



NORTH AMERICAN
INSTITUTE OF
MEDICAL AESTHETICS

3D MEDICAL TECHNOLOGIES | NAIMA EDUCATION

OmniSpec Clinical Training

Medispec Multi-Wave® Shockwave Platform

Theory first, followed by hands-on training

Medispec: 30+ Years of Shockwave Technology

1992

Established

30+

Years of medical shockwave technology

1

Multi-application platform: OmniSpec

HOW THE TECHNOLOGY EVOLVED

1

Urology & lithotripsy

Externally generated shockwaves
for urinary stones

2

Sexual health

Expansion beyond lithotripsy

3

Orthopedics, vascular & regenerative

Musculoskeletal and
regenerative applications

4

OmniSpec

One platform across multiple
applications

Our Role in Canada

3D Medical Technologies

Canadian distributor for Medispec. Technology, clinical education, training and ongoing support.

NAIMA Education

Clinical education and training for OmniSpec clinicians.

OUR RESPONSIBILITY: EVERY CLINICIAN UNDERSTANDS

1 The technology

2 The anatomy

3 Biological mechanisms

4 Patient selection

5 Contraindications

6 Treatment protocols

7 Safe, appropriate use

8 Ongoing support

Understand What Is Underneath the Applicator

Don't memorize applicator placement and shock counts. Ask yourself:

- 1 What anatomy am I treating?
- 2 What tissue am I targeting?
- 3 What biological response am I trying to create?
- 4 Why am I positioning the applicator here?
- 5 Why does this protocol require this treatment pattern?

Understand these, and the protocols become logical rather than memorized.



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01

Shockwave Fundamentals

Lithotripsy | Extracorporeal shockwaves | Electrohydraulic ESWT | Multi-Wave®

From Lithotripsy to Therapeutic Shockwave

1950s-70s

Experimental electrohydraulic shockwave research

Feb 7, 1980

First human ESWL kidney-stone treatment, Munich (Dornier HM1)

After ESWL

Research into how shockwaves interact with living tissue

Today

Therapeutic ESWT: OmniSpec Multi-Wave®

Lithotripsy



Electrohydraulic
shockwave



Therapeutic
ESWT



Mechano-
transduction



Biological
response



OmniSpec Multi-
Wave®

Historical clarification: Medispec did not invent lithotripsy. That milestone belongs to Dornier and the University of Munich. Medispec came later and developed its own shockwave systems and Multi-Wave® technology.

Same Energy, Different Objective

ESWL

Extracorporeal Shock Wave Lithotripsy

- Used for urinary stones
- Medispec systems: E3000 and EM1000
- Electrohydraulic and electromagnetic systems
- Shockwaves directed at the stone

ESWT

Extracorporeal Shock Wave Therapy

- OmniSpec: multi-purpose therapeutic platform
- Sexual health, urology, vascular, orthopedic / MSK
- Controlled response in living tissue
- Appropriately dosed acoustic shockwaves

ESWL



Stone fragmentation

ESWT



Mechano-
transduction



Biological
response

Four Words, Four Questions

WHAT

Shockwave

The acoustic / mechanical pressure wave: the energy itself.

HOW

Electrohydraulic

How OmniSpec generates the shockwave.

WHERE

Extracorporeal

Generated outside the body, transmitted through the skin into targeted tissue.

