RUHANI COLLEGE
OF HEALTH BUSINESS AND TECHNOLOGY

Lecture 16 — Degenerative Disc Disease

Student Handout · RU RMT 20 Pathological Treatments · Ruhani College · Registered Massage Therapy Diploma Program

How to use this handout: it follows the lecture in the order it is delivered, so you can annotate it as we go rather than copying slides. Everything examinable in this lecture is here. Work through the review questions at the end without looking back, then check them against the answers.

Learning outcomes

Notes:

Define DDD — Explain why it is better described as a condition than a disease.

Describe the pathology — The disc, the aging changes, and the three stages.

Recognise symptoms — And identify which ones massage therapy can address.

Assess safely — Within scope and as part of the health-care team.

Treat & advise — Apply a stage-appropriate protocol and self-care homework.

Work within limits — Apply the key contraindications and cautions for DDD.

An Overview — More than "wear and tear"

Degenerative disc disease (DDD) is the gradual breakdown of the intervertebral discs that cushion the spine. Because it results from normal aging, it is more accurately called a condition than a disease.

Condition, not disease

Often silent

A normal part of aging.

Many have it without pain.

It is frequently painless. When it does produce symptoms, low-back pain is the usual result — and that is where massage therapy can help.

Leads to low-back pain

Our role

The top cause of disability.

Relieve pain, spasm & stress.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Understanding DDD

DDD is a common, often silent consequence of aging — and a leading contributor to low-back pain and disability.

Notes:

General Information — Common causes & who is affected

Normal aging

Prolonged sitting

Spinal trauma

The primary driver of disc degeneration.

Sustained loading of the lumbar spine.

Accelerates degeneration at any age.

Genetic predisposition

Athletes & non-athletes

3rd–5th decades

A family history raises the risk.

Occurs with roughly equal frequency.

Onset in mid-life, with higher prevalence in women.

Notes:

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Contributing Factors — Lifestyle factors that accelerate DDD

Repetitive heavy lifting

Abdominal obesity

Especially when combined with twisting.

Adds an anterior load that strains the spine.

Smoking

Poor nutrition

Impairs blood supply and disc nutrition.

Slows the tissue's ability to repair itself.

Notes:

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Morbidity & Mortality — A common, often silent condition

25%

60%

60–90%

of 40-year-olds show DDD on MRI — with no symptoms

of those over 40 have asymptomatic DDD

of adults experience low-back pain each year

Because DDD is usually painless, its true prevalence cannot be measured directly. But low-back pain — its main manifestation — is the leading cause of disability in adults over 45.

Notes:

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Prognosis — Outcome depends on the stage at diagnosis

Saddle anesthesia

Intractable pain

Notes:

Early treatment — Pain often subsides within 1–4 weeks of conservative care.

Untreated — Degenerating discs can injure the spinal cord or nerve roots.

Spinal stenosis — Canal narrowing that produces muscle weakness.

Self-repair limited — The most serious outcome; may require surgery.

Perineal numbness — a surgical emergency. — The disc's capacity to heal itself is uncertain.

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

The Burden of Low-Back Pain — Why DDD deserves your attention

Low-back pain is the single leading cause of disability in adults over 45, and DDD is one of its major contributors.

Widespread

1 disability

60–90% of adults yearly.

In adults over 45.

Because conservative care is first-line, massage therapy has a genuine role: safe, drug-free relief of the muscular pain, spasm and stress that surround the condition.

DDD contributes

MT helps

A key underlying cause.

Conservative symptom relief.

Notes:

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Pathophysiology

To understand DDD, first understand the healthy disc — then how aging, load, and time change its structure and function.

Notes:

Structure & Function — The healthy intervertebral disc

Notes:

Nucleus pulposus — Gel-like centre, roughly 85% water; the disc's shock absorber.

Annulus fibrosus — Tough concentric outer rings that contain the nucleus.

Disc height — About 0.25 inch — it allows flexion, extension and rotation.

Spine stabilisers — Ligaments, erectors, abdominals and hip muscles.

