

SHOCK WAVE & RPW CLINICAL EVIDENCE

FOCUSED and RADIAL

BIOLOGICAL EFFECTS - MECHANOTRANSDUCTION & CAVITATION

Auersperg V, Trieb K. (2020), Extracorporeal shock wave therapy: an update. EFORT Open Rev. Oct 26;5(10):584-592

Cristina d'Agostino M, Craig K, Tibalt E, Respizzi S. Shock wave as biological therapeutic tool: From mechanical stimulation to recovery and healing, through mechanotransduction. Int J Surg. 2015 Dec;24(Pt B):147-53.

Ogden JA, Tóth-Kischkat A, Schultheiss R. Principles of shock wave therapy. Clin Orthop Relat Res. 2001 Jun;(387):8-17.

ANALGESIC

Schmitz C, DePace R. Pain relief by extracorporeal shockwave therapy: an update on the current understanding. Urol Res. 2009 Aug;37(4):231-4.

MENS HEALTH

Li G, Man L. (2021), Low-intensity extracorporeal shock wave therapy for male chronic pelvic pain syndrome: a systematic review and meta-analysis. Transl Androl Urol. Mar;10(3):1202-1211

Robinson DM, Tan CO,(2021), Tenforde AS. Functional Gains Using Radial and Combined Shockwave Therapy in the Management of Achilles Tendinopathy. J Foot Ankle Surg. Jun 24:1067-2516(21)00226-X.

Wu SS, Ericson KJ, Shoskes DA. (2020), Retrospective comparison of focused shockwave therapy and radial wave therapy for men with erectile dysfunction. Transl Androl Urol. Oct;9(5):2122-2128

STEM CELLS

Zhang H, Li ZL, Yang F, Zhang Q, Su XZ, Li J, Zhang N, Liu CH, Mao N, Zhu H. Radial shockwave treatment promotes human mesenchymal stem cell self-renewal and enhances cartilage healing. Stem Cell Res Ther. 2018 Mar 9;9(1):54.

Neuland H, Delhase Y, Duchstein HJ, Schmidt A, Bloc W. Extracorporeal Shock Waves Influences Migration, Proliferation and Growth of Human Mesenchymal Stem Cells. ISMST Newsletter May 2008;4(1):13-16.

Facchin F, Canaider S, Tassinari R, Zannini C, Bianconi E, Taglioli V, Olivi E, Cavallini C, Tausel M, Ventura C. Physical energies to the rescue of damaged tissues. World J Stem Cells. 2019 Jun 26;11(6):297-321.

ACHILLES TENDINOPATHY (FSW & RPW)

Fan Y, Feng Z, Cao J, Fu W. (2020), Efficacy of Extracorporeal Shock Wave Therapy for Achilles Tendinopathy: A Meta-analysis. *Orthop J Sports Med.* Feb 27;8(2):2325967120903430

Gerdesmeyer L, Mittermayr R, Fuerst M, Al Muderis M, Thiele R, Saxena A, Gollwitzer H. Current evidence of extracorporeal shock wave therapy in chronic Achilles tendinopathy. *Int J Surg.* 2015 Dec;24(Pt B):154-9.

Mani-Babu S, Morrissey D, Waugh C, Screen H, Barton C. The effectiveness of extracorporeal shock wave therapy in lower limb tendinopathy: a systematic review. *Am J Sports Med.* 2015 Mar;43(3):752-61.

KNEE OA (FSW & RPW)

Avendaño-Coy J, Comino-Suárez N, Grande-Muñoz J, Avendaño-López C, Gómez-Soriano J. (2020), Extracorporeal shockwave therapy improves pain and function in subjects with knee osteoarthritis: A systematic review and meta-analysis of randomized clinical trials. *Int J Surg.* Oct;82:64-75. doi: 10.1016/j.ijisu.2020.07.055. Epub Aug 13.

