



Littekentherapie: The road to scar"less" healing



Peter Moortgat

Towards a scar"less" world



(Na)Zorgmodellen Littekenzorg

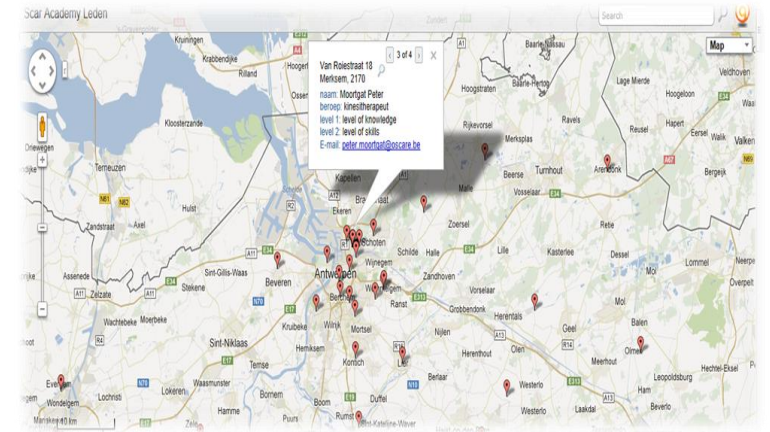
**Acute zorg + nazorg in
het hospitaal**

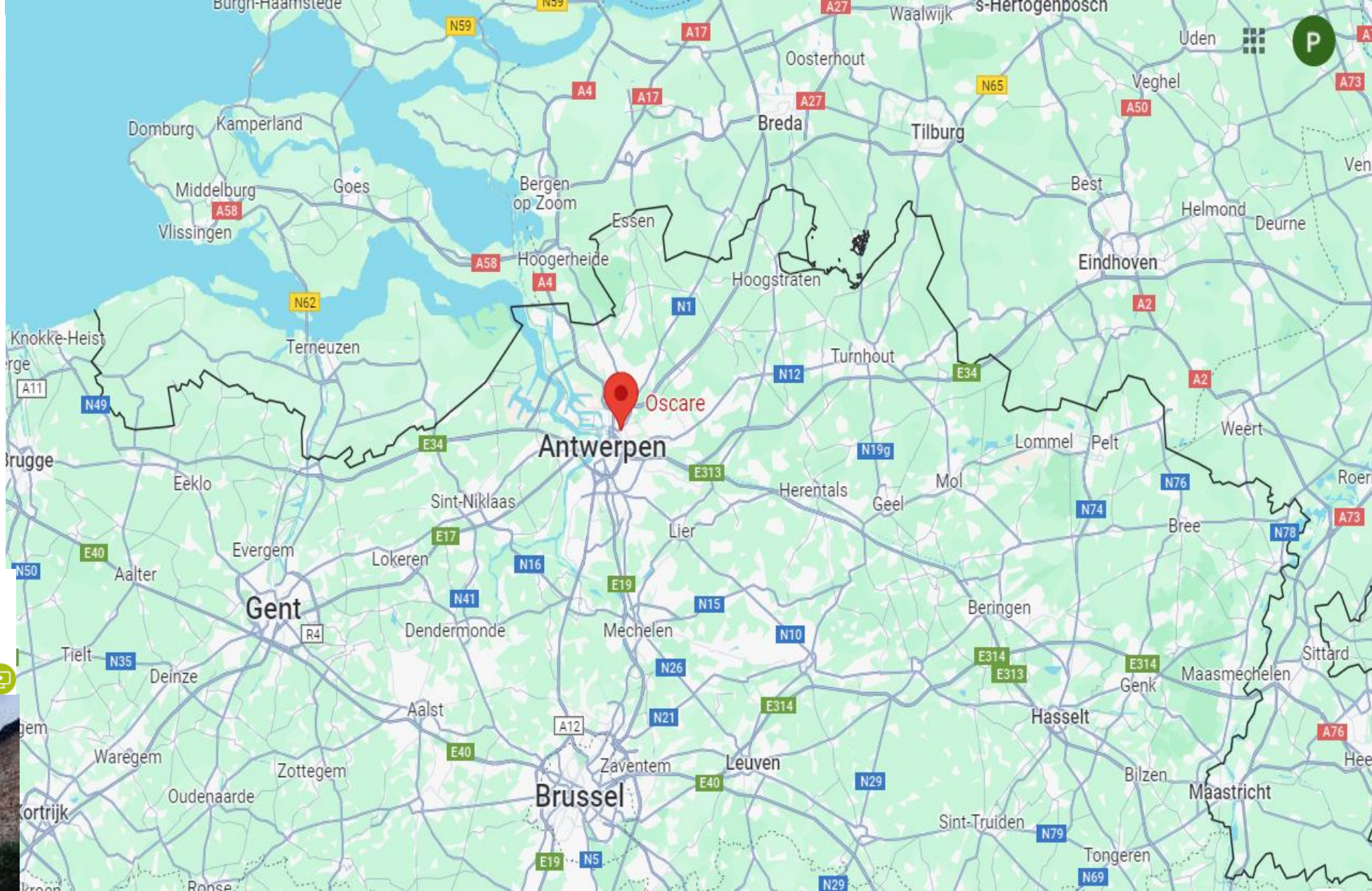
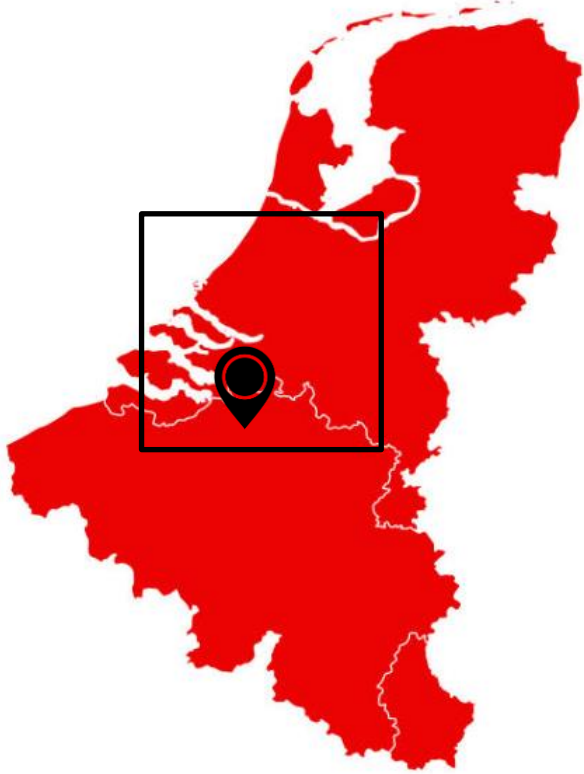


