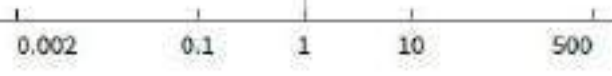
Analysis 1.8. Comparison 1 Shock wave therapy (ESWT) versus placebo, Outcome 8 Calcification size (complete resolution).

Study or subgroup	Shock wave therapy n/N	Placebo n/N	Risk Ratio M-H, Random, 95% CI	Weight	Risk Ratio M-H, Random, 95% CI
Cosentino 2003	11/35	0/35		19.93%	23[1.41,375.77]
Hsu 2008	7/33	0/13		19.92%	6.18[0.38,100.99]
Pleiner 2004	6/23	2/20		60.16%	2.61[0.59,11.5]
Total (95% CI)	**91**	**68**		**100%**	**4.78[1.31,17.39]**

Total events: 24 (Shock wave therapy), 2 (Placebo)

Heterogeneity: Tau^2=0.15; Chi^2=2.21, df=2(P=0.33); I^2=9.66%

Test for overall effect: Z=2.37(P=0.02)

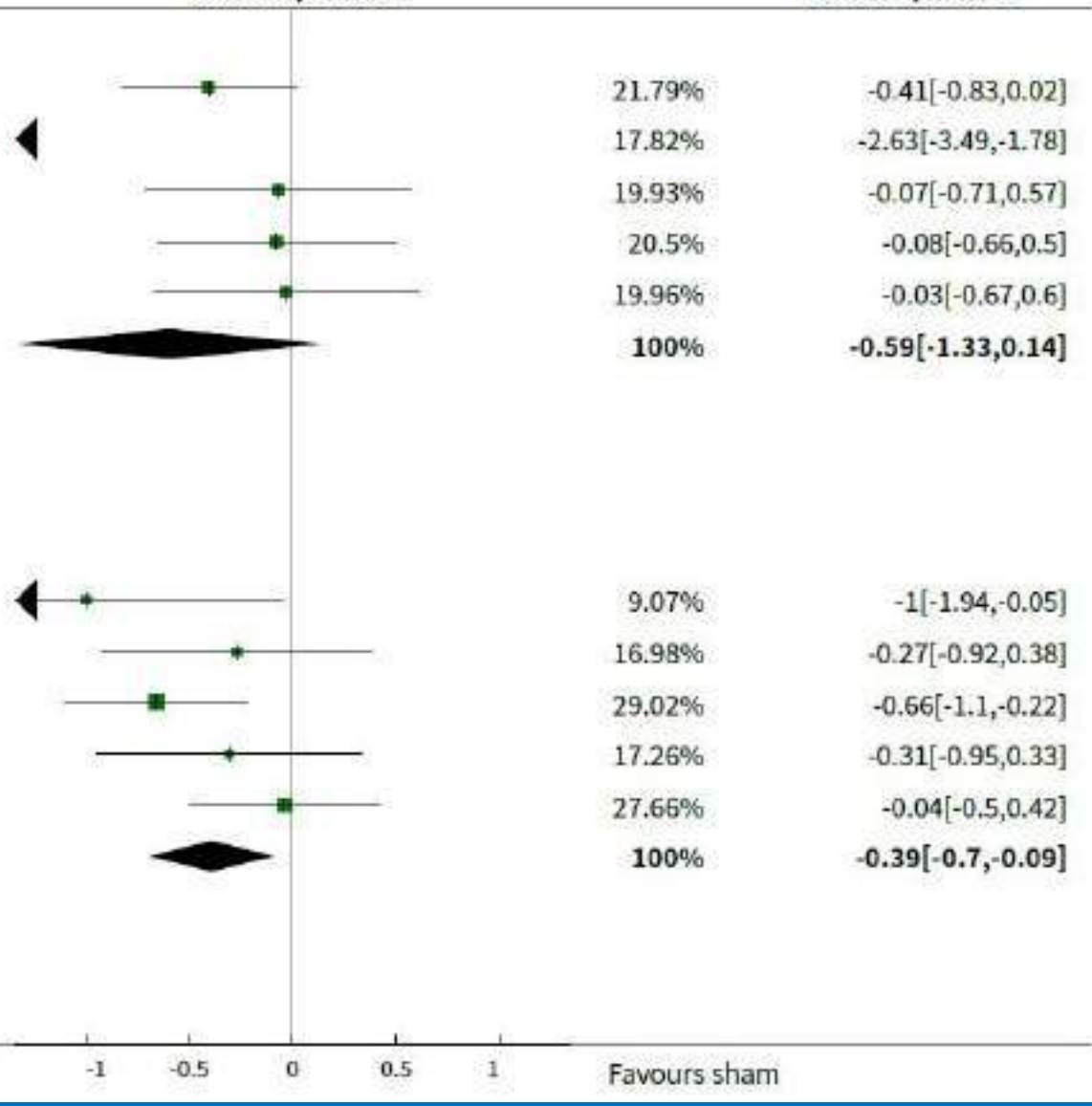


Favours placebo — Favours shock wave

Risico SWT: 24/91 (26%); placebo: 2/68 (3%)

Analysis 1.11. Comparison 1 Shock wave therapy (ESWT) versus placebo, Outcome 11 Subgroup analysis: pain (various scales, lower score indicates less pain).

Study or subgroup	ESWT N	ESWT Mean(SD)	Sham N	Sham Mean(SD)	Std. Mean Difference Random, 95% CI	Weight	Std. Mean Difference Random, 95% CI
1.11.1 Calcification							
Gerdesmeyer 2003	46	-2.7 (2.1)	42	-1.8 (2.3)		21.79%	-0.41[-0.83,0.02]
Hsu 2008	33	2.1 (1.5)	13	6.8 (2.3)		17.82%	-2.63[-3.49,-1.78]
Kolk 2013	21	5.1 (2.8)	17	5.3 (2.7)		19.93%	-0.07[-0.71,0.57]
Kvalvaag 2017	23	2.6 (2.6)	23	2.8 (2.4)		20.5%	-0.08[-0.66,0.5]
Pleiner 2004	20	3.5 (2.8)	18	3.6 (3.3)		19.96%	-0.03[-0.67,0.6]
Subtotal ***	**143**		**113**			**100%**	**-0.59[-1.33,0.14]**
Heterogeneity: Tau^2=0.6; Chi^2=29.73, df=4(P<0.0001); I^2=86.54%							
Test for overall effect: Z=1.59(P=0.11)							
1.11.2 No calcification							
Galasso 2012	11	4.1 (4.4)	9	8.9 (4.9)		9.07%	-1[-1.94,-0.05]
Kolk 2013	19	4.3 (2.9)	18	5.1 (2.9)		16.98%	-0.27[-0.92,0.38]
Li 2017	42	-4.5 (8.1)	42	-0.5 (2.5)		29.02%	-0.66[-1.1,-0.22]
Schmitt 2001	20	2.3 (3)	18	3.2 (2.8)		17.26%	-0.31[-0.95,0.33]
Speed 2002	34	38.1 (28.3)	40	39.3 (31.8)		27.66%	-0.04[-0.5,0.42]
Subtotal ***	**126**		**127**			**100%**	**-0.39[-0.7,-0.09]**
Heterogeneity: Tau^2=0.03; Chi^2=5.5, df=4(P=0.24); I^2=27.33%							
Test for overall effect: Z=2.53(P=0.01)							
Test for subgroup differences: Chi^2=0.25, df=1 (P=0.62), I^2=0%							



Analysis 8.9. Comparison 8 Extracorporeal shock wave therapy (ESWT) high dose versus ESWT low dose, Outcome 9 Calcification size (mm).

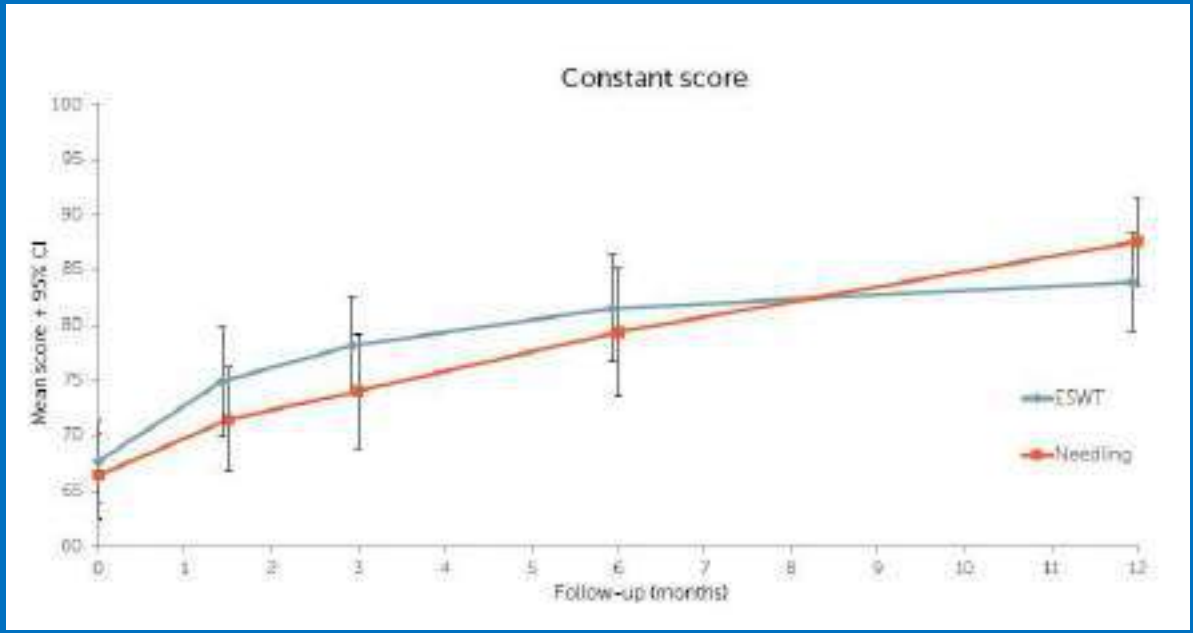
Study or subgroup	ESWT high dose N	ESWT high dose Mean(SD)	ESWT low dose N	ESWT low dose Mean(SD)	Mean Difference Random, 95% CI	Weight	Mean Difference Random, 95% CI
8.9.1 6 months							
Cacchio 2006	45	0.9 (1.2)	45	18.9 (6.4)		73.89%	-18[-19.9,-16.1]
Gerdesmeyer 2003	47	-152.8 (148.7)	46	-77.7 (181.8)		8.29%	-75.1[-142.68,-7.52]
Ioppolo 2012	23	-135.9 (71.7)	23	-109.7 (75.7)		17.83%	-26.18[-68.8,16.44]
Subtotal ***	**115**		**114**			**100%**	**-24.19[-44.83,-3.55]**
Heterogeneity: Tau^2=149.13; Chi^2=2.88, df=2(P=0.24); I^2=30.55%							
Test for overall effect: Z=2.3(P=0.02)							

