Washington State Health Care Authority

Extracorporeal shock wave therapy for musculoskeletal conditions

Final evidence report: Appendices

February 13, 2017

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Extracorporeal Shock Wave Therapy

Provided by:

Spectrum Research, Inc.

Final Evidence Report
APPENDICES

February 13, 2017

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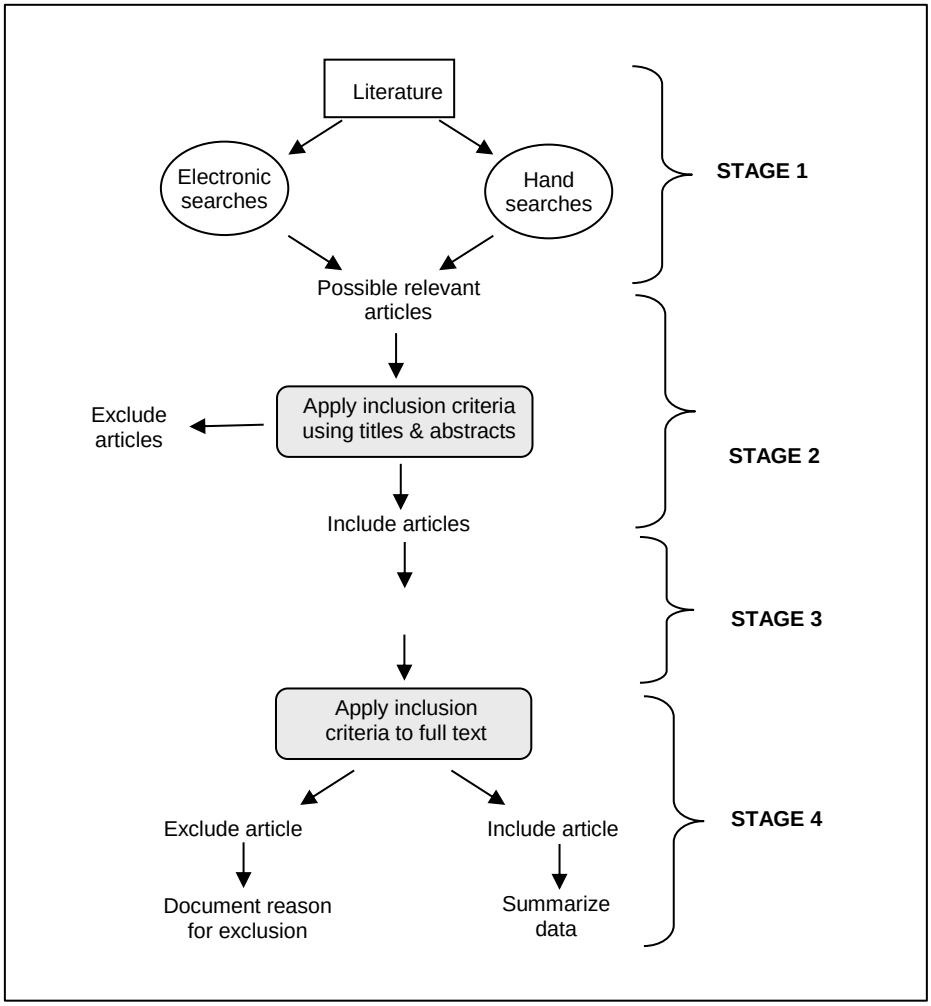
APPENDIX A. Algorithm for Article Selection



APPENDIX B. Search Strategies

Below is the search strategy for PubMed, Embase, and Cochrane. Parallel strategies were used to search other electronic databases listed below. Keyword searches were conducted in the other listed resources.

Search strategy (PubMed)
Search date: Database inception to 07/27/2016

Filters: Abstract, English, humans

Database: PubMed

1.	"Extracorporeal Shock Wave Therapy" OR "extra corporeal shock wave therapy" OR "extra corporeal shockwave therapy" OR "extracorporeal shockwave therapy" OR shockwave* OR "shock wave" OR "shock waves" OR "ESWT"	4735
2.	stone*[TI] OR kidney*[TI] OR renal[TI] OR *renal[TI] OR nephro*[TI] OR urol*[TI] OR bladder[TI] OR uret*[TI] OR gallbladder[TI] OR cholelithiasis[TI] OR gallstone*[TI] OR pancrea*[TI] OR calculi[TI] OR calculus[TI] OR calyceal[TI] OR diverticule*[TI] OR liver*[TI] OR wound*[TI] OR diabet*[TI] OR scar[TI] OR scars[TI] OR ulcer*[TI] OR amput*[TI] OR neuroma*[TI] OR sialadenitis[TI] OR salivary[TI] OR cardiac[TI] OR heart[TI] OR cardiology[TI] OR cardiomyopathy[TI] OR *vascular[TI] OR angina[TI] OR hypertension[TI] OR vascular[TI] OR ischem*[TI] OR artery[TI] OR arteries[TI] OR vessel*[TI] OR coronary[TI] OR brain[TI] OR neuro[TI] OR neuraxial[TI] OR nerve*[TI] OR plaque*[TI] OR carotid[TI] OR spine[TI] OR spinal[TI] OR lumbar[TI] OR cervical[TI] OR erectile[TI] OR penis[TI] OR penile[TI] OR Peyroni*[TI] OR plastic*[TI] OR cellulit*[TI] OR décolletage[TI] OR augmentation[TI] OR facelift*[TI] OR cancer*[TI] OR *cancer[TI] OR *cancers[TI] OR tumor[TI] OR tumors[TI] OR tumour[TI] OR tumours[TI] OR meningioma[TI] OR cornea*[TI] OR ocular[TI] OR retina*[TI] OR pulmonary[TI] OR respirator*[TI] OR COPD[TI] OR broncho*[TI] OR orthodontic*[TI] OR tooth[TI] OR teeth[TI] OR dental[TI] OR lipid*[TI] OR thyroid[TI] OR *thyroid*[TI] OR palsy[TI] OR stroke*[TI] OR spastic*[TI]	1,980,879
3.	Cadaver*[TI] OR Case Reports[Publication Type] OR Comment[Publication Type] OR Infant[mh] OR rat[TI] OR rats[TI] OR mouse[TI] OR mice[TI] OR dog[TI] or dogs[TI] OR porcine[TI] OR "in vitro"[TI] OR "in vivo"[TI] OR "cell"[TI] OR "cells"[TI] OR cytokine*[TI] OR microorganism*[TI] OR neutrophil*[TI] OR osteoblast*[TI] OR phantom[TI] OR simulation[TI] OR microbubble*[TI] OR bubble*[TI] OR suspension*[TI] OR nanomotor*[TI] OR *particle*[TI] OR microscopy[TI]	2,130,767
4.	#1 NOT (#2 OR #3)	1442

Search strategy (Embase)
Search date: Database inception to 08/16/2016

Limits: Articles, articles in press, erratum
(Not surveys, reviews, conference abstracts, notes, editorials, letters)

Database: Embase

1.	'Extracorporeal Shock Wave Therapy' OR 'extra corporeal shock wave therapy' OR 'extra corporeal shockwave therapy' OR 'extracorporeal shockwave therapy' OR shockwave* OR 'shock wave' OR 'shock waves' OR 'ESWT'	12451
2.	'tendinopathy' OR 'tendonitis' OR 'plantar fasciitis' OR ('shoulder pain' AND ('subacromial' OR 'non-specific')) OR 'osteoarthritis' OR 'heel spur' OR 'calcaneal enthesophytosis'	111672
3.	#1 AND #2	476
4.	stone*:ti OR kidney*:ti OR renal:ti OR nephro*:ti OR urol*:ti OR bladder:ti OR uret*:ti OR gallbladder:ti OR cholelithiasis:ti OR gallstone*:ti OR pancrea*:ti OR calculi:ti OR calculus:ti OR calyceal:ti OR diverticule*:ti OR liver*:ti OR wound*:ti OR diabet*:ti OR scar:ti OR scars:ti OR ulcer*:ti OR amput*:ti OR neuroma*:ti OR sialadenitis:ti OR salivary:ti OR cardiac:ti OR heart:ti OR cardiology:ti OR cardiomyopathy:ti OR angina:ti OR hypertension:ti OR vascular:ti OR ischem*:ti OR artery:ti OR arteries:ti OR vessel*:ti OR coronary:ti OR brain:ti OR neuro:ti OR neuraxial:ti OR nerve*:ti OR plaque*:ti OR carotid:ti OR spine:ti OR spinal:ti OR lumbar:ti OR cervical:ti OR erectile:ti OR penis:ti OR penile:ti OR Peyroni*:ti OR plastic*:ti OR cellulit*:ti OR décolletage:ti OR augmentation:ti OR facelift*:ti OR cancer*:ti OR tumor:ti OR tumors:ti OR tumour:ti OR tumours:ti OR meningioma:ti OR cornea*:ti OR ocular:ti OR retina*:ti OR pulmonary:ti OR respirator*:ti OR COPD:ti OR broncho*:ti OR orthodontic*:ti OR tooth:ti OR teeth:ti OR dental:ti OR lipid*:ti OR thyroid:ti OR palsy:ti OR stroke*:ti OR spastic*:ti	6255532
5.	Nonunion* OR fracture* or 'greater trochanteric pain syndrome' OR 'shin splint' OR 'shin splints' OR 'medial tibial stress syndrome' OR 'carpal tunnel syndrome' OR 'coccydynia' OR 'Dupuytrens Disease' OR 'myofascial pain syndrome' OR 'bone marrow edema syndrome of the hip' OR 'chronic pelvic pain syndrome' OR 'tailbone pain' OR ((muscle OR limb) AND 'spasticity')	350412
6.	Cadaver*:ti OR Case Reports:it OR Comment:it OR 'Infant'/exp OR rat:ti OR rats:ti OR mouse:ti OR mice:ti OR dog:ti or dogs:ti OR porcine:ti OR 'in vitro':ti OR 'in vivo':ti OR 'cell':ti OR 'cells':ti OR cytokine*:ti OR microorganism*:ti OR neutrophil*:ti OR osteoblast*:ti OR phantom:ti OR simulation:ti OR microbubble*:ti OR bubble*:ti OR suspension*:ti OR nanomotor*:ti OR particle*:ti OR microscopy:ti	4640325
7.	#3 NOT (#4 OR #5 OR #6)	409
8.	Applied limits	210

ESWT Search (Cochrane)

1.	'Extracorporeal Shock Wave Therapy' OR 'extra corporeal shock wave therapy' OR 'extra corporeal shockwave therapy' OR 'extracorporeal shockwave therapy' OR shockwave* OR 'shock wave' OR 'shock waves' OR 'ESWT'	1376
2.	'tendinopathy' OR 'tendonitis' OR 'plantar fasciitis' OR ('shoulder pain' AND ('subacromial' OR 'non-specific')) OR 'osteoarthritis' OR 'heel spur' OR 'calcaneal enthesophytosis'	9446
3.	#1 AND #2	220
4.	stone*:ti OR kidney*:ti OR renal:ti OR nephro*:ti OR urol*:ti OR bladder:ti OR uret*:ti OR gallbladder:ti OR cholelithiasis:ti OR gallstone*:ti OR pancrea*:ti OR calculi:ti OR calculus:ti OR calyceal:ti OR diverticule*:ti OR liver*:ti OR wound*:ti OR diabet*:ti OR scar:ti OR scars:ti OR ulcer*:ti OR amput*:ti OR neuroma*:ti OR sialadenitis:ti OR salivary:ti OR cardiac:ti OR heart:ti OR cardiology:ti OR cardiomyopathy:ti OR angina:ti OR hypertension:ti OR vascular:ti OR ischem*:ti OR artery:ti OR arteries:ti OR vessel*:ti OR coronary:ti OR brain:ti OR neuro:ti OR neuraxial:ti OR nerve*:ti OR plaque*:ti OR carotid:ti OR spine:ti OR spinal:ti OR lumbar:ti OR cervical:ti OR erectile:ti OR penis:ti OR penile:ti OR Peyroni*:ti OR plastic*:ti OR cellulit*:ti OR décolletage:ti OR augmentation:ti OR facelift*:ti OR cancer*:ti OR tumor:ti OR tumors:ti OR tumour:ti OR tumours:ti OR meningioma:ti OR cornea*:ti OR ocular:ti OR retina*:ti OR pulmonary:ti OR respirator*:ti OR COPD:ti OR broncho*:ti OR orthodontic*:ti OR tooth:ti OR teeth:ti OR dental:ti OR lipid*:ti OR thyroid:ti OR palsy:ti OR stroke*:ti OR spastic*:ti	303317
5.	Nonunion* OR fracture* or 'greater trochanteric pain syndrome' OR 'shin splint' OR 'shin splints' OR 'medial tibial stress syndrome' OR 'carpal tunnel syndrome' OR 'coccydynia' OR 'Dupuytrens Disease' OR 'myofascial pain syndrome' OR 'bone marrow edema syndrome of the hip' OR 'chronic pelvic pain syndrome' OR 'tailbone pain' OR ((muscle OR limb) AND 'spasticity')	16314
6.	Cadaver*:ti OR 'Case Report*':ti OR 'Comment':ti OR rat:ti OR rats:ti OR mouse:ti OR mice:ti OR dog:ti or dogs:ti OR porcine:ti OR 'in vitro':ti OR 'in vivo':ti OR 'cell':ti OR 'cells':ti OR cytokine*:ti OR microorganism*:ti OR neutrophil*:ti OR osteoblast*:ti OR phantom:ti OR simulation:ti OR microbubble*:ti OR bubble*:ti OR suspension*:ti OR nanomotor*:ti OR particle*:ti OR microscopy:ti	38108
7.	MeSH descriptor: [Infant] explode all trees	
8.	#3 NOT (#4 OR #5 OR #6 OR #7)	676
9.	Excluded 1 methods study	675

Parallel strategies were used to search the others listed below. Keyword searches were conducted in the other listed resources.

Electronic Database Searches

The following databases have been searched for relevant information:

Agency for Healthcare Research and Quality (AHRQ)
Cumulative Index to Nursing and Allied Health (CINAHL)
Cochrane Database of Systematic Reviews
Cochrane Registry of Clinical Trials (CENTRAL)
Cochrane Review Methodology Database
Database of Reviews of Effectiveness (Cochrane Library)
EMBASE
PubMed
Informational Network of Agencies for Health Technology Assessment (INAHTA)
NHS Economic Evaluation Database
HSTAT (Health Services/Technology Assessment Text)
EconLIT

Additional Economics, Clinical Guideline and Gray Literature Databases

AHRQ - Healthcare Cost and Utilization Project
Canadian Agency for Drugs and Technologies in Health
Centers for Medicare and Medicaid Services (CMS)
Food and Drug Administration (FDA)
Google
Institute for Clinical Systems Improvement (ICSI)
National Guideline Clearinghouse

APPENDIX C. Excluded Articles

Articles excluded as primary studies after full text review, with reason for exclusion.

	Citation	Reason for exclusion after full-text review
	RCTs considered and excluded	
	Plantar fasciitis	
1.	Buchbinder R, Ptasznik R, Gordon J, Buchanan J, Prabaharan V, Forbes A. Ultrasound-guided extracorporeal shock wave therapy for plantar fasciitis: a randomized controlled trial. Jama 2002;288:1364-72.	Sham set-up used low energy Excluded for efficacy, kept for safety
2.	Chow IH, Cheing GL. Comparison of different energy densities of extracorporeal shock wave therapy (ESWT) for the management of chronic heel pain. Clinical rehabilitation 2007;21:131-41	Wrong comparison, comparison of different energies, no safety data reported
3.	D'Andréa Greve JM, Grecco MV, Santos-Silva PR. Comparison of radial shockwaves and conventional physiotherapy for treating plantar fasciitis. Clinics 2009;64:97-103.	RCT is a subset of Grecco 2013
4.	Dogramaci Y, Kalaci A, Emir A, Yanat AN, Gokce A. Intracorporeal pneumatic shock application for the treatment of chronic plantar fasciitis: a randomized, double blind prospective clinical trial. Archives of orthopaedic and trauma surgery 2010;130:541-6.	Intercorporeal procedure—inserted a probe into the heel
5.	Dorotka R, Sabeti M, Jimenez-Boj E, Goll A, Schubert S, Trieb K. Location modalities for focused extracorporeal shock wave application in the treatment of chronic plantar fasciitis. Foot & ankle international 2006;27:943-7	Comparison of methods of guidance for ESWT
6.	Eslamian F, Shakouri SK, Jahanjoo F, Hajialiloo M, Notghi F. Extra Corporeal Shock Wave Therapy Versus Local Corticosteroid Injection in the Treatment of Chronic Plantar Fasciitis, a Single Blinded Randomized Clinical Trial. Pain medicine (Malden, Mass) 2016;17:1722-31.	Did not evaluate patients with chronic symptoms (< 3 months)
7.	Krukowska J, Wrona J, Sienkiewicz M, Czernicki J. A comparative analysis of analgesic efficacy of ultrasound and shock wave therapy in the treatment of patients with inflammation of the attachment of the plantar fascia in the course of calcaneal spurs. Archives of orthopaedic and trauma surgery 2016:1-8.	Did not evaluate patients with chronic symptoms (< 3 months)
8.	Mardani-Kivi M, Karimi Mobarakeh M, Hassanzadeh Z, et al. Treatment Outcomes of Corticosteroid Injection and Extracorporeal Shock Wave Therapy as Two Primary Therapeutic Methods for Acute Plantar Fasciitis: A Prospective Randomized Clinical Trial. Journal of Foot and Ankle Surgery 2015;54:1047-52.	Did not evaluate patients with chronic symptoms (< 3 months)
9.	Marks W, Jackiewicz A, Golabek-dropiewska K, et al. Low-energy extracorporeal shock-wave therapy in treatment of painful heel: Double blind randomized controlled, prospectivetrial with follow-up	Sham set-up used low energy, no safety data reported

	Citation	Reason for exclusion after full-text review
	after 24 months. Gazzetta Medica Italiana Archivio per le Scienze Mediche2013:759-64.	
10.	Marks W, Jackiewicz A, Witkowski Z, Kot J, Deja W, Lasek J. Extracorporeal shock-wave therapy (ESWT) with a new-generation pneumatic device in the treatment of heel pain. A double blind randomised controlled trial. Acta orthopaedica Belgica 2008;74:98-101.	Did not evaluate patients with chronic symptoms (< 3 months)
11.	Rompe JD, Cacchio A, Weil L, Jr., et al. Plantar fascia-specific stretching versus radial shock-wave therapy as initial treatment of plantar fasciopathy. The Journal of bone and joint surgery American volume 2010;92:2514-22.	Did not evaluate patients with chronic symptoms (< 3 months)
12.	Rompe JD, Schoellner C, Nafe B. Evaluation of low-energy extracorporeal shock-wave application for treatment of chronic plantar fasciitis. The Journal of bone and joint surgery American volume 2002;84-a:335-41.	Sham set-up used low energy, no safety data reported
13.	Saber N, Diab H, Nassar W, Razaak HA. Ultrasound guided local steroid injection versus extracorporeal shockwave therapy in the treatment of plantar fasciitis. Alexandria Journal of Medicine 2012;48:35-42.	Did not report on an outcome of interest
14.	Sorrentino F, Iovane A, Vetro A, Vaccari A, Mantia R, Midiri M. Role of high-resolution ultrasound in guiding treatment of idiopathic plantar fasciitis with minimally invasive techniques. La Radiologia medica 2008;113:486-95.	Did not report on a comparison of interest
15.	Vahdatpour B, Sajadieh S, Bateni V, Karami M, Sajjadieh H. Extracorporeal shock wave therapy in patients with plantar fasciitis. A randomized, placebo-controlled trial with ultrasonographic and subjective outcome assessments. J Res Med Sci 2012;17:834-8.	Sham set-up used low energy, no safety data reported
16.	Wang CJ, Wang FS, Yang KD, Weng LH, Ko JY. Long-term results of extracorporeal shockwave treatment for plantar fasciitis. The American journal of sports medicine 2006;34:592-6.	Quasi-RCT; allocation by chart number
	Lateral epicondyle tendinopathy	
1.	Devrimsel G, Kucukali Turkyilmaz A, Yildirim M, Ulasli MA. A comparison of laser and extracorporeal shock wave therapies in treatment of lateral epicondylitis. Turkiye Fiziksel Tip ve Rehabilitasyon Dergisi2014:194-8.	Commentary
2.	Gunduz R, Malas FU, Borman P, Kocaoglu S, Ozcakar L. Physical therapy, corticosteroid injection, and extracorporeal shock wave treatment in lateral epicondylitis. Clinical and ultrasonographical comparison. Clinical rheumatology 2012;31:807-12.	Not published in English (Korean)
3.	Kang HJ, Her MS, Lee SY, Hahn SB. Comparison of the Clinical Results of HILT Versus ESWT in the Lateral Epicondylitis. Journal of the Korean Society for Surgery of the Hand2009:61-6.	Laser was used as control

	Citation	Reason for exclusion after full-text review
4.	Lebrun CM. Shock-wave treatment for chronic lateral epicondylitis in recreational tennis players. Clinical journal of sport medicine : official journal of the Canadian Academy of Sport Medicine 2005;15:198-9.	Laser was used as control
5.	Lee SS, Kang S, Park NK, et al. Effectiveness of initial extracorporeal shock wave therapy on the newly diagnosed lateral or medial epicondylitis. Ann Rehabil Med 2012;36:681-7.	Sham set-up used low energy, no safety data reported
6.	Oh JH, Lhee SH, Park JY, Choi HW, Jeon SH, Eom JS. Extracorporeal Shock Wave Therapy versus Platelet-rich Plasma Injection for the Treatment of Lateral Epicondylitis: A Prospective Randomized Clinical Trial. Journal of the Korean Society for Surgery of the Hand2011:241-6.	Sham set-up used low energy, no safety data reported
7.	Rompe JD, Hopf C, Kullmer K, Heine J, Burger R, Nafe B. Low-energy extracorporal shock wave therapy for persistent tennis elbow. International orthopaedics 1996;20:23-7.	Sham set-up used low energy, no safety data reported
8.	Spacca G, Necozione S, Cacchio A. Radial shock wave therapy for lateral epicondylitis: a prospective randomised controlled single-blind study. Europa medicophysica 2005;41:17-25.	Did not evaluate patients with chronic symptoms (< 3 months)
9.	Staples MP, Forbes A, Ptasznik R, Gordon J, Buchbinder R. A randomized controlled trial of extracorporeal shock wave therapy for lateral epicondylitis (tennis elbow). The Journal of rheumatology 2008;35:2038-46.	Did not evaluate patients with chronic symptoms (< 3 months)
	Shoulder Tendinopathies	
1.	Albert JD, Meadeb J, Guggenbuhl P, et al. High-energy extracorporeal shock-wave therapy for calcifying tendinitis of the rotator cuff: a randomised trial. The Journal of bone and joint surgery British volume 2007;89:335-41	Wrong comparison, comparison of different energies; Excluded for efficacy, kept for safety
2.	Cacchio A, Paoloni M, Barile A, et al. Effectiveness of radial shock-wave therapy for calcific tendinitis of the shoulder: single-blind, randomized clinical study. Physical therapy 2006;86:672-82.	Sham set-up used low energy; Excluded for efficacy, kept for safety
3.	Daecke W, Kusnierczak D, Loew M. Long-term effects of extracorporeal shockwave therapy in chronic calcific tendinitis of the shoulder. Journal of shoulder and elbow surgery / American Shoulder and Elbow Surgeons [et al] 2002;11:476-80.	Not published in English (German)
4.	Damian M, Zalpour C. Trigger point treatment with radial shock waves in musicians with nonspecific shoulder-neck pain: data from a special physio outpatient clinic for musicians. Medical problems of performing artists 2011;26:211-7.	Sham not described
5.	Diehl P, Gerdesmeyer L, Gollwitzer H, Sauer W, Tischer T. [Calcific tendinitis of the shoulder]. Orthopade 2011;40:733-46.	Not published in English (German)
6.	Engebretsen K, Grotle M, Bautz-Holter E, Ekeberg OM, Brox JI. Predictors of shoulder pain and disability index (SPADI) and work status	Did not report on an outcome of interest

	Citation	Reason for exclusion after full-text review
	after 1 year in patients with subacromial shoulder pain. BMC musculoskeletal disorders 2010;11:218.	
7.	Farr S, Sevelda F, Mader P, Graf A, Petje G, Sabeti-Aschraf M. Extracorporeal shockwave therapy in calcifying tendinitis of the shoulder. Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA 2011;19:2085-9.	Wrong comparison, comparison of different energy levels; Excluded for efficacy, kept for safety
8.	Gross MW, Sattler A, Haake M, et al. [The effectiveness of radiation treatment in comparison with extracorporeal shockwave therapy (ESWT) in supraspinatus tendon syndrome]. Strahlentherapie und Onkologie : Organ der Deutschen Rontgengesellschaft [et al] 2002;178:314-20.	Not published in English (German)
9.	Haake M, Rautmann M, Wirth T. Assessment of the treatment costs of extracorporeal shock wave therapy versus surgical treatment for shoulder diseases. International journal of technology assessment in health care 2001;17:612-7.	Not published in English (German)
10.	Haake M, Sattler A, Gross MW, Schmitt J, Hildebrandt R, Muller HH. [Comparison of extracorporeal shockwave therapy (ESWT) with roentgen irradiation in supraspinatus tendon syndrome--a prospective randomized single-blind parallel group comparison]. Z Orthop Ihre Grenzgeb 2001;139:397-402.	Not published in English (German)
11.	Haake M, Deike B, Thon A, Schmitt J. Exact focusing of extracorporeal shock wave therapy for calcifying tendinopathy. Clinical orthopaedics and related research 2002:323-31	Did not report on a comparison of interest
12.	Hearnden A, Desai A, Karmegam A, Flannery M. Extracorporeal shock wave therapy in chronic calcific tendonitis of the shoulder--is it effective? Acta orthopaedica Belgica 2009;75:25-31	Sham set-up used low energy; Excluded for efficacy, kept for safety
13.	Ioppolo F, Tattoli M, Di Sante L, et al. Extracorporeal shock-wave therapy for supraspinatus calcifying tendinitis: a randomized clinical trial comparing two different energy levels. Physical therapy 2012;92:1376-85.	Wrong comparison, comparison of different energy levels; Excluded for efficacy, kept for safety
14.	Krasny C, Enenkel M, Aigner N, Wlk M, Landsiedl F. Ultrasound-guided needling combined with shock-wave therapy for the treatment of calcifying tendonitis of the shoulder. The Journal of bone and joint surgery British volume 2005;87:501-7.	Did not report on a comparison of interest
15.	Kim JY, Lee JS, Park CW. Extracorporeal shock wave therapy is not useful after arthroscopic rotator cuff repair. Knee surgery, sports traumatology, arthroscopy : official journal of the ESSKA 2012;20:2567-72	Did not report on a population of interest
16.	Kvalvaag E, Brox JI, Engebretsen KB, Soberg HL, Bautz-Holter E, Roe C. Is radial Extracorporeal Shock Wave Therapy (rEWST) combined with supervised exercises (SE) more effective than sham rESWT and SE in patients with subacromial shoulder pain? Study protocol for a double-	Study protocol only—no results published to date

	Citation	Reason for exclusion after full-text review
	blind randomised, sham-controlled trial. BMC musculoskeletal disorders 2015;16:248.	
17.	Loew M, Daecke W, Kusnierczak D, Rahmanzadeh M, Ewerbeck V. Shock-wave therapy is effective for chronic calcifying tendinitis of the shoulder. The Journal of bone and joint surgery British volume 1999;81:863-7	Wrong study design; not a randomized control trial
18.	Melegati G, Tornese D, Bandi M. Effectiveness of extracorporeal shock wave therapy associated with kinesitherapy in the treatment of subacromial impingement: A randomised, controlled study. Journal of Sports Traumatology and Related Research2000:58-64.	Full text article could not be located
19.	Perlick L, Luring C, Bathis H, Perlick C, Kraft C, Diedrich O. Efficacy of extracorporal shock-wave treatment for calcific tendinitis of the shoulder: experimental and clinical results. Journal of orthopaedic science : official journal of the Japanese Orthopaedic Association 2003;8:777-83.	Wrong comparison, comparison of different energy levels; Excluded for efficacy, kept for safety
20.	Pleiner J, Crevenna R, Langenberger H, et al. Extracorporeal shockwave treatment is effective in calcific tendonitis of the shoulder. A randomized controlled trial. Wiener klinische Wochenschrift 2004;116:536-41.	Wrong comparison, comparison of different energy levels; Excluded for efficacy, kept for safety
21.	Rompe JD, Zoellner J, Nafe B. Shock wave therapy versus conventional surgery in the treatment of calcifying tendinitis of the shoulder. Clinical orthopaedics and related research 2001:72-82.	Wrong study design; not a randomized control trial
22.	Rompe JD, Burger R, Hopf C, Eysel P. Shoulder function after extracorporal shock wave therapy for calcific tendinitis. Journal of shoulder and elbow surgery / American Shoulder and Elbow Surgeons [et al] 1998;7:505-9.	Wrong comparison, comparison of different energy levels; Excluded for efficacy, kept for safety
23.	Sabeti-Aschraf M, Dorotka R, Goll A, Trieb K. Extracorporeal shock wave therapy in the treatment of calcific tendinitis of the rotator cuff. The American journal of sports medicine 2005;33:1365-8.	Did not report on a comparison of interest
24.	Sabeti M, Dorotka R, Goll A, Gruber M, Schatz KD. A comparison of two different treatments with navigated extracorporeal shock-wave therapy for calcifying tendinitis - a randomized controlled trial. Wiener klinische Wochenschrift 2007;119:124-8.	Wrong comparisonm comparison of different energy levels; Excluded for efficacy, kept for safety
25.	Saggini R, Cavezza T, Di Pancrazio L, et al. Treatment of lesions of the rotator cuff. Journal of biological regulators and homeostatic agents 2010;24:453-9.	Did not report on a comparison of interest
26.	Schmitt J, Tosch A, Hunerkopf M, Haake M. [Extracorporeal shockwave therapy (ESWT) as therapeutic option in supraspinatus tendon syndrome? One year results of a placebo controlled study]. Orthopade 2002;31:652-7.	Not published in English (German)
27.	Schofer MD, Hinrichs F, Peterlein CD, Arendt M, Schmitt J. High- versus low-energy extracorporeal shock wave therapy of rotator cuff	Wrong comparison, comparison of different

	Citation	Reason for exclusion after full-text review
	tendinopathy: a prospective, randomised, controlled study. Acta orthopaedica Belgica 2009;75:452-8.	energy levels; Excluded for efficacy, kept for safety
28.	Seil R, Rupp S, Hammer DS, Ensslin S, Gebhardt T, Kohn D. [Extracorporeal shockwave therapy in tendionosis calcarea of the rotator cuff: comparison of different treatment protocols]. Z Orthop Ihre Grenzgeb 1999;137:310-5.	Not published in English (German)
29.	Tornese D, Mattei E, Bandi M, Zerbi A, Quaglia A, Melegati G. Arm position during extracorporeal shock wave therapy for calcifying tendinitis of the shoulder: a randomized study. Clinical rehabilitation 2011;25:731-9	Did not report on a comparison of interest
	Achilles Tendinopathies	
1.	Notarnicola A, Maccagnano G, Tafuri S, Forcignano MI, Panella A, Moretti B. CHELT therapy in the treatment of chronic insertional Achilles tendinopathy. Lasers in medical science 2014;29:1217-25.	Did not report on a comparator of interest
	Patella Tendinopathies	
1.	Peers KH, Lysens RJ, Brys P, Bellemans J. Cross-sectional outcome analysis of athletes with chronic patellar tendinopathy treated surgically and by extracorporeal shock wave therapy. Clinical journal of sport medicine : official journal of the Canadian Academy of Sport Medicine 2003;13:79-83.	Not published in English (German)
2.	Thijs KM, Zwerver J, Backx FJG, et al. Effectiveness of Shockwave Treatment Combined With Eccentric Training for Patellar Tendinopathy: A Double-Blinded Randomized Study. Clinical Journal of Sport Medicine 2016.	Sham set-up used low energy; Excluded for efficacy, kept for safety
3.	Vetrano M, Castorina A, Vulpiani MC, Baldini R, Pavan A, Ferretti A. Platelet-rich plasma versus focused shock waves in the treatment of jumper's knee in athletes. The American journal of sports medicine 2013;41:795-803.	Did not report on a comparator of interest
4.	Zwerver J, Verhagen E, Hartgens F, van den Akker-Scheek I, Diercks RL. The TOPGAME-study: effectiveness of extracorporeal shockwave therapy in jumping athletes with patellar tendinopathy. Design of a randomised controlled trial. BMC musculoskeletal disorders 2010;11:28.	Trial design for Zwerver 2011 (below); no outcomes
5.	Zwerver J, Hartgens F, Verhagen E, van der Worp H, van den Akker-Scheek I, Diercks RL. No effect of extracorporeal shockwave therapy on patellar tendinopathy in jumping athletes during the competitive season: a randomized clinical trial. The American journal of sports medicine 2011;39:1191-9	Sham set-up used low energy; Excluded for efficacy, kept for safety

	Citation	Reason for exclusion after full-text review
	Knee Osteoarthritis	
1.	Wang CJ, Wang FS, Huang CC, Yang KD, Weng LH, Huang HY. Treatment for osteonecrosis of the femoral head: comparison of extracorporeal shock waves with core decompression and bone-grafting. The Journal of bone and joint surgery American volume 2005;87:2380-7.	Did not report on a population of interest
	Trochanter Pain Syndrome	
1.	Rompe JD, Segal NA, Cacchio A, Furia JP, Morral A, Maffulli N. Home training, local corticosteroid injection, or radial shock wave therapy for greater trochanter pain syndrome. The American journal of sports medicine 2009;37:1981-90.	Wrong study design; not a randomized control trial

APPENDIX D. Risk of Bias and Strength of Evidence

Each study is rated against pre-set criteria that resulted in a Risk of Bias (RoB) assessment and presented in a table. The criteria are listed in the Tables below.

