



PRESSURE ULCER PREVENTION AND TREATMENT

Rationale -

Due to the effect of pressure on tissue, the Healthcare Consultant must have the knowledge of the modalities for pressure relief and the products available for treatment of pressure ulcers.

Behavioral Objectives

The learner will be able to do the following:

- Describe the pressure relief necessary for capillary circulation.
- Explain the reason for moist wound healing, as opposed to wet-to-dry dressing.
 - Name topical products used in treatment.
 - Name pressure relief products used for treatment.

Outline

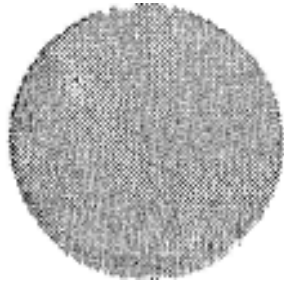
1. Treatment - Pressure Relief:
 - a. Critical to healing
 - b. Only treatment necessary
 - c. Complete pressure relief necessary
2. Moist Wound Healing versus Wet-to-Dry
3. Cleaners
4. Hydrocolloid Dressing
5. Transparent Dressing
6. Gel Dressing
7. Alginates
8. Absorption Dressing
9. Whirlpool
10. Surgical
11. Enzymes



ULCER SHAPES from OUTSIDE PRESSURE

ROUND

Intense pressure, short time over small point of a bone.
Clean Edge.



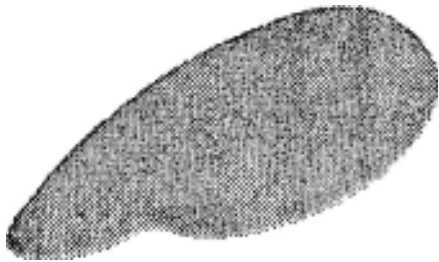
TRIANGULAR

Lower pressure, longer time; sacral area. Irregular Edge.



OBLONG

Intense pressure, short time.
Clean Edge.



TEARDROP

Necrotic over sacrum.
Terminal patient



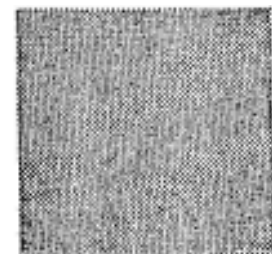
OBLONG

Intense pressure with shear. Foot
Ragged Edge.



SQUARE

Contracture with shear on heel
Straight Edges.



LONG TERM ULCER

Irregular,
Indented Edges.





PROTOCOL

PRESSURE ULCERS PRESSURE RELIEF	Essential
NUTRITION	Protein
INFECTION	Treat
NECROTIC TISSUE	Remove
MOIST WOUND COVER	Healing
COPIOUS DRESSING	Absorbable Dressing
MINIMAL EXUDATE	Hydrocolloid/Gel
PROTECTION	Semi- permeable/Gel
PRESSURE RELIEF	CONTINUE



INTRODUCTION:

Contracture is the root cause of many pressure ulcers of the lower extremities. The LEEDerBoot™ Therapeutic Foot and Leg Orthotic System are of great value in treating these conditions. Identifying and understanding treatment of the contracture and the importance of pressure relief are basic to successful therapy.

DEFINITION: *DECUBITUS ULCER*

A decubitus ulcer or pressure sore is a wound of the skin and the underlying tissue due to a decrease or stopping of the blood flow to the cells. It can be made worse by friction or shear. Pressure over a bony prominence is the primary cause.

CLASSIFICATION OF *DECUBITUS ULCER*

- | | |
|------------------|--|
| Stage I | Unbroken skin pink-red or mottled-blanches on touch:
Does not go away in 20-30 minutes. |
| Stage II | Skin is blistered or cracked open - surrounded by a reddened area. |
| Stage III | Open lesion down to the muscle - may or may not have necrotic tissue. |
| Stage IV | Open lesion through the muscle - may be filled with necrotic tissue - may be covered with hard black eschar. |

PREVENTION - THE NURSE'S RESPONSIBILITY

Good nursing care does not require a physician's order:

1. Frequent position change.
2. Protect all bony prominences - shoulders, elbows, coccyx, hips, knees, ankles, heels, and feet - use pressure relieving devices.
3. Keep the bed clean, dry and free from wrinkles.
4. Keep the skin clean and moisturized, as incontinence and wetness lead to tissue breakdown and bacterial growth.



5. Watch for early signs of pressure, such as redness on the body or shiny round areas on the heels or sides of the foot

AREAS TO WATCH

1. Negative nitrogen balance, albumin of 3.0 or less.
2. Incontinence - increases bacterial growth.
3. Moisture and heat.
4. Contractures of the lower extremity - increase pressure on the toes, heels, ankles, knees and the trochanter against the mattress.
5. Sensory loss - patient no longer feels excess pressure sensation - tingling.
6. Edema - increases internal pressure.

FACTORS THAT PROMOTE HEALING

1. Remove all pressure over affected areas - turn every hour - special bed, mattress, **LEEDer Boot™** Splint System for lower extremity.
2. Good nutrition - extra protein essential.
3. Promote good circulation - passive exercise - massage.
4. Cleanliness - bathing and protection of skin from incontinence.
5. Proper positioning - contracture control.

PRESSURE ULCER TREATMENT PROCEDURE

Stage I

Area is pink-red or mottled.

1. Gently clean and dry reddened area.
2. Apply moisturizing lotions.
3. Gently massage around reddened area - **DO NOT** massage directly over the sore, as it is damaged tissue.

Stage II

Skin may be blistered or cracked, surrounded by reddened area.

1. Gently clean area with special cleansers - **DO NOT** use Betadine or hydrogen-peroxide, as both are destructive to tissue.

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2. Cover injured area with a topical dressing to protect from contamination.



**Stage III
tissue.**

3. Relieve pressure with special mattress, bed, or the LEEDer Boot Splint System for the lower extremity.
4. Change position frequently.
5. Assure good nutrition.

Open lesion - may or may not have necrotic

1. Debride area surgically by physician or special enzymes per physician's order.
2. Cleanse with gentle cleansers - flush with normal saline if Betadine is ordered.
3. Treat with topical dressing per physician's order.
4. Relieve pressure with a special mattress, bed, or the LEEDer Boot Splint System for the lower extremity.
5. Assure good nutrition.
6. Change position frequently and observe ulcer to maintain pressure relief.

Stage IV

Open lesion - may have necrotic tissue present.

1. Debridement of area surgically by physician or with special enzymes per physician's order.
2. Whirlpool until wound is clear of necrotic tissue.
3. Cleanse with gentle cleansers - flush with normal saline if Betadine is ordered.
4. Treat with topical dressing per physician's order.
5. Relieve pressure with special mattress, bed, or the LEEDer Boot Splint System for the lower extremity.
6. Assure good nutrition.



7. Change position frequently and observe ulcer to maintain pressure relief and detect infection (heat or redness).

IMPORTANT POINTS TO REMEMBER

1. When pressure is removed, healing will occur regardless of the topical dressing that is used.
2. Contractures may increase the risk of pressure necrosis.
3. Betadine and hydrogen peroxide are destructive to healthy tissue - always rinse off with normal saline after use.
4. Wounds heal faster with a moist topical dressing.
5. Good nutrition is vital for healing,
6. Dark red or blanched white areas around the ulcer indicate the pressure has not been removed.
7. Document:
 - A. Status of the skin on admission.
 - B. Site of the pressure sore.
 - C. Stage.
 - D. Size - measured.
 - E. Appearance of pressure sore - necrotic - drainage - odor.
 - F. Treatment:
 1. Black eschar - moist dressing - whirlpool.
 2. Copious exudate - absorbable dressing:
 - Granuals
 - Gels
 - Gauze
 3. Moderate exudate - hydrocolloid dressing.
 4. Minimal exudate - protection - semi permeable or transparent dressing.

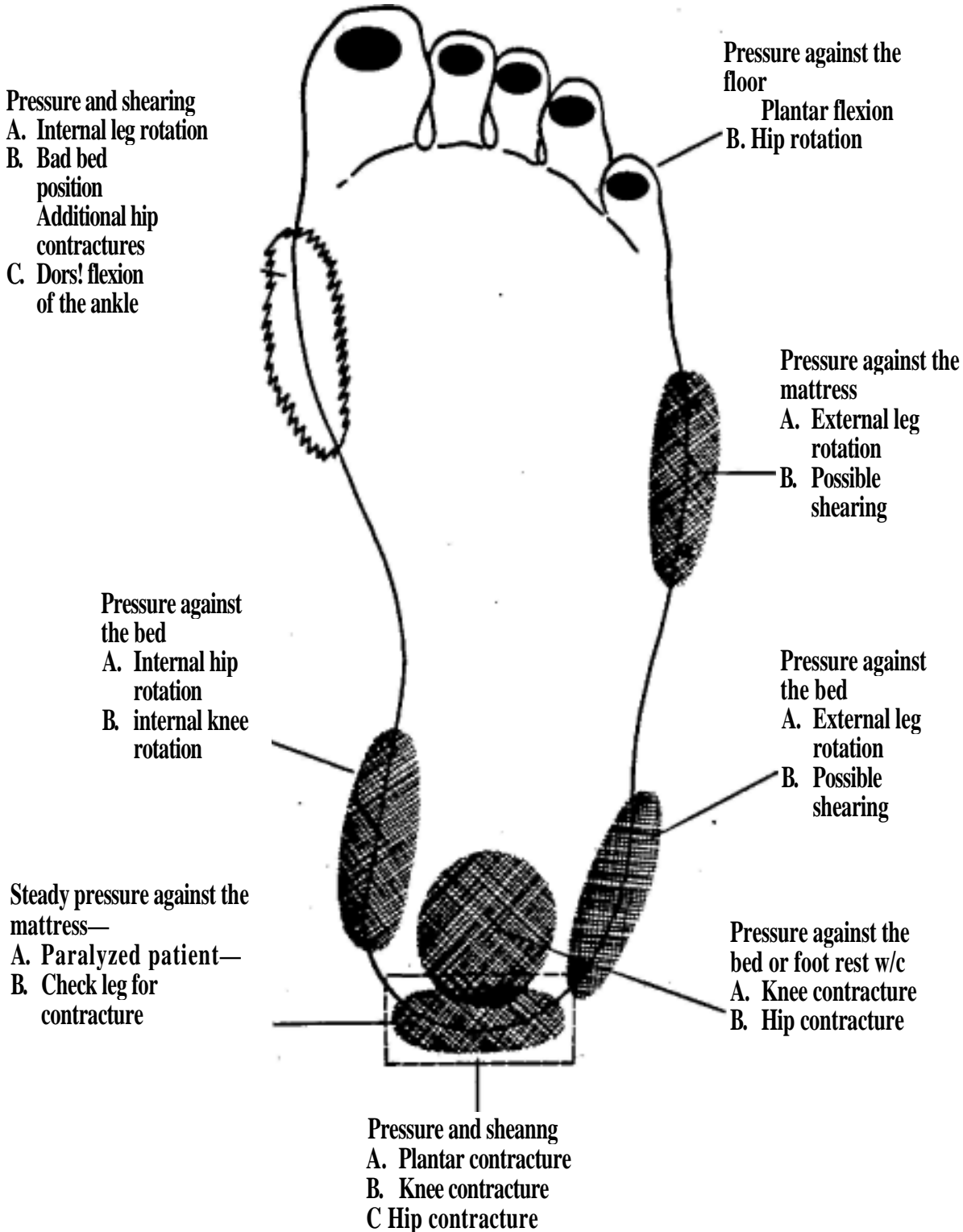
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PRESSURE CAUSES PRESSURE ULCERS