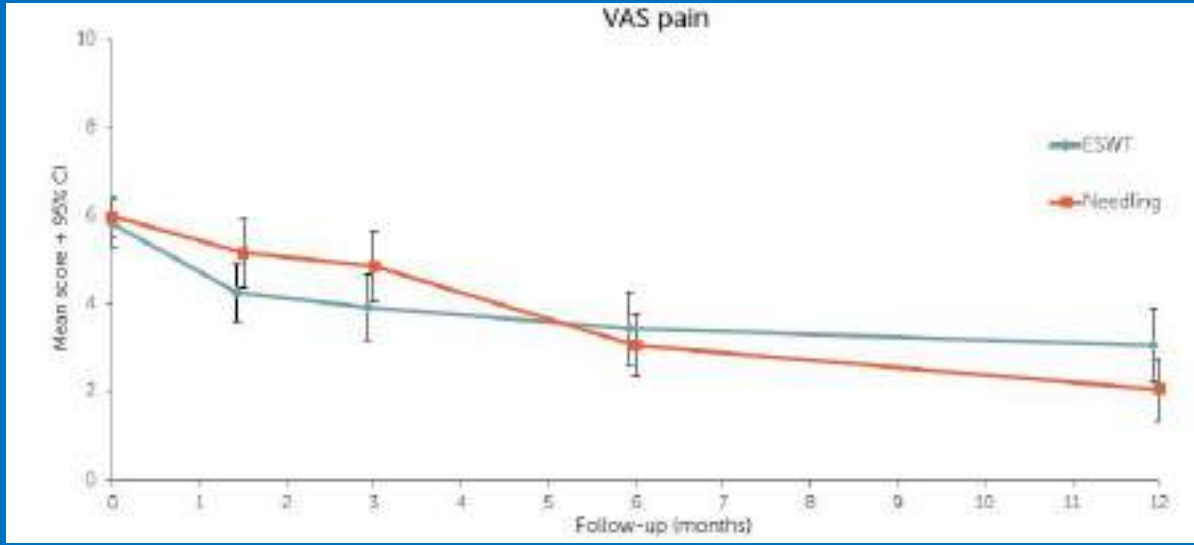
Table 3. Results

	Author (year)	No pts (shoulders)	Baseline	6 months	1 year	2 year	>2 year	>5 year	Resorption / change in size
High-energy ESWT	Kim (2014)	29	ASES: 49.9 SST: 34%	ASES: 76.4 SST: 70.8%	ASES: 74.6 SST: 70.8%	ASES: 78.3 SST: 78.6			Partial 16.7%, full 42.6%, none 41.7%. Pre: 11±1mm Post: 5.6±0.8mm
	Ioppolo (2012)	23	CMS: 49.26±8.6	CMS: 79.4±0.33					Full 42.6%. Size reduction in mm^2: 135.91±71.69
	Hsu (2008)	33	CMS: 57.3	CMS: 85	CMS: 88				Partial 36.3%, full 21.2%, none 45.5% Pre: 11.9±5.4 mm Post: 5.5±6.3 mm
	Perlick (2004)	40	CMS: 48.4		CMS: 73.2				Partial 20.0%, full 25%, none 45%
	Pleiner (2003)	23 (31)	CMS: 46±21	CMS: 70					Partial 19.4%, full 19.4%, none 61.2%
	Gerdes-meyer (2003)	48	CMS: 60±11	CMS: 91.0 (86.7-95.3) 95% CI	CMS: 91.6 (87.3-96.0) 95% CI				Full 60.4%. Size reduction in mm^2: 128.9 (170-87.7)
	Cosentino (2003)	35	CMS: 45±18	CMS: 76±16					Partial: 40%, full 31.5%, none 28.5%
	Daecke group I (2002) group II	56 59	CMS: 49±13 CMS: 44±12		CMS: 67±17 CMS: 69±19		CMS: 88±8 CMS: 85±8		Radiologic changes 47% (6m), 93% (4y) Radiologic changes 77% (6m), 93% (4y)
	Rompe (1998)	50	CMS: 53±13.1	CMS: 88±11.5					Partial 42%, full 22%, none

Table 1. Demographics and baseline data

	ESWT (n=41)	UGN (n=41)
	Mean (SD)	Mean (SD)
Gender, n (%)		
Male	14 (34)	15 (37)
Female	27 (66)	26 (63)
Age, mean (SD)	51.6 (9.4)	52.7 (8.7)
BMI, mean (SD)	25.6 (4.3)	25.6 (3.4)
Duration complaints (years), mean (SD)	3.4 (3.0)	3.0 (3.0)
Location, n (%)		
Supraspinatus	35 (85)	36 (88)
Infraspinatus	4 (10)	3 (7)
Subscapularis	2 (5)	2 (5)
Size deposit (mm), mean (SD)	15.5 (5.8)	15.8 (4.5)
Gärtner, n (%)		
Type I	13 (32)	21 (68)
Type II	28 (51)	20 (49)
CMS, mean (SD)	67.7 (12.2)	66.4 (12.7)
DASH, mean (SD)	38.7 (16.0)	35.2 (15.8)
VAS pain, mean (SD)	5.8 (1.8)	6.0 (1.5)





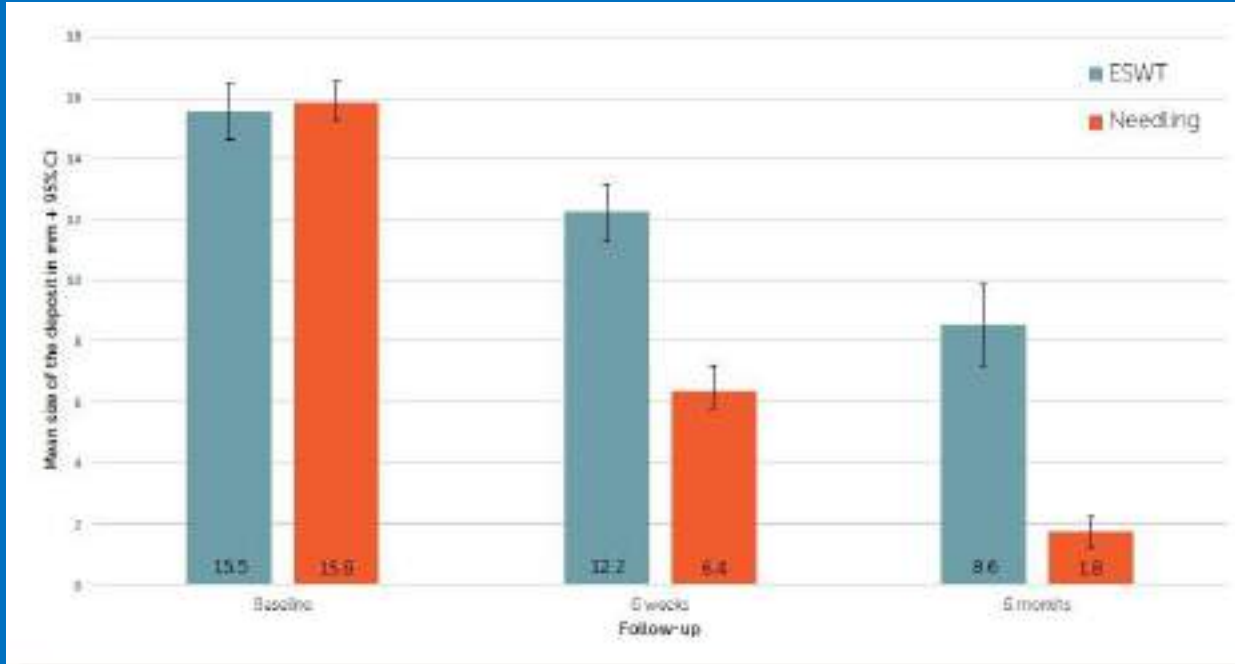


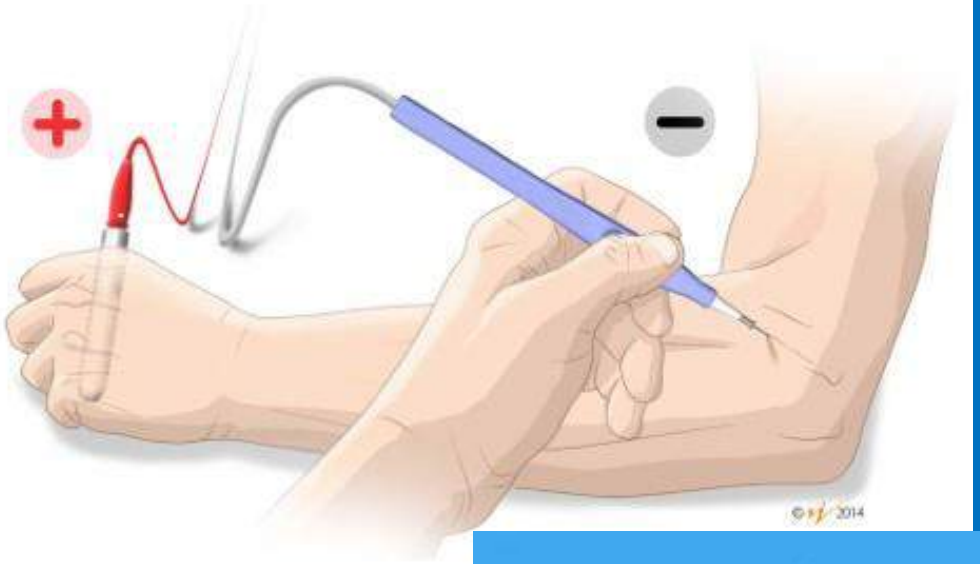
Fig 3. Change in size of calcific deposits. (CI, confidence interval; Extracorporeal shockwave

Shockwave therapie

- Past redelijk bij ‘bekende’ fysiotechnische behandelvormen
- Is al tamelijk verbreid onder fysiotherapeuten (rSWT)
- Doseringsparameters moet wel duidelijker worden (Patiënt voelt het wel; enige subjectieve dosering is mogelijk)
- Verschillen rSWT en fSWT moeten duidelijker worden
- Fysiotherapeuten gaan naast rSWT ook fSWT toepassen