**Nazorg in Centre of
Excellence**



**Individuele nazorg in de
periferie**





Pijlers



NAZORG

Behandeling van elke persoon in zijn totaliteit.



ONDERZOEK

Altijd opzoek naar de beste behandelingen.



OPLEIDING

Samen de littekens te lijf gaan is een cruciale stap.



PREVENTIE

Brandveilig(er) leven begint bij jezelf!

CIRCLE OF CARE



Patient Centered Care



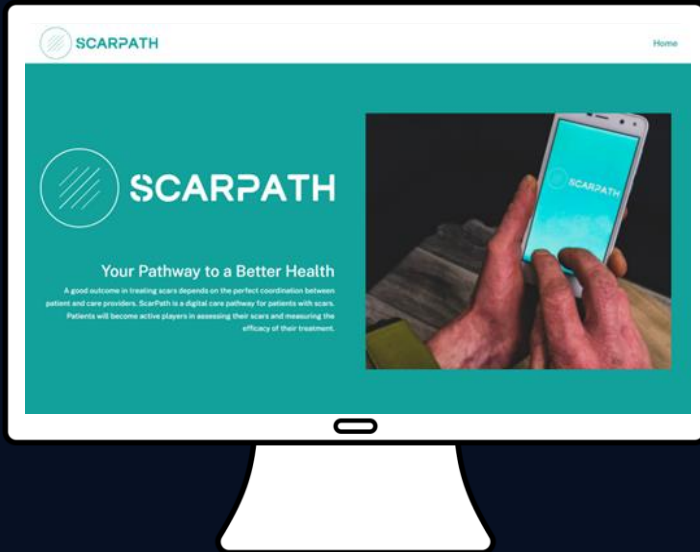
PATIENT-CENTERED

STRONG
SATISFACTION
VALUE-BASED
NUTRITION POPULATION
CHRONIC
HEALING ACUTE
INDEPENDENCE
COMMUNITY INFORMATION

HR00L

EMPOWERMENT

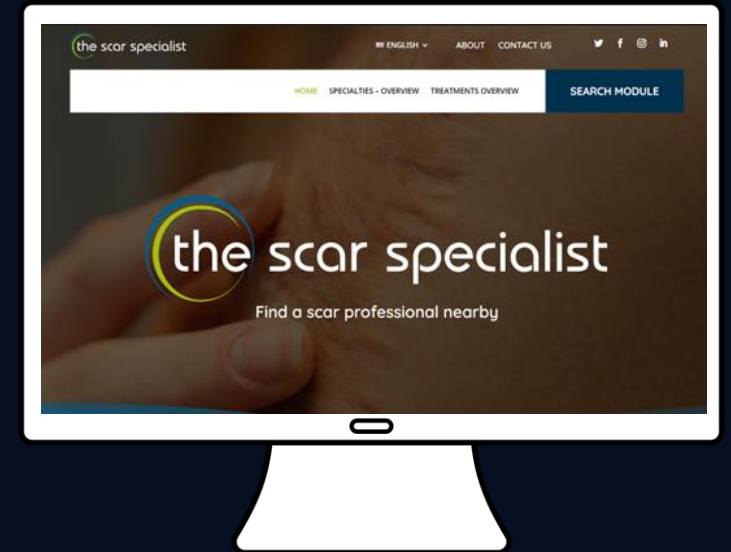
EXPERIENCE
DECISION-MAKING
PROMS
COMMUNICATION
EDUCATION
PATIENT
CARE
ENGAGEMENT
PUBLIC
AUTONOMY
HEALTHCARE
APPOINTMENTS
DRUG
HEALTH



