



CLINICAL MILESTONES



EXERCISE
— THOUGHT —

Dedication

This document was created by the physiotherapists, students & interns at Exercise Thought Physiotherapy and is freely available for all to use for the benefit of people in pain and the physiotherapy profession.

Acknowledgement

The information compiled in this document is the collective work of, including: Rachel Ewart, Cameron Brown, Ben Ursich, Bailee Hodgson, Sean Frost, Richard Sydenham, Adele Russo, Emma Smidtke, Jess Toone, Mitch Mullens, Ben McLaren, Hayley Mettes, Abbey Sinclair, Josh Armstrong, Riley Nichols and Sam Suke

Level 1

Typical Lx disc
Ankle sprain/#
Lx muscle hyperactivity
Facet arthropathy (old, degenerative)
SIJ
Sciatica
Piriformis syndrome
Calf, hamstring, quad, add. muscle strains
Tendinopathy: achilles, patellar, gluteal
Tendinopathy: tennis/golfers elbow, peroneal
Wry neck
Postural dysfunction
Thoracic outlet syndrome
Costochondritis
Falls

AC joint disruption
Headache: TT, CG, Migraine
Rotator cuff
Subacromial impingement/bursitis
Meniscus
Tennis & golfer's elbow
De Quarvain's Tenosynovitis
Plantar fascia
Shin splints
Compartment syndrome
Osgood Schlatters
Severs
Metatarsal stress #
Osteoarthritis
Red flags



Level 2

Facet arthropathy (young, reactive, stress, #)
Shoulder instability/hypermobility
Internal disc injury
Vertigo: BPPV, menieres, labrynthitis
Fibromyalgia
Multiple sclerosis

Parkinson's
Diabetes
Pubic symphysis
Adductor tendinopathy
Paediatric hip: SUFE, Perthes, dysplasia, irritable hip
Avulsion # of ASIS/AIIS/traction apophysitis



Level 3

Central sensitisation
CRPS: Type 1 & 2
Stroke
Sh dislocation
Whiplash
Polymyalgia rheumatica
Crohn's

Rheumatoid arthritis
Scheurmann's
Ankylosing spondylitis
Psoriatic arthritis
Septic arthritis
Reactive arthritis
Morto's neuroma

ABBREVIATIONS

*	Reassessment
#	Fracture
ADL	Activity of daily living
aggs	Aggravating factors
Ax	Assessment
c/o	Complains of
COPD	Chronic obstructive pulmonary disease
Cx	Cervical
d/c	Discharge
d/t	Due to
d/w	Discuss with
DDx	Differential diagnosis
Dx	Diagnosis
EIS	Erect in standing
FF	Free fluids
FHx	Family history
FIS	Flexion in standing
FWB	Full weight bearing
HEP	Home exercise plan
HOPC	History of presenting condition
Hx	History
LBP	Low back pain
LFIS	Lateral flexion in standing

LL	Lower limb
Lx	Lumbar
MBA	Motorbike accident
Mx	Management
NAD	No abnormalities detected
Ox	Objective assessment
PHx	Past medical history
r/v	Review
RTW	Return to work
SOB	Shortness of breath
STM	Soft tissue massage
STR	Stretch // Soft Tissue Release
Sx	Subjective assessment
Tx	Thoracic
UL	Upper limb
x/12	Months
x/52	Weeks
x/7	Days

Bronchiectasis

Description	Chronic lung disease <ol style="list-style-type: none"> 1. Persistent and lifelong widening of bronchial airways, 2. Weak mucociliary transport mechanism due to repeated infection, 3. Easier bacterial invasion and extra mucus pooling in widened airways.
Causes	Unknown cause Risk factors include: <ul style="list-style-type: none"> • Airway damage • Immunodeficiency • Pulmonary disease • Lung infections • Conditions that cause airway blockages
Presentation	Persistent cough Excessive mucus Frequent airflow obstruction Episodes of worsening symptoms
Aggs	Conditions aggravating airways
Eases	Medication
Objective	Peripheral examination for signs of chronic lung disease Exacerbations
DDx	Relies on clinical and radiological diagnosis. Therefore, patients referred onwards following initial presentation
Risk factors	Other conditions or infections that may cause damage to airways or immunodeficiency
Treatment	Active cycle of breathing technique (ACBT) Postural drainage Autogenic drainage: technique that utilises breathing control to clear secretions from airways Exercise is recommended to increase aerobic capacity, airway clearance, fitness and endurance Prophylactic administration of antibiotics

COPD

Description	Chronic inflammatory lung condition characterised by progressive airflow obstruction and tissue destruction (i.e., leads to breathing difficulties) 3rd most prevalent cause of global morbidity and mortality in 2022 Inclusive of: Emphysema (i.e., causes SOB – alveoli damage) Chronic bronchitis (i.e., long-term inflammation of bronchial tubes) Asthma – SOMETIMES (i.e., narrowing of airways due to inflammation + muscle tightening)
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Causes	Prolonged exposure to harmful particles or gases (i.e., second-hand smoke, air pollution, dust, fumes and chemicals) – OFTEN ENVIRONMENTAL/OCCUPATIONAL EXPOSURE Tobacco smoking most common cause worldwide
Presentation	Ask about occupation (i.e., gauge exposures) Increasing breathlessness Persistent chesty cough (i.e., w/ phlegm) Frequent chest infections Persistent wheezing
Aggs	Exposed to second-hand smoke Air pollution Overexertion Strong fumes/fragrances (e.g., perfume) Temperature (i.e., cold, dry or hot air)
Eases	Short-acting bronchodilator inhalers Controlled breathing Appropriate exercise
Objective	Lung function tests Performing submaximal outcome measures (e.g., 6 minute walk test, RPE scales) Spirometry: measure of how quickly someone can exhale air Chest X-ray/CT: Can Ax for emphysema and for indications of surgical intervention
DDx	Bronchiectasis Asthma
Risk factors	>40yo Smoking FHx
Treatment	Physiotherapy: Strength and endurance based exercise, Pulmonary rehab For every episode of COPD, Physio can generate thousands of dollars in benefits Pharmacological: bronchodilators (i.e., short and long-acting), inhaled/oral steroids Surgery Occasionally recommended

Long COVID

Description	Illness occurs in people who have Hx of probable or confirmed COVID-19 infection; usually within 3/12 from onset of COVID-19, w/ symptoms and effects that last for <u>at least 2/12</u> . Diagnose of exclusion.
Causes	Prior SARS-CoV-2 (COVID-19) infection
Presentation	Fatigue SOB or difficulty breathing

	<p>Memory, concentration or sleep problems Persistent cough Chest pain Difficulty speaking Muscle aches or joint pain Loss of smell or taste Depression or anxiety Fever Heart palpitations</p>
Aggs	Intensive exercise (can exacerbate symptoms)
Eases	<p>Medication: Paracetamol or Ibuprofen to relieve pain and fevers</p> <p>Rest</p>
Objective	<p>No single test for long COVID – your GP will conduct Sx and Ox to determine your likelihood of condition</p> <p>Physical exam: Ax of ongoing COVID-19 symptoms</p> <p>MRI: Ax lung damage from COVID-19</p>
DDx	<p>Influenza Bronchitis</p>
Risk factors	<p>Age and sex: Older people and females are more likely to develop long COVID</p> <p>Not being vaccinated: Not having received COVID-19 vaccination</p> <p>Severe initial COVID infection: Individuals who had severe illness during acute COVID-19 phase, including those who required intensive care</p> <p>Underlying conditions: Those w/ underlying conditions or diseases (e.g., respiratory disease, obesity, diabetes, hypertension, chronic CVD, chronic kidney disease, post-organ transplantation or active cancer)</p>
Treatment	<p>Medication: Antiviral medications to assist w/ COVID-19 symptoms</p>

Asthma

Description	Common condition characterised by at least partially reversible inflammation of airways and reversible airway obstruction due to airway hyperreactivity It can be acute, subacute or chronic and/or exercise induced
Causes	Genetic
Presentation	Wheeze, SOB, chest tightness or difficulty breathing and cough Episodic symptoms that are worse at night and in early morning, and occur in response to certain triggers
Aggs	Exercise, allergen exposure, cold air
Eases	Drugs: inhaled steroids and long acting antagens
Objective	MHx FHx Physical Ax: airway examination, respiratory rate etc. Allergy testing
DDx	Infection COPD
Risk factors	FHx Asthma more common in those that have other allergies
Treatment	Breathing retraining techniques Physical training: fitness and cardiorespiratory performance Respiratory muscle training Education

Lumbar						
Lumbar	Disc	Nerve root compression	Canal stenosis	Young Facet	Old Facet	Muscle hyperactivity

Description	Lx pain where primary source is intervertebral disc/s	Arises from nerves that have been damaged or compressed. Causes can be arthritis, bone spurs, inflammatory diseases, degenerative spinal conditions (i.e., spinal stenosis), spinal injury or infection, abnormalities (i.e., tumours, cysts) or herniated discs. NOT same as radiculopathy	A degenerative condition of narrowed spinal canal (central central stenosis) or Lx vertebral foramina (foraminal/lateral stenosis) occurs. This reduces space available for, and can compress, neurovascular elements. Most commonly occurs in neck (Cx) + lower back (Lx).	Overload of facet joint/s. Begins as bone stress. Can progress to stress # (pars defect).	Degenerative facet arthropathy Pain can refer, but not into buttock	Involuntary muscle contraction. Sometimes secondary to other causes of Lx pain.
Presentation	MOI associated w/ F/compression. Worse on nxt AM/day after onset. Dull aching pain. Sometimes vague location. +/- radiating pain. Key Qs: how do you feel first thing in morning? Better sitting or standing?	Tingling, numbness Muscle weakness Hypersensitivity Pain in Lx +/- limbs Burning, shooting, searing Unilateral pain (rarely bilateral) Aggs: prolonged sitting	Gradual onset Radiating pain/numbness/tingling/burning/shooting in thigh/glute/leg w/ standing and walking. Usually bilateral and asymmetrical. Shopping cart sign++ +/- weakness	Unilateral LBP Occasionally somatic buttock pain May also have excessive Lx lordosis	Excessive Lx lordosis Painful irritation of posterior part of Lx spine. Deep pain, sometimes referring to some local muscles.	Specific muscle pain No referral Mild or severe intensity Often position or movement-specific e.g. sitting upright, bending Reduced ROM Increased tone Pain w/ ADLs
Agg	Rising from sitting Lx F: prolonged sitting >60', driving, bend, sneeze/cough, lift		Lx ext (narrowing): overhead activity, standing, walking, axial loading.	Lx E esp. Lx E + ipsilateral rotation Prolonged overhead activity, axial loading, prolonged walking, standing	Movement, rotation and ext. Lx E, esp. Lx E + ipsilateral rotation (quadrant testing)	Anxiety Worrying about Lx

Eases	Lx E, cobra, walk, stand, washing hair		Sitting, Lx flexion (widens canal)	Rest. Lx lateral F (opposite to painful position, create space in facet joint, reduce neural drive/muscle tone)	Rest, hanging traction, exercising without pain.	Relaxed breathing Lx F postures Massage
Risk factors	High physical load Sitting lots Bending/lifting lots		Age-related changes: osteophytes, spurs, disc bulging/herniation Obesity Sedentary lifestyle	Late teens/early 20s Spike in Lx E load (bowling seasonally, high jump, running, new movements, gymnastics, diving) Growth spurt	Older age Obesity Sedentary Repetitive bend/lift	Stress Previous back pain Fear of back pain
Position of relief	Lumbar extension		Lx F Sitting	Lx F (opposite to painful position, decompress facet joint, reduce neural drive/muscle tone)	Lx flexion, movement that does not cause any pain.	Lx F or sitting
Differential Diagnosis	OA		Facet arthropathy Peripheral vascular disease	Muscle hyperactivity	Synovial cysts	Fibromyalgia
Objective testing	Lx ROM Slump if neural implication SLR Directional preference	Reduced Lx ROM Slump test (Lx) Spurling's Test (Cx) SLR Loss of sensation Muscle weakness Loss of reflexes Dermatomal distribution of symptoms	FIS: NAD EIS: +/- pain Lumbar Ext Loading Test Shopping Cart Sign Strength test (normal/mild reductions)	Lx Quadrant test (facet compression test, KEMP test) Michelis' test (SL stance, Lx E, +ve if contralateral LBP reproduced) Lx E Unilateral PAIVM	Lx E (quadrant, KEMP test) Unilateral PAIVM Advanced facet arthropathy on XR, CT, MRI	Lx ROM Palp: tonic Lx paraspinals

Treatment	<ol style="list-style-type: none"> 1. Minimise Agg's 2. Promote Eases 3. Education re disc mechanics 4. Resume all usual activity and loads 5. Relieving exercises: prone laying, cobra, back extensions, walking, cat/camel, superman 6. Manual therapy: central PAIVMs, PA facilitated cobra's, STM in prone, hamstring release. 7. Surgery: microdissectomy, fusion 	NSAIDs <ol style="list-style-type: none"> 1. Minimise Agg's 2. Promote Eases 3. ?Education re nerve pressure mechanics 4. Exercise to relieve 5. Spinal manipulation effective for acute Lx + Cx 6. Manual traction for Cx 	<ol style="list-style-type: none"> 1. Flexion postures & exercises 2. Weight loss 3. Heat pack 4. Core/back strengthening 5. Manual therapy (in Lx F) 6. Endurance exercises 7. Postural advice 8. Aerobic fitness 9. Hydrotherapy 10. NSAIDs Surgery: remove osteophytes or spurs that crowd spinal cord	<ol style="list-style-type: none"> 1. Reduce/remove Lx E load 2. CT/MRI to differentiate bone stress from stress # 3. Lx F stretches - allow irritated facet to settle 4. Release Lx paraspinals 5. Identify and correct any tendencies to hyperE 6. Anti-lordosis bracing in high-risk or persistent cases 	<ol style="list-style-type: none"> 1. Weight loss 2. Reduce Lx E load 3. Core/back strengthening outside aggravating positions 	<ol style="list-style-type: none"> 1. Reassurance: no serious of lasting pathology, muscular 2. Massage 3. Lx F e.g. Deep squat, fold forward 4. Hydrotherapy 5. Heat pack 6. Analgesia Screen/clear primary causes <ol style="list-style-type: none"> 1. Disc unlikely if no stiffness/pain felt on waking 2. Facet unlikely if symptoms are broad and not localised to specific facet joint
Resources	HOW TO HELP YOURSELF WITH DISCOGENIC BACK PAIN!!! - YouTube McKenzie approach: finding repeated or sustained movement that reduces and/or abolishes symptoms. Maintain this improvement for several days. Finally, patient performs recovery of function, which is having patient do once pain			https://www.ncbi.nlm.nih.gov/books/NBK538292/		

	provoking movements to determine if they are now pain-free. (eg. Lx extension)					
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Stimulus Conditions

Kinesiophobia	<p>Fearfulness of moving</p> <p>Kinesiophobia includes three components:</p> <ol style="list-style-type: none"> 1. Threatening stimulus 2. Increased Sympathetic Arousal 3. Defensive behaviour 	<p>Reluctance to engage in movement</p> <p>Often signalled through facial expression (non-verbal) or verbal cues</p>	<p>Tampa Scale of Kinesiophobia</p>	<p>Recovery Strategies</p> <ul style="list-style-type: none"> - Setting functional objectives - Learning how to regulate safe behaviours - Gradually exposing oneself to fearful activities
Central Sensitisation	<p>Central sensitisation is defined as an increased responsiveness of nociceptors in CNS to either normal or sub-threshold afferent input resulting in: Hypersensitivity to stimuli.</p>	<ol style="list-style-type: none"> 1. Allodynia 2. Hyperalgesia 3. Anxiety 4. Headaches 5. Poor memory 6. Bad concentration 	<ol style="list-style-type: none"> 1. Pain towards ordinary touch 2. Concentration Tests 3. Quantitative sensory testing 	<ol style="list-style-type: none"> 1. Aerobic Exercise 2. Strength Training 3. Flexibility Training

Thoracic

Thoracic	Costochondritis	Heart attack	Rib #	Intercostal strain	Thoracic dorsal arachnoid web/cyst
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Description	<p>Days-6/52</p> <p>Acute, non-traumatic, +/- tightness intercostals</p> <p><i>“Costochondritis is inflammatory. It is caused by inflammation of costal cartilages and their sternal articulations, also known as costochondral junctions”</i></p>	<p>Not palpable. Non-mechanical symptoms.</p>	<p>Rib fractures usually occur due to blunt and penetrating trauma to rib cage. e.g. motor vehicle accidents, falls, assaults.</p> <p>Pathological fractures can occur in people wi</p> <p>Stress fractures can occur more commonly in high-level athletes eg. rowers,</p>	<p>Intercostal muscles are muscles that present within rib cage. There are 3 muscle layers that line spaces between ribs - external layer, internal layer and innermost layer.</p> <p>Intercostal muscle strains are not usually common w/ daily activities, it normally happens when muscles that line ribs are weakened, overexertion of muscles or as result of direct trauma from falling or car accident or blow from contact sports such as hockey or repetitive torso twisting.</p>	<p>A dorsal arachnoid web is an abnormal collection of arachnoid tissue that may compress spinal cord, usually in upper Tx spine producing symptoms of numbness and weakness in legs. Bowel and bladder function may also be impaired.</p> <p>Arachnoid webs can cause severe cord compression w/ associated syrinx and resulting myelopathy, weakness, sensory loss, and bowel/bladder dysfunction. There have been little over 60 cases total reported in literature w/ only one systematic review.</p>
Presentation	<p>Costochondritis usually has no clear cause. However, costochondritis might be associated w/ trauma, illness or physical strain such as severe coughing.</p> <ul style="list-style-type: none"> - Pain may be described as sharp or dull - Pain can be gradual or onset can be rapid and may report swelling of upper costal cartilage of costochondral junction - Symptoms may disappear and return at 	<p>Most heart attacks involve discomfort in center or left side of chest that lasts for more than few minutes or that goes away and comes back. The discomfort can feel like uncomfortable pressure, squeezing, fullness or pain.</p>	<p>Tenderness on palpation, crepitus, and chest wall deformity are common findings of rib fracture. The most common symptom of rib fractures is pain w/ touch, taking deep breath, sneezing or coughing. As these fractures are quite painful, patients take short shallow breaths, and minimise movement. This can lead to collapse of alveoli in lung.</p>	<ul style="list-style-type: none"> - Sudden severe upper back/rib pain, stiffness, difficulty breathing/shallow breathing pattern. - Can be gradual onset (days-weeks) if stress is sustained (i.e. begins rowing). <p>As result of:</p> <ul style="list-style-type: none"> - Trauma- muscles stretch and tear at level of impact as ribs suddenly move apart. - Overexertion - Repetitive forceful movements - repetitive twisting. - Twisting beyond normal ROM - Twisting under load 	

	<p>same level or other levels of rib</p> <ul style="list-style-type: none"> - Pain <p>can often be reproduced by mild-moderate palpation</p> <ul style="list-style-type: none"> - Mostly of unilateral origin 				
Aggs	<p>Deep breath/sneezing</p> <p>Slouching</p> <p>Direct pressure/rib expansion</p> <p>Thx rotation</p>	Overdose of medication.	Deep breath, sneezing, coughing.	Deep breathing, coughing, reaching overhead	
Eases	Rest		Rest from agg activities.		
Risk factors	<p>Trauma to chest (car accident or fall).</p> <p>Women older than 40.</p>	<ul style="list-style-type: none"> - Increasing age, most common above age of 65. - Male gender. - Smoking. - High blood cholesterol. - High blood pressure. - Physical inactivity. - Obesity and being overweight. - Heredity. 	<ul style="list-style-type: none"> - Osteoporosis. - Sports participation. - Cancerous lesions in rib. 	Physical labor, sports w/ repeated use of arms/shoulder/upper back, contact sports	
Differential diagnosis	<p>Acute Coronary Syndrome</p> <p>Pneumothorax</p> <p>Pneumonia</p> <p>Pulmonary Embolism</p> <p>Tietze's Syndrome</p> <p>Xiphoidalgia</p> <p>Slipping Rib Syndrome</p>	You will know if it is heart attack.	Brachial plexus, pneumothorax, lung herniation.	<p>Rib # (pain++)</p> <p>Pneumonia/lung disease (non-specific pain)</p> <p>Upper back pain (diff MOI, UBP due to long periods of poor posture, intermittent pain)</p>	
Objective testing	<p>X-ray.</p> <p>Pain often reproduced by palpation - mostly between 2nd-5th ribs</p> <ul style="list-style-type: none"> - Aggs: slouching or exercise - Loss of normal spinal 		X-ray.	<p>Rule out # (X-ray, palpation, pain severity), and lung diseases (can they pinpoint pain)</p> <p>Identify aggs- Rotation, deep breathing, reaching overhead</p>	

