The Ministry of Health

Physiotherapy Council of Kenya

Assessment and Management Clinical Protocols

November 2023

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Douglas Kotut

REGISTRAR /CEO

FOREWORD

The formulation of the physiotherapy is the answer to the clamor of standardizing our approach to these common Physiotherapy problems.

We are proud to say that this work complies with the highest standards based on evidence-based medicine appropriate for the Kenyan setting. Every reference that was examined and summarized has the most up to date quality evidence of the current data on prevention, diagnosis and prognosis. Therapy formulation is the highest risk/benefit cost effective that is available in our setup. The other purpose of these protocols is to standardize physiotherapy care that can be recommended to the Ministry of Health and Health insurance institutions.

This will be made available to each Physiotherapist and will be coordinated with other members of the medical team concerned in the treatment of physiotherapy conditions. It is the goal of the supporters of these protocols to update accordingly to meet the changes in time.

The Physiotherapy Council of Kenya will commit to update and revise protocols so as to set standard locally and internationally.

Recognizing the need to make protocols for the most common cases attended to in physiotherapy departments underscores the commitment of the Council to ensure standardization of care and the commitment to ensure that the public enjoy highest attenable quality of health care an envisioned in the Universal Health Care (UHC) program.

We believe that this milestone will create a positive and lasting mark in the Physiotherapy community both locally and internationally. It boasts of being independent, unbiased and at its core, the true essence of research.

Research creates new knowledge and new knowledge you have gained. All of these in pursuit of the best care we can give our patients. In the end, they are the reason why we are called Physiotherapists. The vocation we have chosen demands continuous education. Learning goes beyond passing an examination and getting a certificate. Physiotherapy involves a diverse group of physiotherapists applying evolving means of treatment and using the basic, to the innovative, to the most advanced modality and equipment there is available. This is to achieve the Physiotherapy Council of Kenya mission to promote and advance the field of rehabilitation medicine and elevate the standards of practice through training, education, research and service thereby improving the quality of life of the Kenyan people.

The Physiotherapy Council of Kenya vision to be a nationally recognized and globally accepted Council of dynamic, compassionate and highly competent physiotherapist is our perspective. These protocols are just some of the tools in making it a reality. We therefore challenge each and every member of the Physiotherapy Council of Kenya to make a commitment to further their education, develop their skills, dream big and be at the forefront of comprehensive healthcare of the Kenya people.

Henry Opondo

CHAIRPERSON

PHYSIOTHERAPY COUNCIL OF KENYA (PCK)

PCK is a regulatory body established under an Act of Parliament (Physiotherapists Act No 20 of 2014) whose main function is to make provision for training and licensing of Physiotherapists and to regulate their practice. The principal function is to protect health and safety of the public by ensuring ethical and competent Physiotherapists offer services to the public. The Council has a responsibility to ensure practitioners, Physiotherapy clinics/facilities premises comply with the set rules and standards.

VISION

To have competent and ethical physiotherapy practitioners that are responsive to local and global health needs.

MISSION

To advance standards of physiotherapy practice and training through continuous skills development, research, development of appropriate guidelines and regulations.

CORE VALUES

- Innovative
- Responsive
- Customer focused
- Transparency and accountability

PHYSIOTHERAPY

Physiotherapy is a profession that primarily provides services to individuals and populations to develop maintain and restore maximum movement and functional abilities throughout the lifespan. This includes providing services in circumstances where ageing, injury, diseases, disorders, conditions or environmental factors threaten movement & function. Functional movement is central to what it means to be healthy. Physiotherapy is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation. This encompasses physical, psychological, emotional, and social wellbeing. Physiotherapy involves the interaction between the physiotherapist, patients/clients, other health professionals, families, caregivers and communities in a process involving assessment of movement potential, setting and agreeing upon goals using knowledge and skills unique to physiotherapists.

AIM OF THE PROTOCOL

This Physiotherapy practice protocol seeks to ensure conformity to global standards of Physiotherapy Practice and warrant delivery of effective Physiotherapy services in Kenya.

LIST OF ABBREVIATION

AAROM	Active Assisted Range of Motion
ACBT	active cycle of breathing technique
ACBT	Active Cycle of Breathing Techniques
AD	Autogenic drainage
ADL	Activities of daily living
ADL	Activities of daily living
ADL	Activities of daily living
ADL	Activities of daily living
ADL	Activities of Daily Living
ADL	Activities of Daily Living
AFO	Ankle Foot Orthoses
AIDP	Acute Inflammatory Demyelinating Polyneuropathy
AP	Antero-posterior
AROM	Active Range of Motion
ASES	American Shoulder and Elbow Surgeons,
ASIA	America Spinal Injury Association
ATFL	Anterior talofibular ligament
BC	Breathing control
BI	Brain Injury

BI	Brain injury
BOS	Base of Support
BP	Blood Pressure
BWSTT	Body weight supported treadmill training
BWSTT	Body-Weight-Supported-Treadmill-Training
CAI	Chronic Ankle Instability
CB	Chronic Bronchitis
CCT	Circuit Class Training
CCW	Counter clockwise
CFL	Calcaneo-fibular ligament
CIDP	Chronic Inflammatory Demyelinating Polyneuropathy
CIMT	Constraint Induced Movement Therapy
CKC	Close Kinetic Chain
COG	Centre of Gravity
COPD	Chronic obstructive pulmonary disease
COPD	Chronic Obstructive Pulmonary Disease
COPD	Chronic obstructive pulmonary disorder
CPAP:	Continuous positive airway pressure
CPM	Continuous Passive Motion
CPM	Continuous Passive Motion

CRP	C-Reactive Protein
CRPS	Complex Regional Pain Syndrome
CT	Computed Tomography
CVA	Cardiovascular Accident
CVS	Cardial vascular accident
CW	Clockwise
DASH	Disabilities of the Arm, Shoulder and Hand,
DIP	Distal interphalangeal
DM	Diabetes Mellitus
DOC	Disorders of Consciousness
DOC	Disorders of consciousness
DVT	deep venous thrombosis
DVT	deep venous thrombosis
EMG	Electromyography
EMG	Electromyography
ER	External Rotation
ES	Electrical Stimulation
ESR	Erythrocyte Sedimentation Rate
FES	Functional electrical stimulation
FET	forced expiratory technique

FET	The forced expiration technique
FGA	Functional Gait Assessment
FIM	Functional independent measure
FWB	Full Weight Bearing
GBS	Guillain-Barré syndrome
GOLD	Global Initiative for Obstructive Lung Disease
GPP	Good Practice Points
GRF	Ground Reaction Force
HFCWO	High Frequency Chest Wall Oscillation
HOOS	Hip disability and osteoarthritis outcome score
IADL	Independent Activities of Daily Living
IADL	Independent Activities of Daily Living
IBN	Idiopathic brachial neuritis
IP	In patient
IP	In Patient
IPPB	Intermittent positive pressure breathing
IR	Internal Rotation
ISNCSCI	International standards for neurological classification of spinal cord injury
IVIG	Intravenous Immune Globulins
JROM	Joint Range of Motion

LE	Lower Extremity
LSI	Limb Symmetry Index
MCP	Metacarpal phalangeal
MD	Medical Doctor
MD	Medical Doctor
MDS	Movement disorder society
MDT	Multi-disciplinary team
MFS	Miller Fisher Syndrome
MMN	Multifocal Motor Neuropathy
MRI	Magnetic Resonance Imaging
NIV	Non-Invasive Ventilation
NLI	Neurological Level of Injury
NMES	Neuromuscular electrical stimulation
NMR	Neuromuscular Retraining
NMS	Neuromuscular Electro Stimulation
NP	Neuropathic pain
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
OARS	Older Americans Resources and Services
OHS	Oxford Hip Score
OKC	Open Kinetic Chain

OP	Out patient
OP	Out Patient
OT	Occupational Therapist
OT	Occupational therapist
OT	Occupational therapy
$PaCO_2$	Partial Pressure Carbon Dioxide
PADL	physical activities of daily living
PCK	Physiotherapy Council of Kenya
PCL	Posterior Cruciate Ligament
PD	Parkinson's disease
PD	Postural drainage
PDQ	Parkinson's Disease Questionnaire
PEP	Positive expiratory pressure
PEP	Positive Expiratory Pressure
PIP	Proximal Interphalangeal
PLP	Phantom Limb Pain
PLS	Phantom Limb Sensation
PNI	Peripheral Nerve Injury
POD	postoperative day
POD	postoperative day

PRICE	Protection, Rest, Icing, Compression and Elevation
PROM	Passive Range of Motion
PROM	Passive Range of motion
PROM	Passive Range of Motion
PRT	Progressive resistance training
PT	Physical Therapist
PT	Physical Therapist
PT	Physical therapist
PTFL	Posterior talofibular ligaments
PTTL	Posterior tibiotalar Ligament
PWB	Partial Weigh Bearing
QOL	Quality of Life
QOL	Quality of life
RA	Rheumatoid Arthritis
RCQOL	Rotator Cuff Quality of Life,
RICE	Rest, Ice, Compression, and Elevation
RM	Rep Maximum
ROM	Range of Motion
ROM	Range of Motion
RSI	Relative Strength Index

SANE	Single Assessment Numeric Evaluation,
SAQ	short arc quadriceps
SCI	Spinal cord Injury
SLP	Speech and language pathologist
SLP	Speech and language pathologist
SLR	Straight Leg raisin
SLST	Single Limb Stance Test
SOB	Shortness of breath
SPA	Sanitas per Aquam meaning Health through water
TCL	Tibiocalcaneal ligaments
TEE	Thoracic expansion exercises
TENS	Transcutaneous electrical nerve stimulation
TENS	Transcutaneous Electrical Nerve Stimulation
TENS	Transcutaneous Electrical Nerve Stimulation
TES	Trophic Electrical Stimulation
THA	Total Hip Replacement
THREAD	Thyroid disorders, Heart problems, Rheumatoid arthritis, Epilepsy, Asthma or other respiratory problems, Diabetes
TKA	total knee replacement
TMD	Temporo-Mandibular

TMJ	Temporo-mandibular Joint.
TMT	Tinetti Mobility Test
TN	Trigeminal Neuralgia
TNL	Tibionavicular ligaments
TSTS	Timed sit to stand test
TUG	Timed up and go test
UBE	Upper Body Exercise
UE	upper extremity
UMNL	Upper Motor Neuron Lesion
UPDRS	Unified Parkinson's disease Rating Scale
VAC	Voluntary Anal Contraction
VMO	Vastus Medialis Oblique
WBAT	Weight Bearing Activity Training
WBAT	Weight Bearing Activity Training
WHO	World Health Organization
WOMAC	Western Ontario and McMaster university osteoarthritic index
WOOS	Western Ontario Osteoarthritis of the Shoulder index,
WORC	Western Ontario Rotator Cuff index,
WOSI	Western Ontario Shoulder Instability index.

SECTION ONE
1.0: ORTHOPAEDICS

1.1.1: ADHESIVE CAPSULITIS (FROZEN SHOULDER) PROTOCOL

INTRODUCTION

Adhesive capsulitis (also known as Frozen Shoulder) is a chronic fibrosing condition characterized by insidious and progressive severe restriction of both active and passive shoulder range of motion in the absence of a known intrinsic disorder of the shoulder

ASSESSMENT

- Pain
- Flexibility (JROM)
- Strength and Endurance
- Functional assessment
- Special tests (empty can test, Speed's test, drop arm test, and Neer and Hawkin's impingement tests)
- If surgery is performed, important post-operative signs to monitor include
- Swelling of the shoulder and surrounding soft tissue
- Abnormal pain response, hypersensitivity, and increase in night pain
- Severe JROM limitations
- Weakness in the upper extremity musculature

MANAGEMENT

GOALS

- Control pain
- Regain normal shoulder range of motion
- Regain normal upper extremity strength and endurance

- Achieve function based on the patient's goals
- Continuous Passive Motion (CPM) may be used for range of motion.

PHASE 1: WEEK 1-8

GOALS

- Reassure patient
- Alleviate pain
- Reduce swelling
- Improve JROM
- Improve shoulder function

Exercise

- JROM Gradually (Pendulum exercises, AROM, AAROM, and PROM).
- Home exercise/stretching program to be performed by the patient 15 reps, 3-5x per day.
- Sustained stretch of 15-30 seconds should end every JROM routine.
- Anterior and posterior capsular stretches.

Strength

- Gentle strengthening of rotator cuff and scapular stabilizers may be done within pain-free range, but focus should be on JROM

NB: If no progress is being made, consult the referring Doctor

Shoulder stabilizer

For post-surgical patient

Modalities

- Electrotherapy (Ultrasound, TENS) for pain, inflammation control and joint stiffness.
- Moist heat to affected shoulder for 10 mins prior to stretching
- Ice for 15-20 minutes after stretches

PHASE 2: WEEK 8-16

GOALS

- Control pain
- Achieve normal or near-normal JROM
- Participation in activities of daily living

Exercise

Joint range of motion

- Continue AROM, AAROM PROM,
- Forward flexion 0-140°
- Extension 0-60^0
- External rotation 0-45°
- Internal rotation 0-90^0 As accommodated
- Continue capsular stretches

Strength

- Rotator cuff strengthening in all planes 3 x week
- Start with isometric strengthening
- Progress to Thera-band strengthening (graduated tensile strength)
- Progress to dumb bells (graduated weights)
- Continue Scapular stabilization program

Modalities

- Electrotherapy as appropriate
- Moist heat prior to therapy
- Ice 15-20 minutes after therapy

PHASE THREE (RETURN TO OCCUPATION)

- Consider the patient's occupation and participation orientation and plan for rehabilitation accordingly

1.1.2: LOW BACK PAIN

INTRODUCTION

Low back pain is a symptom or rather a complaint expressed in terms of location. Studies define low back pain as pain on the posterior aspect of the body between the gluteal folds and margins of the twelfth rib with or without referred leg pain. It is the most prevalent musculoskeletal disorder in all age groups reported in the primary care setting in rural and urban Africa. Generally, low back pain has three sources, which are, specific spinal pathology, nerve root pain /radiculopathy or nonspecific cause. One requires a thorough clinical examination to isolate back pain with specific pathology or radiculopathy

ASSESSMENT

- Perform a full patient evaluation
- Perform a comprehensive re-evaluation with general assessment in low back pain patients not improving after four to six weeks.
- Identify yellow flag signs or psychosocial risk factors to better manage low back pain patients.
- Suggest immediate referral, evaluation, and treatment of low back pain patients presenting with red flag signs indicating a serious pathology.

- In physical examination perform a full physical and neurologic examination, functional status and psychosocial risk factor assessment for patients with low back pain.

LOW BACK PAIN WITH RADICULOPATHY

- Recommend considering congruence of signs and symptoms to symptoms increase sensibility and specificity of the neurological exam of a patient with low back pain.
- Recommend the following in low back pain patients with probable radiculopathy secondary to disc herniation:
    a) Do the SLR test and crossed leg SLR test
    b) Map pain distribution
    c) Not to rule out radiculopathy in elderly, diabetic, HIV positive patients with normal SLR test.
    d) Immediate referral for surgical evaluation of low back pain patients with steppage.
- Consider the following in low back pain patients with probable radiculopathy secondary to disc herniation:
    a) Do the slump test to patients with severe clinical presentation of acute or sub-acute low back pain;
    b) Perform the "provocative active side bend" assessment, either alone or as part of a flexion-extension-rotation assessment;
    c) Perform one or more of the neural tension tests (e.g., straight leg raise, slump, prone knee bend, femoral stretch) bilaterally; checking for leg or below the knee pain
    d) Perform Wasserman test, SLR test, patellar and Achilles tendon reflex test, foot sensibility (e.g. lateral, medial and back), muscle strength test (e.g. knee extension, foot dorsi- and plantarflexion, toe dorsiflexion) and foot (e.g. medial, lateral and back) sensibility.

DIAGNOSIS

NON-SPECIFIC LOW BACK PAIN

- Strongly endorses against the use of diagnostic imaging tests such as radiographs, CT and MRI in evaluating acute, non-traumatic, and non-specific cases of low back

pain.

- Recommend to acute or chronic low back pain patients who are not improving, to have an x-ray of the lumbar spine (AP and lateral views, without oblique views) prior to a CT or MRI.
- Suggests;
    a. Requesting for an X-ray in the absence of expected improvement or with worsening of the patient's condition.
    b. Laboratory blood tests in the absence of red flag signs.

LOW BACK PAIN WITH RADICULOPATHY

- Strongly recommends that after 4 – 6 weeks of low back pain, CT scan or MRI are recommended if surgery is considered and/or severe or progressive neurologic signs and symptoms are present.
- Recommend when a diagnostic test is indicated in low back pain, with or without radiculopathy an MRI is preferred. However, CT scan is an alternative when MRI is contraindicated.
- Recommends neurophysiological expert evaluation when etiological or level diagnosis are uncertain, prognostication information is required, or to monitor/document low back pain objectively.
- Do not recommend ordering for CT scan and MRI in the first 4-6 weeks unless there is highly painful sciatica or progressive motor deficit.
- Do not recommend EMG exam in the first four weeks of low back pain since it does not predict radicular pain.

LOW BACK PAIN DUE TO OTHER SPECIFIC CONDITIONS

- Recommends ordering x-rays in patients with low back pain after lumbar blunt trauma or acute injuries (fall, motor-vehicle accidents, motorcycle, pedestrian, cyclists, etc) to assist in diagnosis.

- Recommends x-ray of the whole spine (in standing) in patients with scoliosis.
- Recommends CT scan or MRI in patients with spinal stenosis.
- Suggests ordering standing and dynamic x-ray in cases of spinal instability and spondylolisthesis
- Suggests requesting for blood and urine exams, acute phase reactants and x-ray of the spine and sacroiliac joints in patients with rheumatologic or spondyloarthritic cases of back pain.

MANAGEMENT

PHYSICAL ACTIVITY, THERAPEUTIC EXERCISE WITH RELATED INTERVENTIONS, EDUCATION & ADVICE

- Strongly endorses that patients with acute non-specific low back pain remain physically active and to avoid bed rest. If the patient must rest, it must be limited to no more than two days.
- There is strong evidence against prescribing any specific exercise program over another in managing acute non-specific low back pain.
- Suggests therapeutic exercise as a treatment option in acute non-specific low back pain.
- Suggests back school (i.e. control posture, reduce stress, and modify work activity) in patients with acute non-specific low back pain.
- Suggests McKenzie approach as a possible exercise option for acute non-specific low back pain.

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Strongly endorses against the use of continuous traction in acute nonspecific low back pain. Intermittent traction with longer rest phases is recommended.

- Recommends the use of Interferential therapy and Laser therapy as treatment options in the treatment of acute non-specific low back pain.
- Recommends against the use of TENS in patients with acute non-specific low back pain.
- Suggests the use of heat, cold, shortwave diathermy, Ultrasound and lumbar supports in the treatment of acute non-specific low back pain.

OTHER NON-INVASIVE PROCEDURES

- Endorse spinal manipulation as possible treatment option in patients with acute non-specific low back pain.
- Suggests massage and spinal mobilization as possible treatment options for acute non-specific low back pain.

ACUTE LOW BACK PAIN WITH RADICULOPATHY

CONSERVATIVE MANAGEMENT

PHYSICAL ACTIVITY, THERAPEUTIC EXERCISE WITH RELATED INTERVENTIONS, EDUCATION & ADVICE

- Recommends acute low back pain patients with radiculopathy to avoid bed rest (except for 2-4 days in severe cases), to remain physically active within limits of pain, and to return early to work accompanied by activity modifications.

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Suggests the use of ultrasound in the treatment of acute low back pain with sciatica.

- Do not recommend the use of heat, TENS nor continuous traction in the treatment of acute low back pain with radiculopathy.

OTHER NON-INVASIVE PROCEDURES

Other non-invasive procedures for management of acute low back pain with radiculopathy include:

- Massage
- Manipulation
- Mobilization
- Suggests spinal manipulation in the treatment of acute low back with radiculopathy.

ACUTE LOW BACK PAIN DUE TO OTHER SPECIFIC CONDITIONS

Lumbar supports

- Suggests lumbar supports in the treatment of acute low back pain in patients with low back pain secondary to spinal stenosis and spinal instability

SUB-ACUTE LOW BACK PAIN

NON-SPECIFIC SUB-ACUTE LOW BACK PAIN

CONSERVATIVE MANAGEMENT

PHARMACOLOGIC MANAGEMENT

- Strongly endorses the use of acetaminophen for the treatment of sub-acute low back pain. It is to be considered the first line drug and not to exceed 3g/day.
- Recommends the use of NSAIDs as second line of drug in the treatment of sub-acute low back pain.
- Recommends that either opioids and non-opioids may be used in the treatment of sub-acute low back pain. However, opioids are not superior to non-opioids in its

efficacy.

- Recommends muscle relaxants, tricyclic antidepressants, benzodiazepines and tramadol in the treatment of sub-acute low back pain.
- Suggests the use of anti-epileptic drugs in the treatment of sub-acute nonspecific low back pain in consultation with a physician.

PHYSICAL ACTIVITY, THERAPEUTIC EXERCISE WITH RELATED INTERVENTIONS, EDUCATION & ADVICE.

- Strongly endorses that patients with sub-acute non-specific low back pain remain physically active and avoid bed rest.
- Recommends therapeutic exercise as a treatment option in sub-acute non-specific low back pain.
- Recommends against prescribing any specific exercise program over another in managing sub-acute non-specific low back pain.
- Suggests back schools (i.e. control posture, reduce stress, and modify work activity) and Viniyoga in the management of sub-acute non-specific low back pain.

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Endorses against using continuous traction in treating patients with sub-acute non-specific low back pain. Intermittent traction with longer rest phases is recommended.
- Recommends the use of Interferential Therapy, lumbar supports and laser therapy in the treatment of sub-acute nonspecific low back pain.
- Suggests the use of heat, cold, Shortwave diathermy, TENS and Ultrasound in the treatment of sub-acute nonspecific low back pain.

SUB-ACUTE LOW BACK PAIN WITH RADICULOPATHY.

CONSERVATIVE MANAGEMENT

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Suggests the use of lumbar supports in the treatment of sub-acute low back pain secondary to spinal stenosis and instability of undetermined duration.
- Do **NOT** recommend the use of continuous traction in the management of sub-acute Low Back Pain with Radiculopathy.

CHRONIC LOW BACK PAIN

NON-SPECIFIC CHRONIC LOW BACK PAIN

CONSERVATIVE MANAGEMENT

PHARMACOLOGIC MANAGEMENT

- Strongly endorses the use of acetaminophen and NSAIDs in the treatment of chronic non-specific low back pain.
- Recommends the use of opioids (i.e., codeine, oxymorphone), muscle relaxants (i.e., cyclobenzaprine, non-benzodiazepine), benzodiazepines and tramadol in the treatment of chronic non-specific low back pain, after an unsuccessful trial of non-opioid analgesic.
- Recommends the use of anti-depressants and anti-epileptic drugs in the treatment of chronic non-specific low back pain in consultation with the physician.

PHYSICAL ACTIVITY, THERAPEUTIC EXERCISE WITH RELATED INTERVENTIONS, EDUCATION & ADVICE.

- Strongly endorses that patients with chronic non-specific low back avoid bed rest and be managed with therapeutic exercises.
- Strongly endorses individualized or client-specific exercise programs
- Recommends back schools (i.e. control posture, reduce stress, and modify work

activity).

- Suggests McKenzie exercise approach and Viniyoga as possible management options

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Strongly **AGAINST** using continuous traction.
- **DO NOT** endorse the use of thermal therapy (heat)
- Recommends low-level laser therapy
- Do not recommend the use of transcutaneous electrical stimulation and lumbar support in the treatment of chronic non-specific low back pain.
- Suggests use of therapeutic ultrasound and interferential therapy in the treatment of chronic non-specific low back pain.

CHRONIC LOW BACK PAIN WITH RADICULOPATHY

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Do not recommend traction in the treatment of chronic low back pain with radiculopathy.

CHRONIC LOW BACK PAIN DUE TO OTHER SPECIFIC CONDITIONS

CONSERVATIVE MANAGEMENT

PHYSICAL AGENTS, MODALITIES, TRACTION & LUMBAR SUPPORTS

- Suggests the use of lumbar supports in the treatment of chronic low back pain secondary to spinal stenosis and instability.
- Suggests the use of continuous traction in patients with spinal stenosis.

OTHER NON-INVASIVE PROCEDURES

Other non-invasive procedures for management of chronic low back pain due to other specific conditions include massage, manipulation and mobilization.

- Superficial massage and graded manipulation in chronic low back pain with disc herniation are proposed.

NB: Do not recommend spinal manipulation and mobilization in chronic low back pain with spinal instability.

Do not suggest spinal manipulation and mobilization for chronic low back pain associated with painful scoliosis

TAKE KEEN NOTE OF THE FOLLOWING DURING HISTORY TAKING:

- Age
- Pain evaluation
- Localization
- Pain characteristics
- Radiation
- Pain schedule
- Posture pain relationship
- Functional and working impairment
- Previous treatment effect
- Physical and psychosocial risk factors
- Professional risk factors

RED FLAGS

- Violent trauma (such as a fall from height or an automobile accident)
- Constant, progressive, non-mechanical pain

- Thoracic or abdominal pain
- Pain at night that is not eased by a prone position
- History of or suspected cancer, HIV or other pathologies that can cause back pain
- Chronic corticosteroid consumption
- Unexplained weight loss, chills or fever
- Significant and persistent limitation of lumbar flexion
- Loss of feeling in the perineum (saddle anesthesia), recent onset of urinary incontinence

The risk of a serious condition may be higher in those under 20 or over 55 years of age. Particular attention must be paid to the previously mentioned signs and symptoms in patients in these age groups.

YELLOW FLAGS

- Belief that pain and activity are harmful
- Sickness behaviours' (like extended rest)
- Low or negative moods, social withdrawal
- Treatment beliefs do not fit best practice
- Problems at work, poor job satisfaction
- Heavy work, unsociable hours (shift work)
- Overprotective family or lack of support

CLINICAL EVALUATION OF LOW BACK PAIN

- Pain and/or functional limitation of the trunk
- Pain during spinous process, facet joints, ligament and muscle palpation
- Neurological examination

Strength testing

- Ankle dorsiflexion strength (able to heel walk)
- Great toe dorsiflexion strength
- Plantar flexion (able to toe walk)
- Hip flexors

Reflex testing

- Ankle and knee reflexes
- Knee extension

Sensory testing

- Neurodynamic tests

Special tests

- Anterior drawer's Test
- Apley's Test
- Lachman Test
- Lever Sign
- McMurrays Test
- Muller's Test
- Posterior drawer's Test
- Apprehension Test
- Slocum's Test
- Femoral Nerve Tension Test
- Slump Test
- Waddell Sign

REHABILITATION POST LOW BACK SURGERY

INITIAL EXERCISE PROGRAM

- Aerobic Exercises

- To protect the low back during aerobic exercise, maintain the spine in a neutral position while stabilizing with the abdominal muscles.
    a. Stationary bike for 20 to 30 minutes.
    b. Treadmill for 20 to 30 minutes.
- Early Exercise Program
    a. Ankle Pumps
    b. Heel Slides for 10 repetitions
    c. Heel slides with abdominal Contractions without holding breath- Repeat 10 times.
    d. Wall Squats (Check with the surgeon before attempting) Stand with your back leaning against wall.
        - Walk feet 12 inches in front of body.
        - Keep abdominal muscles tight while slowly bending both knees to 45°.
        - Hold 5 seconds.
        - Slowly return to upright position.
        - Repeat 10 times.
        - Straight Leg Raises
        - Lie on your back with one leg straight and one knee bent.
        - Tighten abdominal muscles to stabilize your low back.
        - Slowly lift leg straight up about 6 to 12 inches and hold for 1 to 5 seconds.
        - Lower leg slowly.
        - Repeat 10 times.
    e. Intermediate Exercise Program **(**Single Knee to Chest Stretch)
        - Lie on your back with both knees bent.
        - Hold thigh behind knee and bring one knee up to chest.
        - Hold 20 seconds, then relax.

- Repeat 5 times on each side.

f. Hamstring Stretch

- Lie on your back with legs bent.
- Hold one thigh behind knee.
- Slowly straighten knee until a stretch is felt in back of thigh.
- Hold 20 seconds, then relax.
- Repeat 5 times on each side.

- Advanced Exercise Program

g. Hip Flexor Stretch

- Lie on your back near edge of bed, holding knees to chest.
- Slowly lower one leg down, keeping knee bent, until a stretch is felt across top of the hip/thigh.
- Hold 20 seconds, then relax.
- Repeat 5 times on each side.

h. Piriformis Stretch

- Lie on your back with both knees bent.
- Cross one leg on top of the other.
- Pull your opposite knee to your chest until a stretch is felt in the buttock/hip area.
- Hold 20 seconds, then relax.
- Repeat 5 times on each side.

i. Lumbar Stabilization Exercises with Swiss Ball

- Lie on your back with knees bent and calves resting on ball.
- Slowly raise arm over your head and lower arm, alternating right and left sides.
- Slowly straighten one knee and relax, alternating right and left sides.
- Slowly straighten one knee and raise opposite arm over your head. Alternate opposite arms and legs.

