately tightening and then relaxing different muscle groups
- Guided imagery : concentrating on a specific image (such as the color and texture of an orange) to focus your mind and make you feel more relaxed
- Mindfulness meditation: focusing your thoughts and letting go of negative emotions

POSITIONING

Proper position and regular change in position promote sense of comfort and well being as well as prevention of many complications such as:

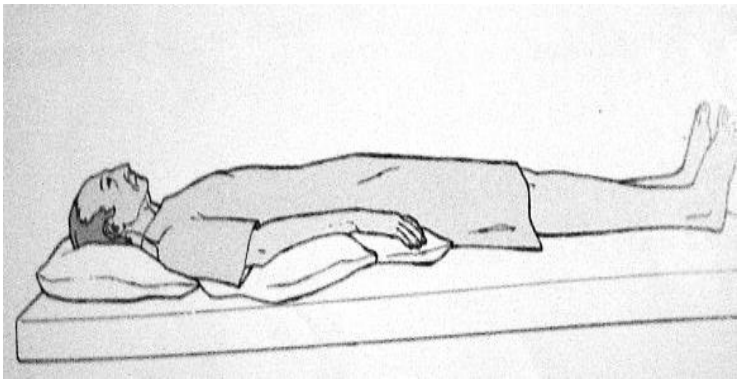
- Pressure ulcers.
- Stiffness of joints.
- Stagnation of circulation.
- Weakness of muscles.
- Loss of elasticity and flexibility.

Procedures during changing positions:

- Explain the procedure to the patient.
- Use good body mechanics for patients and therapist.
- The movement must be gentle and quite.
- Use assistive devices for support and good alignment.

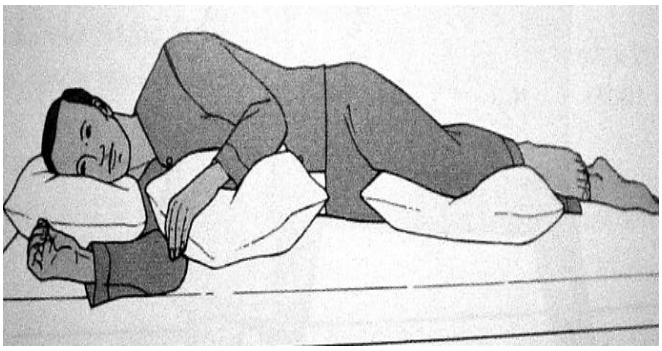
Supine position

It is the back lying position. The bed is flat, the head and shoulders are supported on a pillow, arms and hands are at the person's sides. The hands may be supported on small pillows with palms down. A rolled towel is placed under lower back. Often a small pillow is under the ankles. It is the most supported position.



Side lying position

A person in the lateral position lies on one side or the other. A pillow is under the head and neck. The upper leg and thigh are supported with pillows. A small pillow is under upper hand and arm, and a pillow is positioned against person's back.



Indications:

• For turning patient to avoid pressure ulcers.

• Commonly used in restrictive lung disease.

• For prevention of spinal deformities.

• For post operative cases.

• Used for application of stretching exercise.

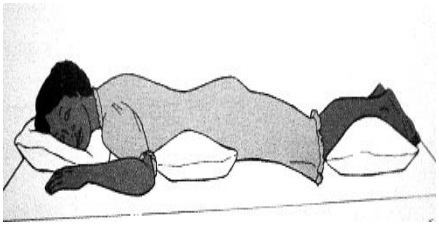
Sims' position

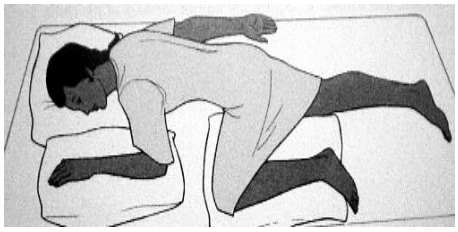
The Sims' position is a modified side-lying position. The upper leg is in about 80º flexion so it is not on the lower leg, and the lower arm is behind the head. Good alignment involves placing a pillow under the person's head and neck, supporting the upper leg with a pillow, and placing a pillow under the upper arm and hand.