FOR

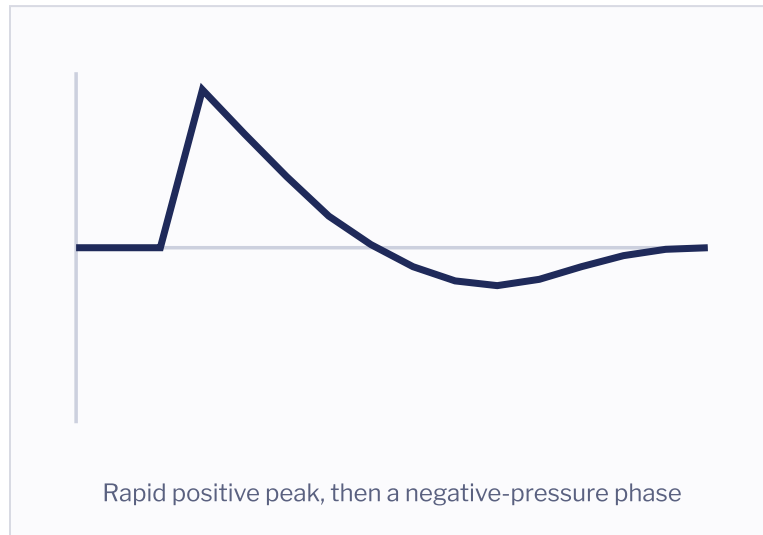
Lithotripsy

One application: using the shockwave to fragment urinary stones.

OmniSpec uses electrohydraulic extracorporeal shockwave therapy (ESWT): the same energy, used therapeutically to stimulate a biological response.

Shockwave: What the Energy Is

- An acoustic / mechanical pressure wave
- Travels through a medium such as water or body tissue
- Very rapid rise in pressure, followed by a negative-pressure phase
- Produces mechanical stress and physical effects, including cavitation
- In therapy, these forces can initiate mechanotransduction and downstream biological responses



Electrohydraulic: How the Shockwave Is Generated

1

Electrical discharge

Between electrodes in a fluid-filled chamber

2

Pressure wave

Rapidly expanding from the discharge

3

Reflector

Directs the acoustic shockwave

4

Treatment field

Energy delivered to targeted tissue

EXTRACORPOREAL: WHERE IT IS GENERATED

The applicator couples the acoustic energy through the skin into targeted tissue. Nothing is inserted into tissue to generate the shockwave.

Multi-Wave®: Directing the Energy

START WITH A SINGLE REFLECTION

- 1 Shockwave generated
- 2 Wave reaches the reflector
- 3 Reflector redirects the acoustic energy
- 4 Energy travels into the treatment field

Now add the “Multi”

- Multiple points of reflection instead of one focal point
- A stream of shockwaves distributed across a comparatively deep and large therapeutic zone

Electrohydraulic: how the wave is generated. Multi-Wave®: how it is directed and distributed.

Putting the Terms Together



OmniSpec generates an acoustic shockwave electrohydraulically, outside the body, and delivers that energy into targeted tissue for a therapeutic biological effect.



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02

When the Shockwave Reaches Tissue

Mechanical stimulus > biological signal

The Teaching Sequence

1

Multi-Wave® acoustic shockwave

2

Mechanical stress + cavitation

3

Mechano-transduction

4

Cellular / biological signalling

5

Vasodilation
Short-term vascular response

6

Angiogenesis /
neovascularization
Longer-term vascular response

7

Improved blood flow / perfusion

8

Tissue regeneration and repair

The bridge: cells sense mechanical force and convert it into biochemical signals.

Define the Key Terms

Mechanical stress

The physical forces placed on tissue and cells by the acoustic wave.

Cavitation

Microscopic gas bubbles form, oscillate and collapse in fluid in response to shockwave pressure changes.

Mechanotransduction

Cells convert the mechanical stimulus into biochemical / cellular signalling.

Vasodilation

Existing blood vessels widen, producing a more immediate increase in blood flow.

Angiogenesis

New blood vessels develop from existing blood vessels.

Neovascularization

The broader development of new vascularization within tissue.

Two Names to Know: VEGF and eNOS

VEGF

Vascular Endothelial Growth Factor

- Signalling protein involved in angiogenesis
- Promotes endothelial-cell responses involved in developing new vasculature

eNOS

Endothelial Nitric Oxide Synthase

- Enzyme associated with nitric oxide (NO) production by vascular endothelial cells
- NO contributes to smooth-muscle relaxation and vasodilation

The takeaway: a mechanical acoustic stimulus, applied to initiate cellular signalling and subsequent vascular and tissue responses.