- Slowly "walk" ball forward and backward with legs.

j. Lumbar stabilization exercise with Swiss ball,
lying on floor
   - Sit on ball with hips and knees bent 90° and feet resting on floor.
   - Slowly raise arm over your head and lower arm, alternating right and left sides.
   - Slowly raise and lower heel, alternating right and left sides.
   - Slowly raise one heel and raise opposite arm over your head. Alternate opposite arm and heel.
   - Marching: Slowly raise one foot 2 inches from floor, alternating right and left sides.

k. Lumbar stabilization exercise with Swiss ball, sitting on ball
   - Stand with ball between your low back and wall.
   - Slowly bend knees 45° to 90°. Hold 5 seconds. Straighten knees.
   - Slowly bend knees 45° to 90° while raising both arms over head.

l. Lumbar stabilization exercise with Swiss ball, standing
   - Lie on your stomach over ball
   - Slowly raise alternate arms over head.
   - Slowly raise alternate legs 2 to 4 inches from floor.
   - Combine 1 and 2, alternating opposite arms and legs.
   - Bend one knee. Slowly lift this leg up, alternating right and left legs.

NOTE: Be careful not to arch the low back.

m. Lumbar stabilization exercise with Swiss ball, lying on ball
   - Lie on your stomach over ball.
   - "Walk" hands out in front of ball until ball is under legs. Reverse to starting position.

- "Walk" hands out in front of ball until ball is under legs, then slowly raise alternating arms over head.
- "Walk" hands out in front of ball and slowly perform push-ups

n. Wall squats: Heel Raises (Check with the surgeon before attempting)

- Stand with your weight evenly distributed on both feet.
- Hold onto the wall or a sturdy chair for stability.
- Slowly raise your heels off the floor.
- Hold 5 seconds.
- Slowly lower your heels to the floor.
- Repeat 10 times.
- Repeat 10 times.

1.1.3: ANTERIOR CRUCIATE LIGAMENT INJURY REPAIR (ACL)

INTRODUCTION

This is a common knee injury. Individuals who participate in high demand activities like soccer, football, basketball and any other body loading activities are more likely to injure their anterior cruciate ligaments. About half of all injuries to the anterior cruciate ligament occur along with damage to other structures in the knee, such as articular cartilage, meniscus, or other ligaments. Partial tears of the anterior cruciate ligament are rare; most ACL injuries are complete or near complete tears.

DIAGNOSIS FOR CRUCIATE LIGAMENT INJURY

- X-rays. X-rays may be needed to rule out a bone fracture. However, X-rays don't show soft tissues, such as ligaments and tendons.
- Magnetic resonance imaging (MRI). Show the extent of an ACL injury and signs of damage to other tissues in the knee, including the cartilage.

- Ultrasound. May be used to check for injuries in the ligaments, tendons and muscles of the knee.

SPECIFIC TEST FOR CRUCIATE LIGAMENT INJURY

- Lachman test

MANAGEMENT

GOALS

- Reduced pain
- Improved knee stability
- Improved function / mobility
- Full recovery and return to occupational activity (may take up to twelve months)

MANAGEMENT OF MILD TEARS CONSERVATIVELY

- 0-2 weeks: bring the swelling under
- Begin early rehabilitation exercises such as normalising walking pattern and some muscle activation.
- 2-6 weeks: Working towards full range of movement in the knee.
- 6-12 weeks: Gradually start strengthening exercises. Start cycling on a static bike, as long as patient have full range of motion

NB: Patient should avoid pivoting, jumping, hopping and quick changes of direction.

PRE-OPERATIVELY

Where possible the patient will be seen pre-operatively, and with consent, the following will be assessed:

- General Health
- Current functional levels
- Social / Work / Hobbies
- Functional range of movement
- Balance / Proprioception- note: a knee brace may be provided if the patient is proprioceptively deficient in the affected knee pre-operatively, otherwise braces are usually not required post-operatively
- Gait / mobility, including walking aids, orthoses
- Post-operative expectations
- Patient information leaflet issued
- Post-operative management explained

POST-OPERATIVELY

INITIAL REHABILITATION PHASE: In-patient Stay (Usually 0-3 days)

GOALS

- To be safely and independently mobile with appropriate walking aid/s, adhering to weight bearing as tolerated in consultation with the operating surgeon.
- To achieve full knee extension and 90°knee flexion
- To be independent with home exercise programme.
- To understand self-management / monitoring.

Restrictions

- No Closed Kinetic Chain (CKC) exercises

- If patient has a grade 3- on straight leg raise (SLR) then unaffected leg may assist in AAROM.

Treatment

- Pain-relief: Ensure adequate analgesia.
- Advice / Education: Teach how to monitor sensation, colour, circulation, temperature, swelling, and what to do if concerned. Teach protection, rest, icing, compression and elevation (PRICE).
- Swelling management.
- Exercises: Ankle pumps and elevation

Exercises

- Isometric quadriceps/gluteus/hamstrings
- Knee range of movement exercises to achieve full range of extension and 90° flexion
- Ankle range of movement exercise
- Gait re-education: Ensure safe and independently mobile with appropriate walking aid/s.
- Mobility: Ensure patient is independent with transfers and mobility, including stairs if necessary.
- Brace: If required, to ensure brace fits and patient understands how to don and doff brace as appropriate

<u>On discharge from the ward</u>

- Independent and safe mobilising with appropriate walking aid/s, including safety on stairs, slippery floors as appropriate.
- Independent and safe with home exercise programme.

- Achieving full range of knee extension and 90° flexion
- Independent with swelling management
- Ongoing out-patient physiotherapy arranged within 2 weeks post operatively
-

INITIAL REHABILITATION PHASE: 0-2 weeks

GOALS

- Achieving full range of knee extension to 120° knee flexion
- Monitor and manage joint effusion (particularly in the morning)
- Full quadriceps activation
- Full weight bearing with mobility aid/s at 2 weeks

NB: If sedentary employment and free of complications, patient may be able to return to work from 2-4 weeks post- operatively, as long as provisions are made to elevate leg and adhere to home program.

INTERVENTIONS

- Pain Relief: Ensure adequate analgesia
- Advice / Education: Comprehensive education and instruction on restrictions and on carrying out activities of daily living to manage pain and swelling
- Posture advice / education.
- Management of swelling
- Gait re-education & Mobility: to ensure safely and independently mobile with walking aid/s and to progress weight bearing status to FWB at 2/52 post op if knee control, pain and swelling allows.
- Stretches of tight structures as appropriate.
- Exercises:

-
- Knee range of movement exercises to ensure achieving full range of extension and progressing range of movement into flexion
- Stationary cycling can be introduced at 2/52 post op as long as resistance is minimal and there is sufficient ROM to complete a revolution without pain
- Strengthening of muscles stabilizing the knee i.e. closed kinetic chain quadriceps exercises in prone, open kinetic chain hamstring exercises

Manual therapy:

- Soft tissue techniques as appropriate.
- Joint mobilizations as appropriate i.e. patella mobilizations and to educate patient to continue independently
- Hydrotherapy as appropriate.
- Pacing instruction and advice as appropriate.
- Brace: Ensure brace fits and patient understands how to don and doff as appropriate
- Electrotherapy: When appropriate.

Milestones to progress to next phase

- Achieving full range of knee extension and 120° of flexion
- Monitor and manage joint effusion (particularly in the morning)
- Full quadriceps activation (full isometric contraction and no quadriceps weakness on SLR assessment
- Full weight bearing with mobility aid/s

2- 6 WEEKS GOALS

- Achieving full active range of knee movement.

- Minimal activity related to swelling
- Wean from mobility aids as comfort, swelling and knee control allows, to achieve no gait abnormalities.
- Symmetry on ascending and descending stairs

NB:

If on manual employment they may return to work after 6 weeks with pacing, provided there are no complications.

Driving: Educate on driving skills with consideration on type of vehicle. Patients must be educated and understand pacing up of driving and general activities.

INTERVENTIONS

- Pain Relief: Ensure adequate analgesia
- Advice / Education: Comprehensive education and instruction on restrictions and on carrying out activities of daily living to manage pain and swelling
- Posture education and advice.
- Swelling management.
- Gait re-education.
- Mobility: Ensure safely and independently mobile with walking aid/s progressing to safe and independent mobility without mobility aid/s.

Exercises

- Stationary cycling can be introduced as long as resistance is minimal and there is sufficient ROM to complete a revolution without pain. Progress resistance and duration as appropriate.
- Swimming can be commenced once there is satisfactory wound healing, but not breast stroke leg kick.

- Strengthening of muscles stabilizing the knee progressing resistance with thera-band/weights and/or COG shift as appropriate
- Core stability and gluteal control work
- Balance/Proprioceptive exercises progressing to an unstable BOS and COG shift as appropriate
- Stretches of tight structures as appropriate.
- Biofeedback may be used if altered sequencing of muscles is detected.
- Manual therapy:
    - Soft tissue techniques as appropriate.
    - Joint mobilisations as appropriate
- Hydrotherapy if appropriate.
- Pacing advice as appropriate.
- Brace: Wean from brace once gained sufficient proprioceptive control and strength around the knee
- Electrotherapy: when appropriate.

Milestones to progress to next phase

- Achieving full range of knee movement.
- Minimal activity related joint effusion
- Unilateral CKC squat with knee valgus control
- Step up with knee valgus control
- Single leg stance eyes open R=L

RECOVERY REHABILITATION PHASE: 6 weeks – 12 weeks Goals

- Bilaterally equal proprioception tests on single leg stance
- Bilaterally equal strength of hamstrings, hip adductors, hip abductors and gastrocnemius

Restrictions

No jogging until proprioception on an uneven surface, knee valgus control when leaping and unilateral CKC squat with knee valgus control is achieved. This can be expected to be at approximately 12 weeks post op.

If manual employment may be able to return to work after 6 weeks with pacing provided no complications.

Interventions

- Pain Relief: Ensure adequate analgesia
- Education and Advice: Comprehensive education and instruction on restrictions and on carrying out activities of daily living to manage pain and swelling.
- Posture education and advice.
- Swelling management.
- Mobility: Ensure safety and independent mobility without walking aid.
- Exercises

Example exercises

- Rowing machine can be introduced progressing resistance and duration as appropriate.
- Stepper can be introduced progressing resistance and duration as appropriate.
- Road cycling can be introduced progressing duration as appropriate.

- Balance / Proprioception progress unilateral exercises with unstable BOS and COG shift.
- Strengthening of muscles stabilising the knee progressing resistance with thera-band/weights and/or COG shift as appropriate Strengthening exercises of other muscle groups as appropriate.
- Core stability and gluteal control work
- Stretches of tight structures as appropriate to ensure normal flexibility of quadriceps, hamstrings and calf muscles.
- Review lower limb biomechanics and kinetic chain, addressing issues as appropriate.
- Biofeedback may be used if altered sequencing of muscles is detected.
- Manual therapy:
- Soft tissue techniques as appropriate.
- Joint mobilisations as appropriate.
- Hydrotherapy as appropriate.
- Pacing instructions and advice as appropriate.
- Brace: Wean from brace once gained sufficient proprioceptive control and strength around the knee.
- Electrotherapy: as appropriate.

Milestones to progress to next phase

- Bilaterally equal proprioception tests on single leg stance
- Bilaterally equal strength of hamstrings, hip adductors, hip abductors and gastrocnemius

INTERMEDIATE- FINAL REHABILITATION PHASE: 12 weeks – 1 year

Goals

- 1RM single leg press relative strength index (RSI) greater than or equal to 125% Leg symmetry Index (LSI) 85% - 100% of knee extensors
- Symmetry on hop tests
- performance testing requirements and when consultant has agreed for patient to return to activity
- Graded return to specific activity if set as patient goal, when has satisfied functional performance
- No contact sports for 6 months post operatively
- Establish long term injury prevention program

Restrictions

- Return to sport/activity when functional performance testing requirements is satisfied, and the consultant has consented to return to sport/activity
- No contact sports for 6 months post operatively.

Treatment

- Education and Advice.
- Posture education and advice.
- Mobility: progression of mobility and function.

Exercises:

- Jogging progressing to change of direction and rotation component as appropriate
- Swimming breaststroke leg kick can be introduced from 4/12 post operatively

- Plyometrics
- Jump training
- Agility training
- Hop tests
- Strengthening through range to include CKC quadriceps if appropriate, commence outer range first and progressing to inner range
- Introduction of sports specific and occupation specific rehabilitation
- Core stability and gluteal control work
- Stretches of tight structures as appropriate.
- Review lower limb biomechanics and kinetic chain, addressing issues as appropriate
- Balance / Proprioception work progressing to unstable BOS and COG shift Progress from static to dynamic exercises as appropriate.
- Manual Therapy:
- Soft tissue techniques as appropriate.
- Joint mobilisations as appropriate.
- Hydrotherapy as appropriate.
- Pacing advice as appropriate.
- Brace: Wean from brace once gained sufficient proprioceptive control and strength around the knee.
- Electrotherapy: as appropriate.

Milestones for discharge

- Good proprioceptive control dynamically.
- Return to normal functional level.
- Satisfied criteria for functional testing and return to sports/activity if set as patient goal.

Failure to meet milestones

- Refer back to team / Discuss with interdisciplinary team.
- Continue with outpatient physiotherapy if still progressing and appropriate goals.

1.1.4: POSTERIOR CRUCIATE LIGAMENT REPAIR

INTRODUCTION

PCL tears make up less than 20% of injuries to knee ligaments. Injuries that tear the PCL often damage some of the other ligaments or cartilage in the knee, as well. In some cases, the ligament can also break loose a piece of underlying bone. PCL injuries are often due to a blow to the knee while it's bent. Common causes include: Striking the knee against the dashboard during an auto accident, falling on the knee while it's bent. Sports are a common cause of PCL injury. These injuries are especially common in: Football, Soccer, Baseball, Skiing. An injury to the PCL can cause mild to severe damage. PCL injuries includes.

DIAGNOSIS FOR CRUCIATE LIGAMENT INJURY

- **X-rays.** X-rays may be needed to rule out a bone fracture. However, X-rays don't show soft tissues, such as ligaments and tendons.
- **Magnetic resonance imaging (MRI).** Show the extent of an ACL injury and signs of damage to other tissues in the knee, including the cartilage.
- **Ultrasound.** May be used to check for injuries in the ligaments, tendons and muscles of the knee.

SPECIFIC TEST FOR CRUCIATE LIGAMENT INJURY

- **Posterior drawers test**

ASSESSMENT

PRE-OPERATIVELY

Where possible the patient will be seen pre-operatively, and with consent, the following assessed:

- General Health
- Current functional levels

- Social / Work / Hobbies
- Functional range of movement
- Balance / Proprioception
- Gait / mobility, including walking aids, orthoses
- Post-operative expectations
- Patient information leaflet issued
- Post-operative management explained

CONSERVATIVE MANAGEMENT

- Grade I and II PCL tears usually recover rapidly and most patients are satisfied with the outcome. Athletes are normally ready for return to play within 2-4 weeks

An acute grade III injury can also be managed conservatively.

- Immobilisation in a range of motion brace in full extension is recommended for two to four weeks, due to the high probability of injuries to other posterolateral structures.
- The posterior tibial sublaxation caused by the hamstring is minimised in extension, causing less force to the damaged PCL and posterolateral structures.
- Return to play after conservative management of grade III tears is normally between 3 and 4 months.

POST-OPERATIVELY

Always check the operation notes, and the post-operative instructions. Discuss any deviation from routine guidelines with the team concerned.

INDICATIONS FOR SURGERY

The main indication of Posterior Cruciate Ligament (PCL) reconstruction surgery is symptomatic instability following PCL injury. The aim of PCL reconstruction surgery is to restore the functional stability of the knee.

EXPECTED OUTCOME

- Improved pain relief
- Improved function / mobility
- Improved knee stability
- Return to low impact sports/activity may be possible but strenuous sport/activity unlikely
- Full recovery may take up to twelve months

MANAGEMENT

INITIAL PHASE: 0-6 weeks

Goals

- To be safely and independently mobile with appropriate walking aid, adhering to weight bearing status, which is usually PWB unless otherwise indicated by the consultant
- To be independent with home exercise programme as appropriate
- To understand self-management / monitoring, e.g. skin sensation, colour, swelling, temperature, etc
- To be able to don and doff hinge knee brace safely.

Restrictions

- Ensure that partial weight bearing restrictions are adhered to
- Wear hinge brace locked at 20 º for 3/52. After 3 weeks brace can be adjusted and locked at 0º when mobilising.
- At 3 weeks post operatively, brace can be unlocked for exercises to work towards 0º-60º ROM.

- If sedentary employment and no complications, patient can return to work from 2-4 weeks post-operatively, as long as there are provisions to elevate leg and adhere to home program.
- Pain-relief: Ensure adequate analgesia

Exercises:

Example of exercises

- Ankle foot pumps to maintain/improve circulation
- Static co-contraction of hamstring/quadriceps and active ankle ROM
- Education and Advice: Teach how to monitor sensation, colour, circulation, temperature, swelling, and what to do if concerned.
- Swelling Management: Teach protection, rest, icing, compression and elevation (PRICE).
- Mobility: ensure patient independence with transfers and mobility, including stairs if necessary, according to weight bearing status and with appropriate aid.
- Brace: Ensure brace fits and patient understands how to don and doff brace as appropriate.
- Electrotherapy as appropriate

On discharge from ward:

- Independent and safe mobilising, including on stairs with appropriate aid.
- Independent and safe with home exercise programme.
- Independent with swelling management.
- Ongoing out-patient physiotherapy arranged within 6 weeks post operatively.

REHABILITATION PHASE: 6 weeks – 12 weeks

Goals

- Increase to FWB using appropriate walking aids safely
- 0°-90 ° flexion at 12 weeks post operatively

Restrictions

- At 6 weeks post operatively, hinge knee brace can be adjusted to 0°-90° working towards 0°-90° AROM at 12 weeks post operatively
- No formal weight bearing restrictions; weight bear as tolerated

Treatment plan

- Pain relief
- Education and Advice
- Posture education and advice
- Mobility: ensure safety and independent mobility, progress off walking aids once appropriate and safe.
- Gait Re-education

Examples of exercises:

- Active assisted range of movement (AAROM) within ROM restrictions
- Active range of movement (AROM) with ROM restrictions
- Strengthening of muscles stabilising the knee progressing resistance with theraband/weights and/or COG shift as appropriate (keep open chain until 12 weeks)
- Core stability work and gluteal control work
- Balance / Proprioception progress unilateral exercises with unstable BOS and COG shift.
- Review lower limb biomechanics and kinetic chain, addressing issues as appropriate
- Biofeedback may be used if altered sequencing of muscles is detected.

- Swelling Management
- Manual Therapy:
    - Soft tissue techniques as appropriate
    - Joint mobilisations as appropriate
- Monitor sensation, swelling, colour, temperature, etc
- Hydrotherapy as appropriate
- Pacing education and advice as appropriate
- Electrotherapy as appropriate
- Brace Hinge brace set at 0-30 ° flexion at 6/52 post operatively and gradually increasing to 0 - 60 ° flexion at 12/52 as comfort allows. With sufficient knee control, unlock brace when mobilizing.

Milestones to progress to next phase

- Mobilising FWB independently and progressing from walking aid as appropriate with hinge brace in situ, unlocking brace when knee control is adequate
- Achieving 0-90 ° flexion within hinge brace
- Bilateral equal proprioception tests on single leg stance

Failure to meet milestones

- Refer back and discuss with interdisciplinary team
- Refer to "failure to progress chart"

REHABILITATION PHASE: 3 months – 1 year

Goals

- Wean off brace and mobilise independently
- Gain full AROM of knee
- 1RM single leg press RSI greater than or equal to 125%
    - Calculation of Relative Strength Index

    - (RSI (%) = weight pushed (kg) ÷ bodyweight (kg) × 100)
- LSI 85% - 100% of knee extensors
    - Calculation of Limb Symmetry Index
    - (LSI (%) = injured limb score ÷ uninjured limb score × 100)
- Symmetry on hop tests i.e. multiple single hop stabilization test, single leg hop for distance
- If satisfied with criteria for functional testing then progress to graded return to sport/activity if set as patient goal
- Establish long term injury prevention program

Restrictions

- No jogging until proprioception on an uneven surface, knee valgus control when leaping and unilateral closed kinetic chain squat with knee valgus control is achieved.
- Return to sport once satisfied of functional performance testing requirements and when consultant has consented that patient can return to sport/activity. This is expected to be after 1 year post-operatively
- Do not do breaststroke swimming before 4/12

Treatment Plan

- Mobility / function: Progression of mobility and function, increasing dynamic control with specific training to functional goals
- Gait Re-education
- Exercises:
    - Jogging progressing to change of direction and rotation component as appropriate
    - Plyometric

    - Jump training
    - Agility training
    - Hop tests
    - Multiple single hop stabilization test
    - Strengthening through range to include CKC quadriceps if appropriate
    - Introduction of sports specific and occupation specific rehabilitation
    - Core stability and gluteal control work
    - Stretches of tight structures as appropriate.
    - Review lower limb biomechanics and kinetic chain, addressing issues as appropriate
    - Balance / Proprioception work progressing to unstable BOS and COG shift. Progress from static to dynamic exercises as appropriate. Wean from brace once gained sufficient proprioceptive control and strength around the knee.
    - Review lower limb biomechanics and kinetic chain, addressing issues as appropriate.
- Swelling Management
- Manual Therapy:
- Soft tissue techniques as appropriate
- Joint mobilisations as appropriate
- Pacing advice
- Electrotherapy as appropriate
- Hydrotherapy as appropriate

Milestones for discharge

- Independently mobile unaided without hinge brace
- Good knee control and muscle strength
- Achieving full AROM

- Good proprioceptive control dynamically.
- Return to normal functional level.
- Return to sport/activity if set as goal; satisfied criteria for functional testing and return to sports/activity if set as patient goal.

Failure to meet milestones

- Refer back and discuss with interdisciplinary team.
- Refer to "failure to progress chart"

MONITORING AND THE EFFECTIVENESS OF THIS PROTOCOL

Failure to progress

If a patient is failing to progress, then consider the following:

POSSIBLE PROBLEM	**ACTION**
Swelling	Ensure elevating leg regularly. Use ice as appropriate if normal skin sensation and no contraindications. Decrease amount of time on feet. Pacing. Use walking aids. Circulatory exercises. Modify exercise programme as appropriate. Should continue isometric work at all times. If decreases overnight, monitor closely. If does not decrease over a few days, refer back to surgical team

Pain	Decrease activity. Ensure adequate analgesia. Elevate regularly. Decrease weight bearing and use walking aids as appropriate. Pacing. Modify exercise programme as appropriate. Should continue isometric work at all times. If persists, refer back to surgical team.
Pain {its repetition of column above }	Decrease activity. Ensure adequate analgesia. Elevate regularly. Decrease weight bearing and use walking aids as appropriate. Pacing. Modify exercise programme as appropriate. Should continue isometric work at all times. If persists, refer back to surgical team.
Breakdown of wound e.g. inflammation, bleeding, infection	Refer to surgical team. Consult with the surgeon

Recurrent Instability	Refer back to surgical team. Ensure exercise progressions are at suitable level for patient. Address core stability.
Numbness/altered sensation	Review immediate post-operative status if possible. Ensure swelling under control. If new onset or increasing refer back to surgical team. If static, monitor closely, but inform surgical team and refer back if deteriorates or if concerned.

1.1.5: TMJ DYSFUNCTION

INTRODUCTION

The TMJ is made up of several parts: the lower jaw (or mandible) and the socket (or temporal bone). In between the mandible and the socket is a disc. The disc allows the joint to glide smoothly on opening and closing. The joint is also held in place by muscles and ligaments. Pain is the most common symptom of TMJ problems, although not everyone gets pain. Symptoms can include:

- Pain in the jaw joints and facial muscles
- Clicking, grinding or locking of the jaw
- Headaches & Dizziness
- Difficulty opening or closing the mouth comfortably
- Pain on talking, chewing (especially hard food) & yawning
- Ear pain, ringing in the ears (tinnitus) & hearing loss

ASSESSMENT

- TMJ Disability Index (appendix 2)

ASSESS THE MOVEMENT OF THE MANDIBLE

- **C-Curve**
- This occurs secondary to hypo mobility due to an internal derangement
- The mandible deviates to the involved side during the mid-range of motion before the jaw returns back to the centre.

S-Curve

- Occurs secondary to hypermobility due to poor neuromuscular control of the muscles of mastication.
- Structures causing the dysfunction can include the masseter, temporalis, disc, and lateral ligaments.

TREATMENT

GOALS

- Relief pain
- Minimize stiffness
- Restore normal function and mobility

CONTRAINDICATIONS

- Excessive chewing (e.g. Nails, gum, pen tops & your cheek). This stops the jaw from having rest
- Excessive mouth opening (e.g. Yawning, Holding the torch with the mouth).

MANAGEMENT

- Pain Medication
- Resting the jaw in the hand
- Avoid Sleeping face down, as this puts a strain on the neck.

- Apply heat for chronic and ice for acute TMJ dysfunctions for 15-20 minutes on the area of pain
- Soft Tissue Manipulation to the joint and surrounding muscles
- Exercise the jaw regularly.

Advice

- Avoid clenching or grinding the teeth.
- Change to a soft food diet to avoid hard and chewy foods.
- Cut tough food into small pieces.
- Maintain and keep a good posture to prevent or relieve neck and jaw pain

Exercises

- Relaxed Jaw Position

Place the tongue lightly on the top of the mouth behind upper front teeth, allowing the teeth to come apart and relaxing the jaw muscles.

- Goldfish' Exercise 1 (partial opening)
    - Keep tongue on the roof of your mouth.
    - Place one index finger on the TMJ.
    - Place other index finger on the chin.
    - Allow the lower jaw to partially drop down and back with help from the index finger.
    - Monitor this partial jaw opening in a mirror to make sure the opening is straight (tongue stays up).
- Repeat 6 times, 6 times a day
- **Goldfish' Exercise 2 (partial opening)**
    - Keep tongue on the roof of your mouth.
    - Place one finger on each TMJ.

- Allow the lower jaw to partially drop down and back to bring the chin to the throat.
- Monitor this partial jaw opening in a mirror to make sure the opening is straight.

- Repeat 6 times, 6 times a day
- Goldfish' Exercise 3 (full opening)
  - Keep tongue on the roof of your mouth.
  - Place one index finger on the TMJ.
  - Place the other index finger on your chin.
  - Allow the lower jaw to fully drop down and back with help from the index finger.
  - Monitor this full jaw opening in a mirror to make sure the opening is straight (tongue stays up).

Progression: perform with tongue dropped off the roof of the mouth

- Goldfish' Exercise 4 (full opening)
  - Keep tongue on the roof of the mouth.
  - Place one finger on each TMJ.
  - Allow the lower jaw to fully drop down and back to bring the chin to the throat.
  - Monitor this full jaw opening in a mirror to make sure the opening is straight.
- Repeat 6 times, 6 times a day

Progression: perform with tongue dropped off the roof of the mouth

- Mandibular Stabilization Exercises

  Maintaining the jaw in a neutral position, apply gentle pressure to the jaw using your index finger/thumb on: Hold for 2 seconds; repeat 5 times, 5 times a day

- Mandibular Stabilization Exercises (Advanced)
  - Place knuckle of index finger between top and bottom teeth.
  - Remove it, keeping the teeth separated one-knuckle apart.
  - Apply gentle pressure to the to the jaw using your index finger/thumb as

- Cervical Retraction 'Chin Tucks'
    - Standing or sitting with shoulders back and chest up, bring the chin straight back, creating a 'double chin'. Do not allow the head to bend up or down a
    - Hold for 2-3 seconds, repeat 10 times
- Neck Stretches

1.1.6: SHOULDER ATHROPLASTY

INTRODUCTION

Total shoulder arthroplasty, or TSA, is a procedure used to replace the diseased or damaged ball and socket joint of the shoulder with a prosthesis made of polyethylene and metal components.

ASSESSMENT

PRE-OPERATIVELY

Where possible the patient will be seen pre-operatively, and with consent, the following assessed:

- General Health
- Current functional levels
- Social / Work / Hobbies
- Functional range of movement
- Balance / Proprioception
- Gait / mobility, including walking aids, orthoses
- Post-operative expectations
- Patient information leaflet issued
- Post-operative management explained

POST-OPERATIVELY

Always check the operation notes, and the post-operative instructions. Discuss any deviation from routine guidelines with the team concerned.

Outcome Measure:

- Shoulder Pain and Disability Index (SPADI)

MANAGEMENT

NB

Patients with a concomitant repair of a rotator cuff tear and/or a TSA/HHR secondary to fracture or cuff arthropathy should be progressed to the next phase based on meeting the clinical criteria (not based on the postoperative time frames) as appropriate in collaboration with the referring surgeon. The given time frames are an approximate guide for progression, achieving the clinical criteria should guide the clinician and patient through this protocol.

