



Student Handout

Lecture 06 — Degenerative, Demyelinating, Movement and Infectious Disorders

Progressive disease · Movement disorders · Infection — and the treatment plan for each

- Every condition is worked through to a treatment plan, not left as a description
- Contains the absolute contraindications that make acute neurological infection untreatable
- Emphasis on supportive and palliative goals, realistic expectations and honest goal-setting
- Clinical reference: Rattray & Ludwig, Clinical Massage Therapy (Talus, 2000) — MS, Parkinson's and related entries

How to use this handout

- This handout carries the full content of the lecture in the same order as the slides, so you can follow along without transcribing.
- Headings match the slide titles exactly. Use the wide left margin for your own notes.
- Anything marked MASSAGE THERAPY APPLICATION is the clinical consequence of the material above it — that is what you are being examined on.
- Reference lines give the source. Rattray refers to Rattray & Ludwig, Clinical Massage Therapy (Talus, 2000); CMTA links go to the current Standards of Practice.

THIS LECTURE

Learning Outcomes

By the end of Lecture 6, the student will be able to:

- Describe the pathophysiology and clinical presentation of the principal degenerative, demyelinating, movement and infectious disorders of the nervous system.
- Differentiate upper from lower motor neuron involvement in each condition and predict the presentation that follows.
- Identify the absolute, local and relative contraindications applying to each condition.
- Formulate realistic treatment goals within the RMT scope for progressive and incurable disease.
- Recognise when to modify treatment, obtain physician clearance, or refer.
- Apply infection prevention and control requirements where a condition is transmissible.
- Adapt consent, communication and documentation for clients with cognitive impairment.
- Use Rattray's condition entries as the basis for a defensible treatment plan.

FRAMEWORK

Categorising Pathology for Treatment Planning

The category a condition belongs to predicts the shape of the treatment plan before you know anything else about the individual.

The categories

- Progressive degenerative — neurons are lost over time and will not be recovered. ALS, Alzheimer's, Huntington's.
- Demyelinating — myelin is damaged, often with relapse and remission. Multiple sclerosis, Guillain-Barré syndrome.
- Movement disorders — abnormal, involuntary or reduced movement. Parkinson's, dystonia, tremor.
- Infectious — an organism attacks nervous tissue. Encephalitis, meningitis, herpes zoster, poliomyelitis.



What each predicts

- Progressive: goals are supportive and palliative; the plan changes as the disease changes; expectations must be honest.
- Demyelinating: goals shift with relapse and remission; treat conservatively during a relapse.
- Movement disorders: goals target the secondary muscular consequences of abnormal movement.
- Infectious: acute infection is an absolute contraindication; treatment belongs to the recovery phase with clearance.

REVIEW

Upper and Lower Motor Neuron — the Pattern That Organises This Lecture

Established in Neurology 1 and 2, and applied to every condition that follows.

Upper motor neuron

- The neuron running from the motor cortex down the corticospinal tract to the anterior horn. It never leaves the central nervous system.
- A lesion removes descending inhibition from the reflex arc, which is then left unopposed.
- Spasticity — velocity-dependent increased tone, greater with rapid movement.
- Hyperreflexia; clonus; a positive Babinski sign.
- Weakness in a broad pattern rather than a single muscle.
- No significant atrophy early, because the muscle is still innervated. Disuse atrophy develops later.
- Seen in: stroke, multiple sclerosis, cerebral palsy, spinal cord injury above the conus.

Lower motor neuron

- The neuron running from the anterior horn out through the spinal nerve to the muscle. It is the final common pathway.
- A lesion disconnects the muscle from all input, so nothing reaches it.
- Flaccidity — decreased or absent tone.
- Hyporeflexia or areflexia; no Babinski sign.
- Weakness confined to the muscles supplied by that neuron.
- Marked atrophy, and fasciculations from denervated fibres.
- Seen in: poliomyelitis, peripheral neuropathy, Guillain-Barré, cauda equina lesions, root compression.

MESSAGE THERAPY APPLICATION

- The pattern tells you what your hands will meet before you touch the client — resistance that rises with speed, or a limb with no protective tone at all. Handle each accordingly.

FRAMEWORK

The General Principle for Progressive Disease

- Massage therapy will not alter the course of a progressive neurological disease, and no treatment plan should imply that it might.
- What it can do is real and valuable: reduce pain, reduce the discomfort of spasticity, maintain range of motion, help prevent contracture, support circulation and skin health, ease the muscular strain of compensation, and provide comfort and human contact.
- Goals are therefore supportive and palliative, and they are legitimate clinical goals.
- The plan must be reviewed frequently, because the client's capacity, energy and needs change over the course of the disease.
- Setting an honest expectation at the outset protects the client from disappointment and protects you from an indefensible claim.
- Caregiver support and coordination with the wider care team are part of the plan, not an extra.



MESSAGE THERAPY APPLICATION

- Say it plainly: "I can't change the condition, but I can make you more comfortable, help keep your joints moving, and give you an hour where something is being done for you." That is an honest, in-scope offer.

Rattray, F., & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions*. Talus Inc. ISBN 978-0-9698177-1-0.

DEGENERATIVE

Amyotrophic Lateral Sclerosis — Pathophysiology

The disease

- Progressive degeneration of both upper and lower motor neurons — the only common condition to affect both simultaneously.
- Upper motor neuron loss in the corticospinal tracts produces spasticity and hyperreflexia.
- Lower motor neuron loss in the anterior horn produces flaccidity, atrophy and fasciculations.
- Approximately ninety per cent of cases are sporadic; a minority are familial.
- Sensation, cognition and eye movement are typically preserved, although a proportion of clients develop frontotemporal changes.
- Prognosis is poor, with survival typically measured in a small number of years from diagnosis.

Why the mixed picture matters

- You will palpate spastic hypertonicity in one limb and flaccid wasting in another, in the same client.
- Reflexes may be brisk in some segments and absent in others.
- This combination in a client not yet diagnosed is a serious finding requiring prompt referral.
- Preserved sensation means the client feels everything you do — pressure judgment cannot be relaxed.
- Preserved cognition means the client is fully aware of their situation; communicate accordingly.