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03

OmniSpec ED1000: Men's Sexual Health

Erection > ED > PDE5 > ED1000 mechanism > anatomy > applicator

An Erection Is a Neurovascular Event

Step 1: Sexual stimulation

Activates neural pathways and initiates nitric oxide (NO) release in penile erectile tissue

Step 2: NO and cGMP

NO stimulates cGMP (cyclic guanosine monophosphate), which relaxes smooth muscle in penile arteries and erectile tissue

Step 3: Increased blood flow

Relaxed smooth muscle allows arteries to dilate and blood to fill the erectile tissue

THREE SYSTEMS MUST WORK TOGETHER

Neurological signalling

Vascular function

Smooth-muscle relaxation

From Nitric Oxide to Rigidity

1 Nitric oxide (NO)

2 cGMP increases

3 Smooth-muscle relaxation

4 Penile arteries dilate

5 Increased arterial inflow

6 Corpora cavernosa expand with blood

7 Subtunical veins compressed against tunica albuginea

8 Venous outflow decreases (veno-occlusion)

9 Blood trapped; pressure increases

10 RIGIDITY / ERECTION

An erection requires BOTH adequate arterial inflow AND the ability to restrict venous outflow.

Key Penile Anatomy

1 Penile shaft

2 Corpora cavernosa

3 Corpus spongiosum

4 Tunica albuginea

5 Penile arteries

6 Penile root

7 Right and left crura

8 Ischiopubic rami

Corpora cavernosa

The principal erectile bodies responsible for rigidity.

As they fill, they press against the noncompliant tunica albuginea, compressing subtunical veins: the veno-occlusive mechanism.

What Is Erectile Dysfunction?

The persistent inability to achieve or maintain an erection sufficient for satisfactory sexual activity.

CONTRIBUTING CAUSES

1 Vasculogenic	2 Psychogenic	3 Neurologic	4 Hormonal / endocrine	5 Medication- related	6 Structural	7 Mixed
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PRIMARY ED1000 FOCUS

Vasculogenic ED

Vascular impairment contributes to inadequate erectile blood flow and/or vascular function.

IMPORTANT

Arousal is not erection

Normal desire and arousal can exist while the downstream erectile response is impaired.

Where Viagra and Cialis Fit

Viagra

sildenafil

Cialis

tadalafil

PDE5

phosphodiesterase type 5: the enzyme that breaks down cGMP

WHAT A PDE5 INHIBITOR DOES



Think of cGMP as helping open the pipe. PDE5 breaks cGMP down. A PDE5 inhibitor slows that breakdown so the pipe stays open longer.

PDE5: The Body's Normal Off-Switch

When stimulation decreases and the erection resolves:

1

PDE5 breaks down cGMP

2

cGMP levels fall

3

Smooth muscle contracts again

4

Arterial inflow decreases

5

Cavernosal pressure falls

6

Subtunical veins no longer
compressed

7

Venous outflow resumes

8

Blood leaves; penis returns
toward flaccid

A PDE5 inhibitor doesn't create the erection. It slows the off-switch.

Important Distinction

PDE5 inhibitors DO NOT

- Directly create sexual arousal
- Simply manufacture nitric oxide

PDE5 inhibitors DO

- Specifically inhibit PDE5-mediated degradation of cGMP
- Generally depend on sexual stimulation and activation of the NO-cGMP pathway

Sexual stimulation



NO



cGMP



PDE5 inhibitor slows
breakdown



Erectile effect

ED1000 / MAMBA: Medispec Terminology

EDSWT

Erectile Dysfunction Shock Wave Therapy

Li-ESWT

Low-Intensity Extracorporeal Shock Wave Therapy

Electrohydraulic

The method used to generate the acoustic shockwave

Multi-Wave®

Medispec's approach to distributing shockwaves across an extended treatment zone

PDE5 inhibitors pharmacologically support the erectile pathway. ED1000 uses Li-ESWT to produce a controlled mechanical stimulus within targeted penile tissue.

ED1000: Connecting the Science

1

Li-ESWT

2

Mechanical stimulus

Mechanical stress + cavitation

3

Mechano-transduction

Stimulus translated into cellular signalling

4

Cellular & vascular signalling

5

eNOS + VEGF pathways

NO-related signalling;
angiogenesis

6

Vasodilation + angiogenic
response

7

Angiogenesis,
neovascularization, vascular
remodelling

8

Potential improvement in penile
tissue perfusion

The objective is a potential improvement in penile tissue perfusion.