Indications:

• For cardiopulmonary disorders.

- For easier breathing.
- More comfortable position.





Prone position

Persons in the prone position lie on their abdomen with their head turned to one side. Small pillows are placed under the head, abdomen, and

lower legs. Arms are flexed (80º- 90º) at the elbows with hands near the head.

Indication:

• For changing patient's position.

• Used for application of stretching position.

Contraindications:

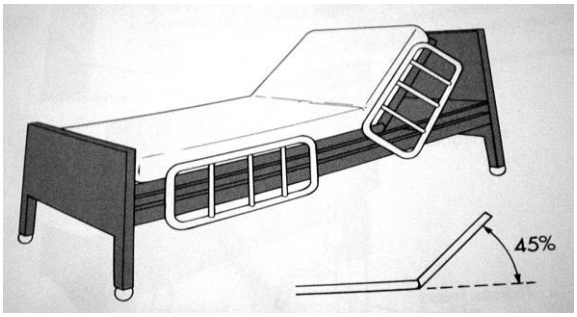
- Post cardiac surgery
- Obstructive lung diseases especially asthmatic patients
- Can not be used for patient with urinary catheter.

Fowler's position

It is a semi sitting position. Fowler's position involves raising the head of the bed 45 to 60 degrees with keeping the spine-straight, supporting the head with a small pillow, and supporting the arms with pillows. Place a small pillow under the lower back and thighs.

Indications: Suitable for heart and respiratory disorders due to reduction of load on heart and lung with improvement of peripheral circulation. Eating, watching television, visiting, and reading are easier in Fowler's position.

Contraindications: Hypotensive patients due to effect of gravity.



Semi-Fowler's position

The head of the bed is raised 45 degrees, with raising knee 15 degrees. This position is comfortable and allows for easier breathing. However, raising the knee portion can interfere with circulation through:

• Improving venous return.

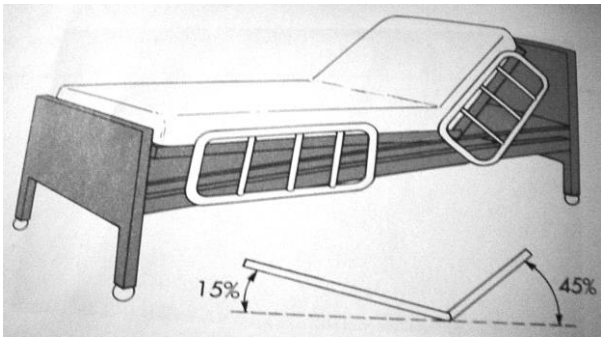
• Reduce load over cardiopulmonary system.

• Reduction of stress over back and abdominal muscles.

Indications:

- For easier breathing for heart and respiratory patients.
- It is a more comfortable position.

Contra indications: Interfere with lower limb circulation as in cases of poor peripheral circulation.



Trendelenburg's position

The head of the bed is lowered, the foot of the bed is raised and the bed frame is tilted. The position promotes venous blood flow from lower extremes to the heart. It is also used to drain secretions from lungs as in cases of suppurative lung diseases.

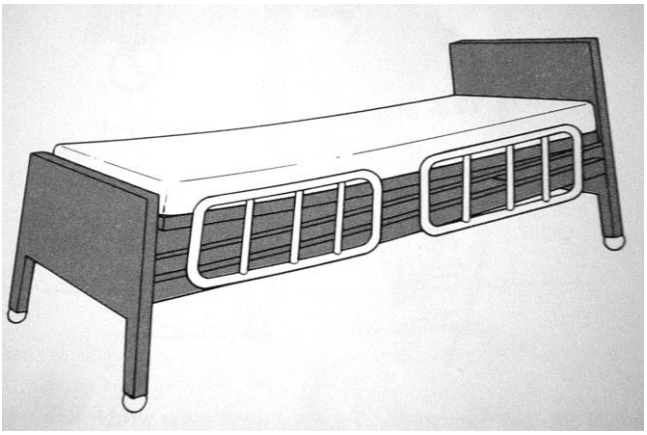
Indications:

- Easier for venous return due to the effect of gravity.
- Drain lung secretions, and then help in posture drainage.
- For hypotensive patients (Improving cerebral circulation).
- Used in lymphatic drainage.