1/ ScarPath



2/ howtotreatscars.com



3/ thescarspecialist.com



SCARPATH

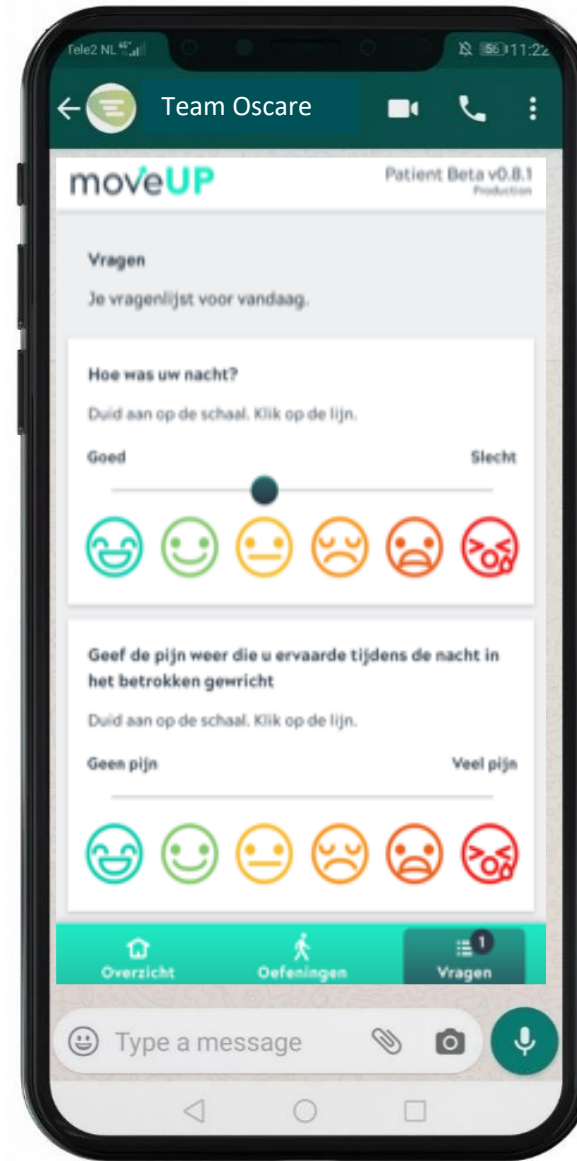
Your Pathway to a Better Health

A good outcome in treating scars depends on the perfect coordination between patient and care providers. ScarPath is a digital care pathway for patients with scars.

Patients will become active players in assessing their scars and measuring the efficacy of their treatment.



Listen to your
patient
Examples of PROMs



SCARPATH: THE ROAD AHEAD HAS MANY TURNS

ASSESSMENT PATHWAY

- Patient Reported Outcome Measures (PROMs)
- Subjective Observer Assessment by Clinician
- Objective Outcome Measurements

TREATMENT PATHWAY

- Initial treatment plan in accordance with assessment analysis
- Updated treatment plan after follow-up measurements
- Continuous updating

EDUCATIONAL MODULE

- Stimulating health literacy by educational texts and videos
- Supporting self-care by instructional videos
- Links to howtotreatscars.com and thescarspecialist.com