NB: PROM IS NOT STRETCHING!

PHASE I – IMMEDIATE POST SURGICAL PHASE:

Goals

- Allow healing of soft tissue
- Maintain integrity of replaced joint
- Gradually increase passive range of motion (PROM) of shoulder; restore active range of motion (AROM) of elbow/wrist/hand
- Reduce pain and inflammation

- Reduce muscular inhibition
- Independent with activities of daily living (ADLs) with modifications while maintaining the integrity of the replaced joint.

Precautions

- Sling should be worn continuously for 3-4 weeks
- While lying supine, a small pillow or towel roll should be placed behind the elbow to avoid shoulder hyperextension / anterior capsule stretch / subscapularis stretch. (When lying supine patient should be instructed to always be able to visualize their elbow. This ensures they are not extending their shoulder past neutral.) – This should be maintained for 6-8 weeks post-surgically.
- Avoid shoulder AROM.
- No lifting of objects
- No excessive shoulder motion behind back, especially into internal rotation (IR)
- No excessive stretching or sudden movements (particularly external rotation (ER))
- No supporting of body weight by hand on involved side
- Keep incision clean and dry (no soaking for 2 weeks)
- No driving for 3 weeks

Post-Operative Day1 (in hospital)

- Passive forward flexion in supine to tolerance
- Gentle ER in scapular plane to available PROM (as documented in
- operative note) – usually around 30°
- (Attention: DO NOT produce undue stress on the anterior joint
- capsule, particularly with shoulder in extension)
- Passive IR to chest

- Active distal extremity exercise (elbow, wrist, hand)
- Pendulum exercises
- Frequent cryotherapy for pain, swelling, and inflammation management
- Patient education regarding proper positioning and joint protection techniques
- Early Phase I: (out of hospital)
- Continue above exercises
- Begin scapula musculature isometrics / sets (primarily retraction)
- Continue active elbow ROM
- Continue cryotherapy as much as able for pain and inflammation
- management

LATE PHASE I

- Continue previous exercises
- Continue to progress PROM as motion allows
- Begin assisted flexion, elevation in the plane of the scapula, external rotation, internal rotation in the scapular plane
- Progress active distal extremity exercise to strengthen as appropriate

Criteria for progression to the next phase (II):

If the patient has not reached the below ROM, forceful stretching and mobilization/manipulation is not indicated. Continue gradual ROM and gentle mobilization (i.e. Grade I oscillations), while respecting soft tissue constraints.

- Tolerates PROM program
- Has achieved at least 90° PROM forward flexion and elevation in the scapular plane.
- Has achieved at least 45° PROM ER in plane of scapula
- Has achieved at least 70° PROM IR in plane of scapula measured at 30° of abduction.

PHASE II – EARLY STRENGTHENING PHASE

Not to begin before 4-6 Weeks post-surgery to allow for appropriate soft tissue healing

Goals

- Restore full passive ROM
- Gradually restore active motion
- Control pain and inflammation
- Allow continue healing of soft tissue
- Do not overstress healing tissue
- Re-establish dynamic shoulder stability

PRECAUTIONS:

- Sling should only be used for sleeping and removed gradually over the
- course of the next 2 weeks, for periods throughout the day.
- While lying supine a small pillow or towel should be placed behind the
- elbow to avoid shoulder hyperextension / anterior capsule stretch.
- In the presence of poor shoulder mechanics avoid repetitive shoulder
- AROM exercises/activity against gravity in standing.
- No heavy lifting of objects (no heavier than coffee cup)
- No supporting of body weight by hand on involved side
- No sudden jerking motions

EARLY PHASE II:

- Continue with PROM, active assisted range of motion (AAROM)
- Begin active flexion, internal rotation, external rotation, elevation in the plane of the scapula pain
- Free ROM

- AAROM pulleys (flexion and elevation in the plane of the scapula) – as long as greater than 90° of PROM
- Begin shoulder sub-maximal pain-free shoulder isometrics in neutral
- Scapular strengthening exercises as appropriate
- Begin assisted horizontal adduction
- Progress distal extremity exercises with light resistance as appropriate
- Gentle glenohumeral and scapulothoracic joint mobilizations as indicated
- Initiate glenohumeral and scapulothoracic rhythmic stabilization
- Continue use of cryotherapy for pain and inflammation.

LATE PHASE II:

Progress scapular strengthening exercises.

Criteria for progression to the next phase (III):

If the patient has not reached the below ROM, forceful stretching and mobilization/manipulation is not indicated. Continue gradual ROM and gentle mobilization (i.e. Grade I oscillations), while respecting soft tissue constraints.

- Tolerates P/AAROM, isometric program
- Has achieved at least 140° PROM forward flexion and elevation in the
- scapular plane.
- Has achieved at least 60+° PROM ER in plane of scapula
- Has achieved at least 70° PROM IR in plane of scapula measured at 30° of abduction
- Able to actively elevate shoulder against gravity with good mechanics to 100°.

PHASE III – MODERATE STRENGTHENING

Not to begin before 6 Weeks post-surgery to allow for appropriate soft tissue healing and to ensure adequate ROM:

Goals:

- Gradual restoration of shoulder strength, power, and endurance
- Optimize neuromuscular control
- Gradual return to functional activities with involved upper extremity
- Precautions:
- No heavy lifting of objects (no heavier than 3 kg.)
- No sudden lifting or pushing activities
- No sudden jerking motions

EARLY PHASE III:

- Progress AROM exercise / activity as appropriate
- Advance PROM to stretching as appropriate
- Continue PROM as needed to maintain ROM
- Initiate assisted shoulder IR behind back stretch
- Resisted shoulder IR, ER in scapular plane
- Begin light functional activities
- Wean from sling completely
- Begin progressive supine active elevation strengthening (anterior deltoid) with light weights (0.5-1.5 kg.) at variable degrees of elevation

LATE PHASE III:

- Resisted flexion, elevation in the plane of the scapula, extension (therabands / sport cords)
- Continue progressing IR, ER strengthening
- Progress IR stretch behind back from AAROM to AROM as ROM allows

(Pay particular attention as to avoid stress on the anterior capsule.)

Criteria for progression to the next phase (IV):

If the patient has not reached the below ROM, forceful stretching and mobilization/manipulation is not indicated. Continue gradual ROM and gentle mobilization (i.e. Grade I oscillations), while respecting soft tissue constraints.

- Tolerates AA/AROM/strengthening
- Has achieved at least 140° AROM forward flexion and elevation in the
- scapular plane supine.
- Has achieved at least 60+° AROM ER in plane of scapula supine
- Has achieved at least 70° AROM IR in plane of scapula supine in 30° of
- abduction
- Able to actively elevate shoulder against gravity with good mechanics to at least 120°.

Note: (If above ROM are not met then patient is ready to progress if their ROM is consistent with outcomes for patients with the given underlying pathology).

PHASE IV – ADVANCED STRENGTHENING PHASE

Not to begin before 12 Weeks to allow for appropriate soft tissue healing and to ensure adequate ROM, and initial strength:

Goals

- Maintain non-painful AROM
- Enhance functional use of upper extremity
- Improve muscular strength, power, and endurance
- Gradual return to more advanced functional activities
- Progress weight bearing exercises as appropriate

PRECAUTIONS

- Avoid exercise and functional activities that put stress on the anterior capsule and surrounding structures. (Example: no combined ER and abduction above 80° of abduction.)
- Ensure gradual progression of strengthening

EARLY PHASE IV:

- Typically, patient is on a home exercise program by this point to be performed 3-4 times per week.
- Gradually progress to a strengthening program
- Gradual return to moderately challenging functional activities.

LATE PHASE IV (TYPICALLY 4-6 MONTHS POST-OP):

Return to recreational hobbies, gardening, sports, golf, doubles tennis

Criteria for discharge from skilled therapy:

- Patient able to maintain non-painful AROM
- Maximized functional use of upper extremity
- Maximized muscular strength, power, and endurance
- Patient has returned to advanced functional activities

1.1.6: TOTAL HIP REPLACEMENT (THA)

INTRODUCTION

Total hip replacement (or hip arthroplasty) is a technique that has become widespread in recent years in response to the need for improving hip joints that have been damaged by injury or arthritis.

ASSESSMENT

- Vital signs
- Pain
- Position
- Respiratory function
- JROM (with precautions for the operated hip)
- Strength
- Leg length
- Swelling

MANAGEMENT

PRE-OPERATIVE

- Muscle strengthening
- Gait training

Education and advice:

- Patient information booklet
- Precautions and contraindications
- Rehabilitation process
- Goals & expectations
- Functional/ADL adaptions
- Safety principles
- Encourage to stop smoking if applicable
- Discharge planning
- Teach
    - Bed exercises
    - Transfers in and out of bed (within precautions)
- Gait re-education with mobility assistive device (crutches vs walking frame vs rollator)
- Stair climbing

POST-OPERATIVE

Day 1 post-surgery:

- Education and advice
- Precautions and contraindications
- Bed exercises:
- Circulation drills
- Upper limb exercises to stimulate the cardiac function
- Maintenance of the non-operated leg: attention should be paid to the range of motion in order to preserve controlled mobilisation on the operated hip
- Isometric quadriceps (progressing to concentric VMO) and gluteal contractions
- Active-assisted (progressing to active) heel slides, hip abduction/adduction
- Bed mobilisation using unilateral bridging on the unaffected leg
- Transfer to sit over edge of bed
- Sit to stand with mobility assistive device (preferably a device giving more support like a walking frame or rollator)
- Gait re-education with mobility assistive device as tolerated (weight bearing status as determined by surgeon)
- Ambulate out of bed and room on wheelchair and sit for a maximum of 1 hour
- Positioning when transferred back to bed

Day 2 post-surgery

- Bed exercises as described above, progressing repetitions and decreasing assistance given to patient
- Progression of distance mobilised and/or mobility assistive device
- Incorporate balance exercises if needed
- Sitting in a high that maintains above 90^0 hip flexion.

Day 3 post-surgery

- Bed exercises as described above, progressing repetitions and decreasing assistance given to patient
- Progression of distance mobilised and/or mobility assistive device
- Stair climbing (at least 3, or as per home requirements)
- Sitting on a chair
- Revision of precautions, contraindications and functional adaptions
- Give 6 weeks progressive resistive strengthening home exercise to patient; this can include stationary cycling, as long as the patient stays within the precautions (especially posterior approach surgery)
- Discharge from hospital

Accelerated protocol:

- Combine day 2 & 3 treatment protocols to discharge the patient on day 2 post surgery.

6 weeks' post-surgery:

- Patients are normally followed up by orthopaedic surgeons and Physiotherapists
- They determine if the patients are allowed to do the following:
    - Full range of motion at the hip
    - Full weight bearing without mobility assistive device
    - Driving

After 6 weeks:

- Gain of initial ROM, stabilization, and proprioception
- Endurance
- Flexibility
- Balance
- Speed, precision, neurological coordination
- Functional exercises

PRECAUTIONS & CONTRAINDICATIONS

- Hip flexion past 90 degrees
- Crossing the operated leg over the non-operative leg (adduction)
- Internal rotation of the hip

NB: Patients are at risk of hip dislocation after replacement as a result of the trauma to the hip stabilizers (capsule, ligaments and muscles) as well as due to the size difference of the prosthesis to the bones. Reduced size of the prosthetic femur head when compared to the average human femur head makes it easier to dislocate until the stabilizing tissues have healed and adapted to this smaller size. This generally takes up to 6 weeks to heal.

Outcome measures

- Harris Hip Score
- Oxford Hip Score (OHS)
- 6 Minute Walking Test
- Timed Get Up & Go Test
- Western Ontario and McMaster universities osteoarthritis index (WOMAC)
- SF-36
- Fear Avoidance Belief Score
- Hip Disability & Osteoarthritis Outcome Score (HOOS)
- International Hip Outcome Tool
- Ibadan Knee/Hip Osteoarthritis Outcome Measure

1.1.7: TOTAL KNEE ARTHROPLASTY (TKA)

INTRODUCTION

Total knee arthroplasty (TKA) is an elective operative procedure to treat an arthritic or injured knee. This procedure replaces your damaged knee joint with an artificial knee implant.

ASSESSMENT

- Pain
- Rom
- Strength
- Girth
- Leg length

MANAGEMENT

PHASE I: PROTECTIVE PHASE WEEK 1-2 (HOSPITAL STAY)

GOALS

- Reduce pain, inflammation, and swelling
- Allow soft tissue healing
- Increase motor control and strength
- Increase independence with bed mobility, transfers, and gait
- Educate patient regarding weight bearing
- Patient to work toward full passive knee extension at 0o and work toward increasing flexion ROM to 90^0

PRECAUTIONS

- Keep incision clean and dry
- No water to the incision site
- Coordinate treatment times with pain medication

- Patients should perform WBAT with assistive device for primary TKA, unless otherwise indicated by surgeon
- While in bed, patient to be positioned with towel roll at ankle to prevent heel ulcers and promote knee extension
- Observe for signs of deep vein thrombosis (DVT), increased swelling, erythema, calf pain. If present, notify MD immediately

POST-OPERATIVE DAYS (POD) 1–4

- Evaluation and initiation of ROM
- Treatment 2x/day
- Cold pack or ice pack to manage pain, inflammation, and swelling
- Patient education for positioning and joint protection strategies
- Therapeutic exercises in supine: passive, active assisted heel slides, ankle pumps, quadriceps and gluteal sets and short arc quadriceps (SAQ)
- Therapeutic exercises in sitting: Passive/Active Assisted/Active knee extension/flexion
- Bed mobility and transfer training
- Gait training on flat surfaces and on stairs with appropriate assistive device per
- Discharge plan
- Fit appropriate assistive and mobility devices

PHASE II – TRANSITIONAL PHASE WEEKS 1-3

GOALS

- Allow healing/follow precautions
- Reduce pain, inflammation, and swelling
- Increase range of motion (ROM): work toward achieving full knee extension at 0o and flexion ROM between 90-1200

- Increase muscle strength
- Increase independence with bed mobility, transfers, and gait
- Gait training – Appropriate use of assistive device to emphasize normal gait pattern and limit post-operative inflammation
- Therapeutic Exercise (To be performed 3x/day after instruction by therapist)
- Passive/Active Assisted/Active range of motion (P/AA/AROM) exercises in supine: ankle pumps, heel slides.
- P/ AA/AROM exercises in sitting: long arc quads, ankle pumps. Including therapist assist for increasing ROM into flexion and full extension.
- Strengthening: Quadriceps setting in full knee extension, gluteal setting, short arc
- quadriceps (SAQ), hooklying ball/towel squeeze, bridging.
- Bed mobility and transfer training

PRECAUTIONS

- Monitor wound healing for signs and symptoms of infection. If present, notify MD

GAIT TRAINING

- Continue training with assistive device. Wean from walker to crutches to cane only when patient can make transition without onset of gait deviation.
- Encourage all normal phases of gait pattern using appropriate device.

MODALITIES

- Ice pack for 10-15 minutes 3x/day to manage pain, inflammation, and swelling

Criteria for progression to next phase:

- Minimal pain and inflammation
- Physiotherapist ambulates with assistive device without pain or deviation
- Independent with current daily home exercise regimen

- Progression to driving: must be off all narcotic analgesics in order to concentrate on driving tasks. Discuss specifics with surgeon

III – OUTPATIENT EARLY PHASE (WEEKS 3-6)

GOALS

- Reduce pain and inflammation
- Increase ROM gradually progressing toward 0-120o
- Increase strength with emphasis on hip abductor/extensor and quadriceps /hamstring musculature
- Balance and proprioceptive training to assist with functional activities
- Gait training: Wean off assistive device when patient can ambulate without deviation
- Functional activity training to enhance patient autonomy with ADLs/mobility

MANAGEMENT

- Therapeutic Exercise progression of exercise from Phase II
- Stationary Bike
- 4-way straight leg raise (SLR)
- Closed chain weight shifting activities including side-stepping
- Balance exercises: single leg stance, alter surface, eyes open/closed
- Leg press; wall slides
- Lateral step up and step down with eccentric control
- Front step up and step down

FUNCTIONAL ACTIVITIES

- Sit to stand activities
- Lifting and carrying
- Ascending/descending stairs
- Gait Training

MODALITIES

- Cold pack for 10-15 minutes 1-3x/day to manage pain and swelling
- Neuromuscular Electrical Stimulation (NMES) for quadriceps re-education as necessary

CRITERIA FOR PROGRESSION TO NEXT PHASE:

- Minimal pain and inflammation
- Patient ambulates without assistive device without pain or deviation
- Good voluntary quadriceps control

PHASE IV – OUTPATIENT INTERMEDIATE PHASE (WEEKS 6-12)

GOALS

- Increase overall strength throughout lower extremities
- Return to all functional activities
- Begin light recreational activities

THERAPEUTIC EXERCISE

- Continue Phase III exercises by increasing resistance and repetitions
- Front lunge and squat activities
- Progress balance and proprioception activities (STAR and ball toss, perturbations)
- Initiate overall exercise and endurance training (walking, swimming, progress biking)

CRITERIA FOR DISCHARGE

- No pain with functional activities of daily living
- Good lower extremity strength of >= 4/5 throughout
- Patient is independent with reciprocal stair climbing
- Patient consistently adheres to plan of care and home exercise program

PHASE V – RETURN TO HIGH LEVEL ACTIVITY (3+ MONTHS)

- Continue walking, swimming and biking programs for aerobic Conditioning/endurance
- Begin outdoor activities e.g. cycling
- Obtain clearance from surgeon and Physiotherapist for return to impact sports/activity such and tennis or jogging

1.1.8: WRY NECK/TORTICOLLIS

INTRODUCTION

Wry neck can also be referred to as acute wry neck since the onset is sudden. Wry neck is an extremely common condition, which can be quite disabling as the sufferer experiences constant severe pain with simple neck movements. It is the thought that the pain and reduction in range of motion results mainly from two mechanisms. Either Facet Wry Neck caused by a locked facet joint or Discogenic Wry Neck caused by a cervical disc injury.

ASSESSMENT

- Pain
- Posture
- Muscle length
- Functional activities
- Gait (In severe/chronic cases)
- ROM and the degree of deformity.

MANAGEMENT

GOALS

- Educate and advice
- Relief pain

- Improve function
- Improve Posture
- Improve ROM
- Re-educate gait
- Correct the deformity

MANAGEMENT

Early mild cases

- Soft tissue manipulation: Massage can relax the muscle preceding the stretching maneuvers.
- Thermal Therapy Modality: Carefully administered thermo-therapy modality induces relaxation.
- Passive movements: The patient is placed in supine position with head beyond the edge of the table with the neck in extension by positioning a pillow under the thoracic region; Shoulders are stabilized by an assistant.
- To attain relaxation, all the movements of the cervical spine are done in a form of slow relaxed passive movements.
- This should be followed by sustained passive stretching to the affected muscle. E.g. when the right sternocleidomastoid is involved the head should be gradually be bent inside flexion to the left, held there for a while and then rotated gradually to the right. Try to gain as much overcorrection as possible by applying gradual traction to gain further stretching.
- Maintenance of Correction: Once the correction is achieved. It has to be maintained by passively holding or keeping a sandbag.
- The same maneuver can be repeated during the subsequent visits.
- Active correction: Active correction is best achieved by assisting the patient's head to follow an object moved in the proper arc of correction. For children, a bright-coloured object or a sound production is ideal to attract the child attention.

- PNF: patients with neck extension can be used to an advantage with emphasis on stretch and traction
- Home treatment programme: This assumes an important role as these manipulations needs to be repeated. The caregiver should be trained properly for this. The best method is to put the patient in prone and then teach the caregiver to carefully move the head towards the affected side and the patient is encouraged to look back over the right shoulder.
- Positioning: Exact positioning of the head during sleep is important. The patient should be made to sleep on the opposite side of the lesion and the position of head adjusted by pillow or sandbag in a maximally corrected posture during sleep. This positioning has two advantages; First, there is natural relaxation of the muscle- Secondly, whatever correction is achieved, is maintained for a longer period during sleep. However, the caregiver should intermittently check the correction.
- Older children and adults: With advancing age the deformity gets organized and does not get corrected by conservative management.
- Surgical: The sterna and the clavicular heads of sternocleidomastoid are divided close to the origin along with the release of the tight fascia. The head is then immobilized in over-corrected position for 2 to 4 weeks. Mobilization is begun as soon as the immobilization is removed.

Exercises

- Gentle exercises and stretching should begin immediately to minimize stiffness. Mild pain should be expected; however significant pain should be avoided.
- Slowly increase activity levels as tolerated.
- Provide exercises to improve muscle strength, joint flexibility and balance. These exercises will help to recover, limit pain and reduce the chance of the injury recurring.

1.1.9: GOLFER'S ELBOW

INTRODUCTION

Golfer's elbow is an injury to the muscles that flex your wrist and fingers. The site of injury is typically the medial epicondyle, a bony bump on the inside of the elbow where these muscles attach. Typically, the golfer's elbow patient will experience pain when performing gripping tasks or resisted wrist/finger flexion.

DIAGNOSIS

- Based on the medical history and
- Physical examination.

SPECIFIC ASSESSMENT TECHNIQUES

- Provocative special test

MANAGEMENT

GOALS

- Reduction of elbow pain.
- Facilitation of tissue repair.
- Restoration of a normal joint range of motion and function.
- Restoration of normal muscle length, strength and movement patterns.
- Normalisation of the upper limb neuro-dynamics.
- Normalisation of cervical joint function.

MANAGEMENT

- Apply ice to the elbow and inner part of the forearm (in acute cases)
- Graduated strengthening exercises
- Stretches

- Use a brace for extra support
- Return gradually to activity that involves the arm

Surgery will be considered if other treatment options have not worked. The surgeon may remove damaged tissue. They may also remove build-ups of scar tissue or extra bone, which could be putting pressure on the tendon.

EXERCISES

- Ball squeezes: Squeezes are a simple exercise involving a soft rubber ball or stress reliever. Place the ball in the palm of the affected hand and make a fist around it. Squeezing and releasing in repetition will strengthen the forearm.
- Finger extensions: Squeeze all five fingertips together and stretch a rubber band around them. Extend the fingers away from each other as far as the rubber band will allow.
- Wrist extensions: Before performing this exercise, get a 40-60% of 1RM weight. Place the injured forearm on a knee or table, with the hand suspended over the edge. Hold the weight in this hand, and slowly raise and lower it.
- Forearm pronation and supination: This exercise involves holding a heavy object. Lay the damaged forearm on a table or knee for stability. To start, hold the object so that the palm is parallel to the body. Rotate the hand so that the palm faces downward. Return to the starting position, then rotate the hand so that the palm faces the ceiling.

PREVENTION

- Strengthen the related muscles by doing exercises, such as those mentioned above.
- Using proper form during activities such as golf or tennis
- Stretching before and after activity
- Stopping any activity that starts to cause pain

1.1.10: SOFT TISSUE INJURIES

INTRODUCTION

Soft tissues injuries include injuries to muscles, tendons and ligaments. A soft tissue injury generally involves one or more of the following structures via sprain, strain or direct blows: Muscle, Tendon, Ligament. A player returning from injury or illness should refrain from activity until declared fit to play by a sports medicine professional.

ASSESSMENT

Objectively document

- Inflammation
- Bruises
- Pain level
- Popping or snap sound

PHYSIOTHERAPY MANAGEMENT

The severity of the muscle strain, and what function or loads the injured muscle will need to cope with, will impact the length of the healing and rehabilitation process.

In the acute stage, use the following recommendations

- Ice and a compression bandage (15-20 min).
- Elevate the injured region if it is swollen.
- Advice the patient to use crutches.
- Advice the patient to Cease or reduce activity level to the level of pain tolerance

Treatment for sprains

- The initial treatment for soft tissue injuries is based on the principles of 'RICE' and 'Avoid HARM'. These are most important in the first 48-72 hours following the injury and can speed up recovery.

- Use crutches or a sling.
- Never put ice straight onto the skin.
- Use ice packs for 15–20 minutes every one to two hours when awake.
- Compression; Apply bandage that does not restrict circulation or cause additional pain. The bandage should cover the whole joint.
- Elevation; Raise the limb above the level of the heart, if possible.
- Support the limb with cushions or a sling to keep it raised

In the first 48-72 hours, avoid:

- Heat and
- Soft Tissue Manipulation

Sub-acute stage (After 72 hours)

- Advice on analgesics
- Heat: to facilitate circulation
- Protect the joint until healing takes place
- TENS: to reduce pain (Pain Relieving
- Ultrasound: facilitate healing (Non Thermal)
- Taping

The chronic stage

- Support (Brace, splint, etc.)
- continue with ultrasound
- ambulatory aid

Prevention

Many soft-tissue injuries can be prevented through;

- Proper conditioning
- Training,
- Balanced fitness
- Warm up
- Cool down
- Stretches

1.1.11: RHEUMATOID ARTHRITIS

INTRODUCTION

Rheumatoid Arthritis is an autoimmune disease that causes inflammation in the joints. The main symptoms are joint pain and swelling. Rheumatoid Arthritis causes inflammation in the synovium. The inflammation is caused by a build-up of fluid and cells in the synovium.

ASSESSMENT

- elevated erythrocyte sedimentation rate (ESR)
- elevated C-reactive protein (CRP)
- Presentation of the DIP& PIP joints(inflammation)
- Radiological examination

PRESENTATION AND RADIOLOGICAL IMAGING

Stage 1: No destructive changes on x-rays (Avoid stretches in acute cases).

Stage 2: Presence of x-ray evidence of periarticular osteoporosis, subchondral bone destruction but no joint deformity

Stage 3: X-ray evidence of cartilage and bone destruction in addition to joint deformity and periarticular osteoporosis.

Stage 4: Presence of bony or fibrous ankylosis along with stage 3 features

The following treatment plan applies to all the stages depending on the presentation of the patient

MANAGEMENT

- Education
- Therapeutic Exercise
- Heat/Cold Therapy
- Pain Management
- Splinting Joints
- Manual techniques
- Hydrotherapy

1.1.12: HIP ARTHRITIS (OSTEOARTHRITIS)

INTRODUCTION

Osteoarthritis of the hip is a joint disease that mostly affects the joint cartilage. Eventually, there's wear and tear around the acetabulum and the head of femur. There is Muscle weakness and the resultant hip joint instability. Hip osteoarthritis usually happens gradually over time. Risk factors includes: Overweight, age, Previous joint injury. Muscle weakness, Nature of work, Poor biomechanics, malformed joints or a genetic defect in joints.

ASSESSMENT

- Pain level
- Muscle power
- ROM
- Gait assessment
- Leg length measurement
- Palpation
- Hip biomechanics

MANAGEMENT

PHASE I - Pain Relief and Protection

- Cryotherapy
- NSAIDs.
- Electrotherapy

PHASE II

- Restore
    - Range of motion
    - Muscle length and resting tension
    - Muscle strength
    - Endurance
    - Proprioception
    - Balance and gait patterns

PHASE III - Restoring Full Hip Function

- Returning to the normal activities.

NB: Tailor the hip rehabilitation to help achieve patient's functional goals.

If surgery is prescribed

- Educate patient on surgery
- Teach isometric muscle contraction
- Maintain optimal endurance through ambulation

Post operatively

Day 1-7 Consider:

- chest physiotherapy
- Isometric exercises
- Ankle pumps
- Sit out of bed
- Ambulation with walking frame
- Gentle knee exercises
- Joint Range of Motion exercises

After day 7

- Continue strengthening exercises and Joint Range of Motion exercises (Prepare for discharge)
- Crutch walking
- Stair climbing
- Toileting
- discharge through physio as an out-patient

1.1.13: ARTHRITIS OF THE KNEE JOINT

Knee osteoarthritis is a degenerative knee condition where the articular cartilage of the knee joint gradually wears away. As the arthritis progresses, bony spurs also develop in and around the knee joint in response to the change in load distribution and biomechanics. The affected joints include: the tibiofemoral joint and the patellofemoral joint.

ASSESSMENT

- Pain level
- Muscle power
- Range of Motion
- Gait assessment
- Leg length measurement
- Knee deviation
- Knee Biomechanics
- Palpation

MANAGEMENT

PHASE I - Pain Relief & Protection

- Cryotherapy
- NSAIDs.
- Electrotherapy

PHASE II

- As the hip pain and inflammation settles, attention shifts to restoration of:
    - Range of motion
    - Muscle length and resting tension

- muscle strength and endurance
- Proprioception
- Balance and gait pattern

PHASE III

- Returning to the normal activities.