Contraindications:

- Hypertension.
- After meals.
- Congestive heart failure.
- Restricted diaphragm movement.
- Increased intracranial pressure after head surgeries injuries.
- Headache.
- Pregnant women.
- Interfere with peripheral circulation.

- Increase intra ocular pressure.
- Increase dental ache.



Reverse Trendelenburg's position

The head of the bed is raised, and the foot of the bed is lowered. The position promotes stomach emptying.

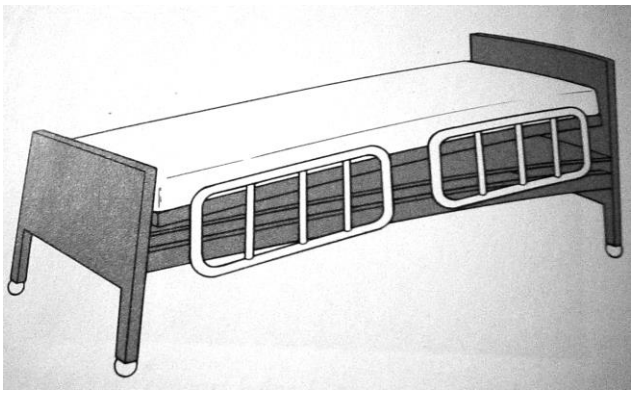
Indications: Assist stomach emptying.

Contraindications:

- Lower limb edema as it increases with lowering position.
- Congestive heart failure patient.
- Hypotension.

Comfort and Safety

The person's skin is protected during lifting and moving. Friction and shearing injure the skin as both cause infection and pressure ulcers. Reduce friction and shearing by rolling or lifting the person. A cotton draw sheet serves as a lift sheet (turning or pull sheet) to move the person in bed and reduce friction.



PATIENT TRANSFER

Transfer means that move elderly subject from one place to another. Therapist may help elderly subject who need transfer many times each day. Transferring may be manual or by mechanical lifts. Many elderly are able to transfer themselves from one place to another with little assistance, where others require a lot of assistance.

Transfer varieties:

People transfer from the bed to a wheel chair and back again, or from a wheel chair to a dining chair or commode and back again. Also, transfer from wheel chair to car and back again.

Reasons for transfer:

-Changing position frequently helps us to stay comfortable, while we are sitting or in lying down.

-Prevent complications that can result from spending long time in the same position.

-It is important for exercises, elderly evaluation, demonstration and orientation.

Before transferring procedure:

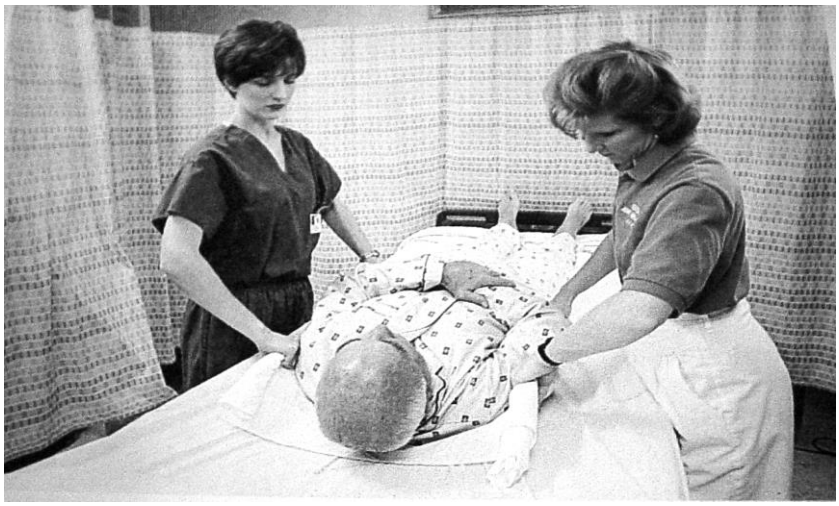
-Ask a co-worker to help you.