DEGENERATIVE

ALS — Presentation and Treatment Planning

Clinical picture

- Progressive weakness, muscle wasting and cramping, often beginning asymmetrically in one limb.
- Spasticity and hyperreflexia from upper motor neuron loss; atrophy and fasciculations from lower motor neuron loss.
- Bulbar involvement: dysarthria, dysphagia, and difficulty managing secretions.
- Respiratory muscle involvement in later stages, with breathlessness on lying flat.
- Fatigue is significant and disproportionate.

Treatment plan

- Goals: reduce pain and the discomfort of spasticity, maintain available range, support circulation and comfort.
- Keep sessions short; fatigue is easily provoked and slow to resolve.
- Position for airway and breathing comfort — semi-reclined or side-lying rather than flat prone in later stages.
- Support limbs fully; a flaccid limb gives no protective feedback and joints are vulnerable.
- Passive range of motion within comfortable limits, applied slowly to avoid provoking spasticity.
- Skin checks where mobility is reduced. Coordinate with the care team and support the caregiver.

Werner, R. (2019). *A Massage Therapist's Guide to Pathology* (7th ed.). Books of Discovery.

DEMYELINATING

Multiple Sclerosis — Pathophysiology

The disease

- An immune-mediated condition in which myelin in the central nervous system is attacked, producing plaques of demyelination.



- Demyelination slows or blocks conduction; axonal loss accumulates over time and accounts for progressive disability.
- Lesions are disseminated in space and in time — different sites, at different points.
- Most common in young adults, with a female predominance, and more prevalent at higher latitudes. Canada has among the highest prevalence in the world.
- The peripheral nervous system is not affected, because it is myelinated by Schwann cells rather than oligodendrocytes.

Types

- Relapsing-remitting: discrete relapses with partial or complete recovery between them. The most common initial pattern.
- Secondary progressive: steady progression developing after an initially relapsing course.
- Primary progressive: steady progression from onset without distinct relapses.
- Clinically isolated syndrome: a first episode that may or may not progress to a diagnosis.
- The pattern determines whether the client has good days and bad days, or a steadily changing baseline.

Rattray, F., & Ludwig, L. (2000). Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions. Talus Inc. ISBN 978-0-9698177-1-0 — condition entry: Multiple Sclerosis.

DEMYELINATING

Multiple Sclerosis — Clinical Presentation

Common features

- Fatigue — the single most commonly reported and most disabling symptom.
- Optic neuritis: painful loss of vision in one eye, often the first presentation.
- Sensory disturbance: numbness, tingling, band-like sensations, and Lhermitte's sign — an electric sensation down the spine on neck flexion.
- Spasticity and weakness, usually with an upper motor neuron pattern.
- Ataxia, intention tremor and dysarthria from cerebellar involvement.
- Bladder urgency, frequency and incontinence; bowel dysfunction.
- Cognitive change, particularly processing speed; and neuropathic pain.

Heat sensitivity

- Uhthoff's phenomenon: a transient worsening of symptoms with a rise in body temperature, because conduction in a demyelinated axon fails at higher temperatures.
- Triggered by hot baths, hot weather, fever and vigorous exercise.
- The effect is temporary and reverses on cooling; it is not a relapse and does not indicate new damage.
- It is nonetheless distressing and functionally limiting.

TREATMENT PLANNING

Multiple Sclerosis — Building the Plan

Adaptations

- Keep the treatment room cool. Avoid hot packs, hot hydrotherapy, saunas and any general heating — heat is the single most important modification.
- Avoid overheating the client under heavy blankets.
- Manage fatigue: shorter sessions, and scheduling at the client's best time of day.
- During an acute relapse, treat very conservatively or not at all; obtain clearance and coordinate with the neurologist.
- Sensory impairment means the therapist takes responsibility for pressure and temperature judgment.
- Bladder urgency: offer a bathroom before beginning and be matter-of-fact about it.



Goals and technique

- Reduce spasticity-related discomfort and maintain range of motion; help prevent contracture.
- Address the compensatory muscular strain of altered gait and mobility aid use.
- Support circulation and skin integrity where mobility is reduced.
- Slow, sustained technique; avoid rapid passive movement, which provokes spasticity.
- General relaxation to reduce the sympathetic load that worsens symptoms.
- Home care: gentle positional stretches and rest positioning, never a graded exercise programme.

Rattray, F., & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions*. Talus Inc. ISBN 978-0-9698177-1-0 — condition entry: Multiple Sclerosis.

MOVEMENT DISORDERS

Parkinson's Disease — Pathophysiology

The disease

- Progressive degeneration of dopamine-producing neurons in the substantia nigra pars compacta of the midbrain.
- Loss of dopaminergic input to the striatum disrupts the basal nuclei circuits that modulate movement.
- Symptoms typically appear once a substantial majority of these neurons have already been lost.
- Lewy bodies — intracellular aggregates of alpha-synuclein — are the pathological hallmark.
- The basal nuclei do not project directly to the cord, which is why the result is disordered movement rather than weakness.

Cardinal signs

- Resting tremor — classically pill-rolling, present at rest and reduced by voluntary movement. The opposite pattern to cerebellar intention tremor.
- Rigidity — increased tone independent of movement velocity, described as lead-pipe or, with tremor superimposed, cogwheel.
- Bradykinesia — slowness and progressive reduction in the amplitude of repetitive movement. Required for the diagnosis.
- Postural instability — impaired righting reflexes, appearing later and carrying a high fall risk.

Rattray, F., & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions*. Talus Inc. ISBN 978-0-9698177-1-0 — condition entry: Parkinson's Disease.

MOVEMENT DISORDERS

Parkinson's — Associated Features and Medication

Other features

- Flexed, stooped posture with a forward head position.
- Shuffling, festinating gait with reduced arm swing; freezing of gait, particularly in doorways.
- Masked facies with reduced blink and reduced facial expression.
- Micrographia — handwriting becoming progressively smaller.
- Hypophonia — a quiet, monotone voice.
- Autonomic features: constipation, orthostatic hypotension, seborrhoea, excessive salivation.
- Non-motor features: REM sleep behaviour disorder, loss of smell, depression, and later cognitive change.