Definition of the class of evidence and risk of bias for studies on therapy*

Risk of Bias	Studies of Therapy*	
	Study design	**Criteria***
Low risk: Study adheres to commonly held tenets of high quality design, execution and avoidance of bias	Good quality RCT	Random sequence generation Statement of allocation concealment Intent-to-treat analysis Blind or independent assessment for primary outcome(s) Co-interventions applied equally F/U rate of 80%+ and <10% difference in F/U between groups Controlling for possible confounding‡
Moderately low risk: Study has potential for some bias; study does not meet all criteria for class I, but deficiencies not likely to invalidate results or introduce significant bias	Moderate quality RCT	Violation of one or two of the criteria for good quality RCT
	Good quality cohort	Blind or independent assessment for primary outcome(s) Co-interventions applied equally F/U rate of 80%+ and <10% difference in F/U between groups Controlling for possible confounding‡
Moderately High risk: Study has significant flaws in design and/or execution that increase potential for bias that may invalidate study results	Poor quality RCT	Violation of three or more of the criteria for good quality RCT
	Moderate or poor quality cohort	Violation of any of the criteria for good quality cohort
	Case-control	Any case-control design
High risk: Study has significant potential for bias; lack of comparison group precludes direct assessment of important outcomes	Case series	Any case series design

* Additional domains evaluated in studies performing a formal test of interaction for subgroup modification (i.e., HTE) based on recommendations from Oxman and Guyatt[3]:

† Outcome assessment is independent of healthcare personnel judgment. Reliable data are data such as mortality or re-operation.

‡ Authors must provide a description of robust baseline characteristics, and control for those that are unequally distributed between treatment groups.

Is the subgroup variable a characteristic specified at baseline or after randomization? (subgroup hypotheses should be developed a priori)
Did the hypothesis precede rather than follow the analysis and include a hypothesized direction that was subsequently confirmed?
Was the subgroup hypothesis one of a smaller number tested?

Determination of Overall Strength of Evidence

Following the assessment of the quality of each individual study included in the report, an overall "strength of evidence" for the relevant question or topic is determined. Methods for determining the overall strength of evidence are variable across the literature and are most applicable to evaluation of therapeutic studies.

SRI's method incorporates the primary domains of quality (RoB), quantity of studies and consistency of results across studies as described by AHRQ.

The following four possible levels and their definition will be reported:

High – High confidence that the evidence reflects the true effect. Further research is very unlikely to change our confidence in the estimate of effect.
Moderate - Moderate confidence that the evidence reflects the true effect. Further research may change our confidence in the estimate of effect and may change the estimate.
Low - Low confidence that the evidence reflects the true effect. Further research is likely to change the confidence in the estimate of effect and likely to change the estimate.
Insufficient – Evidence either is unavailable or does not permit a conclusion.

All AHRQ "required" and "additional" domains (risk of bias, consistency, directness, precision, publication bias) are assessed Bodies of evidence consisting of RCTs were initially considered as High strength of evidence, while those comprised of nonrandomized studies began as Low strength of evidence. The strength of evidence could be downgraded based on the limitations described above. There are also situations where the nonrandomized studies could be upgraded, including the presence of plausible unmeasured confounding and bias that would decrease an observed effect or increase an effect if none was observed, and large magnitude of effect (strength of association).

Example methodology outline for determining overall strength of evidence (SoE):

All AHRQ "required" and "additional" domains* are assessed. Only those that influence the baseline grade are listed in table.

Baseline strength: Risk of bias (including control of confounding) is accounted for in the individual article evaluations. HIGH = majority of articles RCTs. LOW = majority of articles cohort studies.

DOWNGRADE: Inconsistency** of results (1 or 2); Indirectness of evidence (1 or 2); Imprecision of effect estimates (1 or 2); Sub-group analyses not stated *a priori* and no test for interaction (2)

UPGRADE: Large magnitude of effect (1 or 2); Dose response gradient (1)

Outcome	Strength of Evidence	Conclusions & Comments	Baseline	DOWNGRADE	UPGRADE
Outcome	**HIGH**	Summary of findings	**HIGH** RCTs	**NO** consistent, direct, and precise estimates	**NO**
Outcome	**MODERATE**	Summary of findings	**LOW** Cohort studies	**NO** consistent, direct, and precise estimates	**YES** Large effect
Outcome	**LOW**	Summary of findings	**HIGH** RCTs	**YES (2)** Inconsistent Indirect	**NO**

*Required domains: risk of bias, consistency, directness, precision. Plausible confounding that would decrease observed effect is accounted for in our baseline risk of bias assessment through individual article evaluation. Additional domains: dose-response, strength of association, publication bias.

**Single study = "consistency unknown"

APPENDIX E. Study Quality: RoB evaluation

Appendix Table E1. Risk of Bias for RCTs Evaluating Plantar Fasciitis

Study year	Random sequence generation	Concealed allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U > 80%	<10% difference in F/U between groups	Controlling for confounding	Risk of bias
FESWT vs Sham									
Cosentino 2001	No	No	Unknown	Yes	Yes	Yes	Yes	No	Mod high
Gollwitzer 2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Gollwitzer 2015	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Haake 2003	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Kudo 2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Malay 2006	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Mod low
Ogden 2004	Yes	Yes	Unknown	Yes	No	Yes	Yes	Yes	Mod Low
Rompe 2003	Yes	Yes	Unknown	Yes	Yes	3 mos: Yes 12 mos: No	Yes	Yes	Mod low
Rompe 1996	No	No	Unknown	Unknown	Yes	Unknown	Unknown	Yes	Mod high
Saxena 2012	Yes	Yes	Unknown	Unknown	Yes	Unknown	Unknown	No	Mod high
Speed 2003	Yes	Unknown	Yes	Yes	No	Yes	No	No	Mod high

Study year	Random sequence generation	Concealed allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U > 80%	<10% difference in F/U between groups	Controlling for confounding	Risk of bias
Theodore 2004	Unknown	Unknown	Unknown	Yes	Yes	Yes	Yes	No	Mod high
FESWT vs Active Control									
Chew 2013	Unknown	Yes	No	Yes	Yes	No	No	No	Mod high
Hammer 2002	Unknown	Unknown	Yes	No	Yes	Yes	Yes	No	Mod high
Porter 2005	Unknown	Yes	No	Yes	Yes	Yes	Unknown	Yes	Mod low
Radwan 2012	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Mod low
Wang 2006	No	No	No	Yes	No	Yes	Yes	No	Mod high
Yucel 2010	Unknown	Unknown	Yes	Unknown	No	Yes	Yes	No	Mod high
RESWT vs Sham									
Gerdesmeyer 2008	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Ibrahim 2010	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Mod low
Mehra 2003	Unknown	Yes	Unknown	Yes	Yes	Yes	Yes	Unknown	Mod high
RESWT vs Active Control									
Grecco 2013	No	Unknown	Yes	No	Yes	Yes	Yes	Yes	Mod high
Konjen 2015	Yes	Yes	Yes	Unknown	Yes	Yes	Yes	Yes	Mod low

FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mod, moderately; mos, months; RCTs, randomized control trials; RESWT, radial extracorporeal shock wave therapy

Appendix Table E2. Risk of Bias for RCTs Evaluating Lateral Epicondylitis

Study year	Random sequence generation	Concealed allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U > 80%	<10% difference in F/U between groups	Controlling for confounding	Risk of bias
FESWT vs Sham									
Chung 2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Collins 2011	Unknown	Unknown	No	Yes	Yes	Yes	Yes	Yes	Mod high
Haake 2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Low
Melikyan 2003	Unknown	Unknown	No	Yes	Yes	Yes	Unknown	No	Mod high
Pettrone 2005	Unknown	Yes	3 mos: Yes 12 mos: No	3 mos: Yes 12 mos: No	Yes	3 mos: Yes 12 mos: No	Yes	Unknown	Mod low
Rompe 2004	Yes	Yes	Yes	3 mos: Yes 12 mos: No	Yes	Yes	Yes	Yes	Low
Speed 2002	Unknown	Unknown	Yes	Yes	Yes	Yes	Yes	Yes	Mod high
FESWT vs corticosteroid injection and or autologous blood injection									
Crowther 2002	Unknown	Yes	No	Unknown	Yes	No	No	No	Mod high
Ozturan 2010	Unknown	Unknown	Unknown	No	Yes	Yes	Yes	No	Mod high
FESWT vs Percutaneous Tenotomy									
Radwan 2008	Unknown	Yes	No	No	Yes	Yes	Yes	Yes	Mod high
RESWT vs Sham									
Capan 2016	Yes	Unknown	no	Yes	Yes	Yes	Yes	no	Mod high
Mehra 2003	Unknown	Yes	Unknown	Yes	Yes	Yes	Yes	Unknown	Mod high

FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mod, moderately; mos, months; RCTs, randomized control trials; RESWT, radial extracorporeal shock wave therapy

Appendix Table E3. Risk of Bias for RCTs Evaluating Shoulder Tendinopathy

Study year	Random sequence generation	Concealed Allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U of >80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Rotator Cuff									
Cosentino 2003	Unclear	Unclear	Unclear	No	Yes	Unclear	Unclear	Unclear	Mod high
Del Castillo-Gonzalez	Yes	Unclear	Yes	Unclear/No*	Yes	Yes	No	Unclear	Mod high
.3	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Mod low
Gerdesmeyer 2003	Yes	Yes	Yes	Yes	Yes	3 and 6 mos: Yes 12 mos: No	3 mos: Yes 6 and 12 mos: No	Yes	Low/Mod low†
Hsu 2008	Yes	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	Unclear	Mod high
Kim 2014	Yes	Yes	Yes	Unclear/No*	Yes	Yes	Yes	Unclear	Mod low
Kolk 2013	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	No	Mod high
Pan 2003	Yes	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes	Mod high
Peter 2004	Yes	Unclear	Unclear	Yes	Unclear	Yes	No	Unclear	Mod high
Schmitt 2001, Efe 2014	Yes	Yes	Yes	Yes	Unclear	3 mos: Yes 120 mos: No	Yes	Unclear	Mod low/Mod high†
Speed 2002	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Mod low
Adhesive Capsulitis									
Chen 2014	Yes	Unclear	Yes	Yes/No‡	Yes	Yes	Yes	Unclear	Mod Low (Constant) Mod High (Oxford)

Study year	Random sequence generation	Concealed Allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U of >80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Hussein 2016	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Mod Low
Vahdatpour 2014	Yes	Unclear	Yes	Yes	Yes	Yes	No	Unclear	Mod High
Subacromial Shoulder Pain									
Engebretsen 2009, 2011	Yes	Unclear	Yes	No	Yes	Yes	Yes	Yes	Mod low
Primary Long Bicep Tenosynovitis									
Liu 2012	Yes	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes	Mod low

FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mod, moderately; mos, months; RCTs, randomized control trials; RESWT, radial extracorporeal shock wave therapy

*Unclear for clinician reported outcomes but patients were aware of treatment, therefore patient-reported outcomes were not blindly assessed
†Low risk of bias for 3 month follow-up results, moderately low risk of bias for 120 month follow-up results
‡ Clinician reported outcomes were blindly assessed but patients were aware of treatment, therefore patient-reported outcomes were not blindly assessed

Appendix Table E4. Risk of Bias for RCTs Evaluating Achilles Tendinopathy

Study year	Random sequence generation	Concealed Allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U of >80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Costa 2005	Yes	Yes	Yes	Yes	Unknown	3 mos: No 12 mos: Yes	Yes	No	Mod Low
Rasmussen 2008	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Mod Low
Rompe 2009	Yes	Yes	Yes	Yes/No*	Yes	Yes	Yes	No	Mod Low
Rompe 2008	Yes	Yes	Yes	Yes/No*	Yes	Yes	Yes	No	Mod Low
Rompe 2007	Yes	Yes	Yes	Yes/No*	Yes	Yes	Yes	No	Mod Low

F/U, follow-up; mod, moderately; mos, months; RCTs, randomized control trials

*Clinician reported outcomes were blindly assessed but patients were aware of treatment, therefore patient-reported outcomes were not blindly assessed

Appendix Table E5. Risk of Bias for RCTs Evaluating Patella Tendinopathy

Study year	Random sequence generation	Concealed Allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U of >80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Taunton 2003	No	Unclear†	Unclear	Yes	Unclear	Yes	No	Unclear	Mod High
Wang 2007	No	Unclear	Yes	No	Unclear	Yes	Yes	No	Mod High

F/U, follow-up; mod, moderately; mos, months; RCTs, randomized control trials

Appendix Table E6. Risk of Bias for RCTs Evaluating Knee Osteoarthritis

Study year	Random sequence generation	Concealed Allocation	Intention to treat	Blind assessment	Co-interventions applied equally	Complete F/U of >80%	<10% difference in F/U between groups	Controlling for confounding	Risk of Bias
Chen 2014	Yes	Yes	Yes	Unclear	Unclear	Unclear	Unclear	Unclear	Mod High
Zhao 2013	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	No	Mod Low

F/U, follow-up; mod, moderately; mos, months; RCTs, randomized control trials

APPENDIX F. Study Characteristics and Patient Demographics

Appendix Table F1. Plantar Fasciitis: Study Characteristics and Patient Demographics

	Population	Inclusion/exclusion criteria	ESWT/control
Focused extracorporeal shock wave therapy (FESWT) vs. sham			
Cosentino (2001) Country: Italy Study period: NR Sponsor: NR COI: NR	N=60 Age: 55.6 (45-68) years Male: 28% Sx duration (mos): 8.4 (6-12) F/U (% ESWT, % Sham): 1 mos (100%, 100%), 3 mos (NR, NR) Cross-over: none	**Inclusion criteria:** pain over radiologically examined heel spur, unsuccessful conservative treatment for > 6 months **Exclusion criteria:** rheumatoid arthritis, spondarthritis, crystal induced arthropathies, neurological abnormalities, nerve entrapment syndrome, pregnancy, age, < 18 years old, infectious of tumorous diseases, skin ulcerations, and bursitis	**FESWT (n=30)** Device: Orthima Shocks, energy: 1200, 0.4 mJ/mm^2 Total energy: NR Intensity: high No. sessions: 6 sessions performed once every 7-10 days US guidance: yes Anesth: NR **Sham (n=30)** ESWT applied to the same area but with no energy applied Anesth: NR **Co-intervention** None; no other therapy was allowed during the period of the study
Gollwitzer (2007) Country: Germany Study period: NR 12 month enrollment Sponsor: NR COI: NR	N=40 Age: 56.4 ± 11.7 years Male: 38% Sx duration (mos): > 6 F/U (% ESWT, % Sham): 6 wks, 3 mos (95%, 100%) Cross-over: none	**Inclusion criteria:** chronic plantar heel pain resistant to conservative treatments for > 6 months, VAS pain score ≥ 5, Roles and Maudsley Score of 3 or 4, ≥ 18 years old, failed 2 nonpharmacological and 2 pharmacological treatments **Exclusion criteria:** systemic inflammatory disease, inflammatory disorders of the ankle, collagenosis, metabolic disease, tendon ruptures in treatment area, nerve entrapment syndrome,	**FESWT (n=20)** Device: Duolith SD1 Shocks, energy: 2000, 0.25 mJ/mm^2 Total energy: 1500 mJ/mm^2 Intensity: high No. sessions: 3 sessions within 3 wks US guidance: no Anesth: none* **Sham (n=20)**

	Population	Inclusion/exclusion criteria	ESWT/control
		neurological or vascular insufficiencies, active malignant disease, calcaneal fat pad atrophy, hyperthyroidism, active or chronic infection or osteomyelitis in treatment area, calcaneal fracture, anticoagulation therapy, cardiac or respiratory disease, Paget's disease, worker's compensation or litigation immunosuppressive therapy, local anesthetic injection, CSI injection within 6 weeks of treatment or long-term use, iontophoresis or US or electrotherapy within 4 weeks of treatment, NSAIDs within 7 days of treatment, application of heat, ice, massage, stretching and/or change of orthotics within 2 days of treatment, previous surgery, prior use of ESWT, bilateral symptoms	Same settings but air-chambered polyethylene foil was placed between coupling head and the participant Anesth: none **Co-intervention** 2 grams paracetamol per day for up to 14 days followed by 2 grams paracetamol per week as needed
Gollwitzer (2015) Country: United States (multicenter) Study period: NR Sponsor: Storz Medical COI: one or more of the authors received payments or services, directly or indirectly, from a third party in support of an aspect of this work. In addition, one or more of the authors, or his or her institution, has had a financial relationship, in the thirty-six months prior to submission of this work	N=250 Age: 48.7 (10.9) years Male: 29.7% Sx duration (mos): ≥ 6 F/U (% ESWT, % Sham): 3 mos (94.4%, 91.9%), 12 mos (58.4%, 42.1%)† Cross-over: none	**Inclusion criteria:** PF resistant to nonsurgical treatment for > 6 months, failure of at least two nonpharmacological and two nonpharmacological treatments, PF diagnosis made by foot and ankle specialist with more than ten years of professional experience, diagnostic testing to confirm PF, VAS score ≥ 5, and a Roles and Maudsley score of 3 or 4 **Exclusion criteria:** CSI within 6 weeks of treatment, local anesthetic injection, iontophoresis, ultrasound, or electromyostimulation within 4 weeks of treatment, nonsteroidal anti-inflammatory drug within 1 week of treatment, analgesics, heat, ice, massage, stretching, modification or night splinting, and orthosis within two days of treatment, active infection or history of chronic infection, neurological or vascular insufficiencies, nerve entrapment, disturbance of coagulation, bilateral symptoms, and pregnancy	**FESWT (n=125)** Device: Duolith SD1 Shocks, energy: 2000, 0.25 mJ/mm^2 Total energy: NR Intensity: high No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: none* **Sham (n=121)** Same settings using an air-filled standoff to prevent transmission of shock waves Anesth: none **Co-intervention** 2 grams acetaminophen per day for up to 14 days followed by 2 grams acetaminophen per week as needed

	Population	Inclusion/exclusion criteria	ESWT/control
Haake (2003) Country: Germany (multicenter) Study period: Mar 1999 – Feb 2001 Sponsor: Deutsche Forschungsgemeinschaft; GAOOS; Association for Promoting Science and Research at Rehberg Clinic; Dornier Medizintechnik COI: none	N=272 Age: 53.0 ± 10.8 years Male: 25% Sx duration (mos.): 13 (9-24) F/U (% ESWT, % Sham): 6 wks, 3 mos (94.1%, 94.2%), 12 mos (83.7%, 83.9%) Cross-over: none	**Inclusion criteria**: radiologically proved heel spur (three + clinical signs: pain in the AM or after sitting a long time, local pain where fascia attaches to the heel, increasing pain with extended walking or standing), 6 months failed conservative treatment, no therapy for prior 4 weeks **Exclusion criteria**: bilateral fasciitis, arthrosis/arthritis of the foot, infections or tumors of the lower extremity, rheumatoid arthritis, neurological abnormalities, nerve entrapment, operative treatment of heel spur	**FESWT (n=135)** Device: Epos Ultra Shocks, energy: 4000, 0.08 mJ/mm^2 Total energy: 960 mJ/mm^2 Intensity: low No. sessions: 3 sessions at biweekly intervals US guidance: yes Anesth: local **Sham (n=137)** Same settings, polythene foil filled with air to reflect shock waves Anesth: local **Co-intervention** NR
Kudo (2006) Country: Canada (multicenter) Study period: November 2000-December 2002 Sponsor: all clinical sites received grant funding from Dornier MedTech COI: NR	N= 114 Age: 50 (10.2) years Male: 36% Sx duration (mos): > 6 F/U (% ESWT, % Sham): 3 mos (91.4%, 92.9%), 6 mos, 12 mos Cross-over: at 3 month f/u, all patients were unblinded. Patients in control group were given option to receive ESWT; patients that did not crossover were discontinued from further f/u. Statistical analysis is pending for the 6 and 12 month follow-up and the crossover safety and efficacy data	**Inclusion criteria:** ≥ 18 years old, compliance with physician prescribed stretching program within previous 6 months, single site of tenderness and pain with local pressure over medial calcaneal tuberosity on passive dorsiflexion of the foot, VAS > 5 after walking, history of > 6 months of unsuccessful conservative therapy **Exclusion criteria:** autoimmune disease, PVD, nonpalpable posterior tibial and dorsalis pedis pulses or abnormal capillary refill, diabetes or PN, systemic inflammatory disease, RSD, worker's compensation or litigation, loss of ankle/foot sensation, pregnancy, clubfoot, history of bleeding disorder or hemophilia, tumor(s) in the area, pacemaker, Xylocaine allergy, previous conservative treatment within 2 weeks of treatment, CSI within 1 month of treatment, previous surgery or infection, anticoagulant therapy within 7 days of	**FESWT (n=58)** Device: Epos ultra Shocks, energy: 3500, 0.64 mJ/mm^2 Total energy: 1300 mJ/mm^2 Intensity: high No. sessions: 1 US guidance: yes Anesth: medial calcaneal nerve block **Sham (N=56)** Same settings but a foam cushion was placed in the therapy head Anesth: medical calcaneal nerve block **Co-intervention** Elimination of pain medication and athletic activity until 6 weeks follow-up evaluation

	Population	Inclusion/exclusion criteria	ESWT/control
		treatment, bilateral symptoms, calcaneal stress fracture	
Malay (2006) Country: USA (multicenter) Study period: NR Sponsor: Medispec Ltd. COI: study sponsored by manufacturer	N=172 Age: 51.2 ± 10.4 years Male: 33% Sx duration (mos.): 30 F/U (% ESWT, % Sham): 1 mos, 2 mos, 3 mos (87.8%, 89.5%), 6 mos. (75.7%, 78.9%), 12 mos (67.8%, 70.2%)‡ Cross-over: none	**Inclusion criteria:** proximal PF diagnosis with symptoms ≥ 6 months that had been treated by a licensed healthcare professional for ≥ 5 months; ≥ 5 on VAS scale; single site of tenderness with pressure over calcaneal tuberosity on passive dorsiflexion of foot; 2 failed pharmacological and 2 failed non-pharmacological treatments; ≥ 18 years of age **Exclusion criteria:** pregnancy, cardiac, neurological, hepatic, renal, metabolic, hematological disease or impairment, previous surgery for PF, patients undergoing co-treatment with conservative therapies, CSI within 6 weeks of treatment, neuropathic, malignant, or infectious causes of pain, anticoagulant medications, coagulation disorders, suspected tears of the PF, bilateral symptoms, infection or malignancy near intervention area, conditions advised to avoid radiation, co-participation in another device or drug study during or within 30 days of treatment	**FESWT (n=115)** Device: Orthospec Shocks, energy: 3800, NR Total energy: NR Intensity: NR No. Sessions: 1 US guidance: yes Anesth: none **Sham (n=57)** Same settings, foam-insulation membrane was used to absorb shock waves Anesth: none **Co-intervention** NR
Ogden (2004) Country: USA (multicenter) Study period: 1996–2003 Sponsor: HealthTronics, Marietta, GA COI: industry funding; ≥ 1 authors received payments, benefits, a commitment, or	N=293 Age: 49.7 (20-79) years Male: 34% Sx duration (mos.): 33.6 (6-218) F/U (% ESWT, % Sham): 3 mos (97.3%, 97.2%) 12 mos (60.3%, 44.1%) Cross-over: at 3 month f/u, patients who failed treatment	**Inclusion criteria**: chronic heel pain (moderate-to-severe heel pain at the origin of the proximal PF at the medial calcaneal tuberosity) for ≥ 6 months that failed to respond to conservative treatment; objective assessment of pain in the proximal plantar fascia ≥ 5cm on 10-cm VAS; patient self-assessment of pain after the first 5 minutes of walking in the morning ≥ 5 cm on 10-cm VAS **Exclusion criteria:** positive result to monofilament sensory test (for possible PN) at 2	**FESWT (n=148)** Device: Ossatron Shocks, energy: 1500, 0.22 mJ/mm^2 Total energy: 324.25 mJ/mm^2 Intensity: high No. sessions: 1 or 2 US guidance: no Anesth: ankle block **Sham (n=143)**

	Population	Inclusion/exclusion criteria	ESWT/control
agreement to such benefits from HealthTronics	were allowed to withdraw or continue to 12 month f/u. Active group received retreatment and control group crossed over.	or more of 10 sites; pain in the contralateral heel of > 4 cm on VAS.	Same settings, Styrofoam block placed against treatment head to absorb shock waves, IV bag used to mimic water filled treatment head Anesth: 3 local subcutaneous injections **Co-intervention** NR
Rompe (1996) Country: Germany Study period: 2 years, dates NR Sponsor: NR COI: NR	N=36 Age: 49 (26-61) years Male: 63.3% Sx duration (mos): 18 (12-38) F/U§: 3 wks, 6 wks, 3 mos, 6 mos Cross-over: At 6 week f/u, control group was offered option to cross over to treatment group after 6 week follow-up. All 15 patients decided to receive ESWT	**Inclusion criteria:** pain over a radiologically proven calcaneal spur for greater than 12 months, unsuccessful conservative treatment or operative therapy during 6 months prior to study, three-phase technetium-99 bone scintigraphy findings consistent with PF **Exclusion criteria:** dysfunction in the knee or ankle, local arthritis, generalized polyarthritis, rheumatoid arthritis, ankylosing spondylitis, Reiter's syndrome, neurologic abnormalities, nerve entrapment syndrome, < 18 years old, pregnancy, infectious or tumorous disease	**FESWT (n=15)** Device: Siemens Ostcostar Shocks, energy: 1000, 0.06 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: yes Anesth: NR **Sham (n=15)** Same settings but 1 cm distance was kept between skin and therapy unit Anesth: NR **Co-intervention** None; no other therapy was allowed during the period of the study
Rompe (2003)** Country: Germany Study period: 3 years, dates NR Sponsor: NR COI: one author has received financial benefit from research in this study	N=45 Age: 41.5 (30-61) years Male: 48% Sx duration (mos): 19 F/U (% ESWT, % Sham): 6 mos (86.4%, 87.0%), 12 mos (72.7%, 82.6%) Cross-over: none	**Inclusion criteria:** chronic heel pain for ≥ 12 months, participants that ran ≥ 30 miles per week, attempt of three nonoperative treatments including one prior course of pharmacological treatment **Exclusion criteria:** dysfunction in the knee or ankle, local arthritis, generalized polyarthritis, rheumatoid arthritis, ankylosing spondylitis, Reiter's syndrome, neurologic abnormalities, nerve entrapment, previous surgery, < 18 years old, pregnancy, infections or tumors, previous	**FESWT (n=22)** Device: Sonocur Plus Shocks, energy: 2100, 0.16 , Total energy: NR Intensity: medium No. sessions: 3 sessions at weekly intervals US guidance: yes Anesth: none **Sham (n=23)**

