

Integrating the treatments of tomorrow into the practice of today.

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Learning Objectives

1

Name and describe 3 forms of regenerative medicine available in the United States today

2

Briefly describe the differences between **Radial Pressure**, **Focused Shockwave**, and **Photobiomodulation**

3

Appreciate the body of evidence supporting the use of these modalities early in treatment

4

Understand how to integrate these services into practice

Disclosures

- Key Opinion Leader, Enovis Recovery Sciences
- National Clinical Advisor, GAINSWave
- Key Opinion Leader, CuraMedix

My Message

For many MSK conditions, our current treatment paradigm is outdated, expensive, and serves the system more than the patient. There are treatment modalities available today that primary care and sports medicine practices can utilize in their offices to improve outcomes, reduce costs, and improve patient satisfaction, and benefit your practice financially.

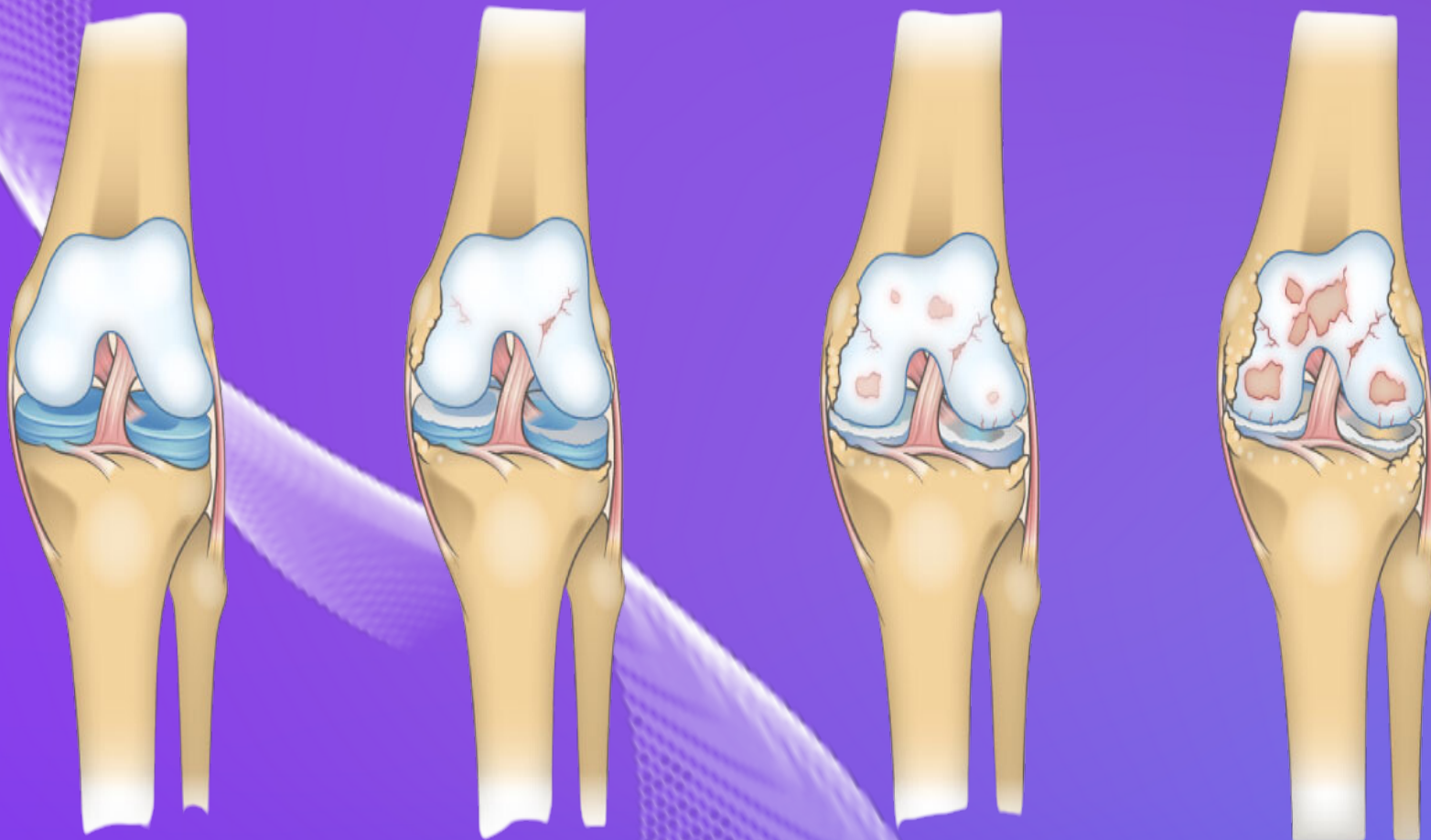
OUR CURRENT PARADIGM

Why should you care?