PATELLAR TENDINOPATHY (FSW & RPW)

Mani-Babu S, Morrissey D, Waugh C, Screen H, Barton C. The effectiveness of extracorporeal shock wave therapy in lower limb tendinopathy: a systematic review. *Am J Sports Med.* 2015 Mar;43(3):752-61.

van Leeuwen MT, Zwerver J, van den Akker-Scheek I. Extracorporeal shockwave therapy for patellar tendinopathy: a review of the literature. *Br J Sports Med.* 2009 Mar;43(3):163-8.

van der Worp H et al. No difference in effectiveness between focused and radial shockwave therapy for treating patellar tendinopathy: a randomized controlled trial. *Knee Surg Sports Traumatol Arthrosc.* 2014 Sep;22(9):2026-32.

PLANTAR FASCIITIS

Aqil A, Siddiqui MR, Solan M, Redfern DJ, Gulati V, Cobb JP. Extracorporeal Shock Wave Therapy Is Effective In Treating Chronic Plantar Fasciitis: A Meta-analysis of RCTs. *Clin Orthop Relat Res.* 2013 Nov;471(11):3645-52.

Chang KV, Chen SY, Chen WS, Tu YK, Chien KL. Comparative Effectiveness of Focused Shock Wave Therapy of Different Intensity Levels and Radial Shock Wave Therapy for Treating Plantar Fasciitis: a Systematic Review and Network Meta-analysis. *Arch Phys Med Rehabil.* 93(7):1259-68.

Li H, Xiong Y, Zhou W, Liu Y, Liu J, Xue H, Hu L, Panayi AC, Mi B, Liu G. Shock-wave therapy improved outcome with plantar fasciitis: a meta-analysis of randomized controlled trials. *Arch Orthop Trauma Surg.* 2019 Dec;139(12):1763-1770.

Lou J, Wang S, Liu S, Xing G. Effectiveness of Extracorporeal Shock Wave Therapy Without Local Anesthesia in Patients With Recalcitrant Plantar Fasciitis: A Meta-Analysis of Randomized Controlled Trials. *Am J Phys Med Rehabil.* 2017 Aug;96(8):529-534.

Morrissey D, Cotchett M, Said J'Bari A, Prior T, Griffiths IB, Rathleff MS, Gulle H, Vicenzino B, Barton CJ. (2021), Management of plantar heel pain: a best practice guide informed by a systematic review, expert clinical reasoning and patient values. *Br J Sports Med.* Oct;55(19):1106-1118

Xu D, Jiang W, Huang D, Hu X, Wang Y, Li H, Zhou S, Gan K, Ma W. Comparison Between Extracorporeal Shock Wave Therapy and Local Corticosteroid Injection for Plantar Fasciitis. *Foot Ankle Int.* 2020 Feb;41(2):200-205.

Yin MC, Ye J, Yao M, Cui XJ, Xia Y, Shen QX, Tong ZY, Wu XQ, Ma JM, Mo W. Is extracorporeal shock wave therapy clinical efficacy for relief of chronic, recalcitrant plantar fasciitis? A systematic review and meta-analysis of randomized placebo or active-treatment controlled trials. *Arch Phys Med Rehabil.* 2014 Aug;95(8):1585-93.

MUSCULOSKELETAL DISORDERS

Al-Abbad H, Allen S, Morris S, Reznik J, Biroš E, Paulik B, Wright A. (2020), The effects of shockwave therapy on musculoskeletal conditions based on changes in imaging: a systematic review and meta-analysis with meta-regression. *BMC Musculoskelet Disord.* Apr 28;21(1):275.

Ioppolo F, Rompe JD, Furia JP, Cacchio A. Clinical application of shock wave therapy (SWT) in musculoskeletal disorders. *Eur J Phys Rehabil Med.* 2014 Apr;50(2):217-30.

SPASTICITY

Cabanas-Valdés R1, Calvo-Sanz J2,3, Urrütia G4, Serra-Llobet P1, Pérez-Bellmunt A5, Germán-Romero A. The effectiveness of extracorporeal shock wave therapy to reduce lower limb spasticity in stroke patients: a systematic review and meta-analysis. *Top Stroke Rehabil.* 2020 Mar;27(2):137-157.