-Explain the procedure to the elderly.

-Lock the bed wheels.

-Raise the bed to the best level suitable for body mechanics.

Moving Elderly Subject Up in Bed with Lift Sheet



Moving person up in bed with a lift sheet

Friction and shearing are reduced, and the person is lifted up easily with lift sheet. Lift sheet is placed under the person's head to just above knees. Lift sheets are used to move persons who are unconscious, paralyzed, and recovering from spinal cord injury.

Transferring procedure:

-Bed should be flat as much as possible.

-Place the pillow against the bed board.

-Therapist stands on one side of the bed, and the assistant stands on the other side.

-Lower bed rails.

-Therapist stands on a broad base of support, point the foot near the elderly head towards the head of the bed, therapist facing the transfer direction.

-Roll the sides of the lift sheet up close to the person.

-Persons head must be supported before transfer.

-Therapist bends his hips and knees.

-Slide the person up in bed on the count of three.

-Shift your weight from near leg to front leg.

-Unroll the lift sheet.

After transfer procedure:

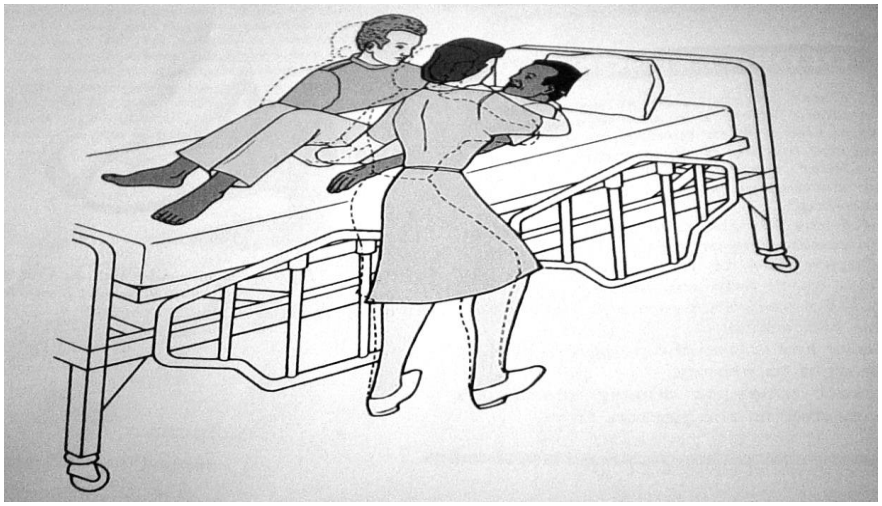
-Elderly must be in comfortable and good body alignment.

-Place the call bell within elderly reach.

-Adjust bed rails as instructed.

-Lower the bed to its lowest position.

Moving the Person Up in Bed with Assistance



Moving the person up in bed

Transferring procedure

-The bed should be flat as possible.

-Place pillow against the head board to prevent head injury.

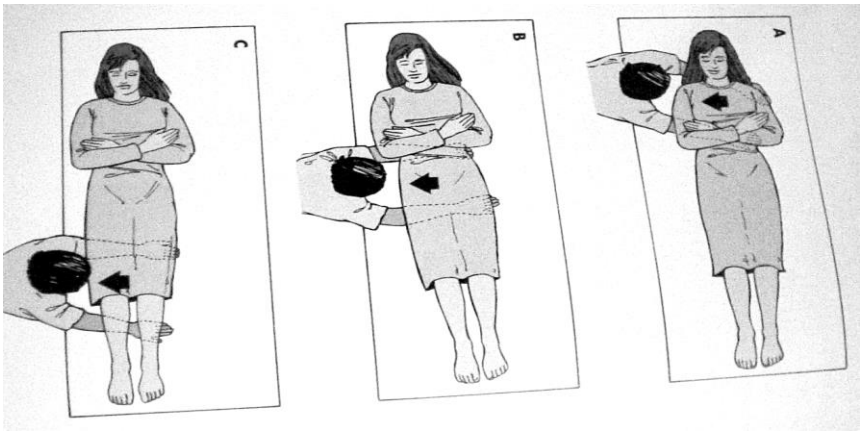
-Stand on the side of the bed, and the co-worker stands on the opposite side.