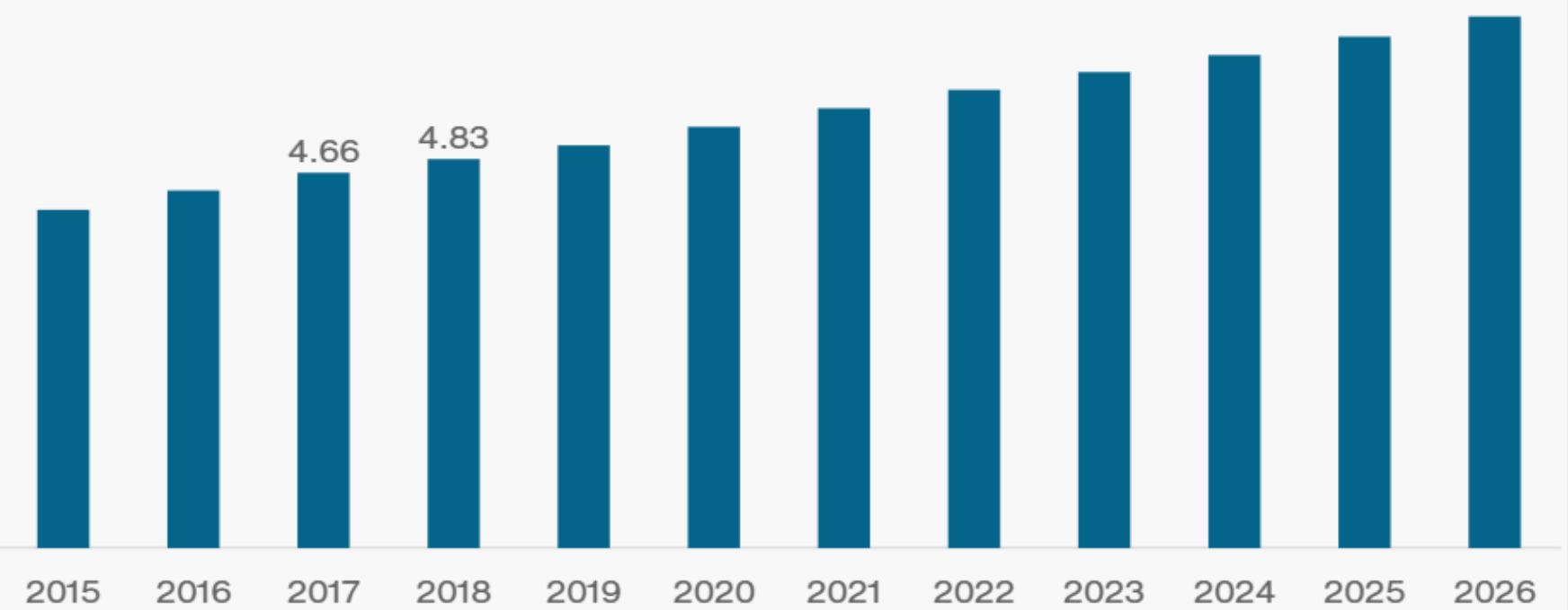
Example

Knee OA

Common, increase as pop ages, cost of knee OA in US, particularly from surgery.
COST OF CARE (COC), Cost of knee replacements in the US is an average \$30k per person.

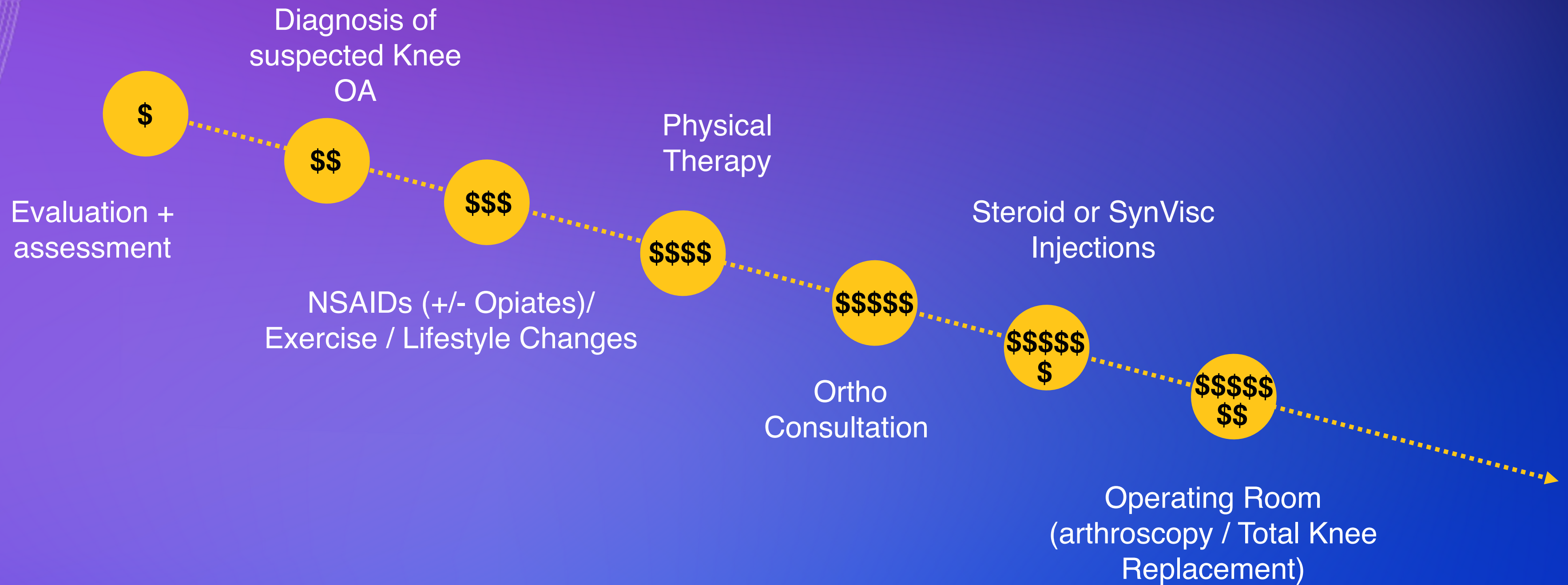


North America Knee Replacement Market Size, 2015-2026 (USD Billion)



www.fortunebusinessinsights.com

The Glide Path to Surgery



Why do we need a change?



Expensive

With nearly 800k total knee replacements done in the US in 2022, over **\$20B annually** is spent.



Complications

Interventional treatments such as arthroscopy and TKR can result in complications such as **infection**.



Medical Addiction

Lack of effective treatments for moderate to severe issues has **fueled the opiate crisis**.