	<p>movement associated w/ chest pain</p> <ul style="list-style-type: none"> - <p>Palpation should be performed w/ 1 digit, on anterior, posterior, and lateral side of chest, clavicle, Cx and Tx spine. When on affected area it reveals reproducible pain which might suggest Costochondritis.</p> <ul style="list-style-type: none"> - <p>Outcome Measures</p> <ul style="list-style-type: none"> - PSFS - GROC - <p>Rotation of thoracolumbar spine</p> <ul style="list-style-type: none"> - Finger to floor distance - The schober test - <p>Thoracolumbar flexion</p> <ul style="list-style-type: none"> - <p>Occiput to wall distance</p>				
Treatment	<p>Education: Does get better. Most cases resolve in days-weeks.</p> <p>GP might prescribe NSAIDs/prednisolone</p> <p>Minimise Aggs Trigger point or cross-fibre friction massage Heat/cold pads Postural exercises</p>	Heart massage and call ambulance.	Breathing and flexibility exercises.	<p>Generally days - 8/52 depending on severity</p> <p>0-2 days: rest and ice, stabilise area w/ pressure when coughing/deep breaths (helps resist ribs moving apart)</p> <p>Can move to heat packs for relief/flexibility Stretching, deep breathing as tolerated and supervised (reduce fear/spasm)</p>	Endoscopic resection has been postulated for management of spinal intradural arachnoid cysts

	<p>Thoracic manual therapies - directed at lateral and posterior rib structures</p> <p>ROM exercises should be induced ASAP Gentle Thx ROM Reassurance (not rib #) Mobilisation of spine/ribs Dry-needling</p>			<p>Strengthening exercises, Thx ext w/ breath holding, backward weight lifting exercise?</p>	
Resources					

Scheuermann's disease AKA Scheuermann's kyphosis	
Description	<p>Begins in childhood. Typically diagnosed between ages of 12-18 (following puberty related growth spurt).</p> <p>Condition results in increased THx kyphosis</p> <p>Type I: Most common (commonly T7-9 vertebrae) Type II: Atypical (affects lower THx, occasionally Lx)</p>
Causes	<p>Idiopathic Timing of growth spurt is thought to have an influence on development</p>
Presentation	<p>'Hunchback' Back pain May present w/ hamstring tightness</p>
Aggs	<p>Activities that involve large degrees of flexion, extension, rotation and lateral flexion (e.g., cricket, gymnastics and athletic field events)</p>
Eases	<p>Stretching (e.g. hamstring) Medication (for pain reductions)</p>
Objective	<p>For +ve Dx, X-ray must depict wedging of 3 consecutive vertebrae, presence of Schmorl's nodes and curve measuring >45 degrees Postural Ax Back ROM Ax</p>
DDx	<p>Postural kyphosis Scoliosis Ankylosing spondylitis Hyperkyphosis attributed to another condition</p>

Risk factors	FHx Boys > girls (2:1)
Treatment	Treatment before cessation of growth is IMPORTANT: Back bracing (doesn't always rectify curve, however prevents progression) Exercise to strengthen back and abdominal musculature Surgery sometimes indicated (i.e., spinal fusion for severe cases) Medication (e.g., NSAIDs)

Posterior Thigh					
Posterior Thigh	Hamstring gr1-2	Hamstring gr3	Neural hamstring	Sciatica	Proximal HS Tendinopathy
Presentation	Sprint/stretch incident, localized place of pain or tightness, palpable & identified by client/athlete	Sprint/stretch incident, localized place of pain or tightness, palpable & identified by client/athlete	MOI: +/- incident No symptoms at rest, vague areas of tightness/tension when loading hamstring, non localized/palpable tension but rather longer band of tension, or maybe only w/ neural tension applied	P/N/N referring to glute/thigh/leg. Pain sitting and standing. Caused by: disc compressing nerve, piriformis compressing nerve, direct injury to sciatic nerve.	Change/increase in load Pain around ischial tuberosity Football, soccer, dance
Agg	Lengthening hamstring/using explosively - particularly loaded	Lengthening hamstring - particularly loaded	Returning to exercising too fast	Sitting (during work or In car). Heavy lifting, long runs, contact sports. Hip and Lx flexion when walking	Hip Flexion → sitting *Worsens w/ knee ext
Ease	RICE	RICE		Ice or hot packs, medicine, performing gentle stretches	
Differential Diagnosis	Avulsion injury Sciatica Neural hamstring	Avulsion injury Sciatica Neural hamstring		Cauda equina syndrome, nerve root impingement, tumour, Potts Disease, piriformis syndrome, epidural abscess, herniated lumbosacral disc, muscle spasm, epidural hematoma	Lumbar referred pain Hamstring muscle injury Apophyseal injury Avulsion fracture Adductor muscle strain
Objective Testing	Bridge: DL, SL, SK, BK, drop-catch Shoe off test Chewy test	Bridge: DL, SL, SK, BK, drop-catch Shoe off test Chewy test			Slump - pain Resisted Knee Flex - pain SL Hamstring Bridge - pain

	Prone kn F resisted Palpation SLR 90-90 test Slump test	Prone kn F resisted Palpation SLR 90-90 test Slump test			Hamstring strength - reduced
Treatment	Can work within pain <4/10 DL/SL bridge, bilateral eccentric sliders, Nordic variations, run Sprint to discharge	As per Gr1-2	Increase neural length/reduce neural sensitivity using sliders/tensioners	Lx F e.g. sitting. Massage, exercising, joint mobilization hip or SIJ.	Decrease compression on ischial tuberosity (wedge cushion) Strengthen quads, glutes & calves Isometrics → heavy slow resistance → plyometrics
Risk factors	Poor flexibility Sports participation PHx	Poor flexibility Sports participation PHx	Insufficient warm-up Fatigue Lack of muscle flexibility		

Ankle				
	Posterior ankle impingement	PFTL sprain	Tib post dysfunction	PVNS (Pigmented villonodular synovitis)
Presentat ion	Posterior talocrural joint pain Results from compression of structures posterior to tibiotalar and talocalcaneal articulations during terminal plantar flexion Bony or soft tissue impingement Joint line tenderness of posterior tibiotalar joint Limited plantar flexion Ligamentous instability (posterior talofibular) Inverted foot to compensate for loss of APF	Inversion/ forceful eversion of ankle PWB tender/ swelling/ bruising	Hx of trauma pain/ swelling medial foot and ankle Exacerbated limp from previous hx of limp Impaired balance Impaired MMT PF/IV Difficulty performing unilateral heel raise Impaired subtalar mobility Pain in lateral foot in severe cases, pt may describe that they are walking on medial aspect of foot Abnormal wear in shoes Change in static/ dynamic foot (pes planus) Increased pronation of foot	knees, ankle, hip. 80% recurrence. Spontaneous. Idiopathic. Open surgery. MRI annually. Night time pain. Ok in daytime.
Aggs	Plantar flexion	Inversion Weight bearing	Standing on toes Painful walking up/down stairs and uneven surfaces	
Eases	RICER			
Differenti al Diagnosi s	Tibialis posterior abnormality Achilles tendinopathy Flexor hallucis longus injury Retrocalcaneal bursitis Haglund's deformity	Ankle impingement Tarsal tunnel syndrome Sinus tarsi syndrome Cartilage or osteochondral injuries	Tarsal coalition Inflammatory arthritis Charcot arthropathy Neuromuscular disease Traumatic disruption of mid foot ligaments	

	Tarsal tunnel	Peroneal tendinopathy or subluxation Posterior tibial tendon dysfunction	Piriformis syndrome (freiberg test?)	
Objective Testing	Anterior drawer test Silfverskiold test Forced dorsiflexion Hyper plantar flexion test Manual strength tests: anterior tibialis, peroneus complex, gastrosoleus complex Flexibility tests: achilles tendon, hamstring Forced plantar flexion Forced inversion	Anterior draw test Talar tilt test Eversion stress test Ottowa ankle rules Knee to wall LL strength Static balance Dynamic balance Agility test	Palpate tib post for pain/ swelling Gait - look for valgus/ pes planus/ pronation Too many toes sign Double leg heel rise Single leg heel rise Plantar flexion/ inversion MMT Foot function index 5 min walk test Milwaukee foot model	
Treatment	Conservative treatment for about 6/12 Peroneal strengthening Plantar flexion mobilisation p/a talocrural mobilisation Rear foot distraction manipulation Peronei strengthening Isometric and eccentric exercises to strengthen lower leg Isometric and eccentric exercises to strengthen and stretch lower leg muscles HEP: achilles tendon stretching Protective dorsiflexion taping	Ankle taping Motor coordination Improve strength ROM training RICER acute	Orthotics CAMBOOT if needed Tib post strengthening Achilles stretching Immobilisation Toe crunches Toe object pick up Foot alphabet	

Hip Pain

Hip Pain	SIJ	Hip OA	Piriformis syndrome	Sciatica	Gluteal Tendinopathy
Presentation	<p>Localised pain over the buttock</p> <p>Often complain of sharp, stabbing, and/or shooting pain extending down posterior thigh (usually not past the knee)</p> <p>Difficulty sitting in one place for too long due to pain</p> <p>Local tenderness of posterior aspect of sacroiliac joint (near the PSIS)</p> <p>Pain occurs when joint is mechanically stressed (eg forward bending)</p> <p>Pts will frequently complain of pain while sitting down, lying on ipsilateral side of pain, or climbing stairs</p>	<p>Typically seen in middle aged or older people.</p>	<p>Neuromuscular disorder where sciatic nerve is irritated by piriformis</p> <p>Persistent buttock Pn +/- radiating posterior thigh/leg</p> <p>Numbness, paresthesia</p> <p>Limping</p> <p>Shortened + hip ER in supine (Splayfoot)</p>	<p>Pressure, stretching or cutting of sciatic nerve</p> <p>Paresthesias, weakness, pain</p>	<p>Hx of change in load</p> <p>Night pain - due to compression of tendons in lying</p>
Agg	<p>SL standing, loaded SL</p>	<p>Weight Bearing, exercise, ADL related pain, EOD pain, increased pain in cold</p>	<p>Difficulty/pn w/ Walking, sitting, squatting, standing, hip adduction, internal rotation (prolonged)</p>	<p>Walking</p> <p>LX F</p> <p>Twisting or coughing</p> <p>Long periods of sitting</p>	<p>Walking uneven surfaces</p> <p>Stretching lateral hip (crossing legs)</p> <p>Ipsilateral laying</p> <p>STS</p> <p>Walk up/down stairs/slope</p>
Ease	<p>Offloading, double leg loading</p>	<p>Rest, offloading joint</p>	<p>Lying down</p> <p>Bending knee</p> <p>Sometimes walking can ease</p>		

Objective	<p>Laslett cluster: distraction, compression, thigh thrust, sacral thrust, gaenslen's.</p> <p>Cluster to rule out, not rule in. +ve cluster = 35% certain -ve cluster = 92% certain https://www.physio-pedia.com/Sacroiliac_Joint_Special_Test_Cluster</p>	<p>Increased BMI Decreased hip ROM (particularly IR, flexion), Strength deficits (hip rotators and abductors), trendelenburg gait</p>	<p>ToP greater sciatic notch, sacroiliac joint or piriformis belly SLR +ve Slump +ve Flexion Adduction Internal Rotation (FAIR) Test: +ve Freiberg test +ve Contracting piriformis Pace and Beatty manoeuvre</p>	<p>Abnormal Gait e.g. Foot drop ER + Abd hip contracture Weakness or atrophy Numbness Sensory changes Slump test, SLR</p>	<p>Weak hip abd. Reduced IR, ER & Flex ToP greater trochanter (ToP in asymp. pop) Pain w/ DL squat & SLSq Pain w/ SLS (due to compression) Donning shoes/socks on (able, sore) Trendelenburg gait Reduced step length Resisted De-Rotation Test +ve FABER +ve Modified Ober's Test +ve</p>
Treatment	<p>Strength/ stability work. Identify deficits - hip/ spinal etc. Taping</p>	<p>Progressive strengthening and exposure to previously limiting activities. Education that imaging not reflective of symptoms "bone on bone" is not end, that it's management condition. Education on weight management</p>	<p>soft tissue mobilization, piriformis stretching, hot packs or cold spray, strengthening hip extensors, abductors and external rotators, as well as correction of faulty movement patterns. Reduce activities that cause pain, but keep active. Stretching exercises. The diagnosis is discussed and there is not clear answer on what treatment is most helpful. Low back massage. Glute bridge.</p>	<p>Pain management -> via use of TENS, massage, gentle stretching and desensitisation techniques.</p> <p>Slump sliders. Stretching exercises. Low back massage. Avoid prolonged sitting.</p>	<p>Education - remove abusive load initially - avoid sitting on ground, crossing legs</p> <p>Reduce Pain - Isometric holds: hip hitch; pendulums; toe ups.</p> <p>Increase Strength</p> <p>Medications: NSAIDs</p>
Risk factors	<p>Pregnacy, high BMO, trauma,</p>	<p>Obesity Low birth weight</p>		<p>Older Poor general health Depression Smoking</p>	<p>Increased peripheral adiposity Post-menopausal women</p>
DDx			<p>Herniated Intervertebral Disc Lx OA Sacroiliac Joint Syndrome FAI</p>		

Knee	Degenerative meniscal injury	Acute meniscal injury	Knee OA	Loose bone fragment
Present ation	Typically seen in middle aged or older people and often accompany knee OA. Often no injury event or even symptoms	MOI typically involves twisting/ pivoting movement. Mechanical symptoms (clicking, catching, locking) only have moderate sensitivity and specificity for diagnosing torn meniscus. Joint effusion can develop immediately or over 24/24. Present w/	Middle aged or older	Pain Swelling Locking Catching of joint

		restricted ROM. Meniscal tears occur in 50% of ACL injuries		
Aggs	WB, jumping, stairs, deep squat, knee hyperflexion	Loaded twisting, pivoting, deep flexion (particularly posterior horn)	WB, exercise, ADL related pain, EOD pain, increased pain in cold	WB, discomfort bending
Eases	Rest, offloading, traction,	Rest	Rest, offloading joint	Offloading joint
Risk Factors	Age (+60), male gender, work related kneeling or squatting.	Wear and tear on knees. Athletes, especially football players and other contact sports.	Joint injury or overuse. Age - risk of increasing w/ age. Gender - women are more likely to get it.	Middle aged or older individuals (degeneration of joint), trauma to knee joint (accident, fall or external force onto knee)
DDx	OA	Collateral ligament injuries.	Other types of arthritis.	Medial meniscus, patellofemoral joint changes
Objective testing	McMurray test Apleys test Thessaly test Joint line tenderness (kn F 45deg & 90deg)	Joint line palpation McMurrays Thessaly's MRI	Increased BMI, antalgic gait, valium vs vacuum deformity, Pain WB (squat, lunge, kneeling), TOP joint line, ROM may be reduced	MRI, -ve knee objective tests
Treatment	Exercise Weight loss	Restore knee function: settle swelling, restore ROM, optimise muscle strength, proprioception, coordination. Restore gait - running & walking. Graduated exposure to pivoting/ twisting movements - sports specific requirements	Progressive strengthening and exposure to previously limiting activities. Education that imaging not reflective of symptoms "bone on bone" is not end, that it's management condition. Education on weight management	Weight loss, knee strengthening exercises Arthroscopy knee surgery to remove loose fragment

Bakers cyst: an extension of the synovial capsule that functions as a pressure-release system when the knee accumulates excess synovial fluid. Can become painful.

Forearm	Lateral Epicondylalgia	Lateral extensor tendinopathy (Tennis Elbow)	Medial epicondylalgia (Golfer's elbow)
Px	Very common (40% of population) Overloaded wrist extensor tendons at common extensor origin ECRB commonly implicated Not inflammatory Often 35-54 yrs	Most common elbow overuse Often involves extensor carpi radialis brevis	Pain on elbow distal to medial epicondyle of humerus, Radiate up and down arm, common on ulnar side of forearm, wrist and occasionally in fingers. Local tenderness over medial epicondyle (over pronator teres and flexor carpi radialis) Onset: sudden or over time
Aggs	Gripping, worst w/ pronation and elbow extension	Gripping- Worst on pronation and elbow extension	Repetitive movements. Wrist ext + elbow supination
Eases	Rest, taping, dry needling	Rest Supination and elbow flexion	Rest, ice, stretch and strengthen, use brace.

Risk Factors	Repetitive movements of wrist and arm (work/sports related).	Jobs that require repetitive gripping. Onset is usually between 34-54 years	Golfers, tennis, throwing sports, weight training, repetitive occupational movements.
DDx	Plica syndrome. Cervical radiculopathy. Medial epicondylitis.	Cervical radiculopathy Osteoarthritis Elbow bursitis Ligament instability Intra-articular pathology Nerve entrapment Distal bicep insertion injury	C6/7 Radiculopathy Ulnar Nerve Compression or Subluxation UCL/MCL Instability
Ox	TOP lateral epicondyle Pain - resisted wrist extension Pain- resisted index /middle finger extension Reduced pain free grip strength RNTT - +/- radial nerve entrapment	Pain on palpation of lateral epicondyle Pain on resisted wrist extension Reduced grip strength	PROM wrist extension (elbow fully extended) ToP medial epicondyle Pain - resisted wrist flex + pronation Grip strength and provocation Golfer's elbow test: palpates medial epicondyle, support elbow w/ one hand, passively supinate forearm and fully extends elbow, wrist and fingers
Treatment	Phase 1: Tendon education, reduce Aggs, STM to relieve muscle tone, PRICE, NSAID Phase 2: stretching, progressive isometric exercises. Phase 3: return to sport		

Wrist/Hand	Scaphoid #	Carpal Tunnel	De Quervain's	Distal radioulnar instability
Px	MOI: FOOSH, forced hyperextension 70-80% of carpal fractures Pain & swelling over anatomical snuff box	Compression of median nerve in carpal tunnel Worse at night Tingling/numbness median nerve distribution	Radial tendons (EPB, APL) Sensitive/swollen/overloaded radial wrist/thumb Overload Gradual onset	
Aggs	Pinching, gripping	Repetitive hand movements, gripping, lifting	Lift, breastfeeding, typing, hammering, ulnar deviation, pinch/grip	
Eases		Flicking/shaking of hand	Neutral thumb and wrist Relative rest	
Risk Factors		Women	30-50yo Women Golf, piano, carpentry, office work, new parents, repetitive movements, pregnancy	

Differential Diagnosis	Other #s: first MC, and carpals De Quervain's Arthritis 1st CMC	Pronator teres syndrome Anterior interosseous syndrome Injury to nerve digitales in palm Cervicobrachial syndrome	OA	
Objective testing	ToP/swollen anatomical snuffbox Pain w/ ulnar deviation XR (+/- evident for 12/7) ROM: reduced thumb	Phalen's Test Tinnel's Test Thenar muscle atrophy Reduced grip/pinch strength Reduced wrist flex	Palpation: ToP over 1st dorsal compartment Swelling: radial wrist Pain w/ resisted thumb ext Special Tests: Finkelstein Test, WHAT test	Watson Test
Treatment	1. Immobilisation 6/52 → XR, look for union 2. Suspected #s w/ negative XRs → repeat XR 7-14/7 3. Restore AROM wrist, thumb, elbow, shoulder 4. Strengthen wrist, hand, grip 5. Functional Restoration RTS 6-12/52 Surgical Fixation	Reduce Aggs Optimise ergonomics Mobilise median nerve STM NSAIDs Splinting/Bracing: especially when repetitive/agg movements cannot be avoided Neural glides for median nerve Surgical release for persistent symptoms	Reduce Aggs Repetitive thumb movements STM EPB/APL muscle belly Gentle ROM Strengthening once symptoms ease Extreme cases: splint (2-3/52), sometimes nighttime only Topical voltaren/hirudoid wrap CSI as last resort before surgery	

	Calf strain	Achilles tendinopathy	Plantar fasciitis	Shin splints / MTSS
Px	Often high speed running injury +/- fatigue	Pain localised to Achilles +/- stiffness +/- athletic Morning stiffness (<60 mins) Gradual onset on b/g of overload	First step after waking stiff/sore & after NWB Warms up	Pain in shin (usually more distal) sudden increase in load (return to sport after break/harder surface/footwear)
Aggs	Load, localised tenderness	Tensile: jumping, sprinting, walking Compressive: hill running (insertional), impact Friction: repetitive ankle movement Pain presents next day		Running/loading
Eases	Rest, ice, compression	Rest	NWB Supportive footwear Stretching Ice	Reduce load Stretching Footwear
Ox	DL/SL calf raise SK/BK Jumps Hops	DL calf raise SL calf raise Jump SL hop ToP Achilles	ToP medial calcaneus Pronation/biomechanics Ankle mobility Subtalar joint mobility	ToP medial tibia KTW Calf/tib ant strength/length Hop Proximal strength and control