More Than Temporary Dilation

SHORT TERM

Vasodilation

Existing vessels widen. A more immediate vascular response.

LONGER TERM

Angiogenesis / neovascularization

Angiogenesis: new vessels from existing vessels.

Neovascularization: the broader process of new vascular development. A longer-term remodelling response.

The proposed mechanism stimulates signalling associated with angiogenesis, neovascularization and vascular remodelling, with the objective of improving penile tissue perfusion.

Medispec describes EDSWT as encouraging neovascularization within the penile shaft and crus.

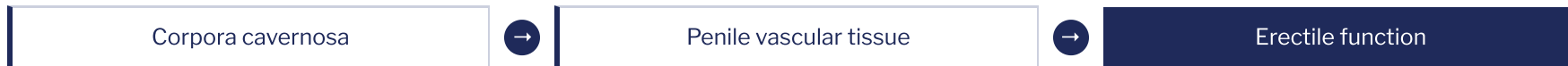
PDE5 Inhibitor vs. ED1000

PDE5 Inhibitor	ED1000 / Li-ESWT
Pharmacologic	Acoustic / mechanical
Inhibits PDE5	Provides controlled mechanical stimulus
Slows cGMP breakdown	Initiates mechanotransduction
Supports smooth-muscle relaxation	Stimulates cellular / vascular signalling
Facilitates erectile response	Proposed angiogenic / neovascular response
Effect depends on drug activity	Objective is vascular / tissue remodelling

Do not teach “medication masks, shockwave cures.” ED has many causes, PDE5 inhibitors are evidence-based, and Li-ESWT response varies with patient selection and disease severity.

Why Each Region Is Treated

Penile shaft



Penile root and crura

The proximal corpora cavernosa continue as the right and left crura, attaching along the ischiopubic rami.



“Find the root. Find the ramus. Identify the course of the crus.” Then follow the Medispec ED1000 protocol for positioning.

Peyronie's Disease and Chronic Pelvic Pain

Peyronie's Disease

- Tunica albuginea
- Fibrotic plaque
- Plaque location and mapping
- Active / acute vs. stable / chronic disease
- Follow the specific Medispec protocol

Chronic Pelvic Pain Syndrome

- Crura treatment regions
- Perineal treatment region
- Relevant pelvic / perineal anatomy
- Objective differs from vasculogenic ED
- Protocol differs from standard ED treatment

Peyronie's: do not teach shockwave as reliably straightening curvature. Keep objectives and evidence separate from correction claims.

From Theory to Anatomy

1

Identify anatomy

2

Palpate landmarks

3

Shaft

4

Penile root

5

Ischiopubic rami

6

Right & left crura

7

Coupling / gel

8

Applicator positioning

9

Medispec protocol

10

Hands-on

“Don't memorize where I put the applicator. Know what is underneath it and why we're treating that location.”



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04

LilyCare: Women's Health

Same technology. Different anatomy and clinical objective.

