



SHOCKWAVES
C L I N I C

MEDICAL APPLICATIONS OF SHOCK WAVES

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What we do

Shockwaves Clinic™ was established in 2018. It deals exclusively with the application of Shock Waves for the treatment of medical diseases, focusing mainly on diseases of the urogenital system. It is based on knowledge gained worldwide during the last 10 years upon the application of low-intensity Extracorporeal Shock Wave therapy (ESWT) in Urological diseases, such as **erectile dysfunction, chronic non-bacterial prostatitis, chronic pelvic pain syndrome and Peyronie's disease** (penile curvatures).

The success of the method depends on three factors:

- ▶ Shock Wave generation technological equipment
- ▶ Therapeutic protocols
- ▶ Shock Wave generation method

To meet the highest standards in Shockwaves Clinic™, we use Shockwave therapy devices that have given the best evidence-based results in international clinical trials.

Moreover, in Shockwaves Clinic™ we apply only protocols that have already been used in clinical trials.

Furthermore, to ensure the optimal implementation of the method, we have chosen to collaborate with the most highly specialized scientific staff in the country having the largest clinical and research experience in Shock Wave applications.



Our premises

Shockwaves Clinic™ has been set up to meet its specific purposes. Its premises comprise the administrative and secretariat areas, as well as **three specially arranged rooms for the Shock Wave therapeutic sessions that ensure patients' privacy.**

Every treatment room has its own Shock Wave high-tech equipment whose efficacy has been proven in international clinical trials.

The aesthetically nice SW treatment rooms are made in compliance with the highest specifications to secure sound attenuation and space functionality. Everything is arranged in such a way so that the visitor feels at ease and does not feel as a "patient".

What do shock waves do?

No side effects
No anesthesia

Shockwave Therapy relieves the symptom without the need of pharmaceutical treatment, without the need of any anesthesia and surgery as needed with penile prosthesis. Causing no pain at all, Shock Waves promptly activate physiological body mechanisms that form new vessels and increase the blood flow in the penile cavernous bodies.

Therapeutic treatments	Reversal of pathology	No side effects/ adverse events	No anaesthesia/ No surgery
Pharmacotherapy	✗	✗	✓
Penile prosthesis	✗	✗	✗
Shock waves	✓	✓	✓

Our medico-technical equipment

According to clinical trials published in the most highly reliable international medical journals, there are 2 Shock Wave generation technologies with proven efficacy.

ED 1000

Medispec ED1000 from Israel, was the first technological equipment used in trials for penile dysfunction, and proved its efficacy in both responders and non-responders to pharmacological treatment for erectile dysfunction. The method is also applied widely in many other urological diseases.



ED 1000

ARIES 2

ARIES2 comes from German Dornier, the first company that discovered Shock Wave Technology in the 70s and used them successfully for the treatment of renal lithiasis (extracorporeal lithotripsy). ARIES2 has been used in studies that led to the development of therapeutic protocols for the treatment of erectile dysfunction. It is also already used for the development of therapeutic protocols in other urological diseases where Shock Waves are applied as therapeutic treatment.

Shockwaves Clinic™ has both types of technological devices, offering alternative options to Physicians when referring their patients for SW treatment.