REMOVAL OF PRESSURE WILL HEAL





Lower Extremity Ulcers

Arterial ulcers are caused by insufficient arterial perfusion to an extremity or location and are also termed "ischemic ulcers." The term "ischemic ulcer" denotes a skin lesion with tissue loss related to arterial disease and is not used to describe the actual perfusion state of the ulcer. Although arterial insufficiency may affect any area of the body, it usually involves the lower extremities. Arterial ulcers are not so common as venous ulcers.

Peripheral arterial insufficiency of the lower extremity has distinct characteristics that are often sufficient to enable the caregiver to distinguish arterial ulcers from venous or neuropathic ulcers.

Location:

Between the toes or tips of toes

Over phalangeal heads

Around lateral malleolus

Where subject to trauma or rubbing of footwear **Characteristics:**

Even wound margins

Gangrene or necrosis

Deep, pale wound bed

Painful



Neuropathic (diabetic) Ulcers

Peripheral neuropathy can accompany diseases such as diabetes mellitus. Diabetic peripheral neuropathy tends to be bilateral and symmetric. Patients complain of pain, however, neuropathic pain must be distinguished from ischemic pain and can be determined when the patient is asked if the pain is relieved by walking; neuropathy is the presumed cause when pain is relieved by ambulation. The neuropathic foot is often termed the "insensate foot."

When managing ulcers on the lower extremity, it is essential that one be able to distinguish between ulcers caused by trauma in the patient with peripheral neuropathy and those caused by arterial insufficiency.

Causes:

Trauma
Pressure
Shear and friction

Location:

Plantar aspect of foot Over
metatarsal heads Under
heel

Characteristics:

Painless
Even wound margins
Deep
Granular tissue present unless coexisting PVD



Venous Ulcers

Venous ulcers of the lower extremities afflict 1% of the general population and 3.5% of persons over 65 years of age, with a recurrence rate approaching 70%. Among older persons, women are affected three times more often than men.

Venous ulcers result from disorders of the deep venous system. Normally, venous valves allow unidirectional blood flow from superficial veins to deep veins, advancing the return of blood from the capillary system to the heart. When the forward flow of venous blood is significantly disturbed or impaired, venous dysfunction ensues. Venous disease consequently initiates a cascade of deleterious events that result in increased hydrostatic pressure, venous hypertension, and, ultimately, dermal ulceration.

Venous ulcers are most commonly found on the medial aspect of the leg, just superior to the medial malleolus. They generally have irregular borders that are flat and slope into a shallow crater. They exhibit edema and are painless unless infected. Exudation is usually present and varies from a small amount to significant quantities.

Location:

Medial aspect of lower leg and ankle
May extend into malleolar area

Characteristics

Irregular wound margins
Superficial (into dermis)
Ruddy, granular tissue
Usually painless Exudate
usually present

CONTRACTURES



Rationale: Due to the effects of immobilization on body tissue, the Healthcare Consultant must have an understanding of the contractures and their effects on the skin. The Healthcare Consultant must have knowledge of the products available and how to use them in prevention and treatment of these conditions.

Behavioral Objectives

The learner will be able to do the following:

- Explain the functions of extensor, flexor, rotator, abductor and adductor muscles.
- Define contractures, their causes and their treatment.
- Recognize full or limited range of motion.
- Define connective tissue components.
- Describe the effect of pressure on the skin.

Definition: Connective tissue shortens and bonds at intersecting points restricting range of motion.

1. Non-fixed: has some degree of range of motion, active or passive.
2. Fixed: has no degree of movement, active or passive.



Timetable for Contractures

After four (4) days of immobility, contractures are noticeable. At the end often (10) days, contractures are significant. At the end of fourteen (14) days, gross contractures or near crippling deformities are present.

For EVERY day after the fourth (4) day, it will take ten (10) days of treatment to restore the extremity to a functional state, **not full range of motion**. Thus, fourteen (14) days of contracture will require one hundred (100) days for recovery. The degree of recovery will depend upon the individual condition and health.

Causes of Contractures

1. Disease: any condition that causes the patient to become weak and eventually immobilized.
 - a. Parkinson's
 - b. Pneumonia
 - c. Arthritis
 - d. Alzheimer's
 - e. Encephalitis
2. Trauma: any injury to the body, head or spinal cord that interferes with movement.
3. Immobility: the body tissue does not recognize a specific cause, just reacts to the lack of exercise or movement.



4. Bed/Chair Positioning: increases the direction of the contracture by poor posture positioning or bedding over the toes.

Immobility and poor bed positioning are two of the major causes of contracture in the long-term care patient. When a patient is confined to bed for long periods of time, joints stiffen even more, and it becomes easy to assume the same "comfortable" position hour after hour. Because moving these stiff joints creates some discomfort or pain initially, the patient may be reluctant to use them, increasing the loss of movement by their inactivity. If the joint remains inactive, a permanent shortening of connective tissue fibers will occur.

ESSENTIAL....

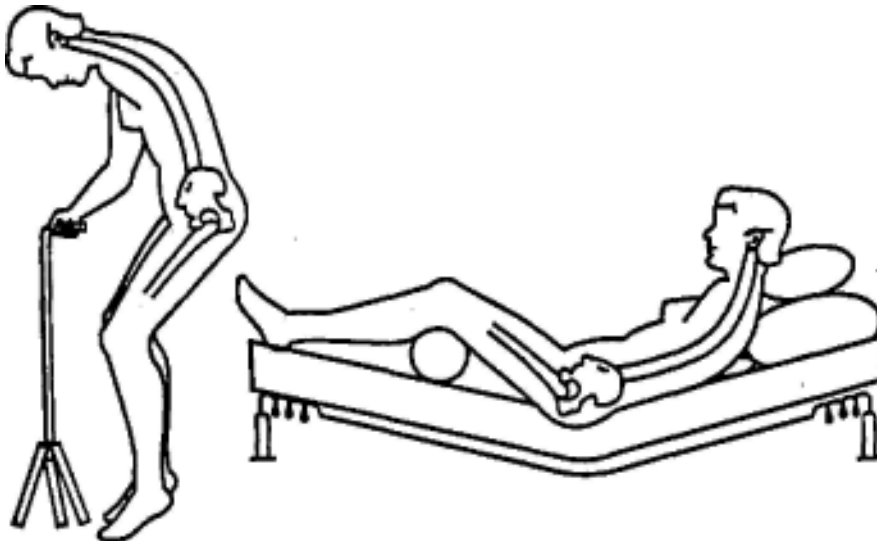
- Range of Motion
- Proper Positioning
- Maintaining Functional Alignment



BED POSITIONING

The extension of the hip when the patient is lying in bed varies from 135 to 150 degrees. The greater extension when standing is due to the greater extensor torque created by the weight of the torso centered slightly posterior to the hip joint. Patients who must remain in bed, even though they are positioned properly, will develop progressive hip flexion contractures unless they receive daily stretching of the hip flexors.

Tightness causing flexion of the knees develops in the hamstring and gastrocnemius muscles and the posterior capsule of the joint if the knees are not stretched to full extension by standing and walking each day. When a patient has a paretic or painful disability and habitually sits or lies with the knees flexed, contractures develop rapidly with progressive limitation of extension of the knees. For arthritis patients or patients with neurologic diseases, the placing of pillows under the knees results in the rapid development of contractures of the knees.





BED POSITIONING

Anytime a resident is positioned in bed, think of them as being able to walk again some day and position them accordingly. This is one of the most important early nursing activities that will be done for the resident.

Head Positioning

When positioning, use only one flat pillow. Using a stack of pillows will cause neck contractures. Sometimes because of age and medical conditions, the resident wants to be "propped up in bed" and the head will assume a forward flexed position, and this cannot be avoided. But to automatically encourage this habit will cause their neck to develop a flexed forward contracture that would give them the posture of looking down all the time when they stand or sit.

Positioning the Knees

When positioning the legs, keep the toes and knees pointed up. Keep the hip slightly abducted in proper positioning. The leg should not be in an externally or internally rotated position for long periods of time. The leg rotating outward when the resident is lying in bed occurs naturally and is not a problem if the resident is not in bed for extended periods of time. If a resident is in bed for long periods of time, has had a stroke or a fractured hip, the hip will tighten in an outward rotation when positioned incorrectly. Walking is almost impossible because the toes and the knees do not point straight because the hip externally rotates.