EPTE: Percutane Electrolyse

- EPTE: Echogeleide Percutane Therapeutische Electrolyse



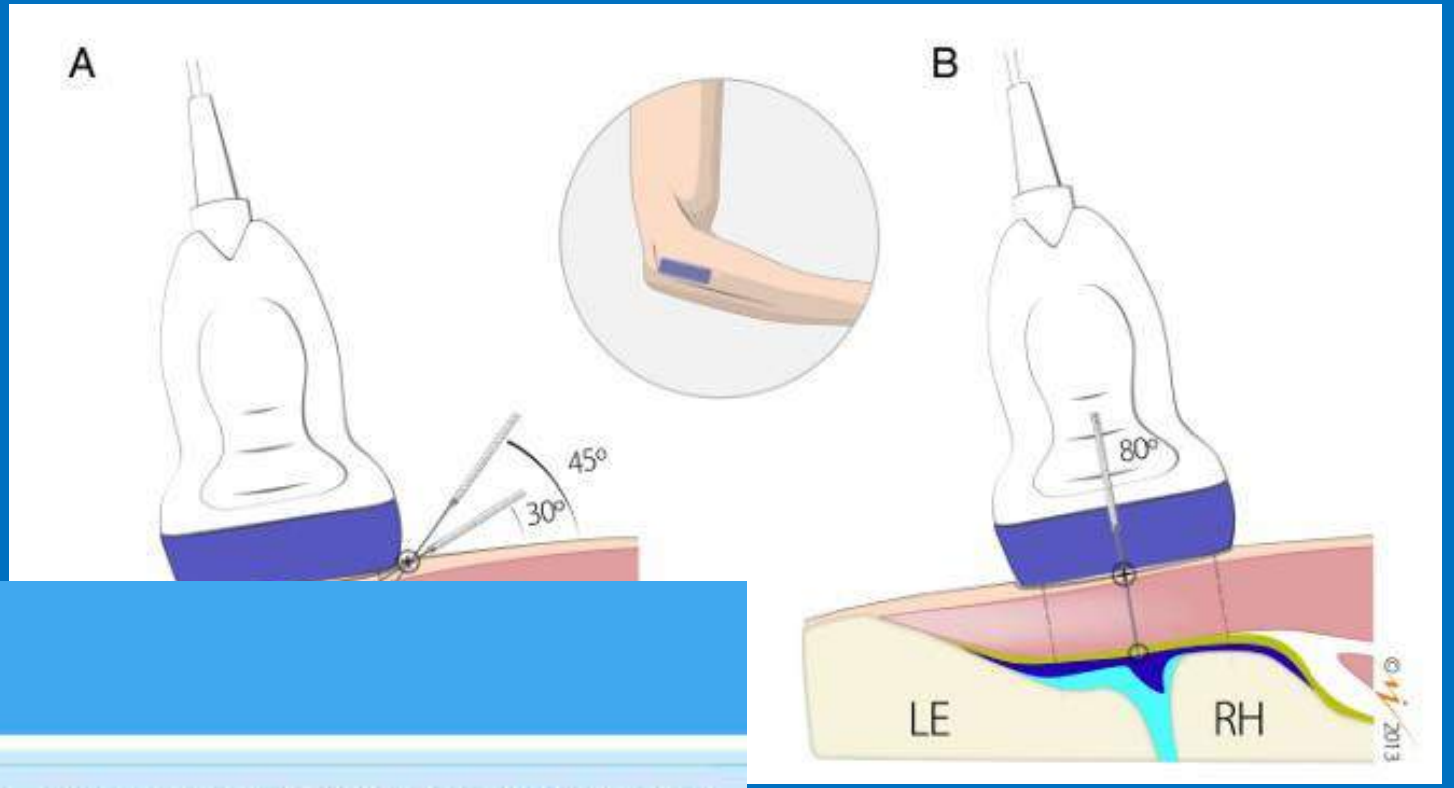
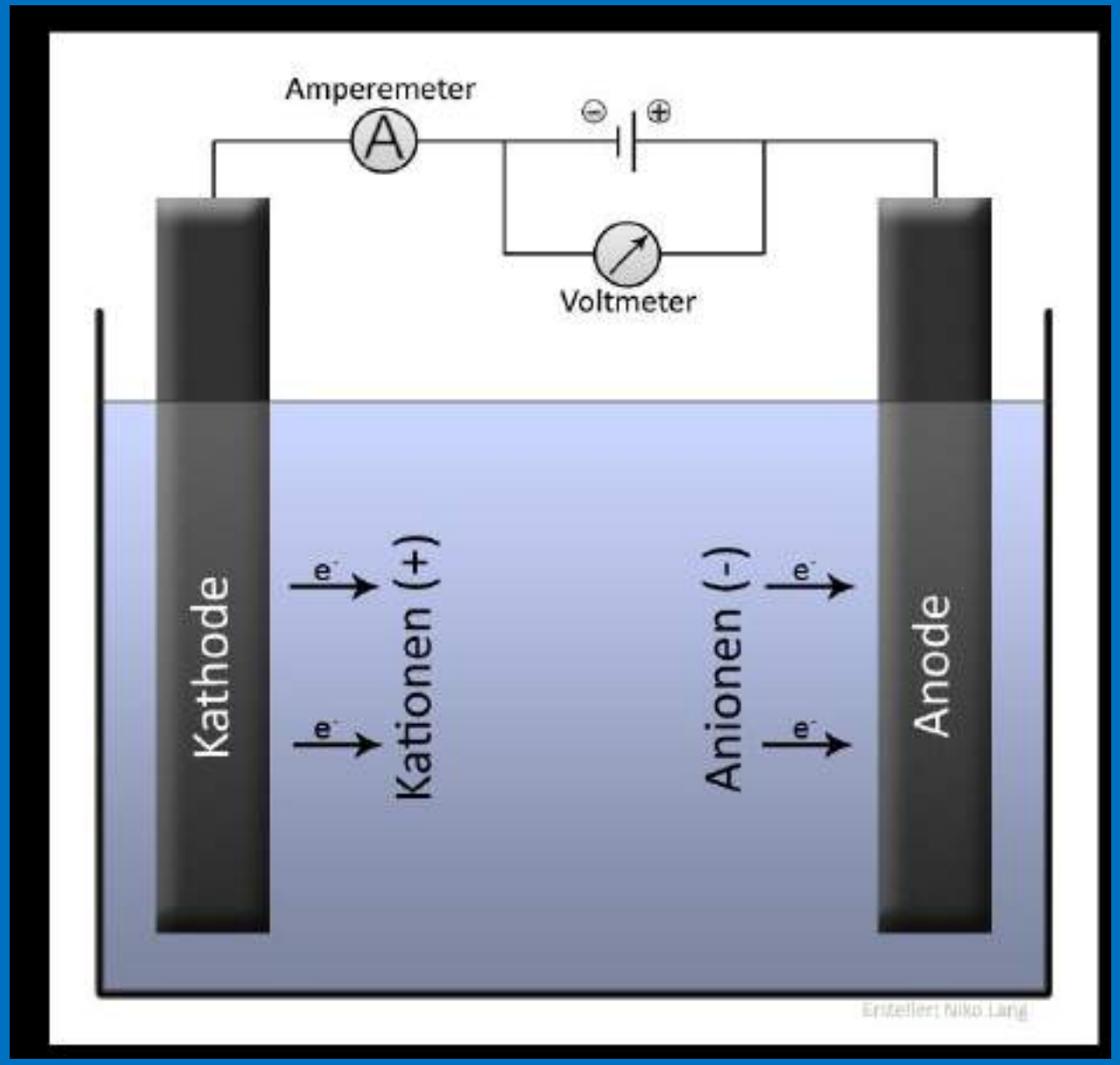


Figure 2 Detail of cathode (m
with the needle) and anode (ha
percutaneous needle electrolysis

Summary points

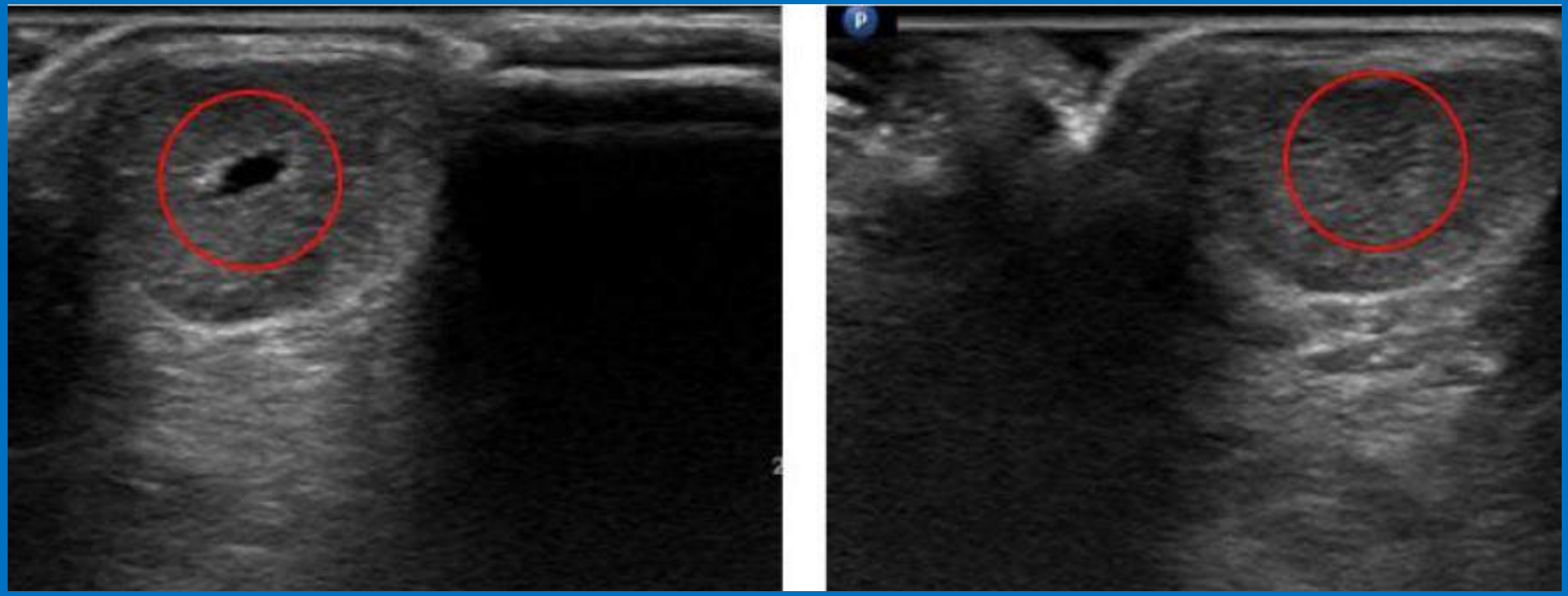
- Percutaneous needle electrolysis (PNE) consists in the application of a galvanic current through an acupuncture needle.
- 36 patients with lateral epicondylitis were treated with four to six session of PNE combined with home exercises.
- All 89% who were assessed at 52 weeks reported no recurrence.