	Population	Inclusion/exclusion criteria	ESWT/control
		spontaneous or steroid-induced rupture of the plantar fascia, bilateral symptoms, participations in a workers' compensation program, use of a systemic therapeutic anticoagulants or NSAIDs for any condition	Same settings but a sound reflecting pad was put between the coupling membrane of the treatment head and the heel Anesth: none **Co-intervention** None; no other therapy was allowed during the period of the study
Saxena (2012)†† Country: United States Study period: May 2006-December 2008 Sponsor: NR COI: NR	N=25 Age: 47.7 ± 11.1 years Male: NR Sx duration (mos): > 6 F/U§: 12 mos Cross-over: none	**Inclusion criteria:** clinical diagnosis of PF > 6 months prior to treatment, prior treatment of at least three modalities‡‡, athletically active **Exclusion criteria:** CSI within 6 weeks of treatment, concurrent use of steroids and/or NSAIDs, a change in shoe gear, orthoses, or activity level during the treatment period§§	**FESWT (n=11)** Device: Duolith SD1 Shocks, energy: 2000, 0.24 mJ/mm^2 Total energy: NR Intensity: high No. sessions: 3 sessions at weekly intervals US guidance: NR Anesth: none **Sham (n=14)** Same settings but a special device head was used that blocked shock waves Anesth: none **Co-intervention** Post intervention icing
Speed (2003) Country: United Kingdom Study period: NR Sponsor: Cambridge Arthritis Research Endeavour (CARE) COI: NR	N=88 Age: 52 (25-76) years Male: 42.0% Sx duration (mos): 15.17 (12-312) F/U (% ESWT, % Sham): 3 mos (91.3%, 81.0%), 6 mos (91.3%, 81.0%) Cross-over: none	**Inclusion criteria:** clinical diagnosis of PF, ≥ 18 years old, unilateral heel pain for at least 3 months **Exclusion criteria:** instability of the foot or ankle, arthritis, diffuse heel pad tenderness, local dermatological problems, generalized polyarthritis, neurological abnormalities, pregnancy, diabetes, connective tissue or infectious disease, vasculitis, or malignancy, anticoagulant therapy, treatment to the affected foot within previous six weeks	**FESWT (n=46)** Device: Sonocur Plus Shocks, energy: 1500, 0.12 mJ/mm^2 Total energy: NR Intensity: medium No. sessions: 3 sessions per month for 3 months US guidance: yes Anesth: none **Sham (n=42)**

	Population	Inclusion/exclusion criteria	ESWT/control
			Treatment head was deflated, no coupling gel was applied, no skin contact, and minimal energy pulses (0.04 mJ/mm^2) Anesth: none **Co-intervention** None; no other therapy was allowed during the period of the study
Theodore (2004) Country: Germany and United States (multicenter) Study period: NR Sponsor: all clinical sites received grants from Dornier MedTech America COI: NR	N=150 Age: 51 (26-72) years Male: 27% Sx duration (mos): 23 F/U (% ESWT, % Sham): 3 mos (96.1%, 98.6%), 6 mos (73.7%, NR), 12 mos (65.8%, NR) Cross-over: at 3 month f/u, control group was unblinded and offered ESWT treatment	**Inclusion criteria:** unilateral single cosite plantar medial heel pain, pain with local pressure over medial calcaneal tuberosity with passive foot dorsiflexion, VAS pain score > 5 after walking in the morning, Roles and Maudsley Score of 3 or 4, 6 months of unsuccessful therapy of NSAIDs and at least two other therapies***, symptoms > 6 months, ≥ 18 years old **Exclusion criteria:** systemic inflammatory disorder, coagulation abnormalities, PVD, diabetes, local tumor, calcaneal stress fracture, PN, infections, pregnancy, loss of ankle or foot sensation, cardiac pacemaker, allergy to xylocaine, bleeding disorder or hemophilia, clubfoot, RSD, nonpalpable posterior tibial and dorsalis pedis pulses, abnormal capillary refill, previous surgery or SWT for PF, CSI within 1 month of treatment, bilateral symptoms, anticoagulant therapy within 7 days of treatment, previous conservative treatment within 2 weeks of treatment	**FESWT (n=76)** Device: Epos ultra Shocks, energy: 3800, 0.36 mJ/mm^2 Total energy: 1300 mJ/mm^2 Intensity: high No. sessions: 1 US guidance: yes Anesth: medial calcaneal nerve block **Sham (n=74)** Same settings, air cushion placed on the therapy head Anesth: medial calcaneal nerve block **Co-intervention** NR
FESWT vs. other treatment			
Chew (2013) Country: Singapore Study period: NR	N=54 Age: 46.1 (37-53) years Male: 53.7%	**Inclusion criteria:** Unilateral symptoms, ≥ 4 mos of plantar heel pain, maximal tenderness at medial calcaneus tubercle, sonographic features of PF	**FESWT (n=19)** Device: Epos Ultra Shocks, energy: 2000, 0.42 mJ/mm^3 Total energy: NR

	Population	Inclusion/exclusion criteria	ESWT/control
Sponsor: Singapore National Medical Research Committee grant COI: NR	Sx duration (mos.): 13.7 (6-24) F/U (% ESWT, % ACP, % control): 1 month, 3 mos (NR, NR, NR), 6 mos (89.5%, 78.9%, 81.3%) Cross-over: none	**Exclusion criteria:** Arthritis, fractures, tumors of the foot or ankle, generalized polyarthritis, seronegative arthropathy, diabetes mellitus, neurologic impairments, lower extremity nerve entrapment, vascular abnormalities, previous foot surgery, CSI within 4 mos of treatment, pregnancy	Intensity: high No. sessions: 2 sessions at weekly intervals US guidance: yes Anesth: none **ACP (n=19)** 10 mL blood drawn, centrifuged at 1500 rpm for 5 min, 3 mL of ACP extracted and injected at site of plantar fascia thickening and tenderness Anesth: none **Stretching (n=16)** Performed solely the physical therapy stretching regime **Co-intervention** Physical therapy stretching regime
Hammer (2002) Country: Germany Study period: January 1999—August 1999 Sponsor: NR COI: NR	N=48 Age: 49.5 (24-79) years Male: 31.9% Sx duration (mos.): 9.4 F/U§: 6 wks, 3 mos, 6mos Cross-over: at 3 month f/u, patients receiving conservative treatment were given ESWT using same protocol as original group	**Inclusion criteria:** ≥ 6 mos unsuccessful conservative treatment, heel spur detected by US, pain at medial calcaneal tuberosity **Exclusion criteria:** PF without pain at insertion, neurological disorders, local infections, local tumors, coagulation disorders, pregnancy	**FESWT (n=24)** Device: Piezoson 300 Shocks, energy: 3000, 0.22 mJ/mm^2 Total energy: NR Intensity: high No. sessions: 3 sessions at weekly intervals US guidance: NR Anesth: NR **Conservative treatment (n=23)** Treatment with iontophoresis with diclofenac and an oral NSAID Anesth: none **Co-intervention** Heel cups

	Population	Inclusion/exclusion criteria	ESWT/control
Porter (2005) Country: Australia Study period: NR Sponsor: Chang Gung Research Fund (CMRP 905) and the National Health Research Institute (NHRI-EX94-9423EP) COI: NR	N=125 Age: 39.3 (18-81) years Male: 33.6% Sx duration (mos): 13.7 (6-54) F/U§: 3 mos and 12 mos Cross-over: none	**Inclusion criteria:** plantar heel pain worse in morning and/or after sitting/lying for ≥ 6 weeks, maximal tenderness at calcaneal attachment of plantar fascia, pain aggravated by hopping and relieved with tie-beam taping **Exclusion criteria:** previous surgery, CSI or ESWT for heel pain, clinical features suggestive of seronegative spondyloarthropathy or regional pain syndrome, rheumatoid arthritis, < 18 years old	**FESWT (n=61)** Device: NR Shocks, energy: 1000 shocks, 0.08 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: NR Anesth: NR **CSI (n=64)** One injection at site of maximal tenderness Anesth: NR **Co-intervention** Standardized Achilles tendon and plantar fascia stretching program
Radwan (2012) Country: NR Study period: July 2005-December 2007 Sponsor: NR COI: NR	N=65 Age: 38.6 ± 9.1 years Male: 61.5% Sx duration (mos.): 17.7 ± 9.8 F/U (% ESWT, % Sham): 3 wks, 3 mos (91.2%, 93.5%), 12 mos (91.2%, 93.5%) Cross-over: none	**Inclusion criteria:** single site heel pain at origin of proximal plantar fascia on medical calcanean tuberosity, failure of ≥ 3 conservative treatments††† in previous 6 mos, self-assessed pain greater than 40 mm on 100 mm VAS after 5 min of walking in the morning **Exclusion criteria:** < 18 years old, local infection, metabolic disorders or malignancy, ankle arthritis, generalized polyarthritis, sero-negative arthropathy, ipsilateral or contralateral vascular or neurological abnormalities, previous surgery, tarsal tunnel syndrome, trauma or deformity or fractures on foot or ankle, active coagulation therapy or bleeding disorder, cardiac arrhythmia, pacemaker or stent, CSI within 6 wks, contralateral heel pain > 40 mm on VAS, pregnancy	**FESWT (n=34)** Device: OssaTron Shocks, energy: 1400, 0.22 mJ/mm^2 Total energy: 324.25 mJ/mm^2 Intensity: high No. sessions: 1 US guidance: no Anesth: conscious sedation **EPFR (n=31)** Incisor blade was used to debride posterior leaflet of the plantar fascia Anesth: general or spinal **Co-intervention** Crutch walking for 2-4 weeks in the EPFR group

	Population	Inclusion/exclusion criteria	ESWT/control
Yucel (2010) Country: Turkey Study period: January 1, 2005—December 31, 2006 Sponsor: NR COI: none	N=60 Age: 43.9 ± 8.33 years Male: 30% Sx duration (mos.): 38.6 ± 9.5 F/U (% ESWT, % conservative treatment): 3 mos (100%, 100%) Cross-over: none	**Inclusion criteria:** post static dyskinesia, pain at medial calcaneal tubercle, ≥ 18 years old, symptoms > 6 mos, ≥ 6 mos unsuccessful conservative treatment‡‡‡ **Exclusion criteria:** previous surgery for PF, previous CSIs, pregnancy, RSD, cardiac pacemaker, calcaneal stress fracture, bleeding disorder or hemophilia, anticoagulant drug therapy, generalized inflammatory arthritis, malignancy, overlying infection, cellulitis	**FESWT (n=27)** Device: Stonelith-V5 Shocks, energy: 3000, NR Total energy: NR Intensity: NR No. sessions: 1 US guidance: NR Anesth: nerve block **CSI (n=33)** One CSI injected at most painful area over the medial calcaneal tuberosity Anesth: NR **Co-intervention** No running or impact activities for 10 days in CSI group
Radial extracorporeal shock wave therapy (RESWT) vs. sham			
Gerdesmeyer (2008) Country: USA and Europe (countries NR) Study period: NR 11 month enrollment Sponsor: Electro Medical Systems COI: NR	N=252 Age: 52.2 ± 11.3 years Male: 31.7% Sx duration (mos.): 25.3 ± 25.7 F/U (% ESWT, % Sham): 3 mos (88.4%, 91.0%), 12 mos. (86.8%, 95.1%)§§§ Cross-over: no true cross-over. However, patients who did not have successful treatment after 12 weeks were unblinded and allowed to pursue other treatment. The worst outcome	**Inclusion criteria:** history of chronic plantar heel pain (≥ 6 month) confirmed using point of max tenderness over medial calcaneal tubercle; 2 failed pharmacological and 2 failed non-pharmacological treatments, ≥ 5 on pain VAS, Roles and Maudsley score of 3 or 4 **Exclusion criteria:** systemic inflammatory disease, osteomyelitis, active infection or history of chronic infection in treatment area, neurological or vascular insufficiencies, nerve entrapment, operative treatment of heel spur	**RESWT (n=129)** Device: Swiss DolorClast Shocks, energy: 2000, 0.16 mJ/mm^2 Total energy: 960 mJ/mm^2 Intensity: medium No. sessions: 3 sessions at bimonthly intervals US guidance: no Anesth: none**** **Sham (n=122)** ESWT applied to the same area using the same sound effects but with no energy applied Anesth: none **Co-intervention**

	Population	Inclusion/exclusion criteria	ESWT/control
	was carried forward for the 12 month analysis		Two grams acetaminophen per day for up to 14 days followed by 2 grams acetaminophen per week as needed
Ibrahim (2010, 2016) Country: USA Study period: October 2007-November 2008 Sponsor: NR COI: NR	N=50 Age: 52.9 ± 3.75 years Male: 36.0% Sx duration (mos.): ≥ 6 F/U (% ESWT, % Sham): 3 mos (100%, 100%) 6 mos (100%, 100%) 12 mos (100%, 100%) 24 mos (92%, 96%) Cross-over: none	**Inclusion criteria**: >18 years old, diagnosis of painful heel syndrome, pain in the morning or after sitting, local pain where fascia attaches to the heel, increasing pain with walking or standing, ≥ 6 months unsuccessful conservative treatment, no prior therapy within previous 4 weeks of referral **Exclusion criteria:** bilateral symptoms, dysfunction of foot or ankle, infections or tumors in lower extremity, neurological abnormalities, nerve entrapment, arthrosis or arthritis of the foot, vascular abnormality, previous surgery on heel spur, hemorrhagic disorders and anticoagulant therapy, pregnancy, diabetes	**RESWT (n=25)** Device: Swiss DolorClast Shocks, energy: 2000, 0.16 mJ/mm^2 Total energy: NR Intensity: medium No. sessions: 2 sessions weekly US guidance: NR Anesth: none **Sham (n=25)** Same settings but a heel clasp was placed on the patient Anesth: none **Co-intervention** None; no other therapy was allowed during the period of the study
Mehra (2003) Country: UK Study period: NR Sponsor: Swiss DolorClast was acquired on loan from Electro Medical Systems COI: NR	N=23 Age: NR Male: 66.0% Sx duration (mos.): 11 mos F/U (% ESWT, % Sham): 3 mos (NR, NR), 6 mos (100%, 100%) Cross-over: none	**Inclusion criteria**: failure of one or more methods of treatment; conservative, topical NSAIDs, steroid injection, and/or surgery **Exclusion criteria:** NR	**RESWT (n=13)** Device: Swiss DolorClast Shocks, energy: 2000, 2.5 bars Total energy: NR Intensity: NR No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: local (1% lignocaine) **Sham (n=10)** Same settings but elbow or heel clasp was placed on patient Anesth: local (1% lignocaine) **Co-intervention** NR

	Population	Inclusion/exclusion criteria	ESWT/control
RESWT vs. other treatment			
Grecco (2013) Country: Brazil Study period: 2005-2009 Sponsor: NR COI: NR	N=40 Age: 49.6 ± 11.8 years Male: 15% Sx duration (mos.): ≥ 3 F/U (% ESWT, % control): 3 mos (100%, 100%), 12 mos (100%, 100%) Cross-over: none	**Inclusion criteria:** diagnosis of PF, plantar fascia thickness > 4 mm, aged between 20 and 68 years, symptoms ≥ 3 mos, literate **Exclusion criteria:** need for physical intervention for PF treatment after proposed treatment, pacemaker, anticoagulant medication, musculoskeletal conditions in lower extremity, central or peripheral neuropathy, systemic inflammatory disease, metabolic and endocrine disease, psychiatric disorders	**RESWT (n=20)** Device: DolorClast Shocks, energy: 2000, 3 bar Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: NR Anesth: NR **Ultrasound (n=20)** Device: NR Energy: 1.2 W/cm^2 No. sessions: 10 sessions, 2 per week Anesth: none **Co-intervention** Kinesiotherapy, gastrocnemius and plantar fascia stretching
Konjen (2015) Country: Thailand Study period: July 2012-May 2012 Sponsor: Ratchadaphiseksomphot Endowment Fund COI: none	N=30 Age: 45.3 ± 1.1 years Male: 20% Sx duration (mos.): 16.2 ± 0.5 F/U (% ESWT, % control): 1 week, 3 wks, 6 wks, 3 mos (100%, 100%), 6 mos (100%, 100%) Cross-over: none	**Inclusion criteria:** > 18 years old, PF diagnosis > 3 mos, at least one unsuccessful conservative treatment†††† > 3 mos, heel pain with first steps > 5 cm **Exclusion criteria:** previous surgery or cancer of the heel, recent trauma, foot and/or ankle fracture, infection or inflammation of the heel, neuro-vascular problems of lower extremities, CSI within 6 wks of treatment, US therapy within 4 wks of treatment, NSAID within 1 week of treatment	**RESWT (n=15)** Device: DolorClast Shocks, energy: 2000, 2 bars Total energy: NR Intensity: NR No. sessions: 6 sessions at weekly intervals US guidance: NR Anesth: NR **Ultrasound (n=15)** Device: NR Energy: 1.2 W/cm^2 No. sessions: 10 sessions, 2 per week Anesth: none

	Population	Inclusion/exclusion criteria	ESWT/control
			Co-intervention Personal health care instructions‡‡‡‡, plantar fascia and gastrocnemius muscle stretching, shoe modifications

ACP, autologous conditioned plasma; Anesth, anesthesia; COI, conflict of interest; CSI, corticosteroid injection; ESWT, extracorporeal shock wave therapy; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; GAOOS, German Association for Orthopaedics and Orthopaedic Surgery; IV, intravenous; min, minutes; mm, millimeters; mos, months; NA, not applicable; NR, not reported; NS, none stated; NSAID, non-steroidal anti-inflammatory drug; PF, plantar fasciitis; PN, peripheral neuropathy; PVD, peripheral vascular disease; RESWT, radial extracorporeal shock wave therapy; rpm, revolutions per minute; RSD, reflux sympathetic dystrophy; SWT, shock wave therapy; Sx, symptom; US, ultrasound; VAS, visual analog scale; wks, weeks

*Standardized rescue medication was available during treatment if pain became unbearable
†Only patients that met criteria for success at 3 month follow-up were asked back for follow-up at 12 months with the intention to assess longevity of successful treatment
‡6 and 12 month visits were safety follow-up visits whereas the 3 months follow-up was an efficacy follow-up visit
§Percent follow-up not reported
**Study examined exclusively recreational athletes that ran more than 30 miles per week
††Study exclusively evaluated athletic population defined as professional, collegiate, or high school athletes, runners who ran at least 25 miles per week, and other athletes who practiced their sport at least 6 hours per week
‡‡Modalities considered were stretching, icing, inserts/orthoses, night splints, physiotherapy, and possible corticosteroid injection and/or NSAIDs
§§Did not include full study period of 12 month follow-up
***Additional therapies included physical therapy, orthotics, stretching exercises, cortisone injection, and casting
†††Conservative treatments included NSAIDs, CSIs, physical therapy, exercise program, and orthotic devices
‡‡‡Defined as NSAIDs and at least two of the following: heat, ice, US, massage, casting, and shoe modifications
§§§Patients who showed successful response at 3 month follow-up continued to 12 month follow-up period; however, the last value was carried forward for patients that left the trial at the three month mark
****Local anesthetic was offered but not patients requested it.
††††Defined as plantar fascia and gastrocnemius stretching, shoe modification, or NASID use
‡‡‡‡Consisted of information for weight and activity control, self-foot massage, and heat and cold application

Appendix Table F2. Lateral Epicondylitis: Study Characteristics and Patient Demographics

	Population	Inclusion/exclusion criteria	ESWT/control
Focused extracorporeal shock wave therapy (FESWT) vs. sham			
Haake (2002) Country: Germany (multicenter) Study period: NR Sponsor: DFG, German National Research Foundation; DGOCC; Association for Promoting Science and Research at Rehberg Clinic; Storz Medical AG; Siemens AG; Richard Wolf Gm bH; Dornier Medizintechnik COI: NR	N=272 Age: 47 years Male: 47% Sx duration (mos): 25.2 (±28.4) F/U (% ESWT, % Sham): 3 mos (91.9%, 89.1%) Cross-over: Crossover was allowed after assessment of the primary end point at 3 mos.	**Inclusion criteria:** Radio humeral epicondylitis (≥2 positive clinical tests); Roles and Maudsley score of 3 or 4; ≥6 mos of unsuccessful conservative therapy (≥3 local injections, ≥10 treatments with physiotherapy, and ≥10 treatments with physical forms of therapy; ≥2-wk interval since the last conservative treatment. **Exclusion criteria:** local arthrosis /arthritis or rheumatoid arthritis; neurological findings; preliminary operation on the epicondyle to be treated or bilateral symptoms, <18 years of age, pregnancy.	**FESWT (n=135)** Device: Various devices Shocks, energy: 2000, 0.07-0.09 mJ/mm^2 Total energy: 420-540 mJ/mm^2 Intensity: low No. sessions: 3, 8 days between US guidance: yes Anesth: local **Sham (n=137)** Same settings, polythene foil filled with air to reflect shock waves Anesth: local **Co-intervention** None; no other therapy was allowed during the period of the study
Chung 2004 Country: Canada (single site) Study period: NR Sponsor: SSAA, Alberta Provincial Canadian IHRTBJH COI: No author or related institution received any financial benefit from research in this study	N=60 Age: 46.2 (7.9) years Male: 60% Sx duration (mos): 4.9 (3.5) F/U (% ESWT, % Sham): 2 mos (96.8%, 89.7%) Cross-over: None	**Inclusion criteria**: ≥18 years; previously untreated symptoms of < 1 year but >3 weeks; tenderness over lateral epicondyle and common extensor origin tendons; pain worsened with resisted wrist extension, hand grip, elbow extension with forearm pronation and wrist palmar flexion; willing to discontinue bracing. **Exclusion criteria**: Active treatment for latera epicondylitis; posterior interosseous nerve compression; trauma to the elbow; Workers' Comp; elite athletes; rheumatologic condition; nerve irritation; pregnancy; blood coagulation disorder; bony or articular elbow lesion; malignancy; pacemaker	**FESWT (n=31)** Device: Sonocur Basic Shocks, energy: 2000, 0.03-0.17 mJ/mm^2 Total energy: NR Intensity: low & medium No. sessions: 3 with a week in between US guidance: no Anesth: no **Sham (n=29)** 2000, .03 mJ/mm2, but air buffer pad prevented transmission of shock waves Anesth: no **Co-intervention** Stretching exercises both groups

	Population	Inclusion/exclusion criteria	ESWT/control
Collins 2011 Country: USA (multicenter) Study period: NR Sponsor: HealthTronics, Atlanta, Georgia; Baylor College of Medicine, Houston, Texas COI: NR	N=183 Age: 45.7 (22-72) years Male: 48% Sx duration (mos): 24.1 (5-264) F/U (% ESWT, % Sham): 2 mos (88.2%, 92.2%), 6 mos (24.7%, 10.0%), 12 mos (20.4%, 11.1%) Cross-over: Only "successes" at 8 weeks were invited to continue to longer follow-up. Those who failed were offered one repeat treatment.	**Inclusion criteria:** ≥21 years of age; pain ≥6 months; failure to respond to ≥3 attempts of conservative treatment; tenderness over affected area 5.0 on a 10-cm scale and participant self-assessment of baseline pain during activity ≥5.0cm on a 10-cm scale. **Exclusion criteria:** Pregnancy; vascular insufficiency, nerve compression or other upper extremity neuropathy; severe osteoarthritis, rheumatoid arthritis, osteoporosis, metabolic disorders, malignancies, Paget disease, osteomyelitis or systemic infection, or fracture of the affected arm	**FESWT (n=93)** Device: OssaTron Shocks, energy: 1500, 18kV Total energy: NR Intensity: high No. sessions: 1 or 2 US guidance: no Anesth: local or Bier block **Sham (n=90)** Same settings, Styrofoam block against coupling membrane to absorb shockwaves; fluid-filled bag placed between Styrofoam block and patient. **Co-intervention** None; no other therapy was allowed during the period of the study
Melikyan 2013 Country: UK Study period: NR Sponsor: Dornier Medizintechnik; BUPA research fund COI: Benefits have been or will be received but are directed solely to a research fund, foundation, educational institution, or other non-profit institution with which one or more of the authors is associated	N=74 Age: 43 years Male: 42% Sx duration (mos): NR, all had "extensive conservative treatment" & awaiting surgery F/U (% both groups combined): 3 mos (86.0%), 12 mos (86.0%) Cross-over: None	**Inclusion criteria:** pain localized to lateral epicondyle, tenderness over lateral epicondyle, supracondylar ridge and first 2cm of the extensor muscle, previous conservative treatment, and increased pain on resisted wrist extension and on elbow extension with full wrist extension. **Exclusion criteria**: pain over radial and posterior interosseous nerve, positive resisted supination test, pain over radio humeral joint, exacerbation of pain on neck movement, previous surgery for lateral epicondylitis, less than 18 years of age.	**FESWT (n=37)** Device: Epos Shocks, energy: NR Total energy: 1000 mJ/mm2 Intensity: unkwn No. sessions: 3 (timing not stated) US guidance: yes Anesth: no **Sham (n=37)** Same settings, foam pad between the device and arm to reflect the shockwaves. **Co-intervention** None; no other therapy was allowed during the period of the study
Pettrone 2005 Country: USA (multicenter)	N=114 Age: 47 years Male: 44%	**Inclusion criteria:** pain ≥6 months, resistant to ≥2 of 3 conventional therapies (physical therapy, NSAIDs, steroid injection),	**FESWT (n=56)** Device: Sonocur Shocks, energy: 2000, .06 mJ/mm2

	Population	Inclusion/exclusion criteria	ESWT/control
Study period: NR Sponsor: In support of the study, one or more of the authors received grants or outside funding from Siemens Medical. COI: None	Sx duration (mos): 21 F/U (% ESWT, % Sham): 3 mos (94.6%, 92.2%), 12 mos (82.1%, 67.2%) Cross-over: Patients who did not have treatment success after 3 months could choose to have treatment group revealed to them and placebo patients could cross over into the ESWT group	tenderness over lateral epicondyle, reproducible pain on wrist extension ≥4 on 10-cm VAS. **Exclusion criteria:** < 18 years of age, elbow injection ≤6 weeks, physical therapy within 4 weeks, anti-Inflammatory or acetaminophen use within 1 week, bilateral epicondylitis, upper extremity arthritis, radial nerve entrapment, prior surgery for epicondylitis.	Total energy: 360 mJ/mm2 Intensity: Low No. sessions: 3 with a week in between US guidance: no Anesth: no **Sham (n=58)** Same settings, sound reflecting pad between the device and arm to absorb shockwaves. **Co-intervention** None; no other therapy was allowed during the period of the study
Rompe 2004 Country: Germany Study period: NR Sponsor: NR COI: None	N=78 Age: 45 years Male: 51% Sx duration (mos): 24.5 (12-132) F/U (% ESWT, % Sham): 3 mos (89.5%, 90%), 12 mos (81.6%, 82.5%) Cross-over: Sham patients were unblended at 3 months and offered to receive crossover.	**Inclusion criteria:** playing recreational tennis ≥ 1 hr/wk, pain ≥12 months, +MRI, pain unresponsive to rest, ≥3 conventional conservative treatments longer than 2 months, VAS score ≥ 4. **Exclusion criteria:** local arthritis, rheumatoid arthritis, cervical compression syndrome, previous operation on the affective elbow	**FESWT (n=38)** Device: Sonocur Shocks, energy: 2000, .09 mJ/mm2 Total energy: 540 mJ/mm2 Intensity: Low No. sessions: 3 with a week in between US guidance: yes Anesth: no **Sham (n=40)** Same settings, polythene foil filled with air to reflect shock waves **Co-intervention** None; no other therapy was allowed during the period of the study
Speed 2002 Country: UK Study period: NR Sponsor: Cambridge Arthritis Research Endeavour (CARE) COI: NR	N=75 Age: 47.5 years Male: 43% Sx duration (mos): 14 (3-42) F/U (% ESWT, % Sham): 3 mos* (95.0%, 94.3%)	**Inclusion criteria:** > 18 years of age, unilatera lateral elbow pain for ≥ 3 months (tenderness at or near the common extensor tendon insertion and pain at the lateral epicondyle reproduced with resisted extension of the middle finger).	**FESWT (n=40)** Device: Sonocur Shocks, energy: 1500, .12 mJ/mm2 Total energy: 540 mJ/mm2 Intensity: Med No. sessions: 3 with a month in between US guidance: yes

	Population	Inclusion/exclusion criteria	ESWT/control
	Cross-over: None	**Exclusion criteria:** additional elbow pathology, polyarthritis, neurological abnormalities, anticoagulant therapy, treatment to affected area within 6 weeks, pregnancy, diabetes.	Anesth: no **Sham (n=35)** Minimum power setting (0.04 mJ/mm2) with the treatment head deflated, no coupling gel and no skin contact **Co-intervention** None; no other therapy was allowed during the period of the study
FESWT vs. other treatment			
Crowther 2002 Country: UK Study period: NR Sponsor: NR COI: No benefits in any form have been or will be received from a commercial party related directly or indirectly to the subject of this article.	N=93 Age: 49 years Male 52% Sx duration (mos): 30 (1-90) F/U (% ESWT, % Injection): 3 mos (94.1%, 59.5%) Cross-over: None	**Inclusion criteria:** over 18 years old, classic history of tennis elbow for ≥ 4 months and no surgical intervention or injection in the previous year, tenderness over the lateral epicondyle and reproducible pain with resisted finger and wrist extension **Exclusion criteria:** dysfunction of the shoulder, neck or thorax, local arthritis, generalized polyarthritis or neurological abnormality, upper limb nerve entrapment, pregnancy, infection, tumor, clotting disorder, anticoagulant therapy, cardiac pacemaker	**FESWT (n = 51)** Device: Storz Minilith SL1 Shocks, energy: 2000, 0.1mJ/mm2 Total energy: 600 mJ/mm2 Intensity: low to medium No. sessions: 3 with a week in between US guidance: yes **Injection (n = 42)** 1 injection of 20 mg triamcinolone with 1.5 ml of 1% lignocaine into the point of maximal tenderness. **Co-intervention** Both groups advised rest and moderate activities to avoid aggravation of symptoms.
Ozturan 2010 Country: Turkey Study period: NR Sponsor: NNR COI: The authors have no financial relationships to disclose	N=60 Age: 45.6 (20-64) years Male: 47% Sx duration (mos): 9.7 (2.8) F/U (% ESWT, CSI, ABI): 3 mos, 6 mos, 12 mos (100%, 90%, 95%) Cross-over: None	**Inclusion criteria:** >18 years of age; history of lateral epicondylitis for a ≥6 months; tenderness of the lateral epicondyle; >40 mm on the VAS during Thomsen test. **Exclusion criteria:** pregnancy; corticosteroid injection or physical therapy for lateral epicondylitis in the previous 3 months; NSAID or acetaminophen in the previous week;	**FESWT (n=20)** Device: Stonelith V5 lithotriptor Shocks, energy: 2000, 0.17 mJ/mm2 Total energy: 1020 mJ/mm2 Intensity: med No. sessions: 3 with a week in between US guidance: no Anesth: local