-Place one arm under the person's shoulder and the other arm under the buttocks, and co-worker do the same. Therapist and co-worker grasp each other's forearm.

-Person flexes his knees to push against the bed with feet if possible.

-Move the person to the head of the bed, and shift your weight from rear leg to your front leg.

Moving Elderly Subject to the Side of the Bed



Moving the person to the side of the bed

Repositioning and care of subject requires moving him to the side of the bed. The person is moved to the side of the bed before turning.

Transferring procedure:

-Subject's bed should be as flat as possible.

Therapist stands on the side of the bed to which you will move the subject, with one foot in front of the other.

-Lower the bed rail beside you, and raise the far bedrail.

-Cross the subject's arms over his chest.

First Method: Moving the person in body segments.

- Therapist places his arm under the subject's neck and shoulders, and other arm under the subject's mid back.
- Move the subject's upper body toward you, and shift your weight to your rear leg.
- Repeat the procedure for the persons waist and thighs, and then for the legs and feet.

Second Method: Moving the subject with a lift sheet.

- Roll the lift sheet up close to the person's shoulders and buttocks, then grasp the rolled up lift sheet.
- Therapist rock back ward and moving the person toward him. Co–worker rocks backward slightly and then forward, while keeping his arms straight.
- Unroll the lift sheet.

After completing either method:

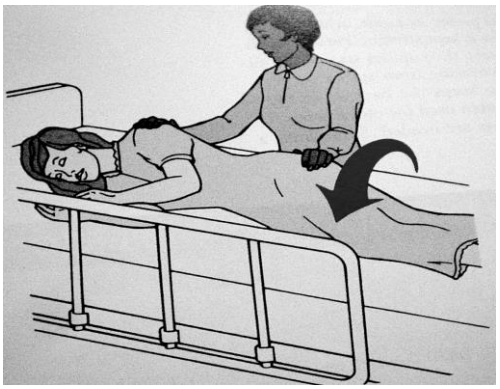
-Make sure the person is comfortable, and repositioned as directed.

-Pillow under the person's head and shoulders.

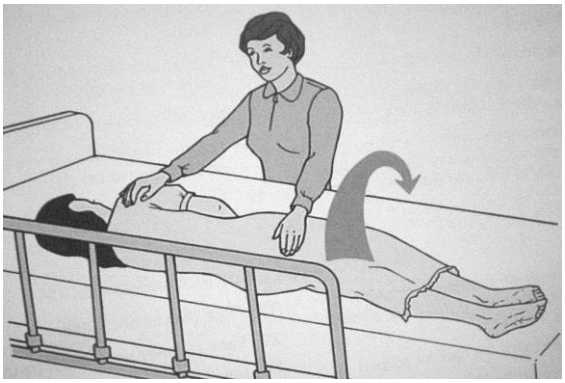
-Place the call bell within subject's reach.

-Lower the bed, and adjust its bed rails as instructed

Turning Persons



(Method 1)



(Method 2)

Procedure:

-Lower the head of the bed to appropriate level, and the bed should be as flat as possible.

-Therapist stands on side of the bed, far bed rail must be up .

-Cross the person's arms over his chest, and cross the leg near you over the far leg.

First Method: Moving the person away from you:

-Therapist stands with wide base of support, place one hand on person's shoulder and the other on buttock near you.

-Push the person gently to ward the other side of the bed.

Second Method: Moving the person toward you:

-Raise bed rail, go to the other side and lower the bed rail.