Dymarek R et al. Shock Waves as a Treatment Modality for Spasticity Reduction and Recovery Improvement in Post-Stroke Adults - Current Evidence and Qualitative Systematic Review. *Clin Interv Aging.* 2020 Jan 6;15:9-28.

Guo P, Gao F, Zhao T, Sun W, Wang B, Li Z. Positive Effects of Extracorporeal Shock Wave Therapy on Spasticity in Poststroke Patients: A Meta-Analysis. *J Stroke Cerebrovasc Dis.* 2017 Nov;26(11):2470-2476.

Jia G, Ma J, Wang S, Wu D, Tan B, Yin Y, Jia L, Cheng L. Long-term Effects of Extracorporeal Shock Wave Therapy on Poststroke Spasticity: A Meta-analysis of Randomized Controlled Trials. *J Stroke Cerebrovasc Dis.* 2020 Mar;29(3):104591.

Kim HJ1, Park JW2, Nam K. Effect of extracorporeal shockwave therapy on muscle spasticity in patients with cerebral palsy: meta-analysis and systematic review. *Eur J Phys Rehabil Med.* 2019 Dec;55(6):761-771.

Martínez IM, Sempere-Rubio N, Navarro O, Faubel R. (2020), Effectiveness of Shock Wave Therapy as a Treatment for Spasticity: A Systematic Review. *Brain Sci.* 2020 Dec 24;11(1):15.

Wu YT et al. Comparison of the effect of focused and radial extracorporeal shock waves on spastic equinus in patients with stroke: a randomized controlled trial. *Eur J Phys Rehabil Med*. 2018 Aug;54(4):518-525.

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GREATER TROCHANTERIC PAIN

Mani-Babu S, Morrissey D, Waugh C, Screen H, Barton C. The effectiveness of extracorporeal shock wave therapy in lower limb tendinopathy: a systematic review. *Am J Sports Med*. 2015 Mar;43(3):752-61.

MYOFASCIAL TPs

Gleitz M et al. Orthopedic trigger point shock wave therapy with focused and radial shock waves: a review of the current situation. *Orthopädische Praxis* 42, 5 (2006), 303-12.

Zhang Q, Fu C, Huang L, Xiong F, Peng L, Liang Z, Chen L, He C, Wei Q. Efficacy of Extracorporeal Shock Wave Therapy on pain, function in Myofascial Pain Syndrome of the Trapezius: a systematic review and meta-analysis. *Arch Phys Med Rehabil*. 2020 Mar 28. [Epub ahead of print].

SHOULDER TENDINOPATHY

Wu YC, Tsai WC, Tu YK, Yu TY. Comparative Effectiveness of Nonoperative Treatments for Chronic Calcific Tendinitis of the Shoulder: A Systematic Review and Network Meta-Analysis of Randomized Controlled Trials. *Arch Phys Med Rehabil*. 2017 Aug;98(8):1678-1692.

SHOULDER ROTATOR CUFF

Abo Al-Khair MA, Eldin Mowafy ME, Hussein MI, Al Sattar Elsergany MA, Khodair SA, El Khouly RM. (2020), Focused, radial and combined shock wave therapy in treatment of calcific shoulder tendinopathy. *Phys Sportsmed*. Dec 6:1-8.

Li C, Li Z, Shi L, Wang P, Gao F, Sun W. (2021), Effectiveness of Focused Shockwave Therapy versus Radial Shockwave Therapy for Noncalcific Rotator Cuff Tendinopathies: A Randomized Clinical Trial. *Biomed Res Int*. Jan 9;:6687094.

IMPROVEMENT ON IMAGING (ROTATOR CUFF CALC TENDINITIS | PLANTAR FASCIITIS | OSTEONECROSIS FEMORAL HEAD)

Al-Abbad H, Allen S, Morris S, Reznik J, Biroš E, Paulik B, Wright A. The effects of shockwave therapy on musculoskeletal conditions based on changes in imaging: a systematic review and meta-analysis with meta-regression. *BMC Musculoskelet Disord*. 2020 Apr 28;21(1):275.