				Biomechanics
Treatment	<4/10 loading Progressively loading Plyometrics: speed/spring RTS	Isometrics (30-45 sec holds) → heavy slow → progress load/speed → plyometrics → functional training Decompress load (heel lift in shoes) NSAID cream/tablets	Release foot/calf inc. foot rolling Education footwear/load management Calf strength/intrinsics Address any ankle/subtalar joint stiffness	STM: calf, medial tib border Calf strength Prox strength
Risk Factors	Poor condition Age	Running load/any overload. Also a period of de loading before returning to regular activity level.	Tib post tendinopathy Navicular # Calcaneal fat pad	
DDx	DVT Achilles tendinopathy Rupture Cellulitis Arterial aneurism	Superficial calcaneal bursitis Sural nerve related pain Accessory soleus (approx. 3%) Posterior ankle impingement Flexor hallucis longus & tib post tendinopathy Injury to calf muscle	Tib post tendinopathy Navicular # Calcaneal fat pad	Calf tightness/strain Stress fracture

	Osgood Schlatters	Compartment Syndrome	Sever's	Stress #s of toes
Presentation	10-15yo, active children Unilateral tib tub ToP Atraumatic Gradual onset MOI: excessive traction of patellar tendon on immature epiphysis AKA osteochondrosis, tibial tubercle apophysitis, tibial traction apophysitis	Increased pressure within compartment, restricting blood flow potentially impacting muscles/nerve Intense pain, tingling, burning, tight/full, numb/paralysis in late stage	10-12yo MOI: repetitive Achilles traction loading of unossified calcaneal apophysis AKA calcaneal apophysitis, calcaneal apophysitis	Severe bone bruising or small crack Overuse Swelling Pain increases w/ activity
Aggs	Load: run, jump, cycle, stairs	Repetitive loading e.g. running	Running, jumping, COD, activities on hard surfaces	WB
Eases	Ice, rest, stretching.	Reduce load Elevate (drain) part	Rest	NWB/PWB
Risk Factors	Male 12-15 years Sudden skeletal growth Repetitive loading: jump & sprint	<30yo Overtraining	Active child/adolescent Growth spurt Resuming sport Aggs: Run, jump, obesity	Sudden increase in physical activity Running, soccer, footy
DDx	Jumper's knee, tibial tubercle fracture	Shin splints, stress #, peroneal nerve entrapment	Achilles tendonitis, calcaneal stress fracture, plantar fasciitis.	Medial tibial stress syndrome Soft tissue injuries

O/	ToP tib tub Tony protuberance at tib tub Quad tone & weakness	Compartment pressure measurement ?popliteal or tibial artery occlusion	Squeeze test ToP Pain on passive ADF Standing on tiptoes	ToP XR
Treat ment	Load Mx Ice pre/post exercise Education - growth related, will resolve	Deload Massage to promote circulation Surgical artery release	Reduce pain/swelling Stretch/strengthen calves Heel pads Shoes w/ elevated heel	Deload and reload to resume all previous activity

Anterior Ankle	Ant impingement	ATFL sprain	Syndesmosis injury	Fibular #	Talar dome
Mechanism	Insidious onset, Forced ADF e.g. tackle, gym high force squat, awkward landing	Loaded inversion	Loaded ADF + ER	MOI: fall, running, MVA, gunshot wounds 3 # types: - below joint - at joint w/ ligaments intact - above joint + syndesmotic lig. tear	Loaded inversion or ADF
Px	Ant. ank pain w/ loaded DF Puffy ant. ank	Swelling Instability Pain	Swelling (usually higher distal tib/fib), Pain especially WBing	Fibula bears 5-10% BW (may be ambulant) +/- sore WB ToP fib shaft +/- visible deformity +/- numb/cold in foot	Deep ank ache/pain Sore++
Risk Factors				Reduced bone mass Cigarette smoking Sports w/ cutting, contact or collision Downhill winter sports	
Objective	KTW Gait/running biomechanics for STJ	Swelling (egg lat. malleolus) Bruising Reduced ROM & balance Anterior draw Talar tilt	Squeeze test (above level of tib-fib. leg) Loaded ADF + ER Palp ant & post syndesmosis from inf. (every 1cm predicts 1-week of rehab i.e. 5cm = 5wks)	ToP XR Ottawa ankle rule	ToP talar dome in passive ADF & plantar grade

Signs/ symptoms	As above	Swelling (egg over lateral malleolus) Bruising Pain Reduced ROM & balance Feeling of instability	As above	As above	Deep ank ache/pain Higher intensity
Treatment	Release calf Mobilise ank jt. Load Mx	Taping PRN Gait retraining AROM if NWB WBAT Proprioception exercises Calf strength	Boot +/- NWB and referral	WBAT. Likely FWB/PWB May require XR if intense pain Can recover naturally If surgical ORIF, follow post-op protocol	
DDx	Talar dome lesion	Fibular avulsion, Salter Harris #: https://en.wikipedia.org/wiki/Salter-Harris_fracture	Deltoid ligament sprain, lateral ankle sprain, maisonneuve fracture.	Syndesmosis injury Acute compartment syndrome Ankle soft tissue injury Paediatric limp Peripheral vascular injuries Soft tissue knee injury	Ant impingement

Neck	Cervical Radiculopathy	Facet joint	Thoracic Outlet Syndrome (TOS)
Presentation	Reported changes in sensation/ weakness. Arm pain > neck pain. Reduction in symptoms when walking w/ arm in pocket vs without. Reduced likelihood of Cx radiculopathy if there's an absence of parasthesia or numbness. Commonly due to disc herniation (43%), stenosis (14%), or combination of both (43%)	Facet joint disease is condition in which facet joints (also termed zygapophyseal joints) of spine become source of pain. Causes: -When degeneration of joint is secondary to natural wearing and abnormal body mechanics condition is known as osteoarthritis (OA). The pathophysiology of OA is not entirely understood but is complex one involving various cytokines and proteolytic enzymes as well as personal risk factors. -Secondary to trauma from eg injury or sporting activities. -Secondary to Inflammatory conditions such eg rheumatoid arthritis, ankylosing spondylitis (contribute due to inflammation of synovium). -Subluxation of facet joints due to spondylolisthesis can also contribute to development of facet joint disease	The thoracic outlet is marked by anterior scalene muscle anteriorly, middle scalene posteriorly, and first rib inferiorly. Compression of neurovascular structures that course from neck to axilla through thoracic outlet. Most common site of compression is costoclavicular space between clavicle and first rib Pain in neck/shoulders Numbness or tingling involving entire UL, or forearm and hand Reported weakness/ fatigue of Upper limb Venous engorgement or coolness of involved arm

Aggs	Hanging, particularly weighted limb. E.g handbag on shoulder, briefcase in hand	Cervical rotation Cervical extension	Carrying heavy things on shoulders, like heavy bag. Overhead activities, shoulder flexion Drooping shoulders and scapula protraction
Eases	Supported UL	Cervical flexion	Rest, stretch, massage, heating pad, shoulder position optimal
Risk Factors	Smoking, lifting heavy objects, playing golf, equipment that vibrates.	-Facet joint syndrome is more common in elderly since changes at joints develop w/ aging. -Having history of doing heavy work before age 20 increases likelihood of developing facet joint osteoarthritis. -Obesity also largely contributes to osteoarthritis; thus, it is likely contributing factor in development of facet joint disease.	Sex - Females are greater than three times more likely to be diagnosed w/ thoracic outlet syndrome than are males. Age - Thoracic outlet syndrome may occur at any age but is most commonly diagnosed in adults between ages of 20 and 50.
Differential Diagnosis	Herpes zoster, entrapment syndromes, nerve compression.	-Sciatica Hip osteoarthritis -Sacroiliac impingement -Lumbar radiculopathy -Myofascial pain -Compression fractures -Disc herniation -Osteophytes -Rheumatoid arthritis	Brachial plexus injury, Cx disc injury, AC joint injury, carpal tunnel syndrome, De Quervain's tenosynovitis
Objective testing	- Spurling test - Reduced reflexes - Positive UL neurodynamic tests - PAIVM's reproducing distal symptoms	-AROM -PROM PPIVM's PAIVM's	Nerve test, MRI, ROM, ultrasound,
Treatment	- Reassurance & Education! - DCNF - Cx traction - Exercise of surrounding areas - Facilitate easing patterns → education for patient modifications as appropriate - Gradually return to agg patterns → i. e. progress walking distance/duration - Contralateral unilateral PAIVM's	Soft tissue massage, posture correction w/ exercising and stretching. Traction. Muscle relaxers.	Exercising - strengthen muscle around neck and shoulder and improve posture. Stretching. Sometimes surgery is an option, but it doesn't always work well. Get to healthy weight. Massage.

Red Flags / Sinister	Signs / symptoms	Actions	DDx
VBI	5Ds, 3Ns, 1A <ul style="list-style-type: none"> • Dizziness (vertigo, lightheadedness) • Diplopia (visual problems- ie double vision) • Dysarthria (speech disorder) • Dysphasia (difficulty w/ swallowing) • Drop attacks • Nystagmus • Nausea • Numbness (particularly around mouth) • Ataxia 	No Cx manips or traction (risk of directing vertebral artery). Refer for carotid doppler via GP. Massage permitted. VBI testing: With patient sitting or in supine, ask them to slowly rotate their head (to check range). Ask them if they are experiencing any nausea, dizziness and numbness. If no symptoms, bring patient's neck into rotation to one side to full ROM and hold for 10 seconds. Ask them same questions. Bring back to neutral and wait 10 seconds, asking again if they feel any symptoms. Then rotate head to other side into full range and hold for 10 seconds and ask if there are any symptoms. Then bring them back into neutral. Wait few moments before performing any other ROM tests. If at any point patient has pain, stop test immediately.	Migraine
Cauda equina	Saddle numbness, bilateral paeesthesia, inability to void bladder or urgency. Genital numbness	Refer to ED for bladder ultrasound (to confirm/deny bladder retention)	Conus medullaris syndrome
Cancer	Rapid unexplained LoW, PHx, FHx, lethargy, disrupted sleep, night sweats, non-mechanical pain	Refer & scan (XR for boney locations, CT/MRI for visceral regions)	Back pain. Neck pain.
General red flag Qs	"TUNA FISH": trauma, unexplained weight loss, neurological symptoms, age>50, fever, IVDU, steroid use, PHx Ca (prostate, renal, breast, lung)		
Notes	IVDU: intravenous drug use (risk of infection) Steroid use risk: increases bone degradation. Prolonged use, reduces bone density and induces OP and osteopenia, which increases likelihood of fractures.		
Aneurysm/brain bleed	Splitting headache (hit in head by shovel), visual disturbances	Chest or back pain.	
Burst ovarian cyst	Non-mechanical symptoms. Sudden increase. Abdominal location, not spinal.	Most cyst are harmless, either w/ no symptoms or mild symptoms. Can be managed w/ pain medicine and then it might be looked at w/ ultrasound.	Hemoperitoneum. Hydronephrosis.

Multiple sclerosis

Syringomyelia

MS is potentially disabling disease of brain and spinal cord. In MS, immune system attacks protective sheath that covers nerve fibers and causes communication problems between your brain and rest of body. Can also cause permanent damage to nerve system.

Asymptomatic syringomyelia patients w/ small syrinx cavities and no obvious etiology are best managed w/ watchful waiting and serial imaging exams e.g. 6-monthly scan

Headache	Tension type headache	Cervicogenic headache	Migraine	Wry neck	VBI
Presentation	Diffuse bilateral. Frontal/periorbital/temporal. 1-30 per month. Mild-moderate. Days-to-weeks. Dull.	Unilateral side locked. Can be simultaneously unilateral. Occipital/frontoparietal/orbital. Chronic, episodic. Moderate-severe. 1hr-weeks. Non-throbbing, non-lancinating, pain usually starts in neck. Maybe mild migraine symptoms.	60% unilateral w/ side shift. Diffuse. 1-4 per month. Moderate-severe. 4-72hrs. Throbbing, pulsating. Nausea, vomiting, visual changes, photophobia, photophobia. Kaleidoscope.		5Ds, 3Ns, 1A Ds: diplopia, dysarthria, dysphasia, dizziness, drop attacks Ns: nausea, numb face, nystagmus A: ataxia
Agg	Multiple, not typically neck movement	Neck movement, postures	Multiple, not typically neck movement, stress,		
Eases	Ease muscle tension. Heat or ice.	Stretching.	Warm shower, ice packs.		
Objective	-ve flexion rotation test	Limited ROM, ToP C0-3. Confirmed by +ve flexion-rotation test		Restricted LF & rot. Difficulty turning head to opposite side. Possible dysfunction in upper Cx spine.	
Treatment					
Risk factors	Male:Female 60:40	Male:Female 50:50	Male:Female 75:25		
DDx	Nystagmus = more likely vestibular issue				

<p>Note</p>	<p>Consider Cloward's sign: Physicians acknowledged that referred pain from IVD pathology was most likely due to encroachment/compression of surrounding nerve root, however referred pain would often exist without radicular pain radiating down UL or evidence of neurological compromise. It was w/ results of this classic article (Cloward, 1959) that neurosurgeons and physicians discovered pain referral patterns related to IVD with/without nerve root involvement. These pain patterns were later described as Cloward Signs. Cloward (1959) explained these pain referrals by exploring clinical anatomy of upper to mid Tx spine. As we know, skin in region of medial border of scapula is innervated by T2-T7 spinal nerves. The muscles that lie in this region are innervated by brachial plexus (C5-T1). Therefore local muscle dysfunction in Tx spine should always warrant an investigation of contributing Cx spinal levels. In clinical practice this is achieved w/ Ax of Cx active and passive range of movements and Ax of passive intervertebral accessory and physiological movements (PAIVMS and PPIVMS).</p>	<p>DEAN WATSON - WATSON PROTOCOL - HEADACHES</p> <p>https://watsonheadache.com</p>			
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TYPES OF PAIN

	Nociceptive	Neuropathic	Neuroplastic
Description	Arises from damage in tissues, reported to brain by nervous system	Arises from damage to nervous system itself, central or peripheral - either from disease, injury, or physical irritation	Arises from an altered nociceptive function within CNS.
Mechanism	Toe stub, bee stings	Hitting funny bone, sciatica, multiple sclerosis, chemotherapy	Can occur in isolation (e.g., fibromyalgia, tension-type headaches) Can occur in mixed-pain state in combo w/ ongoing nociceptive or neuropathic pain (e.g., chronic low back pain)
Characteristics	Typically changes w/ movement, position, and load	Stabbing, electrical, burning	Multifocal pain that is more widespread, intense or both Painful light touch
Other Info		More likely to lead to chronic pain	Likely to lead to chronic pain
https://urbanspinerehab.com/2021/12/06/pain-classifiers-nociceptive-neuropathic-nociplastic/			

General screening questions

1. pain - intensity, duration, sharp, dull, referral
2. Pins and needles? Numbness? Changes in sensation
3. Mechanism of injury
4. medications?
5. AM/PM pattern
6. Aggs and eases

CONDITION	SUBJECTIVE FEATURES	OBJECTIVE FEATURES	Treatment
Patellar tendinopathy	<p>Onset: insidious/change in load/period of deloading</p> <p>Pain: inferior pole of patella</p> <p>Aggs: jumping, running, eccentric quads</p> <p>Symptoms: nil clicking/locking/instability</p> <p>Ease: isometrics, deloading,</p> <p>Common Populations: volleyballers, basketballers</p>	<p>ROM: decreased (esp. flex)</p> <p>Palpation: ToP over inferior pole of patella</p> <p>Strength: decreased quads</p> <p>Functional: decline squat pain, hopping pain</p>	<p>Isometric exercises for pain relief</p> <p>Eccentric loading. Eccentric-concentric loading</p>

<p>Patellofemoral Pain a.k.a. Chondromalacia patellae</p>	<p>Onset: Insidious, atraumatic</p> <p>Pain: anterior, medial, infrapatellar, lateral; vague; retroapatellar</p> <p>Symptoms: small amounts of swelling, crepitus, grinding, instability</p> <p>Aggs: knee flexion/PFJ loading (i.e., sitting, stairs, running, squats, kneeling), eccentric quads</p> <p>Ease:</p>	<p>ROM: decreased (esp. flex)</p> <p>Palpation: patellar margins, patellar tendon</p> <p>Strength: decreased quads</p> <p>Tightness: ITB, hamstring, calves</p> <p>Functional: stairs (up), running, jumping, squatting</p> <p>Special Tests: Apprehension Test</p>	<p>RTS CRITERIA POST PATELLOFEMORAL SURGERY: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4169614/</p> <ul style="list-style-type: none"> - observe alignment issues related to hip/foot/trunk - Valgus - Trendelenburg- hip drop- in Single leg stance - potential strength deficits - hip abduction - hip ER - Quad strength
<p>Patella fat pad impingement</p>	<p>Onset: Localised tenderness</p> <p>Symptoms: swelling over fat pad, nil clicking/locking/instability</p> <p>Pain: sharp pain located at front of knee. Swelling surrounding patella and patellar tendon</p> <p>Aggs: Typically knee extension activities</p> <p>Prolonged periods of standing or sitting w/ crossed legs, walking and squatting, Running, kicking activities, wearing high heels.,</p> <p>Eases: wearing flat shoes</p>	<p>ROM: decreased ext</p> <p>Palpation: ToP over fat pad</p> <p>Strength: normal quads strength</p> <p>Tightness: Quadriceps.</p> <p>genu recurvatum (excessive extension of knee)</p> <p>Forceful trauma to front of knee.</p> <p>Special tests: Hoffas test, Fat pad pinch test(pinch fat pads and conduct passive and active knee extension. MRI.</p> <p>Passive knee hyperextension test: Hyperextending patients knee in supine position</p>	

		Positive test: Reproduction of anterior inferior knee pain	
Quadriceps tendinopathy	<p>localized tenderness/ pain at superior border of patella</p> <p>May feel better once it is warmed up</p> <p>Feeling of knee weakness when attempting to accelerate whilst running or performing squat</p> <p>When quads are on stretch, it may produce pain or stiffness</p>	<p>Palpation:</p> <ul style="list-style-type: none"> - Tender on localised area (ToP inferior pole of patella) <p>Reduced strength of quadriceps</p> <p>Reduced knee ROM</p>	
ITB Friction Syndrome	<p>Onset: Insidious, atraumatic</p> <p>Pain: lateral patella</p> <p>Symptoms: nil crepitus/grinding/instability, rarely swelling</p> <p>Aggs: repetitive knee flex/ext</p> <p>Ease:</p>	<p>ROM: decreased ext</p> <p>Palpation: ToP over lateral condyle femur/tibia</p> <p>Strength: normal quads strength</p>	

Condition	Subjective	Objective	Intervention
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Multiple Sclerosis

the disorder is best managed by an interprofessional team that includes a

- neurologist,
- physical therapist,
- pain specialist,
- nurse specialist,
- ophthalmologist,
- mental health nurse,
- gastroenterologist
- urologist

- Numbness and weakness in one or several limbs progressing from paresthesias,
 - Visual disturbances such as double vision, atrophy of one optic nerve
 - impaired ocular movement
 - Fatigue is typically early symptoms that will present w/ MS
 - **Pain:** Headache, chronic neuropathic pain, paroxysmal limb pain.
 - **Cognitive symptoms:** Short-term memory deficits, diminished executive function, diminished attention/concentration.
 - **Affective Symptoms:** Depression, anxiety.
 - **Motor symptoms:** spasticity, spasms, ataxia, impaired balance and gait.
 - **Speech and swallowing:** dysarthria, dysphonia, dysphagia.
 - **Bladder/Bowel symptoms:** spastic or flaccid bladder, constipation, diarrhoea and incontinence.
 - **Sexual Symptoms:** impotence, decreased libido, decreased ability to achieve orgasm.

Neurological abnormalities (upper and lower body weakness/ numbness/ pins and needles.ie. Lx radiculopathy

Low scores on Fatigue scale for cognitive and motor function Ax.

Positive test for clonus: Spasticity within specific musculature

Impaired balance

Abnormal gait

Breathing abnormalities

Imaging - MS plaques found in white matter in CNS

Spinal tap - biopsy +ive for plaque

Evoked potential test - +ive for demyelination.

Recognise and refer to GP for CT brain.