Medication

- Levodopa combined with a decarboxylase inhibitor is the mainstay.
- Response fluctuates: "on" periods with good mobility alternate with "off" periods of marked rigidity and slowness.
- Dyskinesias — involuntary writhing movements — can appear at peak dose.
- Schedule appointments during a reliable "on" period wherever possible and ask the client when that is.



- Orthostatic hypotension is common, both from the disease and from the medication.

TREATMENT PLANNING

Parkinson's — Building the Plan

Goals and technique

- Reduce rigidity-related discomfort and the secondary muscular pain of a flexed posture.
- Maintain range of motion, particularly in trunk rotation, shoulder and hip extension, and cervical extension.
- Address the anterior chest, hip flexors and cervical flexors that shorten with the characteristic posture.
- Slow, rhythmic, sustained technique; rocking and gentle oscillation are often well tolerated and can reduce rigidity.
- Passive and assisted range of motion within comfort.
- Massage does not slow the disease and does not restore dopaminergic function — say so.

Safety and adaptation

- High fall risk: assist onto and off the table, allow ample time, never leave the client to manage transfers alone.
- Orthostatic hypotension: rise in stages and remain within reach.
- Allow extra time for everything, including undressing and getting settled.
- Ask questions one at a time and allow time to answer; slowed processing is not reduced comprehension.
- Hypophonia means you may need to listen closely — never pretend to have heard.
- Coordinate with physiotherapy, occupational therapy and speech-language pathology where they are involved.

Rattray, F., & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions*. Talus Inc. ISBN 978-0-9698177-1-0 — condition entry: Parkinson's Disease.

DEGENERATIVE

Huntington's Disease

Pathophysiology and presentation

- An inherited autosomal dominant condition caused by a trinucleotide repeat expansion; each child of an affected parent has a fifty per cent risk.
- Progressive degeneration of the basal nuclei, particularly the striatum.
- Chorea: rapid, involuntary, irregular, purposeless movements that flow from one body part to another.
- Onset is typically in mid-adulthood, with progression over years to decades.
- Cognitive decline and psychiatric change — depression, irritability, apathy — accompany and may precede the motor features.
- Later features include dystonia, rigidity, gait and balance disturbance, dysphagia and weight loss.

Treatment plan

- Goals: ease the muscle soreness and fatigue produced by constant involuntary movement; promote relaxation and comfort.
- Positioning is genuinely difficult — use generous bolstering and prioritise safety on the table.
- Consider treating in a chair or on a low table if there is any risk of the client moving off the edge.
- Slow, rhythmic, sustained techniques may temporarily reduce involuntary movement.
- Adapt communication and consent for cognitive change; involve caregivers with the client's agreement.
- Dysphagia means positioning must protect the airway; avoid flat supine in later stages.
- This is supportive and palliative care and will not alter the disease course.

Werner, R. (2019). *A Massage Therapist's Guide to Pathology* (7th ed.). Books of Discovery.



DEGENERATIVE

Alzheimer's Disease — Pathophysiology

The disease

- The most common cause of dementia — a decline in cognitive ability sufficient to interfere with daily life.
- Onset in middle to late life, with progressive worsening over years.
- Gross changes: diffuse cortical atrophy, widened sulci, and enlargement of the cerebral ventricles.
- The hippocampus and medial temporal lobe are affected earliest, which is why new memory formation fails first while remote memory persists.
- Definitive diagnosis has historically required post-mortem examination; clinical diagnosis is made by pattern and by excluding other causes.

Microscopic hallmarks

- Neuritic (senile) plaques: extracellular deposits of misfolded amyloid-beta protein.
- Neurofibrillary tangles: intracellular aggregates of hyperphosphorylated tau protein. Tau normally stabilises microtubules; when it aggregates, the transport system within the neuron fails.
- Loss of cholinergic neurons, which is the target of the cholinesterase inhibitors used in treatment.
- Reversible causes of cognitive decline — thyroid disease, B12 deficiency, depression, medication effects — must be excluded, which is one reason referral rather than assumption is required.

DEGENERATIVE

Alzheimer's — Clinical Presentation by Stage

Early

- Short-term memory loss and difficulty forming new memories; repeating questions.
- Word-finding difficulty and reduced vocabulary.
- Difficulty with complex tasks, planning and managing money.
- Clients may deny, minimise or actively conceal their difficulties.
- Insight is often partially retained, and the awareness is distressing.

Middle and late

- Disorientation to time and place; getting lost in familiar surroundings.
- Personality and behavioural change: agitation, suspicion, restlessness, sundowning.
- Increasing dependence for activities of daily living.
- Communication becomes progressively limited; the person may lose fluent speech entirely.
- Motor and sensory involvement in late disease, with reduced mobility, incontinence and swallowing difficulty.
- Increasing risk of falls, pressure injury and infection.

TREATMENT PLANNING

Alzheimer's — Consent, Communication and the Plan

Consent and communication

- Capacity is decision-specific and can fluctuate; a diagnosis of dementia does not itself remove capacity.
- Obtain consent at each visit, and again before each significant transition within the session.
- Where the client is incapable, consent is obtained from the substitute decision-maker under the Health Care Consent Act, 1996.
- Speak calmly, one idea at a time, using short sentences and the client's name.
- Explain each step before you do it; do not touch without announcing it.
- Do not argue with or correct a mistaken belief; redirect gently instead.

Treatment plan

- Goals: reduce anxiety, agitation and restlessness; promote comfort and sleep; support circulation and skin health.



- Predictable routine: the same room, the same therapist, the same sequence, at the same time.
- Watch non-verbal cues for discomfort — facial expression, guarding, withdrawal — because pain may not be reported accurately or at all.
- Screen for coexisting conditions: fragile skin, osteoporosis, deep vein thrombosis risk, circulatory disease.
- Keep sessions shorter if the client becomes restless.
- Positive, grounding physical contact has genuine value in this population.