LATERAL EPICONDYLITIS

Yan C, Xiong Y, Chen L, Endo Y, Hu L, Liu M, Liu J, Xue H, Abududilibaier A, Mi B, Liu G. (2019), A comparative study of the efficacy of ultrasonics and extracorporeal shock wave in the treatment of tennis elbow: a meta-analysis of randomized controlled trials. *J Orthop Surg Res.* Aug 6;14(1):248

Yao G, Chen J, Duan Y, Chen X. Efficacy of Extracorporeal Shock Wave Therapy for Lateral Epicondylitis: A Systematic Review and Meta-Analysis. *Biomed Res Int.* 2020 Mar 18;2020:2064781.

CARPAL TUNNEL SYNDROME

Kim JC, Jung SH, Lee SU, Lee SY. Effect of extracorporeal shockwave therapy on carpal tunnel syndrome: A systematic review and meta-analysis of randomized controlled trials. *Medicine (Baltimore).* 2019 Aug;98(33):e16870.

Li W, Dong C, Wei H, Xiong Z, Zhang L, Zhou J, Wang Y, Song J, Tan M. (2020), Extracorporeal shock wave therapy versus local corticosteroid injection for the treatment of carpal tunnel syndrome: a meta-analysis. *J Orthop Surg Res.* Nov 23;15(1):556.

Xie Y, Zhang C, Liang B, Wang J, Wang L, Wan T, Xu F, Lei L. Effects of Shock Wave Therapy in Patients With Carpal Tunnel Syndrome: A Systematic Review and Meta-Analysis. *Disabil Rehabil.* 2020 May 18;1-12.

FOCUSED

SPASTICITY

Wu YT, Chang CN, Chen YM, Hu GC. Comparison of the effect of focused and radial extracorporeal shock waves on spastic equinus in patients with stroke: a randomized controlled trial. *Eur J Phys Rehabil Med.* 2018 Aug;54(4):518-525.

Yoon SH, Shin MK, Choi EJ, Kang HJ. Effective Site for the Application of Extracorporeal Shock-Wave Therapy on Spasticity in Chronic Stroke: Muscle Belly or Myotendinous Junction. *Ann Rehabil Med.* 2017 Aug;41(4):547-555.

TENDON REPAIR - TENOCYTES

Notarnicola A, Moretti B. The biological effects of extracorporeal shock wave therapy (eswt) on tendon tissue. *Muscles Ligaments Tendons J.* 2012 Jun 17;2(1):33-7.

Chao YH, Tsuang YH, Sun JS, Chen LT, Chiang YF, Wang CC, Chen MH. Effects of shock waves on tenocyte proliferation and extracellular matrix metabolism. *Ultrasound Med Biol.* 2008 May;34(5):841-52.

Waugh CM, Morrissey D, Jones E, Riley GP, Langberg H, Screen HR. In vivo biological response to extracorporeal shockwave therapy in human tendinopathy. *Eur Cell Mater.* 2015 May 15;29:268-80.

OSTEOBLASTS and BONE MARROW OEDEMA

Tamma R, dell'Endice S, Notarnicola A, Moretti L, Patella S, Patella V, Zallone A, Moretti B. Extracorporeal shock waves stimulate osteoblast activities. *Ultrasound Med Biol.* 2009 Dec;35(12):2093-100.

Häußer J, Wieber J, Catalá-Lehnen P. (2021), The use of extracorporeal shock wave therapy for the treatment of bone marrow oedema - a systematic review and meta-analysis. *J Orthop Surg Res.* Jun 9;16(1):369

NONUNIONS

Schaden W, Mittermayr R, Haffner N, Smolen D, Gerdesmeyer L, Wang CJ. Extracorporeal shockwave therapy (ESWT)- First choice treatment of fracture non-unions? *Int J Surg.* 2015 Dec;24(Pt B):179-83.

Schaden W, Fischer A, Sailler A. Extracorporeal shock wave therapy of nonunion or delayed osseous union. *Clin Orthop Relat Res.* 2001 Jun;(387):90-4.

ANTI-INFLAMMATORY

Mariotto S, de Prati AC, Cavalieri E, Amelio E, Marlinghaus E, Suzuki H. Extracorporeal shock wave therapy in inflammatory diseases: molecular mechanism that triggers anti-inflammatory action. *Curr Med Chem.* 2009;16(19):2366-72.