	Population	Inclusion/exclusion criteria	ESWT/control
		cervical spondylosis; history or radiograph of the upper extremity and elbow arthritis; rheumatologic disease; severe systemic illness; neurological pathology; previous surgery or elbow dislocation	**Corticosteroid injection (CSI) (n=20)** Methylprednisolone acetate (1 mL) injection following local anesthetic injection **Autologous blood injection (ABI) (n=20)** Injection of blood taken from antecubital fossa following local anesthetic injection **Co-intervention** None; no other therapy was allowed during the period of the study
Radwan 2008 Country: Egypt Study period: Nov 2004–Sep 2005 Sponsor: NR COI: NR	N=62 Age: 29.7 (10.6) years Male: 59% Sx duration (mos): 17.5 (6-60) F/U (% ESWT, percutaneous tenotomy): 3 mos, 6 mos, 12 mos (100%, 90%, 95%) Cross-over: None	**Inclusion criteria:** lateral epicondylitis with ≥6 months failure of conservative treatment (NSAIDs, CSIs, physical therapy, exercise program and elbow brace. **Exclusion criteria:** ≥18 years, local infection, malignancy, elbow arthritis, polyarthritis, ipsilateral shoulder dysfunction, neurological abnormalities, radial-nerve entrapment, cardiac arrhythmia, pacemaker, CSI within the previous six weeks or pregnancy.	**FESWT (n=32)** Device: OssaTron (EH) Shocks, energy: 1500, 0.22 mJ/mm2 Total energy: 324 mJ/mm2 Intensity: high No. sessions: 1 US guidance: no Anesth: conscious sedation **Percutaneous tenotomy (n=30)** Percutaneous release of the common extensor origin under general anesthesia
RESWT vs. SHAM			
Mehra (2003) Country: UK Study period: NR Sponsor: Swiss DolorClast was acquired on loan from Electro Medical Systems COI: NR	N=23 Age: NR Male: 66.0% Sx duration (mos.): 11 mos F/U (% ESWT, % Sham): 3 mos (NR, NR), 6 mos (100%, 100%) Cross-over: None	**Inclusion criteria**: failure of one or more methods of treatment; conservative, topical NSAIDs, steroid injection, and/or surgery **Exclusion criteria:** NR	**RESWT (n=13)** Device: Swiss DolorClast Shocks, energy: 2000, NR Total energy: NR Intensity: NR No. sessions: 3 sessions at biweekly intervals US guidance: no Anesth: local (1% lignocaine) **Sham (n=11)**

	Population	Inclusion/exclusion criteria	ESWT/control
			Same settings but elbow or heel clasp was placed on patient Anesth: local (1% lignocaine) **Co-intervention** NR
Capan (2016) Country: Iran Study period: NR Sponsor: NR COI: No conflicts of interest have been reported by authors or by any individuals in control of the content of this article.	N=56 years Age: 47.3 (33-66) Male: 22.2% Sx duration (mos.): 7.8 (5.2) F/U (% ESWT, % Sham): 3 mos (82.1%, 76.6%) Cross-over: None	**Inclusion criteria**: unilateral lateral epicondylitis with symptom duration of more than 3 months who were unresponsive to previous treatments **Exclusion criteria:** history of trauma at the affected elbow, presence of posterior interosseous nerve entrapment, systemic rheumatic disease or infection, pregnancy, malignancies, coagulopathies, anticoagulant use, cardiac pacemaker, and unwillingness to participate in the study	**RESWT (n=28)** Device: ShockMaster Shocks, energy: 2000, 1.8 bar Total energy: NR Intensity: NR No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: none **Sham (n=28)** Same contact gel was applied to the same area; however, the contact of the applicator head with the skin covered by the gel was avoided. Anesth: NR **Co-intervention** NR

ABI, autologous blood injection; COI, conflict of interest; COI: conflict of interest; CSI, corticosteroid injection; DFG, Deutsche Forschungsgemeinschaft; DGOCC, German Association for Orthopaedics and Orthopaedic Surgery; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; IHRTBJH, Health Research Training Program in Bone and Joint Health; mos, months; NR, not reported; NSAID, non-steroidal anti-inflammatory medication; RESWT, radial extracorporeal shock wave therapy; SSAA, Sports Science Association of Alberta; Sx: symptom; VAS, visual analog scale

*****3 months after the start of treatment, 1 month after the last treatment.

Appendix Table F3. Shoulder Tendinopathy: Study Characteristics and Patient Demographics

	Population	Inclusion/exclusion criteria	ESWT/control
Rotator Cuff Tendinopathy: FESWT			
Cosentino (2003) Country: Italy Study period: NR Sponsor: NR COI: NR	N=70 Age: 51.8 years Male: 38.6% Sx duration (mos.): 14.75 (10-20) Dx: calcific tendinopathy; supraspinatus F/U (% ESWT, % Sham)*: 1 month, 6 mos (%NR) Cross-over: none	**Inclusion criteria**: shoulder pain present for ≥ 10 months, calcification of the rotator cuff (≥ 10 mm in x-rays), unsuccessful conservative treatment for ≥ 6 months prior to study **Exclusion criteria:** local and generalized arthritis, osteoarthritis, algodystrophy, pregnancy, infectious or tumorous diseases, skin ulcerations, neurological abnormalities, dysfunction in the neck and/or thoracic region, partial or complete ruptures of the rotator cuff	**FESWT (n=35)** Device: Orthima Shocks, energy: 1200, 0.28 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 4 sessions every 4-7 days US guidance: NR Anesth: none **Sham (n=35)** Same set up but no energy was applied Anesth: none **Cointervention(s)** None; no other treatment or drugs were used during the study period, patients were instructed to use the arm but to avoid painful movements.
Galasso (2012) Country: Italy Study period: NR Sponsor: in part, by Storz Medical AG, Tagerwilen, Switzerland COI: none	N= 20 Age: 50.9 ± 10.6 Male: 55% Sx duration (mos.): 53.3 ± 29.3 Dx: non-calcific tendinopathy; supraspinatus F/U (% ESWT, % Sham): 6 wks, 3 mos (100%, 100%) Cross-over: none	**Inclusion criteria**: unsuccessful non-pharmacological and non-surgical conservative treatment† for ≥ 3 weeks, unsuccessful pharmacological treatment, history of ≥ 1 subacromial steroid injection, ≥ 18 years old, not pregnant, NCST diagnosed by X-ray, MRI and physical examination, unilateral symptoms, free passive range of movement and ≥ 90 degrees active abduction in the affected shoulder **Exclusion criteria:** hypertension, angina, heart failure, ventricular arrhythmias, WBC count < 2000 or > 15000, platelet count < 50000, bleeding disorders, anticoagulant therapy, use	**FESWT (n=11)** Device: Modulith SLK Shocks, energy: 3000, 0.068 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 2 sessions at 7 day intervals US guidance: yes Anesth: 2% lidocaine **Sham (n=9)** Same set up but shockwave generator was disconnected, prerecorded sound of the ramp-up shocks was played Anesth: 2% lidocaine

	Population	Inclusion/exclusion criteria	ESWT/control
		of narcotics or NSAIDs and/or has used analgesics or NSAIDs within 72 hours of study, prior shoulder surgery, prior SWT, pacemaker, bilateral symptoms, malignant tumors, anatomy that prevents focusing of device in area of supraspinatus tendon, upper extremity neurological disorder, rotator cuff tear, acromiohumeral interval < 7 mm, acute subacromial bursitis, generalized polyarthritis, rheumatoid arthritis, allergy to local anesthetic	**Cointervention(s)** Use of pain medication (e.g., acetaminophen) as needed was allowed and recorded
Gerdesmeyer (2003) Country: Germany and Austria (multicenter) Study period: February 1997-March 2001 Sponsor: German Association for Orthopedics and Orthopedic Surgery (DGOCC) and Dornier Medizintechnik COI: none	N=144 Age: 50.4 ± 8.9 years Male: 39.6% Sx duration (mos.): 42.2 ± 25.7 Dx: calcific tendinopathy; supraspinatus (88%) or infraspinatus (12%) F/U (% high ESWT, % low ESWT, % Sham): 3 mos (91.7%, 95.8%, 87.5%), 6 mos (97.9%, 95.8%, 85.4%), 12 mos (72.9%, 91.7%, 66.7%) Cross-over: none	**Inclusion criteria**: ≥ 6 months of pain from type I or II‡ idiopathic calcific tendonitis resistant to conservative treatment§, ≥ 18 years old, calcific deposits ≥ 5 mm in diameter **Exclusion criteria:** type III Gartner deposits, rheumatic disease, connective tissue disease, diabetes, coagulation disturbance, pregnancy, glenohumeral or acromioclavicular joint arthritis, previous surgery for shoulder pain, bursitis or infection or tumor of the shoulder, instability of shoulder or rotator cuff, abnormal peripheral neurologic findings, unsuccessful prior ESWT	**FESWT (n=96)** Device: NR Shocks, energy: High (n=48):1500, 0.32 mJ/mm^2 Low (n=48): 6000, 0.08 mJ/mm^2 Total energy: 0.960 mJ/mm^2 Intensity: high and low No. sessions: 2 sessions within 16 days US guidance: no Anesth: intravenous analgesia and/or sedation as necessary (local anesthetic prohibited) **Sham (n=48)** Same set up but an air chambered polyethylene foil was placed between device and patient and no coupling gel was applied to the site of the shock wave head Anesth: none **Cointervention(s)** 10 physiotherapy sessions**
Hsu (2008) Country: NR	N=46 Age: 55.4 (range, 30-82) years Male: 41.3%	**Inclusion criteria**: shoulder pain due to calcific tendinitis, failure of non-operative treatment††	**FESWT (n=33)** Device: OrthoWave Shocks, energy: 1000, 0.55 mJ/mm^2

	Population	Inclusion/exclusion criteria	ESWT/control
Study period: July 2002-February 2004 Sponsor: NR COI: NR	Sx duration (mos.): 12.0 (range, 6-72) Dx: calcific tendinopathy (NOS F/U: 6 wks, 3 mos, 6 mos, 12 mos (%NR) Cross-over: none	**Exclusion criteria:** previous shoulder surgery, pregnancy, rotator cuff tear, malignancy, local infection, cardiac pacemaker, use of anticoagulants, clotting problems, generalized polyarthritis, arthritis of the shoulder, < 18 years old	Total energy: NR Intensity: NR No. sessions: 2 sessions at biweekly intervals US guidance: NR Anesth: 2% lidocaine **Sham (n=13)** Dummy electrode Anesth: 2% lidocaine **Cointervention(s)** NR
Kim (2014) Country: South Korea Study period: November 2005-March 2011 Sponsor: NR COI: none	N=62 Age: 55.8 (range, 45-78) years Male: 9.3% Sx duration (mos.): NR (> 3 mos per inclusion criteria) Dx: calcific tendinopathy; supraspinatus F/U (% ESWT, % Needling): mean 25.2 mos (90.1%), mean 21.1 mos (83.3%) Cross-over: none	**Inclusion criteria**: diagnosis of unilateral calcium deposition at the supraspinatus tendon, symptoms > 3 months **Exclusion criteria:** rotator cuff tear, adhesive capsulitis, arthritis, fracture, infection, and history of treatment for the affected shoulder	**FESWT (n=32)** Device: NR Shocks, energy: 1000, 0.36 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: NR **US guided needling (n=30)** 18 gauge needle used to perform multiple percutaneous punctures for each deposit followed by a 1 mL injection of Depo-Medrol Anesth: 2% lidocaine **Cointervention(s)** Oral NSAIDs for 7 days; permitted to perform daily normal activities to the extent possible, without any immobilizer brace
Pan (2003) Country: Taiwan	N=60 Age: 56.5 ± 1.9 years Male: 35%	**Inclusion criteria**: radiographically and sonographically verified calcific tendinitis, VAS score ≥ 4 or continuous pain for > 6 months	**FESWT (n=32)** Device: Orthospec Shocks, energy: 2000, 0.26-0.32‡‡ mJ/mm^2 Total energy: NR

	Population	Inclusion/exclusion criteria	ESWT/control
Study period: January 2001-January 2002 Sponsor: NR COI: none	Sx duration (mos.): 24.2 ± 5.9 Dx: calcific tendinopathy; supraspinatus (70%), subcapularis (20%), infraspinatus (8%), teres minor (2%) F/U (% ESWT, % TENS): 2 wks, 4 wks, 3 mos (100%, 96.4%) Cross-over: none	**Exclusion criteria:** systemic diseases, cardiac pacemaker or other implanted device, neuropathic or malignant or infectious causes of pain, rotator cuff tear, previous surgery for calcification or percutaneous needle aspiration or glucocorticosteroid injection within 3 months of treatment, pregnancy	Intensity: NR No. sessions: 2 sessions 14 days apart US guidance: yes Anesth: none **TENS (n=28)** Device: Neurosan50 No. sessions: 3 sessions a week for 4 weeks Anesth: none **Cointervention(s)** None; all patients were asked to stop analgesic medication and physiotherapy 2 weeks before the baseline assessment
Peters (2004) Country: Germany Study period: NR Sponsor: NR COI: NR	N=90 Age: 52 ± 6 years Male: 38.9% Sx duration (mos.): NR (≥ 6 mos per inclusion criteria) Dx: calcific tendinopathy; supraspinatus F/U (% ESWT, % Sham): 3 mos (100%, 90%) Cross-over: none	**Inclusion criteria**: symptoms for ≥ 6 mos, undergone ≥ 10 sessions of physical therapy, substantial restriction of shoulder mobility, pain that required taking NSAIDs **Exclusion criteria:** NR	**FESWT (n=62)** Device: Minilith Shocks, energy: High (n=31): 1500, 0.44 mJ/mm^2 Moderate (n=30): 1500, 0.15 mJ/mm^2 Total energy: NR Intensity: high or moderate No. sessions: sessions every 6 weeks up to 5 sessions, symptoms had resolved, or patients dropped out of study US guidance: yes Anesth: none **Sham (n=29)** Same set up but instrument was turned off Anesth: none **Cointervention(s)** NR
Schmitt (2001)/Efe 2014 Country: Germany	N=40 Age: 52 (range, 29-66) years	**Inclusion criteria**: clinical diagnosis of chronic tendinitis or supraspinatus, absence of	**FESWT (n=20)** Device: Minilith SL 1

	Population	Inclusion/exclusion criteria	ESWT/control
Study period: March 1999-February 2000 Sponsor: NR COI: none	Male: 50% Sx duration (mos.): NR (≥ 6 mos per inclusion criteria) Dx: non-calcific tendinopathy; supraspinatus F/U (% ESWT, % Sham): 6 wks, 3 mos (95%, 90%), 120 mos (75%, 70%) Cross-over: no true cross-over but at the 6 and 12 week f/u, patients not satisfied with treatment were unblinded. The control group was offered ESWT and the active group was offered alternative options	calcification, duration of symptoms ≥ 6 months, failure of conservative treatment§§, no treatment within 4 weeks of study, free range of movement or abduction of ≥ 90 degrees and free rotation **Exclusion criteria:** glenohumeral or acromioclavicular arthritis, tear of the rotator cuff, allergy to mepivacaine, previous shoulder surgery, local tumors or infections, < 18 years old, neurological disorders, acute bursitis of the shoulder	Shocks, energy: 2000, 0.11 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: yes Anesth: 10 ml mepivacaine **Sham (n=20)** Same setup but foil was placed between the patients and the water cushion of the device, the typical sound created by an ESWT machine was present Anesth: 10 ml mepivacaine **Cointervention(s)** NR
Speed (2002) Country: UK Study period: NR Sponsor: NR COI: none	N=74 Age: 52.6 (range, 25-75) years Male: 41.9% Sx duration (mos.): 23.2 ± 25.2 Dx: non-calcific tendinopathy (NOS) F/U (% ESWT, % Sham): 1 month, 2 mos, 3 mos (88.2%, 87.5%), 6 mos (79.4%, 80%) Cross-over: none	**Inclusion criteria**: > 18 years old, unilateral tendonitis of the rotator cuff, symptoms for ≥ 3 months **Exclusion criteria:** demonstrable shoulder pathology, instability, polyarthritis, neck pain, local dermatological condition, neurological abnormalities, anticoagulant therapy, treatment of affected shoulder within 6 months of study, pregnancy, diabetes, connective tissue or infectious disease, vasculitis, or malignancy	**FESWT (n=34)** Device: Sonocur Plus Unit Shocks, energy: 1500, 0.12 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 3 sessions at monthly intervals US guidance: yes Anesth: none **Sham (n=40)** Same setup but treatment head was deflated, no coupling gel was used, and standard contact with skin was avoided; machine made typical sound associated with an ESWT machine Anesth: none

	Population	Inclusion/exclusion criteria	ESWT/control
			Cointervention(s) None; no other therapy was allowed during the period of study
Rotator Cuff Tendinopathy: RESWT			
Kolk (2013) Country: Netherlands (multicenter) Study period: 2001-2003 Sponsor: Electro Medical Systems COI: Although none of the authors has received or will receive benefits for personal or professional use from a commercial party related directly or indirectly to the subject of this article, benefits have been or will be received but will be directed solely to a research fund, foundation, educational institution, or other non-profit organization with which one or more of the authors are associated.	N=82 Age: 47.1 (range, 24-67) years Male: 30.5% Sx duration (mos.): 26.3 (6-180) Dx: calcific (48.8%) and non-calcific (48.8%) tendinopathy (NOS); acromio-clavicular arthrosis (3.7%) F/U (% ESWT, % Sham): 3 mos, 6 mos (79.5%, 89.5%) Cross-over: none	**Inclusion criteria**: between 18 and 67 years old, clinical signs of chronic tendinitis, symptoms for ≥ 6 months, no treatment within 6 weeks of study **Exclusion criteria:** pregnancy, blood coagulation disorders, systemic diseases, tumors in the shoulder region, pacemaker, glenohumeral arthritis, frozen shoulder, rotator cuff tear, previous shoulder surgery	**RESWT (n=44)** Device: Swiss DolorClast Shocks, energy: 2000, 0.11 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at 10-14 day intervals US guidance: NR Anesth: none **Sham (n=38)** Same setup but a placebo treatment probe was used that emitted the same sounds as the RESWT probe Anesth: none **Cointervention(s)** Patients were advised to use the arm normally and to take their usual pain medication
Del Castillo-Gonzalez (2016) Country: Spain Study period: January 2007-December 2013	N=243 Age: 49 ± 7 years Male: 31.8 % Sx duration (mos.): NR Dx: calcific tendinopathy	**Inclusion criteria:** ≥ 5 mm calcification, VAS score ≥ 6, no allergies to medications used **Exclusion criteria:** total or partial tendon rupture	**FESWT (n=121)** Device: Swiss DolorClast Shocks, energy: 2000, 0.20 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 2 sessions weekly for 4 weeks

	Population	Inclusion/exclusion criteria	ESWT/control
Sponsor: in part by a grant awarded by the Santander Group to the Foundation Alfonso X el Sabio University COI: none	F/U (% ESWT, % UGPL): 3 mos (99.1%, 66.1%), 6 mos (99.1%, 66.1%), 12 mos (99.1%, 66.1%) Cross-over: none		US guidance: yes Anesth: none **Ultrasound-guided percutaneous lavage (n=122)** 20-G syringe with 2% mepivacaine was used for lavage. An 18-G needle was used if calcification was too dense **Cointervention(s)** ESWT: 600 mg ibuprofen every 12 hours for three days UGPL: 1.5 mg bromazepam 30 min prior to procedure
Adhesive Capsulitis: FESWT			
Chen (2014) Country: Taiwan Study period: July 2012-June 2013 Sponsor: NR COI: none	N=40 Age: 53.4 ± 8.4 Male: 32.4 % Sx duration (mos.): NR Dx: primary adhesive capsulitis F/U (% ESWT, % Steroids): 2 wks, 1 month, 6 wks, 3 mos (89.5%, 81.0%) Cross-over: none	**Inclusion criteria**: > 18 years old, shoulder pain and restriction in ROM, symptoms for ≥ 3 months, no treatment (excluding analgesics) within the past 3 months **Exclusion criteria:** rotator cuff problems, calcifying tendinitis, secondary arthritis, fracture, cerebrovascular accident	**FESWT (n=19)** Device: Orthospec Shocks, energy: 1350-1500, 0.6 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 3 sessions at biweekly intervals US guidance: no Anesth: NR **Steroids (n=21)** 30 mg of oral prednisolone daily for 2 weeks followed by 15 mg daily for 2 weeks Anesth: not applicable **Cointervention(s)** Exercise physical therapy program
Vahdatpour (2014) Country: Iran Study period: 2011-2012	N=40 Age: 58.1 ± 10.6 Male: 31.6 %	**Inclusion criteria**: patient tolerated cointerventions and were able to complete wall waking and University of Washington (Jackins) exercises	**FESWT (n=20)** Device: Duolith SD1 Shocks, energy: 1200, 0.1-0.3 mJ/mm^2 Total energy: NR

	Population	Inclusion/exclusion criteria	ESWT/control
Sponsor: grant from Isfahan University of Medical Sciences (grant No: 391061) COI: none	Sx duration (mos.): NR Dx: adhesive capsulitis F/U (% ESWT, % Sham): 2 mos (95%, 85%), 5 mos (95%, 85%) Cross-over: none	**Exclusion criteria:** previous shoulder surgery, shoulder fracture, cancer, inflammatory disorders, bleeding disorders	Intensity: NR No. sessions: 4 sessions at weekly intervals US guidance: NR Anesth: NR **Sham (n=20)** Same set-up but the device was turned off **Cointervention(s)** 15 mg meloxicam daily, activity modification to reduce pain, Pendulum exercises***, and shoulder stretching
Adhesive Capsulitis: RESWT			
Hussein (2016) Country: USA Study period: September 2011-October 2014 Sponsor: none COI: none	N=106 Age: 55.82 ± 1.32 years Male: 37.7% Sx duration (mos.): 11.6 ± 0.2 Dx: primary adhesive capsulitis F/U (% ESWT, % Sham): 1 month (100%, 100%), 6 mos (100%, 100%) Cross-over: none	**Inclusion criteria**: > 18 years old, shoulder pain and restriction in ROM for ≥ 6 months, no treatment (excluding analgesics) within past 3 months, no radiographic findings on anteroposterior, axillary, or scapular y-view shoulder radiographs found **Exclusion criteria:** bilateral symptoms, previous shoulder surgery, shoulder fracture, cancer, glenohumeral or acromioclavicular arthritis, inflammatory disorders, bleeding disorders, diabetes mellitus, severe osteoporosis, pulmonary diseases, neuromuscular disorders, pregnancy, pacemaker	**RESWT (n=53)** Device: Swiss DolorClast Shocks, energy: 2000, 0.16 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 4 sessions at weekly intervals US guidance: no Anesth: none **Sham (n=53)** Same conditions but a clasp was placed inside the applicator head to block transmission of energy Anesth: none **Cointervention(s)** Home-based exercise program
Non-specific/Subacromial Shoulder Pain: RESWT			
Engebretsen (2009 and 2011) Country: Norway	N=104 Age: 48 ± 10.5 years Male: 50%	**Inclusion criteria**: between 18 and 70 years old, subacromial should pain for ≥ 3 months	**RESWT (n=52)** Device: Swiss DolorClast Shocks, energy: 2000, 2.5-4.0 Bar

	Population	Inclusion/exclusion criteria	ESWT/control
Study period: July 2006-August 2007 Sponsor: Health Region East, Norway COI: none	Sx duration (mos.): 3-6 (32.7%), 6-12 (28.8%), 12-24 (13.5%), >24 mos (25.0%) Dx: subacromial shoulder pain F/U (% ESWT, % SE): 6 wks, 3 mos (100%, 96.2%), 4.5 mos (96.2%, 96.2%), 12 mos (92.3%, 88.5%) Cross-over: no true cross-over but within first 18 weeks, two ESWT patient crossed over to supervised exercise (after 1 and 4 treatments, respectively).	**Exclusion criteria:** bilateral symptoms, previous shoulder surgery, instability, clinical signs of cervical syndrome, rheumatoid arthritis, clinical and radiological signs of glenohumeral or acromioclavicular arthritis, inability to understand Norwegian, serious psychiatric disorder, use of anticoagulant drugs, pregnancy, previous enrollment of one of the study interventions	Total energy: NR Intensity: NR No. sessions: 1 weekly session for 4-6 weeks (median 5, IQR 4-6) US guidance: no Anesth: none **Supervised Exercises (n=52)** Two 45 minute sessions weekly for a maximum of 12 weeks Anesth: not applicable **Cointervention(s)** All patients were asked not to have any additional treatment except analgesics (including anti-inflammatory drugs) for the duration of the treatment period; however, 13 patients in the ESWT group and 3 in the exercise group received additional treatment (cortisone injections, chiropractic treatment, physical therapy/supervised exercises) between 12 and 18 weeks (OR 5.5, 95% CI 1.3 to 26.4; p=0.014).
Primary Long Bicep Tenosynovitis			
Liu (2012) Country: China Study period: January 2002-October 2008 Sponsor: NR COI: NR	N=90 Age: 55.5 (range, 27-79) years Male: 65.8% Sx duration (mos.): 21.1 ± 9.3 Dx: primary long bicipital tenosynovitis F/U: 1 month, 3 mos, 12 mos (90%, 83.3%)	**Inclusion criteria**: > 18 years old, anterior shoulder pain for ≥ 6 months **Exclusion criteria:** dislocation and subluxation of the tendon, tear and calcification of the rotator cuff, subacromial impingement syndrome, previous shoulder surgery, local infections and dermatological conditions, neurological disorders, coagulopathy, pacemaker	**RESWT (n=54)** Device: Swiss DolorClast Shocks, energy: 1500, 3 Bar Total energy: NR Intensity: NR No. sessions: 4 sessions at weekly intervals US guidance: yes Anesth: none **Sham (n=25)**

	Population	Inclusion/exclusion criteria	ESWT/control
	Cross-over: none		Same setup but treatment head was deflated and no coupling gel was used; machine made a noise when each pressure pulse was delivered Anesth: none **Cointervention(s)** None

Anesth, anesthesia; COI, conflict of interest; CSI, corticosteroid injection; ESWT, extracorporeal shock wave therapy; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; GAOOS, German Association for Orthopaedics and Orthopaedic Surgery; m, milligrams; mL, milliliter; mm, millimeters; mos, months; NCST, non-calcific supraspinatus tendinopathy; NOS, not otherwise specified; NR, not reported; NSAID, non-steroidal anti-inflammatory drug; RESWT, radial extracorporeal shock wave therapy ROM, range of motion; SE, supervised exercise; SWT, shock wave therapy; Sx, symptom; TENS, transcutaneous electric nerve stimulation; UGPL, ultrasound-guided percutaneous lavage; US, ultrasound; VAS, visual analog scale; WBC, white blood cell; wks, weeks

*Percent f/u at 1 month period not reported
†Defined as therapeutic exercise, and/or ultrasound, and/or iontophoresis, and/or cryotherapy, and/or immobilizations or activity modification
‡According to Gartner definitions
§Defined as including both physiotherapy and local anesthetic or corticosteroid injection
**Included active and passive exercise mobilization techniques, massage, and manual therapy
††Defined as NSAIDs, CSIs, physical therapy, an exercise program, and immobilization of the shoulder using a sling
‡‡Energy level depended on patient's tolerance
§§Defined as a minimum of 10 physiotherapy sessions, ≥ 2 subacromial injections, and use of NSAIDs
***Define as swinging arm forward and back, side to side, and around in circles 5-10 times

Appendix Table F4. Achilles Tendinopathy: Study Characteristics and Patient Demographics

	Population	Inclusion/exclusion criteria	ESWT/control
Focused extracorporeal shock wave therapy (FESWT)			
Costa (2005) Country: UK (multicenter) Study period: April 2001-November 2001 Sponsor: NR COI: One or more of the authors (MLC) has received funding from The Wishbone Trust.	N=49 Age: 52.6 ± 12.4 years Male: 42.9% Sx duration (mos.): 19.3 ± 17.0 Dx: Mixed (46 patients with non-insertional and 3 with insertional tendinopathy) F/U (% ESWT, % Sham): 3 mos (81.2%, 74.1%) 12 mos (91.0%, 85.2%) Cross-over: none	**Inclusion criteria**: > 18 years old, Achilles tendon pain present for ≥ 4 mos; patients were included regardless of previous treatment or of any underlying degenerative joint disease **Exclusion criteria:** pregnancy, local malignancy, coagulopathy, pacemaker	**FESWT (n=22)** Device: Modulith SLK Shocks, energy: 1500, 0.20 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 3 sessions at monthly intervals US guidance: yes Anesth: none **Sham (n=27)** Same settings but bubble wrap covered in an opaque cloth was interposed between the machine head and tendon Anesth: none **Cointervention(s)** NR
Rasmussen (2008) Country: Denmark Study period: October 2004-January 2005 Sponsor: NR COI: none	N=48 Age: 47.5 ± 11.0 years Male: 41.7% Sx duration (mos.): NR (> 3 mos per inclusion criteria) Dx: Mixed (non-insertional/ insertional tendinopathy) F/U (% ESWT, % Sham): 1 month, 2 mos, 3 mos (91.7%, 95.8%) Cross-over: none	**Inclusion criteria**: symptoms > 3 mos, full working capacity, > 18 years old, swelling with dorsiflexion and plantarflexion of the ankle, tenderness in neutral or plantarflexed position, tenderness exacerbated by dorsiflexion **Exclusion criteria:** NR	**FESWT (n=24)** Device: Piezoson 100 Shocks, energy: 2000, 0.12-0.51 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 4 sessions in 4 wks US guidance: no Anesth: none **Sham (n=24)** Same settings but no energy was applied; patient could still hear a ticking sound Anesth: none **Cointervention(s)** Stretching exercises and eccentric training

	Population	Inclusion/exclusion criteria	ESWT/control
Radial extracorporeal shock wave therapy (RESWT)			
Rompe (2009) Country: NR (multicenter) Study period: NR Sponsor: NR COI: none	N=68 Age: 49.7 ± 9.7 years Male: 44.1% Sx duration (mos.): 14.5 ± 6.0 Dx: Non-insertional Tendinopathy F/U (% ESWT, % training): 6 wks, 3 mos (91.2%, 88.2%), 12 mos. (88.2%, 88.2%) Cross-over: no true cross-over. However, patients in both groups who did not have successful treatment at 4 month f/u were allowed to pursue other treatment. F/U at 12 mos reflects patients that crossed*	**Inclusion criteria**: diagnosis of chronic midportion Achilles tendinopathy ≥ 6 months, failure of non-operative treatment†, ≥ 18 and ≤ 70 years old **Exclusion criteria:** professional athletes, peri-tendinous injections within 4 weeks of treatment, bilateral symptoms, symptoms < 6 months, other conditions that could contribute to posterior ankle pain‡, congenital or acquired deformities of the knee and ankle, prior ankle or Achilles tendon surgery, prior Achilles tendon rupture, prior dislocations of fractions in the treatment area within 12 months	**RESWT+eccentric training (n=34)** Device: Swiss DolorClast Shocks, energy: 2000, 0.1 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: none **Eccentric training (n=34)** Eccentric training exercises (3 sets of 15 repetitions with 1 min rest between sets) performed 2 x daily (7 days a week) for 12 weeks; loading with body weight only at start, progressing to use of weights in multiples of 5 kg Anesth: none **Cointervention(s)** All cointerventions during the 3-month follow-up period were discouraged, but prescription of pain medication if necessary was allowed.
Rompe (2008) Country: Germany (multicenter) Study period: NR Sponsor: none COI: none	N=50 Age: 39.8 ± 10.9 years Male: 40% Sx duration (mos.): 25.6 ± 9.4 Dx: Insertional Tendinopathy F/U (% ESWT, % training): 6 wks, 3 mos (92.0%, 88.0%), 15 mos (84.0%, 84.0%)	**Inclusion criteria**: clinical diagnosis of insertional Achilles tendinopathy for ≥ 6 mos, failed non-operative treatment†, ≥ 18 and ≤ 70 years old **Exclusion criteria:** peritendinous injections within 4 weeks of treatment, symptoms for < 6 months, conditions that could contribute to posterior ankle pain‡, congenital or acquired deformities of the knee or ankle, prior surgery of the ankle of Achilles tendon, prior Achilles	**RESWT+ eccentric training (n=25)** Device: Swiss DolorClast Shocks, energy: 2000, 0.12 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: none **Eccentric training (n=25)**

	Population	Inclusion/exclusion criteria	ESWT/control
	Cross-over: no true cross-over. However, patients in both groups who did not have successful treatment at 4 month f/u were allowed to pursue other treatment. F/U at 15 mos reflects patients that crossed over§	tendon rupture, dislocation or fracture in treatment area within 12 months	Eccentric training exercises (3 sets of 15 repetitions with 1 min rest between sets) performed 2 x daily (7 days a week) for 12 weeks; loading with body weight only at start, progressing to use of weights in multiples of 5 kg Anesth: none **Cointervention(s)** All cointerventions during the 3-month follow-up period were discouraged, but If necessary, paracetamol (2000 to 4000 mg daily) or naproxen (1000 mg daily) was prescribed.
Rompe (2007) Country: NR (multicenter) Study period: NR Sponsor: NR COI: none	N=75 Age: 48.6 ± 10.5 years Male: 38.7% Sx duration (mos.): ESWT vs. eccentric: 11.7 ± 7.2; vs. wait-and-see: 10.9 ± 8.8 Dx: Main Body Tendinopathy F/U (% ESWT, % training, % none): 3 mos (96.0%, 92.0%, 92.0%), 12 mos (76.0%, 68.0%, 88.0%) Cross-over: no true cross-over. However, patients in both groups who did not have successful treatment at 4 month f/u were allowed to pursue other treatment. F/U at 12 mos reflects patients that crossed**	**Inclusion criteria**: Clinical diagnosis of chronic midportion Achilles tendinopathy for ≥ 6 months, failure of non-operative treatment†, no non-operative surgery within 3 months of treatment, ≥ 18 and ≤ 70 years old **Exclusion criteria:** peritendinous injections within 4 weeks of treatment, bilateral symptoms, congenital or acquired deformities of the knee or ankle, symptoms for < 6 months, conditions that could contribute to posterior ankle pain‡, prior surgery to the ankle or Achilles tendon, prior Achilles tendon rupture, prior dislocations or fractions in area of treatment within 12 months	**RESWT (n=25)** Device: Swiss DolorClast Shocks, energy: 2000, 0.1 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3 sessions at weekly intervals US guidance: no Anesth: none **Eccentric training (n=25)** Eccentric training exercises (3 sets of 15 repetitions with 1 min rest between sets) performed 2 x daily (7 days a week) for 12 weeks; loading with body weight only at start, progressing to use of weights in multiples of 5 kg Anesth: none **Wait-and-see (n=25)** Training modifications, implementation of stretching exercises, and ergonomic advice were discussed during one additional visit

	Population	Inclusion/exclusion criteria	ESWT/control
			with the orthopedic surgeon; patients were encourage to await spontaneous recovery. **Cointervention(s)** All cointerventions during the 3-month follow-up period were discouraged, but prescription of pain medication if necessary was allowed.