Electrolyse: scheiden in ionen (bijv. NaCL of H_20)



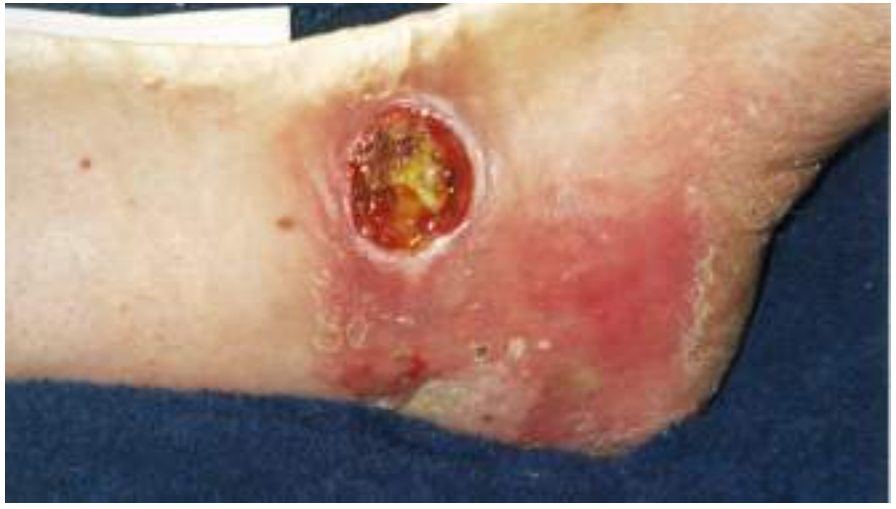
Electrolyse stimuleert herstel pezen;

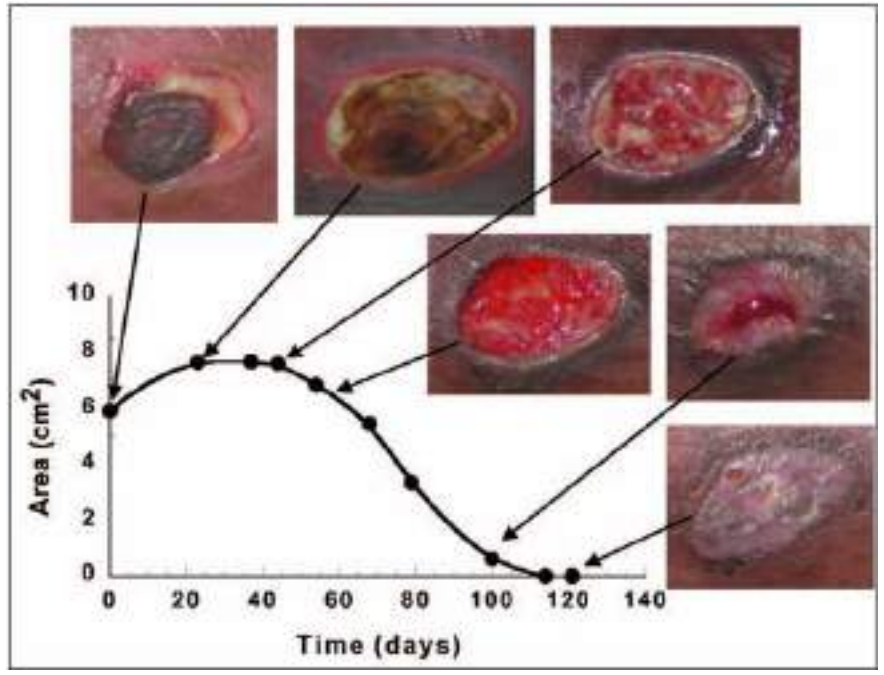
'ook in de hole of the donut'?



PULSERENDE GELIJKSTROOMTHERAPIE HUIDWONDEN

- INVLOED OP DE HUIDLADING
- INVLOED OP DE CELACTIVITEIT/ ELECTROLYSE (ook wel: Elektroforese, Galvanotaxis)
- INVLOED OP DE CIRCULATIE





PULSERENDE GELIJKSTROOMTHERAPIE : de HUIDLADING

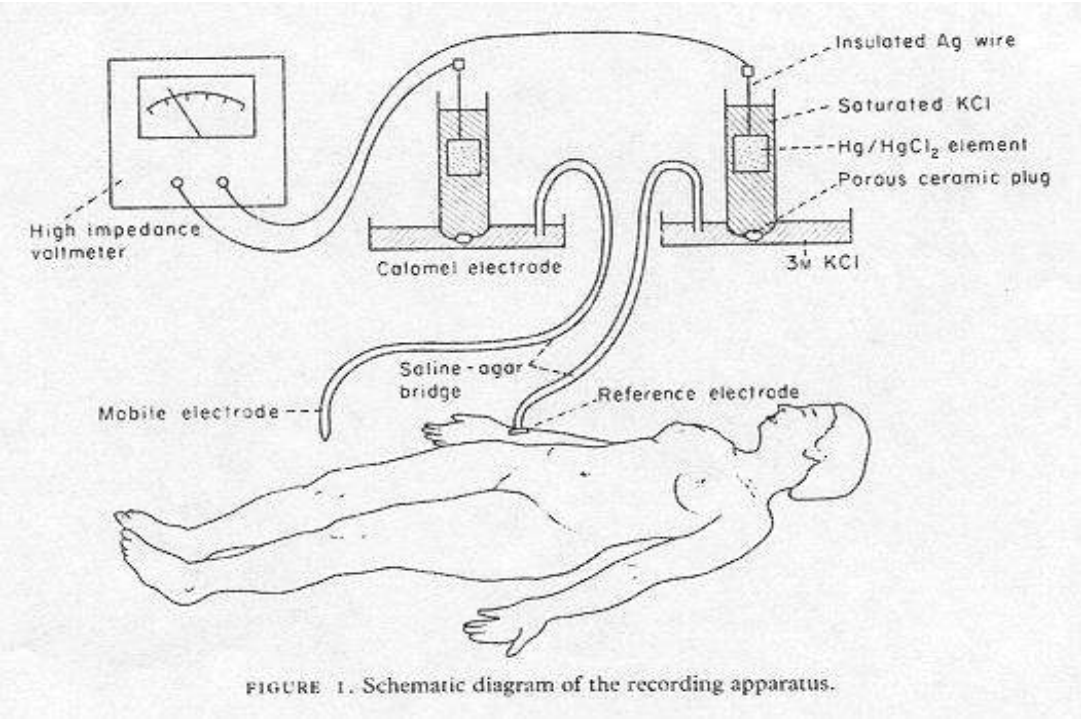
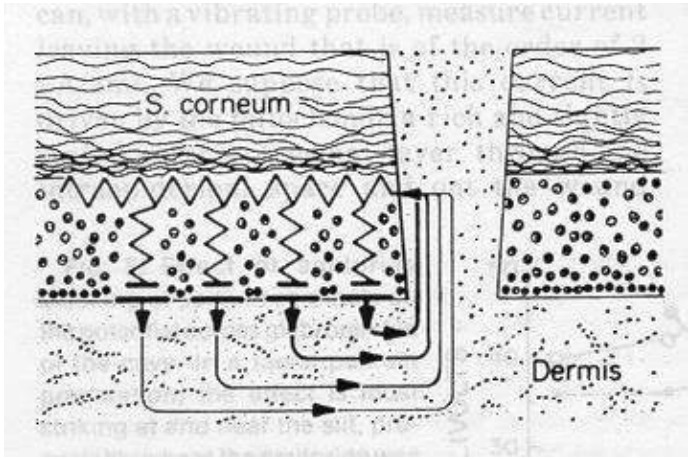


FIGURE 1. Schematic diagram of the recording apparatus.

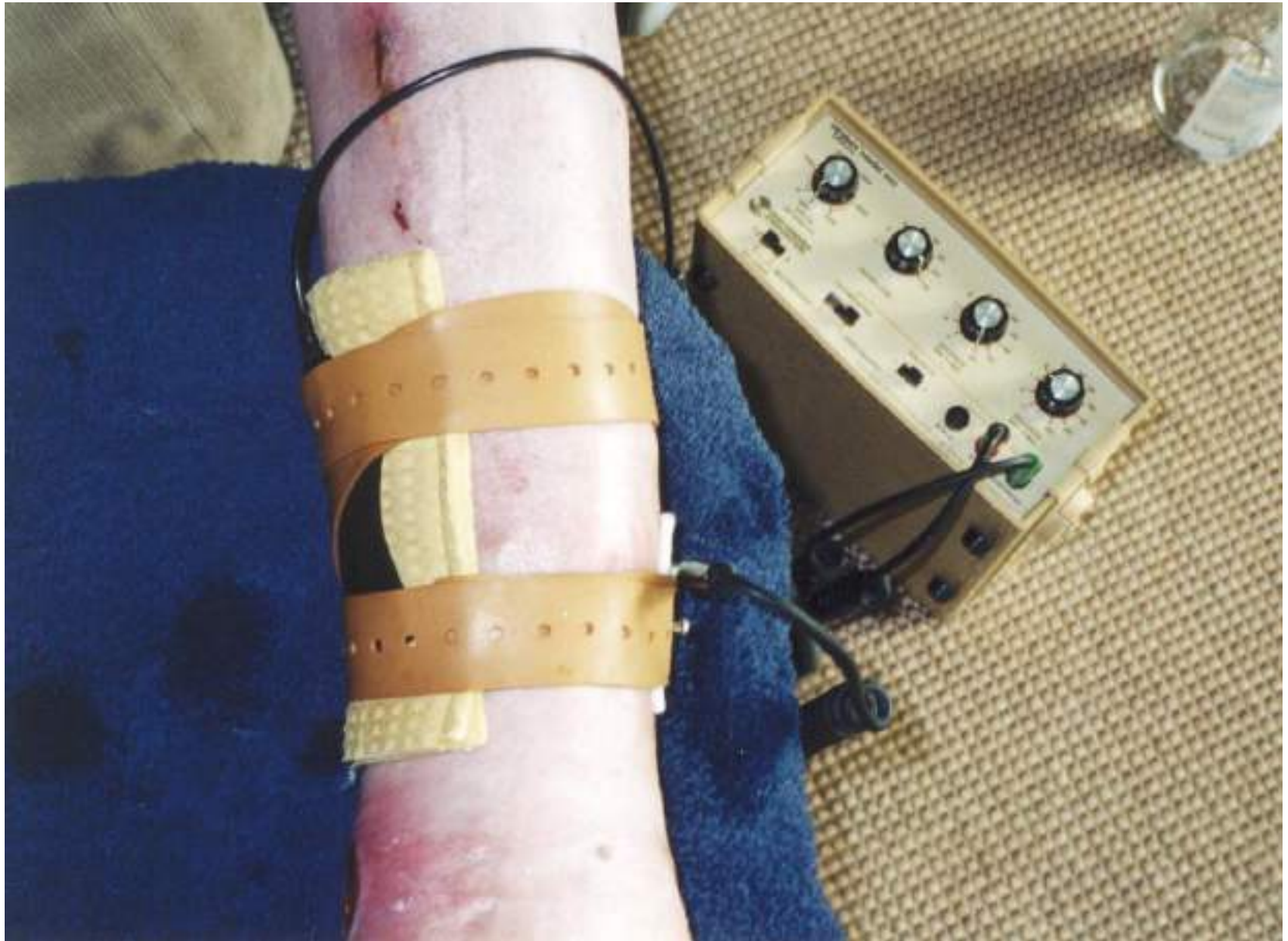


de "injury-current"

de elektrische spanning net onder de str. coneum is lager dan in de diepere huidlaag

BENODIGDHEDEN ELEKTROTHERAPIE:

ELEKTROTHERAPIE PRAKTIJK 1:



WHS
Wound
Healing
Society

Electrostimulation: Current Status, Strength of Evidence Guidelines, and Meta-Analysis

Gerard Koel* and Pamela E. Houghton

Faculty of Physical Activity and Health, Saxion University of Applied Sciences, Enschede, The Netherlands.