Positioning the Ankles

Ankles should be kept flexed, at least at a 90° angle. Continuous plantar flexion of the ankles will cause the heel cord to shorten and tighten. Anytime the resident's feet are flat on the floor, or maintaining at 90° at the ankle, the heel cords are being stretched. Our feet need to have the ability to

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dorsiflex to at least 90° to prevent walking on the toes.
Performing ROM or actively moving the ankle and leaving
covers loose over the feet will help prevent the tightening of the heel cords.
Foot boards are usually ineffective because the resident will move away
from them.



PROPER SITTING POSITION

The pelvis is at the center of the body and enhances movement of the spine. Smooth body movement depends on the position of the pelvis and its relationship to the spine.

We change our positions to increase comfort, shift pressure and change muscle groups that are maintaining upright position. Back muscles balance the center of gravity and allow easy movements. When this balance is not maintained, changing positions requires great effort.

OBSERVATIONS

Does the resident

Have:

1. foot contact with the floor?
2. support for the nonfunctional foot?
3. foot support?
4. proper seat height?
5. proper seat angle in relation to the feet?
6. edema in the lower extremities?
7. proper angle of the knees?
8. proper angle of the hips?
9. a shoe bottom that grips the floor?
10. a level seating surface?
11. a properly sized wheelchair?
12. support for the arm and the proper height of that support?
13. shoulder and elbow ROM?



CONNECTIVE TISSUE

I. Components

1. Fibers
 - a. Collagenous
 - b. Reticular
 - c. Elastic
2. Fibrin - Blood Clots
3. Amorphous Ground Substance

II. Form,

1. Ligaments
2. Tendons
3. Joint Capsules

III. Function

1. Provide the Body:
 - a. Stability
 - b. Support
 - c. Limb Function
 - d. Determine the Range of Motion available to each joint



IV. Microscopic Composition

1. Mostly Collagen
2. Reticulin
3. Elastin
4. Fibrin: Protein in the Blood Clotting Process
5. All embedded in an Amorphous Ground Substance of Protein Polysaccharide Base.



CONNECTIVE TISSUE COMPONENTS

- FIBERS

Collagenous, Reticular, Elastic

- FIBRIN

- AMORPHOUS GROUND SUBSTANCE

Ligaments, tendons, joint capsules, and other related structures serve to provide the body with stability, support and limb function. Together they are the major determinants of the range of motion available to each joint, Microscopically, these elements appear most often as fibrous meshworks, consisting mostly of collagen but including reticulin and elastin. Other elements present are fibrin-a protein substance found in the blood clotting process, and amorphous ground substance-a protein polysaccharide base in which all of this is embedded.

- **Collagen** - A fibrous insoluble protein found in the connective tissue, including skin, bone, ligaments and cartilage.
- **Reticulin** - An albuminoid substance in the connective tissue framework of reticular tissue.
- **Reticular Tissue** - A type of connective tissue consisting of delicate fibers forming interlacing networks.
- **Elastin** - A protein substance forming the principal constituent of yellow elastic tissue.
- **Elastic Tissue** - A form of connective tissue in which yellow elastic fibers predominate.



COLLAGEN FIBERS



NORMAL STATE

- FULL LENGTH
- FULL MOBILITY

L NORMAL STATE

1. Randomly oriented meshwork
2. Intersecting points indicate attachments
3. Remaining intersections mobile - gliding or sliding of fibers against and over one another

The available range of motion is dependent upon the number and density of the linkages and the free length of fiber between the attachment points.



COLLAGEN FIBERS



NON-TRAUMATIC PAIHOLOGICAL STATE

CONDITIONS:

IMMOBILIZED ELDERLY
HEAD / SPINAL CORD INJURY
STROKE
MULTIPLE SCLEROSIS

MUSCULAR DYSTROPHY

REMODELED TO SHORTER LENGTH

THICK FIBERS

IL ABNORMAL STATE

1. Non - Traumatic: Lack of Joint Function
 - a. Immobilization
 - b. Neurological Impairment
 - c. Multiple Sclerosis
 - d. Muscular Dystrophy

Because of the absence of joint function, the connective tissue gradually shortens and attachments occur at more of the intersecting points, thus restricting the range of motion.



COLLAGEN FIBERS

TRAUMATIC PATHOLOGICAL STATE

CONDITIONS:

POST FRACTURE, DISLOCATION
POST SURGICAL
BURSITIS, TENDONITIS
BURNS
RHEUMATOID ARTHRITIS
HEMOPHILIA



REMODELED TO SHORTER LENGTH

THICKER FIBERS

ADDITIONAL COLLAGEN FIBERS

2. Traumatic: Pathological State

- a. Bone Fractures
- b. Dislocations
- c. Joint Surgeries
- d. Tendon Surgeries
- e. Burns
- t Rheumatoid Arthritis

Secondary to the tissue trauma, additional collagen fibers will be laid down within the connective tissue. Additional cross-attachments will appear and restrict range of motion. Edema and impaired circulation will add to the excess collagen fiber deposits.



CONNECTIVE TISSUE HOMEOSTASIS

Stress and motion moderate the formation and absorption of collagen fibers within the tissue. Stress and motion also trigger production of proteoglycan substances, which are essential for maintenance of fiber mobility.

Appropriate collagen formation in conjunction with proteoglycan production leads to proper fiber ordering, and shielding and lubrication of these fibers. These two elements determine tissue structure and necessary tissue mobility, which in turn lead to proper joint function. Finally, joint function enables functional stress and motion. An example of this model at work is the case of serial casting, which prohibits joint function through immobilization. Very often gains in extension are accompanied by losses of flexion.

Therefore, the first conclusion we might draw is that the ideal approach to increasing range of motion is one that alternates very long periods of low force stretch with reasonable periods of functional stress and motion and active exercise.

With this in mind, we will compare elements of both categories of stretch techniques-High Intensity Short Duration and Low Force Prolonged Duration.



HISD—LESS FORCEFUL STRETCH

PRE-STRETCHED



STRETCHED



POST-STRETCHED



- ELASTIC RESPONSE
- LITTLE REMODELING

HISD—FORCEFUL STRETCH

PRE-STRETCHED



STRETCHED



- TEARING

POST-STRETCHED



- ELASTIC RESPONSE
- TISSUE THICKENING



CONCLUSION

LPS™—DYNAMIC TENSION

PRE-STRETCHED STRETCHED POST-STRETCHED



- PLASTIC RESPONSE
- OPTIMAL REMODELING

There is a direct correlation between the intensity of a stretch and the degree of either trauma or weakening of the stretched tissue.

The longest period of low force stretch produces the greatest amount of permanent elongation, with the least amount of trauma and weakening of the connective tissues.



RANGE OF MOTION

The extent to which motion is possible at a particular joint depends on the type of joint, the disease processes affecting the area, the muscles surrounding the joint, and the ability of these muscles to extend and contract in order to produce movement.

Range of Motion is the extent to which the joint is capable of being moved.

The following basic movements are used in range of motion exercises:

FLEXION

EXTENSION

INTERNAL ROTATION

EXTERNAL ROTATION

ABDUCTION

ADDUCTION

SUPINATION

PRONATION

There are three types of range of motion:

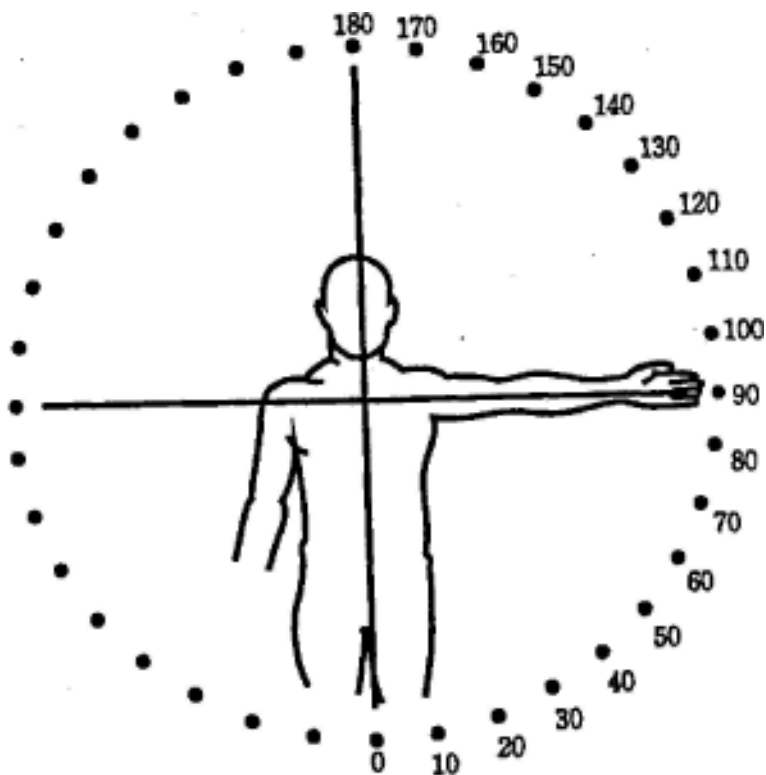
Active- Range of motion performed by the patient without help.

Active Assistive- Caregiver helps patient with range of motion.

Passive- Caregiver performs range of motion.



RANGE of MOTION



- Range of motion is the degree of movement, in all directions, through which a joint can be moved.
- Range of motion can be measured for both passive and active movements.
- Range of motion of a joint is measured in degrees of a circle.
- On full extension, when the limb forms a straight line, the position is designated at 0 degrees.



—————→

THE IMPORTANCE OF RANGE OF MOTION

Good positioning prevents contractures. It is a fact that when contractures are allowed to develop, functional abilities are greatly decreased. Moving the joints and muscles will also aid in preventing contractures. ROM and proper positioning will enhance a decrease in contractures and promote better mobility. For example, if the resident's elbow becomes contracted he/she probably will not be able to dress himself/herself. If knee contractures develop, he/she probably will not be able to walk.