Massage and stretching to relieve muscle cramps.

Preservation of function.

To re-educate and maintain all available voluntary control

Re-educate & maintain postural mechanisms

Incorporate treatment techniques into ways of life by relating to ADLs

Inhibit abnormal tone

Prevent abnormal movement

To stimulate all sensory and perceptual experience

Hematopoietic Stem Cell Transplant (HSCT)

New treatment regime in Mexico proven to halt disease progression

Aims/benefits:

To stop immune system from damaging myelin to restore proper electrical conduction within NS

Reinstatement of appropriate healthy signalling from nerves to muscles often results in clinical and symptomatic improvement

What it involves:

Outpatient based treatment

Use of chemotherapy to eliminate self-destructive lymphocytes (i.e., halting underlying disease)

These cells w/ be eventually replaced w/ new, healthy immune cells created in bone marrow

DESIRED FEATURE	EVIDENCE/JUSTIFICATION
Personal Features	
Uniqueness	Wish to be seen as unique individual, deep understanding + acceptance of personal environment and life choices (empathy) (Bastemeijer et al., 2020).
Autonomy	Right to decide/Independence - be well informed by professional in order to make good decision themselves or to understand why certain decision made by professional is correct one (Bastemeijer et al., 2020).
Collaboration/ Shared decision making	A person centred approach to find out psychological and social factors that attract client to consultation. If these factors are not considered/discussed then they cannot be addressed. This is likely to result in people receiving interventions that clinicians think they need, rather than care based on their expressed needs and preferences. Pt knows that physio respects their opinion and perception of being able to comment and be listened to. (Morera-Balaguer et al., 2019)
Equality	Treating from human to human rather than therapist to human. Allows them to be able to say what they feel at each moment w/ complete freedom, without feeling judged. (Morera-Balaguer et al., 2019)
Therapist Factors	
Technically Skilled	Competent, communication skills, goal- & process-oriented, positive, direct, open, honest. (Bastemeijer et al., 2020).
Contentious	Act morally in clinical decision making Act morally on commercial/financial level (Bastemeijer et al., 2020).
Compassionate/ Empathetic	Concerned (willing and able to empathise), personal contact, take patients seriously (should not generalise or trivialise health problem of patient) (Bastemeijer et al., 2020). The professional and personal manner of therapist, explanations and teaching they provided and extent on which treatment was consultative (Knight et al., 2010). Able to pick up on emotion stressors, fears and anxieties during consultations particularly relating to complex issues (Hammond et al, 2020)
Responsive	Adapt to patient, continuity of care, awareness of vulnerability/dependence, culturally sensitive, make patients feel safe (Bastemeijer et al., 2020).
Attitude	Physio should always have positive attitude -> clients are coming in w/ an issue and may have negative thoughts on situation, physio being negative to situation won't help. (Morera-Balaguer et al., 2019)
Showcasing confidence	Importantly therapist makes you feel like they know what they are doing. (Morera-Balaguer et al., 2019) Trust in therapist' ability to choose appropriate treatment and confidence in professional skills + competence of physios (Bernhardsson et al., 2017)
Interaction Factors	
Partnership	Equality (mutual respect), Cooperation, (expect professional to) Take Lead, shared decision-making (Bastemeijer et al., 2020). All participants wanted to be involved in clinical decision making to varying extents (Bernhardsson et al., 2017).
Empowerment	Enables patients to keep control of their own situations + support/educate them on how to deal w/ their problem. (Bastemeijer et al., 2020)
Communication	Patient centered approach to treatment/ care. Verbal and non verbal communication encompassing empathy, friendliness, encouragement, confidence. Active listening. Being able to convey certain types of news (bad vs good) (Morera-Balaguer et al., 2019)

Authenticity	Making sure you are authentic w/ your patients and not patronising -> will increase your ability to build trust w/ client. (Morera-Balaguer et al., 2019)
Active Listening	Similar to communication as above but showing that you are engaged w/ conversation and giving them your full attention i.e. repeating what they said to make sure.(Morera-Balaguer et al., 2019)
External Factors	
Location/ environment	creates pleasant and welcoming environment within physiotherapy practice (Potter Gordon and Hammer (2003)
Recommendation/ratings	
Accessibility	Duration of consultation and client access to therapist (Knight et al., 2010)
Connections w/ surrounding community	
Treatment Factors	
Active Therapy	Most preferred active treatment strategies such as exercise + advice for self-management, allowing them to actively engage in their therapy. (Bernhardsson et al., 2017).
Evidence based	Participants expressed that treatment methods should be evidence based (Bernhardsson et al., 2017).

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FEATURE	DVT	Calf Strain	Referred Discogenic Lx Pain	Referred Facet-Joint Lx Pain
Pain	ToP leg	Pain on loading	Referred down LL to calf, vague	Dull ache in lower back +/- buttock
MOI			MOI: F/Rot +/- compression loading	

Swelling	+++ lower leg + ankle + foot	Swelling/bruising in muscle area	Nil	Nil
Aggs	Ankle movement	Calf loading (i.e., heel raise)	Lx F, sitting, lifting, cough/sneeze	Lx E, stand, walk
Eases	During movement ie walking	Rest	Lx Extension, standing, walking	Lx F, sitting
Other Symptoms	Warmth Red, pale, bluish Tingling Pain/tender calf & APF While DVT can occur in any deep vein, it most commonly occurs in veins of pelvis, calf, or thigh		History of working in job w/ heavy manual handling. Worse on waking	
Risk Factors	>60yo Physical inactivity Prolonged sitting Post surgery Pregnancy Overweight Smoking Active Cancer Heart Failure IBD Family Hx			
O/	Swelling +++ ToP over leg/ankle ROM may be reduced secondary to swelling	Bruising (maybe) Swelling (maybe) Antalgic gait on affected limb Reduced calf strength Pain on resisted PF ToP at point of injury		
Treatment	Anticoagulants Compression stockings Reduced risk factors Seek emergency medical help if developing symptoms of pulmonary embolism (PE) PE symptoms include: sudden SOB, chest pain that worsens when taking deep breath, feeling	Load Mx Gradual loading Strengthening Plyometric		

	lightheaded or dizzy, fainting, rapid pulse, coughing blood			
	<p>Clinical Case: Glenn</p> <ul style="list-style-type: none"> ● Whole Leg Swelling <ul style="list-style-type: none"> ● Cannot fit into L) shoe ● Loss sensation in toes L) ● Now feeling tingling in L)foot ● Able to move more freely post massage ● US: 2 blood clots - @ knee, ● 4 thinner blood tablets ● Compression stocking used ● Relatively active person <p>Post thrombotic syndrome occurs in 50% of Pt's within 2yrs</p>			

Language Barriers

1. Greeting and mannerisms
2. Can you show me where it hurts?
3. What makes it feel good or bad?

Key words: Pain, good, bad, show me, greeting , here, there, practice, rest water (for hydration or swelling)

Strategies

- Videos
- Visual scales
- Use an interpreter (? google translate)

Wearable Technology for Back Pain

This article talks about sensors being placed at significant landmarks along spine to correct posture which will help reduce back pain.

- https://www.sciencedirect.com/science/article/pii/S1071581919301004?casa_token=mDMYmhDHiTsAAAAA:ytacd7zoLZd4VFjHC9o6gfr2Ln7mjGj_dkNsfKpLsEv3rEmCbFqUxF08IXVUnIX2JAUz7xVsw

A recent study by Ferrone, Napier and Menon (2021), aimed to gain insight into workers' perceptions of LBP and whether they would consider using wearable monitoring technologies to reduce injury risks. surveyed 64 nurses found that almost nine out of ten nurses surveyed were working in presence of back pain or diagnosed back condition. The most common strategy to reduce LBP risk was to adopt proper body mechanics during work, reported by more than one-third of respondents. However, monitoring postures and movements while working is difficult. Throughout shift, nurses may fatigue or be distracted by other more urgent tasks, placing them at risk of LBP through faulty movements or postures. Current OHS implementing lifting advice in workplace has not led to reduced occurrence of LBP. Most respondents were interested in device that could document back injury as work-related to assist w/ insurance claims and help better understand cause of injury. Wearable technology has been shown to be useful in other conditions to drive behaviour change via biofeedback. Understanding mechanism of injury may assist clinicians and patients in resolving condition and avoiding future episodes.

Ferrone, A., Napier, C., & Menon, C. (2021). Wearable Technology to Increase Self-Awareness of Low Back Pain: Survey of Technology Needs among Health Care Workers. *Sensors*, 21(24), 8412.

A recent study by Da Silva et al., (2019) found that 69% of 250 participants in study experienced recurrence lower back pain episodes within 12/12, 40% resulted in activity limiting LBP (Da Silva et al, 2019). We know, as physiotherapist students, that most treatment for LBP consists of regular exercises, manual therapy, analgesics and in severe cases surgery and that early treatments based on pain management and postural control are essential in preventing LBP, rate or recurrence and to mitigate permanent and long term damage. Rodriguez et al., 2021 recently designed noninvasive, cost-effective wearable device to measure back position, study spinal deviations, and establish control method that helps individuals to control their posture, w/ aim of improving effectiveness of physical therapies in patients w/ low back pain. The device uses gyroscopes, accelerometers, and magnetometers to measure angular movements in different sections of back and performs an integrated analysis to obtain postural information of patient in real-time. In their pilot study testing product they found improved postural control, an improvement in quality of life, and reduction of low back pain were observed. Also, none of patients reported discomfort or pain in training sessions in four/12 of pilot study, however its important to note this this pilot study only consisted of 5 participants.

For wearable device to be effective it would need to be calibrated to individual needs and presentation. Wearable Technology can offer calibration options as it gains information such as person's capabilities, context, and routine. Some people felt that this would be useful. The device could be modified to store movement ranges (Singh et al., 2017)

For example, client who presents w/ disc related pain would often find flexion-based activity limiting due to pain. Therefore, wearable device would need to be calibrated to conformable and tolerable degree of flexion and provide sensory and biofeedback when flexion activities exceed this range through repetition or sustained posture

Da Silva, T., Mills, K., Brown, B. T., Pocovi, N., de Campos, T., Maher, C., & Hancock, M. J. (2019). Recurrence of low back pain is common: prospective inception cohort study. *Journal of physiotherapy*, 65(3), 159-165.

Rodriguez, Alvaro, Juan R. Rabuñal, Alejandro Pazos, Antonio Rodríguez Sotillo, and Norberto Ezquerro. "Wearable Postural Control System for Low Back Pain Therapy." *IEEE Transactions on Instrumentation and Measurement* 70 (2021): 1-10.

Singh, A., Bianchi-Berthouze, N., & Williams, A. C. (2017, May). Supporting everyday function in chronic pain using wearable technology. In *Proceedings of 2017 CHI Conference on human factors in computing systems* (pp. 3903-3915).

SIMPLE APPLICATION OF WEARABLES TO LBP TREATMENT OUTCOMES <https://jss.amegroups.com/article/view/5543/html>

Wearable devices currently available on market, such as smart watches, have capabilities pertaining to length of time someone is sedentary/seated. This can be used indirectly in management of LBP as frequent position changes/avoiding prolonged sitting is common recommendation made to these patients. This feature could be made customizable, whereby users can adjust length of time they can remain sedentary before getting an alert and amount of time they need to subsequently move around before returning to sitting.

WEARABLE POSTURE TRACKING DEVICES

- The [UPRIGHT GO](#) is device about size of thumb that you attach to your back w/ adhesives. It contains motion detector that vibrates when you're using poor posture while sitting or standing. One [reviewer](#) called device accurate and responsive.
- The [Lumo Lift](#) is sensor about size of your fingertip that you attach to your clothing near your collarbone. It tracks your posture and activity levels and vibrates when you slouch. According to one [reviewer](#), it detected slouching about 80 percent of time.

Wearable devices that provide real time biofeedback have been shown to improve poor posture in workers. It enables workers to be constantly reminded to reposition themselves whenever they get into poor positions. The device also enables users to maintain optimal posture for longer periods of time.

Simpson, L., Maharaj, M.M., Mobbs, R.J., 2019. The role of wearables in spinal posture analysis: systematic review. BMC Musculoskeletal Disorders 20.. doi:10.1186/s12891-019-2430-6

Challenges to wearable devices:

Adults seeking physiotherapy prioritise diagnosis, pain relief, improved function & education (<https://www.sciencedirect.com/science/article/pii/S18369553173009>).

Shoulder Pain	AC joint (acute)	Frozen shoulder	Cuff pain: tendinopathy	Rotator cuff tear	Biceps rupture	Subacromial impingement/bursitis	Labral/OA sh
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Description			<p>RC:</p> <ul style="list-style-type: none"> - Supraspinatus: Abduction from 0-10 degs, assist abduction to 90 degs - Infraspinatus: primary agonist of external rotation - Teres minor: external rotator - Subscapularis: internal rotator, adduction and extension in some positions (eg arms raised) 				= crepitus, clunking
Presentation	<p>Direct impact onto point of shoulder (fall/hip/shoulder bump). Immediate pain, loss of strength/ROM. Common young footballers</p>	<p>Onset: insidious onset of inflammatory capsular adhesions, occasionally traumatic</p> <p>Pain: gradual increase, sharp at extremes of ROM, may have neck pain</p> <p>Other: gradually decreased ROM, stiffness</p> <p>Night pain: due to sleeping position</p> <p>Stages: Pain > stiffness,</p>	<p>Pain anterolateral shoulder, over time rather than acute, crepitus, clunking, catching, weakness, loss of ROM</p>	- Sudden onset	<p>Popeyes sign</p> <p>Often occurs when lifting or pulling heavy object and bicep tendon separates from bone.</p> <p>Often "snap/Pop" is felt/heard</p> <p>Sharp pain in shoulder or elbow</p> <p>Decreased strength</p> <p>Swelling</p>	<p>Onset: chronic rather than acute</p> <p>Pain: anterolateral shoulder, sharp</p> <p>Other: crepitus, clunking, catching</p> <p>Night pain: due to sleeping position</p> <p>SHx: active individuals, manual professions</p>	

		Stiffness> pain. Peak onset 50-55 y.o					
Aggs	WB through arm, shoulder abd, horizontal flexion	Overhead activities Reaching Personal care - dressing	Sh flex/ abd AROM		May vary depending on severity Often pain present in shoulder or elbow depending where rupture is located (prox/dist)	Abduction Overhead activities	
Eases		Rest			Complete rest Ice Analgesia	Rest	
Objective	Step deformity on observation, WB, sh abd, horizontal flex	Assess whether pain > stiffness OR stiffness > pain No gold standard for diagnosis - rule out other pathologies ROM: global loss of AROM & PROM equally (minimum of stiffness in 3 directions). ER stiffens first, then abd, then F. Weakness: IR, ER, abd Imaging: normal shoulder radiograph	+/- kyphotic Tx - Supraspinatus :Empty and full can test - Infraspinatus: external rotation test - Teres minor: - Subscapularis: Lift-off test, belly press test		Decreased strength Reduced ROM Tender on palpation Visible swelling Popeye sign	ROM: Loss of AROM Diff b/w AROM & PROM Asymmetry in scap-hum rhythm Weakness: ER, abd, elevation (2ndary to pain) Special Tests: Hawkins-Kennedy test Empty can test Lift off/Belly off Speeds test O'Brien's test Relocation test	

Treatment	<p>Phase 1: Tape/ sling, Cx treatment, massage surrounding muscles.</p> <p>Phase 2: Sh isometrics, mobility.</p> <p>Phase 3: Dynamic sh strength.</p> <p>Phase 4: WB, sport specific (fend off opponent)</p>	<p>Education: condition spontaneously resolves itself, stiffness will reduce w/ time</p> <p>Exercise as tolerated</p> <p>Pain > stiffness: Gentle AROM, AAROM (w/ broom stick). STM. Consider CSI if indicated.</p> <p>Stiffness > pain: Begin to push them - push into stiffness, manual therapy. Can consider hydrodilatation (after acute pain phase only). Might need 2x hydrodilations.</p> <p>Mobilise shoulder aggressively after each hydrodilatation.</p> <p>Hydrotherapy = excellent environment to gain range.</p>	<p>Improve Tx if indicated - mainly ext.</p> <p>Scapula-humeral rhythm. Shoulder function (stability vs. mobility)</p> <p>STM for short term relief.</p> <p>Graduated exercise program</p>		<p>Requires near immediate surgery (within 1/52)</p> <p>Ice may be used to manage pain and swelling</p>	<p>Reduce Pain: remove/modify agg factors, ice, pain relief</p> <p>Reduce Inflammation: pain free exercises, pacing activities, progress to PROM → AAROM → AROM → isometrics</p> <p>Optimise AROM + PROM: broom stick for AA exercises, shoulder ROM exercises, restore spinal ROM</p> <p>Improve NM Control + Strength: open chain exercises, close chain (wall push-ups, cat cow!)</p> <p>Surgical Mx: subacromial decompression</p>	
Risk Factors		<p>Family Hx Ethnicity Diabetes</p>				<p>Over use Repetitive movements Postnatal hormones</p>	

		Female, fat, 40-50, fertile					
DDx						Carpal tunnel syndrome C6 Cx radiculopathy Wrist ganglion Scaphoid fracture	

Neck Pain	Cervical Radiculopathy	Facet joint	Thoracic outlet
Presentatio n	Reported changes in sensation/ weakness. Arm pain > neck pain. Reduction in symptoms when walking w/ arm in pocket vs without. Reduced likelihood of Cx radiculopathy if there's an absence of parasthesia or numbness. Commonly due to disc herniation (43%), stenosis (14%), or combination of both (43%)	Pain that is characterised by localised ache and stiffness in Cx region. Pain is usually intermittent. May refer to shoulders, Tx and head. Headaches may be present	Compression of neurovascular structures that course from neck to axilla through thoracic outlet. Most common site of compression is costoclavicular space between clavicle and first rib May present with: <ul style="list-style-type: none"> - Pain in neck/shoulders - Numbness or tingling involving entire UL, or forearm and hand - Reported weakness/ fatigue of Upper limb - Venous engorgement or coolness of involved arm
Aggs	Hanging, particularly weighted limb. E.g handbag on shoulder, briefcase in hand	ROM: aggravated in cx extension,	Overhead activities, shoulder flexion Drooping shoulders and scapula protraction
Eases	Supported UL	eased in cx flexion	Shoulder neutral position

Objective testing	<ul style="list-style-type: none"> - Spurling test - Reduced reflexes - Positive UL neurodynamic tests - PAIVMs reproducing distal symptoms 	PAIVMs reproducing symptom Decreased ROM: ext, lat flex, rotation	Adson's test- patients head laterally rotated to side of symptoms and extended. Patient then abducts arm and inspires deeply. positive test obliterates radial pulse and reproduces symptoms Roos hyperabduction external rotation test- patient opens and closes their hand for 1-3 mins w/ elbows bent and arms abducted to 90 deg then externally rotate to reproduce symptoms
Treatment	<ul style="list-style-type: none"> - Reassurance & Education! - DCNF - Cx traction - Exercise of surrounding areas - Facilitate easing patterns → education for patient modifications as appropriate - Gradually return to agg patterns → i. e. progress walking distance/duration - Contralateral unilateral PAIVMs - PPIVMs 		<ul style="list-style-type: none"> -Scapular correction and body mechanics -Correct sitting and standing position of shoulders -Pectoral and scalene stretches -TP and STM for surrounding musculature -Joint mobilisation of first rib -Tx extension exercises -Brachial plexus nerve mobility exercises
DDx			

LEVEL 2 CONDITIONS

	Tempormandibular joint pain

Treatment	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4549724/
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Shopping Cart Sign

This relates to temporary relief of back pain when an individual bends over as if leaning on trolley/shopping cart.

- Can indicate Lx spinal stenosis
- Involves narrowing of spaces within spine which can put pressure of spinal nerves and spinal cord
- While this condition occurs in both Cx/upper and Lx spine, Shopping Cart Sign only indicates Lx spinal stenosis
- Relief from pain occurs due spaces within spine increasing when bending forward therefore decreasing pressure

Adductor Aponeurosis- RA-AL aponeurosis

Athletic competition that involves hyperextension of hip and trunk w/ twisting motions generates tremendous forces across common tendon attachment of rectus abdominis and adductor longus tendons. Repetitive trauma or single episodes can result in strain or avulsion at this attachment, leading to significant dysfunction in twisting, cutting, or pivoting sports

Adductor Aponeurosis

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4922526/>

Timing of Nordics relative to Training Sessions:

Egyptian Study: <https://synapse.koreamed.org/articles/1150758>

Australian Study:

https://onlinelibrary.wiley.com/doi/full/10.1111/sms.12925?casa_token=k8FW4sKiHE4AAAA%3AZn896WsnQxY-277zcxwFunwxo7TmyEfi-GQMEebNHmFToSldJDG2v7zteae89Y9_faOEr9pVpBsXMHw

Clavicle healing time protocol

Cross education in strength training

Cross education is strength gain or skill improvement transferred to contralateral limb following unilateral training or practice. The present study examined transfer of both strength and skill following strength training program.