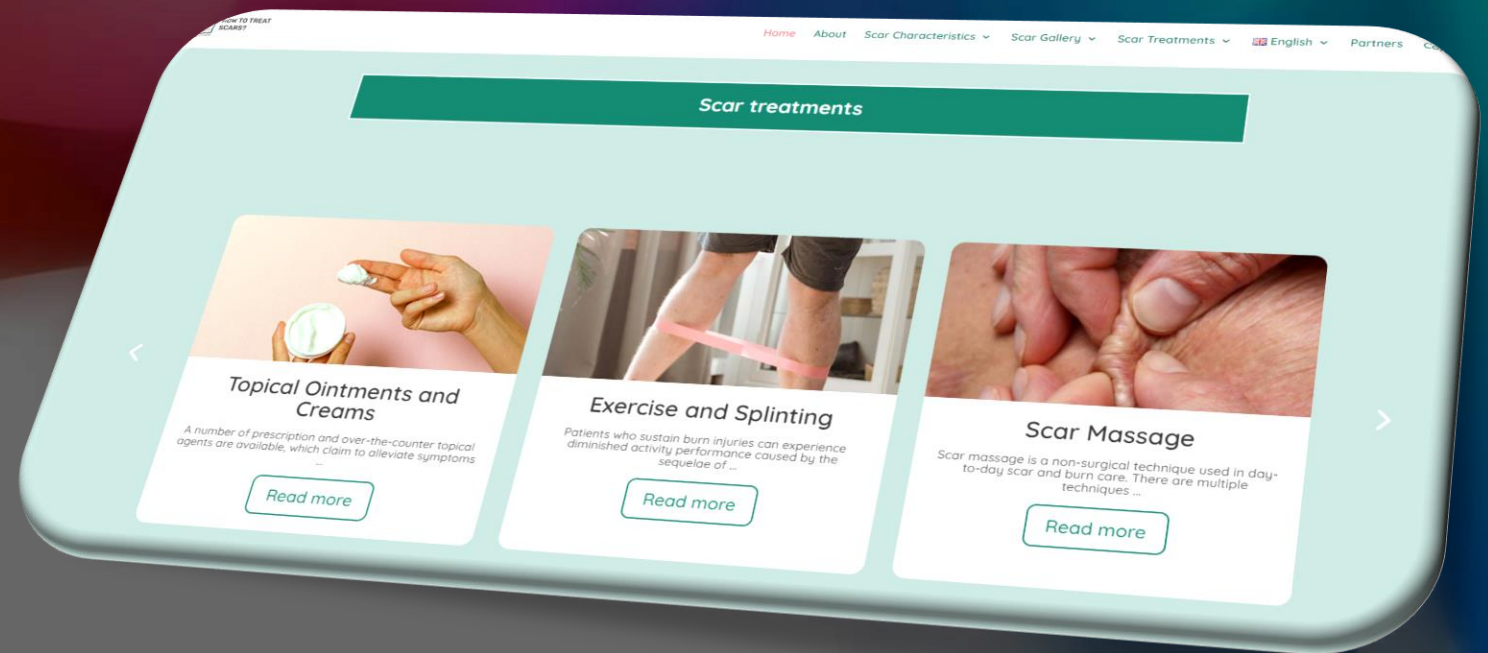


howtotreatscars.com

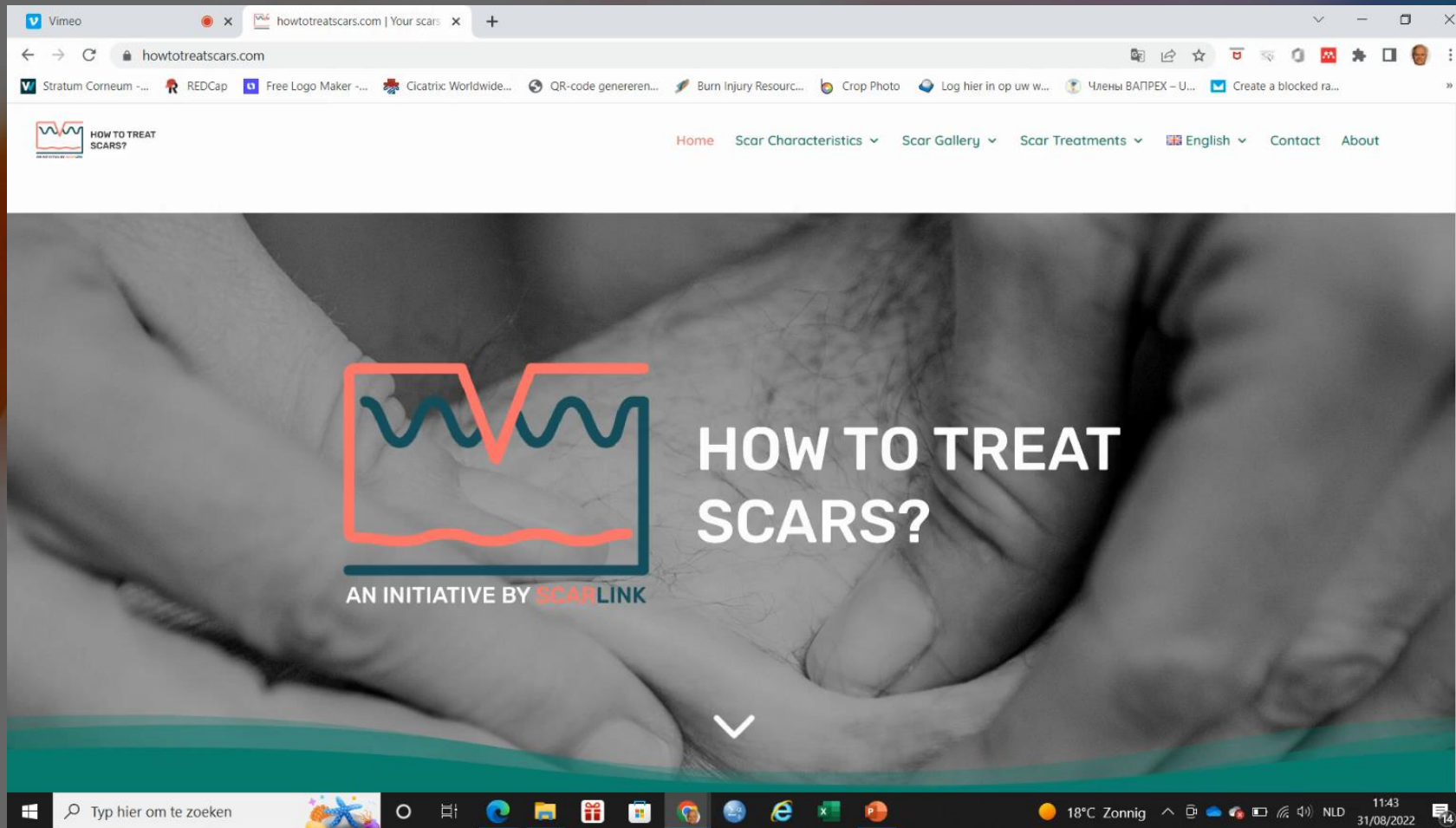


Many people search for solutions for their scars, but except from unvalidated internet sources, relevant information is lacking.

To guide these people in their search we developed an informative website howtotreatscars.com from an interprofessional point of view and with the perspective of Personal and Public Involvement (PPI).



howtotreatscars.com



The screenshot shows a web browser window displaying a video player. The browser's address bar shows the URL howtotreatscars.com. The website's navigation menu includes [Home](#), [Scar Characteristics](#), [Scar Gallery](#), [Scar Treatments](#), [English](#), [Contact](#), and [About](#). The video player features a title card with the following text and graphics:

- HOW TO TREAT SCARS?** (Large white text)
- AN INITIATIVE BY SCARLINK** (Smaller white text below the main title)
- A graphic of a hand with a red and blue line graph overlaid on it, representing scar treatment progress.
- A white downward-pointing chevron icon at the bottom center of the video frame.

The Windows taskbar at the bottom of the screen shows the search bar with the text "Typ hier om te zoeken", several application icons, and system information including "18°C Zonnig", "NLD", and the date "31/08/2022".

[HOME](#)

[SPECIALTIES - OVERVIEW](#)

[TREATMENTS OVERVIEW](#)

[SEARCH MODULE](#)



the scar specialist

Find a scar professional nearby

Find a scar professional nearby

Enter specialist name.

Choose specialty... ▾

Treatments

- Camouflage And Makeup
- Corticosteroid Therapy
- Exercise And Splinting
- Injectables