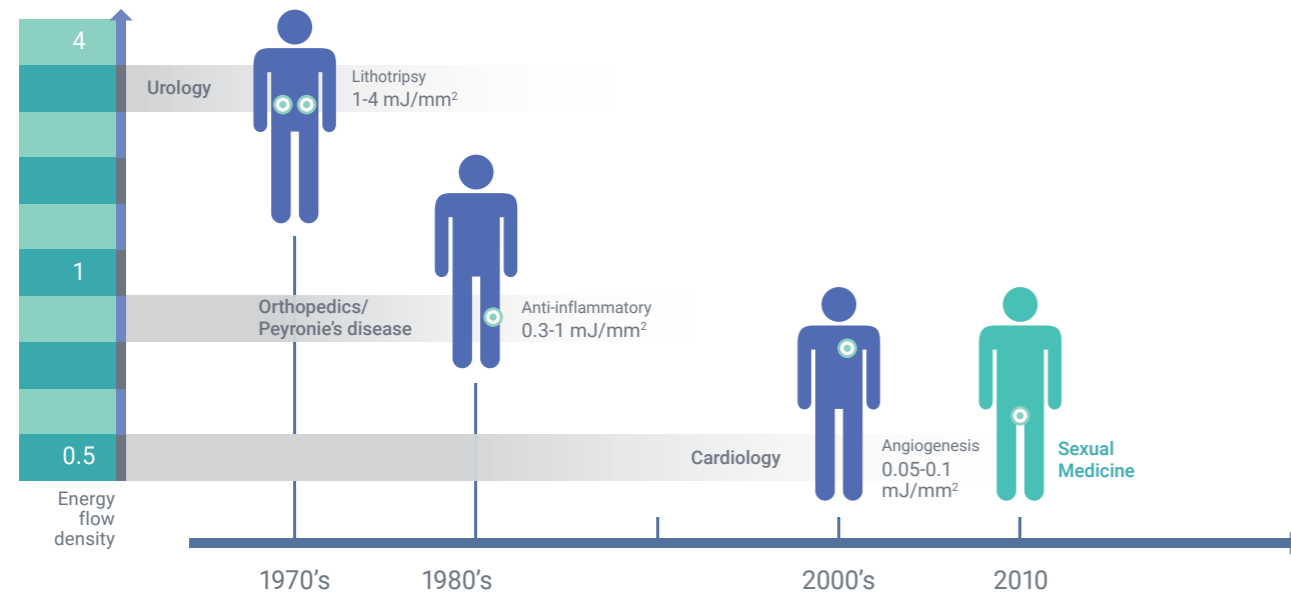
ARIES 2

Historical background of Shock Waves in Medicine

A. High-intensity shock waves

High-intensity Shock Waves were a breakthrough in Urology in 1970 when used in extracorporeal lithotripsy. The Shock Wave technological equipment used for lithotripsy is completely different from the equipment used for the generation of medium- or low-intensity waves. The energy used here uses more power compared to the energy used in Orthopedics and even more power than the energy required for the therapeutic treatment of erectile dysfunction.

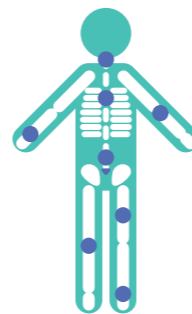
The History of Shock Waves



B. Medium-intensity shock waves

▶ It was in the 80s that the use of Shock Waves expanded in orthopedic diseases with medium-intensity technological SW equipment to treat inflammatory diseases causing chronic pain, such as tendinopathies (with or without calcification), myofascial pain trigger points, and also to avoid formation of scar tissue following an injury. Shock Waves in Orthopedics have been approved by FDA for their anti-inflammatory and analgesic action.

▶ Based on the experience gained with Shock Waves used in orthopedic diseases, it was in 2008 that the first trial was presented for the application of Shock Waves in patients with chronic non-bacterial prostatitis or/and pelvic pain syndrome with good results.

