



NORTH AMERICAN
INSTITUTE OF
MEDICAL AESTHETICS

OMNISPEC PLATFORM TRAINING · EDUCATOR SERIES

DOCUMENT TWO OF THREE

Medispec Shockwave Fundamentals

Lithotripsy · Extracorporeal Shockwaves · Electrohydraulic ESWT · OmniSpec
MultiWave®

The historical foundation of extracorporeal shockwave technology,
the difference between lithotripsy and therapeutic ESWT, and the
four terms every clinician needs to hold apart.

AUDIENCE

Licensed clinicians new to
shockwave, and clinicians
experienced with other
shockwave devices

FORMAT

Theory handout

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2.1 Historical foundation: from lithotripsy to therapeutic shockwave

The first major clinical use of externally generated shockwaves in medicine was lithotripsy.

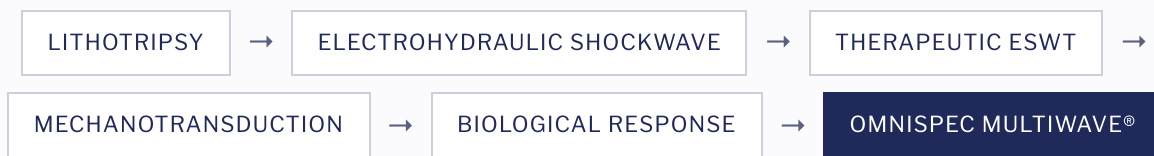
Shockwaves had been studied experimentally before then, including electrohydraulic shockwave research in the 1950s–70s. Extracorporeal Shock Wave Lithotripsy (ESWL) became the first major clinical therapeutic application of extracorporeal shockwaves. The first human kidney-stone treatment with an extracorporeal shockwave lithotripter was performed in Munich on February 7, 1980, using the Dornier HM1.

The original Dornier systems were electrohydraulic: an underwater electrical spark generated the shockwave, and a reflector focused that acoustic energy onto the kidney stone.

TEACHING STATEMENT

“The first major clinical application of extracorporeal shockwave technology was lithotripsy — the use of externally generated shockwaves to fragment kidney and urinary stones. From there, researchers began investigating how shockwaves interact with living tissues, eventually leading to therapeutic applications where the objective is not fragmentation, but stimulation of a biological response.”

FIGURE 1 — THE LINE OF DEVELOPMENT



HISTORICAL CLARIFICATION

Medispec did not invent lithotripsy or introduce the first extracorporeal shockwave device. That milestone belongs to the Dornier / University of Munich work. Medispec came later and developed its own shockwave systems and MultiWave® technology.

2.2 Does Medispec use both lithotripsy and therapeutic ESWT?

Yes. Medispec uses shockwave technology in both lithotripsy and therapeutic extracorporeal shockwave therapy, but for different purposes and with different devices and settings.

Lithotripsy (ESWL)

- ESWL = Extracorporeal Shock Wave Lithotripsy
- Used for urinary stones
- Medispec lithotripsy systems include the E3000 and EM1000
- Goal: fragmentation — shockwaves are directed at the stone to break it into smaller pieces
- Medispec offers electrohydraulic and electromagnetic ESWL systems

Therapeutic ESWT / OmniSpec

- ESWT = Extracorporeal Shock Wave Therapy
- OmniSpec is a multi-purpose therapeutic ESWT platform
- The objective is a controlled biological response in living tissue rather than stone fragmentation
- Applications include sexual health, urology, vascular and orthopedic / musculoskeletal indications

KEY DISTINCTION FOR STUDENTS

“Lithotripsy and therapeutic ESWT both use extracorporeal shockwaves. The difference is what we are trying to accomplish. In lithotripsy, shockwaves are used for stone fragmentation. With OmniSpec therapeutic ESWT, appropriately dosed acoustic shockwaves are used to stimulate a biological response.”

ESWL → STONE FRAGMENTATION**ESWT** → MECHANOTRANSDUCTION → BIOLOGICAL RESPONSE**2.3 Core terminology****A. Shockwave — WHAT THE ENERGY IS**

- A shockwave is an acoustic / mechanical pressure wave.
- It travels through a medium such as water or body tissue.
- It is characterized by a very rapid rise in pressure followed by a negative-pressure phase.
- It can produce mechanical stress and physical effects including cavitation.
- In therapeutic applications, these mechanical forces can initiate mechanotransduction and downstream cellular and biological responses — broader tissue-level processes such as vascular responses, tissue remodelling and repair. Medispec material specifically frames MultiWave® in terms of angiogenesis, repair of existing blood vessels and increased blood flow.

Think: Shockwave = WHAT the energy is.