COMPARING BURNING LOWER LIMB PAIN

	Canal Stenosis	Peripheral Vascular Disease
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Definition	<p>Narrowing of spinal cord which can compress, irritate or pinch spinal cord + exiting nerves.</p> <p>Cause is most commonly age-related changes in spine (such as OA), bulging/ herniated discs, or bone spurs.</p> <p>Most commonly occurs in neck (Cx) + lower back (lumbar)</p>	<p><i>AKA: peripheral arterial disease</i></p> <p>Slow, progressive circulation disorder Causes: narrowing, blockage, or spasms in blood vessel Can affect any blood vessel → organs/tissues supplied by vessels may have altered function Legs + feet are most commonly affected</p>
Presentation	<p>Radiating pain/ numbness/ tingling (usually entire leg) to gluteal region, or leg (specifically thigh) can be noticed when one stands or walks for long time frames.</p> <p>Symptoms are usually bilateral and asymmetrical.</p> <p>May also have weakness, walking upstairs easier than downstairs, shopping cart sign.</p>	<ul style="list-style-type: none"> - Changes to skin - temperature increase, thin, brittle skin on legs/feet - Weak pulses in legs/feet - Hair loss on legs - Impotence - Numbness, weakness or heaviness in muscles - Pain - burning, aching, at rest, commonly in toes, at night - Paleness when legs are elevated - Reddish-blue discolouration of extremities - Restricted mobility <p>Vascular claudication (vascular vs neural as DDX)</p>
Aggs	<p>Lx ext, prolonged over head activity, axial loading, prolonged walking, downhill walking, standing</p>	
Eases	<p>Rest and Lx flexion Lying, Sitting, Walking uphill</p>	
Risk Factors	<p>Age (generally older population)</p>	<p>Unmodifiable:</p> <ul style="list-style-type: none"> - Age (>50 yrs) - Hx of heart disease - Males - Postmenopausal women - FHx high cholesterol, high BP or peripheral vascular disease <p>Modifiable:</p> <ul style="list-style-type: none"> - Diabetes - High cholesterol - High BP - Overweight - Physical inactivity - Smoking or use of tobacco

Objective	Prolonged standing Flexion in standing Extension in standing Strength test (normal/mild reductions) Palpation (ToP Lx, paraspinal, gluteal) Lumbar Ext Loading Test Shopping Cart Sign	Doppler imaging? Restricted mobility Numbness and/or weakness Weak pulses in legs/feet
Treatment	Heat/Ice therapy (heat is usually better) Exercise - core + back strengthening Lumbar-flexion based exercises: single/double knee to chest Manual therapy Lumbar isometric + stretching exercises Endurance exercises Postural/Ergonomic advice Aerobic fitness Hydrotherapy NSAIDs Surgical: remove portions of bone, bony growths on facet joints or discs crowding spinal canal.	

Ankylosing Spondylitis

Description	An inflammatory arthritis of spine that can cause stiffness and fusing of bones (autoimmune disease) Affected joints progressively become stiff and sensitive due to additional bony formation at level of joint capsule and cartilage (attributed to inflammatory mechanism) Most commonly affects SI joints Can also affect other parts of body (i.e., eyes, skin, lungs and bowel) Disease onset typically occurs in young adults (~15-45)
Causes	Causes predominantly unknown Genetics considered contributor
Presentation	Pain and stiffness of back, buttocks or neck (particularly in morning) Pain may cause sleep disturbances Reduced mobility of spine Tendon and ligament pain (often felt in front of chest and heel or sole of foot) May experience excessive fatigue
Aggs	Prolonged periods of sedentary behaviour (i.e., rest, sitting and sleeping)
Eases	Exercise/movement Medication

Objective	Reduced ROM/increased stiffness of affected region Blood tests (measure inflammation levels) X-rays of spine (can present normally in initial stages of disease)
DDx	Chronic LBP Rheumatoid arthritis Degenerative disc pathology Disc herniation Fibromyalgia
Risk factors	FHx of AS increases likelihood HLA-B27 gene (9/10 cases of AS test positive for this) Men > women (2:1)
Treatment	No current cure for AS Lifestyle changes and medication are used for effective management Referral for corticosteroid injections for Mx Exercise: Strength and cardio based exercise is recommended (to promote moving through range, enhance strength and reduce pain) Hydrotherapy is encouraged

Achilles rupture

Presentation	Spontaneous. Gun shot/hit from behind during push-off
Objective	Thompson +ve
Treatment	<ol style="list-style-type: none"> 1. Fowler-Kennedy Protocol (Accelerated Functional Rehab) 2. Surgical repair <p>STM in 0-2/52 to reduce foot/ank swelling, maintain calf flexibility Strengthen++ contralateral leg for cross-education to minimise atrophy of ipsilateral leg</p>

Psoriatic arthritis

Description	A form of inflammatory arthritis that affects some individuals w/ psoriasis (up to ~30% of psoriasis sufferers) Typically affects large joints (e.g, those of LL), small joints (e.g., of finger and toes) and can also affect spine and SI joints Eyes, tendons, GI system and nails may also be involved
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	<p>Psoriatic arthritis onset typically occurs in those aged 30-50, although can begin as early as childhood</p> <p>Men and women are equally at risk</p> <p>5 types:</p> <ol style="list-style-type: none"> 1. Distal interphalangeal predominant 2. Asymmetric oligoarticular 3. Symmetric polyarthritis 4. Spondylitis 5. Arthritis mutilans
Causes	<p>Exact cause is unknown</p> <p>Both genetic and environmental factors are believed to contribute</p>
Presentation	<p>Morning stiffness</p> <p>Joint pain</p> <p>Swelling and warmth</p> <p>Nail changes</p> <p>Psoriasis symptoms (i.e., skin rashes, dryness, redness and inflammation)</p>
Aggs	<p>Prolonged periods of sedentary behaviour (i.e., rest, sitting and sleeping)</p>
Eases	<p>Exercise/movement</p> <p>Medication</p>
Objective	<p>Reduced ROM/increased stiffness of affected region</p> <p>Joint swelling</p> <p>Blood tests (measure inflammation levels and rule out other similarly presenting conditions)</p> <p>X-rays, MRI and ultrasound (Ax joint damage)</p> <p>Occasionally skin biopsies (confirm psoriasis)</p>
DDx	<p>Rheumatoid arthritis (of hands and spine predominantly)</p> <p>Enteropathic arthritis (arthritis of inflammatory bowel disease)</p>

	Spotted bone disease
Risk factors	<p>Genetic predisposition: ~40% of sufferers have family member w/ either psoriasis or arthritis</p> <p>Strep throat: May be triggered by previous infection of streptococcal throat infection</p>
Treatment	<p>Medication: Disease-modifying antirheumatic drug</p> <p>Non-steroidal anti-inflammatory drugs</p> <p>Exercise: Strength and cardio based exercise is recommended (to promote moving through range, enhance strength and reduce pain)</p>

Trochanteric Bursitis	
Description	Inflammation of trochanteric bursa. Frequently confused w/ Greater Trochanter Pain Syndrome (GTPS) but is component of GTPS that also includes other conditions that cause lateral-sided hip pain.
Causes	<p>Bursitis occurs most often because of friction, overuse, direct trauma or too great an amount of pressure.</p> <p>Acute is more likely to be direct trauma or overload</p> <p>Chronic is most likely to be because of overuse and too much pressure.</p>
Presentation	<p>Chronic pain and/or hip tenderness in lateral aspect of hip that may radiate down thigh</p> <p>A snap felt in lateral aspect of hip</p> <p>Ascending stairs is painful activity</p> <p>Patient is unable to lie down on affected side</p> <p>Development of pain-related sleep disturbance</p> <p>Lower back pain</p>
Aggs	<p>Overuse</p> <p>Overloading</p> <p>Palpitation</p>
Eases	Reducing activity and modifying body mechanics
Objective	<p>Copenhagen hip score</p> <p>Oswestry Disability index</p>
DDx	<p>ITB syndrome</p> <p>Referred pain</p>

Risk factors	<p>Woman are more likely to develop bursitis than men</p> <p>Obesity/overweight</p> <p>Trauma</p> <p>Overuse of muscles</p> <p>Dysfunction of glute med insertion</p> <p>Hip OA</p> <p>Repetitive strain etc.</p>
Treatment	<p>Surgical: only if impairment is severe and conservative management is failing. Aim of surgery is to remove thickened burse</p> <p>Conservative: improving flexibility, muscle strengthening and joint mechanics</p> <p>Anti-inflammatory drugs during early inflammatory phase and ice.</p> <p>Second phase: restoring patients strength and restore ROM</p> <p>Final phase: preventing relapse, strengthening core and foot orthotics to help LL biomechanics.</p>

SPECIAL QUESTIONS BY BODY PART

Body Part	Special Questions	What it indicates
General	<p>Unexplained weight loss</p> <p>Night sweats</p> <p>Incontinence</p> <p>Difficulty emptying bladder</p> <p>Cancer Hx</p> <p>Referred pain</p> <p>Numbness/Sensory Changes</p> <p>Pins & needles</p> <p>Fever</p>	Cancer or Infection
Head	<p>Headaches</p> <p>Vertigo</p> <p>VBI Questions (5Ds, 3Ns, 1A): Dizziness, Nausea, Nystagmus - rapid eye movements, Dysphagia - difficulty eating, Dysarthria - difficulty speaking, Numbness, Diplopia - vision changes, Drop Attacks</p>	
Neck	<p>Headaches</p> <p>Referred pain - down arm</p> <p>Numbness/Tingling/Pins & Needles</p>	

Shoulder	Clicking Locking Instability Referred pain Apprehension	
Tx	Chest pain Pin and needles (thoracic outlet syndrome) Burning New lumps Weight loss RA Drug therapy (x-ray and MHx) General health	
Elbow	Infection/Inflammation Malignancy Fracture/Dislocation (Positive Elbow Extension Test) Inflammatory Arthritides Abnormal Vitals Abnormal Vascular/Neurological Exam Heterotopic Ossification (Post-Surgical Consideration) Inappropriate progress from treatment made after surgery Yellow Flags Psychosocial factors Passive coping Fear Avoidance Beliefs	
Wrist/Hand	Pins and needles	
Lumbar	Particularly if there was knock around kidney area - blood in urine?	
Hip	Sudden onset of pain. A history of trauma Any swelling Any deformity An inability to bear weight Any lumps or bumps felt in groin Night pain Any noticeable groin pulsations Constipation or vomiting	

	<p>Haematuria</p> <p>Fever</p> <p>Lower limb neurological symptoms - weakness, numbness or tingling</p> <p>History of steroid use</p> <p>Testicular swelling</p> <p>Night sweats, unintentional weight loss, appetite loss</p> <p>History of malignancy</p> <p>High-risk sexual activity</p>	
Groin	Incontinence	
Knee	<p>Clicking</p> <p>Locking</p> <p>Instability</p> <p>Swelling</p>	
Ankle	<p>Unable to bear weight: rule out fracture (Ottawa Rule)</p> <p>Bilateral pins and needles or numbness in LLs</p> <p>Bowel and bladder dysfunction (i.e. patient is unable to feel themselves going to toilet)</p> <p>Urinary Incontinence</p> <p>Paraesthesia in groin region</p> <p>Loss of pulses in lower leg (vascular compromise)</p> <p>Obvious deformity</p> <p>Joint dislocation</p> <p>Positive Babinski sign</p> <p>Unable to calf raise: rule out Achilles tendon rupture</p>	
Vascular	<p>Hot flush locally</p> <p>Pain in an extremity</p> <p>Asymmetrical Swelling</p> <p>Local Warmth</p>	DVT(Deep vein thrombosis)

Scoliosis Overview

Description - Scoliosis	<p>Abnormal lateral curvature of spine - coronal plane</p> <p>Most commonly diagnosed in childhood or early adolescence</p> <p>Primary age of onset: 10-15 years</p> <p>Occurs equally among both genders</p> <p>Females are 8 x more likely to progress to curve magnitude that requires treatment</p> <p>Affects 2-3% of population (US data)</p>
Type - Idiopathic	<p>typically divided into 4 categories based on age and risk for progression.</p> <p>I. Infantile idiopathic scoliosis is diagnosed when first seen in child under age 3</p> <p>II. Juvenile idiopathic scoliosis is diagnosed in children ages 4 to 9</p> <p>III. Adolescent idiopathic scoliosis is diagnosed when spine curvature changes during growth spurts commonly occurring around puberty(between ages 10 and 18)[11]</p> <p>IV. Adult idiopathic scoliosis occurs in patients older than 18. This condition can also be referred to as de Novo scoliosis. Many of these new diagnoses are related to spinal degeneration however, when onset is not coincident w/ periods of skeletal growth, other non-idiopathic causes should be considered.</p>
Type - Non-Idiopathic	<p>associated w/ other conditions and/or underlying causes. The causes are typically divided into two categories.</p> <p>I. Neuromuscular Scoliosis. This type of scoliosis is associated w/ neuromuscular diseases i.e., Arnold-Chiari malformation/syrinx or trauma to the spinal cord.</p> <p>II. Syndromic Scoliosis is related to other diseases i.e. Marfan's syndrome, spina bifida.</p>
Type - Congenital	<p>occurs when spine doesn't develop properly in utero.</p> <p>Malformations can include hemivertebra, when only one side of vertebral body develops, failure of segmentation, when parts of spine are fused, or rib fusion, where ribs are fused together</p>
Type - Neuromuscular	
Diagnosis	Usually confirmed via x-ray, spinal radiograph, CT scan, or MRI
Presentation	<p>Lateral curvature of spine</p> <p>Lateral body posture</p> <p>One shoulder raised higher than other</p> <p>Clothes not hanging properly</p> <p>Local muscular aches</p> <p>Local ligament pain</p> <p>Back pain</p>
Aggs	Daily wear and tear, jarring of spine, microtraumas
Eases	Exercise, stretching, heat
Outcome Measures	Quality of life SF-36
Objective	<p><i>AIM: distinguish b/w faulty posture + idiopathic scoliosis</i></p> <p>AROM - flex/ext/lat flex</p>

	Adam Forward Bend Test - distinguish b/w structural & non-structural scoliosis Cobb Angle - standard measurement to determine + track progression of scoliosis Scoliometer - designed to measure trunk asymmetry or axial trunk rotation Pulmonary Function Testing - useful in preoperative evaluation of patients
DDx	Syringomyelia, spina bifida, arnold-chiari malformation, leg length discrepancy
Risk factors	Cerebral Palsy, birth defects, muscular dystrophy, injuries and infections in spine, spinal cord abnormalities
Treatment	<p>Surgical: Surgical treatment is reserved for curves which are generally greater than 50 degrees for adolescent patients and adults. Surgery can be performed for smaller curves if appearance of curvature is bothersome to patient or if symptoms are associated w/ scoliosis in adult patient. The goals of surgical treatment are to obtain curve correction and to prevent curve progression by fusing spine at optimum degree of safe correction of deformity. This is generally achieved by placing metal implants onto spine that are then attached to rods, which correct spine curvature and hold it in corrected position until fusion, or knitting of spine elements together</p> <ul style="list-style-type: none"> - Patients w/ early-onset scoliosis (under age 10 years) are offered surgical treatment if: - Cobb angle >50 deg - Major curvature remains progressive despite conservative treatment - Note: spinal fusion is NOT recommended in this age group as it prevents spinal growth + pulmonary development <p>Conservative: The Schroth Method It uses exercises customized for each patient to return curved spine to more natural position. The goal of Schroth exercises is to de-rotate, elongate and stabilize spine in three-dimensional plane. This is achieved through physical therapy that focuses on:</p> <ul style="list-style-type: none"> - Restoring muscular symmetry and alignment of posture - Breathing into concave side of bod - Teaching you to be aware of your posture - The purpose of these exercises is to derotate, deflex and to correct spine in sagittal plane while elongating spine - Conservative therapy consists of: physical exercises, bracing, manipulation, electrical stimulation & insoles

Condition	Cause	Ax	Treatment
Trochanteric bursitis	Overuse (chronic) Friction Trauma (acute)	<p>Sx</p> <ul style="list-style-type: none"> - Pain around greater trochanter - Lateral hip pain or tenderness radiating down thigh - Agg = down stairs, lying on affected side, pain related hip disturbance - LBP 	<p>Aseptic Bursitis = Reduce activity using FITTVP principles if from overuse. Alternatively alter body mechanics if appropriate. Antiinflammatory medication, stretching and strengthening program, heat and ice. If these fail potential corticosteroid injection. Septic Bursitis = intravenous antibiotic Surgical = when therapy fails, The aim of surgery is to remove thickened bursa and bone spurs that have arisen on greater trochanter. Also large tendon of gluteus maximus is treated. Some doctors prefer to remove part of tendon that rubs against greater trochanter while others prefer to elongate tendon</p>

	Too much pressure (chronic)	<p>O</p> <ul style="list-style-type: none"> - Observe posture: Seated = Slouching/ leaning to unaffected side Standing = Slightly flexed hip joint - Palpation for joint tenderness on joint along w/ above and below - ROM = Active hip flexion, internal and external rotation, abduction and adduction will reproduce pain in injured area - faber test - Trendelenburg test, - Ober's test - Thomas test - Combined PROM flexion/ IR - Assess gait = look for heel strike, LLD for glute max function 	<p>surgically Non surgical =</p> <p>Phase 1:</p> <ul style="list-style-type: none"> - Ice - NSAIDS - Electrotherapy - Acupuncture - taping techniques - soft tissue massage - the temporary use of mobility aid to off-load affected side. <p>Phase 2: Strength and stretching program, gait correction to improve muscle length and resting tension, proprioception, balance and gait through supervised and thorough exercise rehabilitation program.</p> <p>Phase 3: specialised program for patient to improve movement and to reduce pain, so that patient can perform their daily activities w/ less difficulty.</p> <p>Phase 4: training your core muscles or fabricating foot orthotics to address any biomechanical faults in LLs.</p>
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Condition	Cause	Ax	Treatment
<p>Tibial Plateau Fracture</p> <ul style="list-style-type: none"> ● Schatzker I - lateral tibial plateau w/o depression ● Schatzker II - lateral tibial plateau w/ depression ● Schatzker III - compression fracture of lateral (IIIa) or central (IIIb) tibial plateau ● Schatzker IV - medial tibial plateau fracture ● Schatzker V - bicondylar tibial fracture plateau 	<p>Traumatic injury;</p> <ul style="list-style-type: none"> ● Hyperextension ● Car crash ● Improper limb alignment ● Fall from height ● High velocity sport impacts <p>Mechanism - Direct impact on lower leg</p>	<p>Sx;</p> <ul style="list-style-type: none"> ● Pain in lower leg ● Swelling ● Inability to weight bare ● Limited ROM ● Deformity in knee region <p>Ax;</p> <ul style="list-style-type: none"> ● Lachmans test ● McMurrays test ● Posterior functional drawer test ● Valgus stress test ● LCL test 	<p>Tx;</p> <p>Common surgical intervention Post surgery - Non weight barely phase 4-8/52</p> <ul style="list-style-type: none"> ● ROM of knee joint ● ROM of ankle joint ● ROM of hip joint ● Strength of muscles surrounding knee joint and above/below joints ● Weight Bearing vs. non-weight bearing may require hydrotherapy work ● Progress as necessary until completing functional movements

<ul style="list-style-type: none"> Schatzker VI - tibial plateau fracture w/ diaphyseal discontinuity 	<p>in varus or valgus position. Excessive vertical stress in conjunction w/ knee flexion.</p> <p>Lateral femoral condyle forcefully colliding w/ articular surface of tibial plateau.</p>	<p>Scans: MRI - CT - XRAY Arthroscopy</p> <p>O;</p> <ul style="list-style-type: none"> Pending on scan results/symptoms Knee PROM Mobility Ax 	
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Condition	Cause	Ax	Treatment
Tarsal Tunnel Syndrome	<ul style="list-style-type: none"> Compression of tibial nerve Entrapment of tibial nerve due to hypertrophy within some muscles such as flexor hallucis longus and/or accessory muscles Swelling or inflammation may place also place pressure on tibial nerve or its branches Collapsing of foot's arch can cause compression Compression under flexor retinaculum 	<p>Sx;</p> <ul style="list-style-type: none"> Tingling, burning or electric shock Numbness Pain Pain felt in inside of foot Symptoms more intense w/ forced eversion & dorsiflexion <p>Ax;</p> <ul style="list-style-type: none"> Gait analysis 2 point discrimination, light touch, pin prick Palpation (between medial malleolus and achilles tendon) <p>Special tests:</p> <ul style="list-style-type: none"> Tinel's sign Dorsiflexion-eversion test Triple compression test 	<p>Tx;</p> <p>Non-surgical approach;</p> <ul style="list-style-type: none"> Physical therapy, mobilisation of foot/ankle Muscle strengthening around ankle joint Nerve flossing <p>Surgical approach;</p> <ul style="list-style-type: none"> Tarsal tunnel release surgery Facilitate strengthening of foot/ankle and supporting structures post op Success varies from 44-96% rate, those w/ +ve Tinel sign respond well to surgery <p>https://www.ncbi.nlm.nih.gov/books/NBK513273/</p>