Anesth, anesthesia: COI, conflict of interest: Dx, diagnosis: FESWT, focused extracorporeal shock-wave therapy: F/U, follow-up: mos, months: NR, not reported: RESWT, radial extracorporeal shock-wave therapy: Sx, symptoms: SWT, shock wave therapy: US, ultrasound: wks, weeks:

*All 15 of 34 patients from the eccentric loading group that failed treatment underwent the combined treatment approach. Six of 34 patients in the eccentric loading combined with SWT group opted for surgical intervention
†Defined as ≥ 1 injection of local anesthetic and/or corticosteroid, anti-inflammatory medications, orthotics and/or heel lift, and physiotherapy
‡Including osteoarthrosis, inflammatory arthritis, radiculopathy, and systemic neurological conditions
§All 18 of 25 patients in the eccentric training group that failed treatment crossed over to SWT. All 9 of 25 patients in the ESWT group that failed treatment crossed over; 8 received eccentric loading treatment and 1 underwent surgery
**All 10 of 25 patients in the eccentric training group that failed treatment crossed over; 8 patients received SWT and 2 patients underwent surgery. All 12 patients in the ESWT group crossed over; 7 received eccentric training, 2 patients underwent surgery, and 3 patients received injections. All 19 patients in the wait-and-see group crossed over; 4 patients received eccentric training, 3 received ESWT, 11 patients received both eccentric training and ESWT, and 1 patient underwent surgery

Appendix Table F5. Patella Tendinopathy: Study Characteristics and Patient Demographics

	Population	Inclusion/exclusion criteria	ESWT/control
Focused extracorporeal shock wave therapy (FESWT)			
Taunton (2003)* Country: NR Study period: NR Sponsor: Nike Research Foundation, BC Sports Medicine Research, Siemens AG, and Sonorex COI: One or more authors has a nominal investment in the local Sonocur machine	N=20 Age: mean NR (range, 23-52 years) Male: 50% Sx duration (mos.): NR (≥ 3 mos per inclusion criteria) F/U (% ESWT, % Sham): 5 wks, 3 mos (90%, 70%) Cross-over: none	**Inclusion criteria**: diagnosis of patellar tendinopathy, symptoms for ≥ 3 months, failure of treatment using NSAIDs **Exclusion criteria:** < 18 years old, physiotherapy within 4 weeks of randomization, NSAIDs or acetaminophen for any chronic condition within 1 week of randomization, lumbar disc disease, compression syndrome, local arthrosis, neurological abnormality, previous surgery for patellar tendinopathy, thrombopathy, infection, tumor, severe systemic disease, systemic therapeutic anticoagulation, pregnancy, previous treatment with ESWT	**FESWT (n=10)** Device: Sonocur Shocks, energy: 2000, 0.17 mJ/mm^2 Total energy: NR Intensity: low No. sessions: 3-5 (1st 3 treatments administered weekly)† US guidance: none Anesth: none **Sham (n=10)** Same settings but an energy absorbing pad was used Anesth: none **Cointervention(s)** NR
Wang (2007) Country: Taiwan Study period: October 2001-May 2005 Sponsor: Chang Gung Research Fund and National Health Research Institute COI: none	N=53 Age: 29.8 ± 10.4 years Male: 54% Sx duration (mos.): 13.8 ± 14.6 F/U (% ESWT, % Conservative): 4 wks, 3 mos (NR, NR), 6 mos (NR, NR), 12 mos (95.8%, 93.1%) Cross-over: none	**Inclusion criteria**: diagnosis of chronic patellar tendinopathy, a VAS score ≥ 5 while walking up and down stairs, ≥ 21 years old, skeletally mature, physically and mentally competent, generally good health **Exclusion criteria:** cortisone injection within 6 weeks of treatment, immunosuppressant agents and/or corticosteroid within 6 months of treatment, diabetes mellitus, occlusive vascular disease, collagen disease, osteoarthritis or rheumatoid arthritis, coagulopathy, infection, radiographic fractures around the knee, cardiac arrhythmia, pacemaker, pregnancy	**FESWT (n=29)** Device: OssaTron Shocks, energy: 1500, 0.18 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: up to 2 sessions‡ US guidance: yes Anesth: none **Conservative treatment (n=24)** NSAIDs, physiotherapy, an exercise program, knee strap, and modification of activity levels Anesth: none **Cointervention(s)**

	Population	Inclusion/exclusion criteria	ESWT/control
			Ice pack and a prescription of nonnarcotic analgesic (e.g., acetaminophen); patients were allowed to resume light activity, heavy activities including sports were not permitted for 4-6 weeks.

Anesth, anesthesia; F/U, follow-up; FESWT, focused extracorporeal shock wave therapy; mos, months; NSAIDs, non-steroidal anti-inflammatory drug; NR, not reported; RESWT, radial extracorporeal shock wave therapy; ROM, range of motion; Sx, symptom; US, ultrasound; VAS, visual analog scale; wks, weeks

*Study exclusively examined an active population
†First three treatments were administered weekly. Subjects received a fourth and fifth treatment based on patients self-measured degree of improvement. The two final treatments were given at least 3 weeks after the third session and one week apart from one another
‡A second treatment was given to patients that had either an inadequate response or recurrent symptoms 4 to 6 weeks after the initial treatment. Inadequate response was defined as less than 50% improvement and experienced pain ≥ 5 on a VAS

Appendix Table F6. Knee Osteoarthritis: Study Characteristics and Patient Demographics

	Population	Inclusion/exclusion criteria	ESWT/control
Focused extracorporeal shock wave therapy (FESWT)			
Chen (2014) Country: Taiwan Study period: NR Sponsor: NR COI: none	N=120 Age: 63.0 ± 7.4 years Male: 15% Sx duration (mos.): mean NR (range, 10-144) F/U (% ESWT, % US, % Isokinetic exercises, % wait and see): 3 mos (83.3%, 83.3%, 86.6%, 80%) Cross-over: none	**Inclusion criteria**: > 40 years old, knee pain, osteophytes, crepitus, and morning stiffness more than 30 minutes without bony enlargement, popliteal cyamella **Exclusion criteria:** NR	**FESWT + isokinetic exercises (n=30)** Device: Piezoelectric Shock Wave Shocks, energy: 2000*, 0.3-0.4 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 6 sessions at weekly intervals US guidance: yes Anesth: NR **Ultrasound + isokinetic exercises (n=30)** Device: Sonoplus 590 Energy: 2.5 W/cm^2 No. sessions: 24 sessions, 3 per week Anesth: none **Isokinetic exercises (n=30)** Isokinetic muscle-strengthening exercise program was performed 3 times per week for 8 weeks **Wait-and-see (n=30)** **Cointervention(s)** Hot packs and passive range motion exercises
Radial extracorporeal shock wave therapy (RESWT)			
Zhao (2013) Country: China Study period: July 2011-Februrary 2012	N=70 Age: 60.9 ± 10.5 years Male: 35.7% Sx duration (mos.): NR (≥ 3 mos per inclusion criteria)	**Inclusion criteria**: ≥ 45 years old, knee pain during previous 3 months, Kellgren and Lawrence grade II or III **Exclusion criteria:** history of spinal stenosis, neurologic disease, previous surgery or intra-articular injection in affected knee in previous 6	**RESWT (n=34)** Device: Swiss DolorClast Shocks, energy: 4000, 0.25 mJ/mm^2 Total energy: NR Intensity: NR No. sessions: 4 sessions at weekly intervals US guidance: none

	Population	Inclusion/exclusion criteria	ESWT/control
Sponsor: National Natural Science Foundation of Chine and China postdoctoral Science Foundation COI: none	F/U (% ESWT, % Sham): 4 wks, 2 mos, 3 mos (88.2%, 86.1%) Cross-over: none	months, any contraindication to magnetic-resonance imaging or radiography	Anesth: NR **Sham (n=36)** Same set-up but no energy was applied Anesth: NR **Cointervention(s)** None; no bed rest was required after treatment, but a low level of physical activity was recommended for 48 hours.

Anesth, anesthesia; F/U, follow-up; FESWT, focused extracorporeal shock wave therapy; mg, milligrams; mos, months; NR, not reported; RESWT, radial extracorporeal shock wave therapy; ROM, range of motion; Sx, symptom; US, ultrasound; wks, weeks

*2000 shocks applied for each popliteal cyamella

APPENDIX G. Data Abstraction Tables: Efficacy Outcomes

Appendix Table G1. Plantar Fasciitis Efficacy Outcomes

Author/Outcome	F/U (mos)	ESWT	Control	p-value
FESWT vs. Sham				
Ogden (2001, 2004)				
Composite success*	3	47% (67/144)	30% (42/141)	.008
Pain in AM	0	8.08 (n=148)	8.14 (n=145)	-
	3	3.43 (n=144)	4.28 (n=141)	.014
Pain with activities	0	3.49 (n=148)	3.53 (n=145)	-
	3	1.72 (n=144)	1.88 (n=141)	ns
Haake (2003)				
RM score (1 or 2)	3	34% (43/127)	30% (39/129)	ns
Pain in AM	0	7.8 (2.4, n=135)	7.7 (2.3, n=136)	-
	3	4.0 (3.2, n=127)	4.3 (3.2, n=129)	ns
	12	1.5 (2.6, n=112)	1.7 (2.4, n=114)	ns
Pain at rest	0	3.9 (2.5, n=135)	3.7 (2.3, n=137)	-
	3	2.4 (2.6, n=127)	2.4 (2.5, n=129)	ns
	12	0.9 (1.9, n=112)	0.9 (1.6, n=115)	ns
Pain free walking	3	22% (28/127)	24% (31/129)	ns
	12	55% (62/113)	54% (62/115)	ns
Theodore (2004)				
Pain in AM	0	7.7 (1.4, n=76)	7.7 (1.5, n=74)	
	3	3.4 (2.7, n=73)	4.1 (3.1, n=73)	.044
AM pain success†	3	56% (41/73)	45% (33/73)	.189
RM (1 or 2)	3	61.6% (45/73)	39.7% (29/73)	.033
Kudo (2006)				
Pain in AM	0	7.5 (1.5, n=53)	7.9 (1.5, n=52)	
	3	3.9 (3.2 n=53)	5.3 (2.7, n=52)	<.001
Pain with activities	0	6.2 (2.0, n=53)	6.0 (2.0, n=52)	
	3	3.7 (3.1, n=53)	4.4 (2.5, n=52)	
AM pain success†	3	47% (25/53)	23% (12/52)	.010
AOFAS Ankle-hindfoot, total	3	30.3 (33.3, n=53)	25.8 (34.2, n=52)	ns
AOFAS Ankle-hindfoot, success‡	3	50.9% (27/53)	34.6% (18/52)	ns
RM (1 or 2)	3	43.4% (23/53)	30.8% (16/52)	ns
Malay (2006)				
Pain (mean Δ)	3	-3.39 (n=112)	-1.78 (n=56)	<.001
Responder§	3	52.7% (59/112)	28.6% (16/56)	.003

Author/Outcome	F/U (mos)	ESWT	Control	p-value
Rompe 1996				
Pain	0	22.0 (n=15)	23.0 (n=15)	
	1.5	4.8 (n=15)	15.2 (n=15)	
Rompe 2003				
Pain in AM	0	6.9 (1.3, n=22)	7.0 (1.3, n=23)	
	6	2.1 (2.0, n=19)	4.7 (1.9, n=20)	<.001
	12	1.5 (1.7, n=16)	4.4 (1.7, n=19)	<.001
AM success**	6	60% (12/20)	27% (6/22)	.060
	12	72% (13/18)	35% (7/20)	.005
AOFAS Ankle-hindfoot, total	0	52.7 (10.0, n=22)	49.7 (10.1, n=23)	
	6	89.9 (8.6, n=19)	69.1 (20.1, n=20)	.003
	12	90.4 (8.3, n=16)	75.4 (17.3, n=19)	.045
Surgery	12	6% (1/16)	5% (1/19)	
Cosentino 2001††				
Pain at rest	0	8.2 (0.9, n=30)	8.3 (1.0, n=30)	
	3	3.0 (1.0, n=30)	7.9 (1.1, n=30)	
Pain in AM	0	8.1 (1.1, n=30)	8.3 (0.9, n=30)	
	3	4.0 (0.9, n=30)	8.3 (1.2, n=30)	
Pain with activity	0	8.2 (0.8, n=30)	8.3 (0.8, n=30)	
	3	4.2 (0.7, n=30)	8.7 (1.1, n=30)	
Gollwitzer 2007				
Composite success‡‡	3	55% (11/20)	40% (8/20)	.215
AM pain success†	3	55% (11/20)	30% (6/20)	.065
Activity success§§	3	50% (10/20)	40% (8/20)	.077
RM (1 or 2)	3	60% (12/20)	40% (8/20)	ns
Gollwitzer 2015				
Composite success‡‡	3	54.4% (68/125)	37.2% (45/121)	.004
AM success†	3	50.4% (63/125)	36.4% (44/121)	.014
Activity success§§	3	49.6% (62/125)	38.8% (47/121)	.046
RM (1 or 2)	3	60.8% (76/125)	37.2% (45/121)	<.001
Speed 2003				
Pain success***	3	37% (17/46)	24% (10/42)	.248
AM pain success**	3	41% (19/46)	36% (15/42)	.664
Saxena 2012				
Pain	0	8.7 (1.4, n=11)	8.0 (1.1, n=14)	
	12	3.4 (3.3, n=11)	5.1 (2.7, n=14)	<.001
RM (1 or 2)	12	27% (3/11)	43% (6/14)	ns

Author/Outcome	F/U (mos)	ESWT	Control	p-value
RESWT vs. Sham				
Gerdesmeyer 2008				
Overall success‡‡	3	60.1% (75/123)	42.2% (49/116)	.004
AM success†	3	60.8 (76/125)	48.3% (57/118)	.051
Activity success§§	3	60.0% (75/125)	40.7% (48/118)	.003
Ibrahim 2010, 2016				
Pain	0	8.5 (1.5, n=25)	8.9 (1.0, n=25)	
	3	1.1 (1.5, n=25)	7.7 (1.0, n=25)	<.001
	6	0.5 (0.5, n=25)	7.4 (2.5, n=25)	<.001
	12	2.3 (0.4, n=25)	6.9 (0.6, n=25)	
	24	1.4 (0.3, n=23)	5.6 (0.7, n=24)	
Pain success***	3	96.0% (24/25)	0% (0/25)	<.001
	6	100% (25/25)	16.0% (4/25)	<.001
	12	72.0% (18/25)	20.0% (5/25)	<.001
	24	95.7% (22/23)	25.0% (6/24)	<.001
RM	0	3.8 (0.5, n=25)	3.8 (0.5, n=25)	
	3	1.4 (1.0, n=25)	3.2 (1.0, n=25)	<.001
	6	1.3 (0.5, n=25)	3.2 (1.0, n=25)	<.001
	12	1.9 (0.2, n=25)	2.8 (0.2, n=25)	<.001
	24	1.5 (0.1, n=23)	3.1 (0.2, n=23)	<.001
Mehra 2003				
Pain	0	5.9 (nr, n=13)	7.0 (nr, n=10)	
	6	1.9 (nr, n=13)	6.6 (nr, n=10)	<.05
Improved†††	6	93% (12/13)	0% (0/10)	<.05
FESWT vs. CSI				
Porter 2005				
AM pain	0	5.52 (3.8, n=61)	5.47 (2.8, n=64)	
	3	3.69 (0.8, n=61)	1.48 (0.7, n=64)	<.001
	12	0.84 (0.4, n=61)	0.84 (0.7, n=64)	ns
Yucel 2010				
Pain	0	5.2 (2.1, n=33)	6.5 (2.5, n=27)	
	3	1.1 (0.9, n=33)	1.2 (1.1, n=27)	ns
Success‡‡‡	3	81.8% (27/33)	85.2% (23/27)	ns
FESWT vs. CT				
Chew 2013			CT§§§	
Pain (median, range)	0	7 (5-8.5, n=19)	6 (3-8, n=16)	
	3	4 (0-7, n=19)	4 (1-9, n=16)	ns
	6	3 (0-8, n=19)	3 (0-7, n=16)	ns

Author/Outcome	F/U (mos)	ESWT	Control	p-value
AOFAS Hind-foot, total	0	62 (44-79, n=19)	72 (51-77, n=16)	
(median, range)	3	85 (72-100, n=19)	80 (53-90, n=16)	ns
	6	90 (72-100, n=19)	87 (73-100, n=16)	ns
Wang 2006			CT****	
Pain	0	4.0 (1.3, n=79)	4.1 (1.1, n=70)	
	34-72	0.2 (0.7, n=76)	4.2 (1.7, n=65)	<.001
Function††††	0	14.1 (4.0, n=79)	13.8 (1.6, N=70)	
	34-72	29.6 (1.9, n=76)	14.0 (1.6, n=65)	<.001
Hammer 2002			CT‡‡‡‡	
Pain at rest	0	3.4 (2.7, n=25)	4.3 (2.7, n=24)	
	3	1.2 (2.0, n=25)	1.0 (2.4, n=24)	ns
	6	1.2 (2.6, n=25)	5.0 (2.0, n=24)	ns
Pain	0	7.8 (1.8, n=25)	7.0 (2.2, n=24)	
	3	2.9 (3.2, n=25)	2.6 (3.0, n=24)	ns
	6	2.3 (3.7, n=25)	1.2 (2.4, n=24)	ns
Pain success§§§§	3	60% (15/25)	67% (16/24)	ns
	6	72% (18/25)	83% (20/24)	ns
Radwan 2012			EPFR	
AM pain (median)	0	7.0 (n=34)	6.8 (n=31)	
	3	4.0 (n=34)	4.1 (n=31)	ns
	52	1.5 (n=34)	1.6 (n=31)	ns
AOFAS total score	0	4.3 (n=34)	4.4 (n=31)	
(median)	3	8.1 (n=34)	7.7 (n=31)	ns
	52	8.7 (n=34)	8.6 (n=31)	ns
RM (1 or 2)	3	64.7% (22/34)	51.6% (16/31)	ns
	12	70.6% (24/34)	77.4% (24/31)	ns
RESWT vs. US				
Grecco 2013				
No pain	3	45% (9/20)	50% (10/20)	ns
	12	70% (14/20)	45% (9/20)	ns
AM pain (0-1, 10 total)	3	70% (14/20)	65% (13/20)	ns
	12	85% (17/20)	80% (16/20)	ns
Pain walking (0-1)	3	70% (14/20)	75% (15/20)	ns
	12	75% (15/20)	95% (19/20)	ns
Konjen 2015				
Pain	0	8.6 (0.1, n=15)	8.7 (0.1, n=15)	
	3	2.0 (0.1, n=15)	4.5 (0.1, n=15)	.001
	6	1.6 0.1, n=15)	4.8 (0.2, n=15)	<.001

ACP, autologous conditioned plasma; AM, morning; AOFAS, American Orthopaedic Foot and Ankle Society; CT, conventional treatment; EPFR, endoscopic partial plantar fascia release; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up;

mos, months; PFPS, plantar fasciitis pain and disability scale; NR, not reported; NS, not statistically significant; RESWT, radial extracorporeal shock wave therapy; RM, Roles and Maudsley; tx, treatment; US, ultrasound; VAS, visual analog scale

*Defined as all of the following: ≥ 50% improvement in the dolorimeter (pressure sensor)-induced baseline pain score, with a required score of ≤ 4 on VAS; ≥ 50% improvement in patient-assess pain on walking; ≥ 1 point improvement on 5-point VAS scale or maintenance of 0 or 1 baseline score for patient self-assessment of activity; no pain medications necessary between 10 and 12 weeks after treatment.
†Achieving ≥60% improvement in pain during first few minutes of walking in the morning.
‡Defined as score of none or mild on the pain domain.
§Achieving ≥50% improvement in pain and a score ≤4 on visual analog scale.
**Achieving ≥50% improvement on first walking in the morning.
††Values not given and were estimated from Fig 1.
‡‡>60% decrease in pain over baseline in ≥2 of 3 pain scores (pain with first morning steps, pain with activities, pain with pressure).
§§>60% decrease in pain over baseline with activity.
***>50% improvement in pain over baseline.
†††Improvement of ≥3 points over baseline.
‡‡‡Loss of heel tenderness with a decrease in VAS pain scale or heel tenderness index score of at least 50% from baseline.
§§§Conventional treatment consisted of home stretching exercises of the gastrocnemius and soleus via lunge stretch with knee bent and straight, palms against the wall; plantar fascia stretch via pulling toes back with fingers while seated and with affected leg crossed over other thigh.
****Non-steroidal medication, orthotics, physical therapy, an exercise program, or a local cortisone injection.
††††Pain at work, pain during free time/sports, pain at night; each scored 0-10, 0 = severe restriction and 10 = no restriction.
‡‡‡‡Conventional treatment consisted of Iontophoresis with diclofenac and oral non-steroidal anti-inflammatory medication.
§§§§Proportion of patients with less than 3 points on VAS pain scale (maximum 10).

Appendix Table G2. Lateral Epicondylitis Efficacy Outcomes

Author/Outcome	F/U (mos)	ESWT	Control	p-value
FESWT vs. Sham				
Haake 2002		cross over		
Composite success*	3	25.8% (32/124)	25.4% (31/122)	ns
RM score (1 or 2)	3	31.7% (38/120)	33.1% (40/121)	ns
Grip strength (mmHg)	3	135 (75, n=120)	148 (72, n=120)	ns
Chung 2004				
Composite success† (Δ from baseline)	2	39% (12/31)	31% (9/29)	ns
Overall Pain (Δ from baseline)	2	1.5 (0.5, n=31)	0.9 (0.4, n=29)	
Pain at rest (Δ from baseline)	2	0.5 (0.4, n=31)	0.3 (0.3, n=29)	
Pain at night (Δ from baseline)	2	0.8 (0.4, n=31)	-0.1 (0.3, n=29)	-
Pain with activity (Δ from baseline)	2	2.6 (0.5, n=31)	1.1 (0.5, n=29)	
Pain free grip strength (kg) (Δ from baseline)	2	-6.8 (1.7, n=31)	-7.4 (2.3, n=29)	
Collins 2011				
Composite success‡	2	35.5% (33/93)	22.2% (20/90)	.043
SF-36 total score	0	30.7 (7.09, n=93)	28.7 (7.40, n=90)	
	2	34.4 (9.58, n=82)	32.4 (8.18, n=82)	
Pain NOS	0	7.37 (1.21, n=93)	7.76 (1.31, n=90)	
	2	3.53 (2.53, n=82)	4.37 (2.58, n=83)	
Melikyan 2003				
Pain NOS	0	5.73 (NR, n=37)	5.64 (NR, n=37)	
	3§	3.70 (NR, n=37)	2.95 (NR, n=37)	ns
	12	2.39 (NR, n=37)	1.95 (NR, n=37)	ns
Pain with 5kg resistance	0	4.69 (NR, n=37)	4.85 (NR, n=37)	
	3	4.25 (NR, n=37)	2.75 (NR, n=37)	ns
	12	2.85 (NR, n=37)	1.79 (NR, n=37)	ns
DASH§	0	16.2 (NR, n=37)	15.2 (NR, n=37)	
	3	13.9 (NR, n=37)	9.9 (NR, n=37)	ns
	12	9.9 (NR, n=37)	7.4 (NR, n=37)	
Grip strength (kg)§,**	0	29.0 (NR, n=37)	29.5 (NR, n=37)	ns
	3	29.0 (NR, n=37)	31.0 (NR, n=37)	ns
	12	33.2 (NR, n=37)	34.2 (NR, n=37)	ns
Surgery	-	46% (17/37)	43% (16/37)	ns
Pettrone 2005				
Pain w/ resistance, success††	3	61% (34/56)	29% (17/58)	.001
Pain w/ resistance‡‡	0	7.4 (16, n=56)	7.6 (16, n=58)	
	3	3.8 (28, n=56)	5.1 (30, n=58)	<.02
UEFS	0	37.6 (14.4, n=56)	36.8 (14.4, n=58)	
	3	18.4 (12.8, n=53)	25.6 (16.8, n=54)	<.01

Author/Outcome	F/U (mos)	ESWT	Control	p-value
Grip strength (kg)	0	32 (12, n=56)	33 (13, n=58)	
	3	38 (5, n=53)	37 (15, n=54)	.09
Rompe 2004				
Pain with resistance‡‡	0	7.1 (1.4, n=34)	7.1 (1.6, n=36)	
	3	3.6 (2.1, n=34)	5.1 (2.1, n=36)	.0001
	12	3.1 (2.4, n=31)	4.3 (2.3, n=33)	.019
Pain w/ resistance, success‡‡	3	65% (25/38)	28% (11/40)	.001
	12	61% (23/38)	38% (15/40)	.069
RM (1 or 2)	3	58% (22/38)	33% (13/40)	.040
	12	63% (24/38)	43% (16/40)	.046
UEFS (Δ from baseline)	3	23.4 (14.8, n=34)	10.9 (14.9, n=36)	<.001
	12	25.1 (16.2, n=31)	18.5 (16.9, n=33)	.078
Grip strength (kg/cm^2)§	0	44.0 (16.5, n=34)	38.5 (16.0, n=33)	
	3	56.0 (13.5, n=34)	45.0 (12.5, n=33)	ns
	12	58.0 (15.0, n=34)	52.0 (11.5, n=33)	ns
Speed 2002				
Pain success, day§§	3	35% (14/40)	37% (13/35)	ns
Pain success, night§§	3	30% (12/40)	43% (15/35)	ns
Pain day	0	7.3 (1.5, n=40)	6.7 (2.2, n=35)	
	3	4.8 (3.1, n=40)	5.2 (3.2, n=35)	
Pain night	0	4.0 (2.8, n=40)	4.4 (3.2, n=35)	
	3	3.4 (3.0, n=40)	3.0 (3.6, n=35)	
FESWT vs. CSI				
Crowther 2002				
Pain success§§	3	60% (29/48)	84% (21/25)	<.05
Pain NOS	0	6.1 (NR, n=48)	6.7 (NR, n=25)	
	3	3.1 (NR, n=48)	1.2 (NR, n=25)	
Surgery referral	3	21% (10/48)	8% (2/25)	
Ozturan 2010				
Pain with resistance‡‡	0	7.78 (13.6, n=19)	7.70 (14.1, n=20)	
	3	2.26 (16.9, n=19)	3.05 (14.6, n=20)	ns
	6	2.21 (17.5, n=19)	4.35 (13.4, n=20)	<.001
	12	2.10 (14.1, n=19)	4.25 (14.8, n=20)	<.001
UEFS	0	49.9 (9.6, n=19)	46.6 (10.9, n=20)	
	3	18.1 (10.3, n=19)	20.6 (6.9, n=20)	ns
	6	19.2 (8.7, n=19)	27.1 (7.7, n=20)	.001
	12	19.5 (4.3, n=19)	27.5 (8.8, n=20)	<.001