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

A Key Relationship — The abdomen and the spine

The relationship between the abdomen and the spine helps explain DDD. Picture a woman in late pregnancy holding her low back as she sits.

Weak abdominals

Tight hip flexors

Less anterior support.

Pull the spine forward.

Weak, stretched abdominal muscles — from pregnancy or obesity — together with tight hip flexors create anterior pull and spinal instability, accelerating the normal aging of the discs.

Anterior load

Instability

Strain on the discs.

Pain and faster aging.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

What Happens With Age — How discs change after the second decade

Nucleus dries out

Annulus stiffens

The water-rich centre loses much of its fluid.

From spongy to tough, dry rubber.

Disc height drops

Healing slows

Contributing to loss of height with age.

Less blood, water and nutrient flow to the disc.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

The Three Stages · 1 of 3 — Stage 1 — Instability

The usually tight-fitting discs begin to slide and bump against nerve roots, and the patient may feel pain and discomfort.

Treatable here. If addressed at this stage, the condition can stabilise.

Pain controllable. Symptoms can be managed therapeutically.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

The Three Stages · 2 of 3 — Stage 2 — Osteophyte formation

Constant, abnormal wear on the spinal joints triggers osteophytes — tiny new bone growths, or spurs.

Nerves compressed. Spurs encroach on nearby nerves and cause stiffness.

Usually permanent. Damage from accumulated osteophytes does not reverse.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

The Three Stages · 3 of 3 — Stage 3 — Stabilization

Bony spurs reduce spinal range of motion, stenosis may develop, and bone may grind on bone.

Voluntary splinting. Guarding creates secondary pain in nearby tissues.

Whole-trunk compensation. The body adapts around an irreversible, painful condition.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Differential Considerations — Conditions that mimic DDD

Spinal osteoarthritis

Herniated disc

Ligament sprain

Degeneration of the facet joints.

Disc material pressing on a nerve.

Overstretched spinal ligaments.

Spinal stenosis

Spinal tumour

Medical diagnosis

Narrowing of the spinal canal.

The most serious mimic — must be excluded.

Essential to confirm DDD and rule these out.

Notes:

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Confirming the Diagnosis — How DDD is diagnosed

Physical examination

Provocative movements

X-ray

A hands-on assessment by the physician.

Motions that reproduce the patient's pain.

Reveals disc-space narrowing and spurs.

CT scan

MRI

Notes:

Use the report — Shows disc hydration and soft-tissue detail.

Detailed view of bony changes. — Always work from the written imaging report.

Source: Ruhani College Lecture 16; Magee (2014)

The Clinical Picture

What the patient feels, which symptoms fall within our scope, and the pain–spasm–pain cycle we aim to interrupt.

Notes:

Overall Signs & Symptoms — What the patient experiences

Muscle weakness

Decreased ROM

Stiffness

In the area supplied by the impinged nerve.

Reduced range of motion in the spine.

Especially with immobility and after rest.

Notes:

Intermittent pain — Worse with prolonged sitting, twisting or lifting.

Episodic flare-ups — Acute episodes alternating with moderate discomfort.

Radiating pain — Pins-and-needles following a dermatome pattern.

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Within Our Scope — Signs & symptoms massage therapy can address

Notes:

Hypertonic erectors — Relieving the pain–spasm–pain cycle in the stabilising muscles.

Decreased ROM — Easing the secondary tightness of prolonged immobility.

Secondary muscle pain — Treating the compensating soft tissue around the spine.

Chronic-pain stress — Lowering the stress of living with persistent pain.

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

A Cycle We Can Interrupt — The pain–spasm–pain cycle

Pain

Notes:

Muscle spasm — Pain provokes protective guarding and spasm.

Reduced circulation — Spasm limits blood flow — feeding more pain.

Disc and joint irritation generate pain. — Massage therapy breaks this cycle at the muscular level — reducing spasm, restoring circulation, and lowering pain.