<p>Polymyalgia Rheumatica</p>	<ul style="list-style-type: none"> • Muscle and joint pain • Causes immune system to attack lining of joints (environmental factors are meant to be reason eg, infections) • Look out for giant cell arteries (inflammation of arteries) of your skull 	<p>Sx;</p> <ul style="list-style-type: none"> • Muscle pain and stiffness • Fatigue • Increased pain due to stiffness • Difficulty sleeping (due to pain) • Difficulty raising arms above shoulder height • Slight fever <p>Ax;</p> <ul style="list-style-type: none"> • MHx • Blood test • Scans checking inflammation 	<p>Medications:</p> <ul style="list-style-type: none"> • Corticosteroids • Calcium & Vitamin D • Methotrexate <p>Exercise based</p> <ul style="list-style-type: none"> • Often leads to muscle weakness, therefore full body strength program may be beneficial.
<p>Shingles (Herpes Zoster)</p>	<ul style="list-style-type: none"> • Reactivation of chickenpox virus • Viral infection that causes painful rash • More common in older people and those w/ weakened immune system 	<p>Sx</p> <ul style="list-style-type: none"> • Lasts 3-5wks • Pain, burning or tingling • Sensitivity to touch • Red rash, dermatomal, w/i 5/7 • Itchy rash • Blistered rash breaks open & crusts over • Fatigue • Headaches <p>Ax;</p> <ul style="list-style-type: none"> • Diagnosed via swab (pathology) • Can diagnose by viewing rash • Blood test 	<p>Early detection and treatment may shorten shingles infection and lessen chance of complications</p> <p>Medications:</p> <ul style="list-style-type: none"> • Acyclovir • Topical Creams • Analgesics • Nerve blocks <p>Exercise based:</p> <ul style="list-style-type: none"> • TENS for pain relief • Facial exercises for functional movement if facial nerve affected. Mirror therapy, mime therapy, facial muscular re-education, and Kabat's exercises • General full body exercises to help w/ postherpetic neuralgia, general immunity improvement

<p>Perthes</p>	
<p>Description</p>	<p>A rare paediatric condition in which disruption of blood supply to femoral head causes bone deterioration</p> <p>Commonly affects children aged between 3 and 10</p> <p>Blood supply eventually returns and bone re-ossifies (although bone may be deformed)</p> <p>Children w/ Perthes have an increased likelihood of developing OA later in life</p>

	<p>Four stages of Perthes: https://perthesdisease.org/2016/09/08/getting-to-know-the-four-stages-of-perthes/</p> <p>Onset Fragmentation Reconstitution Residual</p>
Causes	<p>Unknown: Attributed to disruption of FH blood supply and subsequent lack of O2 and nutrients (causing bone degeneration) – although cause of this disruption is largely unknown</p> <p>May be due to trauma that damages blood vessels or possible clotting disorders causing occlusion</p> <p>Affects approximately 10 in 100,000 children globally</p>
Presentation	<p>May present w/ limp (w/ or without pain) Pain in affected hip, pelvis, thigh and knee region with/without movement Stiffness and reduced hip ROM Uneven leg length Possible thigh muscle atrophy of affected limb Increased likelihood of FH # Worsening pain w/ time (i.e., progression of symptoms)</p>
Aggs	<p>Increased activity High impact exercise (e.g., running and jumping)</p>
Eases	<p>Use of gait aids Rest (depending on severity) Typically eases in 3-4 days</p>
Objective	<p>X-ray MRI (for analysis of disease progression) LL strength testing AROM and PROM Ax</p>
DDx	<p>Coxitis fugax Juvenile idiopathic arthritis Osteomyelitis Meyer's dysplasia Epiphyseal dysplasia Chondroblastoma Cortisone induced necrosis of FH</p>
Risk factors	<p>Age (i.e., children aged 3-10) Genetic predisposition (i.e., risk increased if parent had disease) Gender (i.e., 4x more likely in M than F) Ethnicity Genetic mutations</p>

Treatment	<p>Non-operative: Physiotherapy/exercise to ensure maintenance of joint mobility and distribution of synovial fluid (i.e., provision of nutrients) and enhance muscle strength Use of brace/splint</p> <p>Surgical: Surgery (i.e., osteotomy) to reposition FH within acetabulum</p> <p>Pharmacological: Medication for pain management</p>
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Slipped Upper Femoral Epiphysis (SUFE)	
Description	Disorder of an immature hip: Fracture of growth plate beneath femoral head causing head of femur to slip out of position.
Causes	Unknown: most likely to occur during growth spurt period of adolescents Fracture result of shearing force in excess of strength of growth plate. Risk factors have been identified as excessive weight
Presentation	Symptoms developing over several/12 Pain in their groin, hip, thigh and/or knee Reduced ROM at hip Restricted internal rotation ROM at hip Large hip external rotation (more comfortable) Inability to weight bear
Aggs	Hip internal rotation Forced passive ROM
Eases	Non-weight bearing Reduced ROM
Objective	Diagnostic Imaging: MRI, ultrasound, CT Generally bilateral hip radiography Active hip flexion produces abduction and ER Hip quadrant
DDx	

Risk factors	Increased BMI Puberty related hormones
Treatment	Seize to bear weight on impacted leg. The first goal of treatment is preventing further slipping and avoiding complications. Combination of casting followed by easy ROM exercises and hydrotherapy. When risk of slippage is reduced, light weight bearing can resume along w/ light exercise program, strengthening leg muscles, build proprioception and coordination. X-ray of both hips should be ordered. Urgent orthopaedic assessment. Continuous passive motion exercises for ROM post surgery

Irritable Hip	
Description	Common childhood condition that causes symptoms such as hip pain and limping.
Causes	When the lining that covers the hip joint (the synovial membrane) becomes irritated and inflamed. Some cases of irritable hip occur following a viral infection in the chest, throat or digestive system.
Presentation	Pain in knee or hip Limping Decreased hip ROM Slightly higher body temp (37deg C) Crying at night - babies Common in children 10 or younger
Aggs	Walking Weight bearing
Eases	Rest/non weight bearing
Objective	X-ray Ultrasound Blood test
DDx	SUFE Perthes
Risk factors	Ibuprofen Rest

	Swimming
Treatment	

Rheumatoid Arthritis	
Description	Systemic autoimmune disease involving inflammatory arthritis and extra articular involvement. RA w/ symptom duration of fewer than 6/12 is defined as early, and when symptoms have been present for more than months, it is defined as established.
Causes	Idiopathic Generally considered to be genetic Onset is generally adulthood
Presentation	Common polyarthritis in small joints Other commonly affected joints include wrist, elbows, shoulders, hips, knees, ankles and metatarsophalangeal (MTP) joints Stiffness in joints in morning Swelling Deformity Significant predictors of functional decline among persons w/ RA are slow gait and weak grip. The three most important complaints are pain, morning stiffness and fatigue. Cervical spine is generally involved, which can cause instability caused by ligamentous laxity. Instability can lead to neurological symptoms such as headache and tingling
Aggs	Anything that may cause an inflammatory response (eg. drugs, nutrition) Excess weight Poor sleep Overexertion
Eases	Anti inflammatory drugs Avoiding foods that cause inflammation
Objective	Lab evaluation X-rays of both hands and feet MRI
DDx	Lupus Chronic Lyme disease Osteoarthritis Septic arthritis Psoriatic arthritis

	Sjogren syndrome Sarcoidosis
Risk factors	Female; occupational dust (silica); air pollution; high sodium & iron consumption; low vitamin D; Smoking (seropositive RA); Obesity; Low socioeconomic
Treatment	Goal is to improve symptoms and therefore quality of life Exercise therapy Joint protection advice Massage therapy Education Pain control Improve stability and coordination Hydrotherapy (minimal load on joints) Methotrexate + prednisolone...failing that...qualify for 'biologics': e.g. xeljanz

Crohns Disease	
Description	CD causes chronic inflammation of gastrointestinal tract. In Crohn disease, inflammation extends through entire thickness of bowel wall from mucosa to serosa. The disease has relapsing and remitting course. Many relapses can cause Crohn disease to progress from mild to moderate to severe penetrating (fistulization) or stricturing disease. There is no cure and most patients experience poor quality of life.
Causes	Not known, but generally accepted that there is genetic component
Presentation	Abdominal pain, bloating, diarrhoea, fever, weight loss
Aggs	High sugar diet
Eases	Medication Improved diet
Objective	Crohn's disease activity index
DDx	Infection w/ amoebas Behcet disease Celiac disease Intestinal carcinoid Intestinal tuberculosis Mesenteric ischemia Ulcerative colitis

Risk factors	Genetics, poor dietary habits
Treatment	Medication Education Exercise Methotrexate + prednisolone...failing that...qualify for 'biologics': e.g. xeljanz

Diabetes	
Description	<p>Chronic disease</p> <p>Type 1: Insulin-dependent, juvenile or childhood-onset</p> <p>Type 2: Non-insulin-dependent or adult onset Of those w/ diabetes 95% type 2 Commonly seen in adults, increasingly prevalent in children</p> <p>Gestational Diabetes During pregnancy -> increased risk complications during pregnancy and delivery Risk developing Type 2 diabetes in future</p>
Causes	<p>Type 1: Pancreas does not produce enough insulin, self administered insulin required</p> <p>Type 2: Body does not effectively use insulin it produce Obesity/overweight, physical inactivity</p> <p>Gestational: Hyperglycemia w/ blood glucose values above normal but below diabete diagnosis</p>
Presentation	<p>Type 1: Excessive excretion of urine (polyuria), thirst (polydipsia), constant hunger, weight loss, vision changes and fatigue May occur suddenly</p> <p>Type 2: Similar to type 1, often less marked -> diagnosed several years after arisen</p> <p>Gestational: Diagnosed through prenatal screening not symptoms</p>

located above greater trochanter and underneath insertion of gluteus medius.

2. Subgluteus Maximus bursa - this bursa is located between greater trochanter and insertion of gluteus medius and gluteus maximus muscles.

There are many predisposing factors which may cause trochanteric bursitis:

- Gender - women>men
- Overweight/obesity
- Direct trauma to greater trochanter
- Overuse of muscles around bursa
- Hip OA
- Lumbar spondylosis
- Iliotibial band syndrome
- Dysfunction of gluteus medius insertion
- Repetitive strain
- Hip prosthesis

Internal Lx Disc Injury

Description	Changes to nucleus pulposus without developing herniation
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	<p>Form radial fissure -> potential annular tearing -> irritation -> pain How they go mechanically under load to differentiate Acute on chronic Long standing back issues, w/ acute overload e.g. lifting, long drive, 4WD-ing Loves Lx E</p>
Causes	Compressive load
Presentation	<p>Central lower back pain w/o radiation/minimal to one or both limbs Deep dull aching pain Low spinal mobility Leg pain, marked weightloss, profound depressions, loss of energy</p>
Aggs	Sitting driving, twisting, flexion, coughing
Eases	decreases extension/lying flat, keep neutral
Objective	Gait and posture analysis -> sciatic?, ROM, Spinous and interspinous processes palpated, flexion, extension, lateral flexion
DDx	<p>External disc injury - heriation/rutpure Degenerative disc disease</p>
Risk factors	Obesity, lack of fitness/strength, smoker, age, poor posture, heavy lifting,
Treatment	<p>Dynamic Lx stabilisation Mechanical Diagnosis Therapy (Mckenzie's Method) - utilide response to repeated Lx movements to Ax which direction reduce systoms</p>

External Lx Disc Injury	
Description	Injury to external wall/annulus of disc e.g herniation, sprains, strains
Causes	<p>Gradual disc degeneration Often acute e.g. bend or lift incident</p>
Presentatio n	<p>Leg pain, numbness or weakness More resistance to stressed movements</p>
Aggs	Sitting driving, twisting, flexion, coughing, repeating movement that stresses doesn't like Extension

	Bent over to put something in dishwasher, drying feet after shower, donning socks in morning Does not necessarily love Lx E
Eases	decreases extension/lying flat, keep neutral sometimes relieves w/ degree of F, has unloading and reloading pain
Objective	Gait and posture analysis -> sciatic?, ROM, Spinous and interspinous processes palpated, flexion, extension, lateral flexion
DDx	Internal disc injury - radial fissure Degenerative disc disease
Risk factors	Obesity, lack of fitness/strength, smoker, age, poor posture, heavy lifting, genetics, occupation, sedentary, frequent driving
Treatment	Dynamic Lx stabilisation Mechanical Diagnosis Therapy (Mckenzie's Method) - utilize response to repeated Lx movements to Ax which direction reduce symptoms Spread load e.g mobilising and strengthening Tx and glutes

Psoriatic arthritis in children

Description	A form of inflammatory arthritis that affects some individuals w/ psoriasis (up to ~30% of psoriasis sufferers) Juvenile idiopathic arthritis, chronic joint inflammation and swelling Typically affects large joints (e.g, those of LL), small joints (e.g., of finger and toes) and can also affect spine and SI joints 6% of all juvenile arthritis cases 5 types: 6. Distal interphalangeal predominant 7. Asymmetric oligoarticular 8. Symmetric polyarthritis 9. Spondylitis 10. Arthritis mutilans
Causes	Exact cause is unknown Both immunity and environmental factors are believed to contribute. Genetics 40-80% of diagnosed kids have family member w/ PA
Presentation	Swelling of small and large joint Inflammation where tendons and ligaments attach to bone (enthesitis) Swelling of an entire finger or toe (dactylitis)

	<p>Arthritis of lower back (sacroiliitis)</p> <p>Arthritis of spine (spondylitis)</p> <p>Inflammation of eyes (uveitis)</p> <p>Morning stiffness</p> <p>Back pain or stiffness</p> <p>Pitting or peeling of nails</p> <p>Red nail beds or cuticles</p>
Aggs	Prolonged periods of sedentary behaviour (i.e., rest, sitting and sleeping)
Eases	<p>Exercise/movement</p> <p>Medication</p>
Objective	<p>Reduced ROM/increased stiffness of affected region</p> <p>Joint swelling</p> <p>Blood tests (measure inflammation levels and rule out other similarly presenting conditions) Complete blood counts - Anemia, C-reactive protein, ANA antibody</p> <p>X-rays, MRI and ultrasound (Ax joint damage)</p> <p>Occasionally skin biopsies (confirm psoriasis)</p> <p>Physical examination, FHx and symptoms</p>
DDx	<p>Rheumatoid arthritis (of hands and spine predominantly)</p> <p>Enteropathic arthritis (arthritis of inflammatory bowel disease)</p> <p>Spotted bone disease</p>
Risk factors	<p>Genetic predisposition:</p> <p>~40-80% of sufferers have family member w/ either psoriasis or arthritis</p>
Treatment	<p>Medication:</p> <p>Disease-modifying antirheumatic drug help psoriasis rash</p> <p>Non-steroidal anti-inflammatory drugs</p> <p>Injection steroid directly to affected joints</p>

Biologic medications -> help reduce inflammation

Exercise:

Strength and cardio based exercise is recommended (to promote moving through range, enhance strength and reduce pain)

Physical therapy to improve and maintain muscle and joint function

Septic Arthritis in children

Description	Bacterial/infectious agents invade joint causing inflammation in synovial membrane Potential for joint destruction Uncommon in presentation Joint damage leading to increased morbidity and mortality Can cause systemic damage if left untreated
Causes	Bacterial or viral infections enter through <ul style="list-style-type: none">- Inoculation via surgery- Wound that breaks skin- Another systemic infection Staphylococcus aureus most common pathogen Prolonged antibiotic therapy, risk for fungal infections Puncture wounds + injection drug use = joint infection
Presentation	Acute onset Unable to move joint through AROM/PROM Typically one joint Nil WB Effusion Inflammation Skin rash Low-grade fever Lymphadenopathy Hip joint commonly affected
Aggs	Anything that may cause an inflammatory response (eg. drugs, nutrition) Excess weight Poor sleep Overexertion
Eases	Anti inflammatory drugs Avoiding foods that cause inflammation
Objective	Reduced ROM/increased stiffness of affected region Joint fluid tests/ swelling (WBC, Infections Crystals)

	<p>Blood tests (measure inflammation levels and rule out other similarly presenting conditions) Complete blood counts - Anemia, C-reactive protein, ANA antibody</p> <p>X-rays, MRI and ultrasound (Ax joint damage)</p> <p>Occasionally skin biopsies (confirm psoriasis)</p> <p>Physical examination, FHx and symptoms</p>
DDx	<p>Infection</p> <p>Crystal-induced arthropathies</p> <p>Osteoarthritis</p> <p>Intra-articular injury</p> <p>Inflammatory arthritis</p> <p>Systemic infection</p> <p>Tumour</p> <p>Hemarthrosis</p> <p>Clotting disorders</p> <p>Neuropathic arthropathy</p> <p>Avascular necrosis</p>
Risk factors	<p>Increasing age</p> <p>Hx of infection</p> <p>autoimmune conditions</p> <p>Connective tissue disease</p> <p>Diabetes</p> <p>Sarcoidosis</p> <p>Bites</p> <p>Fracture</p> <p>Central line placement</p> <p>Indwelling catheter</p> <p>Immunocompromised condition</p> <p>HIV</p> <p>Chronic joint damage</p> <p>STI</p> <p>Injection drug user</p> <p>Alcohol</p> <p>Recent immunisation</p> <p>Malnutrition</p> <p>Skin breakdown</p> <p>Complication from ACL reconstruction</p>
Treatment	<p>Antibiotic treatment</p> <p>Educate to protect joint</p> <p>Gentle mobilisation; after responding well following 5 days treatment</p> <p>Once well-managed; aggressive physical therapy to allow max. Post-infection functioning</p> <p>Physical therapy consist of allowing joint to be in functional position and positioning joint to allow passive range of motion activities</p> <p>Joint drainage and surgical interventions</p>

Reactive arthritis in children

Description	Joint pain and swelling caused by an infection in another area in body - mostly in urinary tract, genitals, intestines AKA Reiter's syndrome Not common, often stick around 12/12
Causes	Infection transmitted sexually or foodborne E.g Campylobacter, Chlamydia, Clostridioides difficile, Escherichia coli, Salmonella, Shigella, Yersinia
Presentation	Commonly knee, ankle and feet Pain and stiffness Eye inflammations Inflammation of tendons and ligaments Swollen toes or fingers Skin problems LBP
Aggs	Prolonged periods of sedentary behaviour (i.e., rest, sitting and sleeping)
Eases	Exercise/movement Medication
Objective	Reduced ROM/increased stiffness of affected region Joint fluid tests/ swelling (WBC, Infections Crystals Blood tests (measure inflammation levels and rule out other similarly presenting conditions) Complete blood counts - Anemia, C-reactive protein, ANA antibody X-rays, MRI and ultrasound (Ax joint damage) Occasionally skin biopsies (confirm psoriasis) Physical examination, FHx and symptoms
DDx	Rheumatoid arthritis (of hands and spine predominantly) Enteropathic arthritis (arthritis of inflammatory bowel disease) Spotted bone disease
Risk factors	Age, sex, genetics To minimise infection: food at temperature, cook properly
Treatment	Medication: Rheumatoid arthritis drugs Non-steroidal anti-inflammatory drugs Injection steroid directly to affected joints Exercise: Strength and cardio based exercise is recommended (to promote moving through range, enhance strength and reduce pain) Physical therapy to improve and maintain muscle and joint function

Costovertebral Arthropathy	
Description	Joint disorder/injury to joint between upper back and ribs Ribs and Vertebrae irritated, compressed or rotated
Causes	Trunk and rib cage rotated and overstretch structure supporting joint Triggered by exaggerated and repetitive movement involving upper and mid back
Presentation	Dull ache in upper back that is made worse by deep breathing, coughing or rotation movement of trunk and rib cage Swelling, inflammation Decreased ROM Stiffness Weakness
Aggs	
Eases	
Objective	
DDx	
Risk factors	Age, sex, genetics To minimise infection: food at temperature, cook properly
Treatment	Activity modification Anti-inflammatory medication Electrotherapy Costovertebral joint mobilisation Stretches Soft tissue treatment Acupuncture

LEVEL 3 CONDITIONS

- Osteitis pubis: adductor tendinopathy v. enthesopathy

Type of stroke:	Transient Ischemic Attack (TIA)	Cerebellar	Left hemisphere	Right hemisphere	Haemorrhagic stroke	Ischemic stroke
Description	A brief episode of reduced blood supply to parts of brain. No tissue death	The role of cerebellum is concerned w/ timing, coordination and integration of movements, including eye movements and speech. Therefore, lesions affecting cerebellum would result in disorder of movement coordination often termed as cerebellar ataxia. Tissue damage to cerebellum, typically via ischemic disruption of PICA (Posterior Inferior Cerebellar Artery) or AICA (Anterior inferior cerebellar artery).	This part of brain is concerned w/ sensation and perception, motor control, and higher level cognitive processes.	The part of brain that controls muscle function and also controls speech, thought, emotions, reading, writing and learning. Controls muscles of left side as well.	Occurs due to ruptured brain aneurysm, damaged blood vessel that leaks, or damage that occurs in an ischemic stroke.	When vessel supplying blood to brain is obstructed - can present in pre-determined syndromes due to decreased blood flow to parts of brain
Presentation	Temporary neural deficit, likely resolved. Episode <24 hr w/ no evidence of brain injury	Drunken sailor gait (truncal ataxia)- lateral deviations and unequal steps. Dizziness/vertigo/nausea Ipsilesional- occurs on same side of body	<ul style="list-style-type: none"> - Aphasia - Difficulties w/ reason/math/analysis/organizational ability - Blindness in right visual field of each eye (right hemianopia). - Hemiplegia (right side paralysis) or hemiparesis (right side weakness). 	<ul style="list-style-type: none"> - Left neglect - Inability to localise body parts. - dizziness/nausea - Balance impairment. - Spatial problems- depth perception, - Blindness in Left visual field of each eye (left hemianopia) - Left sided weakness or paralysis and sensory impairment. 	<ul style="list-style-type: none"> - Sudden severe headache at posterior head - Sensitivity to light - One large pupil 	<p>Sudden -</p> <ul style="list-style-type: none"> - numbness or weakness of face, arm or leg, especially one side of body. - confusion. - trouble speaking. - trouble seeing in one or both eyes. - trouble walking. - dizziness , loss of balance or coordination. - severe headache w/ no known cause.