What Changes, and What Doesn't

UNCHANGED

The underlying shockwave technology

CHANGES

Anatomy, treatment field, therapeutic objective and protocol

KEY ANATOMY

1 Clitoris

2 Clitoral crura

3 Labia

4 Perineal body

5 Pelvic floor region

6 External genital vascular anatomy

BIOLOGICAL CONCEPT

Acoustic shockwave



Mechanical stimulus



Cellular / vascular response



Vascular and tissue effects

Before Touching the Applicator

1 Patient selection

2 Indications

3 Contraindications

4 Informed consent

5 Privacy and draping

6 Positioning

7 Anatomical landmarks

8 Ultrasound gel / coupling

9 Applicator contact

10 Patient comfort

11 Communication throughout treatment

12 LilyCare hands-on demo



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05

OrthoSpec: Musculoskeletal

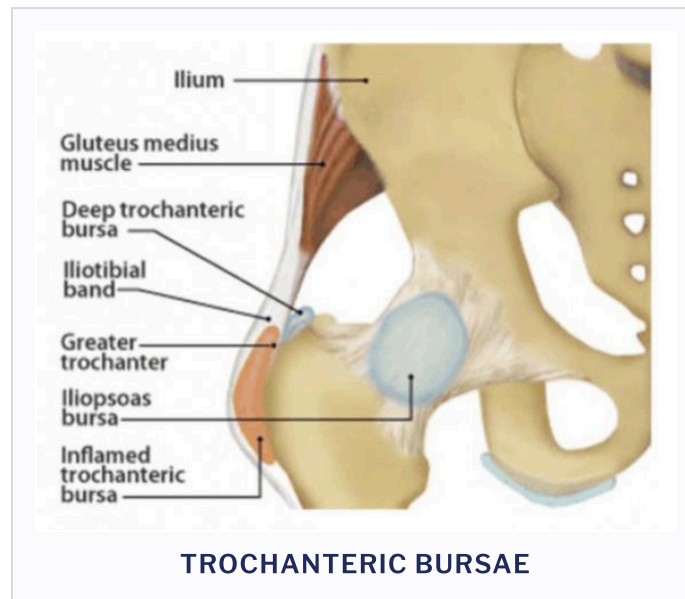
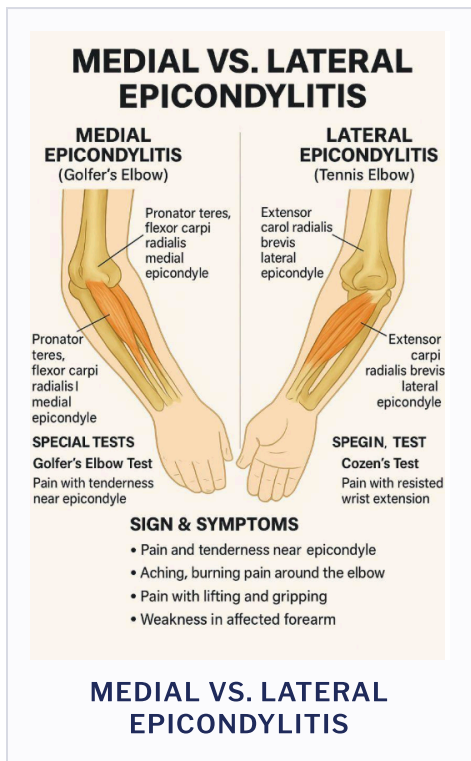
There is no universal OrthoSpec movement pattern.

Different Indications, Different Patterns

Indication	Treatment pattern
Arthritis	Painful area, then slowly travel over the adjacent area
Epicondylitis	Painful area, then adjacent area, then tendon
Trochanteric bursitis	Pain point, ~2 cm surrounding region; concentric circles outward, then back toward the pain point
Trigger points	Treat the defined point per protocol, then cover surrounding muscle with slow movement
Herniated disc	Locate and mark level, delimit adjacent area, low-intensity shockwave, slow travel through region

Medispec explicitly describes its herniated-disc treatment as palliative, not curative.

Epicondylitis and Trochanteric Bursitis



The Same Clinical Thought Process, Every Time

1 Indication	2 Anatomy	3 Target	4 Treatment area	5 Medispec protocol
6 Energy level	7 Number of pulses	8 Frequency	9 Applicator movement	10 Treat

Don't transfer patterns from other shockwave devices. Power sources, intensity and wave characteristics differ between systems. Follow the Medispec protocol for this applicator and indication.

Vertebral Level: Where Are We?

LUMBAR SPINE



L3-L4

Disc between L3 and L4

L4-L5

Disc between L4 and L5

L5-S1

Disc between L5 and the sacrum

The vertebral level tells us where the problem is. Identify the affected level correctly before treating.

Lumbar Levels: L1 to S1



The Intervertebral Disc

The disc helps:

- Absorb and distribute forces
- Permit movement between vertebrae
- Maintain spacing between vertebral bodies

Annulus fibrosus

STRONG OUTER RING

Tough, layered, collagen-rich wall that surrounds and contains the nucleus. Can develop fissures or tears with degeneration or injury.