HOW TO USE RANGE OF MOTION

Passive ROM - The caregiver moves the extremity in such a way that full motion occurs at the joint.

Active ROM - The extremity is moved the same as in passive ROM, except with active ROM the resident uses his/her muscles to do the moving.

Functional Activities for ROM - Functional activities produce full ROM of the joints as well as accomplishing a necessary function for the resident by the resident,

The chart below will show how each type of ROM will help the resident.

PASSIVE ROM

Keeps joints limber and mobile
Keeps muscles limber and mobile
Prevents contractures

ACTIVE ROM

Keeps joints limber and mobile
Keeps muscles limber and mobile
Strengthens
Increases independence

REMEMBER: ALWAYS SUPPORT THE JOINTS!! DO

NOT FORCE BEYOND INITIAL RESISTANCE



BASIC MOVEMENTS

1. Adduction - Movement of a limb toward the center of the body.
2. Abduction - Movement of a limb away from the center of the body.
3. Internal Rotation - Movement of a part toward the center of the body.
4. External Rotation - Movement of a part away from the center of the body.
5. Flexion - Bending a joint
6. Extension - Straightening a joint.
7. Pronation - Turning downward.
8. Supination - Turning upward
9. Plantar Flexion - Movement of the foot downward toward the floor.
10. Dorsiflexion - Movement of the foot toward the leg.
11. Inversion - Turning toward the center.
12. Eversion - Turning toward the outside.
13. Opposition - Movement of thumb opposing each finger.
14. Hyperextension - Extending beyond a straight line.



Conditions causing immobilization and subsequent loss of range of motion:

- Neuromuscular disorders
- Arthritis
- Trauma/fx hip
- Stroke

Benefits of Range of Motion:

- Maintain joint mobility
- Prevent deformities that limit function
- Stimulate circulation

Range of Motion should be done when any of the following are noted;

- A decreased ability or total inability
- Inactivity with stiff joints
- Generalized weakness and fatigue
- Impaired mental status accompanied by inactivity
- Recent hospitalization

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Range of Motion should NOT be done on a resident:

- With septic joints (bacterial invasion of a joint)
- With acute thrombophlebitis (blood clot)
- With severe arthritic joint inflammation (rheumatoid arthritis)
- With a recent trauma (fracture)
- Fixed contracture of joint



GUIDANCE TO SURVEYORS - LONG TERM CARE FACILITIES

TAG NUMBE	REGULATION	GUIDANCE TO SURVEYORS
<p>F323</p> <p>F324</p>	<p>te) Range of Motion.</p> <p>Based on the comprehensive assessment of a resident, the facility must ensure that</p> <p>(1) A patient who enters the facility without a limited range of motion does not experience a reduction in range of motion unless the resident's clinical condition demonstrates that a reduction in range of motion is unavoidable; and</p> <p>(2) A resident with a limited range of motion receives appropriate treatment and services to increase Range of motion and/or to prevent further decrease in range of motion.</p>	<p>Interpretive Guidelines: Section 4B3.25(e) This corresponds to MDS section E.</p> <ul style="list-style-type: none"> •Range of motion (ROM)" means the extent of movement of a joint <p>The clinical condition that may demonstrate that a reduction in ROM is unavoidable is: limbs or digits immobilized because of injury or surgical procedures (e.g., surgical adhesions).</p> <p>This clinical condition may demonstrate that a reduction in ROM is unavoidable only if adequate preventive care was provided, and limitation in ROM or muscle atrophy developed anyway.</p> <p>Consistent with the resident's comprehensive assessment and care plan, adequate preventive care may include active ROM performed by the resident; passive ROM performed by staff, active-assistive ROM exercise performed by the resident and staff, and application of splints and braces, if necessary.</p> <p>Clinical conditions that are the primary risk factors for a decreased range of motion are:</p> <ul style="list-style-type: none"> • Immobilization (e.g., bedfast); • Deformities arising out of neurological deficits (e.g., strokes, multiple sclerosis, cerebral palsy, and polio); and • Pain, spasms, and immobility associated with arthritis or late stage Alzheimer's disease. <p>Survey Procedures and Probes: Section 483.25fel</p> <p>For each sampled resident who needs routine preventive care:</p> <ul style="list-style-type: none"> • Observe staff providing routine ROM exercises. Are they done according to the care plan? <p>Is there evidence that there has been a decline in sampled residents' ROM or muscle atrophy that was avoidable?</p> <ul style="list-style-type: none"> • Was the resident at risk for decline in ROM? if so, why? • What care did the facility provide, including routine preventive measures that addressed the resident's unique risk factors (e.g., use muscle strengthening exercises In residents with muscle atrophy)? • Was this care provided consistently? <p>For all sampled residents who have limited ROM, what is the facility doing to prevent further declines in ROM?</p> <ul style="list-style-type: none"> • Are passive ROM exercises provided and active ROM exercises supervised per the plan of care? • Have care plan objectives and resident progress been evaluated? • Is there evidence that care planning is changed as the resident's condition changes? • Identify if resident triggers RAPs for ADL functional/rehabilitation potential, visual function, and communication.



PATIENT ASSESSMENTS

Representatives are trained to perform visual and physical assessments to:

- determine patient appropriateness for products,
- make referrals for suggestions for inappropriate candidates and,
- determine if patient's condition or status contraindicates splint application such as: fixed contractures, large draining wounds, skin integrity, patient compliance.

Assessment Tips and Patient Rights:

1. Always have a staff member with you during patient assessment in order to avoid patient injury and undue distress. Someone who is familiar with that patient's abilities and needs can alleviate patient anxiety as well as help assess.
2. Before entering a patient's room, "home", knock on the door. Introduce yourself to the patient. Talk with the resident prior to "hands on", explaining who you are and what you would like to do or request for them to do. Even if the resident is "unaware", to be respectful of them and their families by explaining yourself and any anticipated activities. (This process may be repeated several times for patients with short attention span or learning difficulty.)
3. Be careful during patient assessment not to unduly expose a patient. Keep the curtains and doors closed during physical assessment and remember to have a staff member in attendance.
4. Please note that the patient/family has the RIGHT to refuse treatment.



Handwashing Prior to Assessments is MANDATORY!!!!

- Before we perform a "hands-on" assessment, thoroughly wash your hands.
- Wash before and after patient assessment, even if gloves are worn during the assessment! Proper hand washing and universal precautions protect you and the resident. Because the geriatric population has a compromised immune system, we as health care providers must protect the elderly by not spreading germs or infections.
- Wear gloves when possible or necessary. Gloves are to be worn if you anticipate contact with body fluids or suspect an open/draining wound. (Lab coats may protect your clothing).
- Follow staff members' advice and guidelines in infection control measures.

Visual Assessment

Begin by observing the patient's overall condition (and body position). Inquire from the staff:

- normal behavior and patient condition,
- brief history and patient diagnosis,
- past treatment or splints, and
- progression of limb/extremity. (Examples: Walking 6 months ago, prior stroke, knee contracting over last 2 months with limited active and passive range of motion,..)



Physical Assessment

- Speak to the patient/family.
- Explain before and during assessment: "What you anticipate doing prior to moving/assessing each extremity.
- Provide for patient privacy during the assessment.
- Always have a staff member in attendance.
- Wash your hands.
- Be extremely gentle and support the resident's joints during assessment.
- You may begin by asking the patient to move their extremity (active range of motion). Follow with passive range of motion, where you place the joint through its fullest range.

NOTE:

Never range or move the extremity beyond the point of resistance!

See products manual for specific techniques, Anatomy/Physiology, and guidelines for patient assessments.



**VISUAL & PHYSICAL
ASSESSMENT**

Understanding how to do proper patient assessment is very important. Proper assessment will determine what products are needed and how they are to be applied and used. With good patient assessment, the best patient progress can be achieved.

Visual assessment of the upper extremity

Physical assessment of the upper extremity

Visual assessment of the lower extremity

Physical assessment of the lower extremity

Positioning assessment

Selecting the proper orthosis



**VISUAL ASSESSMENT OF THE UPPER
EXTREMITY**

Look at the patient while in bed or a chair. Notice the position of the arm. Is the arm against the torso? Is the elbow flexed? Are the wrist and fingers flexed?

If any of these joints appear to be contracted, a physical assessment needs to be done.

PHYSICAL ASSESSMENT OF THE UPPER EXTREMITY

**DETERMINE THE DEGREE OF CONTRACTORS
NON-FIXED OR FIXED**

REMEMBER - A non-fixed contracture has some degree of range of motion, active or passive.

A **fixed contracture** has no degree of movement, active or passive.

SHOULDER CONTRACTURE:

Place one hand on the shoulder and one hand under the elbow. Carefully raise the arm and determine the amount of rotation and abduction in the shoulder joint. **DO NOT** force beyond initial resistance. Note degree of contracture.

ELBOW CONTRACTURE:

Support the elbow with one hand and hold the wrist with the other. Carefully flex and extend the elbow to determine the amount of movement. **DO NOT** force beyond initial resistance. Note degree of contracture.

WRIST DROP:

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Place one hand under the wrist for support and the other on top of the fingers. Flex and extend the wrist to determine the amount of movement. **DO NOT** force beyond initial resistance. Note degree of contracture.



WRIST CONTRACTURES - Ulnar or Radial Deviations:

Place one hand under the wrist for support. Carefully move the wrist from side to side to determine the amount of movement. **DO NOT** force beyond initial resistance. Note degree of contracture.

FINGER CONTRACTURES:

Hold the hand with one hand and support the finger and thumb joints with the other. Carefully move each of the fingers and thumb, one at a time, to determine the amount of movement in each. **DO NOT** force beyond initial resistance. Note degree of contracture.