Author/Outcome	F/U (mos)	ESWT	Control	p-value
Grip strength (kg)	0	29.9 (7.1, n=19)	30.4 (10.2, n=20)	
	3	36.9 (5.6, n=19)	39.2 (9.0, n=20)	ns
	6	37.2 (5.1, n=19)	34.1 (5.9, n=20)	<.05
	12	39.6 (4.7, n=19)	33.8 (6.7, n=20)	<.05
FESWT VS. Percutaneous Tenotomy				
Radwan 2008				
Pain success with resistance‡‡	3	72.4% (21/29)	85.2% (23/27)	ns
Pain success with resistance***	12	48.3% (14/29)	63.0% (17/27)	ns
Roles Maudsley (1 or 2)	3	65.5% (19/29)	74.1% (20/27)	ns
	12	62.1% (18/29)	77.8% (21/27)	ns
RESWT vs. Sham				
Mehra 2003				
Pain	0	6.6 (nr, n=13)	6.6 (nr, n=11)	
	6	3.0 (nr, n=13)	6.2 (nr, n=11)	<.05
Improved†††	6	78% (10/13)	9% (1/11)	<.05
Capan 2016 (Δ from baseline)				
Pain at rest	3	3.2 (2.3, n=23)	3.1 (2.7, n=22)	ns
Pain with activity	3	4.5 (2.4, n=23)	3.3 (2.7, n=22)	ns
RM score	3	1.0 (0.9, n=23)	1.0 (0.6, n=22)	ns
PRTEE pain	3	15.9 (12.2, n=23)	12.4 (13.1, n=22)	ns
PRTEE function	3	15.4 (13.4, n=23)	10.6 (11.6, n=22)	ns
PRTEE total	3	31.3 (24.6, n=23)	23.0 (24.3, n=22)	ns

FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mos, months; NR, not reported; NS, not statistically significant; PRTEE, patient rated tennis elbow evaluation; RESWT, radial extracorporeal shock wave therapy; RM, Roles and Maudsley; UEFS, upper extremity functional scale; US, ultrasound; VAS, visual analog scale

*Defined a Roles Maudsley score of 1 or 2, and the patient not receiving any additional conservative or operative treatment during observed time-interval.
†Defined as (1) at least a 50% reduction in overall elbow pain as measured by the overall pain VAS, (2) a maximum allowable overall elbow pain score of 4.0 cm, and (3) no use of pain medication for 2 weeks before the 8-week evaluation.
‡Defined as (1) 50% improvement over baseline in investigator's assessment of elbow pain and a pain score of ≤4.0 on VAS; (2) 50% improvement over baseline in self-assessed pain with activity and a pain score of ≤4.0; (3) no analgesics.
§Estimated from figures.
**Elbow flexed 90 degrees.
††Defined as ≥50% improvement in pain during Thomsen test. Thomsen test performed with the shoulder flexed to 60°, elbow extended, forearm pronated, and wrist extended 30°. Pressure is applied on the dorsum of the hand to stress the wrist extensors.
‡‡During Thomsen test.
§§≥50% improvement from baseline.
***≥80% improvement from baseline.
†††Improvement of ≥3 points over baseline

Appendix Table G3. Shoulder Tendinopathy Efficacy Outcomes: Rotator Cuff

Author/Outcome	F/U (mos.)	ESWT Mean (SD or 95% CI, n) or % (n/N)	Control Mean (SD or 95% CI, n) or % (n/N)	p-value
FESWT vs. Sham				
Cosentino 2003				
Constant score (0-100, best)	0	45 (n=35)	48 (n=35)	
	1	74 (n=35)	46 (n=35)	<0.001
	6	76 (n=35)	44 (n=12)	<0.001
Resolution of calcium deposits				
Complete	1	31% (11/35)	0% (0/35)	NR
Partial	1	40% (14/35)	0% (0/35)	NR
Galasso 2012				
Constant score	0	42.45 (9.83, n=11)	41.67 (12.53, n=9)	0.970
	3	74.09 (20.56, n=11)	48 (22.3, n=9)	0.023
Success*	3	63.7 (7/11)	22.3% (2/9)	
Gerdesmeyer 2003				
High Energy				
VAS pain NOS (0-10, worst)	0	6.5 (1.3, n=48)	5.6 (1.6, n=48)	NR
	Δ3	-5.0 (-5.7 to -4.2, n=44)	-1.8 (-2.5 to -1.1, n=42)	<0.001
	Δ6	-5.5 (-6.2 to -4.8, n=47)	-1.1 (-1.8 to -0.5, n=41)	<0.001
	Δ12	-5.6 (-6.3 to -4.9, n=35)	-1.9 (-2.7 to -1.2, n=32)	<0.001
Constant score (0-100, best)	0	60 (11.0, n=48)	64.2 (12.8, n=48)	NR
	Δ3	26.2 (22.3–30.2, n=44)	9.8 (5.1–14.5, n=42)	<0.001
	Δ6	31.0 (26.7–35.3, n=47)	6.6 (1.4–11.8, n=41)	<0.001
	Δ12	31.6 (27.3–36.0, n=35)	13.7 (8.4–19.0, n=32)	<0.001
≥30% improvement in	3	77% (62%–89%, n=44)	21% (10%–37%, n=42)	<0.001
Constant score	6	89% (77%–96%, n=47)	17% (7%–32%, n=41)	<0.001
	12	94% (81%–99%, n=35)	22% (9%–40%, n=32)	<0.001
Low Energy				
VAS pain NOS (0-10)	0	5.7 (1.9, n=48)	5.6 (1.6, n=48)	
	Δ3	-2.7 (-3.3 to -2.1, n=46)	-1.8 (-2.5 to -1.1, n=42)	0.06
	Δ6	-2.4 (-3.1 to 1.7, n=46)	-1.1 (-1.8 to -0.5, n=41)	0.008
	Δ12	-2.6 (-3.2 to -1.9, n=44)	-1.9 (-2.7 to -1.2, n=32)	0.18
Constant score (0-100, best)	0	62.7 (14.0, n=48)	64.2 (12.8, n=48)	NR
	Δ3	16.6 (11.8–21.0, n=46)	9.8 (5.1–14.5, n=42)	0.47
	Δ6	15.0 (10.2–19.8, n=46)	6.6 (1.4–11.8, n=41)	<0.001
	Δ12	17.7 (13.2–22.3, n=44)	13.7 (8.4–19.0, n=32)	0.24
≥30% improvement in	3	40% (26%–55%, n=46)	21% (10%–37%, n=42)	0.07
Constant score	6	41% (27%–57%, n=46)	17% (7%–32%, n=41)	0.02
	12	45% (30%–61%, n=44)	22% (9%–40%, n=32)	0.05
Hsu 2008				
Pain NOS (VAS 0-10, worst)†	0	7.2 (n=33)	7.4 (n=13)	NS
	3	2.1 (n=33)	6.8 (n=13)	<0.05
	6	1.6 (n=33)	6.8 (n=13)	<0.05
	12	1.3 (n=33)	7.0 (n=13)	<0.05
Constant score (0-100, best)	0	57.3 (n=33)	56.2 (n=13)	NS
	3	82.8 (n=33)	54.3 (n=13)	<0.001
	6	85.0 (n=33)	56.8 (n=13)	<0.001
	12	88.0 (n=33)	57.8 (n=13)‡	<0.001

Author/Outcome	F/U (mos.)	ESWT Mean (SD or 95% CI, n) or % (n/N)	Control Mean (SD or 95% CI, n) or % (n/N)	p-value
Overall results				
Excellent or good	NR	87.9% (29/33)	0% (0/13)	NR
Fair	NR	12.1% (4/33)	69.2% (9/13)	NR
Poor	NR	0% (0/33)	30.1% (4/13)	NR
Patient satisfaction	1.5	62.0% (20/33)	NR	
	12	83.0% (27/33)	NR	
Resolution of calcium deposits				
Complete	12	21.2% (7/33)	0% (0/13)	NR
Partial	12	36.3% (11/33)	15.3% (2/13)	NR
Unchanged	12	45.4% (15/33)	84.7% (11/13)	NR
Peters 2004				
High Energy				
No. of treatments§				
1	6	81% (25/31)	0% (0/29)	NR
2	6	19% (6/31)	0% (0/29)	NR
3	6	0% (0/31)	38% (11/29)	NR
4	6	0% (0/31)	35% (10/29)	NR
5	6	0% (0/31)	27% (8/29)	NR
Resolution of calcium deposits				
Complete	6	100% (31/31)	0% (0/29)	NR
Residual	6	0% (0/31)	0% (0/29)	NR
Unchanged	6	0% (0/31)	100% (29/29)	NR
Recurrence of pain	6	0% (0/31)	100% (29/29)	NR
Moderate Energy				
No. of treatments§				
1	6	0% (0/30)	0% (0/29)	NR
2	6	0% (0/30)	0% (0/29)	NR
3	6	27% (8/30)	38% (11/29)	NR
4	6	30% (10/30)	35% (10/29)	NR
5	6	43% (12/30)	27% (8/29)	NR
Resolution of calcium deposits				
Complete	6	0% (0/30)	0% (0/29)	NR
Residual	6	100% (30/30)	0% (0/29)	NR
Unchanged	6	0% (0/30)	100% (29/29)	
Recurrence of pain	6	87% (26/30)	100% (29/29)	NR
Schmitt 2001/Efe 2014				
Constant score	0	40.70 (13.29, n=20)	42.20 (13.04, n=20)	
(age-corrected)	3	66.50 (37.92, n=20)	64.39 (32.68, n=18)	
	120**	105 (24, n=15)	99 (31, n=14)	
Success*	3	50% (10/20)	44% (8/18)	
Subjective improvement (%)	3	40.00 (38.35, n=20)	31.05 (31.43, n=19)	
Pain at rest (VAS 0-10, worst)	0	5.35 (2.54, n=20)	5.40 (3.00, n=20)	
	3	2.30 (3.03, n=20)	3.22 (2.82, n=18)	
	120**	2.2 (2.3, n=15)	2.3 (2.7, n=14)	
Pain with activity (VAS 0-10,	0	7.75 (1.48, n=20)	7.95 (1.96, n=20)	
worst)	3	4.85 (3.07, n=20)	6.11 (3.23, n=18)	
	120**	3.6 (3.5, n=15)	3.0 (2.9, n=14)	
DASH scores	120**	39.8 (17.1, n=15)	38.8 (14.1, n=14)	

Author/Outcome	F/U (mos.)	ESWT Mean (SD or 95% CI, n) or % (n/N)	Control Mean (SD or 95% CI, n) or % (n/N)	p-value
Speed 2002				
SPADI	0	53.6 (20.2, n=34)	59.5 (16.1, n=40)	NS
	3	34.7 (26.6, n=34)	39.7 (27.7, n=40)	NS
	6	24.1 (22.9, n=34)	34.9 (31.7, n=40)	NS
Pain at night (VAS 0-10, worst)	0	6.09 (2.46, n=34)	6.77 (2.57, n=40)	NS
	3	3.81 (2.83, n=34)	3.93 (3.18, n=40)	NS
	6	2.73 (2.69, n=34)	3.33 (3.23, n=40)	NS
≥50% improvement in SPADI	3	35.0% (12/34)	45.0% (18/40)	0.479
≥50% improvement VAS pain at night	3	41.0% (14/34)	37.5% (15/40)	0.941
FESWT vs. US-Guided Needling + CSI				
Kim 2014				
Pain NOS (VAS 0-10, worst)	0	6.3 (n=32)	6.8 (n=30)	NS
	3	2.5 (n=29)	3.3 (n=25)	NS
	6	2.5 (n=29)	1.8 (n=25)	NS
	12	3.3 (n=29)	1.4 (n=25)	<0.05
	Mean 23.0	2.4 (n=29)	1.1 (n=25)	NS
ASES (0-100, best)	0	49.9 (n=32)	41.5 (n=30)	NS
	3	72.5 (n=29)	68.6 (n=25)	NS
	6	76.4 (n=29)	85.2 (n=25)	NS
	12	74.6 (n=29)	90.3 (n=25)	<0.05
	Mean 23.0	78.3 (n=29)	91.1 (n=25)	NS
SST (0-100, best)	0	34.0 (n=32)	38.2 (n=30)	NS
	3	56.9 (n=29)	59.0 (n=25)	NS
	6	70.8 (n=29)	74.1 (n=25)	NS
	12	70.8 (n=29)	83.3 (n=25)	<0.05
	Mean 23.0	78.6 (n=29)	91.7 (n=25)	NS
Resorption of Calcium deposits				
Complete	Mean 23.0	42.6% (12/29)	72.2% (18/25)	NR
Partial	Mean 23.0	16.7% (5/29)	11.1% (3/25)	NR
Size of calcium deposits (mm)	0	11.0 (range 4.9-19.3) (n=32)	14.8 (range, 6.6-31.0) (n=30)	NS
	Mean 23.0 mos.	5.6 (n=29)	0.5 (n=25)	0.001
FESWT vs. TENS				
Pan 2003				
Pain NOS (VAS 0-10, worst)	0	6.50 (1.81, n=32/33 shoulders)	6.70 (1.42, n=28/30 shoulders)	NS
	Δ3	-4.08 (2.59, n=33 shoulders)	-1.74 (2.20, n=29 shoulders)	<0.001
Constant score (0-100, best)	0	63.77 (14.22, n=32/33 shoulders)	65.66 (15.84, n=28/30 shoulders)	NS
	Δ3	28.31 (13.10, n=33 shoulders)	11.86 (13.32, n= 29 shoulders)	<0.001
Constant score ≥85 (%)	3	69% (23/33 shoulders)	43% (12/29 shoulders	
MMT, % (range 0-5)	0			
2		3.0% (1/33 shoulders)	3.3% (1/30 shoulders)	
3		18.6% (6/33 shoulders)	40.0% (12/30 shoulders)	

Author/Outcome	F/U (mos.)	ESWT Mean (SD or 95% CI, n) or % (n/N)	Control Mean (SD or 95% CI, n) or % (n/N)	p-value
4		57.6% (19/33 shoulders)	50.0% (15/30 shoulders)	
5		18.2% (6/33 shoulders)	6.7% (2/30 shoulders)	
MMT (range, 0-5); no. improved/total	3	69.7% (23/33 shoulders)	62.1% (18/29 shoulders)	NS
Size of calcium deposits (mm)	0	9.22 (4.08, n=32/33 shoulders)	9.17 (5.45, n=28/30 shoulders)	NS
	Δ3	4.39 (3.76, n=33 shoulders)	1.65 (2.83, n= 29 shoulders)	0.002
Type of calcification††, no. changed/total	3	48.5% (16/33 shoulders)	10.3% (3/29 shoulders)	0.001
RESWT VS. Sham				
Kolk 2013				
Calcific tendinopathy				
Pain NOS (VAS 0-10, worst)	0	67 (21, n=23)	71 (17, n=17)	0.459
	3	51 (28, n=21)	53 (27, n=17)	0.808
	6	35 (28, n=19)	36 (29, n=15)	0.868
SST (0-100, best)	0	4.9 (3.0, n=23)	4.1 (2.1, n=17)	0.360
	3	6.2 (3.2, n=21)	6.2 (3.8, n=17)	0.788
	6	7.5 (3.6, n=19)	7.7 (4.3, n=15)	0.729
Constant score (0-100, best)	0	54.7 (14.2, n=23)	55.7 (15.9, n=17)	0.850
	3	63.6 (21.4, n=21)	67.2 (19.5, n=17)	0.728
	6	72.7 (22.7, n=19)	78.0 (18.0, n=15)	0.424
Non-Calcific tendinopathy				
Pain NOS (VAS 0-10, worst)	0	64 (20, n=21)	68 (16, n=19)	0.437
	3	43 (29, n=19)	51 (29, n=18)	0.414
	6	24 (23, n=16)	39 (29, n=17)	0.137
SST (0-100, best)	0	4.6 (2.8, n=21)	6.0 (2.6, n=19)	0.103
	3	6.6 (3.0, n=19)	6.8 (4.0, n=18)	0.181
	6	7.8 (3.2, n=16)	7.7 (3.9, n=17)	0.092
Constant score (0-100, best)	0	55.3 (13.6, n=21)	63.5 (12.5, n=19)	0.054
	3	70.8 (17.0, n=19)	73.3 (21.7, n=18)	0.067
	6	79.3 (15.4, n=16)	75.9 (19.4, n=17)	0.115
RESWT vs. US-Guided Percutaneous Lavage				
Del Castillo-Gonzalez 2016				
Pain free (%)	12	65.0% (52/80)	89.26% (108/121)	NR
Pain NOS (VAS 0-10, worst)‡	0	7.5 (n=121)	7.5 (n=122)	0.798
	3	5.2 (n=80)	3.2 (n=121)	<0.01
	6	4.0 (n=80)	2.2 (n=121)	<0.01
	12	3.2 (n=80)	1.3 (n=121)	<0.01
Complete resolution of Calcification	12	55.6% (45/80)	86.78% (105/121)	NR

ASES, American Shoulder and Elbow Surgeons score; CI, confidence interval; CSI, corticosteroid injection; DASH, Disabilities of the Arm, Shoulder and Hand questionnaire; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mos, months; NOS, not otherwise specified; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; SPADI, Shoulder Pain and Disability Index; SST, Simple Shoulder Test; US, ultrasound; VAS, visual analog scale

*Success was defined as an increase in the age-corrected Constant score of ≥30 points or an absolute score of 80% of the normal value. Such an outcome is considered to be clinically significant. Galasso 2012 did not specify that the Constant score was "age-corrected".
†VAS pain scores for the Sham group were estimated from the graph in the article. Score were provided for the ESWT group in the text.
‡Estimated from graph in article.
§Number required for total relief from pain and full restoration of mobility.
**Eight patients underwent arthroscopic subacromial decompression between 1- and 10-year follow-ups. Among these, 6 were unblinded to their previous treatment group while two were still blinded. Four patients received ESWT and 4 received placebo before surgery, which was performed at an average of 2 years after placebo/EWST intervention.
††Type of calcification, n (%): Arc, 19 (57.6%) vs. 12 (40%); Fragment/punctuation, 8 (24.2%) vs. 12 (40%); Nodule, 6 (18.2%) vs. 4 (13.3%); Cyst, 0 vs. 2 (6.7%).

Appendix Table G4. Shoulder Tendinopathy Efficacy Outcomes: Adhesive Capsulitis

Author/Outcome	F/U (mos.)	FESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
FESWT vs. Sham				
Vahdatpour 2014				
SPADI pain subscale score	0	48.8 (10.7, n=19)	52.8 (4.3, n=17)	NR
(higher = worse)	2	22.2 (9.5, n=19)	44.1 (10.4, n=17	<0.001
	5	16.1 (6.7, n=19)	39.5 (10.4, n=17	<0.001
SPADI disability subscale score	0	59.3 (9.6, n=19)	50.4 (8.6, n=17)	NR
(higher = worse)	2	24.8 (17.4, n=19)	42.4 (7.5, n=17)	0.002
	5	19.2 (15.8, n=19)	40.9 (8.7, n=17)	0.002
FESWT vs. Oral Steroids				
Chen 2014				
Constant score (0-100, best)*	0	49 (n=17)	48 (n=17)	ns
	3	75 (n=17)	66 (n=17)	0.041
Oxford score (12-60, worst)*	0	53.5 (n=17)	54 (n=17)	ns
	3	31 (n=17)	33 (n=17)	0.045
RESWT vs. Sham				
Hussein 2016				
DASH score (0-100, worst)	0	73.52 (3.35, n=53)	72.48 (4.70, n=53)	ns
	1	4.27 (6.14, n=53)	58.85 (22.36, n=53)	<0.001
	6	2.73 (4.07, n=53)	56.95 (23.75, n=53)	<0.001
VAS pain (0-10, worst)	0	6.28 (0.97, n=53)	6.26 (1.24, n=53)	ns
	1	1.15 (0.91, n=53)	4.60 (1.34, n=53)	<0.001
	6	0.98 (0.93, n=53)	5.32 (1.33, n=53)	<0.001
Incidences of painful activities				
None	1	67.9% (36/53)	3.8% (2/53)	NR
One		20.8% (11/53)	5.7% (3/53)	NR
Two		5.7% (3/53)	15.1% (8/53)	NR
Three or more		5.7% (3/53)	75.5% (40/53)	NR
None	6	92.5 (49/53)	0% (0/53)	NR
One		7.5% (4/53)	1.9% (1/53)	NR
Two		0% (0/53)	11.3% (6/53)	NR
Three or more		0% (0/53)	86.8% (46/53)	NR

CI, confidence interval; DASH, Disabilities of the Arm, Shoulder and Hand questionnaire; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mos, months; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; SPADI, Shoulder Pain and Disability Index; VAS, visual analog scale.

*All scores were estimated from graphs provided in the article

Appendix Table G5. Shoulder Tendinopathy Efficacy Outcomes: Subacromial Shoulder Pain

Author/Outcome	F/U (mos.)	F-ESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
RESWT vs. Supervised Exercise				
Engebretsen 2009, 2011*				
SPADI score (0-100, worst)	0	45.1 (22.1, n=52)	48.8 (20.6, n=52)	ns
	3	36.1 (28.4, n=52)	27 (24.2, n=50)	NR
Adj. Treatment Effect (3)		10.3 (95% CI 0.8, 19.8)	---	NR
	4.5	29.2 (25.9, n=50)	24.5 (25.6, n=50)	ns
Adj. Treatment Effect (4.5)		8.4 (95% CI 0.6, 16.5)	---	0.047
	12	27.9 (26.6, n=46)	24 (23.4, n=48)	NR
Adj. Treatment Effect (12)		7.6 (95% CI -0.5, 16.6)	---	0.09
No. clinically improved†	4.5	36.0% (18/50)	64.0% (32/50)	0.01
	12	52.2% (24/46)	60.4% (29/48)	ns
Pain at rest (Likert 1-9, worst)	0	3.5 (2.1, n=52)	3.4 (1.9, n=52)	ns
	3	2.9 (2.1, n=52)	2.5 (1.8, n=50)	NR
Adj. Treatment Effect (3)		0.3 (95% CI -0.3, 0.9)	---	NR
	4.5	2.7 (2.0, n=50)	2.5 (1.9, n=50)	NR
Adj. Treatment Effect (4.5)		0.2 (95% CI -0.3, 0.7)	---	ns
	12	2.6 (2.0, n=46)	2.1 (1.5, n=48)	NR
Adj. Treatment Effect (12)		0.4 (95% CI -0.3, 0.7)	---	ns
Pain with activity (Likert 1-9, worst)	0	5.4 (1.9, n=52)	5.6 (2.0, n=52)	NS
	3	4.1 (2.4, n=52)	3.7 (2.2, n=50)	NR
Adj. Treatment Effect (3)		0.5 (95% CI -0.4, 1.3)	---	NR
	4.5	4.1 (2.5, n=50)	3.6 (2.3, n=50)	NR
Adj. Treatment Effect (4.5)		0.6 (95% CI -0.2, 1.3)		ns
	12	3.7 (2.4, n=46)	3.5 (2.2, n=48)	NR
Adj. Treatment Effect (12)		0.4 (95% CI -0.4, 1.4)	---	ns
Function: carrying a shopping bag	0	3.6 (2.0, n=52)	4.1 (1.8, n=52)	NS
(Likert scale 1-7 [impossible])	3	3.2 (2.0, n=52)	3.0 (1.9, n=50)	NR
Adj. Treatment Effect (3)		0.4 (95% CI -0.2, 1.0)	---	NR
	4.5	3.0 (2.1, n=50)	2.8 (1.8, n=50)	NR
Adj. Treatment Effect (4.5)		0.5 (95% CI -0.1, 1.0)		ns
	12	2.9 (2.0, n=46)	2.8 (1.7, n=48)	NR
Adj. Treatment Effect (12)		0.6 (95% CI -0.07, 1.2)	---	ns
Function: taking something down from cupboard (Likert scale 1-7, impossible)	0	4.6 (1.8, n=52)	4.9 (1.2, n=52)	ns
	3	3.5 (2.0, n=52)	3.1 (1.9, n=50)	NR
Adj. Treatment Effect (3)		0.5 (95% CI -0.2, 1.2)	---	NR
	4.5	3.4 (2.0, n=50)	3.2 (1.8, n=50)	NR
Adj. Treatment Effect (4.5)		0.5 (95% CI -0.1, 1.1)		ns
	12	2.8 (1.9, n=46)	3.1 (1.9, n=48)	NR
Adj. Treatment Effect (12)		0 (95% CI -0.2, 1.2)	---	ns
Working‡	0	50% (26/52)	60% (31/52)	ns
	3	54% (28/52)	64% (32/50)	ns
	4.5	52% (26/50)	76% (38/50)	0.02
	12	65% (30/46)	84% (38/48)	ns
Drug tx (daily/each week)§	0	44% (23/52)	50% (26/52)	ns
	4.5	44% (22/50)	36% (18/50)	ns
	12	30% (14/46)	27% (13/48)	ns

Author/Outcome	F/U (mos.)	F-ESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
Emotional distress	0	1.6 (0.5, n=52)	1.5 (0.4, n=52)	ns
(HSCL-25, 1-4 [worst])	12	1.5 (0.5, n=46)	1.4 (0.4, n=48)	ns
Additional treatment**	4.5	26.0% (13/50)	6.0% (3/50)	0.014
	12	43.5% (20/46)	20.8% (10/48)	0.024
Surgery	4.5	2.0% (1/50)	0% (0/50)	NR
	12	8.7% (4/46)	6.3% (3/48)	NR

FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mos, months; HSCL-25, Hopkins symptom checklist-25; NOS, not otherwise specified; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; SPADI, shoulder pain and disability index; tx, treatment; VAS, visual analog scale.
*The treatment effect is the difference between groups in mean changes scores (at 3, 4.5, 12 months) from baseline; they are adjusted for time and baseline values.
†Number clinically improved defined as the smallest detectable real difference between 2 measurements on the same individual of 19.6 points on the SPADI.
‡For 3 and 4.5 months, old age pension not included (four in supervised exercise group and two in radial extracorporeal shockwave group at all follow-ups).
§Includes drug treatments for pain, sleep problems, and depression.
**Includes cortisone injections, chiropractic treatment, and physical therapy/supervised exercise; for additional treatments that occurred between 3-4.5 months the odds ratio was 5.5 (95% CI 1.3, 26.4), p=0.014.

Appendix Table G6. Shoulder Tendinopathy Efficacy Outcomes: Primary Long Bicep Tenosynovitis

Author/Outcome	F/U (mos.)	F-ESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
RESWT vs. Sham				
Liu 2012*				
Pain NOS (VAS 0-10, worst)*	0	5.67 (1.32, n=54)	6.04 (0.97, n=25)	ns
	3	1.83 (1.25, n=54)	5.95 (0.81, n=25)	<0.001
	12	1.43 (0.94, n=54)	5.57 (0.84, n=25)	<0.001
Pain success†	12	77.8% (42/54)	0% (0/25)	NR
L'Insalata score (17-100, best)*	0	60.57 (6.91, n=54)	58.60 (7.04, n=25)	ns
	3	82.50 (5.48, n=54)	59.96 (5.22, n=25)	<0.001
	12	83.44 (5.21, n=54)	64.92 (5.00, n=25)	<0.001
Function/symptom success‡	12	77.8% (42/54)	12% (3/25)	NR

FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mos, months; NOS, not otherwise specified; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; VAS, visual analog scale.

*The rESWT group was further divided into two subgroups: one that had received previous conservative treatments and one that had not; patients in both subgroups showed alleviated pain (VAS score) and improved symptoms and function (L'Insalata score), with no statistically significant difference in either measure between the two subgroups (no data was provided).
†Authors' standard for good clinical result; determined by a VAS score <2 or a decrease of ≥4 points compared with baseline score.
‡Authors' standard for good symptom and function recovery; determined by achieving L'Insalata score >85 or an increased by >20 units when compared with baseline scores.

Appendix Table G7. Achilles Tendinopathy Efficacy Outcomes

Author/Outcome	F/U (mos.)	FESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
FESWT vs. Sham				
Costa 2005				
Pain walking (VAS 0-100, worst)	0	55.5 (30.6, n=22)	55.6 (26.5, n=27)	ns
	3	34.5 (34.2, n=22)	50.3 (36.3, n=27)	ns
Pain at rest (VAS 0-100, worst)	0	41.4 (33.9, n=22)	30 (28.8, n=27)	ns
	3	27.3 (30.6, n=22)	35.1 (34.2, n=27)	ns
Pain w/ sports (VAS 0-100, worst)	0	67.8 (28.3, n=22)	62 (27.3, n=27)	
	3	47.8 (31.4, n=22)	58 (38, n=27)	ns
Walking on tiptoe				ns
Unable	3	27.3% (6/22)	29.6% (8/27)	
<5 sec.	3	18.2% (4/22)	18.5% (5/27)	
5-10 sec.	3	4.5% (1/22)	14.8% (4/27)	
>10 sec.	3	50.0% (11/22)	37.0% (10/27)	
Able to jump				ns
Able	3	36.4% (8/22)	51.9% (14/27)	
Unable	3	63.6% (14/22)	48.1% (13/27)	
EQ-5D (1 to -0.59)	3	0.11 (0.24, n=22)	0.07 (0.24, n=27)	ns
EQol health score	3	1.55 (35, n=22)	−4.23 (20, n=27)	ns
FIL	3	0.95 (0.96, n=22)	0.24 (0.24, n=27)	ns
Rasmussen 2008				
Pain walking (VAS 0-10, worst)*	0	4.0 (n=24)	2.7 (n=24)	NR
	3	1.3 (n=24)	1.7 (n=24)	ns
Pain working (VAS 0-10, worst)*	0	3.5 (n=24)	2.0 (n=24)	NR
	3	1.1 (n=24)	1.2 (n=24)	ns
Pain w/ stairs (VAS 0-10, worst)*	0	5.0 (n=24)	3.0 (n=24)	NR
	3	1.3 (n=24)	2.1 (n=24)	ns
Pain running (VAS 0-10, worst)*	0	7.8 (n=24)	6.5 (n=24)	NR
	3	0.8 (n=24)	1.7 (n=24)	ns
AOFAS (0-100, best)	0	70 (6.8, n=24)	74 (12, n=24)	NR
	3	88 (10, n=24)	81 (16, n=24)	0.04
RESWT vs. Eccentric Loading				
Rompe 2008†				
VISA-A score (0-100, best)	0	53.2 (5.8, n=25)	52.7 (8.4, n=25)	ns
	3	79.4 (10.4, n=25)	63.4 (12.0, n=25)	0.005
General Assessment‡	0	4.9 (0.9, n=25)	5.4 (0.6, n=25)	NR
(6pt Likert, 6=worst)	3	2.8 (1.6, n=25)	3.7 (1.5, n=25)	0.043
Pain during day (NRS 0-10, worst)	0	7.0 (0.8, n=25)	6.8 (1.0, n=25)	ns
	3	3.0 (2.3, n=25)	5.0 (2.3, n=25)	0.004
Success§	3	64% (16/25)	28% (7/25)	<0.02
Analgesic use	3	28% (7/25)	76% (19/25)	<0.01
Rompe 2007**				
VISA-A score (0-100, best)	0	50.3 (11.7, n=25)	50.6 (11.5, n=25)	ns
	3	70.4 (16.3, n=25)	75.6 (18.7, n=25)	0.259
General Assessment‡	0	4.8 (0.9, n=25)	5.3 (0.8, n=25)	
(6pt Likert, 6=worst)	3	2.9 (1.5, n=25)	2.7 (1.5, n=25)	0.557
Pain during day (NRS 0-10, worst)	0	6.8 (0.9, n=25)	7.0 (0.8, n=25)	

Author/Outcome	F/U (mos.)	FESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
	3	4.0 (2.2, n=25)	3.6 (2.3, n=25)	0.494
Success§	3	53% (13/25)	60% (15/25)	ns
RESWT vs. Wait-and-See				
Rompe 2007**				
VISA-A score (0-100, best)	0	50.3 (11.7, n=25)	48.2 (9.0, n=25)	ns
	3	70.4 (16.3, n=25)	55.0 (12.9, n=25)	<0.001
General Assessment‡	0	4.8 (0.9, n=25)	4.8 (0.8, n=25)	NR
(6pt Likert, 6=worst)	3	2.9 (1.5, n=25)	4.3 (1.6, n=25)	0.001
Pain during day (NRS 0-10, worst)	0	6.8 (0.9, n=25)	7.9 (0.6, n=25)	ns
	3	4.0 (2.2, n=25)	5.9 (1.8, n=25)	<0.001
Success§	3	53% (13/25)	24% (6/25)	0.001
RESWT + Eccentric Loading vs. Eccentric Loading Alone				
Rompe 2009**				
VISA-A score (0-100, best)	0	50.2 (11.1, n=34)	50.6 (10.3, n=34)	ns
	3	86.5 (16.0, n=34)	73.0 (19.0, n=34)	0.002
General Assessment‡	0	4.7 (0.9, n=34)	5.2 (0.9, n=34)	NR
(6pt Likert, 6=worst)	3	2.1 (1.1, n=34)	2.9 (1.8, n=34)	0.035
Pain during day (NRS 0-10, worst)	0	6.8 (1.0, n=34)	7.0 (0.8, n=34)	ns
	3	2.4 (2.2, n=34)	3.9 (2.0, n=34)	0.005
Success§	3	82% (28/34)	56% (19/34)	0.001

AOFAS, American Orthopedic Foot and Ankle Score; EQ-5D, EuroQol 5 Dimensions; EQol, EuroQol generalized health status questionnaire; FESWT, focused extracorporeal shock wave therapy; FIL, functional index of lower limb activity; F/U, follow-up; mos, months; NR, not reported; NRS, numerical rating scale; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy SD, standard deviation; VAS, visual analog scale.