Gerard Koel, PT, MSc

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*Correspondence: Saxion University of Applied Sciences, Faculty of Physical Activity and Health, PO Box 70.000, 7500 KB Enschede, The Netherlands (e-mail: g.j.koel@saxion.nl).

Significance: Delayed healing of skin wounds is a serious problem for the patients, clinicians, and society. The application of interventions with proven effectiveness to increase wound healing is relevant.
Recent Advances: This article summarizes the results of effect studies with the application of electrostimulation (ES) as additional treatment to standard wound care (SWC). Therefore, five published narrative reviews are discussed. In addition, 15 studies with a clear randomized controlled trial design are analyzed systematically and the results are presented in four forest plots. The healing rate is expressed in the outcome measure percentage area reduction in 4 weeks of treatment (PAR4). This leads to a continuous measure with mean differences between the percentage healing in the experimental group (SWC plus ES) and in the control group (SWC alone or SWC plus placebo ES). Adding ES to SWC in all wound types increases PAR4 by an extra 26.7% (95% confidence interval [CI] 15.6, 37.8); adding unidirectional ES to SWC increases PAR4 by 30.8% (95% CI 20.9, 40.6) and adding unidirectional ES to the treatment of pressure ulcers increases PAR4 by 42.7% (95% CI 32.0, 53.3).
Critical Issues: There is a discrepancy between the proven effectiveness of ES as additional treatment to SWC and the application of ES in real practice. Possible drawbacks are the lack of clinical expertise concerning the proper application of ES and the extra time effort and necessary equipment that are needed.
Future Directions: Clinicians concerned about the optimal treatment of patients with delayed wound healing should improve their practical competency to be able to apply ES.

Abbreviations and Acronyms

DFU = diabetic foot ulcers
EBM = evidence-based medicine
EF = electric field

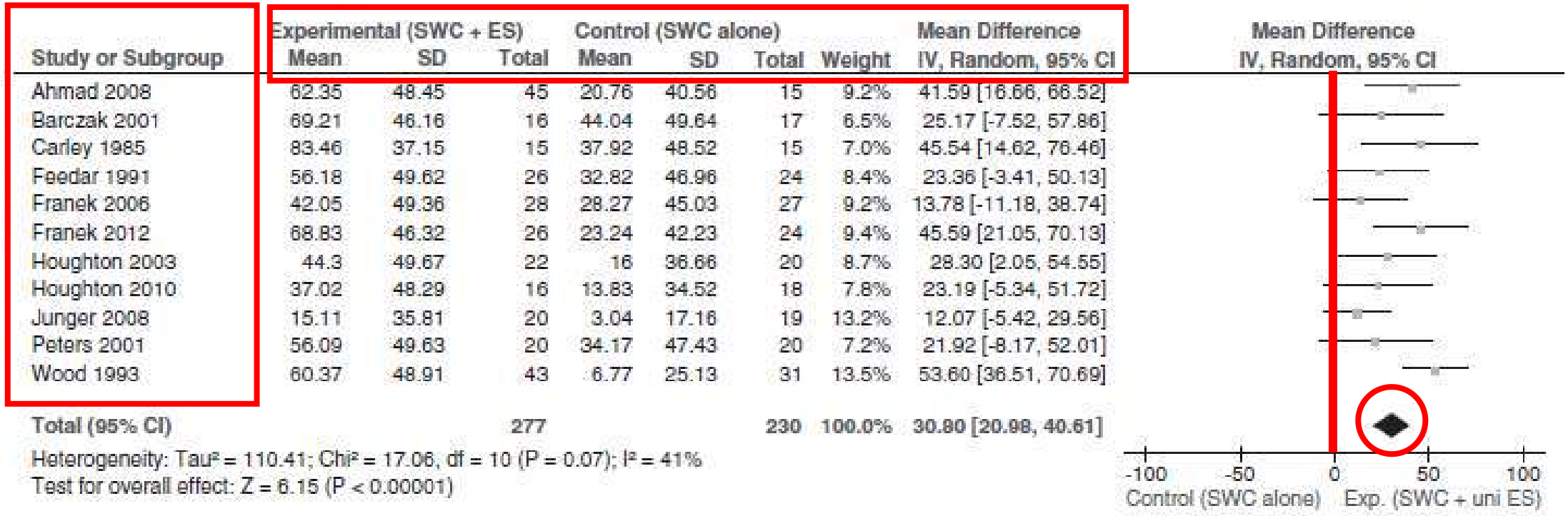

Figure 2. Forest plot with the results of the 11 studies (*left column*)[22,25–31,33,34,36] that applied unidirectional ES on all wound types comparing the mean differences between the experimental group (SWC plus ES) and the control group (SWC alone or SWC plus placebo ES).

Zou de bevordering van weefselherstel ook gelden voor andere orgaansystemen (met name pezen)?

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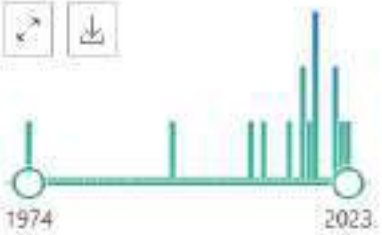
14 results

Page 1 of 2

RESULTS BY YEAR



TEXT AVAILABILITY

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- Books and Documents
- Clinical Trial
- Meta-Analysis
- Randomized Controlled Trial
- Review

Filters applied: Clinical Trial. Clear all

1 Cite Share

Ultrasound-Guided Application of Percutaneous **Electrolysis** as an Adjunct to Exercise and Manual Therapy for Subacromial Pain Syndrome: A Randomized Clinical Trial.

de Miguel Valtierra L, Salom Moreno J, Fernández-de-Las-Peñas C, Cleland JA, Arias-Buría JL.

J Pain. 2018 Oct;19(10):1201-1210. doi: 10.1016/j.jpain.2018.04.017. Epub 2018 May 16.

PMID: 29777953 Clinical Trial.

2 Cite Share

Effect of Waters Enriched in O_2 by Injection or **Electrolysis** on Performance and the Cardiopulmonary and Acid-Base Response to High Intensity Exercise.

Daussin FN, Péronnet F, Charton A, Lonsdorfer E, Doutreleau S, Geny B, Richard R.

Nutrients. 2021 Nov 29;13(12):4320. doi: 10.3390/nu13124320.

PMID: 34959872 Free PMC article. Clinical Trial.

3 Cite Share

Prospective Randomized Trial of **Electrolysis** for Chronic Plantar Heel Pain.

Fernández-Rodríguez T, Fernández-Rolle A, Truyols-Domínguez S, Benítez-Martínez JC, Casaña-Granell J.

Foot Ankle Int. 2018 Sep;39(9):1039-1046. doi: 10.1177/1071100718773998. Epub 2018 May 17.

PMID: 29771148 Clinical Trial.

4 Cite Share

Short-term effectiveness of high- and low-intensity percutaneous **electrolysis** in patients with patellofemoral pain syndrome: A pilot study.

Valera-Calero JA, Sánchez-Mayoral-Martín A, Varol U.

World J Orthop. 2021 Oct 18;12(10):781-790. doi: 10.5312/wjo.v12.i10.781. eCollection 2021 Oct 18.

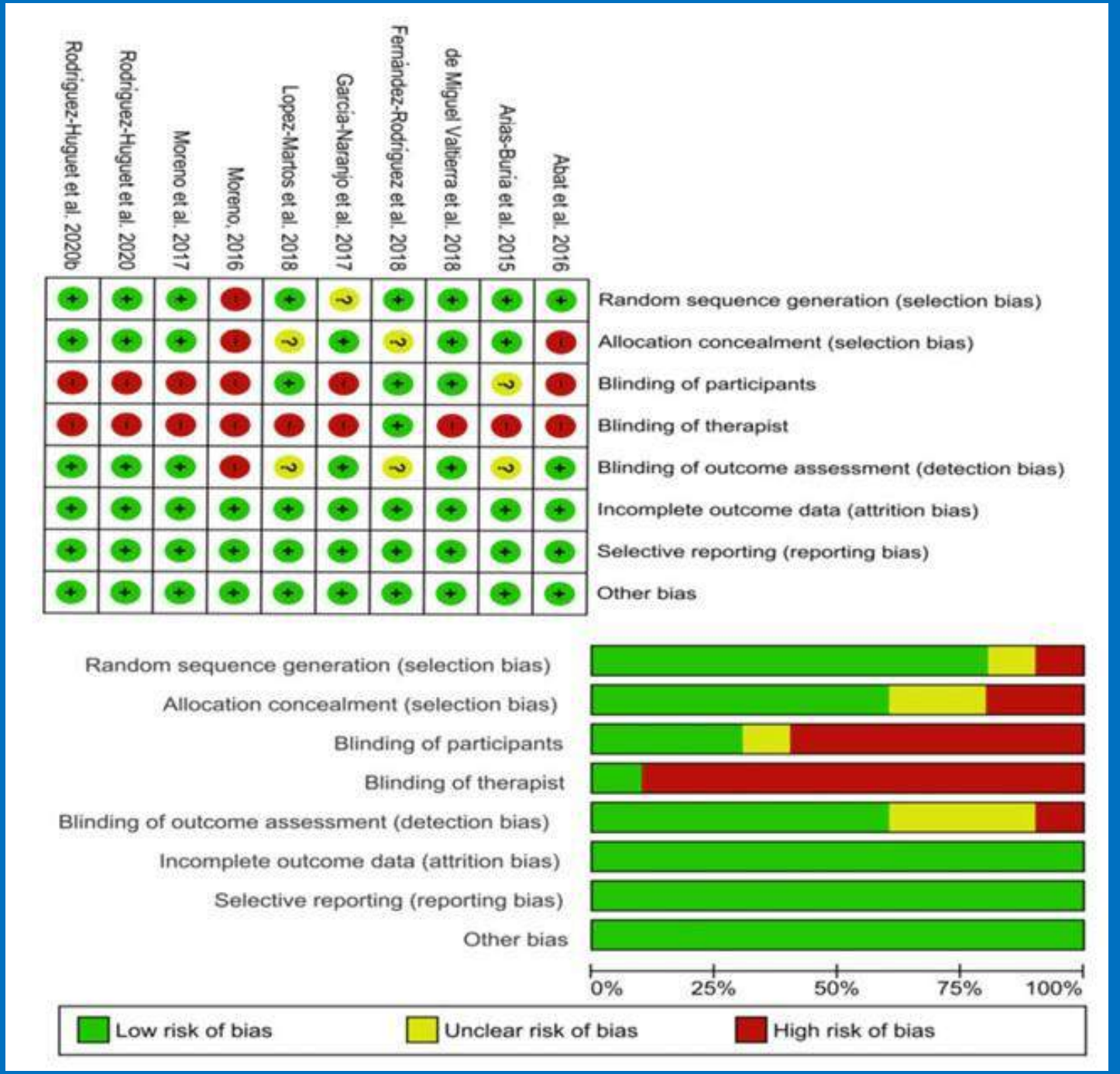
PMID: 34754834 Free PMC article. Clinical Trial.