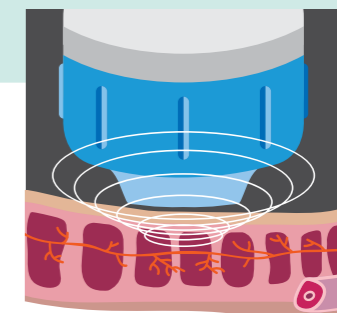


C. Low intensity shock waves

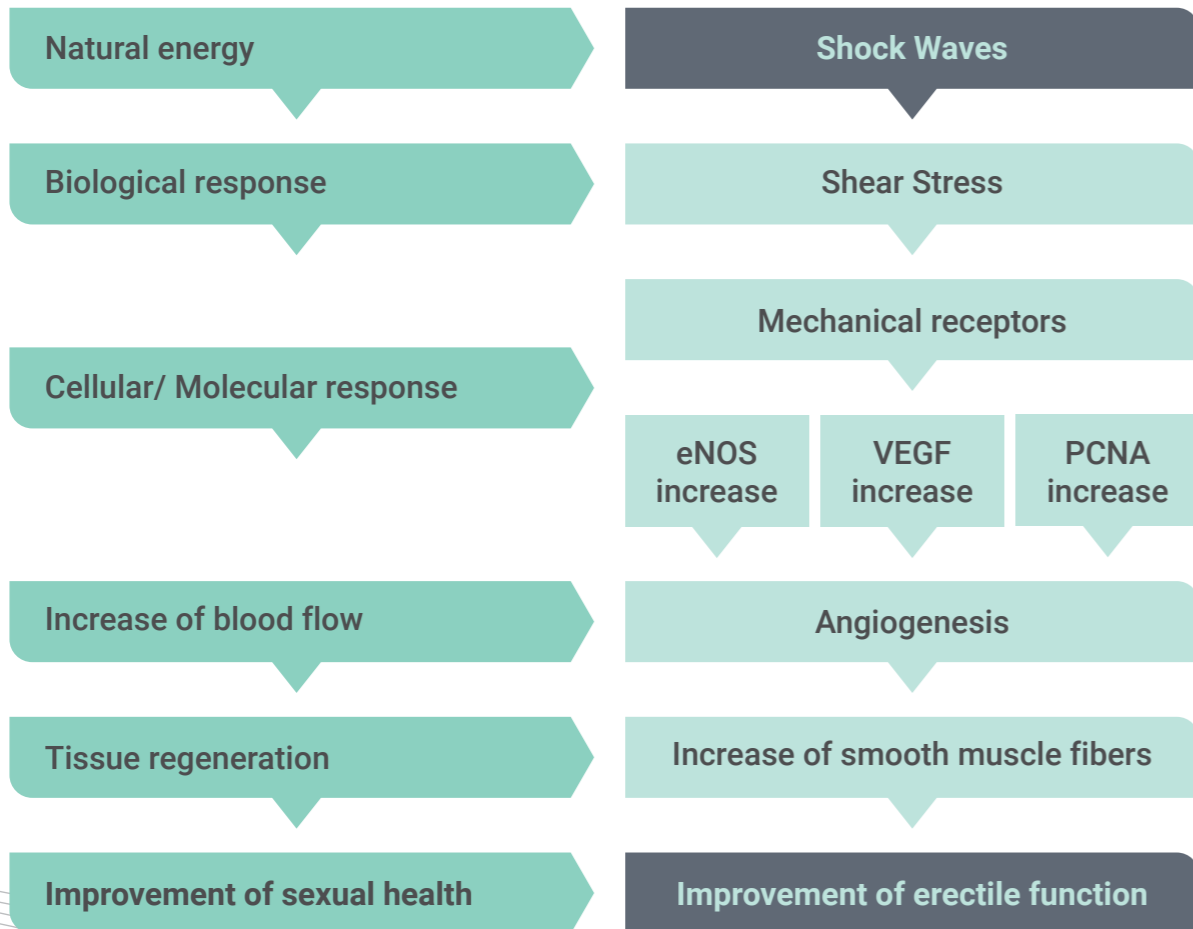
✓ It was in 2000 that the method was first applied with low-intensity Short Waves in Cardiology, where it has been proven to stimulate the creation of new vessels (neovascularization) in the heart muscle following myocardial infarct. Since then, the method has been used in many diseases requiring neovascularization, for example in diabetic patients with lower extremity ulcerations (diabetic foot). This application prompted researchers to try the method in the penis for the therapeutic treatment of erectile dysfunction.

✓ In 2010, the first successful application of the method in patients with vascular erectile dysfunction was published in the most reliable high-impact journal of Urology. **Since then, many studies have followed proving the efficacy and safety of the method.** In 2017, four meta-analyses were published strongly recommending Low-Intensity Shock Waves as the method of choice for the treatment. The technological equipment became even more specialized, along with the manufacturing of special probes for the application of the method on the penis.

✓ Low-intensity Shock Waves are already used in the treatment of chronic non-bacterial prostatitis, and seem to do even better than medium-intensity Shock Waves since they do not cause any pain to patients.