Nucleus pulposus

SOFTER INNER CORE

Hydrated, gel-like centre. High water / proteoglycan content helps distribute compressive loads.

ANNULUS FIBROSUS

strong outer ring

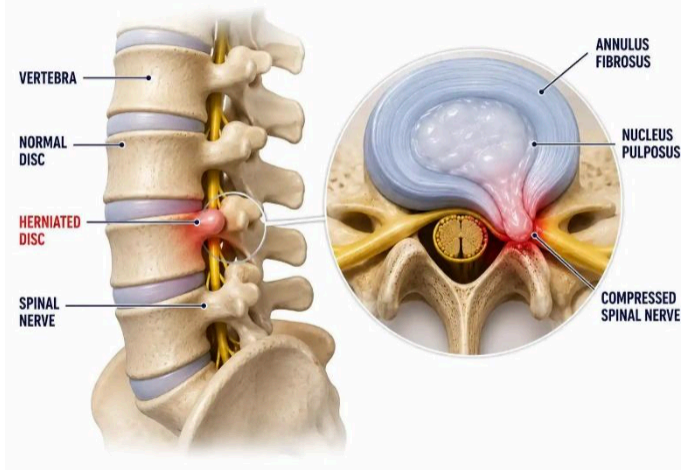
SURROUNDS →

NUCLEUS PULPOSUS

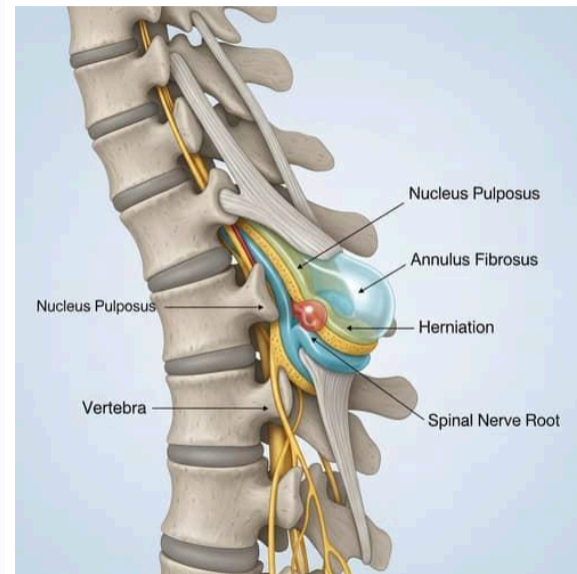
softer inner core

The Intervertebral Disc

LUMBAR DISC



ANNULUS FIBROSUS AND NUCLEUS PULPOSUS



HERNIATION AT THE NERVE ROOT

What Is a Herniated Disc?

1

Vertebral level
Where is it?

2

Intervertebral disc
Between the vertebral bodies

3

Annulus fibrosus
Tough outer ring

4

Nucleus pulposus
Softer inner core

5

Annular defect
Nucleus material displaced

6

Disc herniation

7

Nerve-root irritation
Possible compression

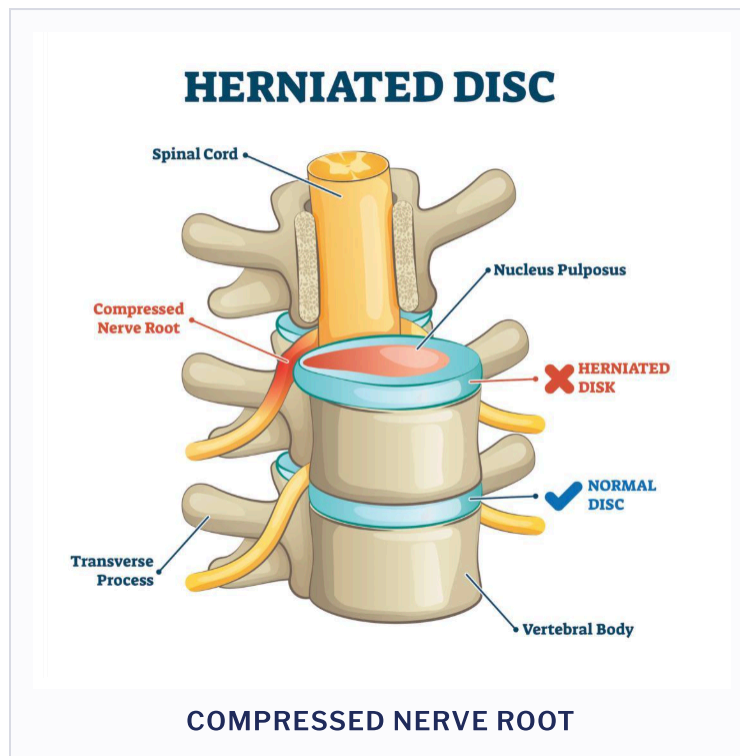
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Symptoms
Pain ± radiating pain, numbness,
tingling, weakness