VISUAL ASSESSMENT OF THE LOWER EXTREMITY

**DETERMINE THE DEGREE OF CONTRACTURE
NON-FIXED OR FIXED**

REMEMBER - A non-fixed contracture has some degree of range of motion, active or passive.

A **fixed contracture** has no degree of movement, active or passive.

HIP FLEXION:

Place one hand under the hip and one hand under the bended knee. Carefully flex and extend the hip joint. **DO NOT** force beyond initial resistance. Note the degree of contracture.

HIP ROTATION:

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Place one hand under the hip joint and the other hand under the bended knee. Carefully rotate the leg while palpating the hip joint. **DO NOT** force beyond initial resistance. Note the degree of contracture.



HIP ADDUCTION/ABDUCTION:

Place one hand under the hip and the other hand supporting the knee. Carefully move the leg toward the center of the body and then away. **DO NOT** force beyond initial resistance. Note the degree of contracture.

KNEE FLEXION:

Support the knee with one hand and place the other hand on the bottom of the foot. Carefully flex and extend the knee joint. **DO NOT** force beyond initial resistance. Note the degree of contracture.

PLANTAR FLEXION CONTRACTURE:

Support the ankle with one hand and place the other hand on the bottom of the foot. Carefully flex and extend the ankle. **DO NOT** force beyond initial resistance. Note the degree of contracture.

INVERSION & EVERSION:

Place one hand under the heel and with the other hand cup the toes. Carefully move the foot in and out, back and forth. **DO NOT** force beyond initial resistance. Note the degree of contracture.

ASSESSMENT OF PROPER POSITIONING WHILE SEATED

HEAD:

Neutral - the head is at midline and level with the shoulders and hips.

Lateral Deviation - head is tilted to the right or left of midline.

Hyperextension - neck is extended posteriorly. **Forward Head** - head is anterior of the shoulders.



TRUNK:

Neutral - the shoulders are in alignment over the pelvis.

Lateral Deviation - the shortening on one side of the trunk with an elongation of the contralateral side in response to a lateral shift in the pelvis. The shoulders align with the pelvis to maintain equilibrium. Indicate if the shortening of the trunk is to the right or to the left.

Kyphosis - trunk has a humped look posteriorly, secondary to excessive flexion of the spine.

Scoliosis - lateral curvature of the spine.

Lordosis - "swayback", extreme anterior curvature of the lumbar spine.

PELVIS:

Neutral - pelvis is bearing weight equally.

Lateral Weight Shift - the pelvis is tilted anteriorly and laterally, due to trunk shortening on that side. The contralateral side of the pelvis, in response, is bearing a greater portion of the body weight. Indicate whether the weight shifted is to the right or to the left.

Anterior Tilt - pelvis moves forward causing shoulders and head to align with the pelvis and the trunk is erect.

Posterior Tilt - pelvis moves posteriorly with the back rounding, shoulders relaxing, and the head coming forward.

Windswept Deformity - in response to a lateral weight shift of the pelvis, the legs rotate laterally at the hip joint towards the side of the pelvis bearing more weight. The thighs are adducted, the knees flexed, and the calves are angled to the contralateral side.



ABLE TO REPOSITION IN CHAIR:

INDEPENDENT - individual can reposition body weight and does this routinely without cueing.

ASSISTED - individual either needs some physical assistance to reposition or needs verbal cues to perform task routinely.

UNABLE - individual cannot reposition self in the chair secondary to cognitive or physical impairments.



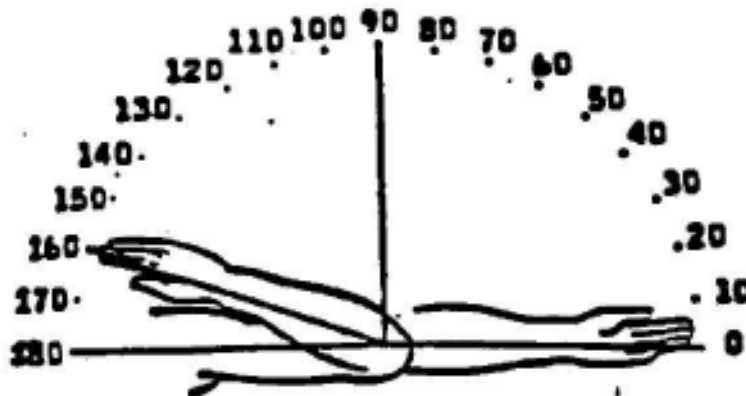
MUSCLE TESTING

ELBOW: With one hand under the elbow and the other at the wrist for elbow flexion/extension.

ELBOW

Flexion 0° - 145° - 160°

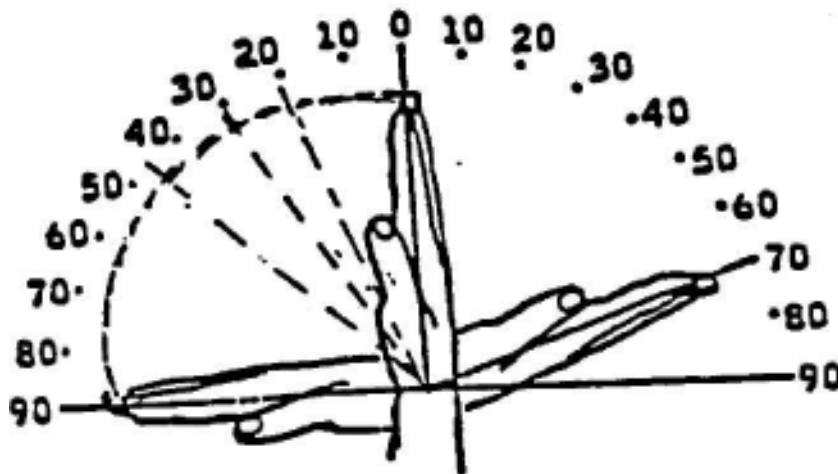
Extension 160°-145°-0°





MUSCLE TESTING

WRIST: With one hand under the wrist and the other holding the fingers for wrist flexion/extension wrist drop





MUSCLE TESTING

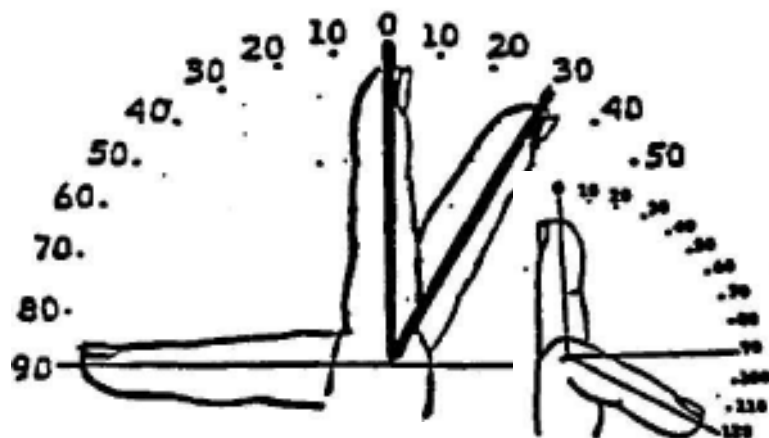
FINGERS: With one hand under the wrist and the other with each finger for **finger flexion**

FINGERS

METACARPAL PHALANGEAL

Flexion 0° - 90°

Extension 0° -20° -30°



PROXIMAL INTERPHALANGEAL

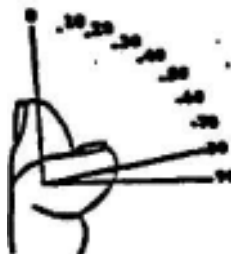
Flexion 0° -120°

Extension 120° - 0°

DISTAL INTERPHALANGEAL

Flexion 0°-80°

Extension 80° - 0°



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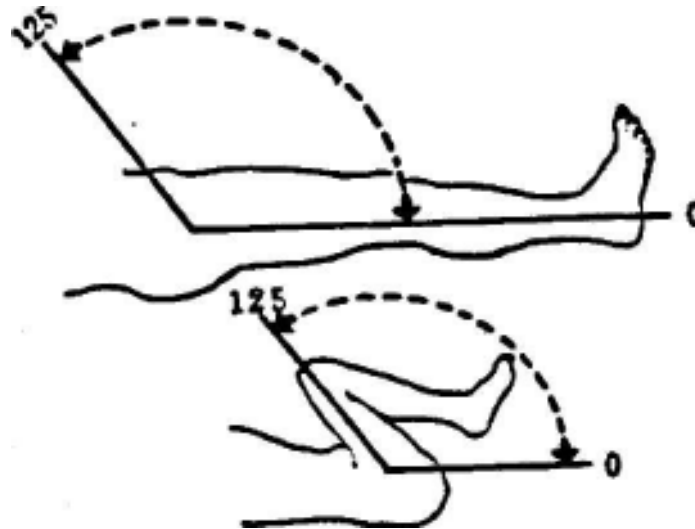


MUSCLE TESTING

HIP: Support patient's leg by placing ankle on your upper arm or shoulder holding the knee in extension with your hand for - **Extension Flexion** (flexion of the hip should also be done with the knee flexed)