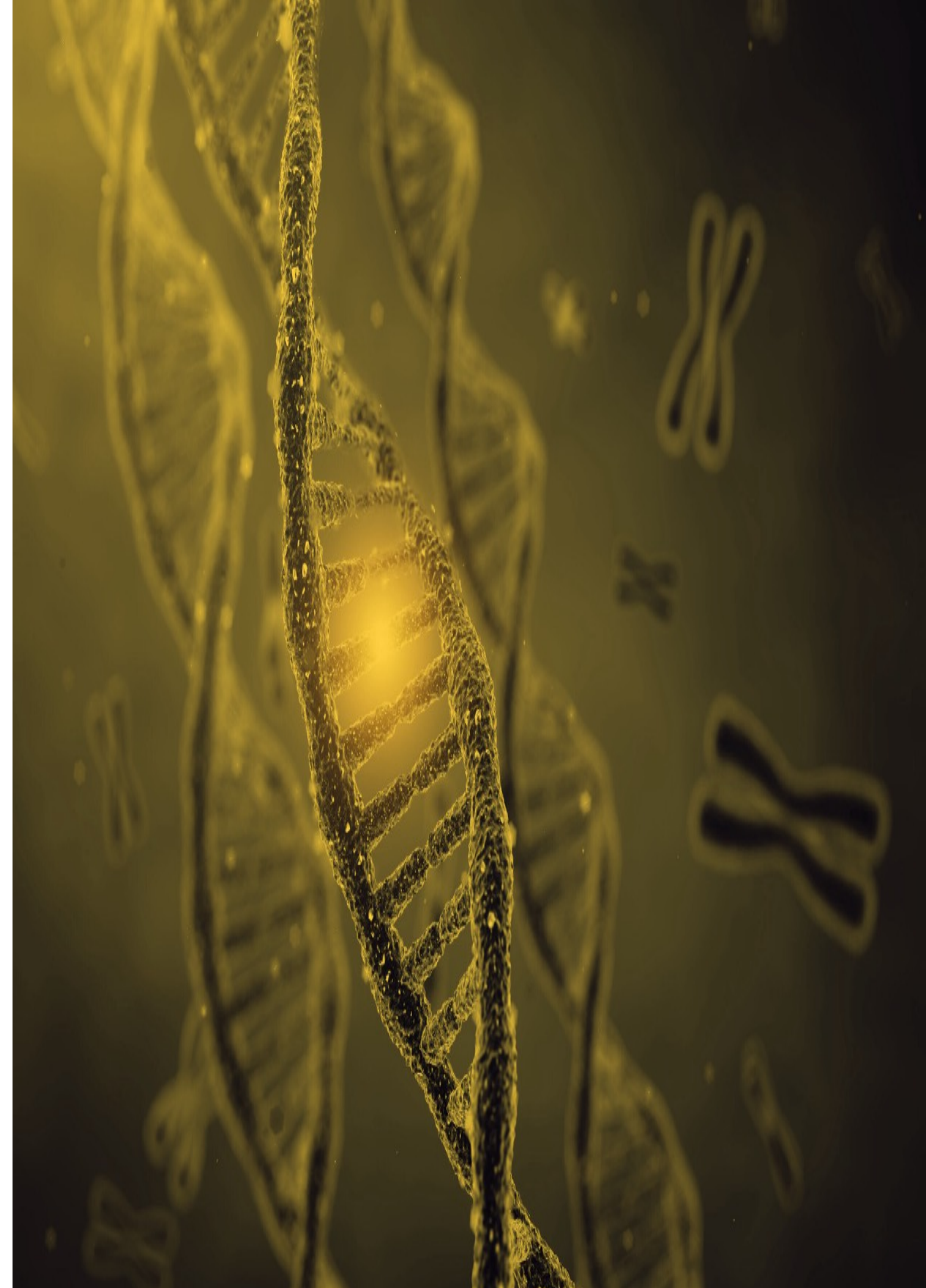


Extensive Rehab

Downtime and rehab costs increase both the **direct and indirect costs**.

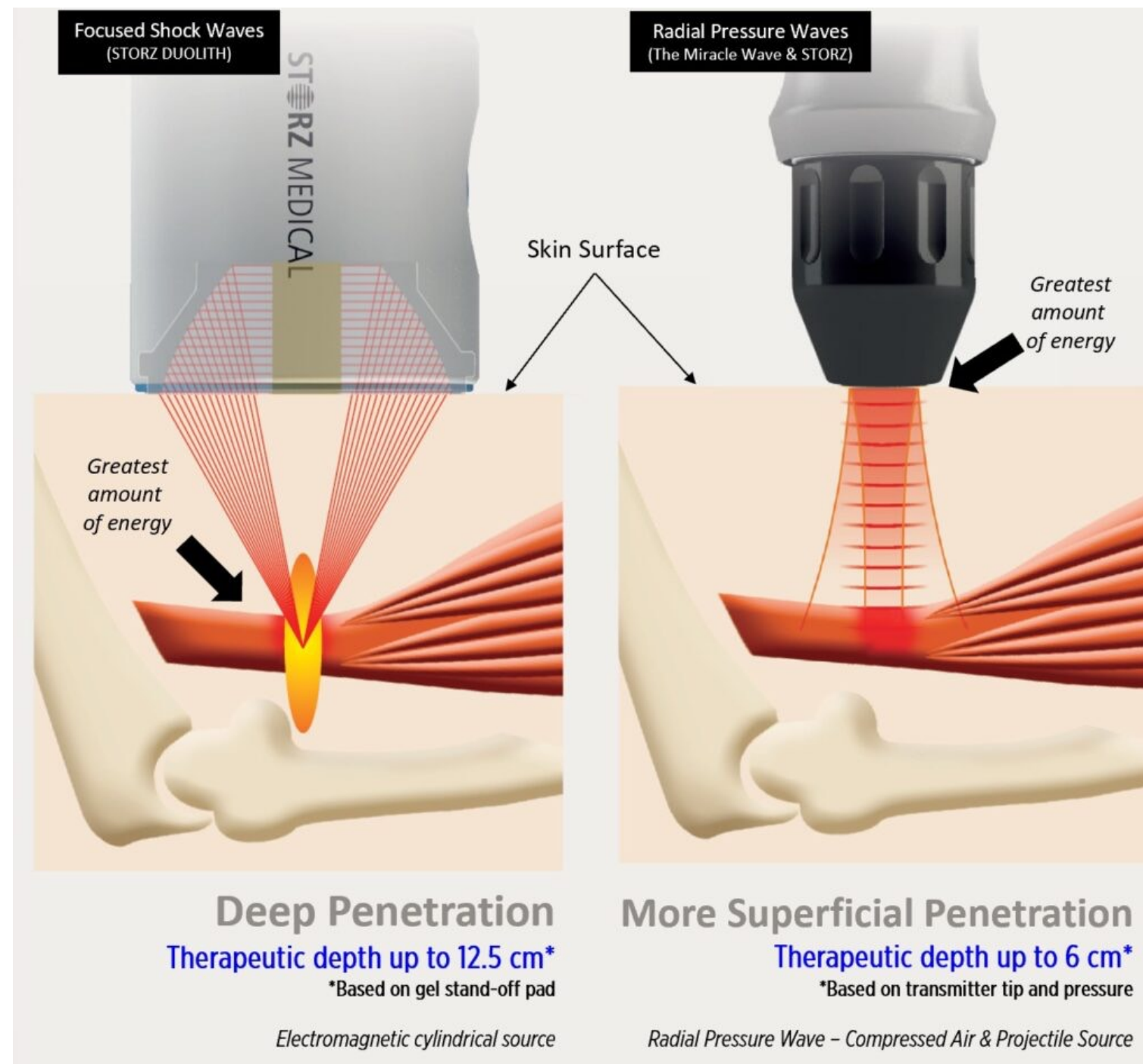
Regenerative Medicine

- Regenerative Medicine: the use of safe effective and evidenced based technology to stimulate a healing response in the body.
 - Examples of Regenerative Medicine
 - **Medical Shockwave**
 - Radial Pressure Wave (RPW, EPAT)
 - Focused Shockwave Wave (FSW, LiST)
 - **Photobiomodulation** (Deep Tissue Laser)
 - **Orthobiologic injections** (PRP, Stem Cells, Exosomes, Bone Marrow Aspirate)



What is shockwave therapy?

- Shockwave therapy involves the application of high-intensity acoustic waves to stimulate specific biologic and physical reactions in tissue.





Radial Pressure Wave

**(Soft Shock) Larger treatment area
of superficial indications**

How does it work?

- Radial waves are generated by means of a pneumatic system. Using compressed air, a projectile is accelerated to a high-speed then suddenly decelerated by a transmitter, which is held to the area being treated. The generated kinetic energy is then transmitted to the tissue from where it propagates outwards aspherically as a radial wave into the tissue. The transmitter surface constitutes the highest pressure and highest energy density.
- Pressure waves mobilize the tissue layers, which in turn breaks up adhesions and trigger points. The shifting of the tissue layers brings about myofascial release, which is the prerequisite for fascia therapy.