CMTO Standard of Practice: Consent — <https://www.cmta.com/rules/consent/> · Health Care Consent Act, 1996 — <https://www.ontario.ca/laws/statute/96h02>

DEGENERATIVE

Other Dementias — a Brief Comparison

Types

- Vascular dementia: stepwise decline following multiple small strokes; focal neurological signs are often present.
- Dementia with Lewy bodies: fluctuating cognition, visual hallucinations, and parkinsonian motor features. Antipsychotic medication can be dangerous in this group.
- Frontotemporal dementia: earlier onset, with personality change, disinhibition and language difficulty preceding memory loss.
- Mixed dementia, most often Alzheimer's with vascular disease, is common.

What differs for the RMT

- Vascular dementia carries cardiovascular comorbidity, anticoagulant use and stroke risk.
- Lewy body dementia carries the parkinsonian fall risk and marked orthostatic hypotension.
- Frontotemporal dementia may involve disinhibited behaviour; professional boundaries must be maintained clearly and calmly, and the situation documented.
- In all cases the core adaptations are the same: consent at each visit, predictable routine, non-verbal pain observation, and coordination with caregivers.

MOVEMENT DISORDERS

Dystonia

Pathophysiology and presentation

- Sustained or intermittent involuntary muscle contractions producing twisting, repetitive movements and abnormal postures.
- May be focal (one region), segmental, or generalised throughout the body.
- Cervical dystonia (spasmodic torticollis) is the most common focal form and presents to massage therapists frequently.
- Blepharospasm affects the eyelids; task-specific forms include writer's cramp and musician's dystonia.
- May be inherited; many cases are idiopathic, and some follow infection or trauma.
- Thought to involve the basal nuclei, though the mechanism is not fully established.
- A sensory trick — a light touch to a particular point — can temporarily reduce the contraction in some clients.

Treatment plan

- Goals: reduce hypertonicity, pain and fatigue in the overworking muscles.
- Address compensatory and postural strain in the surrounding musculature, which is often the source of the presenting pain.
- Avoid techniques that trigger or aggravate the spasm; work within tolerance.
- Sustained gentle holds and warmth may reduce the contraction; monitor the response and adjust.
- Ask about the client's sensory trick and respect it.
- Botulinum toxin injection is a common medical treatment; avoid deep work at recent injection sites and ask about the injection schedule, since symptoms fluctuate across the cycle.



- Supportive care that does not cure; coordinate with medical management.

Rattray, F., & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions*. Talus Inc. ISBN 978-0-9698177-1-0 — condition entry: Torticollis.

MOVEMENT DISORDERS

Tremor — Types and Causes

Types

- Essential tremor: postural and action tremor, most often of the hands, frequently bilateral, often familial, and not associated with underlying pathology. The most common movement disorder.
- Parkinsonian tremor: resting tremor that reduces with voluntary movement.
- Cerebellar (intention) tremor: worsens as the hand approaches a target; from cerebellar damage due to stroke, tumour or multiple sclerosis. Often accompanied by ataxia.
- Dystonic tremor: irregular, occurring in people with dystonia, tied to specific positions and often relieved by complete rest.
- Physiological tremor: a fine tremor present in everyone, exaggerated by anxiety, caffeine, fatigue and cold.

Other contributing causes

- Chronic alcohol use, and alcohol withdrawal.
- Drug withdrawal, and stimulant medication.
- Peripheral neuropathy.
- Hyperthyroidism.
- Establishing the underlying cause guides safe treatment and appropriate referral — massage addresses the symptom, not the source.

TREATMENT PLANNING

Tremor — Building the Plan

Approach

- Goals: general relaxation to reduce stress-aggravated tremor, and relief of the muscular fatigue and soreness produced by continuous movement.
- Address the muscles working hardest against the tremor, and the compensatory patterns.
- Warmth and sustained comfortable contact are usually well tolerated.
- Anxiety amplifies tremor, so a calm environment is itself part of the treatment.
- Expect the effect to be temporary and set expectations accordingly.

Screening and referral

- Establish whether the tremor has been medically assessed and what the cause is.
- A new, unilateral, or rapidly progressive tremor is referred.
- Tremor accompanied by ataxia, weakness or other neurological signs suggests significant pathology — refer rather than treat.
- Where peripheral neuropathy coexists, reduced sensation means lighter pressure and careful skin monitoring.
- Document the tremor's pattern, what provokes it and how it responds to treatment.

INFECTION

The Governing Principle for Infectious Disease

One principle covers every acute infection of the nervous system, and it is not negotiable.

- Acute infection with fever or systemic illness is an absolute contraindication to massage therapy.
- Massage increases circulation and metabolic demand at a time when the body's resources are already committed.
- Many neurological infections are transmissible, placing the therapist, other clients and other staff at risk.
- Several present as medical emergencies where any delay in referral is harmful.



- The correct action is to refer for medical care and to reschedule, treating only after recovery and, where appropriate, with clearance.
- Infection prevention and control requirements apply in full: routine practices, hand hygiene, environmental cleaning and appropriate handling of linens.

CMTO Standard of Practice: Infection Prevention and Control — <https://www.cmta.com/rules/standard-of-practice-infection-prevention-and-control/>

INFECTION

Encephalitis

Pathophysiology and presentation

- Inflammation of the brain tissue itself — from the Greek enkephalos, meaning brain.
- Most commonly viral: herpes simplex virus, arboviruses spread by mosquitoes and ticks, enteroviruses, and rabies.
- Bacterial causes overlap with those of meningitis; meningoencephalitis describes involvement of both.
- Early: flu-like symptoms, fever, headache and confusion.
- Progressing: altered consciousness, personality change, hallucinations, seizures, focal neurological deficits and memory disturbance.
- Herpes simplex encephalitis has a predilection for the temporal lobes and is treatable if recognised early, which is why speed matters.

Massage therapy considerations

- Acute encephalitis is an absolute contraindication and a medical emergency. Refer immediately.
- Fever with altered consciousness or seizures requires emergency services, not a referral letter.
- Post-recovery treatment requires physician clearance.
- Rehabilitation-phase goals: manage residual weakness, deconditioning, fatigue and stress, within the client's tolerance.
- Residual cognitive and memory change is common; adapt consent, communication and home-care delivery accordingly.