*Data estimated from graphs in article. Pain was reduced in both groups, but there was no statistically significant difference between the groups.

†Insertional Achilles Tendinopathy.

‡General outcome was scored by the patient on a 6-point Likert scale, with 1 indicating complete recovery.

§Patients who rated their result as 1 or 2 (i.e., completely recovered or much improved) on the 6-point Likert scale for General Assessment were counted as having a successful outcome.

**Non-Insertional (i.e., main body) Achilles Tendinopathy.

Appendix Table G8. Patella Tendinopathy Efficacy Outcomes

Author/Outcome	F/U (mos.)	FESWT Mean (SD, n) or % (n/N)	Control Mean (SD, n) or % (n/N)	p-value
FESWT vs. Sham				
Taunton 2003				
VISA-P (0-100, best)	0	54.4 (n=10)	49.9 (n=9)	ns
	3	61.4 (n=10)	53.2 (n=9)	<0.05
Vertical jump score (inches)	0	NR	NR	ns
	Δ3*	1.5 (n=10)	0.0 (n=9)	<0.05
Anecdotal reports†				
decreased pain, improved function	3	55.6% (5/9)	0% (0/7)	NR
decreased pain, no change in function	3	NR	14.3% (1/7)	---
pain with stairs but overall improved	3	22.2% (2/9)	NR	---
no improvement	3	22.2% (2/9)	85.7% (6/7)	NR
FESWT vs. Conservative Management‡				
Wang 2007				
Pain with stairs (VAS 0-10, worst)	0	6.00 (1.74, n=30 knees)	5.38 (0.92, n=24 knees)	ns
	24-36	0.59 (1.01, n=30 knees)	4.72 (1.35, n=24 knees)	<0.001
VISA-P (0-100, best)	0	42.57 (10.22, n=30 knees)	39.25 (10.85, n=24 knees)	ns
	24-36	92.0 (10.17, n=30 knees)	41.04 (10.96, n=24 knees)	<0.001
Functional improvement (%)§	24-36	84.8% (20.5%, n=30 knees)	56.7% (26.7%, n=24 knees)	<0.001
Overall clinical outcomes**	24-36			<0.001
Excellent		43% (13/30 knees)	0% (0/24 knees)	
Good		47% (14/30 knees)	50% (12/24 knees)	
Fair		10% (3/30 knees)	25% (6/24 knees)	
Poor		0% (0/30 knees)	25% (6/24 knees)	
Recurrence		13% (4/30 knees)	50% (12/24 knees)	
Satisfactory Results††	24-36	90% (27/30 knees)	50% (12/24 knees)	<0.001
Return to sport	24-36			
at same level		66.7% (10/15)	0% (0/14)	NR
at lower level		33.3% (5/15)	100% (14/14)	NR

CI, confidence interval; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; mos: months; NOS, not otherwise specified; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; VAS, visual analog scale; VISA-P, Victorian Institute of Sports Assessment – Patella.

*Indicates the mean change from baseline in vertical jump score (i.e., improvement in inches); no baseline scores were provided.

†As described by the authors, no other information provided.

‡Conservative management includes non-steroidal anti-inflammatory drugs (NSAIDs), physiotherapy, an exercise regimen, and use of a knee strap.

§The percentage of functional improvement of the knee was based on the overall subjective assessment by comparing with the baseline status before treatment; results are mean ± SD.

**Excellent = knee having no pain in all activities including sports; Good = knee having ≥75% improvement and mild pain with a VAS <4 in all activities including sports; Fair = knee having ≥50% improvement and moderate pain with a VAS <4 in any activities including sports; Poor = knee having <50% improvement and significant pain with a VAS >4 in any activities including sports.
††The result was considered satisfactory if patients had ≥75% improvement in pain with ≤4.0 on a VAS scale while walking up and down stairs and did not take any pain medication.

Appendix Table G9. Knee Osteoarthritis Efficacy Outcomes

Author/Outcome	F/U (mos.)	FESWT Mean (SD or 95% CI, n) or % (n/N)	Control Mean (SD or 95% CI, n) or % (n/N)	p-value
FESWT + Isokinetic Muscular Strengthening (IMS) vs. IMS Alone				
Chen 2014*				
Knee pain NOS (VAS 0-10, worst)	0	5.8 (1.2, n=60 knees)	5.5 (1.4, n=60 knees)	ns
	2	2.6 (1.4, n=56 knees)	4.2 (0.9, n=54 knees)	<0.05
	6	2.2 (1.3, n=52 knees)	4.0 (1.4, n=50 knees)	<0.05
Lequesne's index	0	8.1 (1.3, n=30)	7.8 (1.2, n=30)	ns
	2	4.1 (1.6, n=28)	5.1 (0.9, n=27)	<0.05
	6	2.5 (1.5, n=26)	5.4 (1.7, n=25)	<0.05
Popliteal cyamella deposits	6			
Gone		0% (0/30)	0% (0/30)	NR
Reduced size		30% (9/30)	0% (0/30)	NR
FESWT + IMS vs. Pulse Ultrasound + IMS				
Chen 2014*				
Knee pain NOS (VAS 0-10, worst)	0	5.8 (1.2, n=60 knees)	5.7 (1.5, n=60 knees)	ns
	2	2.6 (1.4, n=56 knees)	3.2 (1.6, n=56 knees)	<0.05
	6	2.2 (1.3, n=52 knees)	3.0 (1.5, n=50 knees)	<0.05
Lequesne's index (0-24,worst)	0	8.1 (1.3, n=30)	7.9 (1.6, n=30)	ns
	2	4.1 (1.6, n=28)	4.5 (1.1, n=28)	<0.05
	6	2.5 (1.5, n=26)	4.0 (1.6, n=25)	<0.05
Popliteal cyamella deposits	6			
Gone		0% (0/30)	0% (0/30)	NR
Reduced size		30% (9/30)	0% (0/30)	NR
RESWT vs. Sham				
Zhao 2013				
Pain walking (VAS 0-10, worst)	0	7.56 (1.3, n=34)	7.55 (1.1, n=36)	ns
	3	3.83 (n=34)	6.41 (n=36)	<0.01
Lequesne's index (0-24,worst)	0	10.2 (2.3, n=34)	10.1 (2.4, n=36)	ns
	Δ3†	-4.1 (-4.9, -3.3) (n=34)	-2.0 (-2.9, -1.0) (n=36)	<0.01
Difference vs. Sham‡	3	-2.1 (-3.4, -0.9)	---	<0.01
WOMAC score (0-96, worst)	0	36.4 (10.3, n=34)	32.8 (10.9, n=36)	ns
	Δ3*	-19.1 (-22.7, -15.6) (n=34)	-8.5 (-12.4, -4.6) (n=36)	<0.01
Difference vs. Sham†	3	-10.6 (-15.8, -5.4)	---	<0.01
Patient perception of disease severity§	0	3.09 (0.67, n=34)	3.11 (0.67, n=36)	ns
	Δ3*	-0.9 (-1.1, -0.6) (n=34)	-0.3 (-0.5, -0.1) (n=36)	<0.01
Difference vs. Sham†	3	-0.6 (-0.9, -0.2)		<0.01

CI, confidence interval; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; IMS, isokinetic muscular strengthening; mos, months; NOS, not otherwise specified; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; VAS, visual analog scale; WOMAC, Western Ontario and McMasters University Osteoarthritis Index.

*All mean scores for Chen 2014 are adjusted for time and baseline scores (Tukey test).
†Indicates the mean change from baseline at 3 months.
‡Treatment effect; the mean difference in change scores from baseline at 3 months.
§Measured by a direct question: Considering all the ways knee OA affects you, how would you rate your condition today? It was rated on a 5-point Likert scale, from 1, very poor; 2, poor; 3, fair; 4, good; to 5, very good.
CI, confidence interval; FESWT, focused extracorporeal shock wave therapy; F/U, follow-up; IMS, isokinetic muscular strengthening; mos, months; NOS, not otherwise specified; NR, not reported; ns, not statistically significant; RESWT, radial extracorporeal shock wave therapy; SD, standard deviation; VAS, visual analog scale; WOMAC, Western Ontario and McMasters University Osteoarthritis Index.

*All mean scores for Chen 2014 are adjusted for time and baseline scores (Tukey test).
†Indicates the mean change from baseline at 3 months.
‡Treatment effect; the mean difference in change scores from baseline at 3 months.
§Measured by a direct question: Considering all the ways knee OA affects you, how would you rate your condition today? It was rated on a 5-point Likert scale, from 1, very poor; 2, poor; 3, fair; 4, good; to 5, very good.

APPENDIX H. Data Abstraction Tables: Safety Outcomes

Appendix Table H1. Plantar Fasciitis Safety Outcomes

Author/Outcome	Outcome	FESWT	Control
FESWT vs. Sham			
Ogden (2001, 2004, FDA SSED 2000)	Bruising, edema or pain during treatment	0.8% (1/130)	0% (0/130)
	Nerve irritation, tingling, ↓ sensation	3.8% (5/130)	0.8% (1/130)
	Post-treatment pain	0.8% (1/130)	3.1% (4/130)
	Mid-substance rupture of plantar fascia	1.5% (2/130)	0% (0/130)
Haake (2003)	Any adverse events	47% (67/144)	30% (42/141)
	Skin reddening	12% (16/135)	4% (51/136)
	Pain	5% (7/135)	1% (2/136)
	Local swelling	2% (3/135)	0% (0/136)
Theodore (2004)	Pain during treatment	73% (55/76)	7% (5/74)
	Pain after treatment	37% (28/76)	32% (24/74)
	Edema	7% (5/76)	8% (6/74)
	Ecchymosis	7% (5/76)	5% (4/74)
	Petechiae/rash	1% (1/76)	1% (1/74)
	Hypesthesia	3% (2/76)	8% (6/74)
	Neuralgia	1% (1/76)	0% (0/74)
	Paresthesia	4% (3/76)	4% (3/74)
Kudo (2006)	Adverse events	Raw data NR†	
	Pain		
	Ecchymosis		
	Edema		
	Paresthesia		
Malay (2006, FDA SSED 2005)	Any adverse events	2.6% (3/115)	0% (0/57)
	Bruising	1.7% (2/115)	0% (0/57)
	Mild local swelling	0.9% (1/115)	0% (0/57)
Rompe 1996	Safety outcomes not reported		
Rompe 2003	Hematoma	0% (0/22)	0% (0/23)
	Infection	0% (0/22)	0% (0/22)
	Neurological	0% (0/22)	0% (0/22)
Cosentino 2001‡	Adverse events	None seen	
Gollwitzer 2007	Adverse event composite score§	3.1, 2.7, 3.0	0.8, 0.9, 1.2
Gollwitzer 2015	All adverse events	77 in 43 pts	24 in 17 pts
	≥1 adverse event	34% (43/126)	14% (17/124)
	Treatment associated pain or swelling	65 in 34 pts	11 in 7 pts
	≥1 pain or swelling event	27% (34/126)	6% (7/124)
Speed 2003	Syncope due to pain	2% (1/46)	0% (0/42)
Saxena 2012	Adverse events	0%	0%

Author/Outcome	Outcome	FESWT	Control
RESWT vs. Sham			
Gerdesmeyer 2008	Adverse events	50 in 33 patients	11 in 10 patients
	≥1 pain/discomfort event	26.4% (33/125)	5.9% (7/118)
	Reddening	0.8% (1/125)	0.8% (1/118)
	Swelling	0.8% (1/125)	0.8% (1/118)
	Numbness	0% (0/125)	0.8% (1/118)
	Unspecified foot pain	1.6% (2/125)	0% (0/118)
	Tendon rupture	0% (0/125)	0% (0/118)
Ibrahim 2010, 2016	Skin reddening	4% (1/25)	0% (0/25)
	Pain with treatment	12% (3/25)	8% (2/25)
Mehra 2003**	Pain	31% (8/26)	
	Redness	15% (4/26)	
	Hematoma	0% (0/26)	
	Migraine	0% (0/26)	
	Hyperventilation	0% (0/26)	
	Syncope	0% (0/26)	
Buchbinder 2002 (sham group had minimal energy)	Pain	1.3% (1/80)	1.2% (1/81)
	Heat/numbness	1.3% (1/80)	0% (0/81)
	Burning sensation	0% (0/80)	1.2% (1/81)
	Bruising	1.3% (1/80)	0% (0/81)
FESWT vs. CSI			
Porter 2005	Local pain & erythema	10% (6/61)	
Yucel 2010	Pain	6% (2/33)	15% (4/27)
	Erythema	6% (2/33)	0% (0/27)
FESWT vs. CT			
Chew 2013	No complications		
Hammer 2002	Safety outcomes not reported		
Radwan 2012	Paresthesia	6% (2/34)	
	Ecchymosis and petechiae	6% (2/34)	
	Postoperative swelling		6.5% (2/31)
RESWT vs. US			
Grecco 2013	No complications		
Konjen 2015	No complications		

CSI, corticosteroid injection; CT, conventional treatment; FESWT, focused extracorporeal shock wave therapy; NR, not reported; pts, points; RESWT, radial extracorporeal shock wave therapy; US, ultrasound;

*Most frequent complications in all groups were pain after treatment and mild neurological symptoms (numbness or dysesthesia) principally related to the ankle-block anesthesia. All patients had complete resolution of neurological symptoms at 3-month follow-up (raw data not reported).

†Adverse events (other than pain) were relatively few, and there was no significant difference in number of side effects reported between groups through 3 months. The adverse events reported were primarily anticipated and included ecchymosis, edema, pain, and transient parasthesias (raw data not reported)

‡Values not given and were estimated from Fig 1.

§7 single items (pain during treatment, pain after treatment, skin redness, hematoma, petechiae, swelling, and scar formation), all of which were considered most likely to be related to the intervention, were defined as adverse reactions (ARs) and assessed by a 5-point ordered categorical scale wherein 0 represented no signs and/or symptoms of an AR, and 4 represented severe signs and/or symptoms. The scores were combined into a summary AR composite score, the possible range for the composite score being 0 to 28.

**Treatment for lateral epicondylitis and plantar fasciitis together; no report of side effects from sham reported.

Appendix Table H2. Lateral Epicondylitis Safety Outcomes

Author	Outcome	ESWT	Control
FESWT vs. Sham			
Haake 2002, 2002	Skin reddening (per patient)	31.3% (42/134)	8.1% (11/136)
	Skin reddening (per treatment)	21.1% (84/399)	4.7% (19/402)
	Petechia (per patient)	2.2% (3/134)	1.5% (2/136)
	Petechia (per treatment)	4.5% (18/399)	1.7% (7/402)
	Bleeding (per patient)	0.7% (1/134)	0.7% (1/136)
	Bleeding (per treatment)	4.5% (18/399)	1.7% (7/402)
	Hematoma (per patient)	7.5% (10/134)	2.9% (4/136)
	Hematoma (per treatment)	4.5% (18/399)	1.7% (7/402)
	Swelling (per patient)	6.7% (9/134)	5.9% (8/136)
	Swelling (per treatment)	2.5% (10/399)	2.7% (11/402)
	Pain (per patient)	11.2% (15/134)	4.4% (6/136)
	Pain (per treatment)	4.8% (19/399)	1.7% (7/402)
	Elbow irritated (per patient)	0.7% (1/134)	0.7% (1/136)
	Elbow irritated (per treatment)	0.3% (1/399)	0.3% (1/402)
	Allergy to anesthetic (per patient)	1.5% (2/134)	0% (0/136)
	Allergy to anesthetic (per treatment)	0.5% (2/399)	0% (0/402)
	Migraine (per patient)	2.2% (3/134)	0% (0/136)
	Migraine (per treatment)	1.0% (4/399)	0% (0/402)
	Syncope (per patient)	2.2% (3/134)	0% (0/136)
	Syncope (per treatment)	0.8% (3/399)	0% (0/402)
	Nausea/dizziness (per patient)	2.2% (3/134)	0.7% (1/136)
	Nausea/dizziness (per treatment)	0.8% (3/399)	0.3% (1/402)
	Cold/flu/bronchitis (per patient)	1.5% (2/134)	0.7% (1/136)
	Cold/flu/bronchitis (per treatment)	0.5% (2/399)	0.3% (1/402)
	Other* (per patient)	3.7% (5/134)	2.2% (3/136)
	Other (per treatment)	1.3% (5/399)	0.8% (3/402)
Chung 2004	Tingling	0% (0/31)	17.2 (5/29)
	Nausea	9.7% (3/31)	0% (0/29)
	Achiness	3.2% (1/31)	3.4% (1/29)
	Soreness	9.7% (3/31)	13.8% (4/29)
	Pain	12.9% (4/31)	10.35 (3/29)
Collins 2011, SSED 2003	Reaction to local anesthesia	3% (3/93)	6% (5/90)
	Pain	5% (5/90)	1% (1/90)
	Swelling, bruising or petechia	7% (19/273)†	
Melikyan 2003	Safety outcomes not reported		
Pettrone 2005	Pain	50% (28/56)	22% (13/58)
	Nausea	18% (10/56)	0% (0/58)
	Local reaction	11% (6/56)	9% (5/58)
	Sweating	9% (5/56)	0% (0/58)
	Dizziness	7% (4/56)	0% (0/58)
	Hypertonia	5% (3/56)	6% (3/58)
	Hypaesthesia	5% (3/56)	2% (1/58)
	Paresthesia	5% (3/56)	14% (8/58)
	Other‡		
Rompe 2004	Transient redness	100% (38/38)	100% (40/40)
	Pain	95% (36/38)	53% (21/40)
	Nausea	21% (8/38)	2.5% (1/40)
Speed 2002	Worsening symptoms	5% (2/40)	0% (0/35)

Author	Outcome	ESWT	Control
	No other adverse events		
FESWT vs. CSI			
Crowther 2002	Safety outcomes not reported		
Ozturan 2010	Pain	100% (19/19)	100% (20/20)
	Nausea	21% (4/19)	0% (0/20)
	Erythema	21% (4/19)	0% (0/20)
	Swelling	15.7% (3/19)	0% (0/20)
	Tremor	5.2% (1/19)	0% (0/20)
FESWT vs. Percutaneous Tenotomy			
Radwan 2008	Paresthesia	3.4% (1/29)	
	Myalgia	6.9% (2/29)	
RESWT vs. Sham			
Capan 2016	No adverse events in either group		
Mehra 2003§	Pain	31% (8/26)	
	Redness	15% (4/26)	
	Hematoma	0% (0/26)	
	Migraine	0% (0/26)	
	Hyperventilation	0% (0/26)	
	Syncope	0% (0/26)	

CSI, corticosteroid injection; FESWT, focused extracorporeal shock wave therapy; RESWT, radial extracorporeal shock wave therapy

*Included one patient with preexisting coronary heart disease who died from cardiac failure; however, death was not causally linked to the shock wave therapy.
†Includes 273 active ESW treatments.
‡Other adverse events occurred in one or two patients such as: joint stiffness, myalgia, tremor, vasodilation, pallor in the ESWT group and accidental injury,
headache, peripheral edema, twitching and sinusitis in the sham ESWT group.
§Treatment for lateral epicondylitis and plantar fasciitis together; side effects from SHAM were not reported.

Appendix Table H3. Shoulder Tendinopathy Safety Outcomes: Rotator Cuff

Author	Outcome	ESWT	Control
FESWT vs. Sham			
Cosentino 2003	Any adverse reaction	0% (0/35)	0% (0/35)
Galasso 2012	"No relevant adverse events* occurred"		
Gerdesmeyer 2003	Unexpected/severe adverse events	0% (0/96)	0% (0/48)
	Clinically significant adverse effects†	0% (0/96)	0% (0/48)
	Pain during treatment		
	Severe	22% (21/94)	8% (4/48)
	Moderate	45% (42/94)	44% (21/48)‡
	Insignificant/none	33% (31/94)	48% (23/48)
	Petechiae, bleeding, hematoma or erythema	72% (68/94)	17% (8/48)
Hearnden 2009 (included for safety only)		0.28 mJ/mm^2	0.03 mJ/mm^2
	Serious/severe complications	0% (0/11)	0% (0/9)
	Bruising (resolved w/o issue)	62% (7/11)	0% (0/9)
Hsu 2008	Local erythematous changes	9.1% (3/33)	NR
	Neurovascular complications	0% (0/33)	NR
Peters 2004	Pain during ESWT		
	10-9 (no pain)	0% (26/61)	100% (29/29)
	8 (discomfort)	65% (20/61)	0% (0/29)
	7 (moderate)	0% (4/61)	0% (0/29)
	6 (moderate)	16% (5/61)	0% (0/29)
	5 (moderate)	0% (0/61)	0% (0/29)
	4-0 (considerable)	19% (6/61)	0% (0/29)
	Hematoma	19% (8/61)	0% (0/29)
	Redding of the skin	0% (0/64)	0% (0/29)
Schmitt 2001/ Efe 2014	"No side effects seen"		
Speed 2002	Could not tolerate therapy§	3% (1/34)	NR
	Deteriorating symptoms§	NR	3% (1/40)
FESWT vs. US-Guided Needling + CSI			
Kim 2014	Not reported		
FESWT vs. TENS			
Pan 2003	Soreness in the upper arm	15.6% (5/32)	NR
	Cardiac palpitations during ESWT (anxiety)	3.1% (1/32)	NR
	Hematoma	0% (0/32)	NR
	Paresthesia	0% (0/32)	NR
RESWT vs. Sham			
Cacchio 2006		0.10 mJ/mm^2	"less active similar therapy"
(included for safety only)	Clinically relevant side-effects	0% (0/45)	0% (0/45)
	Hematoma (4-6 day duration)	6.7% (3/45)	0% (0/45)
Kolk 2013	"No treatment-related complications seen"		
RESWT VS. US-Guided Percutaneous Lavage			

Author	Outcome	ESWT	Control
Del Castillo-Gonzalez 2016	Vagal reaction	NR	5% (6/121)
	Slight discomfort	100% (80/80)	NR
Comparison of different ESWT energy levels**			
Albert 2007 FESWT		Max. 0.45 mJ/mm^2	Max. 0.06 mJ/mm^2
	Serious adverse events	0% (0/40)	0% (0/39)
	Petechiae or small bruises	37.5% (15/40)	0% (0/39)
Farr 2011 FESWT		0.30 mJ/mm^2	0.20 mJ/mm^2
	"No complications were recorded during tx or at any follow-up time"	0% (0/15)	0% (0/15)
Ioppolo 2012 FESWT		0.20 mJ/mm^2	0.10 mJ/mm^2
	"No side effects observed after tx or reported at a further time"	0% (0/23)	0% (0/23)
Perlick 2003 FESWT		0.42 mJ/mm^2	0.23 mJ/mm^2
	Acute bursitis subacromialis††	10.0% (4/40)	5.0% (2/40)
	Petechial bleeding	100% (40/40)	37.5% (15/40)
	Hematoma (superficial)	20.0% (8/40)	2.5% (1/40)
	Acute pain immediately post-tx requiring analgesics	7.5% (3/40)	2.5% (1/40)
Pleiner 2004 FEWST		0.28 mJ/mm^2	<0.07 mJ/mm^2
	Any adverse event	0% (0/23)	0% (0/20)
Rompe 1998 FEWST		0.28 mJ/mm^2	0.06 mJ/mm^2
	Local subcutaneous hematoma	"occurred" (n=50)	"occurred" (n=50)
Sabeti 2007 FEWST		0.20 mJ/mm^2	0.08 mJ/mm^2
	Serious complications (e.g., avascular necrosis)	0% (0/25)	0% (0/22)
Schofer 2009 FESWT		0.78 mJ/mm^2	0.33 mJ/mm^2
	Significant side-effects	0% (0/20)	0% (0/20)
	Increased shoulder pain after 3rd tx	0% (0/20)	5.0% (1/20)

CSI, corticosteroid injection; FESWT, focused extracorporeal shock wave therapy; NR, not reported; RESWT, radial extracorporeal shock wave therapy; TENS, transcutaneous electrical nerve stimulation; US, ultrasound.

*Safety was assessed by analyzing the number and severity of adverse events associated with use of the investigational treatment. Anticipated adverse events (i.e., an event previously identified as occurring with some frequency as a results of the device use) for ESWT stated a priori included subcutaneous hematoma at treatment site, petechiae at treatment site, ecchymosis at treatment site, increased pain in treated shoulder, skin redness at treatment site, bleeding, swelling of treated shoulder, skin irritation at treatment site, migraine, syncope, nausea/vomiting, feeling unwell/dizziness.
†Includes neurologic disorders, tendon rupture, infection, bone edema, aseptic necrosis, or muscle hematoma.
‡For the sham group, authors describe this as "some sensation of pain".
§One patient in the ESWT group and one in the sham group withdrew due to adverse events. In addition, three in the ESWT and four in the Sham also withdrew but for unknown reasons. No other adverse events were reported.
**Included for safety only (not part of the scope for efficacy).
††These patients returned to clinic earlier than the 3-month examination because of acute shoulder pain and underwent ultrasonography. Possibly associated with shock-wave-induced penetration of the calcium deposits into the adjacent subacromial bursa. All these patients showed complete resorption of the calcified deposits at further follow-up visits and significant clinical improvement.

Appendix Table H4. Shoulder Tendinopathy Safety Outcomes: Adhesive Capsulitis

Author	Outcome	ESWT % (n/N)	Control % (n/N)
FESWT vs. Sham			
Vahdatpour 2014	"no significant complications noted"		
FESWT vs. Oral Steroid			
Chen	Transient erythematous swelling Petechial bleeding at treatment site	5.6% (3/53) 0% (0/53)	0% (0/53) 0% (0/53)
RESWT vs. Sham			
Hussein 2016	Hematomas (3-4 day duration) Discomfort or pain during ESWT	5.6% (3/53) 0% (0/53)	0% (0/53) 0% (0/53)

FESWT, focused extracorporeal shock wave therapy; RESWT, radial extracorporeal shock wave therapy

Appendix Table H5. Shoulder Tendinopathy Safety Outcomes: Subacromial shoulder pain

Author	Outcome	ESWT	Control
RESWT vs. Supervised Exercise			
Engebretsen 2009, 2011	Adhesive Capsulitis	NR	2.1% (1/48)
	Aggravation of pain	4.3% (2/46)	NR
	Death	2.2% (1/46)	0% (0/48)

NR, not reported; RESWT, radial extracorporeal shock wave therapy

* Included in the authors consort diagram at the 1 year follow-up time point; no other description or explanation provided.

Appendix Table H6. Shoulder Tendinopathy Safety Outcomes: Primary Long Bicep Tenosynovitis

Author	Outcome	ESWT	Control
RESWT vs. Supervised Exercise			
Liu 2012	Hematoma	0% (0/54)	NR
	Pain during treatment	7.4% (4/54)	NR
	Transient numbness	3.7% (2/54)	NR
	Skin reddening	3.7% (2/54)	NR
	Humeral head necrosis	0% (0/54)	NR
	Rotator cuff-related disease (induced by ESWT)	0% (0/54)	NR

NR, not reported; RESWT, radial extracorporeal shock wave therapy

Appendix Table H7. Achilles Tendinopathy Safety Outcomes

Author	Outcome	ESWT % (n/N)	Control % (n/N)
FESWT vs. SHAM			
Costa 2005	Tendon rupture*	9.0% (2/22)	0% (0/27)
	Minor complication†	0% (0/22)	0% (0/27)
Rasmussen 2008	Not reported		
RESWT vs. Eccentric Loading			
Rompe 2008‡	Tendon rupture	0% (0/23)	0% (0/22)
	Serious complications (NOS)	0% (0/23)	0% (0/22)
	Device-related complications (NOS)	0% (0/23)	0% (0/22)
	Skin reddening	100% (23/23)	NR
	Bruising	0% (0/23)	NR
	Aching in calf	NR	100% (22/22)
	Side effects at 15 mos. (NOS)	0%	0%
Rompe 2007§	Tendon rupture	0% (0/24)	0% (0/23)
	Serious complications (NOS)	0% (0/24)	0% (0/23)
	Device-related complications (NOS)	0% (0/24)	0% (0/23)
	Skin reddening	100% (24/24)	NR
	Bruising	0% (0/24)	NR
	Aching in calf	NR	100% (23/23)
	Side effects at 12-14 mos. (NOS)	0%	0%
RESWT vs. Wait-and-See			
Rompe 2007§	Tendon rupture	0% (0/24)	0% (0/23)
	Serious complications (NOS)	0% (0/24)	0% (0/23)
	Device-related complications (NOS)	0% (0/24)	N/A
	Skin reddening	100% (24/24)	N/A
	Bruising	0% (0/24)	N/A
	Drug-related	N/A	0% (0/23)
	Side effects at 11 mos. (NOS)	0%	0%
RESWT + Eccentric Loading vs. Eccentric Loading Alone			
Rompe 2009§	Tendon rupture	0% (0/30)	0% (0/31)
	Serious complications (NOS)	0% (0/30)	0% (0/31)
	Device-related complications (NOS)	0% (0/30)	N/A
	Skin reddening	100% (34/34)	N/A
	Bruising	0% (0/34)	N/A
	Aching in calf	NA	100% (34/34)

FESWT, focused extracorporeal shock wave therapy; N/A, not applicable; NOS, not otherwise specified; NR, not reported; RESWT, radial extracorporeal shock wave therapy

*Occurred within 2 weeks of treatment. Each patient elected nonoperative treatment; one had complete resolution of symptoms at the end of rehabilitation, while the other patient had persistent weakness on the affected side and had aching related to activity.