Radial Pressure Wave

Biological Effects

- Increase of cell wall permeability
- Stimulation of Microcirculation (Blood, Lymph)
- Release of Substance P Neurotransmitter responsible for pain modulation.
- Powerful vasodilator

Radial Pressure Wave

Applying the treatment

- The radial shockwave comprises three parts – Ultrasonic pulse, audio acoustic pulse and the relatively slow shear wave.
- The pressure waves lose power the deeper they enter the body. For treatments where the targeted tissue is superficial, radial pressure waves will give patients good results, such as plantar fasciitis, tennis elbow or the Achilles tendon. The Storz radial systems offer a wide range of transmitters, including fascia and spine applicators, which allows for both local treatments and the treatment of broad superficial areas. Muscle chains can be treated functionally in the course of the chain.

- Superficial 3-4 cm treatment depth
- Spreads to treat larger areas
- Slow impulse
- Low energy density



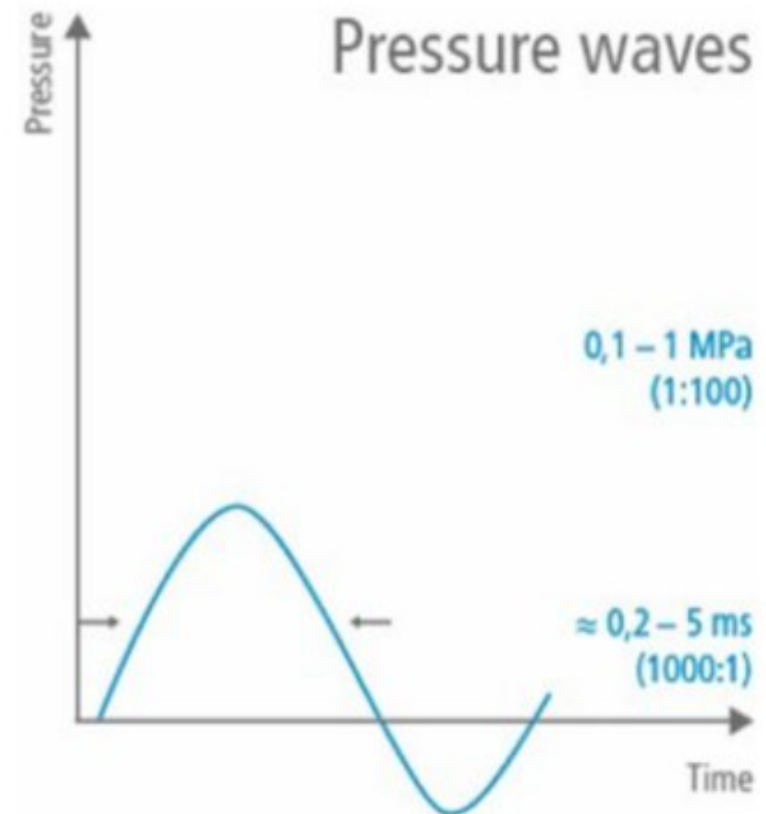
Radial Pressure Wave

The Evidence

Radial pressure waves
Lower energy density



Pressure waves



Focused Shockwave

(Hard Shock) Smaller focal point for greater accuracy and greater treatment depth

How does it work?

- Deeper penetration in a smaller focal zone.
- Ideal for tissue require targeting tissue at a deeper level



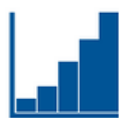
Focused Shockwave

Biological Effects

- Cavitation Release of nitric oxide (increased cell metabolism, neoangiogenesis, anti-inflammatory effect)
- Stimulation of growth factors
- Increase of cell wall permeability
- Stimulation of Microcirculation (Blood, Lymph)
- Release of Substance P Neurotransmitter responsible for pain modulation.
- It is a powerful vasodilator, causing considerable hypotension



Short treatment
time (minutes)



Results in a few
treatments



Precise & targeted
application



Non-invasive and no known
significant adverse effects



Deep tissues can
be reached



Alternative to
medication



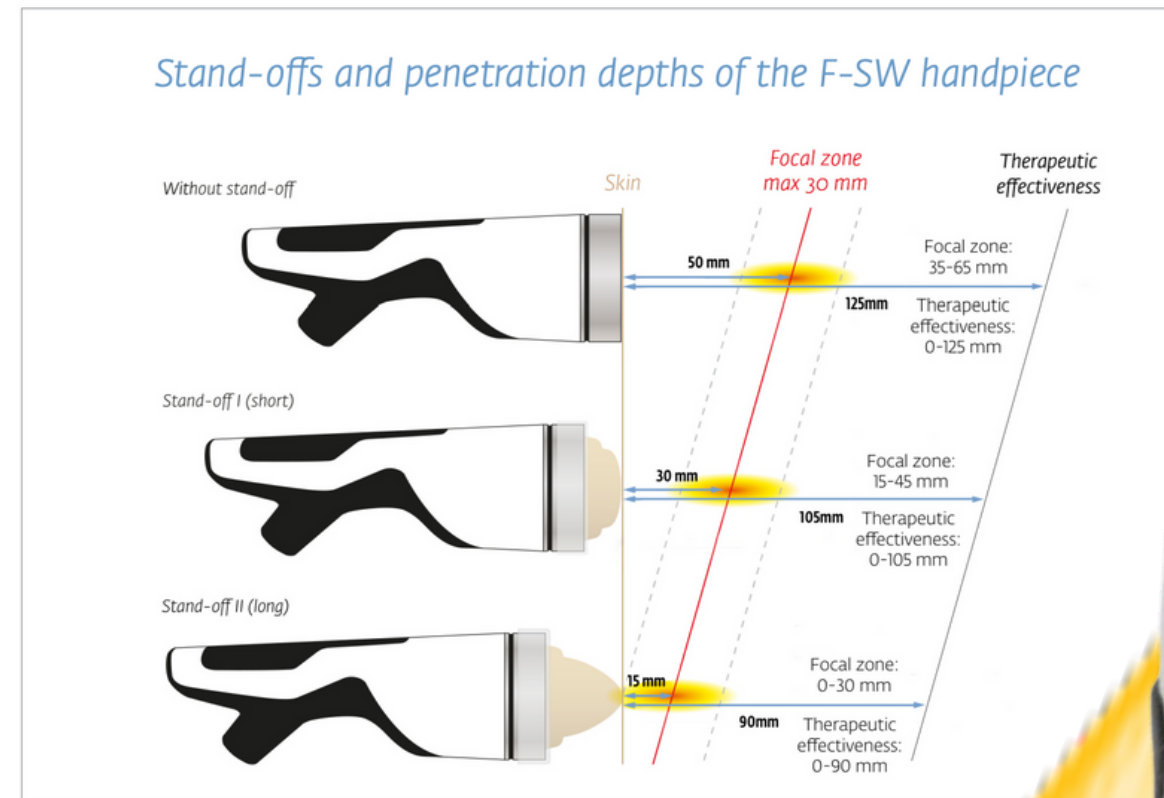
Focused Shockwave

Applying the Treatment

- Deep reach up to 12cm dependent on the attachments used
- Precise energy delivery to the exact area
- Fast impulse
- High energy density

F-SW is used for the treatment of but not limited to:

- Acute injuries in elite athletes
- Knee & Joint arthritis
- Bone and Stress Fractures
- Shin Splints
- Osteitis Pubis -Groin Pain
- Insertional Achilles Pain
- Tibialis Posterior Tendon Syndrome
- Medial Tibial Stress Syndrome
- Haglunds Deformity
- Peroneal Tendon
- Tibialis posterior ankle sprain
- Tendinopathies and Enthesopathies
- Urological indications (ED) Male Impotence or Erectile Dysfunction / Chronic Pelvic Pain / Peyronie's
- Delayed bone-non unions/bone healing
- Wound Healing and other dermatological and aesthetic indications

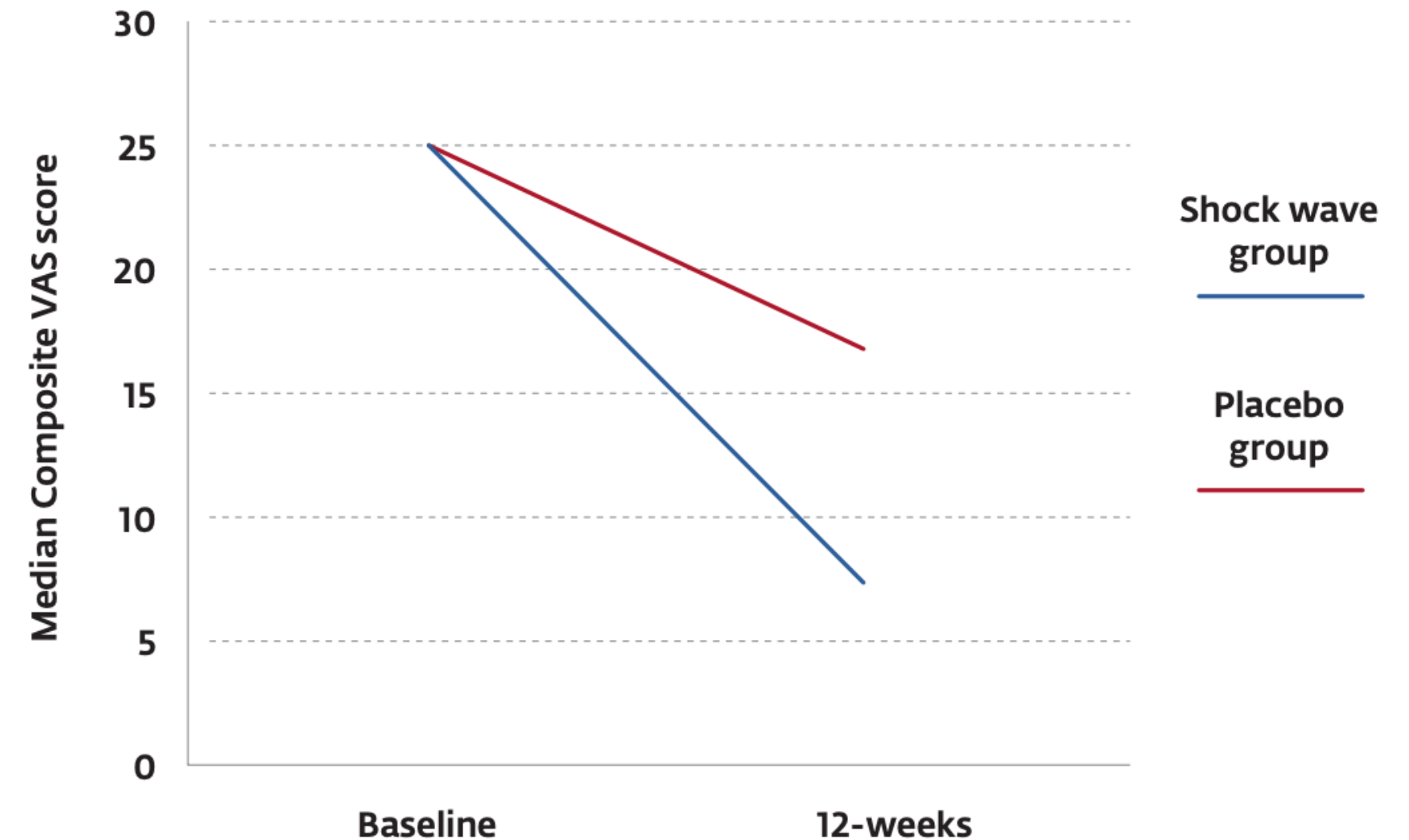


Focused

Shockwave

The Evidence

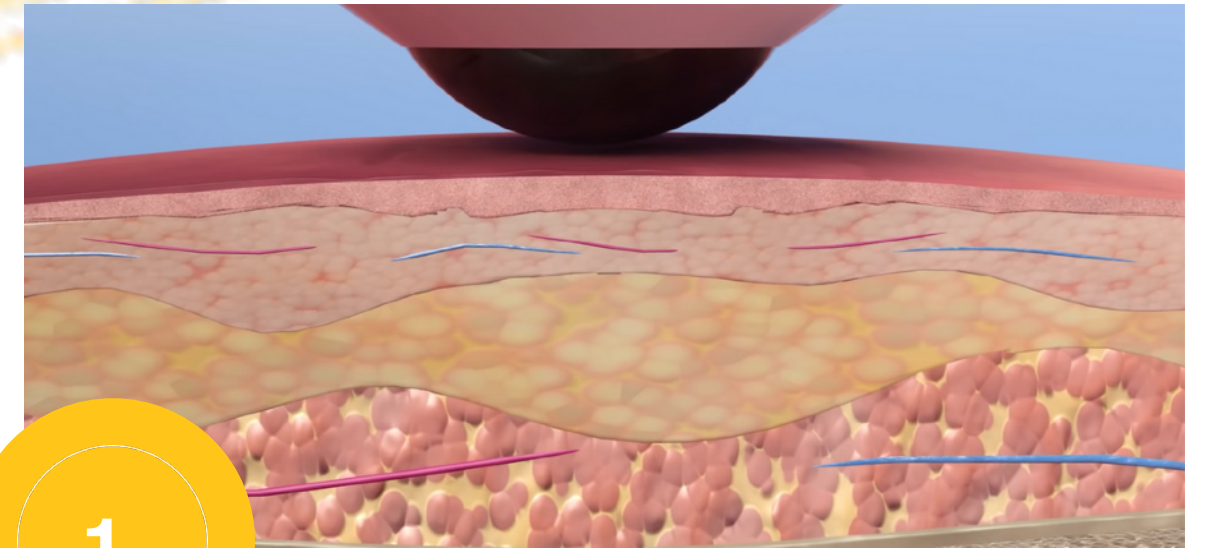
- The focusing mechanism directs each shock to a defined point within the body. The location within the body is adjusted by altering the energy output of the machine or by adjusting the focusing mechanism. A stand off applicator can be used to adapt the depth of energy.