			<ul style="list-style-type: none"> - Decreased sensation on right side. - Potential paresthesias (numbness, tingling, burning or pins and needles) in areas w/ decreased sensation. 	<ul style="list-style-type: none"> - Hemiplegia (left side paralysis) or hemiparesis (left side weakness). - Decreased sensation on left side. - Potential paresthesias (Numbness, tingling, burning or pins and needles) in areas w/ decreased sensation. 		
Clinical neurological tests		Finger-to-finger, finger-to-nose, heel-to-shin, dysdiadochokinesia (rapid alternating movements)		<ul style="list-style-type: none"> - MMSE test. - Strength test. - Sensory function. - Coordination Test (KHF, FNF). - Romberg test. - Walking test. - Memory test. - Aphasia testing. 		
	Can be sign of future stroke					
Treatment				<ul style="list-style-type: none"> - SMART goal. - Make plan. - Retrain lost functions. (movement, cognition, balance, walking, talking, mimic etc.) The evidence is good to teach brain lost functions. - Assistive devices. 		
Risk factors	<ul style="list-style-type: none"> - High blood pressure. - Smoking. - Unmanaged diabetes. - High cholesterol levels. - Lack of regular exercise. - Overconsumption of alcohol, such as frequent binge drinking. 	<ul style="list-style-type: none"> - Smoking. - High cholesterol. - Obesity - Physical inactivity. - Diabetes. - High blood pressure. - Atherosclerosis, or narrowing of arteries. - Heart disease. 		<ul style="list-style-type: none"> - Age older than 55. - FHx of stroke. - Not enough physical activity or obesity. - High cholesterol, high blood pressure, or diabetes. - Smoking cigarettes or using illegal drugs. - heart condition such as atrial fibrillation, myocardial infarction, or valve disease. 	<ul style="list-style-type: none"> - Older age. - Gender - Hypertension. - Excessive alcohol intake. - Having an AVM. 	<ul style="list-style-type: none"> - High blood pressure. - Heart disease. - Diabetes. - Smoking - Birth control pills. - History of TIA's. - High blood cholesterol.

	- Obesity. - High fat diet, particularly saturated fats.			- Hormone replacement therapy. - Oral birth control pills, especially in women older than 35 who smoke cigarettes.		
Physio management						Movement of affected extremities, turning over, sitting, stretching (joint motion, ligament stretch, muscle relaxation) Walking w/ assistance training Strength, balance and coordination exercises - Daily, 2x day, 20 minutes Daily functional activities e.g. pointing, grasping
Medical management						

Complex Regional Pain Syndrome (CRPS) Type 1 + 2	
Description	Chronic persistent pain Developed after limb trauma, in 1+ limbs (most frequently wrist after distal radial fracture) Regional post-traumatic neuropathic pain problem, symptoms disproportionate consequence of painful nerve lesion or trauma Central sensitisation seen as main cause of developing CRPS
Causes	sprains/strains Surgeries Fractures Contusion Crush injuries Nerve lesions Stroke Work-related injury
Presentation	Type 1 - Formally Reflex Sympathetic Dystrophy (RSD) - Trauma remote from affected extremity, w/ or without minor nerve damage

	<ul style="list-style-type: none"> - Allodynia and hyperalgesia - Hypoesthesia and hypoalgesia - disfigured/dislocated feelings in limbs - swelling /edema - Sweating - Abnormal skin blood flow - Temperature changes - Thick, brittle nails - Hair growth/loss - Fibrosis - Clammy skin - Osteoporosis - Muscle weakness - Extremity movement inability - Stiffness - Tremor - Reduced ROM - Atrophy - Burning, spontaneous pain <p>Type 2</p> <ul style="list-style-type: none"> - Formerly Causalgia - Occurs after injury to major peripheral nerve - Allodynia and hyperalgesia - Hypersensitivity of skin to light mechanical stimulation - Limb coldness - Extremity swelling - Sweating - Abnormal skin blood flow - Temperature changes - Smoothness and mottling of skin - Acute arthritis - Movement initiation inability - Stiffness - Tremor - Dystonia - Reduced ROM - Ongoing pain
Aggs	<p>Surgery</p> <ul style="list-style-type: none"> - Stress - Inflammation - Immune system disturbances <p>Casts</p> <p>Ice</p>
Eases	

Objective	Budapest Criteria Sweat testing Three phase bone scan Grip strength Foot function STS VAS ROM
DDx	bone/ST injury Peripheral neuropathy Arthritis Infection Compartment syndrome Arterial insufficiency Raynaud's disease Lymphatic/venous obstruction Thoracic outlet syndrome (TOS) Gardner-diamond syndrome Erythromelalgia Cellulitis Undiagnostic fracture
Risk factors	Stressful life Psychological aspects
Treatment	TENS Hydrotherapy Mirror therapy Desensitisation Gradual WB Stretching Fine motor control Acupuncture Contrast baths Pain education EmNSA

Stroke types

	L MCA	R MCA	L ACA	R ACA	L PCA	R PCA	

Brain areas affected	<p>These vessels provide blood supply to parts of frontal, temporal, and parietal lobes of brain, as well as deeper structures, including caudate, internal capsule, and thalamus</p> <ul style="list-style-type: none"> - Primary somatosensory cortex - Primary motor cortex - Frontal cortex - Broca (commonly L MCA) or Wernicke's area 	<ul style="list-style-type: none"> - midline portions of frontal lobes and superior medial parietal lobes - Frontal - Pre-frontal - supplementary motor cortex, - parts of primary motor and primary sensory cortex 	<ul style="list-style-type: none"> - occipital lobe (perception of colour/form/motion) - inferomedial temporal lobe (emotions/some visual perception) - large portion of thalamus (proprioception and sensory information) - upper brainstem (medulla oblongata- organ function/tongue movement) and pons- unconscious processes) - and midbrain (vision, motor control) 	
Presentation/deficits	<ul style="list-style-type: none"> - Contralateral sensory loss - Contralateral paralysis - Contralateral hemiparesis-weakness - Contralateral spasticity - Ipsilateral eye deviation 	<ul style="list-style-type: none"> - Contralateral hemiparesis w/ loss of sensibility in foot and lower extremity, sometimes w/ urinary incontinence - Potential cognitive impairment 	<ul style="list-style-type: none"> - Contralateral visual field loss or homonymous hemianopia 	
Prevalence	<p>>half</p> <ul style="list-style-type: none"> - More commonly L MCA 			

Diagnosis	Fibromyalgia	Multiple sclerosis	Parkinson's	Falls	Central sensitization	Whiplash	Vertigo
Presentation	Fibromyalgia is chronic condition that causes generalised pain and muscle stiffness in many parts of body.	MS is chronic disease that affects CNS.	Parkinson is progressive, degenerative neurological condition that affects person's control of their body	An unexplained event/multiple events where an individual comes to rest on ground, floor, or lower level.	<p>Hypersensitive to stimuli</p> <p>Responsiveness to no noxious stimuli</p> <p>Pain from outside area of injury</p>	<ul style="list-style-type: none"> -Neck pain -Arm pain -Headaches 	<p>BPPV</p> <p>Spinning sensation (not lightheadedness or feeling off balanced)</p> <p>Nausea</p>

			movements.			<ul style="list-style-type: none"> -Neck stiffness/movement loss -Dizziness -Parasthesia/anaesthesia in upper quadrant -Fear of movement -Altered muscle recruitment patterns -Pain catastrophising and augmented central nociceptive processing -Post-traumatic stress symptoms -Decreased strength in deep neck fxs/exs 	<p>Visual disturbances</p> <p>Loss of balance</p> <p>Triggered By positional change/fear of movement</p>
Descripti on	<p>The most common symptoms are: Extreme tiredness and sleeping poorly. Pain in many different muscles and bones (Gets worse when stressed and in activity). Being more sensitive to pain. Tenderness and stiffness in bones and muscles lasting for at least 3/12.</p>	<p>MS means there is damage to protective sheath (myelin) that surrounds nerve fibres in brain and spinal cord. This damage causes scars, or lesions, in nervous system, meaning that nerves can't send signals around body properly.</p>	<p>Resting tremor. Rigidity. Bradykinesia. Freezing. Difficulty w/ multitasking. Loss of volume in speech. Stooped posture. Shuffling gait.</p>	<p><u>Intrinsic:</u> Medical - stroke, PD, cataracts, psychoactive medications. Physiological - poor vision, muscle weakness, decreased sensation, slow reaction time, impaired balance.</p> <p><u>Extrinsic:</u> Footwear. Household environment/ hazards. Bifocal glasses. Slippery surfaces. Stairs. Poor footpaths.</p> <p>Biomechanical causes make up</p>	<p>Increased responsiveness of nociceptors in CNS to either normal or sub threshold afferent input.</p>	<p>Acute= 4/52</p> <p>Chronic 4/52+</p> <p>Mechanism:</p> <p>Energy is transferred from collision to body</p> <ul style="list-style-type: none"> - Road trauma/traffic accidents -Sporting incidents -High speed acceleration/deceleration motion 	<p>BPPV is thought to arise due to displacement of otoconia (small crystals of calcium carbonate) from maculae of inner ear into fluid-filled semicircular canals. These semicircular canals are sensitive to gravity and changes in head position can be trigger for BPPV</p> <p>The posterior canal is most commonly affected site, but superior and horizontal canals can be affected as well</p>

				<p>greatest no. of falls (trip 40%, slip 13%, lost balance 21%)</p> <p>Up to 60% of falls lead to injury.</p> <p>Leading cause of injury-related death in older persons.</p>			
Testing	<p>Fibromyalgia can be difficult to diagnose since there is no single test or examination for it. Some people have blood tests. A doctor diagnoses fibromyalgia when they think that pattern of pain and tiredness fits condition and doesn't fit other conditions.</p>	<p>MRI in combination w/ initial blood tests.</p>		<p>Functional Independence Measures - open/close door, on/off toilet, walk 4 steps backwards, turn 180 degrees, pick something up off ground.</p> <p>FallScreen - short and long versions.</p> <p>In residential aged care - can person stand independently /unaided?</p>	<p>LANNS scale Neuro exam Active movements Neural tissue provocation tests</p>	<p>-Canadian C-spine rules -Observation of head position and posture Neck AROM, PROM -Palpation of neck- looking for tenderness -Strength -VBI -VOR, VSR, VCR testing -CCFT -DNE test -Scapulothoracic Ax</p>	<p>Posterior canal: Dix Hall pike</p> <p>Horizontal canal: Horizontal roll test</p> <p>Head pitch test</p>
Risk factors	<p>Sex - women are twice as likely to have fibromyalgia as men. Stressful and traumatic events, such as car accidents or PTSD.</p> <p>FHx. Obesity. Repetitive injuries.</p>	<p>Age - 20/40. Sex - women. Certain infections. FHx.</p>		<p>Inappropriate footwear. Inappropriate spectacles. Home hazards. Environmental hazards. Using more than 4 medications. Cognitive impairments. Foot problems. Incontinence. Osteoarthritis. Depression. Dizziness. Vestibular disorders.</p>	<p>Mental health LBP</p>	<p>High velocity activities</p>	<p>Female Hypertension Hyperlipidemia Cardiovascular disease Menopause Migraine COPD</p>
Treatme	<p>Regular exercising</p>			<p>Exercise.</p>	<p>Manual therapy</p>	<p>Main points**</p>	<p>Epley's maneuver</p>

nt	<p>reduces pain and improves sleep (waterbased exercising is good for start).</p> <p>Getting enough sleep.</p> <p>Psychological approaches can also help. Including how to manage stress and pace your life.</p> <p>Education on exercise through pain</p>			<p>Environmental modification.</p> <p>Assistive devices.</p> <p>Multifactorial, individualized intervention.</p> <p>Hip protectors to prevent fractures.</p>	<p>Patient education on pain</p>	<p>-Reassurance</p> <p>-Neck motor control exercises</p> <p>-Refer for appropriate pain relief</p> <p>Manual techniques- Low velocity mobs to symptomatic Cx spine area.</p> <p>Exercise program-</p> <p>Stage 1: Motor learning; postira; neck and shoulder muscle coordination, proprioception, balance, gaze/eye movement control, flexibility</p> <p>Stage 2: Strength and endurance</p>	<p>Semont maneuver</p> <p>Lempert maneuver</p> <p>Gufoni maneuver</p> <p>Habituation techniques</p> <p>Vestibular rehabilitation</p> <p>Cawthorne-cooksey exercise</p> <p>Brandt-daroff exercises</p>
Medical management	<p>Pain relievers such as paracetamol and anti-inflammatory.</p>	<p>Medicine can delay progression of MS and reduce risk of relapses.</p>		<p>Modifying medications.</p> <p>Visual interventions.</p>	<p>NSAIDS</p>	<p>-GP referral if need pain relief meds</p> <p>-Psychological referral for PTSD</p>	<p>Singular nerve neurectomy</p> <p>Posterior canal occulsion</p>
Differential diagnosis.	<p>Myofascial pain syndrome.</p> <p>Chronic fatigue syndrome.</p> <p>Hypothyroidism.</p>	<p>IIDD.</p> <p>ADEM.</p>	<p>Peripheral sensitisation</p>	<p>Nil - falls are *usually* attributed either intrinsic or extrinsic factors as previously mentioned.</p>			<p>Vestibular neuritis</p> <p>Meniere's disease</p> <p>Labyrinthitis</p> <p>Superior canal dehiscence syndrome</p> <p>Post-traumatic vertigo</p>

Diagnosis	Osteitis pubis	Adductor tendinopathy	Enthesopathy
Presentation	<ul style="list-style-type: none"> - Common in distance running and kicking athletes. - Pain in groin area 	<p>Groin pain and stiffness, particularly in morning or beginning of activity</p> <p>Initial intense pain followed by dull ache</p>	

Description	Inflammatory condition affecting pubic symphysis, likely related to overuse (athletes) or trauma (surgery)	Injury or degeneration tendon that attaches muscle to bone around groin	
Causes		Repeated or forceful movement, or sudden COD Forcefully stretched while being flexed or during side to side motion Increased stretching or intensity in exercise	
Aggs	Movement	Difficulty running, flexing hip, bring legs together against resistance Overuse: loaded lunges	
Eases	Ice pack Rest	Warm up before activity Protection, rest, ice, compression	
Objective testing	Pain reproduced on hip adduction Pain on pelvic motion Pain on palpation Squeeze test Bilateral adductor test (difficult to differentiate- reliant on subjective)	Pain on palpation of adductor tendon Develop or acute, sharp pain Swelling or lump groin Groin stiffness Squeeze test MMT	
Risk factors	Distance running/kicking, pregnancy, surgery, arthritis ankylosing spondylitis. Pubic symphysis is insertion point for rectus abdominis and adductors- imbalance in use of either of these may be cause. Decreased motion elsewhere in kinetic chain (ie FAI) can lead to compensatory motion of joint.	Weak and poorly stretched adductor muscles Leg length discrepancy Diabetes Arthritis Chronic foot pronation Chronic knee valgus Male Strength imbalances/asymmetries Pelvic control over/under active hip flexors	
Treatment	<ul style="list-style-type: none"> - 3-6/12 - Mostly conservative Mx, 5-10% req surgery - Correct muscular imbalance around pubic symphysis - Progressiv Exercise program - Stretching - Sport specific functional rehab before RTS Stage 1 <ul style="list-style-type: none"> - Pain control, improve lumbopelvic stability 	Stage 1: Rest from agg factors first 48/24 Potential walking aids allow healing RICE 20mins x3 per day Modify tolerable level of load management (latent response of 24/24) Massage (MMT) Stage 2: Load management of adductors Slight ongoing discomfort due to thickening of tendon Consider age: loading of tendon overtime	-

	<ul style="list-style-type: none"> - Gentle prolonged stretching (not of adductors) <p>Stage 2</p> <ul style="list-style-type: none"> - Strengthening of pelvic, abdominal, gluteal muscles - Abdominal isometrics - Abdominal crunches, glute bridges, core, hip strengthening <p>Stage ³/₄</p> <ul style="list-style-type: none"> - Eccentric hip exercises, hip abduction, lunges and squats <p>Stage 4</p> <ul style="list-style-type: none"> - Sport specific exercises - Kicking only at this stage (maybe end of stage 3 if tolerated) - Eccentric abdominal wall strengthening 	<p>Pain persists, reversal of progress is still possible w/ no long term damage</p> <p>Stage 3: Pain should settle</p> <p>HEP:</p> <ul style="list-style-type: none"> - Butterfly stretch (30sec x4) - Side lunge (30sec x4) - Seated knee adduction w/ resistance band - Standing adduction w/ resistance band <p>Eccentric loading, strengthening, stability exercises</p>	
Medical management	<ul style="list-style-type: none"> - NSAIDs- adjunct to regular therapy - Surgery if necessary 	<p>Surgical Corticosteroids NSAIDs</p>	
Differential diagnosis.	<ul style="list-style-type: none"> - Osteomyelitis - Adductor strain - Rectus Abdominus strain 	<p>Inguinal hernia Iliopsoas bursitis Stress fracture Avulsion fracture Nerve compression Snapping hip syndrome Chronic prostatitis</p>	

Ant hip conditions

DDx	Hip flexor strain/overload	Muco Cele
		Sore w hip F, can be -ve on imaging,

Differential diagnosis table for knee osteoarthritis and soft tissue structures that surround knee joint.