INFECTION

Meningitis

Pathophysiology and presentation

- Inflammation of the meninges — the protective coverings of the brain and spinal cord.
- Viral meningitis is more common and usually self-limiting; bacterial meningitis is less common and can be rapidly fatal.
- Bacterial causes include *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae*.
- Classic triad: fever, severe headache and neck stiffness.
- Also: photophobia, phonophobia, nausea and vomiting, confusion, altered consciousness.
- A non-blanching petechial or purpuric rash suggests meningococcal septicaemia and is a critical emergency.
- Diagnosis usually involves lumbar puncture to examine cerebrospinal fluid.

Massage therapy considerations

- Acute meningitis is an absolute contraindication and a medical emergency.
- Fever plus stiff neck plus headache: do not treat, and arrange emergency assessment immediately.
- Meningococcal disease is transmissible by respiratory droplets; protect yourself, other clients and staff, and follow public health guidance.
- Do not mistake meningeal neck stiffness for muscular tightness. Meningeal stiffness resists flexion specifically and is accompanied by fever and headache.
- Post-recovery, with clearance: address residual fatigue, headache and neck tension gently.



INFECTION

Herpes Zoster — Pathophysiology

- Caused by reactivation of the varicella-zoster virus. The primary infection is chickenpox, usually in childhood.
- After the primary infection the virus becomes latent within the dorsal root ganglia of spinal nerves, or in cranial nerve ganglia, sometimes for decades.
- Reactivation, often associated with age, stress, illness or immunosuppression, sends the virus travelling down the axons of a single sensory nerve.
- The result is a painful, blistering, vesicular rash confined to that single dermatome, on one side only, stopping abruptly at the midline.
- Pain frequently precedes the rash by several days, and can be mistaken for a musculoskeletal problem during that window.
- The rash usually crusts and heals over two to four weeks.
- Ophthalmic involvement — herpes zoster ophthalmicus, affecting the V1 division — threatens sight and is a medical emergency.

INFECTION

Herpes Zoster — Infection Control and Precautions

Transmissibility

- Active vesicular lesions contain live virus and are infectious to anyone without immunity to varicella, in whom they cause chickenpox, not shingles.
- The person is infectious until all lesions have crusted over.
- Transmission is by direct contact with the fluid from the lesions, and by airborne route in disseminated disease.
- Risk is greatest to pregnant clients and staff without immunity, newborns, and anyone immunocompromised.

Practice requirements

- Active shingles is at minimum a local contraindication over and around the affected dermatome, and an absolute contraindication where the client is systemically unwell or the lesions cannot be covered.
- Do not massage over, near, or distal to active lesions; avoid the whole affected dermatome.
- Follow routine practices rigorously: hand hygiene, gloves if any contact is unavoidable, and appropriate handling of linens.
- Reschedule if the client is febrile or unwell.
- Report a suspected first presentation for medical assessment — antiviral treatment is most effective when started early.
- Facial or eye involvement requires same-day medical assessment.

CMTO Standard of Practice: Infection Prevention and Control — <https://www.cmta.com/rules/standard-of-practice-infection-prevention-and-control/>

TREATMENT PLANNING

Post-Herpetic Neuralgia

What it is

- Persistent neuropathic pain in the affected dermatome after the rash has fully healed.
- Defined as pain persisting beyond about three months from rash onset.
- Risk rises sharply with age and with the severity of the acute episode.
- Character: burning, aching, or sharp electric jolts, with allodynia — pain from light touch such as clothing.
- Can persist for a year or considerably longer, and is genuinely disabling.



The treatment plan

- Only once all lesions are fully healed and there is no remaining infectivity.
- Expect allodynia: begin proximal or contralateral, well away from the affected area.
- Use very light contact, and progress by graded desensitisation across sessions rather than within one.
- Address the guarding, postural change and muscular strain that develop in response to protecting the area.
- General relaxation to support descending pain inhibition.
- Do not push into pain — this is a sensitised state and overtreatment will worsen it.
- Coordinate with medical management; neuropathic pain medication is commonly used.

INFECTION

Poliomyelitis

Pathophysiology

- A highly infectious viral disease caused by poliovirus, historically affecting mainly young children.
- Spread by the faecal-oral route through contaminated food or water; enters through the gastrointestinal tract before reaching the nervous system.
- Attacks the anterior horn cells — the lower motor neurons — of the spinal cord grey matter, and sometimes the medulla.
- Most infections are mild or asymptomatic; a small proportion progress to paralytic disease.
- Early: fever, headache, vomiting, fatigue and neck stiffness, followed by muscle weakness and tenderness.
- Paralysis is characteristically asymmetrical and flaccid, most often affecting the legs.
- Bulbar involvement affects the muscles supplied by the cranial nerves, threatening breathing and swallowing.

Massage therapy considerations

- Acute poliomyelitis is an absolute contraindication — an acute, highly transmissible infection.
- Global vaccination has made new cases very rare in Canada, but clients who contracted polio decades ago are still in practice populations.
- The residual picture is a lower motor neuron one: flaccid weakness, atrophy, reduced reflexes, and limb length or deformity differences.
- In the rehabilitation and long-term phases, with clearance: maintain range, support circulation and comfort in affected limbs.
- Respect weakened muscles; monitor sensation and skin integrity.

INFECTION

Post-Polio Syndrome

What it is

- New or worsening symptoms developing in people who had paralytic poliomyelitis decades earlier — typically fifteen to thirty years after recovery.
- Affects a substantial proportion of polio survivors.
- New muscle weakness, muscle and joint pain, and profound fatigue.
- Thought to result from the failure of enlarged motor units: surviving motor neurons that sprouted to reinnervate orphaned fibres eventually cannot sustain the extra load.
- It is a late effect of the original disease, not a new infection, and is not contagious.
- May be slowly progressive; cold intolerance and sleep disturbance are common.

Treatment plan

- Energy conservation is the central principle. Overuse of already-vulnerable motor units causes further loss, not strengthening.
- Shorter sessions and gentler pressure; monitor for post-treatment soreness and fatigue over the following days.