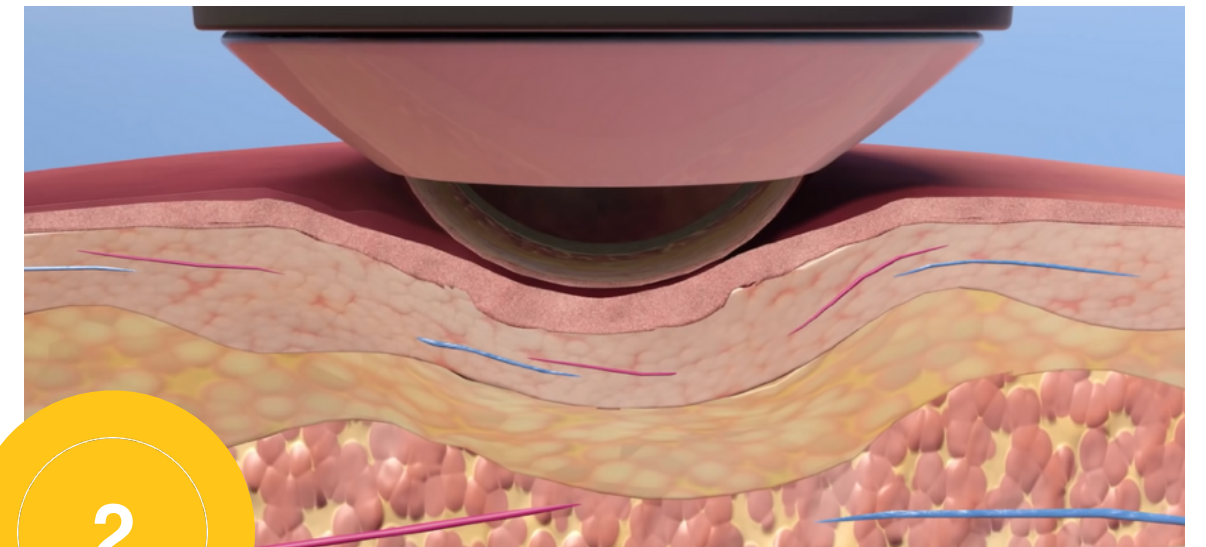
Photobiomodulation

How does it work?

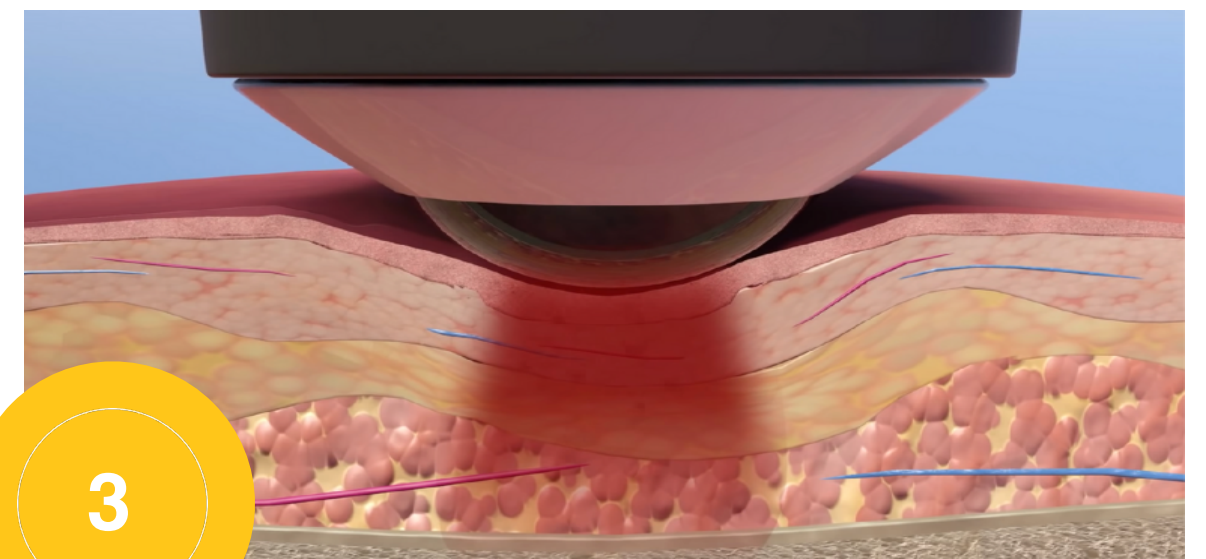
- Laser therapy uses a process called photobiomodulation to change the condition of damaged tissue by stimulating cellular metabolism, thereby accelerating the healing process.
- A large convex treatment head can be used to compress superficial tissues displacing excess fluid and enhancing laser penetration to deep structures. As light flows into the tissue, photons will be scattered, reflected, and absorbed. Lasers operating in the near infrared spectrum from 650 to 1300 nanometers can penetrate to deep tissue structures.
- Light that penetrates into the tissue can be absorbed by melanin, hemoglobin, oxyhemoglobin, and water. Energy from these absorption events will be dissipated as heat, generating a soothing warmth in the tissue.