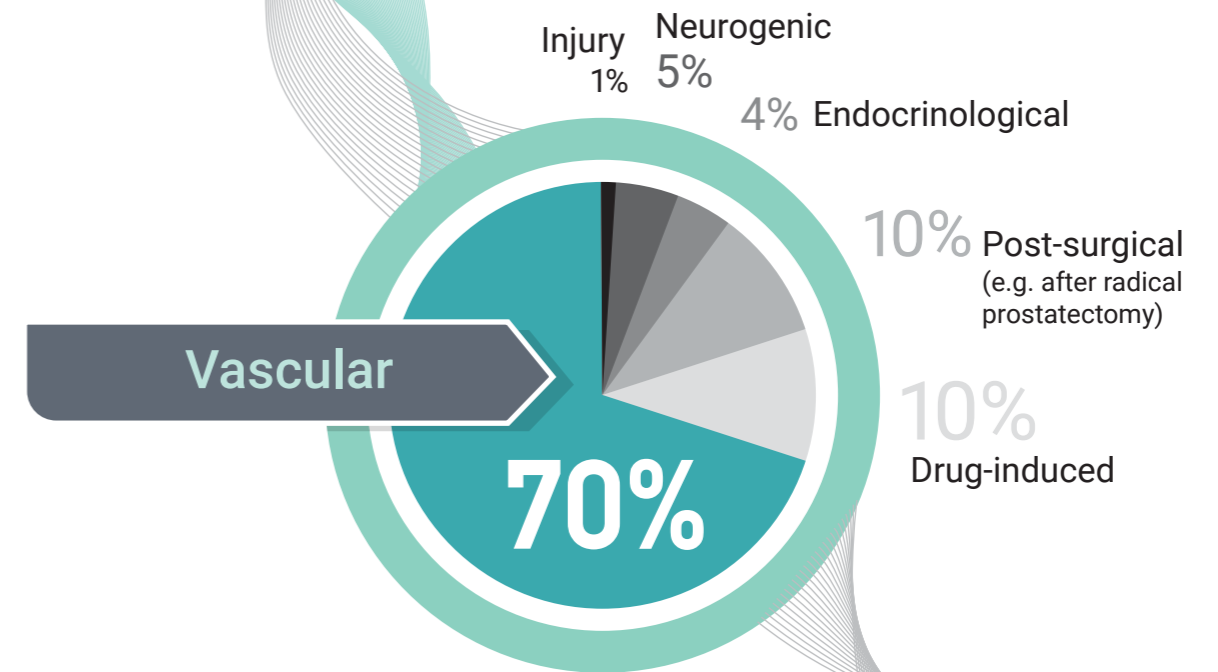


How do Shock Waves work?



70%

Vascular erectile dysfunction is the most common of all types of erectile dysfunction!



Main features of patients with vascular erectile dysfunction

- Age > 40 years
- Gradual manifestation and deterioration of erectile dysfunction.
- Morning erections similar to nocturnal erections (normal nocturnal/ morning erections usually indicate psychogenic cause).
- History of hypertension or diabetes mellitus or cardiovascular disease.
- Risk factors for cardiovascular disease (obesity, smoking, sedentary life, malnutrition).
- Sexual desire exists and is normal.

Therapeutic protocols

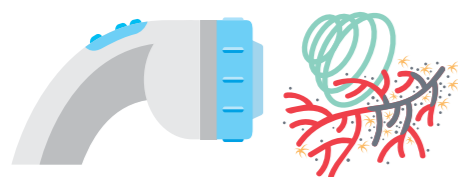
- ▶ This method was initially applied with protocols based on the experience from applications in other organs or in experimental animals. In 2017 results of trials that led to the development of therapeutic protocols based on evidence were presented for the first time within the context of European Urology and Sexual Medicine Congresses.
- ▶ These were the studies that determined all parameters and application modes of Shock Waves.
- ▶ Shock Waves are applied in a range of 6, 12 or 18 therapeutic sessions according to the severity of the problem.
- ▶ The therapeutic sessions take place 1, 2 or 3 times a week with maximum interval between sessions up to 1 week.
- ▶ The energy required ranges between 0,05-0,15 mJ/mm². The studies have demonstrated that the optimal energy amount causing no side-effects and no pain is that of 0,1 mJ/mm².