PRO-INFLAMMATORY

Waugh CM, Morrissey D, Jones E, Riley GP, Langberg H, Screen HR. In vivo biological response to extracorporeal shockwave therapy in human tendinopathy. *Eur Cell Mater.* 2015 May 15;29:268-80.

VASCULARISATION

Raza A, Harwood A, Totty J, Smith G, Chetter I. Extracorporeal Shockwave Therapy for Peripheral Arterial Disease: A Review of the Potential Mechanisms of Action. *Ann Vasc Surg.* 2017 Nov;45:294-298.

Cayton T, Harwood A, Smith GE, Chetter I. A Systematic Review of Extracorporeal Shockwave Therapy as a Novel Treatment for Intermittent Claudication. *Ann Vasc Surg.* 2016 Aug;35:226-33.

NEO-ANGIOGENESIS

Cristina d'Agostino M, Craig K, Tibalt E, Respizzi S. Shock wave as biological therapeutic tool: From mechanical stimulation to recovery and healing, through mechanotransduction. *Int J Surg.* 2015 Dec;24(Pt B):147-53.

Facchin F, Canaider S, Tassinari R, Zannini C, Bianconi E, Taglioli V, Olivi E, Cavallini C, Tausel M, Ventura C. Physical energies to the rescue of damaged tissues. *World J Stem Cells.* 2019 Jun 26;11(6):297-321.

Tepeköylü C, Wang FS, Kozaryn R, Albrecht-Schgoer K, Theurl M, Schaden W, Ke HJ, Yang Y, Kirchmair R, Grimm M, Wang CJ, Holfeld J. Shock wave treatment induces angiogenesis and mobilizes endogenous

CD31/CD34-positive endothelial cells in a hindlimb ischemia model: implications for angiogenesis and vasculogenesis. *J Thorac Cardiovasc Surg.* 2013 Oct;146(4):971-8.

LUBRICIN

Zhang D, Kearney CJ, Cheriyan T, Schmid TM, Spector M. Extracorporeal shockwave-induced expression of lubricin in tendons and septa. *Cell Tissue Res.* 2011 Nov;346(2):255-62.

PLANTAR FASCIITIS (FSW)

Gollwitzer H, Saxena A, DiDomenico LA, Galli L, Bouché RT, Caminear DS, Fullem B, Vester JC, Horn C, Banke IJ, Burgkart R, Gerdesmeyer L. Clinically relevant effectiveness of focused extracorporeal shock wave therapy in the treatment of chronic plantar fasciitis: a randomized, controlled multicenter study. *J Bone Joint Surg Am.* 2015 May 6;97(9):701-8.

Maki M, Ikoma K, Kido M, Hara Y, Sawada K, Ohashi S, Kubo T. Magnetic resonance imaging findings of chronic plantar fasciitis before and after extracorporeal shock wave therapy. *Foot (Edinb).* 2017 Dec;33:25-28.

Melese H, Alamer A, Getie K, Nigussie F, Ayhuallem S.(2021), Extracorporeal shock wave therapy on pain and foot functions in subjects with chronic plantar fasciitis: systematic review of randomized controlled trials. *Disabil Rehabil.* 2021 May 26:1-8

Takla MKN, Rezk SSR. (2019), Clinical effectiveness of multi-wavelength photobiomodulation therapy as an adjunct to extracorporeal shock wave therapy in the management of plantar fasciitis: a randomized controlled trial. *Lasers Med Sci.* Apr;34(3):583-593

ACHILLES TENDINOPATHY

Furia JP. High-energy extracorporeal shock wave therapy as a treatment for chronic noninsertional Achilles tendinopathy. *Am J Sports Med.* 2008 Mar;36(3):502-8.

MTSS - SHIN SPLINTS (FSW)

Gomez Garcia S, Ramon Rona S, Gomez Tinoco MC, Benet Rodriguez M, Chaustre Ruiz DM, Cardenas Letrado FP, Lopez-Illescas Ruiz Á, Alarcon Garcia JM. Shockwave treatment for medial tibial stress syndrome in military cadets: A single-blind randomized controlled trial. *Int J Surg.* 2017 Oct;46:102-109.