1



2

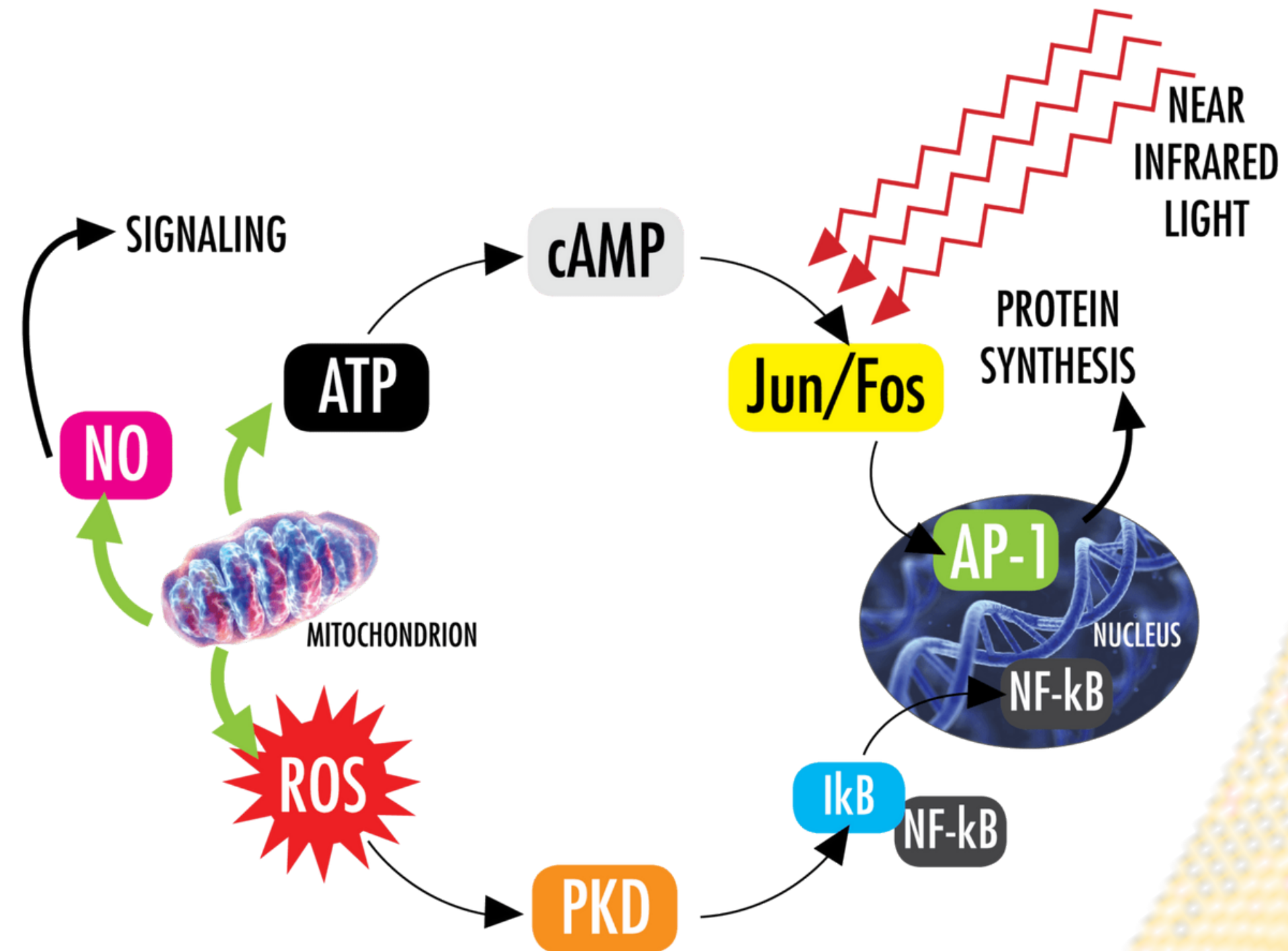


3

Photobiomodulation

Biological effects

- The target for photobiomodulation is the cytochrome C complex which is found in the inner membrane of the mitochondria. Cytochrome C is a vital component of the electron transport chain that drives cellular metabolism. As light is absorbed, Cytochrome C is stimulated leading to increased production of ATP, the molecule that facilitates energy transfer within the cell. In addition to ATP, laser stimulation also produces free nitric oxide and reactive oxygen species. Nitric oxide is powerful vasodilator and an important cellular signaling molecule involved in many physiological processes. The production of these signaling molecules has been shown to induce growth factor production to increase cell proliferation and motility and to promote extracellular matrix deposition and pro-survival pathways.
- The recent development of higher-power Class IV systems afford the clinician the ability to efficiently deliver adequate doses of light deep into tissue to reduce pain, reduce inflammation, and accelerate healing.