The therapeutic process

- ▶ There is no need for any preparation from the patient's side.
- ▶ The application mode of the method reminds a lot of a penile UltraSound test.
- ▶ There is no need for any type of anesthesia, since Shock Waves are absolutely painless. Every session lasts about 20 minutes.
- ▶ The patient lies on the examination bed, and the gel is applied on the target area with the use of a special probe that resembles the ultrasound probe and generates Shock Waves.
- ▶ The probe is placed on the skin and continuously moved around the affected organ by a specially trained sonographer in such a way that Shock Waves are conducted and evenly distributed all over the region.
- ▶ Once the session is completed, the gel is removed from the treated area with the use of cellulose wadding and the patient leaves the SW treatment room.
- ▶ The patient may continue the use of medication for erectile dysfunction and have his regular lifestyle during the period of SW therapy.

The results of the therapy

- ✓ According to international studies, Shockwave Therapy improves erectile dysfunction.
- ✓ In patients with mild or moderate erectile dysfunction, **Shock Waves can bring the quality of erection back to normal levels.**
- ✓ For patients who respond only to the highest dose of pharmacological treatment for erectile dysfunction, there is usually need for 12 or even 18 sessions, so that they fully respond and have no need for any pharmacotherapy.
- ✓ Patients who do not respond to pharmacological treatment for erectile dysfunction need 12 SW therapeutic sessions in order to start responding to pharmacotherapy and regain their sexual life.
- ✓ According to a recent study, repetition of Shock Wave therapy and increase of the number of therapeutic sessions to 18, have been shown to further improve the therapeutic result.
- ✓ The SW application protocol for patients with non-bacterial prostatitis includes 6 therapeutic session (1 session per week). In case of partial response, it is possible to continue the treatment.



Frequency of therapeutic sessions

1, 2 or 3 times/week

Mild
erectile
dysfunction

6

sessions

Moderate
erectile
dysfunction

12

sessions

Severe
erectile
dysfunction

18

sessions

SESSIONS	Efficacy (Minimal Clinically Important Differences)
6	61,9%
12	74,4%
18	83,3%

The most important international scientific trials

Clinical Trials

- 1 Vardi Y, Appel B, Jacob G, Massarwi O, Gruenwald I. **Can low-intensity extracorporeal shockwave therapy improve erectile function? A 6-month follow-up pilot study in patients with organic erectile dysfunction.** EurUrol. 2010;58(2):243-8
The historical first study recording the potential of low-intensity Extracorporeal ShockWave Therapy (ESWT) in the treatment of erectile dysfunction.
- 2 Vardi Y, Appel B, Kilchevsky A, Gruenwald I. **Does low intensity extracorporeal shock wave therapy have a physiological effect on erectile function? Short-term results of a randomized, double-blind, sham controlled study.** J Urol. 2012;187(5):1769-75.
The first sham-controlled study demonstrating the efficacy of the method compared to placebo therapy.
- 3 Kitrey ND, Gruenwald I, Appel B, Shechter A, Massarwa O, Vardi Y. **Penile Low Intensity Shock Wave Treatment is able to shift PDE5i non responders to responders: A double-blind, sham controlled study.** J Urol. 2016;195(5): 1550-5
The first placebo-controlled study demonstrating the efficacy of the method in non-responders to pharmacological treatment for erectile dysfunction (phosphodiesterase inhibitors).
- 4 Kalyvianakis D, Hatzichristou D. **Low-Intensity Shockwave Therapy Improves Hemodynamic Parameters in Patients With Vasculogenic Erectile Dysfunction: A Triplex Ultrasonography-Based Sham-Controlled Trial.** J Sex Med. 2017;14(7):891-897
The first study using penile blood flow measurements to demonstrate the efficacy of the method in the increase of penile blood flow and the improvement of penile haemodynamics.
- 5 Kalyvianakis D, Memmos E, Mykoniatis I, Kapoteli P, Memmos D, Hatzichristou D. **Low-intensity shockwave therapy for erectile dysfunction: a randomized clinical trial comparing two treatment protocols and the impact of repeating treatment.** JSM, in press 2018.
A series of studies resulting in the development of the first therapeutic protocol for the treatment of erectile dysfunction, demonstrating that the efficacy of the method is correlated with the number of therapeutic sessions. Even though there is positive result already after only 6 sessions, increase to 12 sessions improves efficacy even further. The repetition of the method is totally safe. In men with severe erectile dysfunction problem, it has been shown that an 18-session therapy results in even further improvement of erection.
- 6 Frey A, Sønksen J, Fode M. **Low-intensity extracorporeal shockwave therapy in the treatment of post prostatectomy erectile dysfunction: a pilot study.** Scand J Urol. 2016;50(2):123-7.
The first pilot study on the application of Shock Waves in patients following radical prostatectomy, with highly encouraging results.
- 7 Al Edwan GM, Muheilan MM, Atta ON. **Long term efficacy of extracorporeal shock wave therapy [ESWT] for treatment of refractory chronic abacterial prostatitis.** Ann Med Surg (Lond). 2017;14:12-17.
Study demonstrating the efficacy of the method in patients with chronic bacterial prostatitis and chronic pelvic pain syndrome who do not respond to pharmaceutical treatment.