PES ANSERINUS (FSW)

Khosrawi S, Taheri P, Ketabi M. Investigating the Effect of Extracorporeal Shock Wave Therapy on Reducing Chronic Pain in Patients with Pes Anserine Bursitis: A Randomized, Clinical- Controlled Trial. *Adv Biomed Res.* 2017 Jun 6;6:70.

GTR TROCHANTERIC PAIN (FSW)

Mei J, Pang L, Jiang Z. (2021), The effect of extracorporeal shock wave on osteonecrosis of femoral head : a systematic review and meta-analysis. *Phys Sportsmed*. Jun 7:1-9

Ramon S, Russo S, Santoboni F, Lucenteforte G, Di Luise C, de Unzurrunzaga R, Vetrano M, Albano M, Baldini R, Cugat R, Stella G, Balato G, Seijas R, Nusca SM, Servodidio V, Vulpiani MC. (2020), Focused Shockwave Treatment for Greater Trochanteric Pain Syndrome: A Multicenter, Randomized, Controlled Clinical Trial. *J Bone Joint Surg Am*. Aug 5;102(15):1305-1311

Seo KH, Lee JY, Yoon K, Do JG, Park HJ, Lee SY, Park YS, Lee YT. Long-term outcome of low-energy extracorporeal shockwave therapy on gluteal tendinopathy documented by magnetic resonance imaging. *PLoS One*. 2018 Jul 17;13(7):e0197460.

Zhao W, Gao Y, Zhang S, Liu Z, He L, Zhang D, Li W, Meng Q. (2021), Extracorporeal shock wave therapy for bone marrow edema syndrome in patients with osteonecrosis of the femoral head: a retrospective cohort study. *J Orthop Surg Res*. Jan 7;16(1):21.

COCCYDYNIA (FSW)

Marwan Y, Dahrab B3, Esmaeel A, Ibrahim SA, Al-Failakawi J. Extracorporeal shock wave therapy for the treatment of coccydynia: a series of 23 cases. *Eur J Orthop Surg Traumatol*. 2017 Jul;27(5):591-598.

Gönen Aydın C, Örsçelik A, Gök M, Akman Y. The Efficacy of Extracorporeal Shock Wave Therapy for Chronic Coccydynia. *Med Princ Pract*. 2020 Jan 10. doi: 10.1159/000505835. [Epub ahead of print]

CARPAL TUNNEL SYNDROME (FSW)

Seok H, Kim SH. The effectiveness of extracorporeal shock wave therapy vs. local steroid injection for management of carpal tunnel syndrome: a randomized controlled trial. *Am J Phys Med Rehabil*. 2013 Apr;92(4):327-34.

Gesslbauer C, Mickel M, Schuhfried O, Huber D, Keilani M, Crevenna R. (2021), Effectiveness of focused extracorporeal shock wave therapy in the treatment of carpal tunnel syndrome : A randomized, placebo-controlled pilot study. *Wien Klin Wochenschr*. Jun;133(11-12):568-577

Vahdatpour B, Kiyani A, Dehghan F. Effect of extracorporeal shock wave therapy on the treatment of patients with carpal tunnel syndrome. *Adv Biomed Res*. 2016 Jul 29;5:120.

SHOULDER TENDINITIS (FSW)

Badil Güloğlu S.(2021), Comparison of low-level laser treatment and extracorporeal shock wave therapy in subacromial impingement syndrome: a randomized, prospective clinical study. *Lasers Med Sci*. Jun;36(4):773-781

Bannuru RR, Flavin NE, Vaysbrot E, Harvey W, McAlindon T. High-energy extracorporeal shock-wave therapy for treating chronic calcific tendinitis of the shoulder: a systematic review. *Ann Intern Med*. 2014 Apr 15;160(8):542-9.