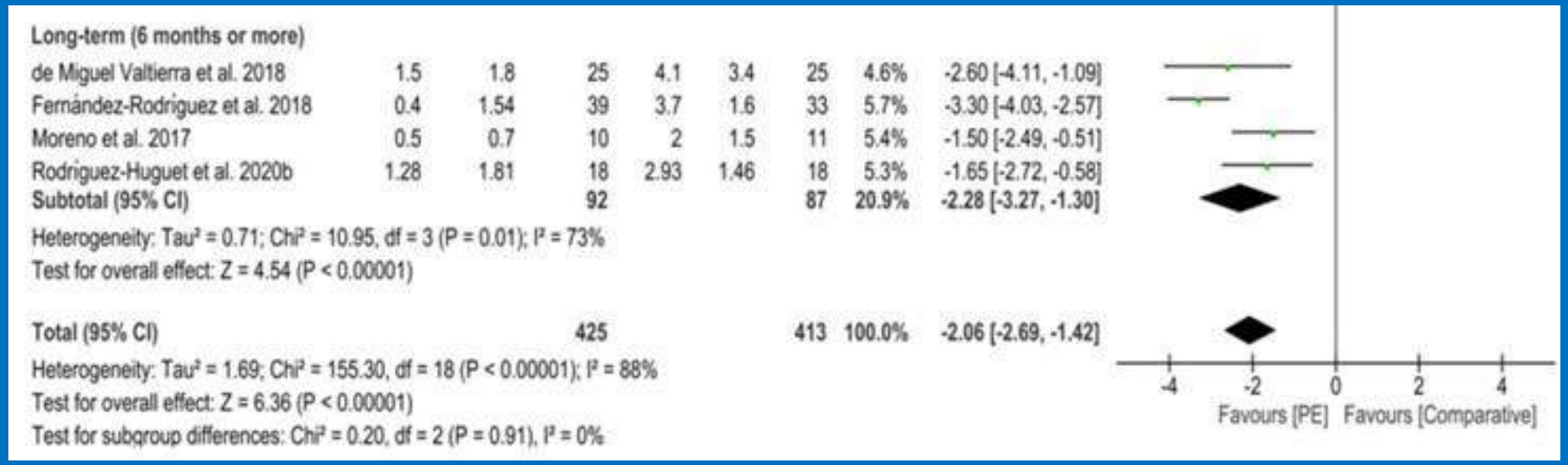
Pain Medicine, 22(5), 2021, 1055–1071
doi: 10.1093/pm/pnaa342
Advance Access Publication Date: 6 November 2020
Review Article

OXFORD

Effectiveness of Ultrasound-Guided Percutaneous Electrolysis for Musculoskeletal Pain: A Systematic Review and Meta-Analysis

Guido F. Gómez-Chiguano, PT, MSc* Marcos J. Navarro-Santana, PT, MSc[†,‡] Joshua A. Cleland, PT, PhD[§] Jose L. Arias-Buría, PT, PhD,[¶,‖] César Fernández-de-las-Peñas, PT, PhD[¶,‖] Ricardo Ortega-Santiago, PT, PhD,[¶,‖] and Gustavo Plaza-Manzano, PT, PhD[†,‖,‖]


Rodriguez-Huguet et al. 2020b
Rodriguez-Huguet et al. 2020
Moreno et al. 2017
Moreno, 2016
Lopez-Martos et al. 2018
García-Naranjo et al. 2017
Fernández-Rodríguez et al. 2018
de Miguel Valtierra et al. 2018
Arias-Buría et al. 2015
Abat et al. 2016
Random sequence generation (selection bias)
Allocation concealment (selection bias)
Blinding of participants
Blinding of therapist
Blinding of outcome assessment (detection bias)
Incomplete outcome data (attrition bias)
Selective reporting (reporting bias)
Other bias
0%
25%
50%
75%
100%
Low risk of bias
Unclear risk of bias
High risk of bias



Conclusion

This meta-analysis found moderate evidence suggesting a large positive effect of percutaneous electrolysis for reducing pain and moderate evidence for a large decrease in pain-related disability for musculoskeletal pain conditions in the short term, midterm, and long term. Future studies are needed to clarify the dosage and which musculoskeletal pain conditions would be most likely to benefit from this intervention.

EPTE: Percutane Electrolyse

- Minder perspectief dan SWT (Shock Wave Therapie)
- Heel veel onduidelijk omtrent dosering
  Ook heel veel variabelen
- Vermoed dat het experimenteel zal blijven

5. Afsluiting, interpretaties…..

- Is er idd minder evidentie voor FT i.e.z.?
  Is de intro van EBFT de reden dat FT i.e.z. niet wordt gebruikt?
  Let wel: voor onderzoekers was FT i.e.z. beter te gebruiken……

- Ligt het aan de veranderde rol van de fysiotherapeut?
  Is inmiddels meer coach dan behandelaar.

- Komt het door verzekering-technische aspecten?
  De behandelfrequentie is lager, geen aparte declaratie codes.

Over oefentherapie bij SAPS
Rationales, effectiviteit en externe evidentie

Externe evidentie oefentherapie bij SAPS/ RCR-SP patiënten.

1.Page MJ, Green S, McBain B, Surace SJ, Deitch J, Lyttle N, Mrocki MA, **Buchbinder** R. Manual therapy and exercise for rotator cuff disease. **Cochrane Database Syst Rev**. 10 juni 2016;(6):CD012224.

2.Bennell K, Wee E, Coburn S, Green S, Harris A, Staples M, et al. Efficacy of standardised manual therapy and home exercise programme for chronic rotator cuff disease: randomised placebo-controlled trial. *BMJ* 2010;340:c2756:1-10.

3.Clausen MB, Hölmich P, Rathleff M, Bandholm T, Christensen KB, Zebis MK, Thorborg K. Effectiveness of Adding a Large Dose of Shoulder Strengthening to Current Nonoperative Care for Subacromial Impingement: A Pragmatic, Double-Blind Randomized Controlled Trial (**SExSI Trial**). Am J Sports Med. 2021; 49:3040-49.

4.Hopewell S, Keene DJ, Marian IR, Dritsaki M, Heine P, Cureton L et al. Progressive exercise compared with best practice advice, with or without corticosteroid injection, for the treatment of patients with rotator cuff disorders (**GRASP**): a multicentre, pragmatic, 2 × 2 factorial, randomised controlled trial. Lancet. 31 July 2021;398(10298):416–28.

5.Schydlowsky P, Szkudlarek M, Madsen OR. Comprehensive supervised heavy training program versus home training regimen in patients with subacromial impingement syndrome: a randomized trial. BMC Musculoskelet Disord. 15 January 2022;23(1):52.

Cochrane Library

Cochrane Database of Systematic Reviews

Manual therapy and exercise for rotator cuff disease (Review)

Page MJ, Green S, McBain B, Surace SJ, Deitch J, Lyttle N, Mrocki MA, Buchbinder R

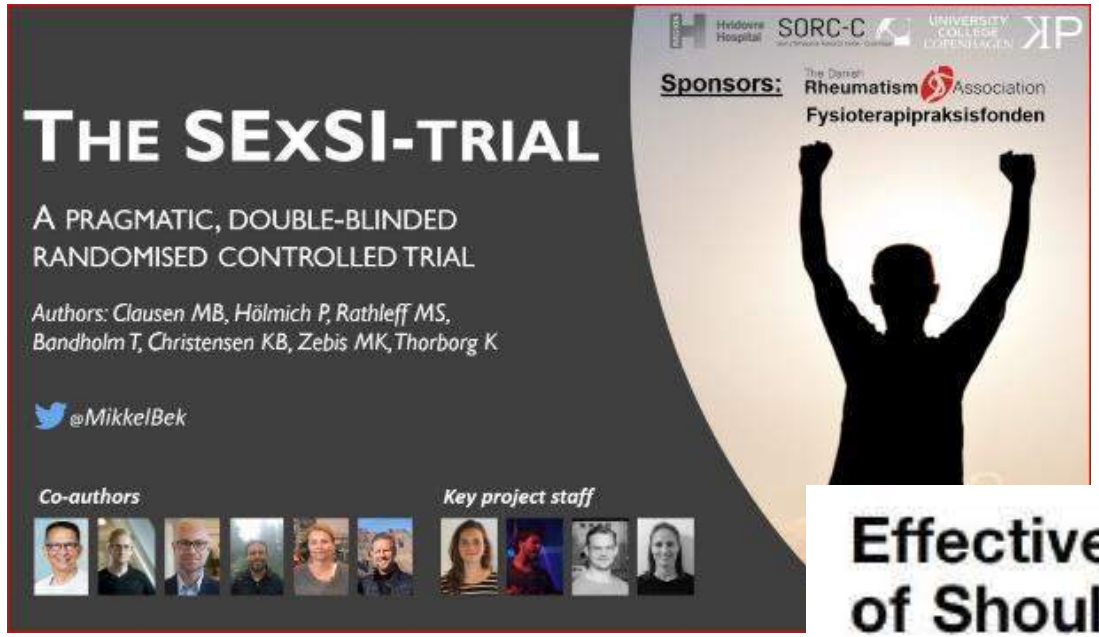
Authors' conclusions

Despite identifying 60 eligible trials, only one trial compared a combination of manual therapy and exercise reflective of common current practice to placebo. We judged it to be of high quality and found no clinically important differences between groups in any outcome. Effects of manual therapy and exercise may be similar to those of glucocorticoid injection and arthroscopic subacromial decompression, but this is based on low quality evidence. Adverse events associated with manual therapy and exercise are relatively more frequent than placebo but mild in nature. Novel combinations of manual therapy and exercise should be compared with a realistic placebo in future trials. Further trials of manual therapy alone or exercise alone for rotator cuff disease should be based upon a strong rationale and consideration of whether or not they would alter the conclusions of this review.