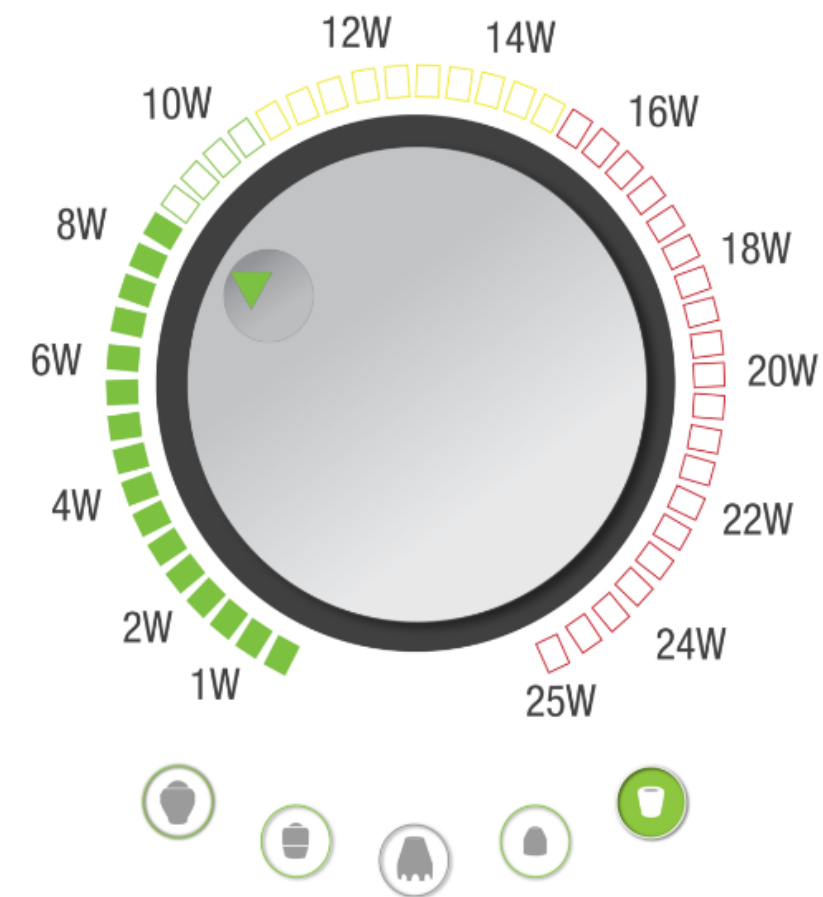




lightforce

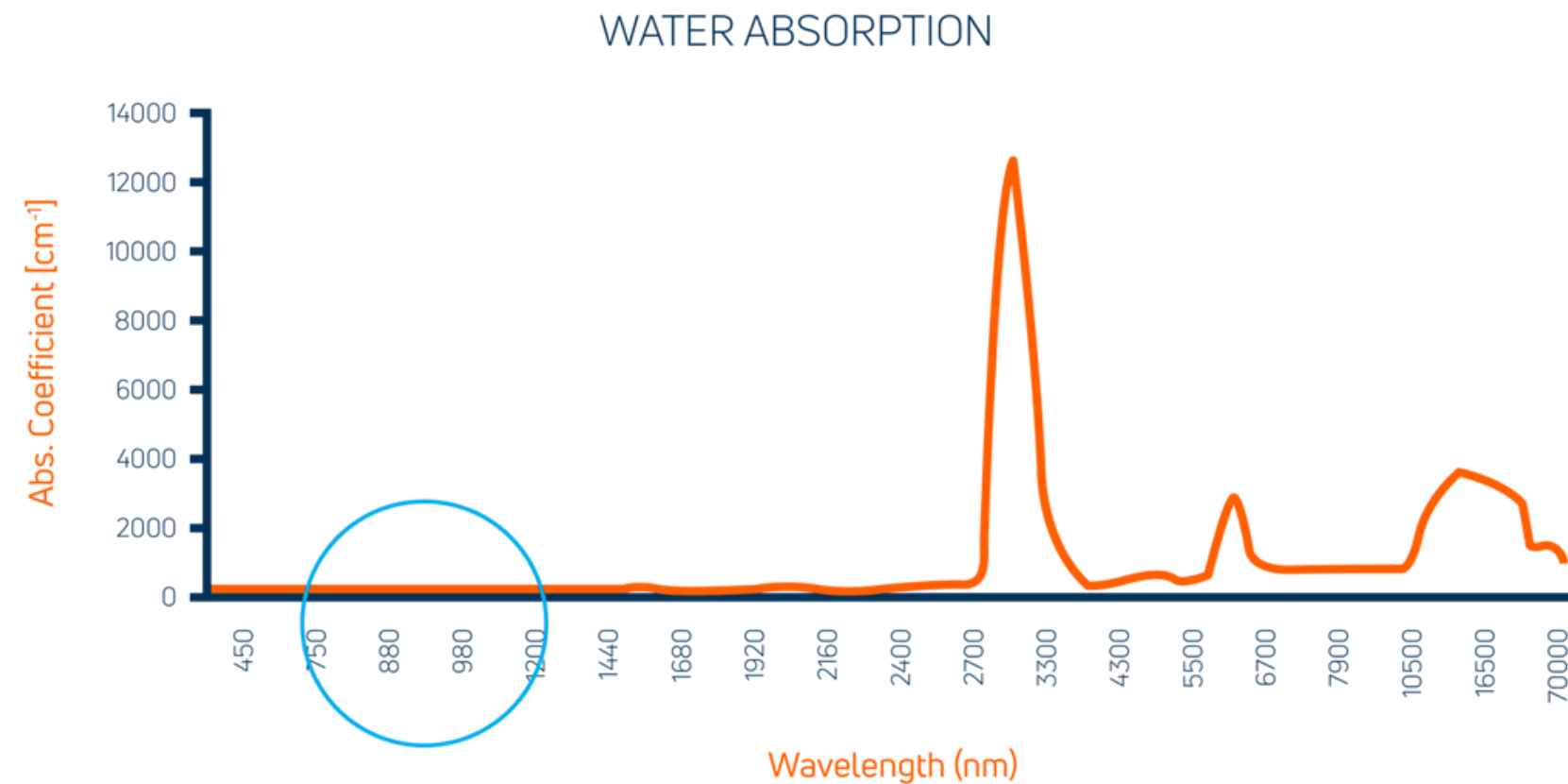
Photobiomodulation

Applying the treatment



Built-in protocols recommend which treatment heads are acceptable or not recommended for different power levels. The smart handpiece recognizes which head is in use and recommends the appropriate power level based on the selected head.

The Evidence



- Many studies have demonstrated analgesic and anti-inflammatory effects provided by photobiomodulation in both experimental and clinical trials.
- Therefore, based on current research, the utilization of LLLT for pain management and osteoarthritic conditions may be a complementary strategy used in clinical practice to provide symptom management for patients suffering from OA and chronic pain.

Published: Alternative Therapies in Health and Medicine, Volume 24, Issue 5, October 2017



Shockwave Research

Received: 29 October 2021 | Revised: 9 February 2022 | Accepted: 11 February 2022

DOI: 10.1002/pmrj.12790

PRACTICE MANAGEMENT



Best practices for extracorporeal shockwave therapy in musculoskeletal medicine: Clinical application and training consideration

Adam S. Tenforde MD¹ | Haylee E. Borgstrom MD, MS¹ |
Stephanie DeLuca MD¹ | Molly McCormack BA¹ | Mani Singh MD² |

British Medical Bulletin, 2015, **116**:115–138
doi: 10.1093/bmb/ldv047
Advance Access Publication Date: 18 November 2015



Efficacy and safety of extracorporeal shock wave therapy for orthopedic conditions: a systematic review on studies listed in the PEDro database

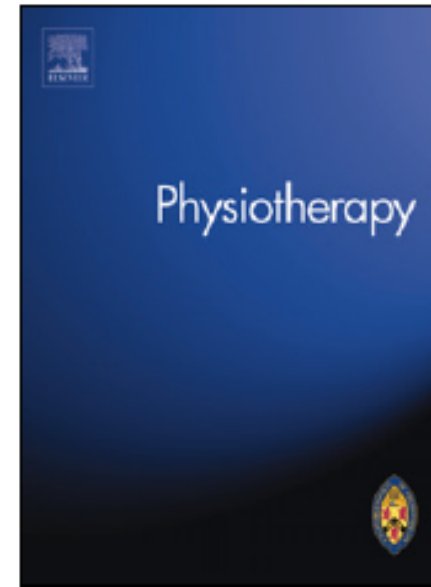
Christoph Schmitz^{†,*}, Nikolaus B. M. Császár[†], Stefan Milz[†],
Matthias Schieker[‡], Nicola Maffulli^{§,¶}, Jan-Dirk Rompell, and John P. Furia^{††}

Photobiomodulation Research

Journal Pre-proof

Effects of low-level and high-intensity laser therapy as adjunctive to rehabilitation exercise on pain, stiffness and function in knee osteoarthritis: a systematic review and meta-analysis

Mohd Azzuan Ahmad, Mohamad Shariff A. Hamid, Ashril Yusof



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Online version at <http://www.minervamedica.it>

European Journal of Physical and Rehabilitation Medicine 2020 December;56(6):733-40
DOI: 10.23736/S1973-9087.19.05835-0

ORIGINAL ARTICLE

A comparative study of the dose-dependent effects of low level and high intensity photobiomodulation (laser) therapy on pain and electrophysiological parameters in patients with carpal tunnel syndrome

Kamran EZZATI ¹, E-Liisa LAAKSO ², Alia SABERI ³ *, Shahrokh YOUSEFZADEH CHABOK ⁴,
Ebrahim NASIRI ⁵, Babak BAKHSHAYESH EGHBALI ³

Chatterjee et al. BMC Geriatrics (2019) 19:218
<https://doi.org/10.1186/s12877-019-1237-5>

BMC Geriatrics

RESEARCH ARTICLE

Open Access

Effect of deep tissue laser therapy treatment on peripheral neuropathic pain in older adults with type 2 diabetes: a pilot randomized clinical trial

Prasun Chatterjee^{1*}, Achal K. Srivastava², Deepa A. Kumar¹, Avinash Chakrawarty¹, Maroof A. Khan³, Akash K. Ambashtha⁴, Vijay Kumar¹, Luis De Taboada⁵ and Aparajit B. Dey¹



Integration

- Not covered by insurance
- Value proposition
- Offering a solution right there in your office – not sending them to CVS, PT, Ortho
- Revenue Stream
- Differentiate
- Referral generator – get people in the door
- Pricing based on demographics
- Being prescriptive with packages



Conclusion



EVIDENCE-BASED

Well establish and growing body of literature, with hundreds of RCTs done each year evaluating the effects and determining best practices.



EFFECTIVE

Safe, well-tolerated, with little to no downtime for treatments done in your clinic.



BACK IN YOUR HANDS

With these tools, **the power to heal** comes back in your hands as primary care and sports medicine providers and offer an alternative to the standard glide path to surgery.

Thank you!

Questions?



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