HIP FLEXION

0° -125°

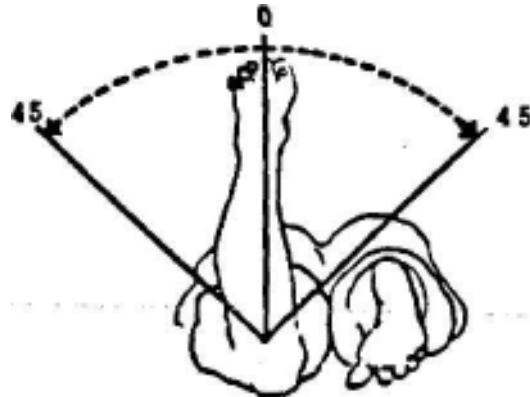




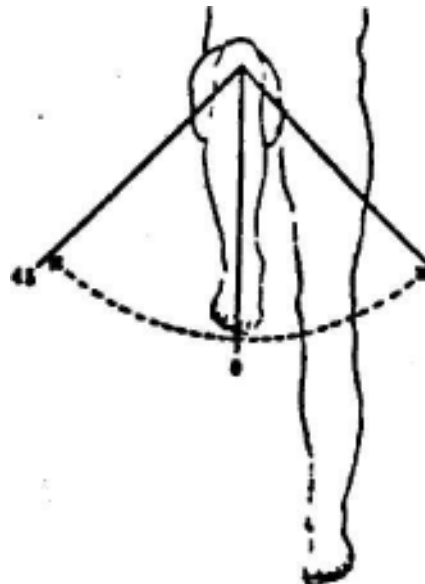
MUSCLE TESTING

HIP ROTATION -With patient's leg resting on the bed, place one hand on top of the knee and the other on top of the ankle (or with both the patient's hip and knee flexed at approximately 90° angle, place one hand under the knee and with the other hold the ankle) for **hip rotation**

**HIP, INTERNAL ROTATION
(PRONE) 0°-45° HIP,
EXTERNAL ROTATION
(PRONE) 0°-45°**



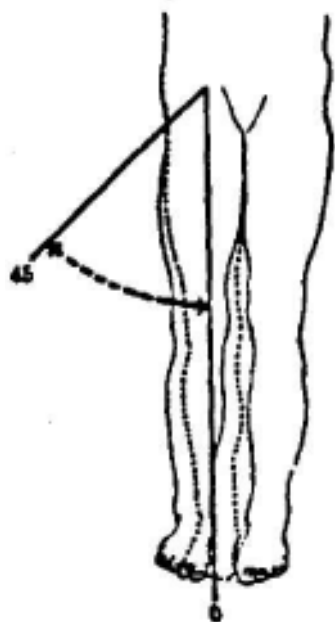
**HIP, INTERNAL ROTATION
(SUPINE) 0° - 45° HIP,
EXTERNAL ROTATION
(SUPINE) 0°-45°**





MUSCLE TESTING

HIP: Support patient's leg by placing one hand under the ankle and the other hand just above the knee for - Abduction
Adduction



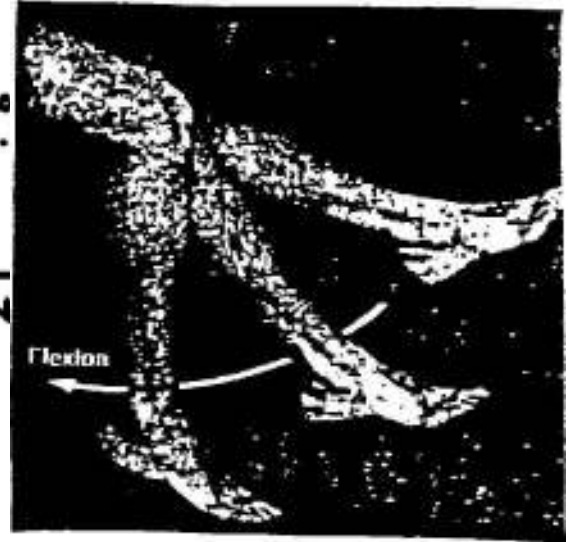
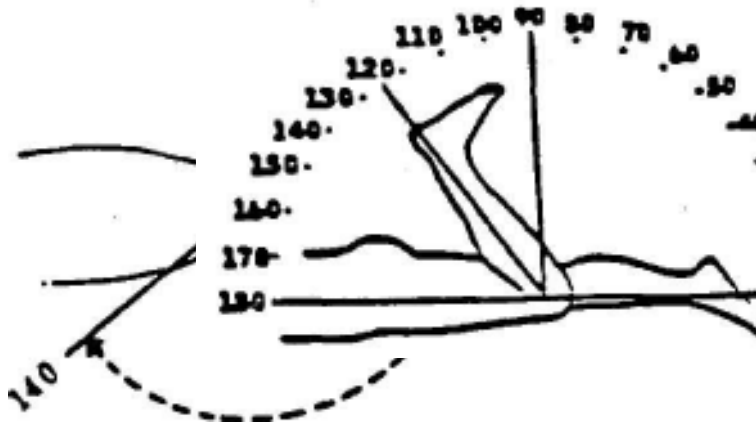
HIP ADDUCTION
0°-
HIP ABDUCTION
0° - 45°



MUSCLE TESTING

KNEE: Flex patient's hip approximately 90° and support the leg by placing one hand just above the knee and grasping the ankle with the other hand for flexion

KNEE, FLEXION
0°-140°

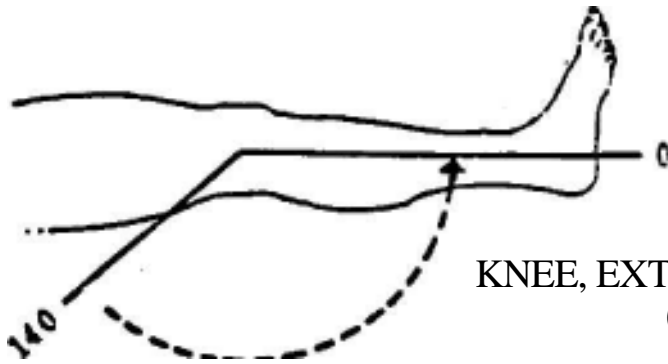


KNEE Flexion
(prone) 0° -120° - 130°

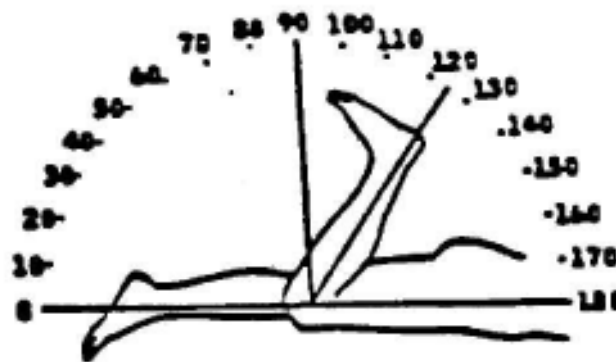
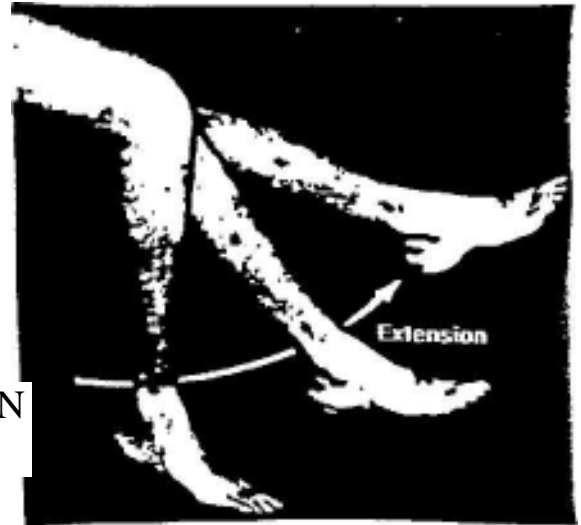


MUSCLE TESTING

KNEE: Flex patient's hip approximately 90° and support the leg by placing one hand just above the knee and grasping the ankle with the other hand for extension



KNEE, EXTENSION
0°-



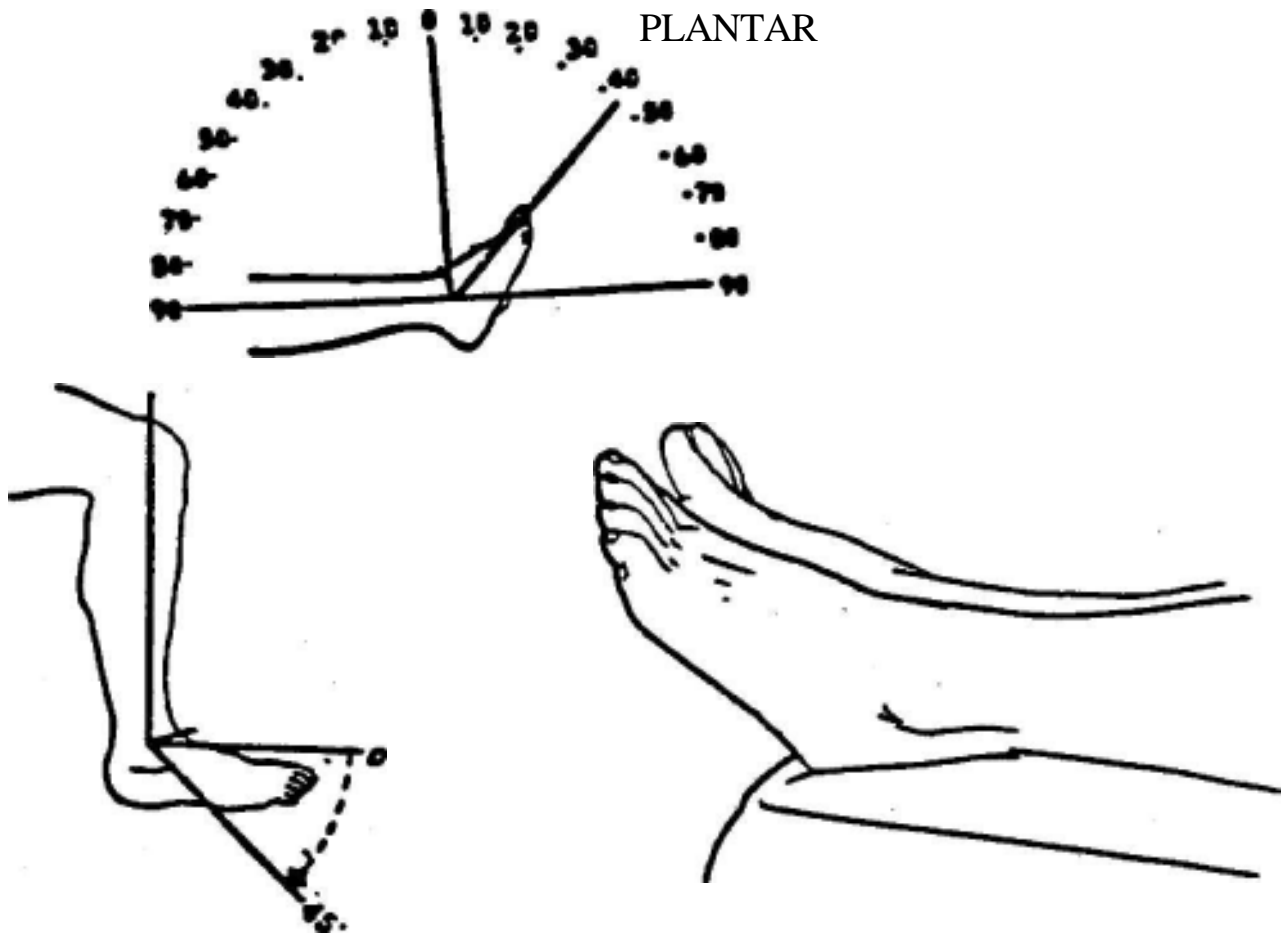
EXTENSION 130° -120° - 0°



MUSCLE TESTING

ANKLE: With patient's leg resting on the bed, place the heel in one hand with the sole of the foot resting against your forearm for **ankle flexion**(foot drop)