- Goals: manage muscle pain, ease overused compensatory muscles, and support function and comfort.
- Never prescribe or encourage strengthening exercise for affected muscles — this is genuinely harmful in this population.
- Support posture and the use of mobility aids; address the strain aids create in the upper limbs.
- Keep the client warm; cold intolerance is common and marked.
- Coordinate with the wider care team.

Werner, R. (2019). *A Massage Therapist's Guide to Pathology* (7th ed.). Books of Discovery.

DEMYELINATING

Guillain-Barré Syndrome

Pathophysiology and presentation

- An acute immune-mediated demyelinating polyneuropathy of the peripheral nervous system.
- Typically follows a gastrointestinal or respiratory infection by one to three weeks.
- Classically presents with rapidly progressive, symmetrical, ascending flaccid weakness beginning in the legs.
- Areflexia is a hallmark. Sensory symptoms and neuropathic pain are common.
- Autonomic instability — fluctuating blood pressure and heart rate — occurs and is dangerous.
- Respiratory muscle involvement may require ventilatory support; this is why it is a medical emergency.
- Most people recover substantially over months, though residual weakness and fatigue are common.

Massage therapy considerations

- The acute and progressive phase is an absolute contraindication and a medical emergency. Rapidly ascending weakness is referred immediately.
- Recovery phase, with clearance: maintain range of motion, prevent contracture, support circulation, and protect insensate skin.
- Respect fatigue absolutely; overwork of recovering muscle delays rather than accelerates recovery.
- Neuropathic pain is common; work within tolerance and expect sensitivity.
- Autonomic instability means slow position changes and careful monitoring.
- Progress gradually across sessions, guided by the client's response over the following days.

PERIPHERAL

Peripheral Neuropathy

Causes and presentation

- Diabetes is the most common cause in Canada; others include alcohol use, B12 deficiency, chemotherapy, hypothyroidism, chronic kidney disease, autoimmune disease and hereditary conditions.
- Typically length-dependent: the longest axons fail first, producing a symmetrical stocking-and-glove distribution starting at the toes.
- Sensory: numbness, tingling, burning, and loss of vibration and proprioception. Neuropathic pain is often worse at night.
- Motor: distal weakness, intrinsic foot muscle wasting, and eventually foot drop.
- Autonomic: impaired sweating, dry cracked skin, and impaired thermoregulation.
- Loss of protective sensation is the critical finding — the client cannot feel injury.

Treatment plan

- Inspect the feet at every visit: skin integrity, colour, temperature, nails, and any wound or callus. Refer any wound promptly.
- The therapist owns all pressure and temperature judgment; client feedback is unreliable by definition.
- No hot or cold applications on insensate areas.
- Light to moderate pressure; monitor the skin during and after.



- Goals: circulation support, comfort, maintenance of range, and management of compensatory strain from altered gait.
- Screen for coexisting peripheral arterial disease before assuming the presentation is purely neuropathic.
- Home care: daily foot inspection using a mirror, and properly fitted footwear.

Rattray, F., & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions*. Talus Inc. ISBN 978-0-9698177-1-0 — condition entry: *Diabetes Mellitus*.

ASSESSMENT

Recognising the Undiagnosed Presentation

Some of the conditions in this lecture will walk into a clinic before they have been diagnosed. The RMT's job is recognition and referral, never diagnosis.

Patterns that warrant prompt referral

- Progressive weakness that is getting worse over weeks, particularly with visible wasting or fasciculation.
- Mixed upper and lower motor neuron signs in the same client — brisk reflexes in one region, absent in another.
- New tremor that is unilateral, or accompanied by rigidity, slowness or balance change.
- Optic symptoms — painful vision loss in one eye, or double vision — in a young adult.
- Sensory symptoms that come and go over weeks in different parts of the body.
- New cognitive or personality change reported by the client's family.
- A painful unilateral rash confined to a single dermatome.

How to refer

- Describe what you observed and what the client reported, in objective terms.
- Do not name a suspected condition to the client. Naming Parkinson's or ALS to someone who has not been assessed causes serious harm and is outside the scope.
- Say that you have found something you cannot account for and that it needs medical assessment, and be specific about the urgency.
- Obtain consent before communicating with another provider, and document it.
- Record the finding, the advice, the date and the client's response.
- Follow up at the next visit to confirm they attended.

Regulated Health Professions Act, 1991 — <https://www.ontario.ca/laws/statute/91r18>

DEMYELINATING

Multiple Sclerosis — Diagnosis, Medication and Course

Diagnosis

- Made medically, on the basis of lesions disseminated in space and in time.
- MRI demonstrates plaques; cerebrospinal fluid analysis may show oligoclonal bands; evoked potentials assess conduction delay.
- Other causes must be excluded, which is why diagnosis often takes time and why clients may present to massage therapy while still undiagnosed.
- A relapse is defined as new or worsening symptoms lasting at least twenty-four hours in the absence of fever or infection.
- A pseudo-relapse is a temporary worsening caused by heat, infection or fatigue, without new lesion activity — the distinction is medical, but the treatment modification is the same: treat conservatively.

Medication and what it changes

- Disease-modifying therapies aim to reduce relapse rate and lesion accumulation. Many are immunosuppressive, which raises infection risk and makes rigorous infection control especially important.
- Corticosteroids are used for acute relapses; long-term or repeated use brings tissue fragility, bruising and reduced bone density.



- Antispasmodics such as baclofen reduce tone and reduce protective feedback — avoid end-range passive movement.
- Neuropathic pain agents cause drowsiness and blunt pain feedback.
- Some clients have an implanted intrathecal baclofen pump; avoid direct pressure over the pump and its tubing.
- Fatigue medication and bladder medication are also common; ask about all of it.

MOVEMENT DISORDERS

Parkinsonism and the Atypical Syndromes

Why the distinction matters

- Parkinsonism describes the syndrome of bradykinesia with rigidity or tremor. Parkinson's disease is the most common cause, but not the only one.
- Drug-induced parkinsonism, most often from antipsychotic and antiemetic medication, is common, usually symmetrical, and may be reversible on withdrawal of the drug.
- Vascular parkinsonism follows small vessel disease and often affects the lower body predominantly.
- Multiple system atrophy adds prominent early autonomic failure — marked orthostatic hypotension and bladder dysfunction.
- Progressive supranuclear palsy adds early falls, usually backward, and impaired vertical gaze.
- Lewy body dementia adds early cognitive fluctuation and visual hallucinations.