Show More

Location ▾

8 Specialists Found

Sort By ▾



Van Tichelen Jurgen

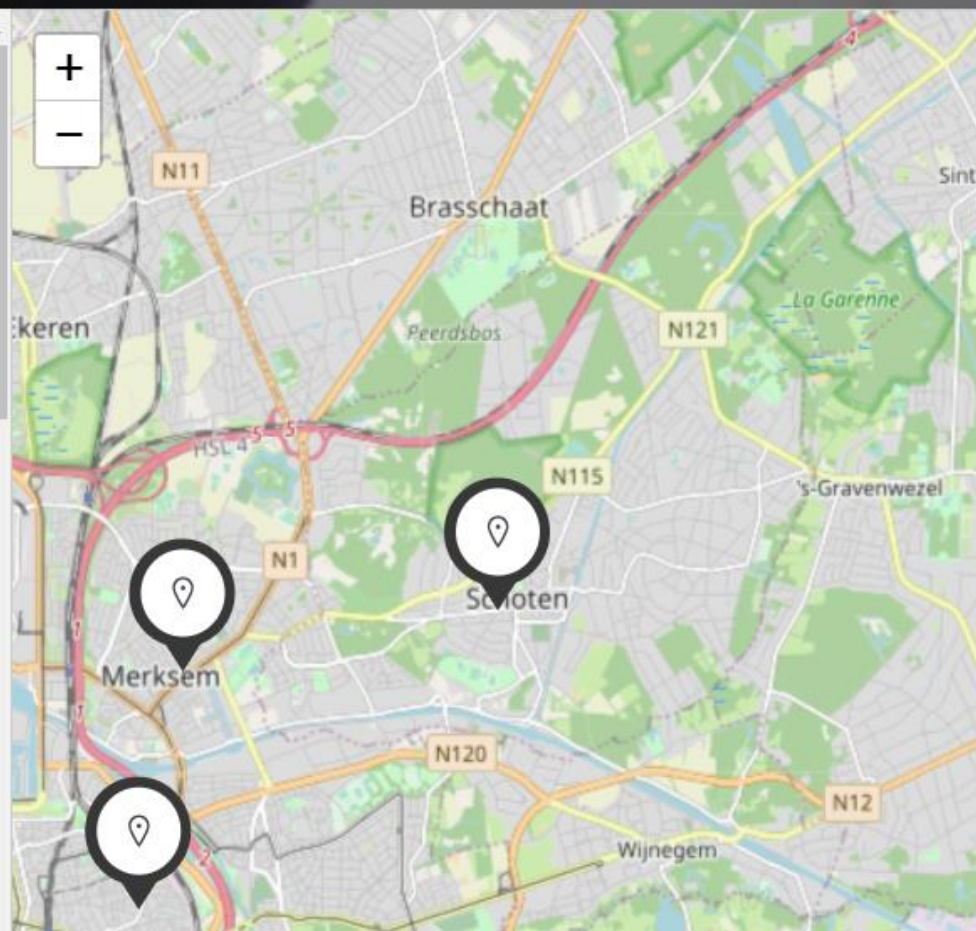
📍 Schoten, Merksem

☎ +32 3 501 79 69

✉ jvantichelen@gmail.com



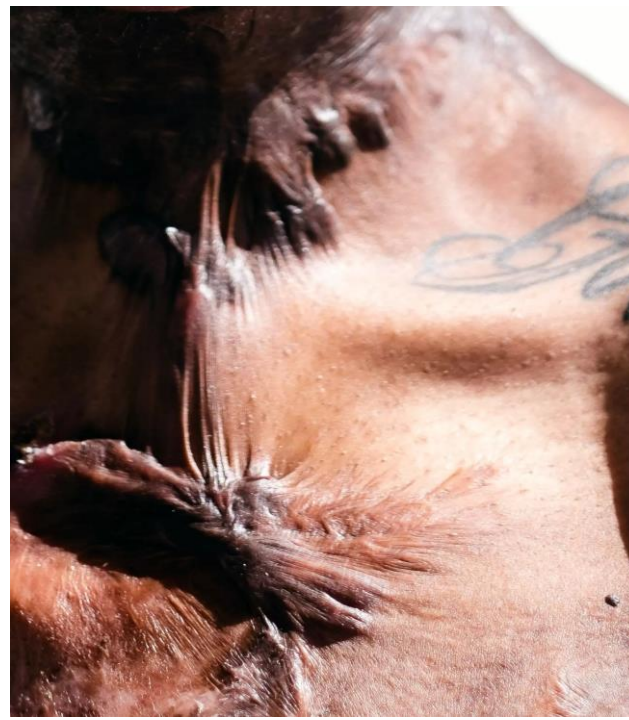
Physical Therapist





LITTEKEN GALLERIJ

- Hypertrofisch litteken
- Brandwonden litteken
- Lineair litteken
- Atrofisch litteken
- Horizontaal keloïd
- Verticaal keloïd
- Klein keloïd



LITTEKENEIGENSCHAPPEN

- Pijn
- Jeuk
- Vascularisatie
- Pigmentatie
- Dikte
- Elasticiteit
- Textuur



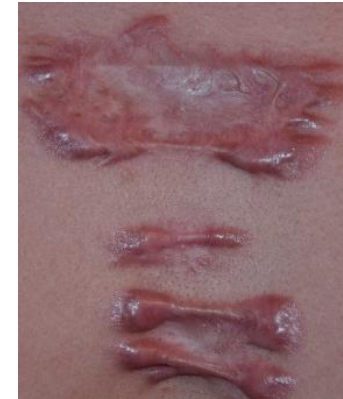
Etiologie van pathologische littekens

- Genetische voorbestemdheid voor keloiden
- Endocrinologische factoren
- Metabole factoren
- Mechanische krachten



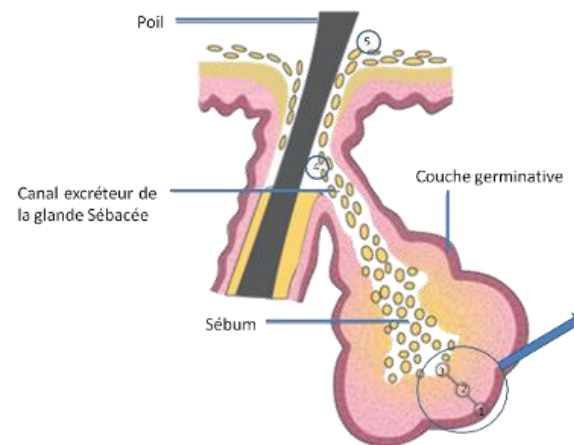
Genetische predispositie voor keloïden

- Afro-amerikaanse patiënten hebben 15 x meer kans op het ontwikkelen van pathologische littekens dan Westerse patiënten.
- Tot op vandaag zijn er bij Japanners, Afro-amerikanen en Han-Chinezen genetische correlaties met keloïde predispositie gevonden op de chromosomen 2q23, 7p11 et 10q23.31.