ANKLE - FLEXION 0° - 45°



ANKLE, PLANTAR FLEXION
(FLEXION) 0°-45°

PLANTAR FLEXION

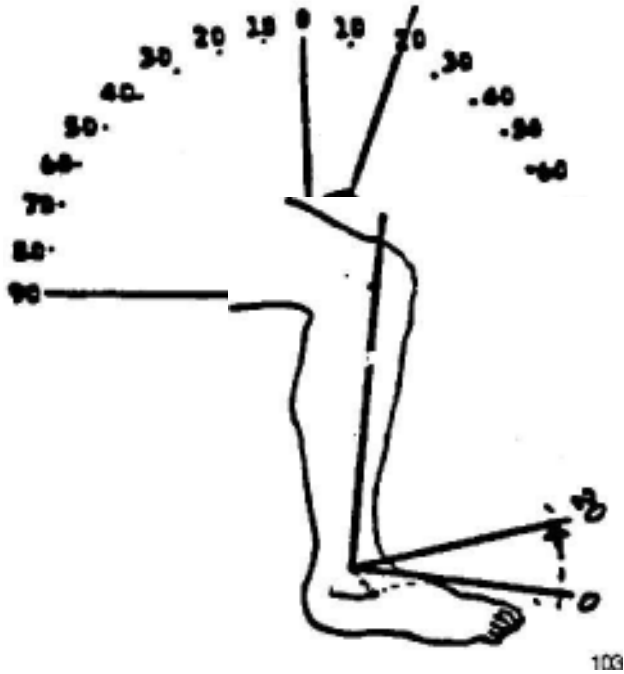


MUSCLE TESTING

ANKLE: With patient's leg resting on the bed, place one hand on his knee to keep it from flexing and grasp the heel in the palm of your other hand with the sole of the foot resting against your forearm for **dorsal flexion**

ANKLE - EXTENSION 0° -20°

DORSAL



**ANKLE, DORSIFLEXION
(EXTENSION) 0°-20°**



TREATMENT

The ideal approach to increasing range of motion is one that alternates periods of low-force stretch with periods of functional motion and active exercise.

Physical therapy per physician order for functional stress motion and active exercise.

Dynamic splints to provide long periods of low-force stretch.

EXPECTED OUTCOME:

Correct contracture.

Increase range of motion of the joint.

Length of time each day the patient receives continuous low-force stretch.

When the ideal treatment modality is in place, the patient will begin to improve daily. The total time for correction depends upon the necessary physical therapy and continuous low-stretch force. The gains continue as long as treatment is used.

The time required for treatment and positive change in a contracture depends upon several factors.

The cause of immobilization.

Length of time the patient has had the contracture.

If any components (blood, edema) are added to the contracted tissue.

Amount of physical therapy available daily.

Length of time each day the patient receives continuous low-force stretch.

When the ideal treatment modality is in place, the patient will begin to improve daily. The total time for correction depends upon the necessary physical therapy and continuous low-stretch force. The gains continue as long as treatment is used.



SPLINTING

	STATIC	DYNAMIC
PURPOSE	prevents motion relieves pain prevention or correction of deformity and contractures substitution and protection for weak or lost muscle function maintain a functional position for bone muscle, tendon or ligaments during healing support of immobilized part	clear choice when attempting to gain joint motion create motion substitute for absent muscle power prevent contractures or impending contractures maintain balance promote rest mobilize specific joints maintain joint function and position prevent ankylosis promote wound healing of newly repaired structures relieve pain decrease adhesions (muscles are moving, pumping away stagnant fluids that wash out toxins, keeping tendons gliding and joints moving thus preventing the formation of adhesions and maintaining good joint mobility)
DESIGN	no movable parts	static base and one or more moveable parts
CHARACTERISTICS	strong short term pressure	provides constant force over a long period of time



SPLINTING

	STATIC	DYNAMIC
ACTION	protects weak muscles from being overstretched by providing the necessary force to counteract a strong muscle group	gives moving muscles an opposing, balancing force in order to maintain joint mobility and freely gliding tendons provides forces to the joint that substitute for lost muscle power and assist weak muscles application of a force on a moving part that remains nearly constant
RESULTS	prolonged use causes joint immobility	increases ROM
BENEFITS	can draw out a contracture reserved for the healing phase	can draw out the contracture and aid in maintaining the correction able to provide a specific force to specific tightness applied to gain motion after the initial healing phase
PRECAUTIONS	should never be used longer than physiologically indicated should never be used if a dynamic splint would be equally effective ones that position the whole limb are meant to stretch a tight joint but frequently position the tightest structure the poorest	must be designed and constructed carefully to provide specific traction with good directional control

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SPLINTING AND POSITIONING

No device is a substitute for proper nursing care, especially regular turn schedules.

Devices should provide support for the body skeleton, offer a reduction in the amount of shearing force exerted on the body surface, and relieve/reduce pressure.

Types of Splints

- Resting hand splint
- Air hand splint
- Palmar guard
- Wrist cock up
- Elbow extension splint
- Knee extension splint
- Foot splint

Purpose

- To prevent contractures of the joints
- To maintain and improve mobility and ROM
- To increase ability to use arms and legs functionally
- Protect weak muscles
- To support a joint
- To stabilize a joint
- To improve alignment
- Prevention of deformity
- Decrease pain
- Prevent skin breakdown

Before and after application of a splint

- Check for evidence of swelling, bruising and skin irritation
- Skin should be clean and dry
- Do ROM to decrease tone to all joints of the extremity
- Determine if cleaning of splint is needed



Why perform ROM before and after applying a splint?

- To manage tone
- Decrease pain when applied and while being worn •
- Prevent stiffness from lack of movement
- Decrease risk of pressure areas
- Decrease risk of contractures
- So problems can be quickly identified
- To gradually move and stretch muscles to allow comfortable splint wear

Where pressure or skin discomfort can occur

- Ends of splint
- Under straps
- Edges of splint
- Bony prominences
- Creases in and around joints

Proper fit

- Should look like it is molded to skin
- Should not dig into skin
- Body part should not move around; fit snugly but not tightly - 1 to 2 fingers between liner and skin comfortably
- Straps fastened properly (1 to 2 fingers between strap and skin)

A splint should be removed if

- Any new reddened areas are noted
- Severe pain or discomfort
- Excessive swelling
- Excessive stiffness

Care of splints

- Wash splint as needed. Use mild soap and lukewarm water. Determine need each time splint is removed. (Hand wash preferred)
- Store splint where the next person can find it.
- Never put in the sunshine or on a heater.
- Press velcro straps together during washing (especially if done in an industrial washer) to prolong life of the velcro.
- Splints are individualized. Do not interchange between residents.

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Contraindications for splinting

- Fixed contractures
- Large draining wounds
- Excessive swelling or edema
- Continuous spasticity
- Excessive pain



GLOSSARY

ABASIA	Inability to walk.
ABDUCT, ABDUCTION	Movement away from the center of the body.
ABSCESS	Localized collection of pus in any part of the body.
ACROMION	Lateral end of the scapula.
ACTIVE ASSISTIVE RANGE OF MOTION	Active Assistive Range of Motion Exercises are either started or finished by the resident, but the motion is completed with assistance of the nurse or caregiver.
ACTIVE RANGE OF MOTION	Active Range Of Motion Exercises are done by the resident taking the arm or leg through as complete a range of motion as possible.
ADDUCT, ADDUCTION	Movement toward the center of the body.
ADL'S	Activities of Daily Living are those tasks that are required to function in the home or work environment on a day-to-day basis.
ALTERED TISSUE PERFUSION	When oxygenated blood does not flow freely through the vessels to the tissue.
AMPUTATION	Cutting off of a limb. Immobility
ANKYLOSIS	and fixation of a joint.
ANTERIOR	The general term applied to the front part of the body.



APHASIA

Loss of ability to understand or communicate.

ANTIBACTERIAL

An agent that inhibits the growth of bacteria.

AREOLAR

A band of connective tissue having little tensile strength and consisting of loosely woven fibers with areolae (small spaces) among them.

ARTERIOSCLEROSIS

"Hardening of the arteries".

ATROPHY

Disappearance or diminution in size and function.

AUTOLYSIS

Disintegration or liquefaction of tissue or of cells by the body's own mechanisms, (leukocytes), enzymes.

BEDSORE

Decubitus Ulcer.

BETADINE

A trademark name for a topical anti-infective (povidone-iodine).

BILATERAL

Both sides.

BLANCHING

Becoming white when pressure is applied.

BONY PROMINENCE

Area of bone that is not flat or that stays on more prominent than the rest of our bones: gave little or no fat between the bone and the skin.