Manual therapy and exercise compared to placebo for rotator cuff disease

Patient or population: rotator cuff disease
Settings: Public hospital physiotherapy units and private physiotherapy practices, Australia
Intervention: soft tissue massage, glenohumeral joint mobilisation, thoracic spine mobilisation, cervical spine mobilisation, scapular retraining, postural taping and supervised exercises in 10 sessions over 10 weeks along with home exercises for 22 weeks
Comparison: inactive ultrasound therapy and application of an inert gel in 10 sessions over 10 weeks

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	No of Participants (studies)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Placebo	manual therapy and exercise				
Overall pain Assessed with SPADI pain score Scale from 0-100 (higher score denotes less pain) Follow-up: 22 weeks	The mean improvement in overall pain score in the control group was **17.3**[1]	The mean improvement in overall pain score in the intervention group was **6.8 points higher** (-0.7 lower to 14.3 higher)	-	120 (1 RCT)	⊕⊕⊕⊕ **HIGH**	Absolute risk difference 7% (1% fewer to 14% more); relative percentage change 14% (1% fewer to 30% more) NNTB not applicable
Function Assessed with SPADI total score Scale from 0-100 (higher score denotes greater function) Follow-up: 22 weeks	The mean improvement in function score in the control group was **15.6**[1]	The mean improvement in function score in the intervention group was **7.1 points higher** (0.3 higher to 13.9 higher)	-	120 (1 RCT)	⊕⊕⊕⊕ **HIGH**	Absolute risk difference 7% (1% to 14% more); relative percentage change 16% (1% to 32% more) NNTB 6 (3 to 103)



Effectiveness of Adding a Large Dose of Shoulder Strengthening to Current Nonoperative Care for Subacromial Impingement

A Pragmatic, Double-Blind Randomized Controlled Trial (SExSI Trial)

Mikkel Bek Clausen,[*†‡] PhD, Per Hölmich,[†] DMSc, Prof., Michael Rathleff,[§‖] PhD, Prof., Thomas Bandholm,[¶#] PhD, Prof., Karl Bang Christensen,[**] PhD, Mette Kreutzfeldt Zebis,[‡] PhD, and Kristian Thorborg,[†¶] PhD, Prof.
Investigation performed at the Sports Orthopedic Research Center–Copenhagen, Department of Orthopedic Surgery, Amager-Hvidovre Hospital, Institute of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark

BMJ Open

Clinical and cost-effectiveness of progressive exercise compared with best practice advice, with or without corticosteroid injection, for the treatment of rotator cuff disorders: protocol for a 2x2 factorial randomised controlled trial (the GRASP trial)

Sally Hopewell,[1] David J Keene,[1] Michael Maia Schlüssel,[1] Melina Dritsaki,[1] Susan Dutton,[1] Andrew Carr,[1] William Hamilton,[2] Zara Hansen,[1] Anju Jaggi,[3] Chris Littlewood,[4] Hessam Soutakbar,[1] Peter Heine,[1] Lucy Cureton,[1] Karen Barker,[5] Sarah E Lamb[1]

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ABSTRACT

Introduction Shoulder pain is very common, with around 70% of cases due to disorders of the rotator cuff. Despite widespread provision of physiotherapy, there is uncertainty about which type of exercise and delivery mechanisms are associated with best outcomes. There is also uncertainty

Strengths and limitations of this study

- The Getting it Right: Addressing Shoulder Pain trial is a large multicentre randomised controlled trial based in primary care and primary care interface services.

Schydlowsky *et al.*
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RESEARCH Open Access

Comprehensive supervised heavy training program versus home training regimen in patients with subacromial impingement syndrome: a randomized trial

Pierre Schydlowsky[1*], Marcin Szkudlarek[1,2,3] and Ole Rintek Madsen[4]

Abstract

Background: There is no consensus on the best training regimen for subacromial impingement syndrome (SIS). Several have been suggested, but never tested.

The purpose of the study is to compare a comprehensive supervised training regimen (STR) based on latest evidence including heavy slow resistance training with a validated home-based regimen (HTR). We hypothesized that the STR would be superior to the HTR.

Effectiveness of Adding a Large Dose of Shoulder Strengthening to Current Nonoperative Care for Subacromial Impingement: A Pragmatic, Double-Blind Randomized Controlled Trial (SExSI Trial): Letter to the Editor

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Dear Editor:

Clausen et al[3] concluded that adding extra strengthening exercises (even described as "a large dose") to a standard exercise program does not result in a better outcome: so, just sexy. However, Powell and Lewis[12] regarded the statement "You need to strengthen your shoulder" as not sexy at all. So, is muscle strength relevant or not relevant for patients with shoulder pain (SP)?

Most patients with SP can generate less power on the SP side as compared with the healthy side.[5,6] Is that clinical symptom caused by muscular insufficiency? Maybe, but more often the reduced tendon capability is the most relevant variable. Patients with subacromial pain syndrome (SAPS) are also described as having rotator cuff–related SP, where inflammation in the rotator cuff tendon is the source of nociception and pain awareness.[6] Furthermore, patients with SAPS are confronted with rather long episodes of pain; so, sensitization plays a role and mental dysfunctions can easily develop, such as decreased self-confidence ("I'm not capable to realize that performance") and dysfunctional cognitions ("My shoulder is damaged"). Besides local somatic tendon-related factors, mental, cognitive, and process factors are correlated to the amount of SP.[2,6,7,9] A physical therapist using a handheld dynamometer to examine the generation of muscle strength is aware that many variables influence the outcome in Newton-meters. In fact, strength is a multimodal outcome. Is an increased amount of strength correlated with a decreased amount of SP? In my opinion, in the normal rehabilitation of patients with SAPS, that correlation is correct: if SP decreases, most patients can generate more strength attributed to better muscle-tendon performance and a decrease of mental, cognitive, and process dysfunctions (eg, sensitization).[12]

Recently we researched the literature to formulate recommendations for Dutch general practitioners to treat their patients with SAPS the best way. As with most other guidelines, exercise therapy was recommended based on slightly positive clinical effects (short-term pain relief and function increase), low costs, easy access, and no negative side effects.[11] In a retrospective study in 2021 of patients with SAPS, Clausen et al[4] predicted that the best exercise results were realized if strengthening exercises were part of the rehabilitation program. The odds ratio for good results for strengthening exercises when compared with nonstrengthening exercises was 1.65 (95% CI, 1.25-2.19). In a systematic review, Naunton et al[10] stated that "resistant and progressive exercises provide an uncertain clinical meaningful improvement in pain and function compared with no treatment or placebo among people with rotator cuff related shoulder pain." Because exercise therapy combines specific effects (muscle strength, tendon-loading capacity) and nonspecific effects (improved confidence, decreased sensitization, better health beliefs), it is difficult to find distinguished effects of different exercise programs.

Why do I not agree with the conclusions of Clausen et al[3]? First my compliments for the trial methodology, for sharing the clinical data, and for the recent articles[3,4,8]: well done. But not well done in my opinion is the "large additional dose of home-based elastic band intervention." Underneath 5 relevant shortcomings in the strengthening program:

- Patients were exercising in a strongly limited range of motion: not >45° of scaption, thereby dysfunctional and monotonous.
- The consequent slow tempo of the exercises: almost isometrical.
- The use of elastic bands for strengthening: it is difficult to realize a consistent loading.
- The boring exercises lead to diminished compliance: 160 s/d in the first 5 weeks, 82 s/d in the middle 5 weeks, and 52 s/d in the last 6 weeks.
- To realize strength increases, the patient had to exercise from 2 to 12 hours in 3 months: patients in this trial performed the strength exercises 2.9 hours in 4 months. The intervention group (standard exercises plus home strength training) exercised 45 min/wk, whereas the control group exercised 51 min/wk. So, the difference between the groups is quite small.

If the shortcomings are relevant, the objective of the program might not be reached; in fact, that is correct: 16 weeks of training in intervention group did not result in any strength increase (Figure 1; from Clausen et al[3] SExSI trial).

Also, the pain scores, range of motion, and quality-of-life scores did not change. That is to be expected: if exercises are not able to increase tendon-loading capacity, pain scores do not change. So, nothing new: the exercise program is not effective.

Nevertheless, Clausen et al concluded, "Adding a large dose of shoulder strengthening to current nonoperative care for longstanding subacromial impingement (SAPS) did not result in superior outcome for shoulder-specific disability after 4 months." In my opinion, there is no large dose (2.9 hours in 4 months, 93 s/d) and also no strengthening (elastic band; SExSI program could be valuable in the first training episode in cases with rather high pain awareness). If the strength was increased and the pain scores were not, the conclusion of the authors might be correct. The strengthening exercises are nonfunctional and in too slow a tempo, with elastic bands in a too limited a range of motion. Patients with SAPS were not challenged to perform the exercises, and possible nonspecific effects on mental, cognitive, and process dysfunctions were not realized.

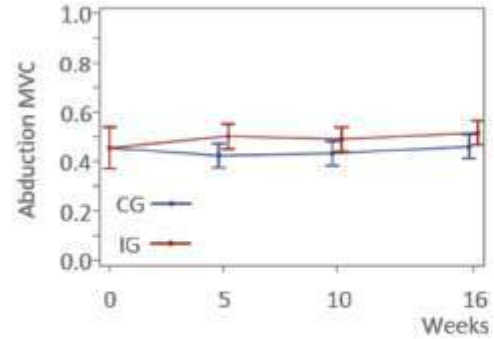

Figure 1. Abduction strength measured with HHD (handheld dynamometer) during 16 weeks of training. Strength is expressed as N·m per kg body weight. Values are presented as mean ± SD. CG, control group (100 SP patients with normal rehab); IG, intervention group (100 SP patients with normal rehab plus 'strengthen your shoulder' program); MVC, maximal voluntary contraction.

To load tendons properly and thereby stimulate better function, we have to pull strong enough upon the tendon collagen fibers[1]; so, in most patients with SAPS, we need strengthening exercises. A proper exercise program needs to be adjusted to the patients, and it needs to be functional.

Now physical therapists are challenged to repeat this treatment protocol with a better exercise program. My patients and I would be very disappointed to train for 16 weeks without pain relief and accompanying strength increase. Of course, in first-line physical therapist practice, most patients with SAPS are not referred to an orthopaedic center, so "my" SAPS population might have a better prognosis than the population in the SExSI trial.

Unfortunately, the SExSI trial combines a good trial methodology with a strengthening exercise program of insufficient quality. Because the objective strengthening is not realized, the conclusions are premature.

Gerard Koel, MSc, PT
Hengelo, the Netherlands

Address correspondence to Gerard Koel, MSc, PT (email: gerard.koel@gmail.com).

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REFERENCES

1. Cardoso TB, Pizzari T, Kinsella R, Hope D, Cook JL. Current trends in tendinopathy management. *Best Pract Res Clin Rheumatol*. 2019;33(1):122-140.
2. Chester R, Jerosch-Herold C, Lewis J, Shepstone L. Psychological factors are associated with the outcome of physiotherapy for people with shoulder pain: a multicentre longitudinal cohort study. *Br J Sports Med*. 2018;52(4):269-275.
3. Clausen MB, Holmich P, Rathleff M, et al. Effectiveness of adding a large dose of shoulder strengthening to current nonoperative care for subacromial impingement: a pragmatic, double-blind randomized controlled trial (SExSI Trial). *Am J Sports Med*. 2021;49(11):3040-3049. doi:10.1177/03635465211016008
4. Clausen MB, Mentild MB, Holm K, et al. Less than half of patients in secondary care adheres to clinical guidelines for subacromial pain syndrome and have acceptable symptoms after treatment: a Danish nationwide cohort study of 3306 patients. *Musculoskelet Sci Pract*. 2021;52:102322.
5. Clausen MB, Witten A, Holm K, et al. Glenohumeral and scapulothoracic strength impairments exist in patients with subacromial impingement, but these are not reflected in the shoulder pain and disability index. *BMC Musculoskelet Disord*. 2017;18:302.
6. Dean BJF, Gettings P, Dakin SG, Carr AJ. Are inflammatory cells increased in painful human tendinopathy? A systematic review. *Br J Sports Med*. 2016;50:216-220.
7. De Baets L, Matheve T, Meeus M, Struyf F, Timmermans A. The influence of cognitions, emotions and behavioral factors on treatment outcomes in musculoskeletal shoulder pain: a systematic review. *Clin Rehabil*. 2019;33(6):980-991.
8. MacDermid JC, Ramos J, Drosdowech D, Faber K, Patterson S. The impact of rotator cuff pathology on isometric and isokinetic strength, function and quality of life. *J Shoulder Elbow Surg*. 2004;13:593-598.
9. Martinez-Calderon J, Meeus M, Struyf F, Miguel Morales-Asencio J, Gijon-Nogueron G, Luque-Suarez A. The role of psychological factors in the perpetuation of pain intensity and disability in people with chronic shoulder pain: a systematic review. *BMJ Open*. 2018;8(4):e020703.
10. Naunton J, Street G, Littlewood C, Haines T, Malliaras P. Effectiveness of progressive and resisted and non-progressive or non-resisted exercise in rotator cuff related shoulder pain: a systematic review and meta-analysis of randomized controlled trials. *Clin Rehabil*. 2020;34(9):1198-1216.
11. NHG-werkgroep; Damen GJ, Koel G, Kuijpers T, et al. NHG-standaard Schouderklachten (M08). Published October 2019. http://www.nhg.org
12. Powell JK, Lewis JS. Rotator cuff-related shoulder pain: is it time to reframe the advice "You need to strengthen your shoulder"? *J Orthop Sports Phys Ther*. 2021;51:156-158.