Verstraelen FU, In den Kleef NJ, Jansen L, Morrenhof JW. High-energy versus low-energy extracorporeal shock wave therapy for calcifying tendinitis of the shoulder: which is superior? A meta-analysis. *Clin Orthop Relat Res*. 2014 Sep;472(9):2816-25.

Louwerens JK, Veltman ES, van Noort A, van den Bekerom MP. The Effectiveness of High-Energy Extracorporeal Shockwave Therapy Versus Ultrasound-Guided Needling Versus Arthroscopic Surgery in the Management of Chronic Calcific Rotator Cuff Tendinopathy: A Systematic Review. *Arthroscopy*. 2016 Jan;32(1):165-75.

SHOULDER ADHESIVE CAPSULITIS (FROZEN SHOULDER)

Vahdatpour B, Taheri P, Zare Zade A, Moradian S. Efficacy of Extracorporeal Shockwave Therapy in Frozen Shoulder. *Int J Prev Med*. 2014 Jul; 5(7): 875–881.

ELBOW EPICONDYLITIS (FSW)

Rompe JD, Decking J, Schoellner C, Theis C. Repetitive low-energy shock wave treatment for chronic lateral epicondylitis in tennis players. *Am J Sports Med*. 2004 Apr-May;32(3):734-43.

Pettrone FA, McCall BR. Extracorporeal shock wave therapy without local anesthesia for chronic lateral epicondylitis. *J Bone Joint Surg Am*. 2005 Jun;87(6):1297-304.

MYOFASCIAL PAIN (FSW)

Jeon JH, Jung YJ, Lee JY, Choi JS, Mun JH, Park WY, Seo CH, Jang KU. The effect of extracorporeal shock wave therapy on myofascial pain syndrome. *Ann Rehabil Med*. 2012 Oct;36(5):665-74.

Luan S, Zhu ZM, Ruan JL, Lin CN, Ke SJ, Xin WJ, Liu CC, Wu SL, Ma C. (2019), Randomized Trial on Comparison of the Efficacy of Extracorporeal Shock Wave Therapy and Dry Needling in Myofascial Trigger Points. *Am J Phys Med Rehabil*. Aug;98(8):677-684

LUMBALGIA

Çelik A, Altan L, Ökmen BM. The Effects Of Extracorporeal Shock Wave Therapy On Pain, Disability And Life Quality Of Chronic Low Back Pain Patients. *Altern Ther Health Med*. 2020 Mar;26(2):54-60.

Hong JO, Park JS, Jeon DG, Yoon WH, Park JH. Extracorporeal Shock Wave Therapy Versus Trigger Point Injection in the Treatment of Myofascial Pain Syndrome in the Quadratus Lumborum. *Ann Rehabil Med*. 2017 Aug;41(4):582-588.

Taheri P, Khosrawi S, (2021), Ramezani M. Extracorporeal Shock Wave Therapy Combined With Oral Medication and Exercise for Chronic Low Back Pain: A Randomized Controlled Trial. *Arch Phys Med Rehabil*. Jul;102(7):1294-1299.

WOUND HEALING

Holsapple JS, Cooper B, Berry SH, Staniszewska A, Dickson BM, Taylor JA, Bachoo P, Wilson HM. (2021), Low Intensity Shockwave Treatment Modulates Macrophage Functions Beneficial to Healing Chronic Wounds. *Int J Mol Sci.* 2021 Jul 22;22(15):7844

MEN'S HEALTH

Abdessater M, Akakpo W, Kanbar A, Parra J, Seisen T, Chartier-Kastler E, Drouin SJ, Roupret M. (2021), Low-intensity extracorporeal shock wave therapy for Peyronie's disease: a single-center experience. *Asian J Androl.* May 21.