CARTILAGE

Firm and nonvascular connective tissue.

CELL MIGRATION

Movements of cells in the repair process.



CIRCUMDUCTION

An action which involves flexion, extension, abduction, adduction and rotation (the thumb circumducts).

COLLAGEN

A fibrous insoluble protein in the connective tissue of skin, bone, ligaments and cartilage.

CONTRACTION

- a. The pulling together of wound edges in the healing process.
- b. A reduction in size of muscle fibers.

CONTRACTURE

An abnormal condition of a joint, characterized by flexion and fixation caused by atrophy and shortening of a muscle, tendon or joint.

CONTRAINDICATION

Anything that makes treatment improper or undesirable.

DEBRIDEMENT

Removal of devitalized tissue.

DECUBITUS

A misnomer for a pressure ulcer.

DEMENTIA

Loss or impairment of mental functions.

DENUDE

Loss of epidermis.

DERMAL WOUND

Loss of skin integrity through the epidermis, may be superficial or deep.

DERMIS

The layer of skin below the epidermis in which hair follicles and sweat glands originate.

DISTAL

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The end of any part
farthest from the midline
or point of attachment.





DORSAL

Pertaining to or laying near the back (posterior) aspect of the hand or foot.

DORSIFLEXION

Movement towards the back or posterior aspect of the hand or foot.

EDEMA

The presence of excessive amounts of fluid in the tissues (swelling).

ELASTIN

Yellow, elastic, fibrous mucoprotein that is the major connective tissue protein of elastic structures.

ENZYMES

Biochemical substances that are capable of breaking down necrotic tissue.

EPIDERMIS

The outer cellular layer of the skin..

EPITHELIALIZATION

Regeneration of the epidermis across a wound surface.

EQUINOVARUS

A form of clubfoot; the heel is turned inward from the midline of the leg and the foot is plantar flexed.

EQUINUS

A deformity in which the foot is plantar flexed, causing the person to walk on the toes without touching the heel.

ERYTHEMA

Redness or purple hue of the skin surface produced by vasodilation.

ESCHAR

Thick, leathery necrotic tissue, devitalized tissue.

EVERSION

Turning outward



EXCORIATION

Superficial loss of substance such as that produced on the skin by scratching.

EXTENSION

A movement which increases the angle away from the body.

EXUDATE

Accumulation of fluids in a wound. May contain serum, cellular debris, bacteria and leukocytes.

FEMUR

Thigh bone.

FIBULA

Smaller of the two bones in the calf.

FIBROBLAST

Any cell from which connective tissue is developed.

FIBROSIS

Abnormal formation of fibrous tissue is developed.

FLACCID

Relaxed, flabby, having defective or absent muscle tone.

FLEXION

A movement which decreases the angle toward the body.

FOOT DROP

An abnormal neuromuscular condition of the lower leg and foot, characterized by an inability to dorsiflex or invert the foot because of damage to the peroneal nerve.

FRONTAL

In front; anterior part of the body.



FULL THICKNESS

Tissue destruction extending through the dermis to involve the subcutaneous layer and possibly muscle, bone and joint.

GAIT

Manner of walking.

GERIATRICS

Branch of medicine concerned with the diseases and problems of the elderly.

GRANULATION

The formation or growth of small blood vessels and connective tissue in a full thickness wound.

GONIOMETER

A calibrated instrument designed to measure the range of motion of a joint.

HEMIPLEGIA

Paralysis of one side of the body.

HUMERUS

Longest and largest bone of the arm.

HYPEREMIA

Presence of excess blood in the vessels; engorgement.

HYPEREXTENSION

Extension beyond the normal limit. Inability

INCONTINENCE

to control or regulate urine or feces.

INFECTION

Overgrowth of microorganisms capable of tissue destruction and invasion, accompanied by local or systematic symptoms.

INFLAMMATION

Defensive reaction to tissue injury: Involves increased blood flow and capillary permeability and facilitates physiological cleanup of wound. Accompanied by



increased heat, redness,
swelling and pain in affected
areas.

ISCHEMIA

A deficiency of blood flow to a part due to constriction or obstruction of a blood vessel.

KYPOSIS

A deformity of the spine characterized by extensive flexion.

LATERAL

On the side; farther from the median.

LESION

A broad term referring to wounds or sores.

LEUKOCYTOSIS

Increase in the number (above 10,000 per cu.mm.) of leukocytes (white blood cells) in the blood.

LIGAMENT

A fibrous band of connective tissue attached to two or more bones.

LORDOSIS

An abnormal extension deformity of the spine; hollow or saddle back.

MACERATION

Softening of the tissue by soaking in fluid.

MACROPHAGE

Cells which have the ability to destroy bacteria and devitalized tissue.

MEDIAL

Structures of the body near midline.

NECROTIC

Dead, avascular.

ORTHOSIS

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A splint or brace used to support, align, prevent or correct deformities or to improve function of moveable parts of the body.



OSTEOPOROSIS	Reduction in the quality of bone resulting in porous bones.
PARAPLEGIA	Paralysis of both lower extremities and, generally, the lower trunk.
PARTIAL THICKNESS	Loss of epidermis and possible partial loss of dennis.
PATELLA	Kneecap.
PLANTAR FLEXION	A pulling of the muscles of the foot in which the toes are pointing downward.
POSTERIOR	Pertaining to or lying near the back.
PRESSURE SORE	An area of localized tissue damage caused by ischemia due to pressure. Synonym: Pressure Ulcer.
PROM	Passive Range of Motion Exercises are done by someone other than the resident.
PRONE	Denoting the hand or foot in pronation, or the body when facing laying face downward.
PRONATION	Rotation of the forearm which brings the palm of the hand downward.
PROXIMAL	Nearest the center of the body or base of attachment.
QUADRIPLEGIA	Paralysis of all four limbs.
RADIAL DEVIATION	Sideways motion of the wrist toward the thumb.



ROM	Range of Motion. The movement of a joint through space.
REHABILITATION	Restoring the ability to function in a normal or near normal manner.
RESTORATIVE	Renewing health and strength.
RIGIDITY	Abnormal or morbid stiffness or inflexibility.
ROTATION	Turning a limb or body part around its axis.
SCAPULA	Shoulder blade.
SCOLIOSIS	An appreciable lateral deviation in the normally straight vertical line of the spine.
SPASM	Involuntary, sudden movement or convulsive contracture.
SPASTIC	Resembling or of the nature of spasms or convulsions; hypertonic.
SPASTICITY	State of hypertonicity; increase in normal tone and heightened deep-tendon reflexes resulting in difficult movement.
SPLINT	Used to fix or support a joint.
SUBLUXATION	An incomplete dislocation.
SUPINATION	Facing forward.
SUPINE	Denoting the hand or foot in supination, or the body when lying face forward.



ULNAR DEVIATION

Sideways motion of the wrist
away from the thumb.

WEB SPACE

Space between the knuckle of the index
finger and the thumb.



EXPECTED OUTCOME:

- Prevent deterioration of tissue and maintain ROM
- Early ambulation/gait training
- Increase mobility
- Adequate circulation in pressure sensitive areas
- Reduce plantar flexion
- Increase dorsiflexion
- Maintain skin integrity

RATIONALE FOR USE:

- Contractures of the lower extremity
- Pressure necrosis of the lower extremity
- Maintain functional alignment of the lower extremity
- Treat foot drop
- Treat pressure necrosis
- Support the foot

AREAS TO WATCH FOR PROBLEMS:

- Heel
- Ankle (lateral and medial!)
- Ball of foot

WHEN TO USE THE LEEDER BOOT

After you have assessed the patient and assessed Range of Motion to all of the joints, you will be able to decide if the LEEDer Boot™ is the proper treatment.

NOTE: Although Medicare Part B will only reimburse for the use of the LEEDer Boot™ when plantar flexion is the warranting diagnosis (Min. 10 degree contracture & Night Splint allowed also), the LEEDer Boot™ has many features that address other contractures of the lower extremity that may also be present. Therefore, a total assessment of the lower extremity should be made.

FOOT DROP (PLANTAR FLEXION CONTRACTURE)

If the ankle joint is not fixed, and there is some movement in the joint, the LEEDer Boot™ may be applied to treat foot drop (plantar flexion



contracture). The degree of contracture and the amount of movement in the joint will determine the on/off schedule of the splint. The greater the degree of contracture and the greater the decrease in range of motion, the shorter the wearing time.

HIP ROTATION

If the hip joint is externally rotated, and there is movement in the joint, apply the LEEDer Boot™ with the rotation bar positioned to the outside. If the hip is internally rotated, apply the LEEDer Boot™ with the rotation bar positioned to the inside. Usually one leg will contract and rotate externally first, then the other will follow rotating internally. It is rare to see only one leg rotated internally.

SCISSORING

If the patient's legs have scissored (crossed) and the hip joints are not fixed, bilateral splints may be applied using the scissor bar to abduct the legs. This scissor bar should only be used while the patient is lying on his/her back.

REMEMBER - This is a guide to help you while you are assessing patients. Every patient is different and must be thought of individually. **KEEP IN MIND-NEVER SPLINT A FIXED CONTRACTURE:** If you feel there is some movement in a joint, but not as much as you might like to see, recommend a few weeks of Range of Motion possibly twice a day, then re-assess. Even a nurses aid doing some Range of Motion while bathing a patient can do a great deal of good.

WEARING TIME SCHEDULE FOR SPLINTS

1. Should be per therapy or physician's orders.
2. A frequently followed schedule is:
 - Begin with 1 hour on and 1 hour off
 - Remove and assess
 - Reapply after 1 hour if there is no redness, edema or pain
 - Increase time frame by 30-60 minutes (on and off as tolerated until maximum time is reached)
 - Remove once a shift for assessment
 - Consult therapy if redness, edema or pain is present

Contracture Management Orthotics
Give **MORE CARE** for less cost ... The LEEDer way

"Since 1996"