NB: Tailor the hip rehabilitation to help achieve patient's functional goals. Age is always an important factor to be considered in all phases of treatment

If surgery is prescribed perform

- Patient education on surgery
- Teach isometric muscle contraction
- Ambulation

Day 1-7 post operatively, consider:

- Chest physiotherapy
- Isometric exercises
- Ankle pumps
- Sit out of bed
- Ambulate with walking frame
- Gentle knee ex
- Joint Range of Motion

After day 7 Post-operatively

- Continue Strengthening exercises & Joint Range of Motion exercises and Prepare for discharge

- Crutch walking
- Stair climbing
- Toileting
- Discharge through physio as an out patient

ARTHRITIS OF THE SHOULDER JOINT

INTRODUCTION

Shoulder osteoarthritis is a gradual, progressive, mechanical, and biochemical breakdown of the articular cartilage and other joint tissues. As the articular surface wears, friction within the joint increases, causing progressive loss of the normal load-bearing surfaces with pain. The predisposing factors include Nature of work, Trauma, Habitual shoulder dislocation and Infections

ASSESSMENT

- Pain level
- Temperature
- Colour
- swelling
- Muscle power testing
- Joint Range of Motion
- Palpation
- Posture
- Special test
    - Neuro-dynamics tests

MANAGEMENT

- Pain management (EPA's, and NSAID)
- Joint mobilization (gentle gliding) techniques
- Joint manipulation techniques
- Minimal Energy Techniques (METs)
- Muscle stretching

Utilize strapping and taping techniques to prevent injuries.

Exercises

- ❖ Pendulum Exercise
- ❖ Shoulder Elevation Stretch
- ❖ Postural Muscle Strengthening add exercises

1.1.14: ANKLE SPRAIN

INTRODUCTION

An ankle sprain is a common injury, highest in sports populations. In lateral ankle ligament the most frequently damaged one is the anterior talofibular ligament (ATFL). On the medial side the strong, deltoid ligament complex posterior tibiotalar (PTTL), tibiocalcaneal (TCL), tibionavicular (TNL) and anterior tibiotalar ligaments (ATTL)] are normally injured during forceful "pronation and rotation movements of the hindfoot".

ASSESSMENT

- Pain level
- Temperature
- Colour
- swelling

- Muscle testing
- ROM
- Gait assessment
- Palpation
- Posture
- Special test
    - Anterior draw (test for ATFL)
    - Talat tilt (Test for CFL)
    - Posterior draw (PTFL)
    - Squeeze test (syndesmotic sprain)
    - External rotation stress test (syndesmotic sprain)

MANAGEMENT

GOALS

Inflammatory Phase (0-3 days)

- Reduction of pain and swelling and improve circulation and partial foot support

  The most common approach to manage ankle sprain is the PRICE protocol: Protection, Rest, Ice, Compression, and Elevation followed by Foot and Ankle Range of motion exercises:

Proliferative Phase (4-10 days)

- Education regarding gradual increase in activity level, guided by symptoms.
- Range of Motion
- Active Stability

- Motor Coordination
- Proprioception
- Tape/Brace:
    - Apply tape as soon as the swelling has decreased.
    - Tape or a brace use depends on patient preference

During early remodeling (11 -21 days)

- Improve muscle strength active (functional) stability, foot/ankle motion, mobility (walking, walking stairs, running).
- Practise foot and ankle functions
- Practice balance, muscle strength, ankle/foot motion and mobility (walking, stairs, running).
- Look for a symmetric walk pattern.
- Work on dynamic stability as soon as load -bearing capacity allows, focusing on balance and coordination exercises.
- Gradually progress the loading, from static to dynamic exercises, from partially loaded to fully loaded exercises and from simple to functional multi-tasking exercises. Alternate cycled with non-cycled exercises (abrupt, irregular exercises).
- Use different types of surfaces to increase the level of difficulty.
- Encourage the patient to continue practicing the functional activities at home with precise instructions regarding the expectations for each exercise.

NB: Advise wearing tape or a brace during physical activities until the patient is able to confidently perform static and dynamic balance and motor coordination exercises.

During late Remodeling and Maturation

- Improve the regional load-carrying capacity, walking skills and improve the skills needed during activities of daily living as well as work and sports.

- Practise and adjust foot abilities (functions and activities)
- Practise motor coordination skills while performing mobility exercises
- Continue to progress the load-bearing capacity as described above until the pre-injury load-carrying capacity is reached
- Increase the complexity of motor coordination exercises in varied situations until the pre-injury level is reached
- Encourage the patient to continue practicing at home

1.1.15: AMPUTATIONS OF LOWER LIMBS

INTRODUCTION

Amputation is the removal of a limb by trauma, medical illness, or surgery. As a surgical measure, it is used to control pain or a disease process in the affected limb, such as malignancy or gangrene.

ASSESSMENT

- Patient's psychological preparedness
- Muscle strength of the non-affected limb
- ROM of the non-affected limb
- Functional levels of the non-affected limb

PRE-OPERATIVE REHABILITATION

- To prepare the patient and family
- The physiotherapy program should be patient-tailored
- Perform bed exercises involving healthy limbs and the trunk

- Instruct breathing exercises
- Patient should master aided ambulation (walking with the aid of crutches or walkers), avoiding thereby burdening of the leg soon to be amputated.
- It is also highly recommendable to introduce the patient to successfully rehabilitated limb amputees.

POST-OPERATIVE REHABILITATION

- comprehensive interdisciplinary patient care
- patient should master aided ambulation
- To manage phantom pain, use TENS and Mirror therapy.
- Phantom sensation:
- Bed position and stretching and flexibility exercises for contracture prevention.
- In trans-tibial amputees: the leg should rest in an extended knee position, while with trans-femoral amputations a neutral position should be maintained.
- Gradual Physiotherapy should start on the postoperative day 1, in-bed exercises.
- breathing exercises and exercises
- strengthen ex for leg, upper limbs and the trunk.
- isometric exercises
- Limb joint mobility exercises
- Bed rest in the pronated position

Should the patient be unable to tolerate the above position due to cardiac/pulmonary symptoms, the exercising should be attempted in the recovery position.

Postoperative day 3

- Sitting and balance exercises

Postoperative day 4-5

- Exercises in an assisted standing position
- Prosthetic ambulation exercises (with an aid of a walker or a pair of crutches).
- Train balance
- Train gait
- Train on coordination

Postoperative days 5-10

- intensify and prolong the exercising session.
- recommendable early-stage walking aids
- prepare for prostheses training to allow for the verticalization and short-path walking.
- Review the patient

PRE-PROSTHETIC REHABILITATION STAGE

- In trans-tibial amputees, the desirable shape of the residual limb is a cylindrical one, while in trans-femoral amputees that shape must be conical. Posttraumatic oedema and haematoma are expected to regress within 15-20 days post amputation.
- education on residual limb hygiene and complications.
- kinesitherapy
- isometric and active exercises (of both open- and closed kinematic chain type), while
- start strengthening exercises (making use of manual or heavy bags burdening) (area dependant)
- independent aided ambulation (with the aid of crutches, a walker cane hybrid or a wheeled walker)
- Shaping of prosthetic stump with compression bandages

PROSTHETIC REHABILITATION STAGE

- Depends on the type of the prosthesis prescribed

- Patient participation is important
- teach coping as well as weight distribution
- Train on transfers

NB: Provision of a prosthetic aid to each individual patient should allow for the choice between various types of prostheses and their components, i.e. modules adjusted based on the clinical status, age, needs and wishes of the target patient and his/her working and living environment.

1.1.16: AMPUTATION UPPER LIMB

INTRODUCTION

The general principles of upper extremity amputation will be common to amputation at any level. In all amputations, the goal is to remove a distal segment of the extremity. This will entail dividing all structures spanning from the proximal limb to the distal segment being amputated. Structures including arteries, veins, nerves, tendons, ligaments, and bones will be divided.

ASSESSMENT

- Patient's psychological preparedness
- Muscle strength of the non-affected limb
- ROM of the non-affected limb
- Functional levels of the non-affected limb

PRE-OPERATIVE REHABILITATION

- To prepare the patient and family
- The physiotherapy program should be patient tailored
- bed exercises involving healthy limbs and the trunk
- Breathing exercises
- patient should master functional activities
- It is also highly recommendable to introduce the patient to successfully rehabilitated limb amputees.

POSTOPERATIVE REHABILITATION

Day 1-2, in-bed exercises

- Comprehensive interdisciplinary patient care
- Phantom pain: Use electro- TENS, Mirror therapy.
- Bed position and Physiotherapy for contracture prevention.
- Gradual Physiotherapy should start on the postoperative
- Breathing exercises and exercises
- Strengthen exercise for lower limbs, the non-affected arm and the trunk.
- Isometric exercises
- Limb joint mobility exercises

Day 3

- Sitting and balance exercises

Day 4-5

- Exercises in an assisted standing position

- Train balance
- Train gait
- Train on coordination

Days 5-10

intensify and prolong the exercising session.

- recommended early fine motor activities
- prepare for prostheses training
- Review the patient

PRE-PROSTHETIC REHABILITATION STAGE

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- Education on residual limb hygiene and possible complications
- Isometric and active exercises (of both open- and closed kinematic chain type)
- Start strengthening exercises (making use of weights)
- independent or aided use of arm prosthesis
- Shaping of prosthetic stump with compression bandages

PROSTHETIC REHABILITATION STAGE

- Depends on the type of the prosthesis that has been issued
- Patient participation is important
- Teach on coping as well as weight distribution.

NB: Provision of a prosthetic aid to each individual patient should allow for the choice between various types of prostheses and their components, i.e. modules adjusted based on the clinical status, age, needs and wishes of the target patient and his/her working and living environment.

1.1.17: SHOULDER ARTHROPLASTY PROTOCOL

INTRODUCTION

Total shoulder arthroplasty, or TSA, is a procedure used to replace the diseased or damaged ball and socket joint of the shoulder with a prosthesis made of polyethylene and metal components.

Hemiarthroplasty involves the humeral articular surface being replaced with a stemmed humeral component coupled with a prosthetic humeral head component.

ASSESSMENT

- Pain level
- Swelling
- Joint Range of Motion
- Muscle strength
- Posture

PRE-OPERATIVELY

- Educate and advice of the pathology and procedure
- Teach chest physiotherapy
- Isometric exercises
- Joint Range of Motion

POST- OPERATIVELY

Immobilization

- shoulder support be worn for the first 48-72hours

- After 3 days, sling can be removed for light activity
- abduction pillow should be worn as needed during the day, whenever the patient is active or in an Unprotected environment; it should always be worn at night for the first 6 weeks.
- Discontinue sling completely at 6 weeks.

1st day Post-Operative Visit

- Wound inspection
- Patient education
- No active shoulder motion for 4 weeks, all planes
- No active internal rotation for 6 weeks
- Sling use as directed by the surgeon
- Keep wound dry
- Icing 3 times/day for 20 minutes

Exercise

- Pendulum exercise without weight
    - Clockwise
    - Counter clockwise
    - Side-to-side
    - Front & back
- AAROM exercise–to patient tolerance–with cane and/or table slides
    - Flexion
    - Abduction
    - External rotation to 20° only or as directed by physician
- AROM exercise
    - Elbow flexion/extension
    - Wrist flexion/extension and supination/pronation
    - Shrugs/retractions

- Ice
    - Modalities-PRN

One week Post-Operatively

- Wound check
    - If wound is sealed, it is okay to shower but not soak
- Exercise
    - Pendulum exercise
    - AAROM exercise–to patient tolerance with cane
    - Isometric exercise in
        - Flexion/extension
        - Abduction
        - External rotation
    - Progressive resistive exercise
        - Shoulder shrugs
        - Scapular retraction - prone
        - Wrist supination/pronation
- Modalities-PRN

Two Weeks Post-Operatively

- Wound check
- Sutures out
- Exercise
    - Triceps/shoulder extension
    - Gripping exercises
    - Wrist flexion/extension

- AAROM
    - Upper Body Exercises, forward/reverse
    - With cane – progress to finger ladder/wall climbs/pulley system
    - Pulleys for home exercise program
    - Pendulum exercise with light weight
    - Isometrics
    - Progressive resistive exercise
- Modalities-PRN
- Ice

Four Weeks Post-Operatively

- Scar mobility
- Exercise
    - AROM
    - All planes – limit External rotation to 30° or as directed by the surgeon
    - Upper Body Ergometer, forward/reverse
    - Progressive resistive exercise - continue as previous, adding serratus punch in supine and without weight
- Modalities-PRN
- Ice

Six Weeks Post-Operatively

- Discontinue sling use
- Exercise
    - AROM
    - All planes – limit external rotation to 45°
    - Upper Body Ergometer, forward/reverse and standing off to side clockwise and counter clockwise
    - Progressive resistive exercise – continue as previous, adding: shoulder

internal/external rotation with low resistance Thera band (limit ER to 45°)

- Wall push-up plus, hand in neutral position
- Rhythmic stabilization

• Body Blade

- One-handed grip in neutral position
- Two-handed grip in front
- Opposite hand diagonal pattern

- Grade I/II glenohumeral joint mobilization-as indicated
- Modalities-PRN
- Ice

Eight Weeks Post-Operatively

- Full PROM, ER to 60°, and advance to full AROM (ER60°); able to add stretching in forward elevation (if lacking)
- Exercise
  - Progressive resistive exercise - continue as previous, adding low resistance/high repetitions for
    - Flexion
    - Supraspinatus (limit to 70°)
    - Scapular retraction
    - Abduction Prone fly
    - Prone extension
  - Wall push-up plus, hands in neutral position
- Body Blade
  - One-handed grip, abduction to 90°
  - Two-handed grip, flexion to 90°
- Plyoball
  - Circles – clockwise and counter clockwise, 1 minute each direction

- Squares – clockwise and counter clockwise, 1 minute each direction
- Grade 1/II glenohumeral joint mobilization-as indicated
- Modalities-PRN
- Ice

Ten Weeks Post-Operatively

- Full PROM, ER to 60°; continue stretching (forward elevation, abduction, IR, ER)
- Exercise
    - Progressive resistive exercise - continue as previous, adding:
        - Kneeling push-up
        - Step-up push-up in quadruped position
    - Plyo ball diagonal patterns
    - Fitter
        - Side-to-side
        - Front & back
- Progress weight and range of motion as tolerated by patient, with closed- and open- chain exercises and proprioceptive activities
- Glenohumeral joint mobilization-as indicated
- Modalities-PRN

Twelve weeks Post-Operatively

- Should have full AROM, ER to 60°; if not, begin passive stretch to achieve full ROM (forward elevation, abduction, IR, ER)
- Exercise
    - Progressive resistive exercise - continue as previous, adding:
        - Body Blade diagonals – progress to single-leg stance
        - Push-up plus in push-up position
        - Step-ups in push-up position

- Glenohumeral joint mobilization-as indicated
- Modalities-PRN
- Ice

Sixteen Weeks Post-Operatively

- Should have full AROM, ER to 75°; continue passive stretch to achieve full ROM
- Exercise
    - Continue with exercise program, progressing with weight & endurance as tolerated
- Grade I/II glenohumeral joint mobilization-as indicated
- Modalities-PRN
- Ice
- Released to perform activities as tolerated

Twenty-four weeks Post-Operatively

- Progression to full activity

1.1.18: CERVICAL SPONDYLOSIS

INTRODUCTION

Cervical spondylosis is a term that encompasses a wide range of progressive degenerative changes that affect all the components of the cervical spine (i.e., intervertebral discs, facet joints, joints of Luschka, ligamentum flava, and laminae). It is a natural process of aging and presents in the majority of people after the fifth decade of life.

ASSESSMENT

- Pain Level
- Functional activities
- Cervical radiculopathy
- Crepitation
- Dizziness
- Diplopia
- Dysarthria
- Fatigue
- Neck disability index
- Posture
- Movement
- Muscle strength
- Neck flexion muscle endurance
- Radiological examinations

MANAGEMENT

- Physical Modalities: Cervical Traction, Thermal therapy, Therapeutic Ultrasound, and Transcutaneous Electrical Nerve Stimulator (Tens)
- Manual Therapy
- Thrust Manipulation
- Non-Thrust Manipulation
- Postural Education
- Thermal Therapy
- Soft Tissue Mobilisation
- Home Exercises

- Education on Ergonomics

1.1.19 FRACTURES

INTRODUCTION

Fractures are breaks or cracks in bones that can result from trauma, accidents, or repetitive stress. Physiotherapy plays a crucial role in fracture management, aiding in the healing process, restoring function, and preventing complications. Documented types of fractures include e.g., open, closed, displaced, non-displaced) fractures.

ASSESSMENT

History Taking:

Details about the fracture incident, mechanism of injury, and specific area affected. Past medical history, pre-existing conditions, and medications. Level of pain, functional limitations, and impact on daily activities.

Physical Examination:

- Inspection and palpation of the affected area to identify swelling, deformities, or open wounds.
- Range of Motion (ROM) assessment to determine limitations and pain levels.
- Muscle strength testing surrounding the fractured area and adjacent regions.
- Evaluation of sensation, circulation, and nerve function in the affected limb.
- Assessing for signs of nerve damage or compromised blood flow.

Functional Limitations:

- Testing functional abilities related to the fracture site, such as weight-bearing, gripping, or joint stability.

Specialized Assessments

Radiological Investigations:

Reviewing X-rays, CT scans, or MRI reports to assess the type, location, and severity of the fracture.

Pain Assessment:

- Using pain scales (e.g., VAS, NPRS) to quantify pain intensity and location.

Joint and Muscle Assessment:

- Assessing for muscle wasting, joint stiffness, or contractures due to immobilization.

Outcome Measures

- Pain Scales:

Visual Analog Scale (VAS) or Numeric Pain Rating Scale (NPRS) to quantify pain intensity.

- Functional Measures:
  - Disability Rating Index (DRI) or Disability of Arm, Shoulder, and Hand (DASH) for upper limb fractures.
  - Lower Extremity Functional Scale (LEFS) for lower limb fractures.
- Quality of Life Measures:
  - Short Form (SF)-36 or EuroQol-5D to assess the impact on overall well-being and functional status.
- **Functional Measures:**
  - Range of Motion (ROM) assessment specific to the affected area.
  - Gait analysis if lower limb fractures are involved.
- **Strength and Muscle Function:**
  - Muscle strength testing using manual muscle testing or dynamometry.
- **Patient-Reported Outcomes:**
  - Assessing quality of life, functional limitations, and satisfaction with treatment.

MANAGEMENT

- **Acute Phase (Post-Injury)**
  - Protection of the fractured area to avoid further damage.

- Pain management techniques (ice, elevation, positioning).
- Gentle range of motion exercises for adjacent joints to prevent stiffness.

- **Subacute Phase (Early Healing)**
  - Gradual progression to active exercises focusing on the unaffected areas.
  - Weight-bearing progression (if applicable) under guidance.
  - Modalities like ultrasound or electrical stimulation to promote healing.
- **Intermediate Phase (Advanced Healing)**
  - Progressive resistance exercises to improve strength and stability.
  - Functional training and proprioceptive exercises.
  - Joint mobilizations to address stiffness and promote mobility.
- **Advanced Healing Phase (Near Full Recovery)**
  - Comprehensive rehabilitation addressing specific functional deficits.
  - Return to sport or activity-specific training if applicable.
  - Emphasis on preventing re-injury and optimizing function.
- **Precautions and Considerations**
  - **Individualized Approach:** Tailoring exercises and interventions based on fracture type, location, and patient's progress.
  - **Protection of Healing Structures:** Avoiding excessive stress on healing bones.
  - **Monitoring Progress:** Regular reassessment to adjust treatment plans accordingly.

1.1.20 DISLOCATIONS

INTRODUCTION

Dislocations occur when the ends of two connected bones are forced out of their normal positions in a joint. These injuries often result from trauma or accidents and can cause pain, instability, and loss of joint function. Physiotherapy plays a critical role in managing dislocations, aiming to restore joint stability, function, and prevent recurrent dislocations.

ASSESSMENT

- **History Taking**
    - Details about the dislocation incident, mechanism of injury, and specific joint involved.
    - Previous dislocations or joint-related injuries.
    - Level of pain, functional limitations, and impact on daily activities.
- **Objective Assessment**

  Physical Examination:
    - Inspection and palpation of the affected joint to identify swelling, deformities, or signs of instability.
    - Range of Motion (ROM) assessment to determine limitations, pain, and joint laxity.
    - Strength testing of muscles around the joint.

  Neurovascular Assessment:
    - Evaluation of sensory changes, circulation, and nerve function in the affected limb.
    - Assessing for signs of nerve damage or compromised blood flow.

  Joint Stability Testing:
    - Specific tests (e.g., apprehension test for shoulder dislocations) to assess joint stability.
    - Examination for signs of ligamentous laxity or joint hypermobility.
- **Specialized Assessments**

  Radiological Investigations:

- X-rays, CT scans, or MRI to confirm the dislocation, assess associated fractures or soft tissue damage.

Functional Limitations:

- Functional movement tests specific to the affected joint to assess the impact on daily activities and mobility.

- **Outcome Measures**
  - **Pain Scales:**
    - Visual Analog Scale (VAS) or Numeric Pain Rating Scale (NPRS) to quantify pain intensity.
  - **Functional Measures:**
    - Disability Rating Index (DRI) or specific joint function assessments.
    - Assessing activities of daily living (ADLs) affected by the dislocation.
- **Assessment of Specific Dislocations**
  - **Shoulder Dislocations:**
    - Specific tests for instability, range of motion deficits, and muscle strength evaluation.
  - **Hip Dislocations:**
    - Assessing hip stability, gait analysis, and functional limitations.

Considerations

1. **Individualized Approach:** Tailoring assessments based on the affected joint, type of dislocation, and patient's symptoms.

2. **Multidisciplinary Collaboration:** Coordination with orthopedic specialists, radiologists, and other healthcare professionals for accurate diagnosis and treatment planning.

MANAGEMENT

- **Acute Phase (Post-Dislocation)**
  - Protection and immobilization of the affected joint.
  - Pain management techniques (ice, elevation, medications).
- **Subacute Phase (Early Healing)**
  - Gradual restoration of range of motion through gentle exercises.
  - Strengthening exercises for surrounding muscles without stressing the injured joint.
- **Intermediate Phase (Strengthening and Stability)**
  - Progressive resistance exercises to improve muscle strength and stability.
  - Proprioceptive and neuromuscular training for joint control and balance.
- **Advanced Healing Phase (Functional Recovery)**
  - Functional training specific to daily activities or sports requirements.
  - Return to sport/activity-specific training if applicable.

Precautions and Considerations

- **Protection of Healing Structures:** Avoiding excessive stress on healing ligaments or joint structures.
- **Gradual Progression:** Incremental advancement of exercises based on healing and patient tolerance.

- **Individualized Approach:** Tailoring exercises based on the affected joint, severity, and patient's progress.

SECTION TWO

2.0: NEUROLOGY

NEUROLOGICAL ASSESSMENT

- Level of Consciousness: (GCS, Coma recovery scale)
- Memory
- Communication
- Cognition
- Attention
- Perception
- Special Senses: (Cranial nerves)
- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Muscle power (muscle group)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)
- Balance
- Posture
- Gait
- function activities
- Assistive devices (fitting)
- Muscle Girth
- Voluntary Control
- Range of Motion
- Limb Length

2.1.1: PARAPLEGIA

INTRODUCTION

Paraplegia is impairment in motor and/or sensory function of the lower extremities, usually due to spinal cord injury or a congenital condition that affects the neural elements of the spinal canal.

ASSESSMENT

- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Muscle power (muscle group)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)
- Balance
- Posture
- Gait
- Function activities
- Assistive devices (fitting)
- Muscle Girth
- Voluntary Control
- Range of Motion
- Limb Length

Outcome Measures

- Functional Independence
- Spinal Cord Independence
- Barthel Index
- Craig Handicap and the CHART
- Clinical Outcomes
- PULSES
- Spinal cord lifestyle scale

NB:

Rehabilitation depends on the level of the spine injury and whether it was a complete or an incomplete spinal cord injury. Patient should be seen a minimum of one time per day.

MANAGEMENT

ACUTE PHASE

- **Early Mobilization and Positioning**
  - Passive range of motion exercises to prevent contractures.
  - Position changes to prevent pressure ulcers.
- **Strengthening and Conditioning**
  - Progressive exercises targeting upper body strength and core stability.
  - Isometric exercises for lower extremities within pain-free limits. This applies if there are signs of recovery of power.
- **Neuromuscular Re-education**
  - Proprioceptive and balance exercises to enhance coordination.
  - Task-specific training to improve functional abilities. This can be done as soon as consultation between physiotherapists and surgeons settles on sitting.
- **Pain Management**
  - Modalities like heat or cold therapy for pain relief.
  - Transcutaneous Electrical Nerve Stimulation (TENS) for pain control.
- **Education and Support**
  - Education on adaptive techniques and equipment for daily activities.
  - Psychological support to cope with the impact of paralysis.

- **Follow-up and Reassessment**
    - **Regular Reassessment**
        - Periodic neurological examinations and functional assessments.
    - **Progress Monitoring**
        - Tracking changes in muscle strength, sensation, and functional abilities.
    - **Adjustment of Treatment Plan**
        - Modification of exercises and interventions based on progress and challenges encountered.

REHABILITATION PHASE

- **Strength and Endurance Training**

Focus on upper body strength, core stability, and endurance exercises. Incorporate weight-bearing exercises for the upper limbs and functional movements.

- **Gait Training and Mobility**

Continued gait training with appropriate assistive devices. Practice on different surfaces and terrains to enhance adaptability. This applies if there are signs of muscle power recovery. If not, Commence wheelchair assessment, prescription and training.

- **Neuromuscular Re-education**

Proprioceptive exercises and balance training. Task-specific training to enhance functional skills and independence.

- **Cardiovascular Fitness**

Aerobic exercises such as arm ergometry, wheelchair propulsion, or adapted cycling. Interval training to improve cardiovascular endurance.

- **Spasticity Management**

Stretching exercises and positioning to manage spasticity. Modalities such as splinting or casting if indicated.

- **Assistive Devices and Adaptive Techniques**

Training on the use of wheelchairs, transfer techniques, and adaptive equipment for daily activities.

- **Pain Management**

Continue addressing chronic pain through various modalities and techniques. Psychological interventions for pain coping strategies.

- **Education and Lifestyle Modification**

Education on skin care, bladder and bowel management, and preventing complications. Counseling and support for adjustment to long-term lifestyle changes.

- **Follow-up and Monitoring**
    - **Regular Progress Evaluation**

      Reassessment of functional abilities, muscle strength, and sensation. Revisiting goals and modifying the treatment plan accordingly.

    - **Community Integration and Participation**

      Encouragement and guidance for participation in social and recreational activities. Support in transitioning to community-based exercise programs or sports.
    - **Psychological Support and Wellness-Mental Health Support**

      Counseling and support groups to address psychological aspects and emotional well-being. Strategies to cope with challenges and adjustments in daily life.

    - **Holistic Care**

Encouragement of healthy lifestyle habits including nutrition, sleep, and stress management.

Precautions during treatment

- Orthostatic hypotension
- Autonomic dysreflexia may be present in patients with SCI at level T6 and above.

Home program

- Include upper extremity, trunk, and lower extremity strengthening and stretching, with emphasis on maintaining gross mobility skills.
- Train on skin care
- Identify resource centre for equipment and maintenance needs.
- Sexual education & referral (based, on need)

2.1.2: TRAUMATIC BRAIN INJURY

INTRODUCTION

Traumatic brain injury usually results from a violent blow or jolt to the head or body. An object that goes through brain tissue, such as a bullet or shattered piece of skull, also can cause traumatic brain injury. Mild traumatic brain injury may affect your brain cells temporarily. More-serious traumatic brain injury can result in bruising, torn tissues, bleeding and other physical damage to the brain. These injuries can result in long-term complications or death.

ASSESSMENT

- Level of Consciousness: (GCS, Coma recovery scale)

- Respiratory assessment
- Memory
- Communication
- Cognition
- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)
- Balance
- Posture
- Gait
- Voluntary Control
- Passive Range of Motion
- Limb Length

GOALS

- Improve level of consciousness
- Positioning in wheelchair and bed
- Spasticity Management
- Standing Programs
- Equipment trials
- Establishing a home program
- Initiate intensive mobility program
- Family/Caregiver Training

MANAGEMENT

- Chest Physiotherapy

- Pain management (TENS, STM, manipulation, mobilization).
- Spasticity management (Low load prolonged stretching, positioning, casting, rhythmical rotation and initiation. etc)
- Head/trunk control
- Identifying movement for command protocols
- Vestibular treatment
- Positioning programs: bed and w/c
- Splinting and Casting for ROM and/or positioning
- Increased arousal and consciousness
- Developmental positions – Weight bearing
    - Quadruped
    - Tall kneeling
    - Prone
        - Standing (Co-treats are important)
- Body weight supported treadmill training (BWSTT)/
- Bed and wheelchair positioning – Inhibitory or support
- Electrical Stimulation (FES/NMES)
- Proprioceptive Feedback
- Caregiver/Family training
- Establishing an extensive home programs and modifying

2.1.3: MULTIPLE SCLEROSIS

INTRODUCTION

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system (CNS) characterized by chronic inflammation, demyelination, gliosis, and neuronal loss. The course may be relapsing-remitting or progressive in nature. Lesions in the CNS occur at different times and in different CNS locations.