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Osteoarthritis and Cartilage

OARSI OSTEOARTHRITIS RESEARCH SOCIETY INTERNATIONAL

Exercise and education vs intra-articular saline for knee osteoarthritis: a 1-year follow-up of a randomized trial

M. Henriksen † *, R. Christensen † ‡, L.E. Kristensen †, H. Bliddal †, C. Bartholdy †, M. Boesen †, K. Ellegaard †, J. Guldberg-Møller †, D.J. Hunter § ||, R. Altman ¶, E. Bandak †

† *The Parker Institute, Copenhagen University Hospital – Bispebjerg Frederiksberg, Denmark*
‡ *Research Unit of Rheumatology, Department of Clinical Research, University of Southern Denmark, Odense University Hospital, Denmark*
§ *Sydney Musculoskeletal Health, Kolling Institute of Medical Research, The University of Sydney, Australia*
|| *Department of Rheumatology, Royal North Shore Hospital, Sydney, Australia*
¶ *Ronald Reagan UCLA Medical Center, Los Angeles, CA, USA*

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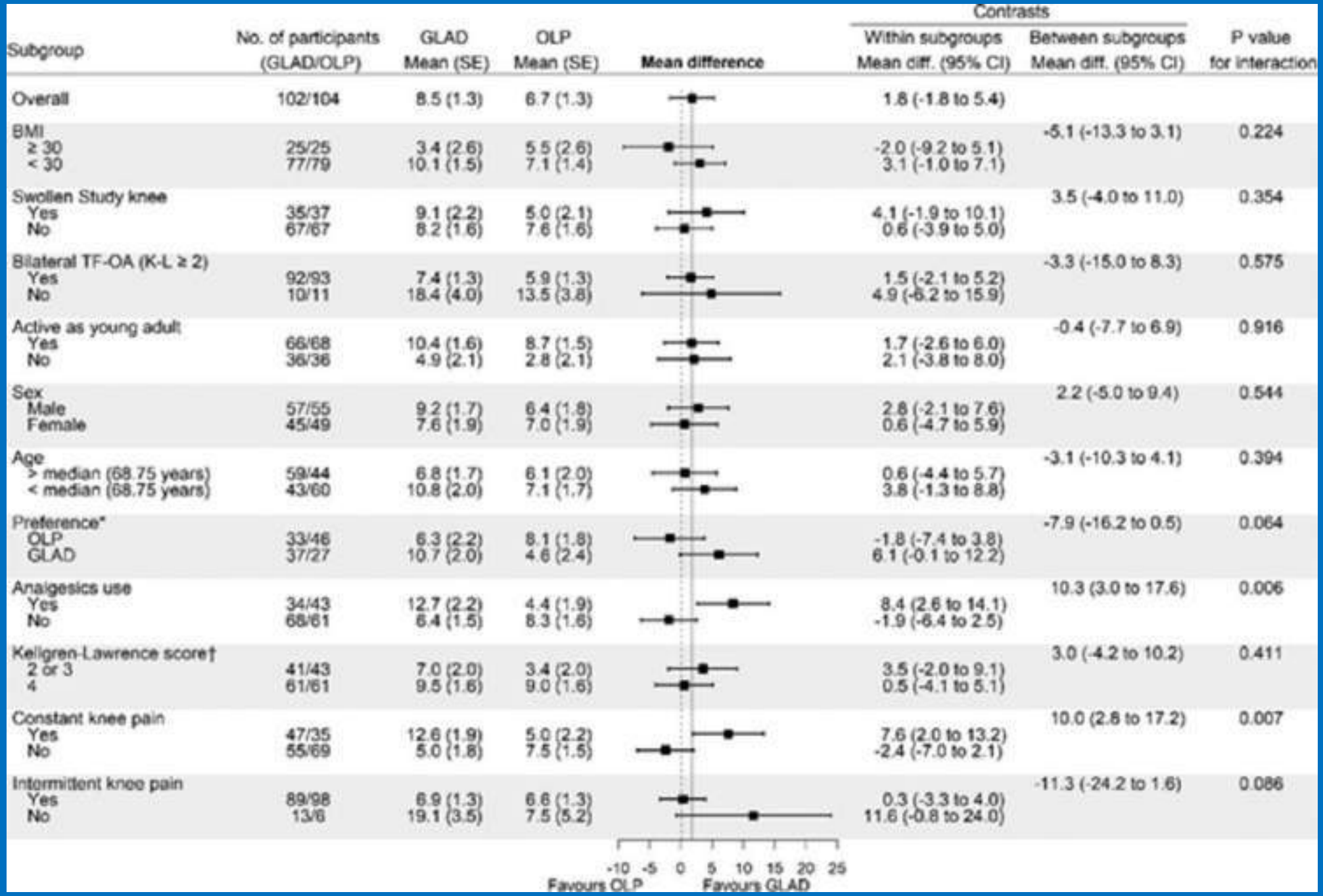
SUMMARY

Objective: To assess the longer-term effect of the Good Life with osteoarthritis in Denmark (GLAD) exercise and education program relative to open-label placebo (OLP) on changes from baseline in core outcomes in individuals with knee osteoarthritis (OA).

Conclusion These results imply that GLAD should not be considered as a one-size-fits-all intervention. For patients who take analgesics for their knee pain or report constant knee pain, GLAD seems to yield clinically relevant benefits when compared to an open-label placebo. The results support a stratified recommendation of GLAD as management of knee OA.


Subgroup
No. of participants (GLAD/OLP)
GLAD Mean (SE)
OLP Mean (SE)
Mean difference
Contrasts
Within subgroups Mean diff. (95% CI)
Between subgroups Mean diff. (95% CI)
P value for interaction
Overall 102/104 8.5 (1.3) 6.7 (1.3) 1.8 (-1.8 to 5.4)
BMI -5.1 (-13.3 to 3.1) 0.224
≥ 30 25/25 3.4 (2.6) 5.5 (2.6) -2.0 (-9.2 to 5.1)
< 30 77/79 10.1 (1.5) 7.1 (1.4) 3.1 (-1.0 to 7.1)
Swollen Study knee 3.5 (-4.0 to 11.0) 0.354
Yes 35/37 9.1 (2.2) 5.0 (2.1) 4.1 (-1.9 to 10.1)
No 67/67 8.2 (1.6) 7.6 (1.6) 0.6 (-3.9 to 5.0)
Bilateral TF-OA (K-L ≥ 2) -3.3 (-15.0 to 8.3) 0.575
Yes 92/93 7.4 (1.3) 5.9 (1.3) 1.5 (-2.1 to 5.2)
No 10/11 18.4 (4.0) 13.5 (3.8) 4.9 (-6.2 to 15.9)
Active as young adult -0.4 (-7.7 to 6.9) 0.916
Yes 66/68 10.4 (1.6) 8.7 (1.5) 1.7 (-2.6 to 6.0)
No 36/36 4.9 (2.1) 2.8 (2.1) 2.1 (-3.8 to 8.0)
Sex 2.2 (-5.0 to 9.4) 0.544
Male 57/55 9.2 (1.7) 6.4 (1.8) 2.8 (-2.1 to 7.6)
Female 45/49 7.6 (1.9) 7.0 (1.9) 0.6 (-4.7 to 5.9)
Age -3.1 (-10.3 to 4.1) 0.394
> median (68.75 years) 59/44 6.8 (1.7) 6.1 (2.0) 0.6 (-4.4 to 5.7)
< median (68.75 years) 43/60 10.8 (2.0) 7.1 (1.7) 3.8 (-1.3 to 8.8)
Preference* -7.9 (-16.2 to 0.5) 0.064
OLP 33/46 6.3 (2.2) 8.1 (1.8) -1.8 (-7.4 to 3.8)
GLAD 37/27 10.7 (2.0) 4.6 (2.4) 6.1 (-0.1 to 12.2)
Analgesics use 10.3 (3.0 to 17.6) 0.006
Yes 34/43 12.7 (2.2) 4.4 (1.9) 8.4 (2.6 to 14.1)
No 68/61 6.4 (1.5) 8.3 (1.6) -1.9 (-6.4 to 2.5)
Kellgren-Lawrence score† 3.0 (-4.2 to 10.2) 0.411
2 or 3 41/43 7.0 (2.0) 3.4 (2.0) 3.5 (-2.0 to 9.1)
4 61/61 9.5 (1.6) 9.0 (1.6) 0.5 (-4.1 to 5.1)
Constant knee pain 10.0 (2.8 to 17.2) 0.007
Yes 47/35 12.6 (1.9) 5.0 (2.2) 7.6 (2.0 to 13.2)
No 55/69 5.0 (1.8) 7.5 (1.5) -2.4 (-7.0 to 2.1)
Intermittent knee pain -11.3 (-24.2 to 1.6) 0.086
Yes 89/98 6.9 (1.3) 6.6 (1.3) 0.3 (-3.3 to 4.0)
No 13/6 19.1 (3.5) 7.5 (5.2) 11.6 (-0.8 to 24.0)
-10 -5 0 5 10 15 20 25
Favours OLP
Favours GLAD

5. Afsluiting, interpretaties…..

- Is er idd minder evidentie voor FT i.e.z.?
  Is de intro van EBFT de reden dat FT i.e.z. niet wordt gebruikt?
  NEE dus; *let wel: voor onderzoekers onderzoeken liever FT i.e.z.!*
- Ligt het aan de veranderde rol van de fysiotherapeut?
  Is inmiddels meer coach dan behandelaar. Grotendeels JA dus.
- Komt het door verzekering-technische aspecten?
  De behandelfrequentie is lager, geen aparte declaratie codes. JA.

- Het is zoals het is, (bijna ☺) niemand treurt er om.
  We gaan gewoon door met fysiotherapie, dan op leefstijl gericht.