B. Electrohydraulic shockwave — HOW THE SHOCKWAVE IS GENERATED

- Electrohydraulic describes a method of producing a shockwave.
- An electrical discharge occurs between electrodes within a fluid-filled chamber.
- The discharge rapidly creates an expanding pressure wave.
- A reflector directs the resulting acoustic shockwave toward the treatment field.
- This is the shockwave-generation method relevant to OmniSpec MultiWave® technology.

Think: Electrohydraulic = HOW the shockwave is made.

C. Extracorporeal — WHERE THE SHOCKWAVE IS GENERATED

TERM	MEANING
Extra	Outside
Corporeal	Relating to the body
Extracorporeal	Outside the body
Shockwave	The acoustic / mechanical pressure wave
Technology	The system that generates and delivers the wave

ESWT therefore stands for Extracorporeal Shock Wave Therapy: the shockwave is generated outside the body and transmitted through the skin into the targeted tissue.

TRAINING EXPLANATION

“Extracorporeal simply means outside the body. The OmniSpec generates the shockwave outside the patient's body, and the applicator couples that acoustic energy through the skin into the targeted tissue. Nothing needs to be inserted into the tissue to generate the shockwave.”

D. Lithotripsy — WHAT THE SHOCKWAVE IS BEING USED TO DO

- Lithotripsy is one medical application of extracorporeal shockwave technology.
- ESWL specifically uses extracorporeal shockwaves to fragment urinary stones.
- The therapeutic objective is mechanical fragmentation of the stone.
- Extracorporeal shockwave is therefore the broader concept; lithotripsy is one specific application.

Think: Lithotripsy = WHAT the shockwave is being used FOR.

2.4 Connecting the terminology to OmniSpec

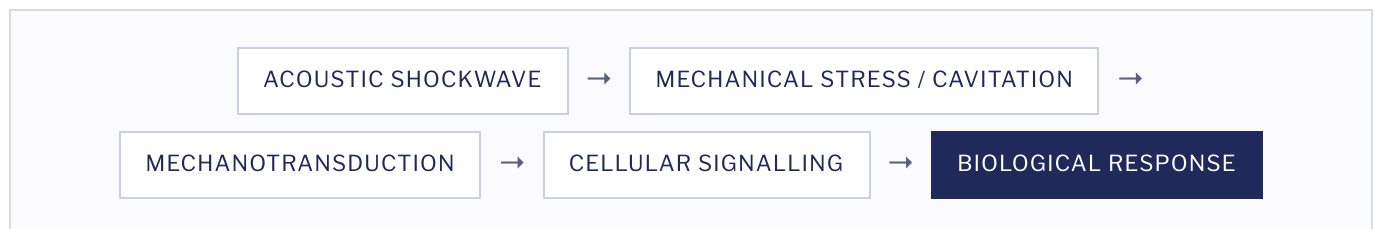
TERM	QUESTION IT ANSWERS	MEANING
Shockwave	WHAT	The acoustic / mechanical pressure wave
Electrohydraulic	HOW	How OmniSpec generates the shockwave
Extracorporeal	WHERE	Generated outside the body
ESWT	THERAPEUTIC USE	Externally generated shockwave used therapeutically
Lithotripsy / ESWL	SPECIFIC USE	Extracorporeal shockwaves used to fragment stones

PUTTING IT ALL TOGETHER

“OmniSpec uses electrohydraulic extracorporeal shockwave therapy.”

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

2.5 Biological bridge: from mechanical energy to tissue response



Mechanotransduction is the process by which cells sense mechanical forces and convert them into biochemical signals. This is the conceptual bridge between the physical shockwave and the downstream biological response.

Medispec's training material describes MultiWave® as stimulating the body's regenerative response, including angiogenesis, repair of existing blood vessels and increased blood flow to the treated area.

2.6 Quick teaching summary

Shockwave	WHAT the energy is.
Electrohydraulic	HOW the shockwave is generated.
Extracorporeal	WHERE it is generated — outside the body.
ESWT	Using the externally generated shockwave therapeutically.
Lithotripsy / ESWL	Using extracorporeal shockwaves specifically to fragment stones.
OmniSpec MultiWave®	Medispec's therapeutic electrohydraulic ESWT platform / technology.

ONE-SENTENCE TEACHING VERSION

- *Shockwave describes the energy*
- *Electrohydraulic describes how we generate it*
- *Extracorporeal tells us it is generated outside the body*
- *Lithotripsy is one application used to fragment stones*
- *OmniSpec ESWT, that energy is used therapeutically to stimulate a biological response.”*

2.7 Source notes

Historical points in this handout reflect the Dornier / University of Munich development of extracorporeal shockwave lithotripsy and the first human kidney-stone ESWL treatment in 1980. Product-specific descriptions reflect Medispec materials and the OmniSpec training material supplied for this training.

TRAINING NOTE

Device-specific indications, settings, treatment patterns, contraindications and claims should be taught from the current Medispec instructions for use and approved Canadian labeling.