-Roll the person toward you gently.

-Make sure the person is comfortable, and lower the bed to its lowest position.

Logrolling the Person

It is a procedure, which the person is turned with one motion. This method is used for patients with spinal cord injuries, persons recovering from spinal surgeries; also it is used for elderly subjects.

Transferring procedure:

-Bed is flat, and raises the bed rail on the side to which the person will be turned.

-Therapist stands on the other side, and lower the bed rail.

-Use turning sheet and place person's arms across his chest.

-Place a pillow between the knees.

-Raise bed rail, go to the other side, and lower the bed rail.

-Therapist stands near the shoulders and chest, and co-worker stands near the buttocks and thighs.

-Ask person to hold his body rigid, and roll him toward you.

-Make sure the person in good alignment.

-Pillows under the person's arm and hand, head and neck, and against the back for support.

The person sits on the side of the bed

Purpose of sitting down:

-Person able to move his feet freely, to stimulate circulation.

- Prepares the person to walk or transfer to a chair.

-Patient can cough and deep breathe from this position.

Preparations before sitting at the side of the bed:

-Detect which side the patient can sit.

-Person lies on side lying and facing you.

-Move furniture to provide free space.

Procedure for sitting:

-Therapist stands near the person's waist.

-Raise the head of the bed to assist the person.

-Lower the bed rail at the side of sitting.

-Therapist slides one arm under the person's neck and shoulders, place the hand under the thighs.

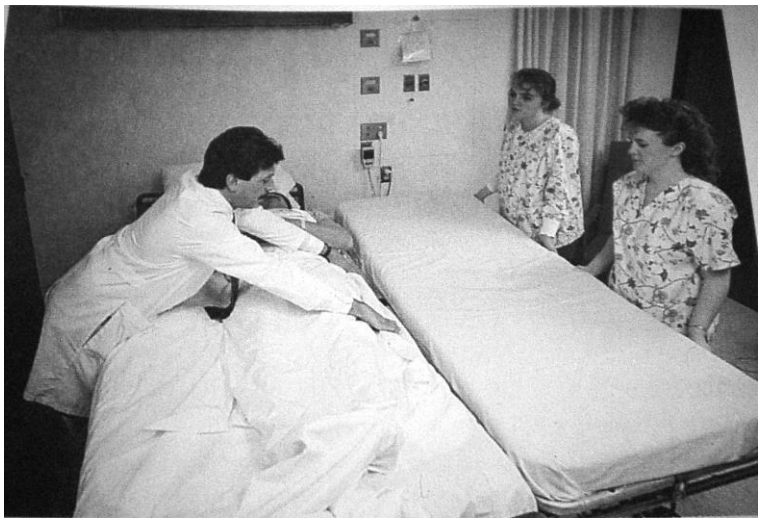
-Pull the person's feet and legs over the edge of the bed.

-Ask the person to hold on to the edge of the mattress for support, and don't leave the person alone.

-Reverse procedure if you want to return the person to bed.

Post procedure: make sure the patient in good alignment, and evaluate the person's tolerance, pulse rate and amount of assistance needed.

Transferring a person to a stretcher



Transferring procedure:

-Cover the person with a sheet, also, the stretcher is covered with a blanket.

-Lower the head of the bed so it is as flat as possible.

-Ask co-workers to move the person to the side of the bed by draw sheet, and to position the stretcher next to the bed.

-Lock the wheels of the bed and stretchers.

-Therapist and co-workers roll up and grasp the draw sheet at the person's hip and mid chest level to support the entire length of the person.

-Transfer the person to the stretcher by lifting and pulling him. Make sure the person at the center of the stretcher.

-Place a pillow under the person's head, fasten safety straps and raise the rails.

-Unlock the stretchers wheels.

Transferring Person to a Chair or Wheel Chair


Safety is important for wheel chair transfers. The person wears slippers to prevent slipping on the floor. Staff members need for transfer depend on the person's physical condition and size. During transferring, the strong side moves at first, and pulls the weaker side along.