Source: Rattray & Ludwig (2000)

Medical Management

Care ranges from conservative self-management to surgery. Medications relieve symptoms but cannot stop disc degeneration.

Notes:

Treatment Options · Conservative — First-line, conservative care

Low-impact exercise

Traction

Brief rest only

Biking, swimming and walking; gentle stretching.

Effective when used judiciously.

A day or two — immobility worsens DDD.

Notes:

Lifestyle change — Weight loss, quitting smoking, better ergonomics.

Heat & cold — Heat for aching; cold for an acute flare-up.

Physical therapy — Core strengthening and safer lifting mechanics.

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Treatment Options · Advanced — When conservative care is not enough

Chiropractic

TENS

Epidural injections

Spinal adjustments for some relief.

Electrical nerve stimulation by a PT.

Anti-inflammatory steroids.

Spinal fusion

Disc replacement

A last resort

Surgically joins affected segments.

Replaces the damaged disc.

Only after 4–6 months of failed therapy.

Notes:

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Common Medications — Managing symptoms pharmacologically

NSAIDs

Corticosteroids

Acetaminophen

e.g. ibuprofen (Motrin, Advil).

e.g. prednisone (Deltasone).

e.g. Tylenol — pain & fever relief.

Muscle relaxants

Opioids

COX-2 inhibitors

e.g. cyclobenzaprine (Flexeril).

e.g. oxycodone (OxyContin) for severe pain.

e.g. celecoxib (Celebrex).

No medication stops disc degeneration — and pain-masking drugs mean you must moderate pressure and trust the patient's response.

Notes:

Source: Ruhani College Lecture 16; Werner (2019)

Massage Therapy Treatment

As an informed member of the care team, the therapist relieves muscular pain, spasm and stress — never the disc itself.

Notes:

Massage Therapist Assessment — Working as part of the care team

Reassess each visit

Assess to treat — never to diagnose DDD.

Notes:

Team member — Treat DDD only alongside the PT or orthopedic surgeon.

Request the report — Ask for the written X-ray, CT or MRI findings.

Know the risks — A simple leg or hip stretch can do real harm.
Screen red flags — Plan treatment for that day's presentation.
Stay in scope — Watch for signs that require prompt referral.
Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Assessment Techniques — Assessing for that day's treatment

Palpate paraspinals

Find trigger points

Locate spasm along the spinal muscles.

Often in the gluteals and hamstrings (lumbago).

Notes:

Ask about comfort — Is a comfortable sitting or lying position hard to find?
Palpate hip muscles — Hamstrings, glutes, rectus femoris & iliopsoas for hypertonicity.
Source: Rattray & Ludwig (2000); Lowe (2009)

Therapeutic Goals — What we aim to achieve

Relieve pain

Reduce spasm

Improve ROM

Provide symptomatic relief of low-back pain.

Break the chronic pain–spasm–pain cycle.

Ease tightness and restore mobility.

Notes:

Decrease stress — Lower the burden of living with chronic pain.
Deep breathing — Bring the patient into a parasympathetic state.
Protect the lungs — Maintain breathing to help prevent pneumonia.
Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Session Frequency — A general treatment schedule

2× / wk

60-minute maintenance sessions thereafter

A general guide only — always adapt to the individual patient and the physician's plan of care.

Notes:

1× / wk — 60-minute sessions for 1 month during active pain & stiffness
Monthly — 60-minute sessions until pain subsides and ROM improves
Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Massage Protocol — Muscles & techniques

Knead and petrissage some of the largest, strongest muscles of the body, focusing on the exact points of lumbar hypertonicity, spasm and radiating pain.

Gluteal complex

Hamstrings

Rectus femoris & IT band

A primary focus of the lumbar work.

Commonly tight and tender in lumbago.

Address anterior and lateral thigh tension.

Iliopsoas

Quadratus lumborum

Erector spinae

Release with care; learn safe technique.

Reach deep with forearms or elbows.

Work the full set of spinal extensors.

Notes:

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Getting Started — Positioning & hydrotherapy

Cold packs

Leave stretches out

Quiet a flare-up or an acute muscle spasm.