ASSESSMENT

- Memory
- Cranial Nerves Assessment
- Sensory System
- Muscle Tone
- Muscle Power
- Coordination (Non-equilibrium & equilibrium)
- Gait Examination: (Ranchos Los Amigos gait cycle evaluation)
- Balance Assessment (Berg Balance Scale)
- Posture
- Fatigue
- Functional activities
- Muscle Girth
- Range of Motion
- 6MWT

OUTCOME MEASURE

- Expanded Disability Status Scale

MANAGEMENT

Relapsing Remitting

- Physiotherapy begins after steroids are initiated
- Rehabilitation focused on impairments and function
- Start early and provide a lot of repetition to reach automaticity
- Make task close to function at home
- Gait Training

- Dual task training initially
- Vary environment, walking surface
- Address asymmetry and hypokinesia
- Cueing
- Auditory
- Visual
- Education on relapse prevention and recognition
- Provide necessary compensatory and supportive equipment
    - FES
    - AFOs
    - Equipment

- Aerobic Exercise
- Strength Training
- Specific balance exercises
- Fall Risk Management
- Aquatic exercise programs

Secondary and Primary Progressive

In addition to the treatment for Relapsing Remitting also focus on

- Compensatory mechanisms
- Equipment Needs
- Caregiver training
- Spasticity management
- Fatigue Management

2.1.4: PARKINSON'S DISEASE

INTRODUCTION

Parkinson's disease (PD), a degenerative neurological disease, mainly concerned with old-age. Parkinson's disease (PD) exhibits a critical threshold of 80% loss of nigro-striatal dopaminergic neurones and results in a series of disabilities, both motor and non-motor. Disease onset is usually diagnosed by resting tremor in one upper limb, with motor symptoms progressing to bradykinesia, stiffness and shuffling gait.

ASSESSMENT

- Memory
- Communication
- Cognition
- Attention
- Perception
- Special Senses: (Cranial nerves)
- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Muscle power (muscle group)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)
- Balance & coordination
    - Romberg & Sharpened Romberg
    - Single Limb Stance Test (SLST)
    - Berg Balance Test, or the Mini Bestest
    - Activities Specific Balance Scale
    - Functional Reach in 4 Directions
- Mobility

- Timed up and go test (TUG)
- Tinetti Mobility Test (TMT)
- Timed sit to stand test (TSTS
- Posture
- Gait
- Activities routine
- Muscle Girth
- Voluntary Control
- Range of Motion
- Risk of fall

OUTCOME MEASURE

- Unified Parkinson's disease Rating Scale (UPDRS)
- Parkinson's Disease Questionnaire (PDQ-39)

MANAGEMENT

GOALS

- Reduce tremor
- Improve Balance
- Muscle Strength
- Manage gait cycles in order to reduce the fall-rates
- Reduce Rigidity
- Improve Flexibility

INTERVENTION

- The Use of Gestes Antagonistes to Overcome Freezing

- Train the patient to perform gestes antagonists (Sensory tricks, to overcome focal dystonia)
- Marching to command (left, right, left, right)
- Stepping over objects, such as a crack in the pavement, the end of a walking stick
- Walking to music or a metronome
- Shifting body weight
- Rocking movements for trunk rehabilitaion
- Weight Supported Ambulation Training with Lite Gait or Biodex to improve gait in Parkinsons patients.

- Use of rehabilitation equipment
  - laser canes to produced virtual imagery glasses for PD patients to walk without aid.
  - Visual cueing in the form of videos for freezing gait improvements

2.1.5: STROKE / HEMIPLEGIA

INTRODUCTION

Stroke is a condition in which poor blood flow to the brain results in cell death. The main risk factor for stroke is high blood pressure. Other risk factors include tobacco smoking, obesity, high blood cholesterol, diabetes mellitus, a previous TIA, and atrial fibrillation.

ASSESSMENT

Acute stroke should have an initial assessment within 48 hours to check

- Memory
- Communication
- Cognition
- Attention

- Perception
- Special Senses: (Cranial nerves)
- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Muscle power (muscle group)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)
- Balance & coordination
    - Romberg & Sharpened Romberg
    - Single Limb Stance Test (SLST):
    - Berg Balance Test, or the Mini Bestest:
    - Activities Specific Balance Scale:
    - Functional Reach in 4 Directions:
- Mobility
    - Timed up and go test (TUG):
    - Tinetti Mobility Test (TMT):
    - Timed sit to stand test (TSTS):
- Posture
- Gait
- Activities routine
- Muscle Girth
- Voluntary Control
- Range of Motion
- Risk of fall

MANAGEMENT

- Constraint-induced movement therapy (CIMT) within the first week of stroke for highly selected patients;

NB: 10 degrees active wrist extension on the affected hand, 10 degrees active thumb abduction on the affected hand, 10 degrees active extension of any other two digits on the affected hand. Early CIMT for haemorrhagic stroke can aggravate the condition.

- Starting rehabilitation when medically stable (preferably within 24 hours after the stroke occurred).
- Task-specific circuit class training or video self-modeling
- Structured rehabilitation within the first six months after stroke
- Management for one-hour active practice per day (at least five days a week)

INPATIENT REHABILITATION

- interdisciplinary rehabilitation
- early supported discharge for mild to moderate stroke

DISCHARGE PLAN

- Interdisciplinary

OUTPATIENT REHABILITATION

- Rehabilitation appropriate to patients' needs
- Interdisciplinary
- Patients with high risk for falls in the community to have a comprehensive set of interventions implemented
- Mobility exercise program
- cardiovascular fitness program
- patient and family education

RE-ASSESSMENT

Moderate stroke should be reassessed weekly for the first month, and then at intervals as indicated by their health status.

- Evaluation of progress
- Community integration needs

LOWER EXTRIMITY THERAPY OPTIONS

- Tailored, repetitive practice of walking (or components of walking)
- Bodyweight supported treadmill
- Robot-assisted gait training
- Combining robot-assisted gait training with functional electro stimulation of the paretic leg
- Ground gait training
- Circuit class training (CCT)
- Use of Cueing of cadence
- Use Joint position biofeedback
- Virtual reality training
- Functional electrical stimulation (FES) transcutaneous electrical nerve stimulation (TNS or TENS)

UPPER EXTRIMITY THERAPY

- constraint-induced movement therapy
- mechanical assisted training
- repetitive task-specific training
- unilateral robot-assisted training of the paretic shoulder and elbow
- bilateral approach training
- Virtual reality training

- EMG-triggered neuromuscular electro stimulation (EMG-NMS) of the paretic wrist and finger extensors
- Circuit class training with workstations for the paretic arm
- Passive bilateral arm training
- mechanical arm trainer

NEGLECT

- Assessment with appropriate tests
- Neglect-oriented training
- Use of simple cues to draw attention to the affected side
- Mental imagery training or structured feedback
- Use of half-field eye patching
- Therapy sessions (e.g., for shoulder pain, postural control, feeding) need to be modified to cue attention to the impaired side

SHOULDER PAIN

- shoulder strapping
- Shoulder bracing
- Education of staff, carers and people with stroke to prevent trauma to the shoulder

SHOULDER SUBLUXATION

- Neuromuscular electro stimulation (NMS)
- firm support for subluxed shoulder (e. g, lap trays, arm troughs and triangular slings)

NB

DO NOT use ultrasound on stroke patient with severe weakness or patients at risk of developing shoulder pain or who have already developed shoulder pain use. Overhead

pulley exercise should NOT be used to maintain range of motion of the shoulder

SPASTICITY

- Low load prolonged stretching
- Weight bearing
    - Botulinum toxin A should be trialed in conjunction with rehabilitation therapy
- Electrical stimulation in combination with EMG biofeedback can be used
- Antispastic positioning, range of motion exercises, stretching and splinting.

CONTRACTURES

- prolonged positioning of muscles in a lengthened position
- Electrical stimulation

STRENGTH

- Strength Training
- Hydrotherapy
- Combination of aerobic endurance training and strength training
- transcutaneous electrical nerve stimulation (TENS) of the paretic leg improves
- Progressive resistance exercises
- Electromyography biofeedback in conjunction with conventional therapy

CARDIOVASCULAR FITNESS

- Lifestyle programs involving aerobic exercising
- Regular, fitness training

RANGE OF MOTION

- Active and passive ROM, and prolonged stretching program
- Joint movement and positioning to prevent the development of maladaptive activity patterns

BALANCE & POSTURE

- Postural control with visual feedback exercises
- Balance exercises

SWELLING OF THE EXTREMITIES

- Dynamic pressure garments for the upper limb
- Electrical stimulation
- Elevation of the limb when resting
- Continuous passive motion

ORTHOSIS

- Walk with a leg orthosis
- For foot drop, use ankle foot orthoses (AFO)
- Orthotic devices or knee stabilization to improve the patient's gait and prevent falls.

ACTIVITIES OF DAILY LIVING

- Mirror therapy
- Walking aids,
- Learn/re-learn leisure or social activities at home
- Memory strategy training in functional situations, using external strategies
- Task-specific practice and train use of appropriate aids

- Optimize sensorimotor, perceptual and cognitive capacities
- ADL training
- Training program that is tailored to the individual needs

2.1.6: BELL'S PALSY

INTRODUCTION

Bell's Palsy, or Bell Palsy, is facial paralysis, which is caused by dysfunction of Cranial Nerve VII, the Facial Nerve. It results in inability or reduced ability, to move the muscles on the affected side of the face. Bell's Palsy is an idiopathic condition.

ASSESSEMENT

Conduct a physical examination, focusing on identifying the patterns of weakness that are caused by Bell palsy:

- Facial movements of the eyebrow
- Eye closure
- Ability to use the cheek in smiling
- Ability to use the lips in a pucker
- Ability to suck the cheeks between the teeth
- Raising the upper lip
- Raising or lowering the lower lip

MANAGEMENT

- Ice stroking on the affected side (order of evidence)
- Infra-red (on the non-affected side)
- Soft tissue manipulation

- Neuromuscular Retraining (NMR)
- Electromyography (EMG) biofeedback
- Transcutaneous Electrical Nerve Stimulation (TENS)
- Proprioceptive Neuro Muscular Facilitation Techniques
- Facial exercises

Education

- Educate the patient about how to protect the face and the eye
- Show the patient how to manage daily life functions with facial paralysis
- Explain the expected path to recovery, so that the patient will know the signs and symptoms of recovery
- Evaluate progress, and determine whether the need for referral

NB:

If recovery doesn't take place within 14 days. Refer for review

2.1.7 FACIAL PALSY

INTRODUCTION

Facial palsy, often resulting from damage to the facial nerve, leads to weakness or paralysis of facial muscles. Physiotherapy plays a vital role in rehabilitating individuals with facial palsy, aiming to restore facial function and improve quality of life.

ASSESSMENT

- Subjective Assessment
    - Patient history: Onset, duration, associated symptoms, previous treatments.
    - Functional limitations: Difficulty speaking, eating, facial expressions.

- Objective Assessment
    - Facial nerve function grading (e.g., House-Brackmann scale).
    - Observation of facial symmetry, muscle tone, and movement.
    - Range of motion (ROM), strength, and coordination tests.
    - Outcome Measures
        - Facial Disability Index (FDI)
        - Facial Clinimetric Evaluation (FaCE) Scale
        - Facial Grading System (FGS)
        - Patient-reported outcomes (e.g., quality of life, self-perception)

MANAGEMENT

Goals of Treatment

- Restore Facial Symmetry: Improve muscle strength and coordination.
- Enhance Functionality: Enable normal facial expressions, speech, eating, and eye closure.
- Prevent Complications: Address associated issues like synkinesis or contractures.
- Improve **Quality of Life:** Enhance self-esteem and social interactions.

INTERVENTIONS

- Facial Exercises:
    - Active and passive exercises targeting specific facial muscles.
    - Mimetic muscle training for coordination and control.
- Neuromuscular Re-education:
    - Facial massage, biofeedback techniques to improve muscle tone.

- Mirror therapy to promote symmetrical movements.

- Electrical Stimulation:
  - Facial nerve stimulation to improve muscle contraction.

- Education and Counseling:
  - Guidance on home exercises, facial hygiene, and strategies to manage functional difficulties.

- Precautions
  - Avoid Overexertion: Gradual progression of exercises to prevent muscle fatigue.
  - Monitor Skin Sensitivity: Be cautious with stimulation techniques to avoid skin irritation.
  - Individualized Approach: Tailor interventions based on the patient's response and tolerance.

EVALUATION OF TREATMENT

- Regular Reassessment:
  - Periodic assessments of facial muscle strength, ROM, and function.

- Outcome Measures Re-administration:
  - Re-evaluation using FDI, FaCE Scale, and other relevant tools.

- Patient Feedback:
  - Assess patient satisfaction, adherence to exercises, and perceived improvements.

- Adjustment of Treatment Plan:
  - Modify interventions based on progress or plateau in improvement.

2.1.8: GUILLAIN-BARRÉ SYNDROME (GBS)

INTRODUCTION

GBS is acquired immune-mediated inflammatory disorders of the peripheral nervous system. GBS appear to be precipitated by an infectious respiratory or gastrointestinal illness. The body's response to the infection is misdirected and the immune system attacks the myelin and sometimes the axons of the peripheral nerves.

ASSESSMENT

- Respiratory system
- Sensory Assessment
- Joint Range of Motion
- Muscle Testing
- Functional Testing
- Mobility
- Respiration
- Deep-Vein-Thrombosis (DVT)
- Autonomic Dysfunction
- Endurance

MANAGEMENT

GOALS

- optimize muscle use at a tolerable pain level.
- Use supportive equipment and other functional adaptations

ACUTE STAGE

NB:

Exercising to exhaustion will delay recovery without benefitting the patient. In this stage the physiotherapists targets:

- Education and training
- Proper positioning
- Advise the patient and their caregivers on the following:
    - Avoid prolonged hip and knee flexion
    - Change position at least every two hours in bed and perform regular pressure reliefs when sitting; and
    - Support weak upper extremities with armrests, a wheelchair tray and/or pillows to prevent stretching of shoulder muscles and joint tissues.

SUB- ACUTE & CHRONIC STAGE

- Community re-integration
- Train the patient and caregivers on the use of assistive devices and other adaptive equipment.
- Passive range-of-motion (if necessary)
- Ankle pumps
- Breathing exercises
- Sensation and motor control, exercises can progress from passive to active-assisted range-of-motion.
- Expand activities gradually.
- Exercises progression
- proprioceptive neuromuscular facilitation (PNF).
- Teach energy conservation (e.g. pacing and breaking tasks into steps).
- Train caregivers in proper body mechanics for transfers, positioning, etc.
- Progress to activities of daily living

- pain management (e.g. TENS, moist heat pack, or sensory desensitization techniques).
- strengthen weak muscles
- Establish a home program
- follow-up assessments

2.1.9: CHRONIC INFLAMMATORY DEMYELINATING POLYNEUROPATHY

Chronic Inflammatory Demyelinating Polyneuropathy is an acquired immune-mediated inflammatory disorders of the peripheral nervous system. In CIDP develops slowly, often over the course of two months or longer. It can manifest in a variety of patterns; however, the most common is a series of recurrent relapses and remissions of ascending weakness over the course of years.

ASSESSMENT

- Respiration
- Sensory Assessment
- Joint Range of Motion
- Muscle Testing
- Functional Testing
- Mobility
- Deep-Vein-Thrombosis (DVT)
- Autonomic Dysfunction
- Endurance

MANAGEMENT

GOALS

- Optimize muscle use at a tolerable pain level.

- Use supportive equipment and other functional adaptations

NB: Therapy does not facilitate nerve repair; however, it does help the recovering patient to learn optimal use of muscles as the nerves heal and innervation improves.

ACUTE STAGE

NB:

Exercising to exhaustion will delay recovery without benefitting the patient.

- Provide patient and caregiver with education and training for the prevention of contractures, DVT and bedsore
- proper positioning and the expected course of future rehabilitation.
- Advise the patient and their caregivers of the following:
    - Avoid prolonged hip and knee flexion;
    - Change position at least every two hours in bed and
    - perform regular pressure reliefs when sitting; and
    - Support weak upper extremities

- Community re- integration
- Train the patient and caregivers on the use of assistive devices and other adaptive equipment
- Passive range-of-motion
- Ankle pumps
- Breathing exercises
- Sensation and motor control, exercises can progress from passive to active-assisted range-of-motion

- Expand activities gradually
- Increase repetitions before resistance in order to avoid injury to muscles, tendons and joints
- Use of proprioceptive neuromuscular facilitation (PNF)
- Teach energy conservation (e.g. pacing and breaking tasks into steps)
- Train caregivers in proper body mechanics for transfers, positioning, etc.
- Progress to daily activities
- pain management (e.g. TENS, moist heat pack, or sensory desensitization techniques)
- strengthen weak muscles
- Establish a home program
- Follow-up assessments

2.1.10: NEURITIS

INTRODUCTION

Neuropathic pain (NP) is a complex and heterogeneous condition which manifest with oscillation between constant or intermittent, spontaneous or induced pain, described as shooting, stabbing, electric shock, burning, painful tingling, pressing, itching and pricking. This pain is associated to other clinical conditions, such as diabetic peripheral neuropathy.

ASSESSMENT

- Muscle power
- Sensation
- Functional movements
- ADL's
- Posture

- Deformities
- Gait

MANAGEMENT

- Pain relief using TENS and STM
- Muscle strengthening exercise
- Prevent muscle shortening and deformity through gentle stretching exercise
- Re-educate balance, co-ordination and proprioception
- functional training
- Splints as needed
- Education

2.1.11: IDIOPATHIC BRACHIAL NEURITIS

INTRODUCTION

Idiopathic brachial neuritis (IBN), is a disorder of unknown aetiology with asymmetric involvement of the brachial plexus. It usually affects young adults and presents with acute severe shoulder pain lasting days to weeks followed by painless paresis of the upper extremity with slow but gradual recovery.

ASSESSMENT

- Muscle bulk/tone
- Muscle strength
- Sensation: numbness over lateral arm, forearm and anatomic snuffbox
- Reflexes

OUTCOME MEASURE

- Shoulder pain and disability index (SPADI)
- Disabilities of the arm, shoulder and hand (DASH)
- Shoulder rating questionnaire (SRQ)
- Nine Hole Peg Test

MANAGEMENT

- Patient education
- Monitoring and maintenance of upper-extremity ROM
- Strengthening exercises
- TENS for pain management
- Resistance exercise must be adjusted to the patient's local exercise capacity and level of pain.
- Electrical stimulation (ES) should be considered when the denervated state is prolonged, i.e., greater than 4 months.
- start with ES as soon as possible
- Progressive stretching and self-stretches
- Muscle strengthening
- Exercise progression, open towards close kinetic chain
- Aerobic activity (aiming for 30 minutes 3 times a week)
- Balance (for falls prevention and stability)
- Postural corrections
- Resistant strengthening exercises

2.1.12: NEUROPATHIC PAIN

INTRODUCTION

Injuries or dysfunctions affecting the CNS may induce difficult to control pain, (central pain). Most common causes are traumatic spinal cord injuries or diseases coursing with myelopathy, brain injuries, especially those involving the thalamus, multiple sclerosis and CNS tumors. In such conditions, injuries may be themselves the source of symptoms. It is also possible that endogenous inhibitory mechanisms are affected, generating pain by inhibitory failure. In all these situations, patients shall have different NP presentations.

ASSESSMENT

- Fear avoidance
- Types of pain
- Muscle bulk/tone
- Muscle strength
- Sensation: numbness over lateral arm, forearm and anatomic snuffbox
- Reflexes

MANAGEMENT

- Pain management. (Low frequency TENS)
- Individualized exercise program
- Passive ROM
- Weight bearing through relevant joints
- Balance training to reduce the risk of falling
- Gait re-education
- Soft tissue manipulation
- Task-specific sessions using graded discrimination tasks, attentive exploration of objects without vision and feedback.
- Mirror imaging to stimulate nerve pathways
- Hydrotherapy

- Advice and support about diet
- Advice about walking aids, orthotics, calipers and wheelchairs.
- Improving safety with everyday tasks

2.1.13: RADICULOPATHIES AND PERIPHERAL NERVE ENTRAPMENT SYNDROMES

INTRODUCTION

Nervous compression is an underlying cause of some neuropathic pains. Several anatomic areas are described as being more vulnerable to vasculo-nervous compression, such as: osteofibrous channels of the distal pathway of brachial plexus nerves (e.g., carpal tunnel), lumbar plexus (sciatic pain) or in the entrance of trigeminal nerve root in the cerebellopontine cistern. Compressive neuropathies have a central component, in addition to a biomechanical cause by compression.

ASSESSMENT

- Neurodynamic tests
- Neuro-conduction tests
- Muscle girth
- PROM
- AROM

MANAGEMENT

- Electric and thermal stimuli
- Burst TENS during 20 to 40 days on the affected nerve, with evaluation after one and three months

- Strengthening, coordination and balance Exercises
- Manual therapy (muscle energy techniques, mobilization without thrust)
- Cold therapy
- Traction modalities
- STM
- Cervical collar
- segmental mobilizations (low velocity manouvers)
- Active exercise

2.1.14: TRANSVERSE MYELITIS (TM)

INTRODUCTION

Transverse Myelitis (TM) is a rare neurological disorder of the spinal cord, caused by inflammation, occurring across one spinal segment, leading to severe motor, sensory and autonomic dysfunction and causing damage to the myelin sheath of the nerves.

ASSESSMENT

Diagnostics

- Radiological investigation
- Laboratory tests – (blood test, CSF, etc.)

Physical assessment

- Muscle Power
- Sensation
- Bowel and bladder function

- Radicular Pain
- Reflexes

MANAGEMENT

- Pain management
- A graduated exercise programmes
- Stretching programme
- Fitting & training mobility aids (wheelchairs, walking aids, orthotic devices)
- Train on Transfers
- Gait training
- Prevent pressure ulcers
- Control of spasticity

2.1.15: SPINAL CORD INJURY

INTRODUCTION

This refer to injury to the spinal cord, causing loss of sensation and motor function depending on the level and severity of injury. Spinal cord injury may be complete or incomplete. The main causes include trauma, pathology

ASSESSMENT

- ASIA Classification
- Bowel and bladder function
- Respiratory function
- Sexual function
- Tone
- Pain
- Muscle girth
- Muscle power

- Patient expectation

OUTCOME MEASURE

- ASIA A & B (complete motor impairment)
- Handheld myometry
- World health organization quality of life (WHOQOL)
- ASIA impairement scale
- Functional Independence Measure
- Graded and Redefined Assessment of Sensibility Strength and Prehension
- Life Satisfaction Questionnaire 9
- Manual Muscle Test (MMT)
- Short Form 36 (SF-36)
- Sickness Impact Profile 68
- Spinal Cord Injury Independence Measure III (SCIM III)
- ASIA C & D (incomplete Motor impairment)
- 6 Minute Walk Test (6MWT)
- 10 Meter Walk Test (10MWT)
- Handheld Myometry
- Timed Up and Go (TUG)
- Walking Index for Spinal Cord Injury II (WISCI II)
- World Health Organization Quality of Life - BREF (WHOQOL - BREF)
- ASIA Impairment Scale

MANAGEMENT

COMPLETE SPINAL CORD INJURY

- Increasing muscle strength above the level of injury
- Maintaining muscle length

- Range of movement below the level of injury
- Muscle stretching below the level of injury
- Regular standing to weight bear and improve function of internal organs
- Improve balance and confidence
- Teaching wheelchair skills
- Breathing control Exercises
- Teaching transfers
- Advice on orthotic devices
- Advice on positioning
- Improving safety
- Hydrotherapy treatment
- Patient education

INCOMPLETE SPINAL CORD INJURY

People with an incomplete spinal cord injury present in different ways depending on the severity of the injury. Each person therefore needs individual treatment and continuous assessment.

- Exercise to strengthen weak muscles (Active assisted exercises, Free active exercises, resisted exercises)
- Electrical nerve stimulation
- Stretches
- Balance training
- Train transfer
- Mobilisation exercises
- Advice on effective positioning
- Advice on orthotic devices and walking aids.
- Hydrotherapy

QUADRIPLEGIA

This is paralysis caused by illness or injury that results in the partial or total loss of use of all four limbs and torso. The loss is usually sensory and motor, which means that both sensation and control are lost.

ASSESSMENT

- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Muscle power (muscle group)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)
- Balance
- Posture
- Gait
- Function activities
- Assistive devices (fitting)
- Muscle Girth
- Voluntary Control
- Range of Motion
- Limb Length

Outcome Measures

- Functional Independence
- Spinal Cord Independence
- Barthel Index
- Craig Handicap and the CHART
- Clinical Outcomes
- Spinal cord lifestyle scale

NB:

Rehabilitation depends on the level of the spine injury and whether it was a complete or an incomplete spinal cord injury.

MANAGEMENT

- Use of braces and tilt tables
- Progress to braces, parallel bars and other walking aids
- Use of a treadmill with overhead harness (to the discretion of therapist) use of functional electrical stimulation
- Use robotic-assisted gait training
- Aggressively strengthen upper extremities, lower extremities, and trunk
- Increase upper extremity strength and endurance with transfers, mobility skills, balance activities, weight shifting, pressure relief, and preparation for coming to stand.
- Increase upper extremity and trunk strength and balance for effective functional ability, protection of skin/soft tissue, and development of independence.
- muscle re-education at level appropriate to deficit
- Joint-range of motion exercises conducted by the patient
- Teach weight shifting and rolling
- Progress to balance in long sitting and wheelchair push-ups
- Initiate transfer training
- Train independent wheelchair, toilet, and tub transfers
- train patient on wheelchair mobility, and safety
- Progress to transfer training to and from uneven surfaces
- Achieve maximal level of functional independence.
- Train the patient using repetitive and intensive gait correction
- Abdominal binder or corset

Home program

- Include upper extremity, trunk, and lower extremity strengthening and stretching, with emphasis on maintaining gross mobility skills.
- Train on skin care
- Identify resource centre for equipment and maintenance needs.
- Sexual education & referral (based, on need)

SECTION THREE

3.0: CARDIO-RESPIRATORY CONDITIONS

INTRODUCTION

Cardiac Respiratory Rehabilitation (CR) is an interdisciplinary team approach to patients with functional limitations secondary to heart disease. Cardiac Rehabilitation has been conventionally divided into four phases. Phase-1 involves Pre-hospitalized and hospitalization period of the patient, Phase-2 is the immediate post discharge period, phase-3 is the stage of a structured exercise program, and phase-4 is the maintenance phase. Cardiac Rehabilitation (CR) has a set of core components that should be included into every program.

ASSESSMENT

- Shortness of Breath (SOB)
- Cough with or without expectoration
- Chest pain
- Noisy breathing –Wheezing/stridor
- Haemoptysis
- Hoarseness of voice
- Voice changes
- Dizziness/faintly syncope
- Headache
- Altered sensorium
- Ankle swelling
- Cyanosis
- Fever

- Excessive sweating
- Loss of appetite
- Nausea
- Vomiting
- Weight loss
- Fatigue
- Weakness
- Exercise tolerance (Bruce test)
- Altered sleep pattern

HISTORY OF PRESENT ILLNESS:

- Site, intensity, type, aggravating factor and relieving factor (SITAR)
- Onset - sudden or gradual
- Location - radiating
- Duration - frequency or chronology (seasonal or daily variations)
- Characteristics - quality or severity
- Current situation - improving or deteriorating
- Effect on activity of daily living (ADL)
- Previous diagnosis of similar episodes
- Previous treatment and efficacy

PAST HISTORY

- Endoscopy, tracheostomy, lobectomy
- Personal and social history
- Sleep
- Appetite / bowel, bladder / nutrition
- Smoking
- Exercise tolerance

- Home environment
- Economic condition - poor/fair / good

COUGH: ONSET - SUDDEN OR GRADUAL

- Duration - Acute < 3 weeks
- Chronic - >3 weeks
- Nature - Dry: irritation
- Wet: signs of infection
- Type - Mucoid
- Mucopurulent: Tuberculosis
- Froathy: pulmonary oedema
- Rusty (blood): Tuberculosis, lobar pneumonia
- Odour - foul: infection

SPUTUM:

Amount

Normal - 100 ml of tracheo-bronchial secretions are produced daily and cleared subconsciously.

Color: Different colors of the sputum indicate different pathologies.

OUTCOME MEASURES-

- NYHA (New York Heart Association)
- MMRC (Modified Medical Research Council)
- ATS (AMERICAN THORACIC SOCIETY)

OBJECTIVE ASSESSMENT

General examination

- Vital sign
- Observation
- Blood Oxygen saturation levels (Spo2)

3.1.1: CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a chronic inflammatory lung disease that causes obstructed airflow from the lungs. Symptoms include breathing difficulty, cough, mucus (sputum) production and wheezing. It's caused by long-term exposure to irritating gases or particulate matter, most often from cigarette smoke. People with COPD are at increased risk of developing heart disease, lung cancer and a variety of other conditions. Emphysema and chronic bronchitis are the two most common conditions that contribute to COPD.

ASSESMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color

- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)

RADIOLOGICAL EXAMINATION

- Chest X-ray
- Chest CT Scan

GOALS

- Improve exercise tolerance
- Advice about self-management in activities of daily living;
- Patients Education to relieve any bronchospasm, facilitate the removal of secretions
- To improve the pattern of breathing, breathing control
- Posture training
- Return to occupation plan

MANAGEMENT

Management of breathlessness

Positioning

- Advise on passively fixing the shoulder girdle for optimising ventilatory muscle efficiency and relief of breathlessness
- Assess the effectiveness of forward lean sitting on relief of breathlessness in all patients with COPD, in both the chronic and acute settings
- Advise modification of the forward lean position for use in standing and lying, for patients for whom forward lean sitting is effective.

Walking aids

- Assess the effectiveness of a rollator frame for patients with COPD disabled by breathlessness.
- Assess the effectiveness of a gutter rollator frame in the acute setting, for patients with COPD severely disabled by breathlessness, especially the elderly.
- Teach individualised energy conservation techniques to help reduce dyspnoea during activities of daily living.

Breathing techniques

- Teach patients with COPD breathing control at rest to relieve dyspnoea.
- Diaphragmatic breathing should not be taught routinely to patients with severe COPD.
- Teach pursed lips breathing during exertion as a potential strategy to reduce respiratory rate and aid recovery in patients with COPD.
- Teach exhalation on effort ("blow as you go!") as a potential strategy to reduce dyspnoea in patients with COPD.
- Teach relaxed, slower, deeper breathing as a potential strategy to facilitate more effective ventilation during exertion in patients with COPD.
- Teach paced breathing as a strategy to maintain control of breathing and reduce dyspnoea during exertion in patients with COPD.
- Ventilation feedback training: Ventilation feedback training is not indicated in patients with COPD.
- Managing anxiety and panic: Teach patients with COPD positioning, breathing and relaxation strategies to help manage anxiety and panic attacks.
- Pulmonary rehabilitation: Pulmonary rehabilitation should include exercise training of the muscles of ambulation, strength training of both upper and lower limbs. Advice and education should be integral to pulmonary rehabilitation.
- **Field exercise tests**

- The recommended number of practice walks must be included when assessing exercise tolerance with a field exercise test for the prescription of either exercise or ambulatory oxygen.

- **Peri-and post-exacerbation pulmonary rehabilitation**
  - Consider pulmonary rehabilitation soon after exacerbation for patients with COPD.
  - Consider some form of rehabilitation during exacerbation to maintain mobility and function in patients with COPD.

- **Respiratory muscle training**
  - Consider adding inspiratory muscle training to a general exercise programme where respiratory muscle weakness is thought to be contributing to the patient's problems.
  - Consider inspiratory muscle training in the management of COPD to improve respiratory muscle strength and/or endurance.
  - Devices that incorporate control of breathing pattern and flow rate should be considered over devices that do not have this function.

- **Non-invasive ventilation**
  - Non-invasive ventilation should be offered to patients with COPD and acute hypercapnic respiratory failure

Intermittent positive pressure breathing

- Tidal volume must be increased to achieve a therapeutic effect
- Care must be taken to ensure settings achieve patient synchrony with the device to reduce work of breathing.

- Short periods of daytime intermittent positive pressure breathing should not be used to treat chronic respiratory failure in stable COPD.
- Consider intermittent positive pressure breathing in acute exacerbations of COPD where patients present with retained secretions but are too weak or tired to generate an effective cough.
- When using intermittent positive pressure breathing in acute respiratory failure, an FiO_2 of 0.4 may be used.

- **Oxygen therapy**
  - Administer oxygen therapy, in both the acute and domiciliary settings, according to current national guidance.
  - Consider assessing the benefit of a walking aid to transport the ambulatory oxygen, especially for the more disabled patient.

Airway clearance techniques

- Consider the active cycle of breathing techniques (which includes the forced expiration technique), autogenic drainage and plain or oscillating positive expiratory pressure for patients with stable COPD who need an airway clearance technique to assist in the removal of secretions.
- Incorporate postural drainage only if it further aids clearance and has no detrimental effects.

- **Pelvic floor muscle training**

Kegel Exercises (necessitated by stress incontinence secondary to frequent coughing).

- Make sure your bladder is empty, then sit or lie down.
- Tighten your pelvic floor muscles. Hold tight and count 3 to 5 seconds.
- Relax the muscles and count 3 to 5 seconds.

- Repeat 10 times, 3 times a day.

3.1.2: CHRONIC BRONCHITIS

Is defined as a chronic cough and sputum production for at least 3 months a year for 2 consecutive years. It is covered under the umbrella term of Chronic Obstructive Pulmonary Disease (COPD). CB is the inflammation and excessive mucus build-up in your bronchi.

CB is caused by overproduction and hyper-secretion of mucus by goblet cells, increasing airflow obstruction. This can be due to smoke inhalation, a viral or bacterial infection, or inflammatory cell activation of mucin gene transcription.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Spirometry Test

MANAGEMENT

Aim of treatment

- To improve exercise tolerance and ensure a long-term commitment to exercise
- To give advice about self-management in activities of daily living
- To increase knowledge of the patient's lung condition and control of the symptoms
- To relieve any bronchospasm, facilitate the removal of secretions and optimise gaseous exchange
- To improve the pattern of breathing, breathing control and the control of dyspnoea
- To teach local relaxation, improve posture and help allay fear and anxiety.

Exercise

- Postural Drainage
- Active Cycle of Breathing
- Autogenic Drainage
- Percussion and Vibrations

3.1.3: ASTHMA

It is a disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person. This condition is due to inflammation of the air passages in the lungs and affects the sensitivity of the nerve endings in the airways, so they become easily irritated.

ASSESSMENT

- Vital Signs

- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- A runny nose
- Swollen nasal passages.
- Check skin for allergic conditions Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Spirometry
- Peak flow Testing

OUTCOME MEASURES

- Asthma-specific quality of life measure
- measures of anxiety and depression
- Nijmegen Questionnaire

MANAGEMENT

Asthma is treated in a variety of ways with the aim of improving the breathing technique. Physiotherapy techniques for asthma are in addition to medication and should never be used as a replacement to prescribed medication; however, the dosage may be reduced as required.

- **Breathing exercises**
    - Reduce work of breathing
    - The Buteyko breathing technique may be considered to help patients control the symptoms of asthma. The Technique involves:
        - Breathing normally through the nose for 2-3 mins
        - Breathing out normally, close nose with fingers, and hold
        - Record number of seconds on first need to breathe, release nose and return to nasal breathing (Control Pause)
        - Wait 3 minutes
        - Repeat and hold breath for as long as possible (Maximum Pause)
- **Exercise training**

Disordered breathing (hyperventilation syndrome)

- Breathing retraining incorporating reducing respiratory rate and/or tidal volume should be offered as a first-line treatment for hyperventilation syndrome, with or without concurrent asthma.

3.1.4: EMPHYSEMA

INTRODUCTION

Emphysema is loss of lung elasticity, permanent enlargement of the air spaces distal to the terminal bronchioles, and destruction of the alveolar walls. It can be classified under the umbrella term chronic obstructive pulmonary disorder (COPD). There are three types of emphysema; centriacinar, panacinar, paraseptal.

ASSESSMENT

- Vital Signs
- Chest pain

- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Spirometry Test

MANAGEMENT

Aims of treatment

- To improve exercise tolerance
- Advice about self-management in activities of daily living
- Patient's education
- Removal of secretion
- Improve the pattern of breathing and breathing control
- Breathing techniques
- Respiratory muscle training
- Ventilation feedback training
- Managing anxiety and panic
- Pulmonary rehabilitation
- Positioning
    - Advise on passively fixing the shoulder girdle for optimising ventilatory muscle efficiency and relief of breathlessness

- Advise modification of the forward lean position for use in standing and lying, for patients for whom forward lean sitting is effective

3.1.5: CANCER OF THE LUNGS

INTRODUCTION

Lung cancer is the uncontrolled growth of abnormal cells that start off in one or both lungs and arises from the cells of the respiratory epithelium. Cancer can be primary (that is formed initially in the lungs) or secondary (cancer that begins in another area of the body but then spreads to the lungs). Primary lung cancer is divided into two types which are classified as small cell lung cancer and non-small cell lung cancer.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait

- Activity limitation
- Pulmonary function test (PFT)

MANAGEMENT

- Hydration
- Autogenic drainage
- Gentle suctioning
- Postural drainage
- Chest physiotherapy, and external oscillation applications
- Exercise tolerance activities

LUNG SURGERY

Three main types of lung cancer surgery:

- Lobectomy: Where one of the large parts of the lung (lobes) is removed
- Pneumonectomy: Where the entire lung is removed
- Wedge resection or segmentectomy: Where a small piece of the lung is removed

PHYSIOTHERAPY MNANAGEMENT

Exercise based rehabilitation after surgical or curative treatment

- Breathing Physiotherapy
- Aerobic exercise and resistance training
- Teach supported coughing
- Ambulation training
- Shoulder and thoracic cage range of motion exercises

- Pre-habitation exercises
- Mobilization exercises

Day one postoperative

- Sit out of bed in ward chair
- Ambulate ≥ 20 m on ward
- Portable supplemental oxygen if required to keep SpO2 ≥ 95%
- Portable suction if large air leak present
- Assistance from one person if required
- Gait aid if patient is unable to ambulate despite assistance from one person
- Teach supported cough with towel wrap
- Commence respiratory physiotherapy if indicated (high-risk patient or presence of PPC)

Day two postoperative

- Ambulate ≥ 50 m on ward
- Portable supplemental oxygen if required to keep SpO2 ≥ 95%
- Portable suction if large air leak present
- Assistance from one person if required
- Gait aid if patient unable to ambulate despite assistance from one person
- Encourage supported cough
- Commence or continue respiratory physiotherapy if indicated (high risk or presence of PPC)

Day three+ postoperative

- Review by physiotherapist only if patient requires ongoing mobility assistance or respiratory physiotherapy
- Once intercostal catheters are removed
- Teach upper limb and thoracic mobility range of motion exercises

- Physiotherapy completes a discharge mobility assessment and provides any discharge planning as required for safety

3.1.6: CYSTIC FIBROSIS

INTRODUCTION

Cystic fibrosis is a hereditary disease that affects the lungs and digestive system. The body produces thick and sticky mucus that can clog the lungs. Cystic fibrosis (CF) can be life-threatening, and affected persons tend to have a shorter-than-normal life span.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)

MANAGEMENT

- Education to patient and care giver
- **Exercise**

- Breathing
- Endurance training

- **Airway clearance**
  - Postural drainage and manual techniques
  - Active cycle of breathing techniques
  - Autogenic drainage
  - Positive expiratory pressure
  - Oscillating positive expiratory pressure devices considered to increase airway clearance further.
- **Suction**
  - Suction should not be considered for use as a routine airway clearance technique in non-intubated patients with cystic fibrosis.
- **Inhalation therapy**
  - Humidification (For mobilization of secretions)
- **Thoracic mobility and strengthening**
  - Question patients with cystic fibrosis about musculoskeletal problems and back pain.
  - Assess the problem if present and institute appropriate posture correction, chest wall mobility and stretching exercises or manual therapy treatments where indicated.
- **Pelvic floor muscle training**

  Kegel Exercises
  - Make sure your bladder is empty, then sit or lie down.
  - Tighten your pelvic floor muscles. Hold tight and count 3 to 5 seconds.

- Relax the muscles and count 3 to 5 seconds.
- Repeat 10 times, 3 times a day.

- **Infection control**

3.1.7: BRONCHIECTASIS

INTRODUCTION

Bronchiectasis is defined as permanently dilated airways due to chronic bronchial inflammation caused by inappropriate clearance of various micro-organisms and recurrent or chronic infection. Bronchiectasis is characterized by thickening of the bronchial wall, leading to increased sputum production and chronic cough.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT

MANAGEMENT

Pulmonary rehabilitation

- Airway clearance techniques
- Postural drainage
- Simple airway clearance techniques
- Consider the active cycle of breathing techniques (which includes the forced expiration technique), autogenic drainage and plain or oscillating positive expiratory pressure for patients with stable COPD who need an airway clearance technique to assist in the removal of secretions.
- Incorporate postural drainage only if it further aids clearance and has no detrimental effects.
- Pelvic floor muscle training

  Kegel Exercises
  - Make sure your bladder is empty, then sit or lie down.
  - Tighten your pelvic floor muscles. Hold tight and count 3 to 5 seconds.
  - Relax the muscles and count 3 to 5 seconds.
  - Repeat 10 times, 3 times a day.

3.1.8: LUNG FIBROSIS

INTRODUCTION

Pulmonary fibrosis is a lung disease that occurs when lung tissue becomes damaged and scarred. This thickened, stiff tissue makes it more difficult for your lungs to work properly. As pulmonary fibrosis worsens, the patient gets progressively shorter breath.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and colour
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)

MANAGEMENT

- Pulmonary rehabilitation as documented above

3.1.9: CHEST WALL DISORDERS

INTRODUCTION

Chest wall disorders are commonly musculoskeletal or neurological conditions and are the most common causes of chest pain.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation

- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture (kyphoscoliosis) and gait
- Activity limitation
- Pulmonary function test (PFT)

MANAGEMENT

- Respiratory muscle training and breathing exercises

- Pulmonary rehabilitation and ambulatory oxygen
    - Ambulatory oxygen for patients with severe kyphoscoliosis who desaturate on exercise.

3.1.10: PNEUMONIA

INTRODUCTION

This is the inflammation of the lung caused by bacteria, in which the air sacs (alveoli) become filled with inflammatory cells and the lungs become solid. Pneumonia is a severe form of acute lower respiratory infection that specifically affects the lungs.

ASSESSMENT

- Vital Signs
- Chest pain

- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussions
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)

MANAGEMENT

- Modified postural drainage
- Coughing and huffing exercises
- Administer humidification
- Breathing exercises - Localized and Diaphragmatic
- Intermittent Positive Pressure Breathing (IPPB) administration - to increase lung volumes
- Mobilization
- Ambulation

For Patients admitted to hospital

- Continuous Positive Airway Pressure/Power (CPAP) should be considered for patients with type 1 respiratory failure who remain hypoxemic despite optimum medical therapy and oxygen.
- Non-invasive Ventilation (NIV) can be considered for selected patients with type II respiratory failure, especially those with underlying COPD.

- Medical conditions permitting, patients should;
    - Sit out of bed for at least 20mins within the first 24hours
    - Increase mobility each subsequent day of hospitalization
- The regular use of Positive Expiratory Pressure (PEP) should be considered
- Patients should NOT be treated with traditional airway clearance, Intermittent Positive Pressure breathing (+/- IPPB) routinely.

3.1.11: PLEURAL EFFUSION

INTRODUCTION

Pleural effusion occurs when excess fluid builds up within the pleural space. This either results from increased production of fluid or an inability to properly drain it. The net effect is an increased separation of the pleural layers reducing the effectiveness of the chest wall mechanical ventilation. Depending on severity it can result in partial collapse of some lower airways, reducing the available lung space for gas exchange.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and colour
- Continence status
- Posture and gait

- Activity limitation
- Pulmonary function test (PFT)

MANAGEMENT

- Secretion clearance:
    - Effective / productive coughing techniques.
    - Positioning
- Breathing technique retraining:
    - Agility exercises
    - Controlling respiratory rate
    - Diaphragmatic breathing
- Relaxation breathing exercises
- Education and Advice

POSTURAL DRAINAGE TECHNIQUES

UPPER LOBE

APICAL SEGMENTS -The patient should sit upright, with slight variations according to the position of the lesion which may necessitate leaning slightly j backward, forward or sideways. The position is usually only necessary for infants or patients being nursed in a recumbent j position, but occasionally may be required if there is an abscess or stenosis of a bronchus in the apical region.

ANTERIOR SEGMENTS - The patient should lie flat on his back with his arms relaxed to his side; the knees should be slightly flexed over a pillow.

POSTERIOR SEGMENT:

Right - The patient should lie on his left side and then turn 450 on to his face, resting against a pillow with another supporting his head. He r should place his left arm comfortably behind his back with his right arm resting on the supporting pillow; the right knee should be flexed.

Left - The patient should lie on his right side turned 450 on to his face with three pillows arranged to raise the shoulder 30cm (i2in) from the bed. He should place his right arm behind his back with his left arm resting on the supporting pillows; both the knees should be slightly bent

MIDDLE LOBE

LATERAL SEGMENT: MEDIAL SEGMENT The patient should lie on his back with his body quarter turned to the left maintained by a pillow under the right side from shoulder to hip and the arms relaxed by his side; the foot of the bed should be raised 35cm (14in) from the ground. The chest is tilted to an angle of 15°.

LINGULA

SUPERIOR SEGMENT: INFERIOR SEGMENT - The patient should lie on his back with his body quarter turned to the right maintained by a pillow under the left side from shoulder to hip and the arms relaxed by his side; the foot of the bed should be raised 35cm (14m) from the ground. The chest is tilted to an angle of 15°.

LOWER LOBE

APICAL SEGMENTS - The patient should lie prone with the head turned to one side, his arms relaxed in a comfortable position by the side of the head and a pillow under his hips.

ANTERIOR BASAL SEGMENTS - The patient should lie flat on his back with the buttocks resting on a pillow and the knees bent; the foot of the bed should be raised 46cm (i8in) from the ground. The chest is tilted to an angle of 20°

POSTERIOR BASAL SEGMENTS - The patient should lie prone with his head turned to one side, his arms in a comfortable position by the side of the head and a pillow under his hips. The foot of the bed should be raised 46cm (i8in) from the ground. The chest is tilted to an angle of 20°.

MEDIAL BASAL (CARDIAC) SEGMENT - The patient should lie on his right side with a pillow under the hips and the foot of the bed should be raised 46cm (i8in) from the ground. The chest is tilted to an angle of 20°.

LATERAL BASAL SEGMENT - The patient should lie on the opposite side with a pillow under the hips and the foot of the bed should be raised 46cm (8inch) from the ground. The chest is tilted to an angle of 20°

3.1.12: LYMPHATIC OBSTRUCTION (LYMPHEDEMA)

INTRODUCTION

Lymphatic obstruction is a blockage of a lymph vessel that drains fluid and immune cells from tissues throughout the body. An obstruction could cause an impaired contraction of the collecting lymphatic's, causing lymphedema which is a build-up of lymph fluid in the soft tissue. Lymphedema has been classified into grades of severity by the International Society of Lymphology.

ASSESSMENT

- Vital Signs
- Chest pain

- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Pulmonary function test (PFT)
- Activity limitation
- Physical examination (Pain, limb length, numbness, skin integrity, ROM, edema, cramp, limb circumference, posture, gait, QOL e.t.c)

MANAGEMENT

NB: Any underlying condition should be managed first. Practice pattern H in the Guide to Physical Therapy can help guide your interventions with lymphedema and the complications.

- Manual lymph drainage
- Short/low stretch Compression garment wear
- Skin Hygiene and care Exercise to improve cardiovascular health
- Patient education (instruction in proper diet to decrease fluid retention and how to avoid injury and infection, anatomy, and self-bandaging).
- Compression pumps
- Psychological and emotional support

Complex Decongestive Therapy:

- Phase one:
    - Skin care
    - Light manual massage (manual lymph drainage)

- ROM
- Compression (multi-layered bandage wrapping, highest level tolerated 20-60 mm Hg)

- Phase two:

  - Compression by low-stretch elastic stocking or sleeve
  - Skin care
  - Active free exercise
  - Light STM as needed

Contraindications for compression include arterial disease, painful post-phlebitic syndrome, and occult visceral neoplasia.

3.1.13: MYOCARDIAL INFARCTION (MI)

INTRODUCTION

A Myocardial Infarction (MI) occurs when an area of the heart does not receive enough blood flow and is subsequently damaged or dies. MI is commonly referred to as a heart attack and is always a medical emergency.

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation

- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Chest, neck and jaw pain
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Assess the emotional needs of the patient

MANAGEMENT

INPATIENT CARDIAC REHABILITATION

PHASE ONE: THE ACUTE PHASE

- Cardiac rehabilitation to starts soon after a cardiac event.
- Interdisciplinary management.

DISCHARGE PLANNING

Appropriate discharge information should include:

- Assessment for discharge. Referral to outpatient cardiac rehabilitation
- Written and verbal Patient's education
- Home exercise program
- Disease process
- Medications
- Pain management
- Discharge instructions

- Pertinent topics related to recovery
- Contact details for local community resources including patient support groups

PHASE TWO: THE SUB-ACUTE PHASE

- monitor patient's cardiac responses to exercise and activity (RPE). Education about proper exercise procedures

OUTPATIENT CARDIAC REHABILITATION

- Evaluate patients progress and plan.

OUTCOME MEASURES

ACRA –Practitioner's Guide to Cardiac Rehabilitation.

Graduated Physical activity.

- Include a supervised group or individual program, including a warm-up and cool-down period, and catering for the individual needs and capacities of each patient.
- Resistance training as appropriate
- Individual review of a physical activity program on a regular basis
- Instruction in self-monitoring during physical activity e.g. chest pain, breathlessness, palpitations.
- Development of an action plan by patient and carer to ensure early response to symptoms of a possible heart attack.

PHASE THREE: OUTPATIENT THERAPY

- Patient exercises on her/his own

- Group exercises
- Rating of perceived exertion (RPE) by the patient
- The Physiotherapist monitors patients progress
- Patient tailored home program

PHASE FOUR: INDEPENDENT ONGOING CONDITIONING

Independent exercise and conditioning is essential to maintaining optimal health and preventing possible future cardiac problems.

- Monitoring and evaluation

  Fundamental to the process of quality improvement is the "Plan, Do, Check, Act" cycle in which plans and activities are constantly reviewed to assess the degree to which anticipated outcomes have been achieved.

3.1.14: CHRONIC ARTERIAL INSUFFICIENCY

INTRODUCTION

Atherosclerosis is the most common cause of chronic arterial occlusive disease of the lower extremities. The arterial narrowing or obstruction that occurs as a result of the atherosclerotic process reduces blood flow to the lower limb during exercise or at rest.

ASSESSMENT

- Vital Signs
- Chest pain

- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Skin for ulceration
- Exercise tolerance /Intermittent claudication (pain)

MANAGEMENT

- Minimize or prevent potential impairments
- Correct impairments or functional limitations currently affecting functional capabilities
- Interdisciplinary approach
- Improve exercise tolerance Relieve pain
- Prevent skin ulcerations
- Improve vasodilatation in affected arteries
- Prevent or minimize joint contractures and muscle atrophy, particularly if the patient is confined to bed
- Promote healing of any skin ulcerations that develop
- Patients education

- Regular, graded aerobic conditioning program of walking
- Positioning Proper care and protection of the skin, particularly the feet or hands
- Proper nail care
- Proper shoe selection and fit
- Avoid use of restrictive clothing
- Avoid exposure to extremes of temperature
- Vasodilation by iontophoresis
- Vasodilation by reflex heating

3.1.15: SPINAL CORD INJURIES (THORACIC REGION)

INTRODUCTION

T-1 through T-5 nerves affect muscles, upper chest, mid-back and abdominal muscles. These nerves and muscles help control the rib cage, lungs, diaphragm and muscles that help you breathe.

T-6 through T-12 nerves affect abdominal and back muscles. These nerves and muscles are important for balance and posture, and they help you cough or expel foreign matter from your airway.

General Effects of Injury to Thoracic Nerves

Thoracic Nerve Section	Area of Body Affected
T-1	Hands and fingers
T-2 – T-5	Chest muscles
T-6 – T-8	Chest and abdominal muscles
T-9 – T-12	Abdominal muscles

ASSESSMENT

- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc.)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Reported pain mechanism in the thoracic spine
- Dangerous mechanism e.g. falls from a height
- Pre-existing spinal pathology, osteoporosis due to steroid use
- Abnormal neurological symptoms e.g. paraesthesia, weakness

MANAGEMENT

Monitoring

- Monitor for the signs and symptoms of respiratory problems and take appropriate action.
- Measure vital capacity routinely in the patient with upper spinal cord injury and take appropriate action if falling.
- Alert medical staff if vital capacity falls to 1 litre or less.

Positioning

- Supine position to maximise vital capacity.
- The head-up 30° position for improving pulmonary function.
- The head-down position should only be used where there is a demonstrable need and only with extreme caution.
- Any patient, especially those with early spinal cord injury, should be carefully monitored for signs of hypoxaemia in head-down positions.
- Take comorbidities and contraindications and precautions to head-down tilt positions into account.

Abdominal binders

- Assess the effect of an abdominal binder for upright sitting where improvement in either vital capacity or respiratory muscle function is required.
- Patients using non-elastic binders should be monitored closely.
- When using an abdominal binder, the optimal position for the individual patient should be determined.

Management of cough and airway secretions

Assisted coughing

- Try manually assisted coughing for patients with an ineffective cough.
- The upright seated position should be considered initially.

Mechanical insufflation–exsufflation

- Mechanical insufflation–exsufflation should be considered for individuals with upper spinal cord injury, if simpler techniques fail to produce an adequate effect.

- Where cough effectiveness remains inadequate with mechanical insufflation–exsufflation alone, combine it with manually assisted coughing.

Functional electrical stimulation

- Consider electrical stimulation of the abdominal muscles as a possible means of enhancing lung volumes and cough effectiveness.

Exercise

- AROM, AAROM, PROM, exercises

Breathing exercises

Respiratory muscle training

- Inspiratory muscle training
- Training of the accessory muscles of respiration with progressive loading

3.1.16: NEUROMUSCULAR DISEASE (THORACIC REGION)

INTRODUCTION

Neuromuscular disease affects the nerves that control voluntary muscles and the nerves that communicate sensory information back to the brain. Nerve cells (neurons) send and receive electrical messages to and from the body to help control voluntary muscles. Neuromuscular disorders can be inherited or caused by a spontaneous gene mutation while some maybe caused by immune system disorder.

ASSESSMENT

- Vital Signs
- Chest pain

- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Physical assessment
- Muscle integrity
- ROM
- Balance, coordination and proprioception
- Respiratory function
- GIT function
- Neurological assessment.

MANAGEMENT

- Airway clearance techniques
- Glossopharyngeal breathing
- Teaching glossopharyngeal breathing

- Manually assisted coughing
- Manually assisted coughing
- Abdominal thrusts should be performed standing in front of the patient where possible to assist communication.
- Mechanical insufflation–exsufflation:
    - Mechanical insufflation–exsufflation should be considered for individuals with upper spinal cord injury, if simpler techniques fail to produce an adequate effect.
    - Where cough effectiveness remains inadequate with mechanical insufflation–exsufflation alone, combine it with manually assisted coughing.
- Intrapulmonary percussive ventilation
    - In patients with ineffective cough, assisted cough strategies must be used additionally to increase cough effectiveness.
    - Close monitoring of Patients for adverse response.

3.1.17: VENOUS INSUFFICIENCY

INTRODUCTION

Venous insufficiency is a fixed venous outflow disturbance of the limbs as a result of a malfunctioning venous system.

ASSESSMENTS

- Doppler
- Ultrasonography

- Venography
- Radiograph
- Physical assessment

ASSESSMENT

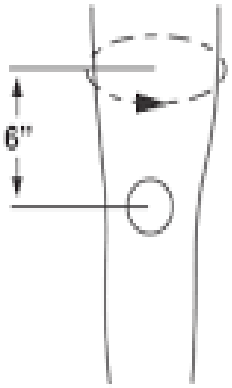
- Vital Signs
- Chest pain
- Inspection (Chest expansion, symmetry. Pattern, atrophy etc)
- Palpation
- Percussion
- Auscultation
- Shortness of Breathlessness (SOB)
- Duration of Cough with or without expectoration
- Sputum amount and color
- Continence status
- Posture and gait
- Activity limitation
- Pulmonary function test (PFT)
- Skin for ulceration

- Exercise tolerance /Intermittent claudication (pain)

MANAGEMENT

- Lifestyle modifications (weight loss, diet, exercise, leg elevation, elastic compression stockings (ECS))
- Compression therapy
    - Graduated ECS with higher pressure at the ankle
- Knee-length stockings are as effective as thigh-length stockings,
- Stockings with 30 to 40 mm Hg compression pressure
- Unna boot (50-60 mm Hg pressure)
- Multilayer bandages (40 mm Hg pressure)

COMPRESSION STOCKINGS MEASUREMENT



SIZE	INCHES	CM
S	14.8-17.2	37-43
M	17.2-19.6	43-49
L	19.6-22	49-55
XL	22-24.4	55-61
XXL	24.4-26.8	61-67

Measure circumference around mid thigh - approx. 6 inches above knee

SECTION FOUR

4.0: PAEDIATRICS

4.1.1: CEREBRAL PALSY

INTRODUCTION

Group of non-progressive, motor (mainly) impairment syndromes secondary to lesions or anomalies of the brain from the foetus to around 2 years of age. Its manifestations can change over time with growth, development and maturation. Can have defects in sensation, cognition, seizure, GI/GU problems, etc. The condition is classified into;

- Diplegic
- Hemiplegic
- Dyskinetic (Athetoid)
- Quadriplegic

ASSESSMENT

History

- Pregnancy and birth history e.g. infections, excessive morning sickness, severe emotional stress, delivery complications and interventions)
- Family Health History
- Social History
- Learning & Developmental History
- Persistence of Primitive Reflexes
- The Moro Reflex

- The Rooting Reflex
- The Palmar Reflex
- Asymmetrical Tonic Neck Reflex (ATNR)
- Tonic Labyrinthine Reflex (TLR)
- Spinal Galant
- Symmetrical Tonic Neck Reflex (STNR)

Systems review

- **Neurological assessment**
  - Tone assessment
  - Tendon reflexes
  - Primitive reflexes
  - Motor function
  - Gait assessment
  - Sensation,
  - Balance
- Posture evaluation in all positions
- Musculoskeletal system
  - Range of Motion
  - Muscle performance (Manual muscle testing, Contracture, Subluxations)
- Bladder & bowel functions
- Gastrointestinal system
- Integumentary (Braden scale)
- Functional level assessment

MANAGEMENT

- Tone management (Decrease exaggerated tone and stimulate normal tone)

N.B. Due to a wide range of factors that may trigger spasticity in each particular patient, triggers for each patient must be recorded.