Meta-analyses

- 8 Clavijo RI, Kohn TP, Kohn JR, Ramasamy. **Effects of Low-Intensity Extracorporeal Shockwave Therapy on Erectile Dysfunction: A Systematic Review and Meta-Analysis.** J Sex Med. 2017;14(1):27-35.
A meta-analysis of studies conducted exclusively in patients with erectile dysfunction, concluding that ESWT will be the treatment of choice in patients with erectile dysfunction.
- 9 Lu Z, Lin G, Reed-Maldonado A, Wang C, Lee YC, Lue TF. **Low-intensity Extracorporeal Shock Wave Treatment Improves Erectile Function: A Systematic Review and Meta-analysis.** Eur Urol. 2017;71(2):223-233.
A meta-analysis of studies in patients with erectile dysfunction, as well as in patients with both Peyronie's disease and erectile dysfunction, confirming the so far positive results.
- 10 Fojecki GL, Tiessen S, Osther PJ. **Extracorporeal shock wave therapy (ESWT) in urology: a systematic review of outcome in Peyronie's disease, erectile dysfunction and chronic pelvic pain.** World J Urol. 2017;35(1):1-9.
A meta-analysis of studies in patients with erectile dysfunction, Peyronie's disease and chronic pelvic pain syndrome, confirming the so far positive results.
Review Articles

Ανασκοπικά άρθρα / Κριτικές

- 11 Wang HJ, Cheng JH, Chuang YC. **Potential applications of low-energy shock waves in functional urology.** Int J Urol. 2017;24(8):573-581
Article recording: a) the so far applications of the method in patients with erectile dysfunction, non-bacterial prostatitis, pelvic pain syndrome and Peyronie's disease (penile curvature), and b) indications for potential future use of Shockwave therapy in bladder diseases.
- 12 Fode M, Hatzichristodoulou G, Serefoglu EC, Verze P, Albersen M. **Low-intensity shockwave therapy for erectile dysfunction: is the evidence strong enough?** Nat Rev Urol. 2017 Oct;14(10):593-606
Article clarifying and presenting the mechanisms through which ESWT improves erection, and also estimating potential use of the therapy in patients with neurogenic erectile dysfunction following radical prostatectomy.
- 13 Hatzichristou D. **Low-Intensity Extracorporeal Shock Waves Therapy (LI-ESWT) for the treatment of erectile dysfunction: Where do we stand?** Eur Urol. 2017;71(2):234-236.
Article going through all so far data, underlying the need to determine therapeutic protocols based on the features of every type of technological device.





How does Shockwaves Clinic™ operate?

Shockwaves Clinic™ complies with international standards and specifications, offering therapeutic protocols based on the most reliable clinical trials published in the most valid and highest impact-factor international medical journals.

Once setting the diagnosis and recommending Shockwave therapy, the Therapist Physician refers the patient to Shockwaves Clinic™ for the appropriate method application. Always in close collaboration with Shockwaves Clinic™, the Therapist Physician is the one who decides which therapeutic protocol is to be applied for his patient. Once the therapeutic treatment is completed, the patient returns to the Therapist/Referring Physician for the follow-up and further treatment.

Upon the completion of Shockwave therapy, the patient is given a detailed report recording the type of Shockwave technological device used, the number and dates of therapeutic sessions, along with various technical parameters (energy intensity, frequency, number of shock waves etc). A copy of the therapeutic report is always sent to the patient's Therapist Physician.