DDX	Knee OA	Soft tissue structures	
Presentation	Typically seen in middle aged or older people. - Pain upon movement - Stiffness, particularly early morning stiffness - Loss of range of movement - Pain after prolonged sitting or lying - Pain on joint line palpation - Joint enlargement. NICE criteria = 45yr+, movement-related joint pain, ≤30min AM kn stiffness	- Likely more acute onset -Meniscus- more clicking/locking. OA more emphasis on morning stiffness	
Aggs	Weight Bearing, exercise, ADL related pain, EOD pain, increased pain in cold	Mechanically based- pain in PM Meniscus- PM pain	
Risk factors	Joint injury or overuse. Age - risk of increasing w/ age. Gender - women are more likely to get it.	Potential damage to VMO - only active factor that can pull patella medially Meniscal tears AGM damage MCL/LCL stability	
	Other types of arthritis.		
O/	Increased BMI, antalgic gait, valium vs vacuum deformity, Pain WB (squat, lunge, kneeling), TOP joint line, ROM may be reduced Joint line palpation Radiographic findings	- Isometric testing - TOP of musculature - Relief found post STM - Difference in muscle tone bilaterally - Special tests that wouldn't aggravate OA - Ligament tests -	

	<ul style="list-style-type: none"> - Joint space narrowing - Osteophyte formation - Subchondral sclerosis - Subchondral cysts - Early stages of OA shows minimal unequal joint space narrowing. 		
Treatment	Progressive strengthening and exposure to previously limiting activities. Education that imaging not reflective of symptoms “bone on bone” is not end, that it’s management condition. Education on weight management		
Differential diagnosis			

	Benign Paroxysmal positional Vertigo	Menieres	Labrynthitis
Present ation	<p>The sole symptom is dizziness that occurs during or after body movements.</p> <p>Duration: seconds- 1 minute Respite in between bouts</p>	<p>Dizziness, hearing loss or ringing in one ear. Signs of Tinnitus</p> <p>Chronic condition</p>	<p>Infection of balancing center in inner ear (labyrinth)</p> <p>Dizziness, nausea, vertigo, loss of hearing</p>
Descript ion/path ophys	<p>When head moves, this causes displaced otoconia in semicircular canals (vestibular system) to move</p> <p>This movement of otoconia send false signal to brain causing vertigo/dizziness</p> <p>The posterior canal is most commonly affected site, but superior and horizontal canals can be affected as well.</p> <p>The treatment positioning/head direction differs depending on which canal is affected</p>	<p>Intermittent episodes of vertigo lasting few minutes to hours</p> <p>Fluctuating sensorineural hearing loss, tinnitus, aural pressure</p> <p>Sudden onset</p> <p>Cochlear or vestibular symptoms</p> <p>Motion sickness-> nausea + Vomiting</p>	<p>Vertigo</p> <p>Effect messages sent to brain by ear -> changing hearing and balance</p>
Aggs	<p>Positional changes impacting head’s relation to gravity</p> <ul style="list-style-type: none"> - Getting out of bed/rolling over - Getting out of car 	<ul style="list-style-type: none"> - watching TV - possible triggers of dizziness - busy shopping centres 	<p>High changing environments</p> <p>Busy visual setting</p>
Eases		Gentamicin (ototoxic antibiotic)	Hydration

Dix hallpike test

- There are other tests of canal involvement- roll test, head pitch test

Interpretation of the Dix-Hallpike Test

Canal	Nystagmus Type	Nystagmus Duration
Posterior	Upbeating & Torsional to Affected/ Dependent Ear	Transient – Canalithiasis Prolonged - Cupulolithiasis
Anterior	Downbeating & Torsional to Affected/ Dependent Ear	Transient – Canalithiasis Prolonged - Cupulolithiasis

Identification of canal involvement based on direction of nystagmus during right Dix-Hallpike Test

Canal	Eye Muscle (Excited)	Right Hallpike-Dix Position	Reversal Phase	Return to Sitting Position
Right posterior	Ipsilateral superior oblique, contralateral inferior rectus	Upbeat, counterclockwise	Down and clockwise	Down and clockwise
Right anterior	Ipsilateral superior rectus, contralateral inferior oblique	Downbeat, counterclockwise	Up (and clockwise)	Up (and clockwise)
Left anterior	Ipsilateral superior rectus, contralateral inferior oblique	Downbeat, clockwise	Up (and counterclockwise)	Up (and counterclockwise)
Right horizontal	Ipsilateral medial rectus, contralateral lateral rectus	Horizontal ^b	Horizontal	Horizontal
Left horizontal	Ipsilateral medial rectus, contralateral lateral rectus	Horizontal ^b	Horizontal	Horizontal

Balance tests:

- Electronystagmography (ENG)
- Cawthorne-Cooksey exercises
-

- Eye movement
- Gaze stabilization exercises
- Hearing test: difference between sounds
- dizziness Handicap Inventory (DHI) (Sx)

Dynamic visual acuity (eye chart)



- Gait and balance Axs
- Electronystagmography (ENG)
 - Cawthorne-Cooksey exercises

Oculomotor testing (OMAT)

- horizontal and vertical saccades-> Ax dizziness etc from 1-10

Treatment	<p>Treatment of BPPV</p> <table border="1" data-bbox="149 204 749 553"> <thead> <tr> <th>Canal</th> <th>Canalithiasis</th> <th>Cupulolithiasis</th> </tr> </thead> <tbody> <tr> <td>Posterior</td> <td>Epley Modified Epley</td> <td>Semont (Head rotated away from affected side)</td> </tr> <tr> <td>Horizontal</td> <td>Roll Appiani</td> <td>Semont (Head neutral) Casani</td> </tr> <tr> <td>Anterior</td> <td>Epley Kim</td> <td>Semont (Head rotated towards affected side)</td> </tr> </tbody> </table> <p>BPPV is treated through maneuvering displaced otoconia inside semicircular canals back into correct place in gel of otolith organs within utricle and saccule.</p>	Canal	Canalithiasis	Cupulolithiasis	Posterior	Epley Modified Epley	Semont (Head rotated away from affected side)	Horizontal	Roll Appiani	Semont (Head neutral) Casani	Anterior	Epley Kim	Semont (Head rotated towards affected side)	<p>Lifestyle changes:</p> <ul style="list-style-type: none"> - allergy-avoidance - large quantities of caffeine, chocolate, tobacco, alcohol, salt - <p>Vestibular rehabilitation:</p> <ul style="list-style-type: none"> -replacement of sensory input that causes dizziness -enhance postural and movement stability -reduce risk of falls <p>Repeated exposure to visually challenging stimuli</p> <p>Gaze stabilization Balance exercises</p>	<p>Vestibular rehabilitation:</p> <ul style="list-style-type: none"> -replacement of sensory input that causes dizziness -enhance postural and movement stability -reduce risk of falls <p>Repeated exposure to visually challenging stimuli</p> <p>Gaze stabilization Balance exercises</p> <p>Decrease sodium intake Increase hydration antihistamines</p>
Canal	Canalithiasis	Cupulolithiasis													
Posterior	Epley Modified Epley	Semont (Head rotated away from affected side)													
Horizontal	Roll Appiani	Semont (Head neutral) Casani													
Anterior	Epley Kim	Semont (Head rotated towards affected side)													
DDx		<ul style="list-style-type: none"> - BPPV - Labrynthitis - Migraines - vestibular schwannoma 	<p>Vestibular neuritis BPPV</p>												
Risk Factors	<ul style="list-style-type: none"> • Most common cause is idiopathic BPPV • Female gender • Hypertension (HTN) • Hyperlipidemia • Cerebrovascular disease • Menopause • Allergies • Migraine • Chronic Obstructive Pulmonary Disease (COPD) • Surgical procedure such as cochlear implant • Infection 	<p>Lifestyle choices</p> <p>Females 3x likely</p> <p>Adults (40-50)</p> <p>Hereditary (autosomal dominant)</p> <p>Northern European descent</p> <p>Histocompatibility antigens (HLA): HLA-A2</p>	<p>Lifestyle: (increased risk if...)</p> <p>Smoker, drinker</p> <p>History of allergies</p> <p>Habitually fatigued</p> <p>Extreme stress</p> <p>Take Prescription medications</p> <p>Take over counter meds (esp aspirin)</p>												

	Cuboid syndrome	Peroneal tendinopathy	Peripheral neuropathy - pharmacologically induced, diabetically induced
Present ation	<p>Lateral midfoot pain</p> <ul style="list-style-type: none"> - Pain is often diffuse along lateral foot between Calcaneocuboid joint and fourth and/or fifth cuboidmetatarsal joints - may radiate throughout foot - Rare injury, but may result from an inversion/plantar flexion ankle sprain - Swelling 	<p>Ankle pain along peroneal tendon. Swelling, redness and warmth around tendon. Thickened tendon and formation of nodule moves w/ tendon May progress to subluxation of tendon or rupture may occur</p>	<p>Weakness, numbness and pain in hands or feet Can affect body functions: urination, digestion, circulation Hypoesthesia Lack of coordination Heat intolerance PNS dysfunction pain Paraesthesia Sensory loss</p>
Descript ion/path ophys	<ul style="list-style-type: none"> - Dysfunctional arthrokinematics or structural congruity of calcaneocuboid(CC) joint - Irritation of fibularis longus tendon- during inversion and plantarflexion sprain fibularis longus may reflexively contract and sublux cuboid - Overuse- causes recurrent cuboid eversion relative to calcaneocuboid joint 	<p>Swelling in lateral aspect of ankle due to friction between peroneal tendon and metatarsal bones. The tendon tries to adapt to overload by increasing size of tendon which increases friction and inflammation. More common in athletes as they tend to roll their feet outward more that cause more friction between tendon and bone.</p>	<p>Chronic hyperglycemia Diabetes Hypoxia Ischemia Slow sensory nerve conduction velocity + motor nerve conduction velocity</p>
Aggs	<ul style="list-style-type: none"> - Hopping, resisted eversion and inversion, pronation and overload. 		<p>Repetitive motions Cramped positions Sedentary lifestyle Dietary choices</p>
Eases	Rest		<p>Avoidance of repetitive motions, uncomfortable positions Exercise regularly Avoid factors causing nerve damage</p>
Objectiv e testing	<ul style="list-style-type: none"> - Tenderness may be present along peroneus longus tendon, cuboid groove, dorsolateral and/or plantar cuboid - Resisted ankle/foot eversion or inversion may elicit pain - Midtarsal adduction test <p>Midtarsal joint passively moved in transverse plane- stabilise calcaneum.</p>		<ul style="list-style-type: none"> - Autonomic reflex screen - Sensory test: touch, vibration, cooling, heat - Nerve conduction test - SF-36 - TUG - 10MWT - Grip strength - Fatigue severity scale

	<p>Distracts lateral cuboid surface from peroneal tendons</p> <ul style="list-style-type: none"> - Midtarsal supination test 		<ul style="list-style-type: none"> - Oxford muscle strength scale - Romberg test
<p>Treatment</p>	<p>Cuboid whip</p>  <p>Cuboid Squeeze</p>	<p>Bracing: Ankle bracing for support and</p>	<p>Regular exercise Foot/hand brace? Stretching Massage Corticosteroids Education Training incorporating balance/coordination whilst preventing muscle atrophy/deformity</p>



DDx

Burns and skin injuries
 Infection
 Falls

Risk Factors

- 17% of ballet ankle injuries
- Mid-tarsal instability
 - Excess weight
 - Exercise
 - Uneven surfaces
 - Pronated feet
 - Chronic ankle instability

Diabetes
 Alcohol misuse
 Vitamin deficiencies
 Infections
 Autoimmune diseases
 Kidney, liver, thyroid disorders
 Repetitive motion
 Family Hx

	Bennett's fracture	Boxer's fracture	Mallet fracture	Tuft fracture
Presentation	Pain + swelling carpometacarpal joint Tenderness Heat Decreased grip strength/pinch grasp Deformity in 1st CMC joint Numbness Inflammation Tenderness	snapping/popping sensation Swelling Discolouration Bruising Deformity in 5th knuckle (MCP) Cut in skin (severe) 5th finger misaligned: rotated towards thumb (severity) Numbness Inflammation Tenderness	Traumatic cause Swollen Painful + sore Distal IPJ flexed	
Description/p athophys	# base of 1st MCP from forced abduction w/ MCP in extension Axial loading through metacarpal in opposite direction	Closed fist makes contact w/ solid object, neck of 5th metacarpal takes full force Result from apex dorsal angulation due to forces exerted by pull of interosseous muscles	Dorsal surface of proximal distal phalanx fracture EDL axial loaded to tip of extended finger, leads to forced flexion at distal IPJ Avulsion # in distal phalanx	Distal surface of distal
Aggs	Thumb abd, add + ext Pinching Grasping	5th/4th MCP movement Weight bearing	Pinching (affect phalanx) Flexion/extension in affected phalanx Weight bearing Grasping	Wearing rings on injured finger Finger flex/ext (initial)
Eases	Ice/cold Immobilisation Compression	Ice/cold Immobilisation Compression	Ice/cold Immobilisation Compression	Ice/cold Immobilisation Compression
Objective testing	Neurovascular exam Grip strength ROM DASH Michigan hand outcome questionnaire (MHO) Patient specific functional scale	Grip strength ROM DASH Michigan hand outcome questionnaire (MHO) Patient specific functional scale	Grip strength ROM DASH Michigan hand outcome questionnaire (MHO) Patient specific functional scale	Grip strength ROM DASH Michigan hand outcome questionnaire (MHO) Patient specific functional scale
Treatment	Immobilisation (splint) acetaminophen/ibuprofen (pain management) Resting hand HEP: Hand exercises	Clean and treat cuts (if visible) Immobilise hand splinting /cast acetaminophen/ibuprofen (pain management) Resting hand	Education Immobilisation splinting (6/52) Orthosis HEP: finger flex/ext	Splint (2-4/52) Clean and treat cuts (if visible) acetaminophen/ibuprofen (pain management)

	Wrist ext, wrist flex, deviate massage/compression (when suitable)	Immobilisation: ulnar gutter splint, galveston splint HEP: Hand exercises massage/compression (when suitable)	exercises (when appropriate) acetaminophen/ibuprofen (pain management) Compression Surgical	Plastic surgery?
DDx	Rolando fractures Extra-articular fractures Gamekeepers thumb	5th MCP base or shaft fractures (requires different treatment plan) 3rd MCP	Swan neck deformity Boutonniere deformity	
Risk Factors	Infection Malunion Arthritis Stiffness Contracture Smoking High alcohol consumption	Infection Malunion Arthritis Stiffness Contracture Smoking High alcohol consumption	Infection Malunion Arthritis Stiffness Contracture Smoking High alcohol consumption	Infection Malunion Arthritis Stiffness Contracture Smoking High alcohol consumption

Condition	Description	Ax	Sx	Treatment
Avulsion # ASIS	<ul style="list-style-type: none"> Forceful contraction of sartorius/TFL in hip E Younger athletes 	<ul style="list-style-type: none"> Weakness in hip F Weakness in kn E AROM/PROM of kn & hip 	<ul style="list-style-type: none"> Weakness Sharp pain Tenderness Difficulty walking 	Displacement >3cm requires surgery Displacement <3cm <ul style="list-style-type: none"> Protected WB Early ROM Strengthening RTS 8-10/52
Avulsion # AIIS	<ul style="list-style-type: none"> Forceful contraction of rec. fem. 			
Traction Apophysitis	<ul style="list-style-type: none"> Overused muscle-tendon junction Affects cartilage & bony attachments Growing bones 13-17yo 			

Cliniko Notes Example:

Cliniko	Poor Example	Great Example
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Client Progress Report	Going okay	Feeling good. Min pain lateral R knee w/ deep squat.
Practitioner Observations	No pain, all good	Min shoulder pain w/ push up, technique adjustment hands below shoulder, feels better.
Exercises, Thoughts & Treatments Prescribed	A few lower body, core, an upper body and some cardio	Push ups TRX 1/2 squats Twisty cats TRX rows Glute bridges
Response To Treatment	Felt fine	little sore after exercises, educated muscle fatigue/soreness
Plan	Give new exercises soon	Progress push ups & TRX rows, must be strict on technique to progress
Where?	Gym	Exercise Thought Indoors.

Suprapatellar Pouch	
Description	<p>AKA suprapatella recess/bursa Located proximal to knee joint between prefemoral and suprapatella fat pad Reduce friction between moving structures Large continuation of synovial membrane of knee joint proximal to trochlea Proximal border is position approx 4cm proximal to superior border of patella, lying deep to quadricep tendon</p>
Potential pathologies	<p>Suprapatella bursitis</p> <ul style="list-style-type: none"> - Dull, achy pain or tenderness - Swelling or redness - Warth - Loss or reduction in motion <p>Aggs: kneeling, running or jumping</p> <p>Mech: Suddenly or gradually</p> <p>Ox: Effusion</p>

Shoulder Dislocation

Description	<p>Humeral head displaced from glenohumeral joint</p> <p>Anterior (forward)</p> <ul style="list-style-type: none"> - Humeral head shifts forward in front of glenoid <ul style="list-style-type: none"> - Bankart lesion possible - Anterior inferior labrum tear - Hill-Sachs lesion <p>Posterior (behind)</p> <ul style="list-style-type: none"> - Humeral head moved behind and above socket - Uncommon type of dislocation <p>Inferior (bottom)</p> <ul style="list-style-type: none"> - Humeral head pushed down and out of socket towards armpit - least common type of dislocation
Causes	<p>Trauma, e.g falls or collision</p> <p>Anterior - when arm is extended</p> <p>Posterior - usually caused by seizures or electrical shock</p> <p>Inferior -</p>
Presentatio n	<ul style="list-style-type: none"> - Malformation - Swelling - Bruising - Intense Pain - Inability to move it <p>Other symptoms</p> <ul style="list-style-type: none"> - Weakness - Numbness - Tingling in neck and arm - Spasms in muscles that make it hurt worse - Tearing of muscles around shoulder joint - Damage to blood vessels or nerves - Instability in shoulder (increased w/ numerous dislocations) <p>Anterior</p> <ul style="list-style-type: none"> - Arm held in abducted and ER position - Loss of normal contour of deltoid and acromion prominent posteriorly and laterally - Humeral head palpable anteriorly - All movement limited and painful - Palpable fullness below coracoid process and towards axilla <p>Posterior</p> <ul style="list-style-type: none"> - Arm is abducted and IR - May/not lose deltoid contour - Notice posterior prominence head of humerus - Tear subscapularis muscle (weak or cannot IR)

Aggs	Anterior - horizontal extension, abduction, external rotation Posterior - protraction, push up/ bench end range, lifting above head
Eases	Stabilisation (sling/rest in elevated/neutral position), Ice, compression, pain, medication
Objective	Pre-reduction radiographs Shoulder apprehension Sulcus sign Richie's Articular Index
DDx	<ul style="list-style-type: none"> - Fracture (clavicle, glenoid, HH, greater tuberosity, proximal humerus) - Rheumatoid arthritis - Rotator cuff injury - Acromioclavicular Joint Dislocation - Labral Pathology - Shoulder subluxation - Axillary nerve/suprascapular Nerve Palsy
Risk factors	Repetitive overhead movement, previous dislocations, genetics (shoulder structure)
Treatment	<p>Anterior</p> <p>Phase 1 (up to 6/52)</p> <ul style="list-style-type: none"> - Maintain anterior-inferior stability - Immobilisation 3-6/52 under 40, 1-2/52 over - AROM of elbow, wrist and hand - Pain reduction - Isometric RC and biceps - Codman exercises - AAROM for external rotation (0-30°) and forward elevation (0-90°) <p>Phase 2 (6-12/52)</p> <ul style="list-style-type: none"> - Restore adequate motion, specifically external rotation - AAROM achieve full ROM - Stretch posterior joint capsule through joint mobilisations or self stretching - No strengthening or repetitive exercises until full ROM <p>Phase 3 (12-24/52)</p> <ul style="list-style-type: none"> - Successful return to sports or PA - Begin strengthening -> impairment based - In pain-free motion focus stability - Progression: RC, scap stabilisers -> then progress to larger musculature -> focus on functional exercises promote participation in society <p>Posterior</p> <p>*Same as anterior besides</p> <ul style="list-style-type: none"> - Posterior glide is contraindicated - Avoid flexion w/ adduction and IR

- Immobilised 3-6/52 if less than 40 year, 2-3/52 is greater 40 years
- Strengthening will focus on posterior (infraspinatus, teres minor and posterior deltoid)

Radiology/Imaging technique	Application
CT	Medicare rebatable w GP referral. Some radiation.
MRI	\$365 out of pocket. Medicare rebateable w/ GP referral for certain conditions: Adults: https://www.melbournradiology.com.au/our-referrers/adult-mri-medicare-rebate-items-for-gps/ Paediatrics: https://www.melbournradiology.com.au/our-referrers/paediatric-mri-medicare-rebate-items-for-gps/ No radiation.
X-ray	\$30-40 out of pocket. Fractures, Tumours.

Condition	Ligamentum teres	Labral tear	Hip OA
Subjective	Agg w twisting	Agg w compression & stretch	
Objective			
Treatment			
Imaging			

Condition	Muscle tear	Fascial tear
Subjective	https://www.sportsinjurybulletin.com/anatomy/muscle-strain-injury-time-to-consider-the-fascia	
Objective		
Prognosis		