- Muscle Strength Training and Regaining/maintenance of ROM

N.B. Physiotherapist must be cognizant of the elements essential for more normal movement in CP i.e.

- Postural tone
- Reciprocal innervation
- Sensory-motor feedback and feed-forward
- Balance reactions
- Biomechanical properties of muscle
- Improvement in ADL
- Provision of assistive technology
  - Wheeled mobility
  - Adjuncts to wheeled mobility like wheelchair glove, ramps Home modification
  - Provision of splints and orthoses to improve function
- Performance of Specific Functional Tasks: Elements Needed to Achieve Level 4
  - Achieve control and strength of antagonists and agonists
  - Reciprocal activities in muscles
  - Active voluntary movement and control of the joint and limb
  - Specific functional tasks will need specific training pertaining to the task to be successful
  - Increased Independence and Improved Quality of Life
  - Include psychosocial support and education to parents/guardians as part of management

OUTCOME MEASURES

- Child Health Questionnaire (CHQ)
- Paediatric Outcomes Data Collection Instrument (PODCI)
- Health-Related Quality of Life (HRQL)
- Measures that help assess the relationship between environment and participation and quality of life, e.g. Parenting Stress Index, Strength and Difficulties Questionnaires, Kidscreen.

4.1.2: ARTHROGRYPOSIS MULTIPLEX CONGENITA

INTRODUCTION

Arthrogryposis Multiplex Congenita (AMC) is a condition that causes a newborn to have stiff, crooked, and contracted joints at birth that causes a loss of range of motion in more than one joint (hands, feet, hips, knees, elbows, shoulders, wrists, fingers, toes, the jaw and the spine). This lack of joint mobility is often accompanied by fibrous ankylosis, which is an overgrowth or proliferation of tissue in the joint. AMC is a non-progressive condition that is diagnosed at birth. The primary impairments of children diagnosed with AMC are decreased joint movement and decreased muscle strength and bulk.

ASSESSMENT

- Pregnancy and birth history (Infants born to mothers affected with myotonic dystrophy, myasthenia gravis, or multiple sclerosis are at risk. Maternal fever of more than 39°C for an extended period or maternal hyperthermia can cause contractures due to abnormal nerve growth or migration)
- Family & Health History (presence of hyperextensibility, dislocated joints, dislocated hips, and clubfeet in other family members)
- Learning & Developmental History

Physical examination

- Extremity joint range of motion mostly affected.
- Muscle bulk assessment (risk of continued atrophy)
- Deformities
- Joint dislocations
- Neurological examination (Sensation and tendon reflexes)
- Muscle flexibility (Contractures)
- JROM (Extremities, spine and jaws)
- Skin integrity
- Posture assessment
- Gait assessment

MANAGEMENT

GOALS

- Education and advice to parents, caregivers, on the condition and the expected prognosis.
- Maintain maximum function and independence
- Improving joint motion
- Prevent further muscle atrophy

INTERVENTIONS

- Gentle joint manipulation
- Management of removable splints for the knees and feet to assist in permitting regular muscle movement
- Management of orthotics that can assist in gait and independence for children with AMC
- Serial casting of contracted joints

- Strengthening the patient's muscles, specifically the hip extensors, quadriceps, and shoulder depressors.
- Stretching of joint and muscle contractures assists in promoting active muscle use to avoid immobilization.
- Assist parents in initiating a stretching program for the family to do at home. It is recommended that stretching be done 3-5 times a day with 3-5 repetitions per set, with each stretch being held 20-30 seconds
- Aquatic therapy
- Hippotherapy
- Education on assistive device
- Dynamic strengthening of the trunk
- Ambulation either independently or with an assistive device

NB: Specifically, in infants' physiotherapy can include:

- Gross motor skills (rolling, sitting, crawling, standing, walking, etc)
- Foot abduction braces,
- Thermoplastic serial splinting
- Position activities such as stretching the hip flexors and prone positioning
- Standing in a standing frame/stander.

4.1.3: DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH)

INTRODUCTION:

The condition is also known as a congenital hip dislocation. It is a collective term for a spectrum of anatomical abnormalities of the hip joint like dislocation or inadequate joint development nearly always diagnosed within the first two years of life. In the joint the articulating bones are displaced which leads to separation of the joint surfaces. There is also a chance that the dislocation is bilateral.

ASSSESSMENT

- Relevant history (Family, pregnancy, delivery, environmental difficulties)
- Assess symmetry in ipsilateral cases (Check for asymmetric thigh or buttock creases)
- Hip stability (Ortolani and Barlow tests)
- Leg length discrepancy
- JROM particularly the hip joints
- Muscle integrity (Length and bulk)

MANAGEMENT

NB: The younger the child, the better the prognosis following physiotherapy.

- At younger than 6 months, the "Pavlik harness" brace is used to hold the hip in the correct position.
- Over time the joint begins normal formation. About 90% of the newborns treated by de Pevlik harness will recover fully. A Frejka Pillow may also be used for positioning.
- When the child is older than 6 months the Pevlik harness may not be successful. In that case a surgeon will place the hip in the proper position under anesthasia.
- Once in this position the child will be placed in a spica cast. The spica cast is similar to the Pevlik harness but allows less movement.
- Regular, low- or non-impact exercise such as swimming, aquatic therapy or cycling train strength and range of motion.
- Weight reduction for that are overweight can significantly reduce the stress on the hip and reduce pain.
- Education on posture correction will lead to a decrease of tress on the joint.
- Introduce play specific activities such as kicking, balance beam activities.
- Gait training on stairs and unlevelled terrain
- Sensory integration

4.1.4: DUCHENNE MUSCULAR DYSTROPHY

INTRODUCTION

Duchenne muscular dystrophy (DMD) is a genetic condition which affects the muscles, causing muscle weakness. It is a serious condition which starts in early childhood. The weakness develops gradually, usually noticeable by the age of three. Symptoms are mild at first but become more severe as the child gets older.

ASSESSMENT

- Relevant History
- Observation for signs and symptoms (Progressive muscle weakness, difficulty sitting and standing independently, History of frequent falls, walking on toes, difficulty climbing stairs
- Creatine kinase, or CK, test
- DNA analysis of mutation in blood cells
- Developmental milestones and ambulatory status
- Functional activities and ADL'S
- Posture and spine assessment
- JROM
- Muscle strength
- Pain / fatigue (Fatigue Severity Scale)
- Respiratory function
- Neurological examination (tone, sensation and reflexes)
- Endurance (6minutes walking test)
- Performance of upper limb.

OUTCOME MEASURES

- 6-minute walking test

- North Star ambulatory assessment scale
- Time taken to climb four steps
- Time taken to rise from the floor

MANAGEMENT

GOALS

- Educate and advice on how to adapt to changes in activity limitations
- Training of gross motor skills such as rolling, crawling and walking, and maybe running, jumping and hopping.
- Encouraging of activities that do not cause extreme fatigue.
- Maintain normal respiratory function and prevent chest complications

INTERVENTIONS

- Regular stretches
- Encourage AROM activities (fatigue free) and use assistance and passive mobilization as applicable
- Swimming and hydrotherapy
- Use of orthoses (splints) at night to slow down contractures in the ankles
- Physical activities to promote cardiovascular fitness.
- Mobility aids and accompaniments
- Train on functional activities
- Proper positioning
- Breathing exercises
- Counter contracture positioning.

4.1.5: ERB'S PALSY

INTRODUCTION

It is a lesion of C5 & C6 nerve roots (in some cases C7 is involved as well) usually produced by widening of the head shoulder interval. Injuries to the brachial plexus affects movement and cutaneous sensations in the upper limb. Depending on the severity of the injury, the paralysis can either resolve on its own over a period of months, require rehabilitative therapy or surgery.

ASSESSMENT

- History
- Child presentation during delivery
- Injury post-delivery
- Use of assistive techniques such as forceps to aid delivery
- Functional movements
- Muscle power
- Sensation and reflexes- Moro reflex is absent on the affected arm.
- Presence of an extra rib.

MANAGEMENT

GOALS

- Prevention or reduction of joint contractures
- Maintain or improve muscle strength
- Promote movement and play
- Encourage participation— (first in the family, and later, in the community)

INTERVENTIONS

- Education on holding, carrying, and play
- Prevention of injury. Explain the possible injuries that could occur unconsciously due to loss of sensation.
- Passive and active exercises.

- Electrical stimulation (TENS) –age dependent
- Constraint-induced movement therapy (CIMT) age dependent
- Repetitive training:
- Improving developmental skills:
- Fostering physical fitness.
- positioning/ immobilization
- Specific splints
- Aeroplan splint

OUTCOME MEASURES

- Toronto test score
- Active movement scale
- Mallet scale
- Toddler Arm Use Test

4.1.6: CLUBFOOT

INTRODUCTION

Clubfoot/ Congenital Talipes Equinovarus (CTEV), is characterized by complex, malalignment of the foot involving soft and bony structures in the hind-foot, mid-foot and forefoot. At the subtalar joint, the foot is held in a fixed equinus, or downward pointing position. The foot affected by clubfoot is shorter, and the calf circumference is less than a normal, unaffected foot.

ASSESSMENT

- Check for other neuromuscular abnormalities e.g. spina bifida

- Cervical spine, head and face for signs of torticollis or facial features that may indicate a syndrome
- Full check from top to base of spine (child in prone) for any abnormality, particularly spina bifida
- The hips for any sign of Development dysplasia of the hip
- Both lower limbs including limb length, range of movement, tone and deformity.
- The local foot assessment will follow the CAVE acronym model i.e. Cavus, Adductus, Varus, and Equinus.

OUTCOME MEASURE

- The Pirani Score

MANAGEMENT

- Ponseti technique

NB: Refer to the orthopaedic surgeon any clubfoot that has not been managed for 2 years or insufficiently managed clubfoot

4.1.7: SPINA BIFIDA

INTRODUCTION

Spina Bifida is defined as "a neural tube defect" (NTD) that results when the inferior neuro-pore does not close. Developing vertebrae do not close around an incomplete neural tube, resulting in a bony defect at the distal end of the tube. The following three types exist. Spina Bifida Occulta, Meningocele and Myelomeningocele

ASSESSMENT

Cardio-respiratory system

- Vital signs
- Respiratory function

Neurological assessment

- Developmental milestones
- Tone assessment
- Deep Tendon reflexes
- Babinski (UMNL)
- Hoffman (UMNL at or above cervical spinal cord)
- Clonus (long standing UMNL)
- Primitive reflexes
- Gait assessment (Depending on patients' presentation)
- Sensation
- Balance
- Posture

Musculoskeletal system

- Strength: position young child against gravity or MMT for older children
- Range of Motion (Goniometry)
- Contractures
- Subluxations

Bladder & Bowel functions

- Incontinence & Retention

Gastrointestinal system

- Status: Swallowing, Salivation, vomiting, Abdominal pains, chronic constipation/Diarrhea

Integumentary

- Braden scale

OUTCOME MEASURES

- Pediatric Evaluation of Disability Inventory (PEDI)
- Functional Independence Measure for Children (WeeFIM)
- Functional Independence Measure (FIM)
- Ages and Stages Questionnaires (ASQ)
- Vineland Adaptive Behavior Scale-II
- Pediatric Symptoms Checklist (PSC)
- Life Satisfaction Questionnaire 9 (LSQ-9)
- Pediatric Quality of Life Inventory (PEDS QL)
- Pediatric Outcomes Data Collection Instruments (PODCI
- Craig Hospital Inventory of Environmental Factors (CHIEF)

MANAGEMENT

GOALS

Across the lifespan, rehabilitation of spinal bifida will be in three phases:

- Primary: Increase or maintain the amount of daily physical activity participated in at the different age levels.
- Secondary: Increase knowledge and awareness of physical activity (i.e., benefits, safety, what/how to do it)
- Tertiary: Improve health outcomes through physical activity participation across the lifespan (holistically maintenance of function, prevent secondary conditions, mental health)
    - Bowel and bladder control
    - Prevent pressure sore

INFANCY

Provide guidance to parents about how to encourage movement and activity in their infant.

- Inform parents of their child's rights to early intervention services that include

TODDLER

- Educate parents on the importance of involving toddlers with SB in formal and informal recreation, physical activity, and social programs/services where they can be actively engaged with their disabled and non-disabled peers. Include the role of PA in mental and physical health, importance of parental modeling etc.

PRE-SCHOOL

- Discuss strategies that balance the parent's involvement with their child's need for independence to participate in physical activity.
- Use an interdisciplinary team approach to ensure kids have properly fitting mobility equipment to maximize physical activity participation.

SCHOOL AGE

- Educate child on role of individual and group PA programs for better QOL and prognosis
- Educate parents to assess most suitable and comfortable environment for the child to participate in PA.

TEENAGE

- Educate teens with SB on the importance of reducing sedentary behaviors and participate in PA among peers.

ALL CHILDREN & TEENS:

- Aerobic activity should make up most of the youth's activity each day; vigorous intensity aerobic activity should be done at least 3 days/week for 30min each or 25 min 5 days/week.
- Muscle strengthening activities should be done at least 3 days/week as part of the 60 or more minutes
- Identify strategies to minimize risks of illness and injury related to participation through activity adaptations and safety precautions.
- Recognize and reduce child, family, and societal barriers to the participation of youth with disabilities in physical activity and sports.

WHEELCHAIR STAGE

- Regular stretches to minimise the development of contractures
- Use of ankle splints when sitting in wheelchair
- Strengthen upper limbs
- Using a standing frame to enhance weight bearing
- Prone lying to discourage contracture patterns
- Swimming, hydrotherapy
- Use of orthoses.

ADULT

- Continued physical activity
- Muscle-strengthening activities on 2 or more days a week

4.1.8: JUVENILE RHEUMATOID ARTHRITIS

Juvenile Idiopathic Arthritis (JIA), formerly Juvenile Rheumatoid Arthritis (JRA) is a chronic inflammatory disorder that occurs before the age 16 and can occur in all races. The

subcategories are: Pauciarticular/Oligoarthritis JIA, Polyarthritis JIA (positive RF & negative RF). Systemic onset JIA, Psoriatic JIA, Enthesitis-related arthritis and undifferentiated arthritis. JIA is an autoimmune disorder that is classified based on the number of joints involved/affected and the presence of other signs and symptoms.

ASSESSMENT

History of symptoms

- Pain (may be detected as early as at 2years)
- Reported episodes of swelling
- Fatigue and fever can easily be mistaken for other conditions
- History of Morning stiffness

Physical Assessment

- Vital signs
- Gait assessment
- JROM
- Strength
- Functional/ADL activities
- Levels of physical activity and endurance
- Assessment of motor skills

MANAGEMENT

- Encourage an active lifestyle with their peers and friends through e.g. recreational sporting. Monitor pain.
- Pain management
  - Nsaids
  - Ultrasound
  - Paraffin wax dips
  - Moist compress (hot pack)
  - Hydrotherapy (warm)

- Cold packs in case of acute inflammation

- Exercise therapy
  - Strengthening exercises (AROM, AAROM or PROM)
  - Range of motion (stretching Exercise-Monitor pain)
  - Education on joint protection –use of braces
  - Education on pain reducing techniques (Active free exercises and RICE)
  - Muscle relaxation techniques (STM)
  - Splints or orthotics maybe be beneficial to help maintain normal bone and joint growth/prevent deformities during growth

4.1.9: OSTEOGENESIS IMPERFECTA

INTRODUCTION

Osteogenesis imperfecta (OI) is a rare genetic disorder of the synthesis of collagen that affects bone and connective tissue that can also be referred to as brittle bone disease. OI can occur by both inheritance and spontaneous genetic mutation and has been linked to over 150 genetic mutations that all take effect on the genes COL1A1 and COL1A2. There are four primary types of osteogenesis imperfecta that are described by the Sillence Classification of Osteogenesis Imperfecta.

ASSESSMENT

- **History**
  - Pregnancy (prenatal screening ultrasonography performed during the second trimester may show bowing of long bones, fractures, limb shortening)
  - Family history of spontaneous fractures
  - History of spontaneous fractures

- **Physical assessment**
  - Joint pain
  - Limb discrepancies
  - Body height (sometimes compared to normal family members and to milestones during infancy)
  - Exercise tolerance (usually reduced)
  - Muscle strength (usually reduced)
  - Spinal and extremity deformities
  - Hearing loss.
  - Possible contractures

MANAGEMENT

- **Pain management (with age consideration)**
  - Ultrasound
  - Paraffin wax dips
  - Moist compress (hot pack)
  - Hydrotherapy (warm)
  - Cold packs in case of acute pains
- **Exercise therapy**
  - Muscles Strengthening exercise (AROM or AAROM)
  - Passive mobilization exercises. The spine and the large extremity joints prime movers should be given more attention.
  - Aerobic exercises to maintain cardiovascular fitness, mental alertness, improved sleep, etc.
  - Posture education and correction
  - Positioning–Pain free and counter contracture positions should be encouraged.
  - Adaptation of ambulation devices that are safe and beneficial to the patients.

- **Gross Motor Function Classification System**
  - Level 1: walks with no restrictions, limited in more advanced gross motor skills
  - Level 2: walks with no assistive devices, but limitations walking out- doors and the community
  - Level 3: walks with assistive devices, limitations walking outdoors and community
  - Level 4: self-mobility with limitations, children need transport or powered mobility in outdoors or the community
  - Level 5: self-mobility is severely limited.
  -

SECTION FIVE

5.0: ONCOLOGY

5.1.1: BREAST CANCER

INTRODUCTION

Breast cancer begins in the cells of the breast. Malignant tumour grows and destroy nearby tissue and may metastasize to other parts of the body. However, not all cell growth in breast tissue is malignant. Benign conditions such as atypical hyperplasia, cysts, and non-cancerous tumours such as intraductal papillomas can form.

ASSESSMENT

Diagnostics

- Mammogram
- Ultrasound
- MRI
- Biopsy
- HER2/neu Test

Physical assessment

- Pain levels
- Respiratory assessment
- Swelling
- Quality of life
- Physical impairments

- Functional limitations
- Postural assessment
- Participation restriction

MANAGEMENT

GOALS

- Reduce pain
- Reduce swelling
- Improve functional activities
- Education
- promote and support physical activity

MANAGEMENT

Physiotherapy treatment should be prescribed based on the individual's needs

PRE-OPERATIVE

- To prepare the patient and family
- Patient education
- Endurance exercises
- Chest physiotherapy
- Elevation of the affected arm

POST-OPERATIVE

- Chests physiotherapy
- Pain Management (mobilization, lymph drainage)
- Soft tissue and joint mobilizations

- Range of motion exercises
- Strengthening exercises
- Functional training
- Elevation
- Deconditioning and endurance training
- Balance exercise

CUIDATE PROGRAM		
	Week 1-4	
Material	Small soft balls, mats and fit balls	
Endurance program	Unspecific work during sessions	
Exercise program	**Content**	**Dosage & progression**
	Half squat with arm movement Standing rows with legs semiflexion Wall push up Abdominal with lower limb movement All tour with hips & knee movement Abdominal with adductors isometric contraction & arm movement Standing hip circumduction Supine on fit-ball with arm movement	Week 1: Learning proposal, assessment maximum load Week 2-3: 75% maximum load Increase 5% per week Continue progression between exercises 2 sets/30sec pause Week 4: 75% maximum load, increase sets (3sets) Maximum velocity execution exercises Increase ROM

	Superman on fit-ball Oblique partial sit up	
	Week 5-8	
Material	Fit-balls, elastic band, mats & small soft balls	
Endurance program	10-25min of fast working with arm movements 2 days per week	
Exercise program	Content	
	Chest press on fit- ball with elastic band Squat with elastic band Seated rows on fit-ball with elastic band Isometric abdominal seating on fit-ball with arm and leg movement Biceps curl on fit-ball with elastic band Biceps curl on fit-ball with elastic band and leg in semiflexion	Week5: 10-12 repetitions x 2 sets Week 6: 12-15 repetitions x 2 sets Week 7: 10-12 repetitions x 3 sets Week 8: 10-12 repetitions x 2 sets Increase resistance with elastic band and positions that require more body control

	Leg curl with fit ball Sit up with lower limb movement	

5.1.2 LYMPHODEMA

INTRODUCTION

Lympohedema is a chronic disease marked by the increased collection of lymphatic fluid in the body, causing swelling, which can lead to skin and tissue changes. The chronic, progressive accumulation of protein-rich fluid within the interstitium (a contiguous fluid-filled space existing between a structural barrier, such as a cell wall or the skin, and internal structures, such as organs, including muscles and the circulatory system) and the fibro-adipose tissue exceeds the capacity of the lymphatic to transport the fluid.

ASSESSMENTS

- History
- Physical examination
- Limb circumference
- Limb volume
- Bio-impedence spectroscopy

MANAGEMENT

Treatment is performed 5 days per week for a few weeks

- Manual lymph drainage
- Short-stretch
- Medical compression bandaging
- Therapeutic limb exercises
- Skin care

5.1.3: LUNG CANCER

INTRODUCTION

This is the uncontrolled growth of abnormal cells in the lungs cells division that forms in tissues of the lung, usually in the cells lining air passages. The two main types are small cell lung cancer and non-small cell lung cancer.

ASSESSMENT

- Pain
- Swelling
- Respiratory system
- Lung function test
- ROM
- Functional activities
- Quality of life

MANAGEMENT

Pre-operative

- Patient education
- Agility exercises

- Breathing exercises
- ROM

Post-operative

- Pain management (TENS, ROM, STM, Manipulation)
- Exercise (aerobic exercise & resistance exercise)
- Chest physiotherapy
- Positioning
- Skin care
- Mobilization
- Home program
- Education

5.1.4: SPINAL CORD TUMORS

INTRODUCTION

Spinal cord tumors are benign, or noncancerous that may compress or invade nerves in and around the spinal cord, causing pain, weakness in the arms and legs, or loss of bowel or bladder control.

ASSESSMENT

- Sensation (deep, superficial & cortical)
- Muscle tone (Muscle groups)
- Muscle power (muscle group)
- Reflexes Coordination: (Non-Equilibrium test & Equilibrium test)

- Balance
- Posture
- Gait
- Function activities
- Assistive devices (fitting)
- Muscle Girth
- Voluntary Control
- Range of Motion
- Limb Length

Outcome Measures

- Functional Independence
- Spinal Cord Independence
- Barthel Index
- Craig Handicap and the CHART
- Clinical Outcomes
- PULSES
- Spinal cord lifestyle scale

MANAGEMENT

- Exercise to strengthen weak muscles (Active assisted exercises, Free active exercises, resisted exercises)
- Positioning
- Electrical nerve stimulation
- Stretches
- Balance training
- Train transfer

- Mobilisation exercises
- Advice on effective positioning
- Advice on orthotic devices and walking aids.
- Hydrotherapy.

5.1.4: PROSTATE CANCER

Prostate cancer is slow growing tumour and which commonly metastasizes, spreading to bone, with fairly high mortality rate. The microscopic changes that occur in the prostate can be slow growing and may never cause health issues and often cause no signs or symptoms. A variation in the rate of prostate cancer progression and spreading suggests genetic involvement along with familial predisposition and diet.

ASSESSMENT

- Pain
- Respiratory assessment
- Swelling
- ROM
- Neurological assessment
- Functional activities
- Continence

MANAGEMENT POST-SURGERY

GOALS

- Reduce pain
- Facilitate clear chest

- Reduce swelling
- Increase ROM
- Managing incontinence
- Improve functional activities

INTERVENTION

- Chest physiotherapy
- Aerobic training
- strengthening exercises
- STM
- Elevation particularly of lower limbs
- Compression
- Pelvic-Floor Exercises
- Early ambulation
- Education

Pre-operative

- Patient education
- Agility exercises
- Breathing exercises
- ROM

Post-operative

- Pain management (ROM, STM, Manipulation)
- exercise (aerobic exercise & resistance exercise)- pelvic floor exercises
- electrical stimulating currents
- Chest physio

- Positioning
- Skin care
- Mobilization
- Education

5.1.5: COLORECTAL CANCER

Colorectal cancer (CRC) is a rapid abnormal cell growth that affects the large intestines and/or rectum. These clusters of cells (adenomatous polyps) develop from the tissue membrane of glandular tissue. Polyps can start as benign and non-cancerous but with time can develop and become cancerous

ASSESSMENT

- Pain
- Respiratory assessment
- Swelling
- ROM
- Neurological assessment
- Functional activities
- Continence

MANAGEMENT

GOALS

- Reduce pain
- Facilitate clear chest
- Reduce swelling
- Increase ROM

- Improve functional activities
- Minimizing fatigue
- Optimizing physical function
- Improve bowel habits
- Improve flexibility
- Reduce stress and anxiety
- Minimize depression

INTERVENTION

- Chest physiotherapy (ACBT)
- Aerobic training
- strengthening exercises
- STM
- Elevation
- Compression
- Pelvic-Floor Exercises
- Early ambulation
- Education

Pre-operative

- Patient education
- Agility exercises
- Breathing exercises
- ROM

Post-operative

- Pain management (ROM, STM, Manipulation)
- exercise (aerobic exercise & resistance exercise)
- Chest physiotherapy
- ROM
- Positioning
- Skin care
- Mobilization
- Education

5.1.6: MALIGNANT MELANOMA

INTRODUCTION

Malignant Melanoma is a cancer that begins in melanocytes. Malignant growths may occur following damage to skin cell DNA. If unrepaired, this damage initiates mutations that result in rapid proliferation of skin cells that form malignant tumors.

ASSESSMENT

- Pain
- Swelling
- Respiratory assessment
- Swelling
- ROM
- Neurological assessment
- Functional activities
- Integumentary system

MANAGEMENT

GOALS

- Reduce pain
- Facilitate clear chest
- Reduce swelling
- Increase ROM
- Improve functional activities
- Optimizing physical function
- Improve flexibility
- Minimize depression

INTERVENTION

- Chest physiotherapy
- Aerobic training
- strengthening exercises
- Elevation
- Compression
- Early ambulation
- Education and advice

5.1.7: CERVICAL CANCER

INTRODUCTION

This is a cancer that forms within the tissues of the cervix. Cervical cancer typically grows at a slow rate and presents asymptomatically. Screening can be done through Pap smear for early detection.

ASSESSMENT

- Pain (Mostly Low Back)
- Swelling
- Respiratory assessment
- ROM
- Neurological assessment
- Functional activities
- Integumentary system
- Psychological symptoms

MANAGEMENT

GOALS

- Reduce pain
- Facilitate clear chest
- Reduce swelling
- Increase ROM
- Improve functional activities
- Improve flexibility
- Minimize depression

INTERVENTION

- Chest physiotherapy
- Aerobic training
- strengthening exercises
- Elevation
- Compression
- Pelvic-Floor Exercises
- Early ambulation
- Education about pathology and care

PRE-OPERATIVE

- To prepare the patient and family
- Patient education
- Exercises of the affected arm
- Elevation particularly of the lower limbs
- Chest Physiotherapy

POST-OPERATIVE

- Chests physiotherapy
- Pain management
- Joint mobilizations
- Range of motion exercises
- Strengthening exercises
- Functional training
- Elevation
- Deconditioning and endurance training
- Balance exercise

5.1.8: PALIATIVE CARE

Palliative care is a practice, which involves progressive and life-limiting illnesses such a cancer, chronic obstructive pulmonary disease, motor neurone disease [MND] and multiple sclerosis.

ASSESSMENT

- Pain Levels
- JROM
- Muscle power
- Quality of life (QoL)

MANAGEMENT

GOALS

- To maintain independence
- To optimize and maintain good quality of life (QoL)
- Reduction/control of the consequences of the illness
- Coping mechanisms and self-management
- To avoid secondary complications associated with life-limiting illnesses.
- Psychological support

INTERVENTIONS

- Transcutaneous electrical nerve stimulation (TENS)
- Tolerable endurance activities
- Patient education on transfers

- Inclusion of the family and/or carer in physiotherapy interventions
- Patient education to patient and family/carers, enabling them to adjust and adapt to consequences of the illness

SECTION SIX

6.0: GERIATRICTS

6.1.1: OSTEOPOROSIS

INTRODUCTION

Osteoporosis is a disease characterized by a decrease in bone density (mass and quality). It is a disorder in which bones become increasingly porous and brittle leading to increased risk of fracture. Osteoporosis is a major health threat across the globe. There are two types of osteoporosis: primary and secondary.