Chung E, Cartmill R. (2021), Evaluation of Long-Term Clinical Outcomes and Patient Satisfaction Rate Following Low Intensity Shock Wave Therapy in Men With Erectile Dysfunction: A Minimum 5-Year Follow-Up on a Prospective Open-Label Single-Arm Clinical Study. *Sex Med.* Aug;9(4):100384

Karakose A, Yitgin Y. (2021) Penile rehabilitation with low-intensity extracorporeal shock wave therapy in patients after prostate cancer surgery. Early physiological changes and postoperative follow-up outcomes. *Int J Clin Pract.* Sep 6:e14804

Kim KS, Choi YS, Bae WJ, Cho HJ, Ha US, Hong SH, Lee JY, Han CH, Kim SW (2021),. Clinical Efficacy of Multi-Focal Low-Intensity Extracorporeal Shockwave Therapy in the Treatment of Chronic Prostatitis/Chronic Pelvic Pain Syndrome: Prospective-Randomized, Double Blind, Placebo-Controlled Study. *World J Mens Health.* Jul 14.

Ladegaard PBJ, Mortensen J, Skov-Jepesen SM, Lund L. (2021), Erectile Dysfunction A Prospective Randomized Placebo-Controlled Study Evaluating the Effect of Low-Intensity Extracorporeal Shockwave Therapy (LI-ESWT) in Men With Erectile Dysfunction Following Radical Prostatectomy. *Sex Med.* Jun;9(3):100338

Mykoniatis I, Pyrgidis N, Sokolakis I, Sountoulides P, Hatzichristodoulou G, Apostolidis A, Hatzichristou D. (2021), Low-Intensity Shockwave Therapy for the Management of Chronic Prostatitis/Chronic Pelvic Pain Syndrome: A Systematic Review and Meta-Analysis. *BJU Int.* Jan 12.15335. Epub ahead of print. PMID: 33434323.

Palmieri A, Arcaniolo D, Palumbo F, Verze P, Liguori G, Mondaini N, Falcone M, Scroppo FI, Salonia A, Cai T;(2021), SIA-Low intensity shock wave for Erectile Dysfunction (LED) Study Group. Low intensity shockwave therapy in combination with phosphodiesterase-5 inhibitors is an effective and safe treatment option in patients with vasculogenic ED who are PDE5i non-responders: a multicenter single-arm clinical trial. *Int J Impot Res.* Sep;33(6):634-640

Vinay J, Moreno D, Rajmil O, Ruiz-Castañe E, Sanchez-Curbelo J. (2021), Penile low intensity shock wave treatment for PDE5I refractory erectile dysfunction: a randomized double-blind sham-controlled clinical trial. *World J Urol.* 2021 Jun;39(6):2217-2222

Wu WL, Bamodu OA, Wang YH, Hu SW, Tzou KY, Yeh CT, Wu CC. (2021), Extracorporeal Shockwave Therapy (ESWT) Alleviates Pain, Enhances Erectile Function and Improves Quality of Life in Patients with Chronic Prostatitis/Chronic Pelvic Pain Syndrome. *J Clin Med.* Aug 16;10(16):3602

CERVICALGIA

Jun JH, Park GY, Chae CS, Suh DC. (2021), The Effect of Extracorporeal Shock Wave Therapy on Pain Intensity and Neck Disability for Patients With Myofascial Pain Syndrome in the Neck and Shoulder: A Meta-Analysis of Randomized Controlled Trials. *Am J Phys Med Rehabil.* Feb 1;100(2):120-129

RADIAL

MEN'S HEALTH (RPW)

Sandoval-Salinas C, Saffon JP, Corredor HA, Fonseca L, Manrique L, Solis G. Are Radial Pressure Waves Effective in Treating Erectile Dysfunction? A Systematic Review of Preclinical and Clinical Studies. *Sex Med.* 2021 Aug;9(4):100393

STEM CELL (RPW)

Zhao Z, Wang Y, Wang Q, Liang J, Hu W, Zhao S, Li P, Zhu H, Li Z. (2021), Radial extracorporeal shockwave promotes subchondral bone stem/progenitor cell self-renewal by activating YAP/TAZ and facilitates cartilage repair in vivo. *Stem Cell Res Ther.* 2021 Jan 7;12(1):19.

MYOFASCIAL PAIN (RPW)

Yalçın Ü. (2021), Comparison of the effects of extracorporeal shockwave treatment with kinesiological taping treatments added to exercise treatment in myofascial pain syndrome. *J Back Musculoskelet Rehabil.* Feb 26.

SPASTICITY – upper extremity (RPW)

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