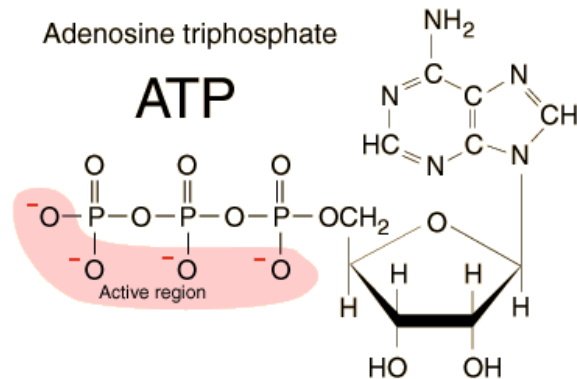
Endocrinologische factoren

- Physiologische hyperactiviteit van de talgklieren
- Weinig keloiden op lichaamsdelen die geen talgklieren bevatten. Voetzolen en handpalmen
- Talgproductie is zeer hoog bij adolescenten en jong volwassenen, bij wie vaak zeer hypertrofe littekens of keloiden te vinden zijn.
- Zwangerschap heeft negatieve invloed op littekengenezing



Metabole factoren

- Men ziet vaak hoge adenosine triphosfaat (ATP) waarden bij mensen met hypertrofische littekens of keloiden.
- Een groot aantal ernstige keloiden gaan vaak samen met verhoogde bloeddruk.
- Er wordt gesuggereerd dat pathologische littekenvorming kan veroorzaakt worden door inadequete voeding rijk aan vetzuren.






Mechanische krachten

- Mechanotransductie
- Mechanomodulatie
- Specificiteit van de anatomische locatie



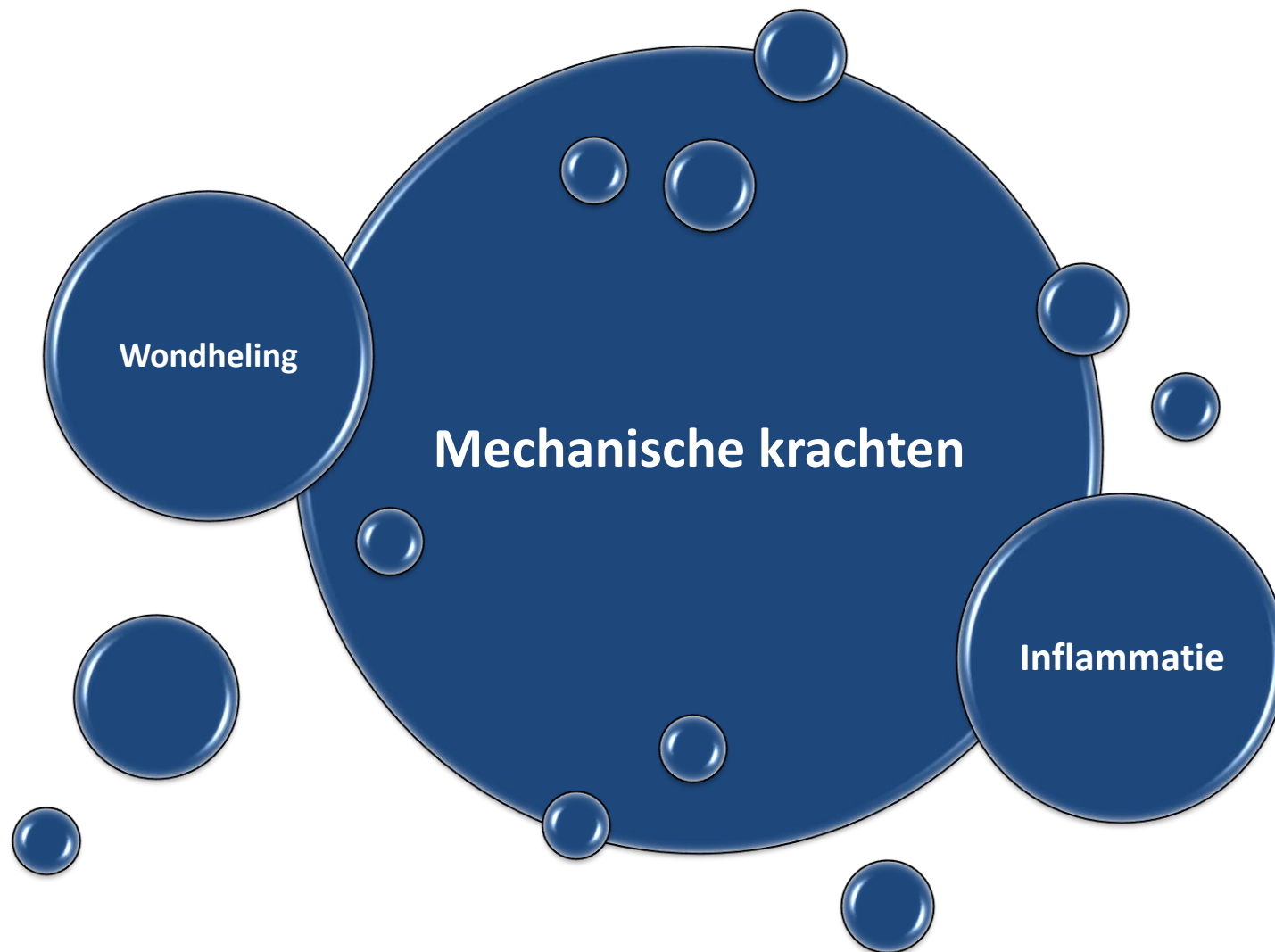
Perspective

Mechanomodulation: Physical Treatment Modalities Employ Mechanotransduction to Improve Scarring