Shockwaves Clinic™

Unique features

Shockwaves Clinic™ deals exclusively with the application of Shockwave Therapy in Urological patients. This specialization offers us the potential to provide high-standard services.

The scientific staff of our Medical Center has the largest experience in Greece in the application of Shock Waves. Our clinical and research experience is widely recognized worldwide.

We are the only Medical Center offering two alternative options utilizing the two most highly reliable Shockwave generation technological devices in the Market, always in accordance with the international experience and literature published in the most valid and highest impact factor scientific journals.

Collaboration with Physicians

In Shockwaves Clinic™, the cornerstone of our philosophy is our close collaboration with Urologists. For every patient referred to us, we apply Shockwave therapy and the appropriate therapeutic protocol always following the written instructions and recommendations of the referring Therapist Physician.

According to our philosophy in Shockwaves Clinic™, the Therapist Physician is the person who knows the patient better than anybody else; therefore, it is only the Physician who decides which Shock Wave technological equipment is to be used, the number of therapeutic sessions needed and the follow-up rate.

Upon the completion of every patient's Shockwave Therapy, a detailed report recording everything related to his therapy is sent electronically to his Therapist Physician. This close collaboration is highly imperative to achieve the optimal therapeutic outcome and benefit for all patients.

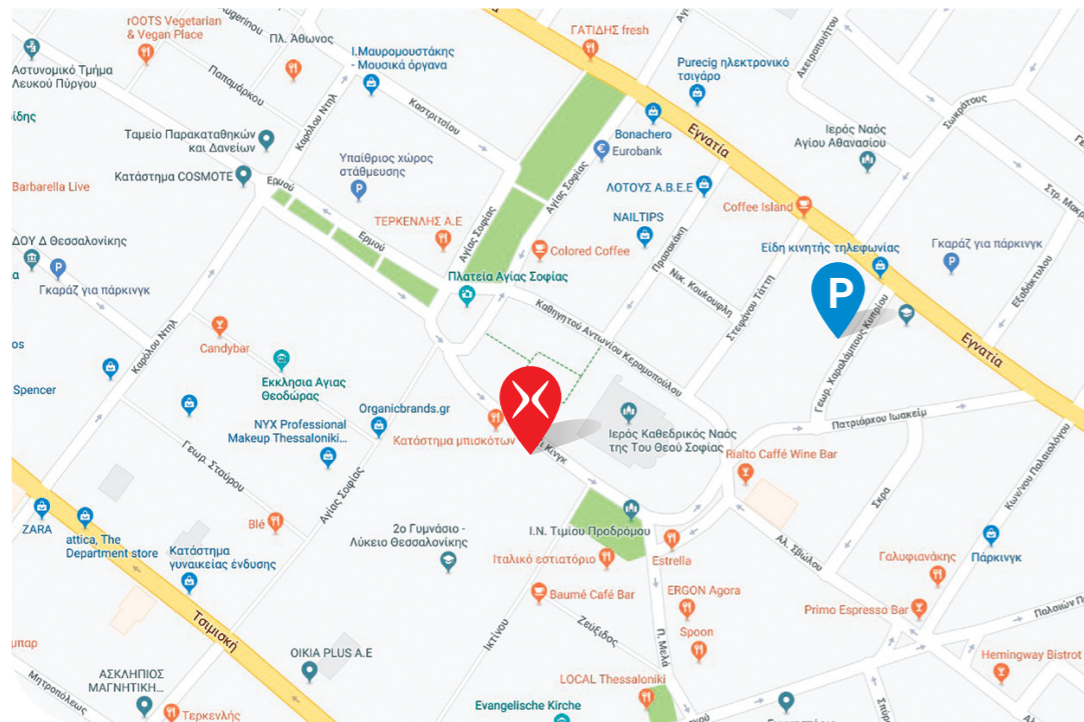


Where to find us

The Medical Center **Shockwaves Clinic™** is located on Aghia Sophia Square right in the center of Thessaloniki -easily accessible to all patients.



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E: shockwavesclinic@gmail.com
www.shockwavesclinic.com
gmap: 40.6326299, 22.9442308



Parking

In collaboration with a private car parking lot, **Shockwaves Clinic™** offers every visitor/patient parking space **FREE OF CHARGE** within 3-minute distance from the Clinic for one (1) hour.



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