What it changes for the RMT

- The atypical syndromes generally progress faster and respond less well to levodopa, so scheduling around an "on" period may not be possible.
- Multiple system atrophy carries a much higher risk of syncope on sitting or standing; change positions in stages and stay within reach.
- Progressive supranuclear palsy carries a very high fall risk, and the falls are backward — position yourself accordingly during transfers.
- In drug-induced parkinsonism, ask about recent medication changes and communicate the observation to the prescriber with consent.
- In every case, treat what you find: rigidity, postural strain, fall-related injury and reduced range.

COMMUNICATION

Talking With a Client Who Has Dementia

Technique

- Approach from the front and within their field of vision. Say your name and why you are there, at every visit.
- One idea per sentence, in short sentences, using ordinary words.
- Allow substantially more time for a response than feels comfortable, and do not fill the silence.
- Ask yes-or-no questions rather than open ones when comprehension is limited.
- Use gesture and demonstration alongside speech.
- Announce each step before you do it — "I am going to work on your shoulder now" — every time.
- Speak at a normal volume unless there is a hearing impairment; dementia is not deafness.

What to avoid

- Do not argue with, correct, or test a mistaken belief. Redirect gently to something concrete and present.
- Do not ask questions that test memory, such as whether they remember you. It causes distress and gains nothing.
- Do not speak about the client to the caregiver as though the client were absent.
- Do not use a raised, sing-song or infantilising voice; it is degrading and it does not aid comprehension.
- Do not rush, and do not show impatience — agitation is frequently a response to the manner of the person in the room.



- Pain may be expressed as agitation, restlessness or resistance rather than reported. Read the behaviour.

CMTO Standard of Practice: Client-Centred Care — <https://www.cmta.com/rules/standard-of-practice-client-centred-care/>

INFECTION

Herpes Zoster — Course and Distribution

Typical course

- Prodromal phase: burning, itching, tingling or deep aching in the affected dermatome, often for two to four days before any rash appears.
- Eruptive phase: a band of erythema followed by grouped fluid-filled vesicles within the dermatome.
- Vesicles become pustular, then crust over across seven to ten days.
- Healing generally completes within two to four weeks, sometimes with scarring and pigment change.
- Systemic features — fever, headache, malaise — may accompany the eruption.

Distribution and the diagnostic trap

- Thoracic dermatomes are the most commonly affected, followed by the trigeminal distribution.
- The rash respects the midline absolutely and involves one dermatome, occasionally two adjacent ones.
- The prodromal phase is the trap: unilateral band-like chest, flank or back pain with no visible cause is easily mistaken for an intercostal strain or a rib dysfunction, and clients present to massage therapy in exactly this window.
- Deep unilateral segmental pain with burning or itching quality, and no mechanical provocation, warrants medical assessment before treatment.
- Antiviral treatment is most effective when begun within the first seventy-two hours, so recognising the prodrome has real value for the client.
- Vaccination substantially reduces the incidence of shingles and of post-herpetic neuralgia in older adults.

APPLICATION

Case — Multiple Sclerosis in Remission

Presentation

- A client in their thirties with relapsing-remitting multiple sclerosis diagnosed four years ago, currently in remission and on a disease-modifying therapy.
- Chief complaint is neck and shoulder pain from desk work, with fatigue by mid-afternoon.
- Reports that a hot bath makes their legs feel weak for an hour afterwards.
- Assessment: mildly increased tone in both lower limbs, brisk knee reflexes, reduced light touch over both feet, no new symptoms in six months.

Reasoning and plan

- Safe to treat: yes, medically stable and in remission.
- The reported bath effect is Uhthoff's phenomenon, not a relapse — but it confirms heat sensitivity and sets the environmental requirement.
- Cool room, no hot packs, no heavy blankets, no heating modalities at any point.
- Treat the chief complaint directly: cervical and shoulder girdle work is the most changeable finding and the client's priority.
- Lower limb work is secondary — slow sustained technique for tone-related discomfort.
- Reduced foot sensation: therapist sets pressure and inspects skin.
- Immunosuppression: rigorous infection control, and reschedule if you are unwell.
- Schedule in the morning, before the mid-afternoon fatigue. Review at six sessions.



APPLICATION

Case — Parkinson's Disease With a Caregiver Present

Presentation

- A client in their seventies with Parkinson's diagnosed six years ago, attending with their spouse who provides most of the daily care.
- Marked forward head and flexed trunk posture; shuffling gait; a resting tremor in the right hand.
- Reports low back and neck pain, and two falls in the past three months.
- Takes levodopa four times daily and reports being "best" about an hour after a dose.
- The spouse reports their own worsening low back and shoulder pain from assisting with transfers.

Reasoning and plan

- Schedule appointments to fall within the reliable "on" period the client has identified.
- Fall risk is high and confirmed by history: assist all transfers, never leave the client on the table alone, allow ample time.
- Orthostatic hypotension from both disease and medication: sit for a full minute before standing, and stay within reach.
- Treat the anterior chest, hip flexors and cervical flexors that shorten with the flexed posture, and the extensors that are overworking against it.
- Maintain trunk rotation, shoulder and hip extension range.
- Slow rhythmic technique and gentle oscillation; avoid rapid passive movement.
- Ask questions one at a time, address the client directly, and allow time for the reply despite the quiet voice.
- Offer the spouse assessment as a client in their own right — caregiver strain is a real and treatable presentation, and supporting the caregiver supports the client.

DOCUMENTATION

Recording and Reviewing the Plan in Progressive Disease

What to record

- The stage and current status as reported, including any relapse, medication change or new symptom since the last visit.
- Objective findings using standard scales, so that change over months is visible in the record.
- The functional baseline: what the client can currently do, in their own terms.
- Which precautions applied and which modifications you made because of them.
- Consent obtained at this visit, and from whom, where capacity is affected.
- Any communication with another provider and the consent that permitted it.