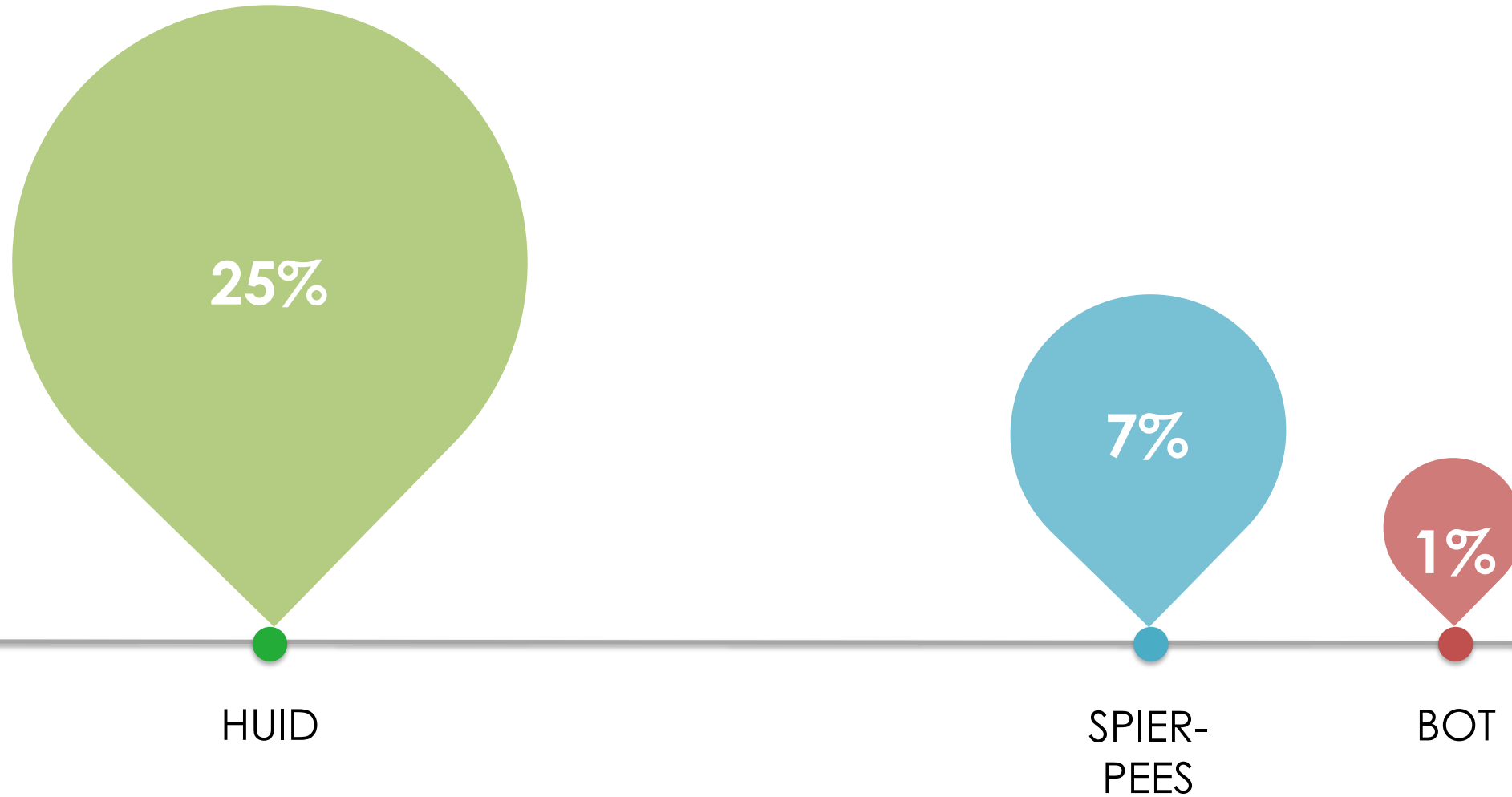
Ulrike Van Daele ^{1,2,*} , Jill Meirte ^{1,2} , Mieke Anthonissen ^{1,2,3}, Tine Vanhullebusch ², Koen Maertens ^{1,4}, Lot Demuyne ² and Peter Moortgat ¹ 