ASSESSMENT

- History/ Co morbidities (Cancer and cancer treatment, Chronic renal failure, Osteogenesis imperfect, Rheumatic diseases, Chronic pulmonary disease, Cushing's Disease, Hypothyroidism, Hyperparathyroidism, Type 2 Diabetes Mellitus
- Physical examination
    - Back pain: Episodic, acute low thoracic/high lumbar pain
    - Fractures
    - Decrease in height
    - Kyphosis
    - Dowager's hump
    - Decreased activity tolerance

MANAGEMENT

Physical therapy intervention for individuals with osteoporosis, or even osteopenia:

- Weight-bearing exercises
- Flexibility exercises
- Strengthening exercises
- Postural exercises
- Balance exercises
- **Endurance training**

    - Clinical Considerations

      Metabolic bone diseases result in impaired healing rates, therefore should be considered when determining prognosis

    - Manipulations**:** A strong precaution should be taken before performing manual techniques such as manipulations or joint assessments that may increase an individual's risk for fractures, especially in the spine.
    - Body Weight Supported Treadmill Training**:** It is contraindicated to use body weight supported treadmill training with individuals who have severe osteoporosis or lower extremity, pelvic, or rib fracture. Severe osteoporosis is considered a T-score greater than 2.5.

6.1.2: DECUBITUS OR PRESSURE ULCERS

INTRODUCTION

A pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear that result in ischemia, cell death, and tissue necrosis. A pressure sore can develop in a few hours, but the results can last for many months and even cause death.

ASSESSMENT

Establish the presence of:

- Persistent erythema
- Non-blanching erythema
- Blisters
- Discoloration
- Localized heat
- Localized oedema as per scaling
- Incontinence
- Functional abilities
- Co-morbidities
- Sensation

MANAGEMENT

GOALS

- Reducing pressure ulcers
- Prevent and minimize complications
- Reduce both high-cost and high-volume adverse event resulting from Pressure ulcers.

INTERVENTIONS

- Exercises to prevent contractures
- Train positioning
- Skin hygiene and care

- Early ambulation depending on condition

- Repositioning and Mobility
    - Turn and reposition
    - Determine the frequency for turning based on the support surface and the tolerance of skin.
    - Determine length of time per turning
    - Use heel offloading devices or polyurethane foam dressings on individuals at risk for heel ulcers
    - Place thin foam or breathable dressings under medical devices.
- **Education**

    - Teach the individual and family about risk for pressure injury
    - Engage individual and family in risk reduction interventions.

6.1.3: URINARY INCONTINENCE IN GERIATRICS

INTRODUCTION

Urinary incontinence (UI) is the complaint of involuntary leaking or loss of urine. Prevalence increases with age, making it a considerable public health concern for the elderly The impact of UI on health-related quality of life is substantial, and is associated with comorbid conditions, institutionalization and mortality.

ASSESSMENT

- History (Medical and Obstetrical, voiding, fluid intake)
- Muscle recruitment patterns (pelvic floor muscles)

- Functional ability (undo buttons and zippers, pull down pants, and sit on the toilet, which will depend on hip mobility and upper extremity dexterity and strength).
- Alignment and dynamic stabilization of the low back
- Cognitive aspects
- Neurological assessment
- Gait and balance

MANAGEMENT

- Interdisciplinary team to provide evidence based care.

- Address fear

Pelvic Floor Muscle Training

Pelvic floor muscle training (PMFT) improves both SUI and UUI. PMFT require tightening of the pelvic muscles and holding the contraction for a few seconds, followed by a rest period. PMFT may prevent urgency and UUI by inhibiting and aborting inappropriate detrusor contractions while stimulating the guarding reflex in adults with SUI.

- Train dynamic posture
- Abdominal muscle recruitment patterns
- Train posture
- Biofeedback
- Electrical Stimulation

6.1.4: SLEEP DISORDERS/INSOMNIA IN GERIATRICS

INTRODUCTION

Insomnia is a chronic or acute sleep disorder characterized by a complaint of difficulty initiating, and/or maintaining sleep, and/or a subjective complaint of poor sleep quality that result in daytime impairment and subjective report of impairment". Sleep disturbances are highly prevalent in older adults, with insomnia being the most common sleep disorder.

ASSESSMENT

- History (age, gender e.t.c)
- Medical illness
- Work shifts
- Psychiatric illness
- Quality of life.
- Dissatisfaction with sleep pattern.
- Irritability.

MANAGEMENT

GOALS

- Raise the body temperature
- Increase physical stress to the body and hence the brain
- Increased flexibility with stretching
- Improved lung capacity
- Tone the muscles
- Balanced muscles

Pain treatment

- Breathing Exercises in Sleep Disorders
- Quiet Mind and Body

Focus Attention

Help slow down the mind to encourage sleep, keep patient's attention on the movement of the breath. Instruct patient to make each breathe a little slower and a little deeper. With each exhale, allow the body to feel heavy and sink into the bed.

Relaxation Techniques

Sleep education and empowerment

NB: Exercise is thought to be a safe, efficacious, and cost-saving intervention to promote health and quality of life, and has been used in many studies as an intervention to improve insomnia or sleep.

Music

SECTION SEVEN

7.0: WOMEN HEALTH

7.1.1: POST OPERATIVE CAESAREAN SECTION

INTRODUCTION

Caeserian section also known as C section is the use of surgery to deliver babies. It is necessary where delivery of the baby through the vagina will put the mother at risk although we find some mothers doing it electively.

ASSESSMENT

- Pain
- Surgical wound
- Chest sounds and movement
- Posture
- Gait

MANAGEMENT

GOALS

- To improve pulmonary function and decrease the risk of pneumonia
- To decrease incisional pain with coughing, movement or breast feeding
- To prevent post-surgical vascular or gastrointestinal complications
- To enhance incisional circulation and healing; prevent adhesion formation
- To prevent injury and reduce low back pain
- To correct posture. Particularly regarding child care
- To decrease post-surgical discomfort from flatulence, itching or catheter
- To prevent pelvic floor dysfunction
- To develop abdominal strength

INTERVENTIONS

- Breathing Exercises
- Coughing and / or huffing technique
- Pain management Postoperative TENS
- Incision support with pillow when coughing or breastfeeding
- Gentle abdominal exercise with incisional support
- Active leg exercises.
- Early ambulation.
- Abdominal massage to peristalsis.
- Scar mobilization.
- Friction massage.
- Positioning
- STM.
- Ppositioning for ADLs
- Body mechanics
- Pelvic floor exercises.
- Education regarding risk factors and types of pelvic floor dysfunction.
- Abdominal exercise progression, including corrective exercises for diastasis rectii.

PRE AND POST SURGICAL REHABILITATION

PRENATAL AND POST NATAL CARE

ASSESSMENT

- Posture.
- Low back pain
- Fluid retention
- Blood pressure

- Gestation period

Goal

- Education on pre and post-natal care.
- Advice on exercise
- Maintain correct body posture.
- Management of low back pain
- Pain relief
- Breathing and relaxation
- position and posture,

MANAGEMENT IN PRE NATAL

- Play and spouse inclusion
- Warm baths
- Compression
- STM
- Breathing exercises
- Relaxation program
- Music, dance and distraction
- Transcutaneous electrical nerve stimulation

NB (TENS) can be used in labour. A low-frequency

7.1.2 LUMBOPELVIC PAIN AND DYSFUNCTION

This pain mostly experienced by pregnant women as a result of posture distortion.

ASSESSMENT

- Pain assessment
- Gait and Movement

- Posture assessment
- Musculoskeletal system review

MANAGEMENT

- Posture correction
- Education
- General exercise
- Hydrotherapy
- Adopting comfortable resting positions
- Transfers and ambulation
- Proper ergonomics
- Positions for delivery, breastfeeding, nappy changing, bathing and handling the growing baby

Woman may be advised to:

- Remain active within the limits of pain
- Accept help and involve the spouse
- Rest when needed
- Avoid standing on one leg
- Consider alternative sleeping positions
- Explore alternative ways to climb stairs
- Plan her day
- Avoid activities that involve asymmetrical positions of the pelvis
- Consider alternative positions for intercourse
- Organize hospital appointments for the same day if possible
- Avoid activities which make the pain worse (e.g. vacuuming, pushing a supermarket trolley, lifting heavy weights)
- Comfortable position during labour (for example left-side-lying or kneeling upright with support)

7.1.3 ARTICULAR DYSFUNCTIONS/ MOVEMENT RESTRICTION OF THE SPINE AND PELVIC GIRDLE

INTRODUCTION

This refers to dysfunction spine and pelvic girdle that is caused by abnormal motion in the joint, either too much motion or too little motion. It typically results in inflammation or debilitating.

MANAGEMENT

- Position undertaken with the woman inside lying.
- mobilisation or manipulation techniques
- muscle energy techniques (MET).
  The techniques for treating pregnant woment as a result of posture distortion. It is more in large pregnancies.
  trigger points, strain/ counter strain, positional release,
- Soft tissue manipulation techniques
- Taping to offload overactive muscles.
- sacroiliac/trochanteric belt for sacroiliac and symphysis pubis instability both ante- and postnatally may stabilise the pelvic girdle joints

Muscle re-education

- Abdominal, spinal and pelvic girdle muscle motor control
- Recruitment and strength training of both pelvic girdle stabilizing muscles
- Targeted trunk core stability muscles, plus the hip abductors, adductors, flexors and extensors.
  - Exercise core stabilizers,

7.1.4 DIASTASIS RECTUS ABDOMINIS

INTRODUCTION

It is the postnatal gap between the recti at the level of the umbilicus

PAIN MANAGEMENT

- TENS the current density is kept low, large electrodes are used
- Warm parks
- Side flexion maneuvers away from the pain and manual therapy techniques

7.1.5 NERVE COMPRESSION SYNDROMES

INTRODUCTION

Fluid retention may occur during the third trimester, which can lead to a variety of nerve compression syndromes.

ASSESSMENT

- Pain Levels
- Nerve interphase integrity tests i.e., (Neuro-conduction test)
  - Straight Leg Raise
  - Slump test
- Functional activities
- JROM
- Gait
- Posture

MANAGEMENT

- Wrist splints
- TENS (Post drainage)
- Cryotherapy (15-20 Min).
- Postural advice
- Elevation
- Medical compression stockings

NB: the physiotherapist should work closely with the gynecologist

7.1.6 EXERCISE AND PREGNANCY

Benefits and contraindications

Potential benefits of exercise include:

- Maintenance of cardiovascular fitness
- Maintenance of healthy weight range
- Improvement of body awareness, posture, co-ordination and balance
- Increase in endurance and stamina
- Provision of social interaction with exercise
- Possible reduction in problems during labour and Delivery
- Possible prevention of gestational diabetes
- Reduction in minor complaints of pregnancy
- More rapid postnatal recovery

Contraindications to exercise include:

- Poorly controlled cardiovascular, respiratory, renal or thyroid disease
- Diabetes (type 1, if poorly controlled)
- History of miscarriage, premature labour, fetal growth restriction, cervical incompetence

- Hypertension, vaginal bleeding, reduced fetal movement, anaemia, breech presentation, placenta praevia

Advice

The advice given to regular and non-regular exercisers will differ (examine for exercise safety and prescribe accordingly)

Regular exercisers

- Consultation between the physiotherapist, Physician and midwife before beginning exercise in necessary
- Exercise at a moderate level
- Discontinue contact sports and activities which carry a high risk of falling or abdominal trauma
- Self-regulate both the level of intensity and duration of exercise, aiming to keep core temperature below 38°C
- Aim for low impact activity
- Wear suitably supportive footwear to reduce musculoskeletal stresses
- Maintain adequate fluid intake to prevent dehydration, and avoid exercise during hot and humid weather, or with pyrexia
- Warm-up and cool-down for at least five minutes
- Do not use developmental stretching (because of the effects of relaxin)
- Seek professional advice on specific exercises (e.g. for the pelvic floor muscles).
- Avoid ballistic exercise, low squats, crossover steps and rapid changes of direction.
- Do not exercise in supine after 16 weeks gestation, to avoid aortocaval compression
- Eat to appetite, without calorific restriction

- Work towards cross-training to avoid over-training

Non-regular exercisers

In addition to the above, women not used to regular exercise should be advised:

- Not to start an exercise programme until >13 weeks gestation
- Begin with non-weight-bearing exercises, such as aqua-natal classes;
- Progress from simple and basic levels of exercise, increasing exercise tolerance gradually,

When to stop

NB: All women should stop exercising immediately and seek advice from a doctor if they experience

- Abdominal pain
- Per vaginum (from the vagina) bleeding
- Shortness of breath
- Dizziness
- Fainting
- persistent severe headache
- Palpitations or tachycardia
- PGP, which may also lead to difficulty in walking

Types of exercise General categories

- Leisure sports
- Low impact aerobics (or equivalent classes). The emphasis is on maintaining fitness levels
- Music/dancing

- Pilates or yoga (modified for pregnancy) cater for the non-aerobic elements of fitness – flexibility, control of breathing and relaxation.
- Back care classes. Core stability exercises
- Gym work. static bicycle, treadmill or cross-trainer Weights, sets and repetitions should be decreased further as pregnancy progresses

SUMMARY

ANTENATAL CLASSES

- Advice on safe exercise
- Back and pelvic girdle care
- Pelvic floor and abdominal exercises
- Activities of daily living and work
- Management of pregnancy-related musculoskeletal dysfunctions
- Coping strategies for labour, e.g. relaxation, positions of comfort, breathing awareness

POSTNATAL PHYSIOTHERAPY

Advice on early postnatal exercises and return to fitness.

Inpatient postnatal management:

Caesarean section:

- early mobility
- bed exercises
- respiratory complications,
- pelvic floor muscle and abdominal exercises;

Perineal trauma

- Advice
- Exercises-remain ambulant to levels agreed by physiotherapist and gynecologist.
- Ice therapy

- Appropriate electrotherapy

Incontinence

- training in PFM exercises
- Persistent pelvic floor dysfunction should be treated
- Incontinence of stool and urine among women who experienced a third-degree epithelium)

7.1.7 UROGENITAL DYSFUNCTION

INTRODUCTION

These are disorders that affect the urinary and genital tracts.

ASSESSMENT

- Pain
- Surgical wound
- Posture
- Gait

MANAGEMENT

Pelvic floor muscle training

- PFMT for women with stress urinary incontinence.
- Advice women to contract their PFMs before and during coughing, sneezing,

Teaching PFM exercises

To teach the pelvic floor contractions, the following instructions have been suggested:

- Imagine you are trying to stop passing urine and breaking wind

- Squeeze tightly inside your vagina
- Lift and squeeze.

It has been suggested that imagery may help women contract correctly

e.g.,

- imagining a lift or elevator closing the doors (squeeze) and moving up (lift)
- Action of a vacuum cleaner.

Biofeedback

- Biofeedback may be via electromyography, a pressure sensor or real-time ultrasound.

Electrical stimulation

Behavioural modification

- Advice on weight-loss, adjustment of fluid intake, smoking cessation, and exercise modification and regularization of bowel habit.
- Avoidance of heavy physical work, lung disease and smoking,

7.1.8. ANORECTAL DYSFUNCTION

INTRODUCTION

This are painful but common conditions like hemorrhoids, tears, fistulas, or abscesses that affect the anal region.

ASSESSMENT

- Pain
- Surgical wound

- Posture
- Gait

MANAGEMENT

- PFM training
- Biofeedback
- Electrical stimulation

7.1.9 GYNAECOLOGICAL SURGERY

MANAGEMENT

Pre-operative care

- Ergonomic advice
- Groups exercises

The physiotherapist might include:

- Assessment of risk factors (e.g. respiratory conditions, VTE risks, impaired mobility, current medication, etc.)
- Identification of urogenital or anorectal dysfunction
- Identification of affected muscle

Postoperative care

Be aware of the findings at surgery, and their potential physical and psychological

impact on the patient.

ASSESSMENT AND ADVISE

- Respiratory function
- Circulation /risk of deep vein thrombosis
- Mobility
- comfort and posture – including bed exercise/ and transfers
- Urination and defecation position on the toilet and wound support
- Abdominal exercises to help reduce discomfort when moving, and ease and low back pain or flatus
- Pelvic floor muscles (PFMs)
- Discharge from hospital.
- Gradual increase in physical activity, but heavy lifting should be avoided for at least 6 weeks

7.1.10 PELVIC PAIN (ACUTE AND CHRONIC PAIN)

INTRODUCTION

Pelvic pain in women has many varied sources, diagnoses and outcomes. It can be acute or chronic. Acute pain usually has an easily identifiable cause, such as dyspareunia (pain on sexual intercourse) caused by scar tissue following childbirth.

GOALS

- Decrease pain
- Increase function and treat existing (and help prevent future) mus- culoskeletal dysfunction

- Assessment
- Detailed musculoskeletal examination
- Assessment of the pelvic floor muscles
- Appropriate treatment modalities

MANAGEMENT

- Restoration of muscle balance
- Muscle energy techniques
- Core stability exercises
- Pelvic floor muscle rehabilitation
- Electrical stimulation
- Soft-tissue mobilizations
- Joint manipulation
- Breathing and relaxation techniques
- Heat/cold therapy hydrotherapy
- Biofeed-back
- Back and alternative therapies

7.1.11 MENOPAUSE

INTRODUCTION

Menopause is the cessation of menstruation and marks the end of a woman's reproductive years. It has significant implications for a woman's health and

Most women experience the menopause between the ages of 40 and 58 years, with a median age of 52 years

ASSESSMENT

- Vasomotor effects – hot flushes and night sweats; vaginal dryness which may result in painful intercourse; sleep disturbance
- Mood changes – depression, anxiety, irritability
- Cognitive disturbances, e.g. forgetfulness
- Somatic symptoms, e.g. back pain, stiff and painful joints, tiredness
- Urinary incontinence
- Menorrhagia (heavy bleeding)
- Quality of life – either positive or negative effects

MANAGEMENT

- Exercise. Women at this stage of reproductive health should be advised to maintain an active lifestyle.
- Health education. Should be made to understand the specific cycle of life they are at and how to cope with the physiological changes
- Breathing techniques to enhance relaxation and promote fitness

7.1.12: POST NATAL PHYSIOTHERAPY

INTRODUCTION

This is the first six weeks after birth. The most vulnerable time for both mother and child. Lack of care in this time period may result in death or disability as well as missed opportunities to promote healthy behaviours, affecting women, newborns, and children:

MANAGEMENT

First 24 hours after birth:

- Start pelvic floor muscle exercises
- Empty bladder every 2 - 3 hours
- Patient should move around as normally as possible while taking deep breathes

Pelvic floor muscles exercises

- Start to exercise your pelvic floor muscles within 24 hours of delivery (once you can empty your bladder as normal).
- Exercise the pelvic floor muscles in any position (lying down, sitting or standing).
- The patient should avoid heavy lifting.
- Avoid sit-ups and high impact exercise for at least 3 months after the birth
- The patient should avoid straining when they are emptying the bowels

Pain Relief

- Ice packs can help reduce swelling and discomfort

Postnatal Exercise program

Exercise one: Drawing in

- The patient should lie on the side or back with the knees slightly bent.
- Let the tummy relax completely. Gently draw in the lower part of the tummy as they breathe out. It may help to squeeze the pelvic floor muscles at the same time.
- Hold for 5 seconds, breathing normally, and then relax.
- Repeat up to 10 times and gradually build up the time one can hold for. Aim to build up to 10 seconds of holding, 10 times.

Exercise two: The tilt

- Gently tilt the hips by pressing the base of the back into the bed (as if pulling the pubic bone up towards the ribs). This may also help to relieve back pain.
- Hold for 5 seconds, breathing normally, and then relax.
- Repeat 5 -10 times.
- Make sure the tummy stays in during this exercise. If the patient can't keep it gently in, go back to exercise number 1.

Exercise three: The gentle twist

Lie on the back with the knees bent.

- Draw in the lower part of the tummy as in exercise 1.
- Slowly move your knees a few inches to the side, keeping them together. Keep the hips still and the stomach muscles drawn in. Bring the knees back to the middle, and then relax.
    - Repeat to the other side.
    - Repeat 5 -10 times on each side.
- Over the next six weeks the patient should try to increase the fitness with the exercises (pelvic floor muscle & tummy exercises. A short daily walk – gradually increase the distance
- Swimming

Back and Posture

- The patient should take care of the back and posture in the first weeks after birth. This is a common time to develop back pain.
- Stand and walk tall, with the tummy and bottom tucked in.

Standing Pelvic Tilt

For patient with low back pain after having the baby.

- Stand with the back against a wall, feet out from the wall a little
- Gently tilt your hips (move your pubic bone towards your ribs)
- Hold for 4 seconds, then relax. • Repeat 6 times.

Back and Posture care while Feeding the baby

- Support the back
- Relax the shoulders
- Rest feet comfortably on the ground
- Make sure that the baby is resting at a comfortable height

Changing a nappy and bathing the baby

- Do this with the baby at waist height. For lower surface, kneel down.
- In the early weeks do not carry a baby bath full of water.

Lifting

- Keep the back straight and bend the knees to kneel down.
- The mother should bring the toddler close to the body, draw in the tummy muscles and tighten the pelvic floor.
- Use the strong thigh muscles to stand up. Never lift when bending or twisting to the side.

Car Seats and Pushchairs

- Avoid carrying the car-seat with the baby in it where possible, as this can be very heavy.
- Choose a pushchair with handles at a comfortable height or adjustable handles.

7.1.13: FITING BRA

Chest size

- Stand straight and wrap the measuring tape snugly around your ribcage, just underneath your breast.
- Ensure the tape is parallel to the ground and positioned straight across your back.
- Exhale gently and take the measurement in inches or centimeters. Make sure the tape is snug but not too tight.

NB

If measurement ends up to be an ODD number, go up to the next EVEN number.

Cup size

- Measure around the chest at the largest or fullest part of the breasts, called your "bust line."
- Need to measure with the arms straight down,
- The bust line measurement will be higher than the chest ("under the breast") measurement.
- The cup size is the difference between the chest size and the bust line measurement.

Bra cup size:

Cup Size:	**Difference:**
AA Cup	½ inch
A Cup	1 inch

B Cup	2 inch
C Cup	3 inch
D Cup	4 inch

7.1.14: VESICOVAGINAL FISTULA (VVF) & RECTOVAGINAL FISTULA (RVF)

INTRODUCTION

Vesicovaginal fistula (VVF) is an abnormal fistulous tract extending between the bladder and the vagina that allows the continuous involuntary discharge of urine into the vaginal vault. A rectovaginal fistula (RVF) is an abnormal connection between rectum and the vagina. Bowel contents can leak through the fistula, allowing gas or stool to pass through the vagina.

ASSESSMENT

- Pain
- ROM
- Functional activities
- Assessment of pelvic floor muscle strength, tone, and coordination.
- Evaluation of pelvic floor muscle contractions and relaxation.

- Examination of bladder function, including urinary frequency, urgency, and leakage.
- Assessment of bowel function, constipation, and fecal incontinence.
- Musculoskeletal Evaluation: Assessment of any musculoskeletal issues or pelvic floor dysfunction contributing to the fistula or exacerbating symptoms.

GOALS

- Education on pre and post-operative care.
- Advice on exercise
- Maintain correct body posture.
- Pain relief
- Breathing and relaxation
- Strengthening weak pelvic floor muscles and improving their coordination.
- Teaching relaxation techniques for hypertonic pelvic floor muscles.
- Managing Incontinence: Implementing behavioral strategies, bladder training, and pelvic floor exercises to address urinary or fecal incontinence.
- Enhancing Quality of Life: Providing education on self-care techniques and lifestyle modifications to manage symptoms and improve overall well-being.

MANAGEMENT

- **Pelvic Floor Exercises:** Kegel exercises and specific pelvic floor muscle training tailored to individual needs.
- **Biofeedback and Electrical Stimulation:** Using biofeedback techniques or electrical stimulation to assist in muscle retraining.
- **Bladder and Bowel Retraining:** Implementing strategies to improve bladder and bowel control, including scheduled voiding or defecation.

- **Patient Education:** Providing information on dietary modifications, fluid intake, and healthy bowel and bladder habits.

SECTION EIGHT

8.0: BURNS

INTRODUCTION

A burn is a type of injury to the skin or other tissues, caused by heat, cold, electricity chemicals, friction, or radiation.

ASSESSMENT

- Pain (use FLACC for children between 2months and 7 years)
- Ascertain the type of burn
- History of first aid, falls, or electrical burns
- Record associated injuries e.g. fractures
- Record burn on special areas
- Total body surface area (TBSA)
- Depth of burn injury
- Psychological symptoms

MANAGEMENT

GOALS

- Pain management
- Edema control
- Prevention of respiratory complications
- Prevention of contractures
- Maintaining JROM
- Prevent excessive scarring
- Promote wound healing
- Prevent psychological disorders

INTERVENTIONS

- An interdisciplinary burn rehabilitation approach (address wound care, pain, range of motion, dressing, splinting and casting, conditioning strengthening and psychological status).
- Pain management (TENS, analgesics, movement, Ultrasound)
- Positioning with special devices in bed and chair. (Counter contracture pattern)
- Active, and active assisted exercises
- Breathing exercises as needed
- Passive mobilization exercises as needed
- Intermittent compression and elevation
- STM
- Casting and splinting of body parts to prevent contractures.
- Range of motion under anaesthesia as indicated.
- Transfer activities
- Ambulation/assistive devices.
- Massage to healed skin to desensitize and loosen scar tissue
- Sustained stretch to all healed areas over joints with tightness.
- Active and active assistive exercises to all joints involved.
- Evaluative activities of daily living and modification with assistive devices as needed.
- Conditioning program consisting of treadmill, upper-body ergometer, and bike.
- Individualized strengthening programs
- Fitting with compression garments to control scarring
- Silicone gel sheeting for hypertrophic scars.
- Prescription for prosthetic or orthotic devices where needed.
- Exercises for endurance and coordination

NB: Major areas of contracture concern in the recovering period are hands, neck, hip and ankle. These may require specialized splints:

Modalities for Burn Rehabilitation

- Electrical stimulation (to enhance adherence to underlying scar tissue).
- Continuous passive motion (CPM) - suitable for patients who resists the exercise due to fear of pain.

OUTCOME MEASURES

- VAS
- FLACC (Face Leg, cry and Consolability)
- Burn Specific Health Scale (BSHS)

Post graft grafts immobilization time:

Surgical Procedure	**Immobilization Time**
Biological Dressings	<24hours
Autograft (superficial to intermediate)	24-48hours
A split-thickness skin graft (STSG)	3-5 days
A full-thickness skin graft FTSG	5-7 day

APENNDICES

LIST OF CONTRIBUTORS

Sr/No.	Name of participant	Designation	Institution
1.	Dr Naomi Wanjiru	Consultant/Lecturer	MOI
2.	Dr Wallace Karuguti	Consultant/Lecturer	JKUAT
3.	Dr Nassib Tawa	Chairman/Lecturer	PCK/JKUAT
4.	Douglas Kotut	Registrar	PCK
5.	Dr Daniel Nyamongo	Lecturer ./Chairman	JKUAT/KSP
6.	Daniel Kangutu	Lecturer	KMTC
7.	Jessica Shiraku	Chief Physiotherapist	Nairobi Hospital
8.	Dickson Okumu	Chief Physiotherapist	KNH
9.	Henry Opondo	Chief Physiotherapist	Karen Hospital
10.	Mercy Wachiuri	Physiotherapist in charge	Nakuru CRH
11.	Titus Kilika	Chief Physiotherapist	MOH HQS
12.	Teresa Ogumbo	Senior Physiotherapist	MOH HQS
13.	Betty Kiruki	Senior Physiotherapist	Kiambu County
14.	Reuben Kyui	Senior Lecturer	KMTC
15.	Martin Otieno	Senior Physiotherapist	Private Practice
16.	Peter Mukiri	County Physiotherapist	Kiambu County

17.	Rahab Ngatia	County Physiotherapist	Nyeri County
18.	Robert Mbajo	Senior Physiotherapist	Private practice
19.	Jonah Mwasia	County Physiotherapist	Nakuru County
20.	Lucy Bayu	Senior Physiotherapist	KMTC Nakuru
21.	Isaac Kones	Physiotherapist	Narok County
22.	Lilian Opollo	County Physiotherapist	Kisumu County
23.	John Mukoma	County Physiotherapist	Busia County
24.	Jeremiah Ongai	Senior Physiotherapist	Bungoma County
25.	Mike Ogolla	Senior Physiotherapist	Kisumu County
26.	Joan Kibet	Consultant Physiotherapist	Centre for Victims of Torture (CVT)
27.	Oliver Keitany	Dep/Physio I/C	MTRH
28.	Emily Koskei	Senior Physiotherapist	KNH
29.	Fred Ochieng	Physiotherapist	PCK
30.	Ann Mutio	Administator	KSP

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