What level? What disc? Where is the annulus? Where is the nucleus?

Do not imply shockwave physically pushes the herniated nucleus back into the disc.

Disc Herniation and the Nerve Root



Trigger Points: Hands-On Sequence

A trigger point isn't simply "where it hurts." It is a hypersensitive point within a taut band of skeletal muscle that reproduces local and/or characteristic referred pain.

1

Identify the pain complaint

2

Identify relevant muscle / anatomy

3

Palpate for a taut band

4

Find the hypersensitive point in the band

5

Does palpation reproduce familiar pain?

6

Mark the trigger point

7

Define surrounding treatment region

8

Check Medispec trigger-point protocol

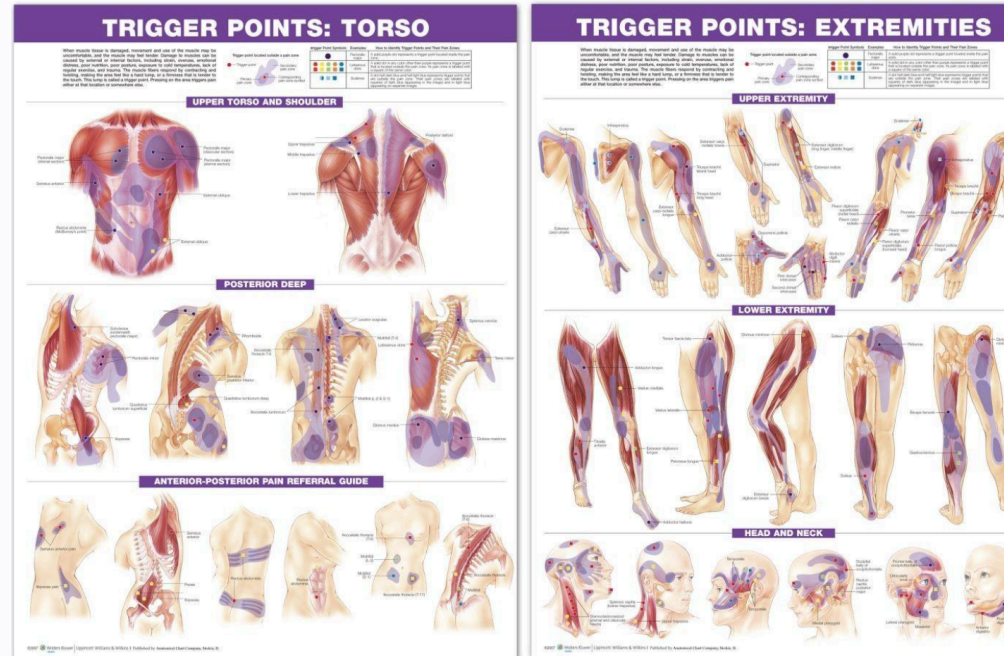
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Treat the point per prescribed settings