Help person to stand by using transfer belt:

- Stand in front of the person
- Ask the person to place his or her fists on the bed.
- Make person's feet are flat on the floor and lean forward.
- Grasp the transfer belt at each side.
- Brace your knees against the person's knees, and your feet with person's feet.
- Ask the person to push down on the mattress, and therapist pull the person into a standing position.

Help person to stand without using a transfer belt:

- Therapist places his hands under the person's arms, and his hands are around the person's shoulder blades.
- Have the person lean forward, and block the person's knees and feet.
- Ask the person to push down on the mattress, and pull the person up into a standing position.
- Support the person in the standing position with or without transfer belt.
- Therapist continue to block the person's knees and feet to prevent falling
- Turn the person until can grasp the far arm rest of the chair, and continue until the other armrest is grasped.
- Lower the person into the chair as the therapist bends his hips and knees. The person assists by leaning forward and bending the elbows and knees.
- Make sure the persons buttocks are to the back of the seat, and person's feet on the footrests.

Post procedure: Evaluate the person if there is pain, discomfort, fatigue or headache; also assist the amount of assistance required for transfer.

Transferring person to a wheel chair with assistance

-Help the person to sit by raising the head of the bed.

-Place the wheel chair at the side of the bed.

-Remove the arm rests near the bed.

-Lock wheel chair & bed wheels, put cushion on chair seat.

-Stand behind the wheel chair.

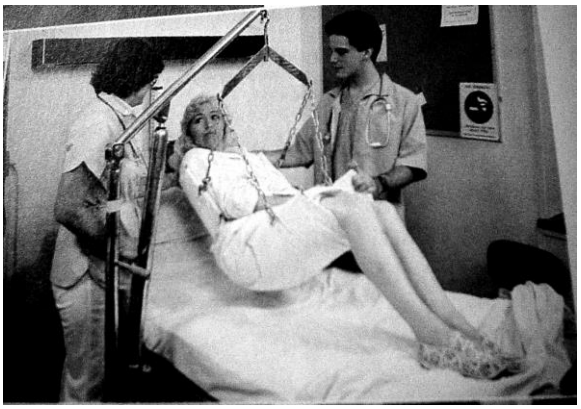
-Therapist put his arms under the person's arms, and grasps the persons forearm.

-Ask the co-worker to grasp the person's thighs and calves, and then bring the person toward the chair.

-Put the arm rest back to the wheelchair, and the person in good alignment.

-Put the shoes on the person, and raise the person's feet on the foot rests.

Transferring by using a mechanical lift



Lifts are used for transfer the person to chairs, whirlpools, or cars. Before using lifts, compare the person's weight and the lifts weight limit. The following procedures are used for person's safety.

Transferring procedure:

-Turn the person from side to side to center the sling under the person.

-Place the chair at the head of the bed, and the wheelchair away from the bed by one foot.

-Raise the lift, so it can be positioned over the person.

-Lock the lift wheels, and attach the sling to the swivel bar.

-Cross the person's arms over the chest, let the person holds the straps but not the swivel bar.

-Pump the lift high enough until the person and sling are free from bed.

-Position the lift so that, persons back is toward the chair, and lowers the person into the chair.

-Leave the sling under the person after unlocks it from the swivel bar.

-Put the slippers on the person, and position the person's feet on the wheel chair footrests.

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Student activities

Course title: P.T for Internal Medicine and Geriatrics. level : Third

Academic year: 2024/2025 - First semester

Student name: …….. ID #:……Lab section #:…….

1. **Attendance**

Lectures														
Practical sections														

2. **Quizzes :**

Quiz 1	**Quiz 2**	**Quiz 3**	**Quiz 4**	**Quiz 5**	**Quiz 6**	**Quiz 7**	**Quiz 8**	**Quiz 9**	**Quiz 10**
Student average mark									

2. Practical assignment:

……..

3. Teamwork research assignment

…….

Student total mark	

Lab section demonstrator **lecturer of the course**

…… **…….**