Leg and spine stretches are for the PT or surgeon.

Notes:

Comfortable positioning — Have plenty of pillows; the patient may not tolerate lying flat.

Hot packs — Soften hypertonic tissue before deeper work.

Source: Rattray & Ludwig (2000); Ruhani College Lecture 16

Aftercare & Safety

Self-care extends the benefit of every session — and clear contraindications keep your patient safe between visits.

Notes:

Homework · 1 of 2 — Breathing & staying mobile

Notes:

Breathe deeply — Several deep breaths through the day help prevent pneumonia.

Don't hold your breath — Pain makes shallow breathing a habit — break it.

Keep moving — Take the stairs, park farther, walk nearby errands.

Avoid immobility — Stillness only worsens DDD — create reasons to move.

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Homework · 2 of 2 — Self-care & posture

Moist heat

Ice for flare-ups

Apply for deep, aching low-back pain.

Use when pain is sharp or particularly bad.

Notes:

Sit upright — Avoid slumping; support the spine when seated.

Explain the why — Pair every instruction with its reason and encouragement.

Source: Ruhani College Lecture 16; Rattray & Ludwig (2000)

Contraindications & Cautions — Working safely with DDD

Notes:

No comfortable position — Inability to lie still signals prompt physician referral.

No ROM without status — Avoid hip/spinal stretches without known disc involvement.

No heat in a flare-up — Heat can worsen an active inflammatory process.

No traction or MFR — Avoid spinal traction or myofascial release if disc status is unknown.

Account for medication — Narcotics and relaxants mask pain — moderate your depth.

Trust the response — Let the patient's feedback guide pressure at every visit.

Source: Werner (2019); Rattray & Ludwig (2000)

References and further reading

– Rattray, F., & Ludwig, L. (2000). Clinical Massage Therapy: Understanding, Assessing and Treating Over 70 Conditions. Toronto: Talus Inc.
– Werner, R. (2019). A Massage Therapist's Guide to Pathology (7th ed.). Books of Discovery.
– Magee, D. J. (2014). Orthopedic Physical Assessment (6th ed.). St. Louis: Saunders / Elsevier.
– Lowe, W. (2009). Orthopedic Assessment in Massage Therapy. Sisters, OR: Daviau-Scott.
– Notes:

Key takeaways — Relieve the pain, respect the disc

DDD is a normal part of aging that we cannot reverse. Within scope, and alongside the medical team, we relieve the muscular pain, spasm and stress that accompany it — safely and conservatively.

Ruhani College · RU-RMT 20 Pathological Treatments · Lecture 16

Notes:

Review questions

Answer these from memory before checking the answers below.

1. What structures make up an intervertebral disc, and what does each contribute?
2. Describe the degenerative cascade in degenerative disc disease.
3. What is the typical symptom pattern of lumbar degenerative disc disease?
4. What findings would prompt referral rather than treatment?
5. What are realistic treatment goals for a client with degenerative disc disease?

Answers

1. The nucleus pulposus is the gelatinous centre that distributes load hydraulically; the annulus fibrosus is the concentric fibrous ring that contains it and resists torsion; and the cartilaginous end plates transmit load and nutrition between disc and vertebral body.

2. The disc loses water content and height, the annulus develops fissures and bears more load, the segment becomes less stable and load transfers to the facet joints, which then develop degenerative change themselves. Osteophyte formation and reduced foraminal height can follow.

3. Stiffness and aching that is worst first thing in the morning and after sustained postures such as long driving or sitting, often easing with movement, with pain aggravated by loading positions such as flexion and by prolonged standing.

4. Progressive neurological deficit, saddle anaesthesia, bladder or bowel change, bilateral leg symptoms, unexplained weight loss, night pain unrelieved by position, or any suggestion of cauda equina compression.

5. The degeneration itself is not reversible. Realistic goals are reducing the muscular guarding and hypertonicity that accompanies it, improving segmental and hip mobility, easing pain, and supporting the client with posture, movement and activity-pacing education.