†In particular, no local bruising after application of shockwaves. The majority of patients (similar proportions in both groups) reported aching in the calf up to 48 hours after treatment.

‡Insertional Achilles Tendinopathy.

§Non-Insertional (i.e., main body) Achilles Tendinopathy.

FESWT, focused extracorporeal shock wave therapy; N/A, not applicable; NOS, not otherwise specified; NR, not reported; RESWT, radial extracorporeal shock wave therapy

*Occurred within 2 weeks of treatment. Each patient elected nonoperative treatment; one had complete resolution of symptoms at the end of rehabilitation, while the other patient had persistent weakness on the affected side and had aching related to activity.
†In particular, no local bruising after application of shockwaves. The majority of patients (similar proportions in both groups) reported aching in the calf up to 48 hours after treatment.
‡Insertional Achilles Tendinopathy.
§Non-Insertional (i.e., main body) Achilles Tendinopathy.

Appendix Table H8. Patella Tendinopathy Safety Outcomes

Author	Outcome	ESWT % (n/N)	Control % (n/N)
FESWT vs. Sham			
Taunton 2003	NR		
Zwerver 2011* (included for safety only)		Mean 0.25 (max. 0.42) mJ/mm^2	<0.03 mJ/mm^2
	Any side effect or adverse complication	0% (0/30)	0% (0/28)
FESWT vs. Sham (both groups also received eccentric exercise)			
Thijs 2016* (included for safety only)		0.20 mJ/mm^2	≤0.03 mJ/mm^2
	Any complication	0% (0/22)	0% (0/30)
FESWT vs. Conservative Management†			
Wang 2007	Transient numbness and hypoesthesia	3.7% (1/27)	NR
	Systematic or local complications (NOS)	0% (0/27)	0% (0/23)
	Device-related complication (NOS)	0% (0/27)	N/A

FESWT, focused extracorporeal shock wave therapy; N/A, not applicable; NOS, not otherwise specified; NR, not reported
*Population was comprised solely of competitive athletes.
†Conservative management includes non-steroidal anti-inflammatory drugs (NSAIDs), physiotherapy, an exercise regimen, and use of a knee strap.

Appendix Table H9. Knee Osteoarthritis Safety Outcomes

Author	Outcome	ESWT % (n/N)	Control % (n/N)
FESWT + Isokinetic Muscular Strengthening (IMS) vs. IMS Alone			
Chen 2014	"no specific sides effects (e.g., swelling, erythema, or skin erosion) during or after ESWT"		
FESWT + IMS vs. Pulse Ultrasound + IMS			
Chen 2014	"no specific sides effects (e.g., swelling, erythema, or skin erosion) during or after ESWT"		
RESWT vs. SHAM			
Zhao 2013	"no adverse events occurred during or after ESWT"		

FESWT, focused extracorporeal shock wave therapy; IMS, Isokinetic Muscular Strengthening; N/A, not applicable; NOS, not otherwise specified; NR, not reported; RESWT, radial extracorporeal shock wave therapy

APPENDIX I. Detailed Strength of Evidence Tables for Safety by Condition

Table I1. Strength of Evidence Summary: Plantar Fasciitis Harms and Complications Results

Outcome	Follow-up	RCTs	N	Serious Risk of Bias	Serious Inconsistency	Serious Indirectness	Serious Imprecision	Conclusion	Quality
Plantar Fasciitis: Focused ESWT vs. Sham									
Serious adverse events	Any	1 RCT (Ogden 2001/FDA SSED 2000)	260	No	Unknown	No	Yes[3,4,5] (-3)	Conclusion: Two patients in the FESWT group suffered midsubstance plantar fascia tears over the course of follow-up in one trial.	⊕◯◯◯ INSUFFICIENT
Non-serious adverse events	Any	11 RCTs (Ogden, Haake, Theodore, Kudo, Malay, Rompe 2003, Cosentino, Gollwitzer 2007, Gollwitzer 2015, Speed, Saxena)	1,503	No	Yes[2] (-1)	No	Yes[3] (-1)	Conclusion: Pain during treatment, local swelling, transient sensory neurological symptoms and ecchymosis/petechial were the most commonly reported non-serious adverse events; however, events were reported inconsistently. Two trials reported that no complications occurred.	⊕⊕◯◯ LOW
Plantar Fasciitis: Focused ESWT vs. Active Controls*									
Serious adverse events	Any	1 RCT (Wang)	149	Yes[1] (-1)	Unknown	No	Yes[3,4] (-2)	Conclusion: One death occurred in the FESWT group during follow-up but was considered unrelated to the treatment.	⊕◯◯◯ INSUFFICIENT
Non-serious adverse events	Any	5 RCTs (Porter, Yucel, Chew, Wang, Radwan)	362	Yes[1] (-1)	No	No	Yes[3] (-1)	Conclusion: Local pain and erythema/ecchymosis were the most common non-serious adverse events reported. Two trials reported that no complications occurred.	⊕⊕◯◯ LOW

Outcome	Follow-up	RCTs	N	Serious Risk of Bias	Serious Inconsistency	Serious Indirectness	Serious Imprecision	Conclusion	Quality
Plantar Fasciitis: Radial ESWT vs. Sham									
Serious adverse events	Any	1 RCT (Gerdesmeyer 2008)	243	No	Unknown	No	Yes[3,4,5] (-3)	Conclusion: No serious adverse events occurred.	⊕◯◯◯ INSUFFICIENT
Non-serious adverse events	Any	3 RCTs (Gerdesmeyer 2008, Ibrahim, Mehra) 1 RCT† (Buchbinder 2002)	319 161	No	No	No	Yes[3] (-1)	Conclusion: Across all four trials, the most common non-serious adverse event was pain during the treatment, followed by transient reddening of the skin (3 trials), and numbness (2 trials).	⊕⊕⊕◯ MODERATE
Plantar Fasciitis: RESWT vs. Ultrasound									
Serious adverse events	Any	0 RCTs						No evidence.	⊕◯◯◯ INSUFFICIENT
Non-serious adverse events	Any	2 RCTs (Grecco, Konjen)	70	No	No	No	Yes[3] (-2)	Conclusion: No non-serious events occurred.	⊕⊕◯◯ LOW

*Control groups included corticosteroid injections (Porter, Yucel) and conventional treatment (e.g., NSAIDs, orthotics, physical therapy, exercise program, cortisone injection) (Chew, Wang, Radwan)

†Included for safety only. Compared ESWT using different energy levels or to a sham using negligible energy.

Reasons for downgrading:

1. Serious risk of bias: the majority of studies violated one or more of the criteria for good quality RCT (or cohort study) related to the outcome reported (see Appendix for details)
2. Inconsistency: differing estimates of effects across trials
3. Imprecise effect estimate for a dichotomous outcome: small sample size and/or confidence interval includes both negligible effect and appreciable benefit or harm with ESWT/control
4. Imprecision downgraded an additional level (so -2) because evidence was based on a single small study
5. Imprecision downgraded an additional level because the sample size was too small to detect rare events.

Table I2. Strength of Evidence Summary: Tendinopathy Harms and Complications Results

Outcome	Follow-up	RCTs	N	Serious Risk of Bias	Serious Inconsistency	Serious Indirectness	Serious Imprecision	Conclusion	Quality
Elbow, Shoulder, Patellar or Achilles Tendinopathy*: Focused ESWT vs. Sham									
Serious adverse events	Any	5 RCTs (Haake, Collins, Costa, Gerdesmeyer, Hsu) 5 RCTs† (Albert, Hearnden Perlick, Sabeti, Schofer) 1 case report (Lin)	679 266	No	Yes[2] (-1)	No	Yes[3,4] (-2)	Conclusion: Serious adverse events in the FESWT and sham group, respectively: • Death: 0.7% (1/134) vs. 0% (0/136); not causally linked to FESWT (1 RCT, elbow) (Haake) • Tendon rupture: 9.0% (2/22) vs. 0% (0/27) (1 RCT (Costa), 1 case report, Achilles) • Allergy/reaction to anesthetic: 2.2% (5/227) vs. 2.2% (5/226) (2 RCTs, Elbow) (Haake, Collins) • Acute bursitis subacromialis: 7.5% (6/80) vs. not applicable† (1 RCT, Shoulder) (Perlick) Additionally, two RCTs included for efficacy and four RCTs included for safety only (all 6 in the shoulder) reported no unexpected/severe or clinically significant adverse events (Gerdesmeyer, Albert, Hearnden, Sabeti, Schofer) or neurovascular complications (Hsu).	⊕○○○ INSUFFICIENT
Non-serious adverse events	Any	15 RCTs (Haake, Chung, Collins, Pettrone, Rompe, Speed 2002 elbow, Cosentino, Galasso, Gerdesmeyer, Hsu, Peters, Schmitt/Efe, Speed 2002	1,336	No	Yes[2] (-1)	No	Yes[3] (-1)	Conclusion: Non-serious adverse events were reported inconsistently; the most common included pain during treatment, local erythematous changes, nausea/dizziness, and reddening of the skin. Four RCTs included for comparative efficacy and an additional five trials included for safety only reported that no adverse events or side effects were seen in either group/following FESWT.	⊕⊕○○ LOW

Outcome	Follow-up	RCTs	N	Serious Risk of Bias	Serious Inconsistency	Serious Indirectness	Serious Imprecision	Conclusion	Quality
		shoulder, Vahdatpour, Costa) 7 RCTs†; shoulder (Albert 2007, Farr 2011, Iopollo 2012, Perlick 2003, Pleiner 2004, Rompe 1998, Schofer 2009) 2 RCTs†; patellar (Thijs 2016, Zwerver 2011)	418 110						
Elbow, Shoulder, or Patellar Tendinopathy‡: Focused ESWT vs. Active Controls§									
Serious adverse events	Any	1 RCT (Wang)	54 knees in 50 pts.	Yes[1] (-1)	Unknown	No	Yes[3,4] (-2)	Conclusion: No serious adverse events occurred.	⊕○○○ INSUFFICIENT
Non-serious adverse events	Any	5 RCTs (Ozturan, Radwan, Pan, Chen, Wang)	184	Yes[1] (-1)	Yes[2] (-1)	No	Yes[3] (-1)	Conclusion: Local erythemous changes and transient sensory neurological symptoms were the most commonly reported non-serious adverse events; however, events were reported inconsistently.	⊕○○○ INSUFFICIENT
Elbow or Shoulder Tendinopathy: Radial ESWT vs. Sham**									
Serious adverse events	Any	0 RCTs 1 RCT† (Cacchio)	90					Conclusion: No evidence from trials included for comparative efficacy and safety. One additional trial (Shoulder; Cacchio) included for safety only reported that no serious adverse events occurred.	⊕○○○ INSUFFICIENT
Non-serious	Any	4 RCTs	268	Yes[1] (-1)	No	No	Yes[3] (-1)	Conclusion: Non-serious adverse events occurred infrequently across three trials (2	⊕⊕○○ LOW

Outcome	Follow-up	RCTs	N	Serious Risk of Bias	Serious Inconsistency	Serious Indirectness	Serious Imprecision	Conclusion	Quality
adverse events		(Capan, Mehra, Kolk, Hussein) 1 RCT† (Cacchio 2006)	90					included for comparative efficacy and 1 included for safety only) and included mild pain, redness, and hematoma; two trials reported that no complications occurred in either group.	
Shoulder or Achilles Tendinopathy††: Radial ESWT vs. Active Control‡‡									
Serious adverse events	Any	5 RCTs (Rompe 2007, 2008, 2009, Liu, Engebretsen)	301	No	Yes[2] (-1)	No	Yes[3,4] (-2)	Conclusion: Serious adverse events in the RESWT vs. control groups, respectively: • Death: 2.0% (1/51) vs. 0% (0/50) at 12 mos.; however, the cause of death was not reported (1 RCT, Shoulder) (Engebretsen). Additionally, no incidences of tendon rupture were reported by 3 RCTs (Achilles (Rompe 2007, 2008, 2009) or humeral head necrosis by 1 RCT (bicep) (Liu)	⊕○○○ INSUFFICIENT
Non-serious adverse events	Any	6 RCTs (Rompe 2007, 2008, 2009, Del Castillo-Gonzalez, Liu, Engebretsen)	502	No	Yes[2] (-1)	No	Yes[3] (-1)	Conclusion: Pain during treatment, skin reddening (but no bruising), and transient numbness were commonly reported after RESWT; however, non-serious adverse events were inconsistently documented.	⊕⊕○○ LOW
Achilles Tendinopathy: Radial ESWT vs. No Treatment									
Serious adverse events	Any	1 RCT (Rompe 2007)	47	No	Unknown	No	Yes[3,4,5] (-3)	Conclusion: No serious adverse events occurred.	⊕○○○ INSUFFICIENT
Non-serious adverse events	Any	1 RCT (Rompe 2007)	47	No	Unknown	No	Yes[3,4] (-2)	Conclusion: Skin reddening (but no bruising) was seen in all RESWT patients; no other non-serious events occurred.	⊕⊕○○ LOW

*Elbow (6 RCTs) (Haake, Chung 2004, Pettrone, Rompe, Speed), Shoulder (8 RCTs; 7 rotator cuff tendinopathy and 1 adhesive capsulitis) (Cosentino, Galasso, Gerdesmeyer, Hsu, Peters, Schmitt/Efe, Speed, Vahdatpour), and Achilles (1 RCT) (Costa).

†Included for safety only. Compared ESWT using different energy levels or to a sham using negligible energy.

‡Elbow (2 RCTs) (Oztruan, Radwan), Shoulder (2 RCTs; 1 rotator cuff, 1 adhesive capsulitis) (Pan, Chen), and Patella (1 RCT) (Wang)

§Control groups included corticosteroid injection (Oztruan), percutaneous tenotomy (Radwan), TENS (Pan), oral steroid therapy (Chen), and conservative management (NSAIDS, physiotherapy, exercise regimen, knee strap) (Wang).

**Elbow (2 RCTs) (Capan, Mehra) and Shoulder (2 RCTs) (1 rotator cuff and 1 adhesive capsulitis) (Kolk, Hussein).

††Achilles (2 RCTs) (Rompe 2008, 2007, 2009) and Shoulder (4 RCTs) (1 rotator cuff, 1 long bicep tenosynovitis, 1 subacromial pain) (Engebretsen, Del Castillo-Gonzalez, Liu).

‡‡Control groups included ultrasound-guided percutaneous lavage (Del Castillo-Gonzalez), eccentric loading (Rompe 2007, 2008, 2009), and supervised exercise (Engebretsen)

Reasons for downgrading:

1. Serious risk of bias: the majority of studies violated one or more of the criteria for good quality RCT (or cohort study) related to the outcome reported (see Appendix for details)
2. Inconsistency: differing estimates of effects across trials
3. Imprecise effect estimate for a dichotomous outcome: small sample size and/or confidence interval includes both negligible effect and appreciable benefit or harm with ESWT/control
4. Imprecision downgraded an additional level (so -2) because evidence was based on a single small study
5. Imprecision downgraded an additional level because the sample size was too small to detect rare events.

Table I3. Strength of Evidence Summary: Knee Osteoarthritis Harms and Complications Results

Outcome	Follow-up	RCTs	N	Serious Risk of Bias	Serious Inconsistency	Serious Indirectness	Serious Imprecision	Conclusion	Quality
Knee Osteoarthritis: Focused ESWT vs. Active Controls*									
Serious adverse events	Any	0 RCTs						No evidence.	⊕◯◯◯ INSUFFICIENT
Non-serious adverse events	Any	1 RCT (Chen)	180 knees in 90 patients	Yes[1] (-1)	Unknown	No	Yes[3,4] (-2)	Conclusion: No non-serious adverse events occurred.	⊕◯◯◯ INSUFFICIENT
Knee Osteoarthritis: RESWT vs. Sham									
Serious adverse events	Any	0 RCTs						No evidence.	⊕◯◯◯ INSUFFICIENT
Non-serious adverse events	Any	1 RCT (Zhao)	N=70	Yes[1] (-1)	Unknown	No	Yes[3,4] (-2)	Conclusion: No adverse events occurred.	⊕◯◯◯ INSUFFICIENT

*This trial included two control groups: isokinetic muscular strengthening alone and isokinetic muscular strengthening + ultrasound.

Reasons for downgrading:

1. Serious risk of bias: the majority of studies violated one or more of the criteria for good quality RCT (or cohort study) related to the outcome reported (see Appendix for details)
2. Inconsistency: differing estimates of effects across trials
3. Imprecise effect estimate for a dichotomous outcome: small sample size and/or confidence interval includes both negligible effect and appreciable benefit or harm with ESWT/control.
4. Imprecision downgraded an additional level (so -2) because evidence was based on a single small study
5. Imprecision downgraded an additional level because the sample size was too small to detect rare events.

APPENDIX J. Sensitivity Analyses

Plantar Fasciitis

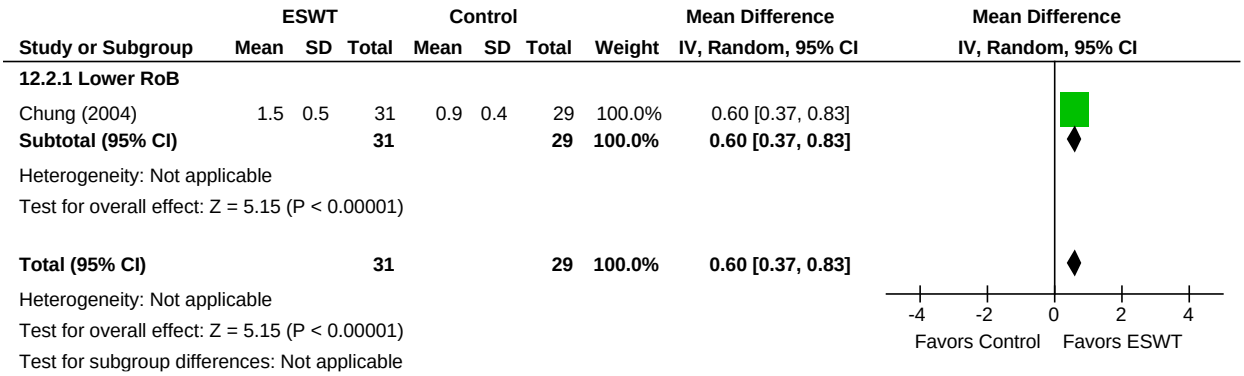
Sensitivity Analyses for Plantar Fasciitis

Outcome	I^2 : # of Studies (K) MD or *RR* (95% CI)	I^2 w/o outlier : # of Studies (K) MD or RR (95% CI)	I^2 Lower RoB Only : # of Studies (K) MD or RR (95% CI)	I^2 Profile Likelihood : # of Studies (K) MD or RR (95% CI)
Improved pain over baseline in first walking in the morning, short-term	98% : K = 5 1.41 (-0.23, 3.04)	0% : K = 4 0.69 (0.44, 0.94)	-	-
Improved pain over baseline in first walking in the morning, long-term	98% : K = 2 1.54 (-0.91, 3.99)	NA* : K = 1 0.30 (-0.10, 3.44)	98% : K = 2 1.54 (-0.91, 3.99)	95% : K = 2 1.53 (-1.47, 4.56)
Improved pain at rest over baseline, short-term	100% : K = 2 2.50 (-2.01, 7.01)	NA* : K = 1 0.20 (-0.18, 0.58)	NA* : K = 1 0.20 (-0.18, 0.58)	99% : K = 2 2.50 (-3.05, 8.05)
Improved pain with activities over baseline, short-term	100% : K = 3 1.80 (-1.29, 4.89)	80% : K = 2 0.44 (-0.33, 1.22)	80% : K = 2 0.44 (-0.33, 1.22)	99% : K = 3 1.81 (-1.22, 4.82)
RESWT IMPROVED PAIN OVER BASELINE 6 MONTH	93% : K = 2 5.09 (2.25, 7.93)	NA*: K = 2 5.09 (2.25, 7.93)	NA* : K = 1 6.50 (5.67, 7.33)	85% : K = 2 5.13 (1.57, 8.56)

*Not available because after removing the outlier only one study remains therefore I^2 cannot be calculated

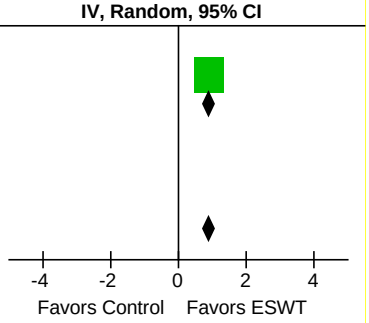
Elbow Epicondylitis

ESWT vs. SHAM in epicondylitis: CHANGE VERSUS BASELINE IN PAIN, SHORT-TERM FOLLOW-UP – Lower risk of bias only



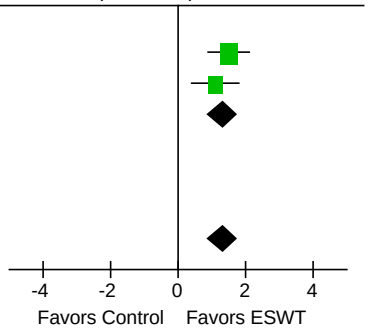
ESWT vs. SHAM in epicondylitis: CHANGE VERSUS BASELINE IN NIGHT PAIN, SHORT-TERM FOLLOW-UP – Lower risk of bias only

Study or Subgroup	ESWT Mean	ESWT SD	ESWT Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
12.3.1 Lower RoB								
Chung (2004)	0.8	0.4	31	-0.1	0.3	29	100.0%	0.90 [0.72, 1.08]
Subtotal (95% CI)			**31**			**29**	**100.0%**	**0.90 [0.72, 1.08]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 9.90 (P < 0.00001)								
Total (95% CI)			**31**			**29**	**100.0%**	**0.90 [0.72, 1.08]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 9.90 (P < 0.00001)								
Test for subgroup differences: Not applicable								



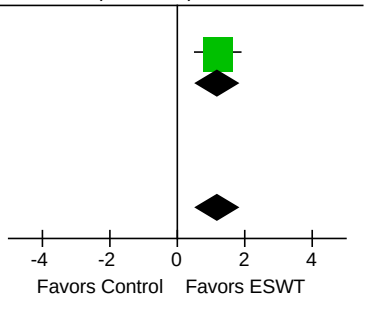
ESWT vs. SHAM in epicondylitis: CHANGE VERSUS BASELINE IN PAIN WITH RESISTANCE, SHORT-TERM FOLLOW-UP – Lower risk of bias only

Study or Subgroup	ESWT Mean	ESWT SD	ESWT Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
12.4.1 Lower RoB								
Rompe (2004)	3.5	1.3	34	2	1.3	36	56.8%	1.50 [0.89, 2.11]
Pettrone (2005)	3.6	1.8	56	2.5	2	58	43.2%	1.10 [0.40, 1.80]
Subtotal (95% CI)			**90**			**94**	**100.0%**	**1.33 [0.87, 1.79]**
Heterogeneity: Tau² = 0.00; Chi² = 0.72, df = 1 (P = 0.40); I² = 0%								
Test for overall effect: Z = 5.67 (P < 0.00001)								
Total (95% CI)			**90**			**94**	**100.0%**	**1.33 [0.87, 1.79]**
Heterogeneity: Tau² = 0.00; Chi² = 0.72, df = 1 (P = 0.40); I² = 0%								
Test for overall effect: Z = 5.67 (P < 0.00001)								
Test for subgroup differences: Not applicable								



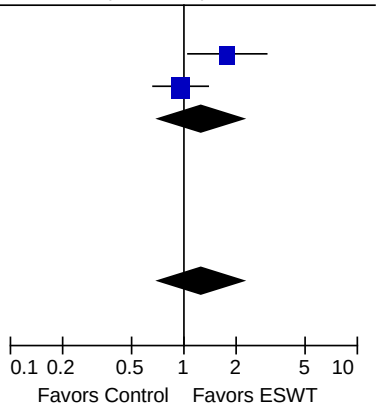
ESWT vs. SHAM in epicondylitis: CHANGE VERSUS BASELINE IN PAIN WITH RESISTANCE, LONG-TERM – Lower risk of bias only

Study or Subgroup	ESWT Mean	ESWT SD	ESWT Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
12.5.1 Lower RoB								
Rompe (2004)	4	1.5	34	2.8	1.4	36	100.0%	1.20 [0.52, 1.88]
Subtotal (95% CI)			**34**			**36**	**100.0%**	**1.20 [0.52, 1.88]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.46 (P = 0.0005)								
Total (95% CI)			**34**			**36**	**100.0%**	**1.20 [0.52, 1.88]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.46 (P = 0.0005)								
Test for subgroup differences: Not applicable								



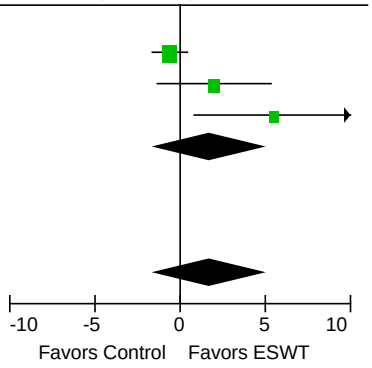
ESWT vs. SHAM in epicondylitis: PROPORTION WITH ROLES MAUDSLEY SUCCESS (1 OR 2), SHORT-TERM FOLLOW-UP – Lower risk of bias only

	ESWT		Control			Risk Ratio	Risk Ratio
Study or Subgroup	**Events**	**Total**	**Events**	**Total**	**Weight**	**M-H, Random, 95% CI**	**M-H, Random, 95% CI**
12.6.3 Lower RoB							
Rompe (2004)	22	38	13	40	45.3%	1.78 [1.06, 3.00]	
Haake (2002)	38	120	40	121	54.7%	0.96 [0.66, 1.38]	
Subtotal (95% CI)		**158**		**161**	**100.0%**	**1.27 [0.69, 2.33]**	
Total events	60		53				
Heterogeneity: Tau² = 0.14; Chi² = 3.65, df = 1 (P = 0.06); I² = 73%							
Test for overall effect: Z = 0.77 (P = 0.44)							
Total (95% CI)		**158**		**161**	**100.0%**	**1.27 [0.69, 2.33]**	
Total events	60		53				
Heterogeneity: Tau² = 0.14; Chi² = 3.65, df = 1 (P = 0.06); I² = 73%							
Test for overall effect: Z = 0.77 (P = 0.44)							
Test for subgroup differences: Not applicable							



ESWT vs. SHAM in epicondylitis: CHANGE VERSUS BASELINE IN GRIP STRENGTH, SHORT-TERM FOLLOW-UP – Lower risk of bias only

	ESWT			Control				Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
12.8.1 Lower RoB									
Chung (2004)	6.8	1.7	31	7.4	2.3	29	44.1%	-0.60 [-1.63, 0.43]	
Pettrone (2005)	6	8.5	53	4	9.1	54	31.6%	2.00 [-1.34, 5.34]	
Rompe (2004)	12	9.9	34	6.5	9.6	33	24.3%	5.50 [0.83, 10.17]	
Subtotal (95% CI)			**118**			**116**	**100.0%**	**1.70 [-1.64, 5.05]**	
Heterogeneity: Tau² = 6.32; Chi² = 7.95, df = 2 (P = 0.02); I² = 75%									
Test for overall effect: Z = 1.00 (P = 0.32)									
Total (95% CI)			**118**			**116**	**100.0%**	**1.70 [-1.64, 5.05]**	
Heterogeneity: Tau² = 6.32; Chi² = 7.95, df = 2 (P = 0.02); I² = 75%									
Test for overall effect: Z = 1.00 (P = 0.32)									
Test for subgroup differences: Not applicable									



APPENDIX K. Subgroup Data

Table K1. Subgroup data for Malay 2006, plantar fasciitis

	FESWT*	Sham*	Interaction
Sex			
Men	-3.5 (n=35)	-1.59 (n=21)	.15
Women	-2.10 (n=77)	-1.59 (n=35)	
Age			
<45 years	-2.54 (n=36)	-1.65 (n=16)	.89
46-64 years	-2.43 (n=64)	-1.33 (n=33)	
>64 years	-2.87 (n=12)	-2.51 (n=7)	
Weight			
≤160 lb	-2.05 (n=36)	-1.28 (n=18)	.35
161-192 lb	-2.29 (n=33)	-2.08 (n=24)	
≥193 lb	-2.93 (n=41)	-1.02 (n=14)	

FESWT: focused extracorporeal shockwave thearpy; lb: pounds.
*Mean change from baseline to month 3 in investigator assessment of heel pain; means adjusted for clinical site and baseline assessment.

Table K2. Subgroup data for Kolk 2013, rotator cuff tendinopathy

	F/U	RESWT	Sham	p-value
Calcific				
VAS pain (0-10 [worst])	0	67 (21, n=23)	71 (17, n=17)	
	3	51 (28, n=21)	53 (27, n=17)	.808
	6	35 (28, n=19)	36 (29, n=15)	.868
Simple Shoulder Test	0	4.9 (3.0, n=23)	4.1 (2.1, n=17)	
	3	6.2 (3.2, n=21)	6.2 (3.8, n=17)	.788
	6	7.5 (3.6, n=19)	7.7 (4.3, n=15)	.729
Non-calcific				
VAS pain (0-10 [worst])	0	64 (20, n=21)	68 (16, n=19)	
	3	43 (29, n=19)	51 (29, n=18)	.414
	6	24 (23, n=16)	39 (29, n=17)	.137
Simple Shoulder Test	0	4.6 (2.8, n=21)	6.0 (2.6, n=19)	
	3	6.6 (3.0, n=19)	6.8 (4.0, n=18)	.181
	6	7.8 (3.2, n=16)	7.7 (3.9, n=17)	.092

RESWT: radial extracorporeal shockwave therapy; VAS: visual analog scale.

APPENDIX L. Clinical Experts

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