10

Treat surrounding muscle per protocol

Trigger-Point Reference Charts



TORSO AND EXTREMITIES — REFERRED-PAIN ZONES

Trigger-Point Chart: Head, Neck, Shoulder & Chest

Muscle	Where to palpate	Common referred-pain pattern
Upper trapezius	Upper shoulder between neck and acromion	Side of neck, temple, behind ear / head
Levator scapulae	Upper medial border of scapula toward neck	Neck and upper medial scapular region
Sternocleidomastoid (SCM)	Along SCM from mastoid toward sternum / clavicle	Head, temple, forehead, around eye / ear
Suboccipitals	Base of skull	Occiput, sometimes toward forehead / eye
Scalenes	Lateral neck	Shoulder, arm, forearm and hand
Infraspinatus	Posterior scapula below scapular spine	Anterior shoulder and down arm
Supraspinatus	Above scapular spine	Lateral shoulder / upper arm
Rhomboids	Between medial scapular border and spine	Local / interscapular aching
Pectoralis major	Anterior chest muscle	Anterior chest, shoulder and arm
Pectoralis minor	Deep to pectoralis major near coracoid	Anterior shoulder / chest and arm

Trigger-Point Chart: Arm & Back

Muscle	Where to palpate	Common referred-pain pattern
Deltoid	Anterior, middle or posterior deltoid	Primarily local shoulder / upper-arm pain
Biceps brachii	Anterior upper arm	Anterior shoulder / arm
Triceps	Posterior upper arm	Posterior arm / elbow
Forearm extensors	Lateral elbow to posterior forearm	Lateral elbow, forearm, sometimes hand
Forearm flexors	Medial elbow to anterior forearm	Medial elbow / forearm
Quadratus lumborum	Posterior abdominal wall, iliac crest to 12th rib	Low back, SI / buttock / hip region
Erector spinae	Paraspinal muscle columns	Local or regional spinal pain
Multifidus	Deep paraspinal region	Local / deep spinal pain

Trigger-Point Chart: Hip & Leg

Muscle	Where to palpate	Common referred-pain pattern
Gluteus maximus	Posterior buttock	Buttock / sacral region
Gluteus medius	Lateral / posterolateral ilium	Lateral hip, buttock, sometimes thigh
Gluteus minimus	Deep lateral hip	Buttock, lateral / posterior leg; can mimic sciatica
Piriformis	Deep buttock, sacrum to greater-trochanter region	Buttock and posterior thigh
Tensor fasciae latae (TFL)	Anterolateral hip	Lateral hip / thigh
Adductors	Medial thigh	Groin and medial thigh
Quadriceps	Anterior thigh	Anterior thigh and knee region
Hamstrings	Posterior thigh	Posterior thigh, buttock or knee
Gastrocnemius	Superficial calf	Calf; some points refer toward ankle / foot
Soleus	Deep calf	Calf / heel region
Tibialis anterior	Anterolateral shin	Anterior ankle / dorsum of foot
Peroneal / fibularis	Lateral lower leg	Lateral ankle / foot



Safety Before Hands-On

BEFORE EVERY TREATMENT

RIGHT Patient	RIGHT Indication	RIGHT Anatomy	RIGHT Applicator	RIGHT Protocol	RIGHT Settings	RIGHT Treatment area
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Review contraindications for THIS application

Review application-specific contraindications and precautions before every treatment.

Don't transfer lists between applications

The OrthoSpec contraindication list does not automatically apply to ED1000 or LilyCare. Use current Medispec documentation for that treatment.

Four Questions Before Every Application



1 What are you treating?

2 What anatomy is underneath your applicator?

3 Why are you treating that location?

4 What does the Medispec protocol tell you to do?

Same platform. Same shockwave principles. Different anatomy, objectives, applicators and protocols.

ED1000



LilyCare



OrthoSpec



HANDS-ON

Trainee Resources and Training Notes

KEEP THESE OFFICIAL MEDISPEC RESOURCES ACCESSIBLE

01

What Is a Shockwave?

Medispec

02

Angiogenesis

Medispec

03

ED1000

Medispec

Device-specific content

Indications, settings, treatment patterns, contraindications and claims are taught from the current Medispec instructions for use and approved Canadian labeling.

Source notes

Historical points reflect the Dornier / University of Munich development of ESWL and the first human treatment in 1980. Product descriptions reflect Medispec and OmniSpec training materials.