Reviewing the plan

- Progressive disease requires more frequent formal review than a static condition, because the baseline moves.
- Review at least every six to eight sessions, and immediately after any relapse, fall, hospitalisation or medication change.
- Maintenance of the current baseline is a successful outcome and should be written as such — do not record decline as treatment failure where the disease is progressing.
- Where the client's needs have moved beyond your scope, refer and document the reasoning.
- Where treatment is no longer producing benefit, say so honestly and discontinue or change the plan.
- Records must meet the CMTO Record Keeping standard throughout.

CMTO Standard of Practice: Record Keeping — <https://www.cmta.com/rules/standard-of-practice-record-keeping/>



REFERENCE

Contraindication Summary

Absolute contraindications

- Acute encephalitis — medical emergency; refer immediately.
- Acute meningitis — medical emergency; may be transmissible; refer immediately.
- Acute poliomyelitis — acute transmissible infection.
- Guillain-Barré syndrome in the acute or progressive phase — medical emergency.
- Any acute infection with fever or systemic illness.
- Active herpes zoster where the client is systemically unwell, lesions cannot be covered, or facial and eye involvement is present.

Local and relative

- Herpes zoster — local contraindication over and around the affected dermatome until all lesions have crusted.
- ALS — supportive and palliative; adapt to stage, fatigue and respiratory status.
- Multiple sclerosis — treat conservatively during a relapse; heat is contraindicated at all times.
- Parkinson's and Huntington's — adapt to fall risk, positioning difficulty and cognitive change.
- Alzheimer's and other dementias — indicated with adaptation; consent and communication are the key modifications.
- Post-polio syndrome — indicated with strict energy conservation.
- Peripheral neuropathy — indicated with pressure, thermal and skin precautions.
- Post-recovery treatment after any acute infection requires physician clearance.

TREATMENT PLANNING

The Decision Path for Progressive Disease

- One — Is there an acute component today? Fever, systemic illness, a relapse, rapidly progressive weakness. If yes, do not treat; refer.
- Two — What is the motor pattern? Upper motor neuron, lower motor neuron, both, or a basal nuclei movement disorder. This predicts tone, reflexes and what handling the client will tolerate.
- Three — What is the sensory status? Where sensation is impaired, the therapist takes over pressure and temperature judgment and inspects the skin.
- Four — What is the fatigue and energy picture? This determines session length far more than the pathology does.
- Five — What are the safety issues? Falls, transfers, positioning, airway, swallowing, seizure risk, autonomic instability.
- Six — What is realistically achievable, and have I said so honestly? Comfort, range, circulation, compensatory strain, caregiver support.
- Seven — Who else is involved, and what am I coordinating with them?

COLLABORATION

Working Within the Circle of Care

Who else is usually involved

- Family physician and neurologist.
- Physiotherapy for mobility, strength and gait; occupational therapy for function, equipment and home adaptation.
- Speech-language pathology where there is dysarthria or dysphagia.
- Nursing and personal support workers, particularly where mobility is limited.
- Family caregivers, who often carry the largest share of the work.



The RMT's part

- Refer, with the client's consent, to the professional whose expertise best addresses the need.
- Communicate findings objectively; never state or imply a diagnosis.
- Ask about and respect the plans set by others — do not contradict a physiotherapy programme without discussion.
- Recognise caregiver strain: caregivers frequently develop their own musculoskeletal problems and are legitimate clients in their own right.
- Document all communication and the consent that permitted it.

CMTO Standard of Practice: Collaboration and Professional Relationships — <https://www.cmta.com/rules/standard-of-practice-collaboration-and-professional-relationships/>

SUMMARY

Key Takeaways

- For progressive disease, massage therapy is supportive and palliative. It will not alter the disease course, and the plan must say so honestly.
- ALS uniquely produces upper and lower motor neuron signs together, with sensation and cognition preserved — the client feels and knows everything.
- Multiple sclerosis is a central demyelinating disease with heat sensitivity as the single most important treatment modification; keep the room cool and avoid all heating modalities.
- Parkinson's disease is a basal nuclei disorder producing resting tremor, rigidity, bradykinesia and postural instability; plan around the medication cycle and the fall risk.
- Alzheimer's disease is managed through consent at every visit, predictable routine, and non-verbal observation of discomfort.
- Acute infection of the nervous system is an absolute contraindication; encephalitis and meningitis are emergencies, and herpes zoster is transmissible until all lesions crust.
- Post-polio syndrome and Guillain-Barré recovery are both governed by energy conservation — overwork causes loss, not gain.
- In peripheral neuropathy the client cannot feel injury, so the therapist owns pressure, temperature and skin inspection.

CONSOLIDATION

Review Questions and References

Review questions

- Which condition in this lecture produces both upper and lower motor neuron signs, and why does that matter on assessment?
- Explain Uhthoff's phenomenon and the treatment modifications that follow from it.
- Contrast the tremor of Parkinson's disease with cerebellar intention tremor.
- For which conditions is massage an absolute contraindication, and what is your first action in each case?
- Why is herpes zoster confined to a single dermatome on one side of the body?
- Explain why energy conservation is central to treating post-polio syndrome.
- How would you adapt consent and communication for a client with Alzheimer's disease?
- State the seven steps of the decision path for planning treatment in progressive disease.

References

- Rattray, F., & Ludwig, L. (2000). Clinical Massage Therapy. Talus Inc. — Multiple Sclerosis, Parkinson's Disease and Torticollis entries.
- Werner, R. A Massage Therapist's Guide to Pathology (7th ed.). Books of Discovery.
- Salvo, S. G. Mosby's Pathology for Massage Professionals (5th ed.). Elsevier.



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- Tortora, G. J., & Derrickson, B. Principles of Anatomy and Physiology (16th ed.). Wiley.
- CMTO Standard of Practice: Infection Prevention and Control — <https://www.cmto.com/rules/standard-of-practice-infection-prevention-and-control/>
- CMTO Standards and Rules — <https://www.cmto.com/rmts/standards-and-rules/>