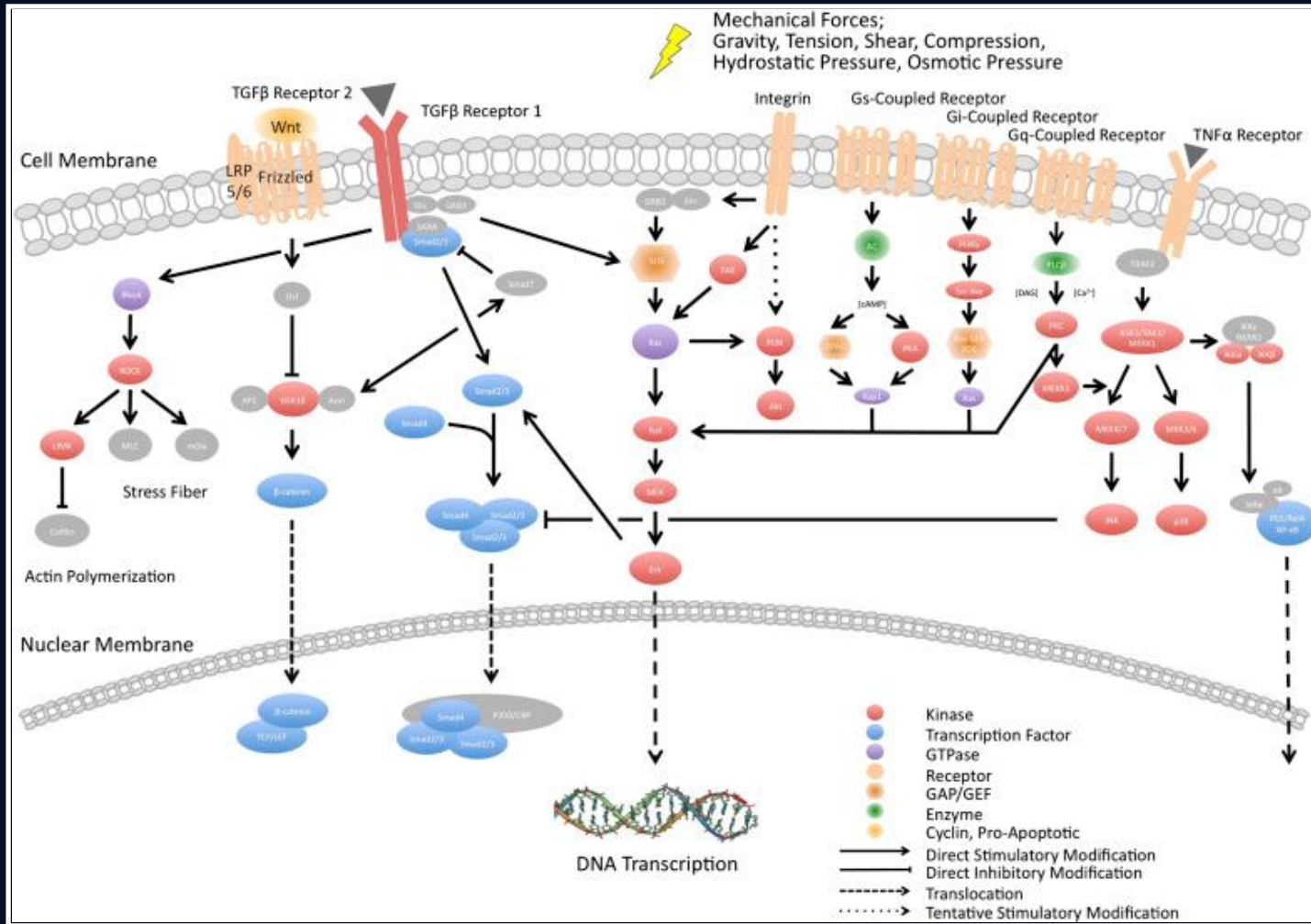
“This perspective article aims to translate research findings at the cellular and molecular levels into working mechanisms of physical anti-scarring interventions. Mechanomodulation of scars applied with the right amplitude, frequency, and duration induces ECM remodeling and restores the ‘tensile’ homeostasis. Depending on the scar characteristics, specific (combinations of) non-invasive physical scar treatments are possible.”





IMPACT VAN EXTERNE MECHANISCHE KRACHTEN





MECHANOTRANSDUCTION IN PHYSICAL SCAR MANAGEMENT

Mechanotransduction converts mechanical stimuli to biochemical signals. Integrins, stretch-activated ion channels, and cytoskeletal filaments help initiate signaling cascades in response to forces. This understanding could be used to improve physical therapy, as mechanotransduction lets cells sense and respond to mechanical forces.

Van Daele, U., Meirte, J., Anthonissen, M., Vanhullebusch, T., Maertens, K., Demuynck, L., & Moortgat, P. (2022). Mechanomodulation: physical treatment modalities employ mechanotransduction to improve scarring. *European Burn Journal*, 3(2), 241-255.

A high-angle, wide shot of a multi-lane highway with traffic. The road is divided by a central metal guardrail. On the left side, there are green embankments and some road signs. The traffic consists of various vehicles including cars, trucks, and a large white box truck in the foreground. The text 'Mechanosignaling pathways in normal skin' is overlaid in white on a dark grey semi-transparent background in the center of the image.

Mechanosignaling pathways
in normal skin



Mechanosignaling pathways
in burn scars

MECHANOMODULATION

Control the dose dependent factors that influence scarring outcomes and guide cell behavior.

- Intensity
- Frequency
- Duration
- Timing



BEHANDELING – DOEL



- EVOLUTIEVE (JONGE) LITTEKENS
 - Wondheling versnellen
 - Inflammatie afremmen
 - Mechanomodulatie
- UITGEDOOFDE (OUDE) LITTEKENS
 - Reactivering van het litteken

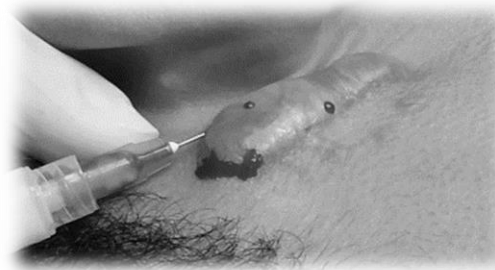


BEHANDELMOGELIJKHEDEN

NIET-INVASIEVE BEHANDELINGEN



SEMI-INVASIEVE BEHANDELINGEN



INVASIEVE CHIRURGIE



Niet-invasieve zelfzorg



HOW TO TREAT SCARS?



Hydraterende crèmes



Siliconen therapie



Topicale behandelingen



Camouflage/Maquillage



Druktherapie



Oefentherapie



Topicale behandelingen

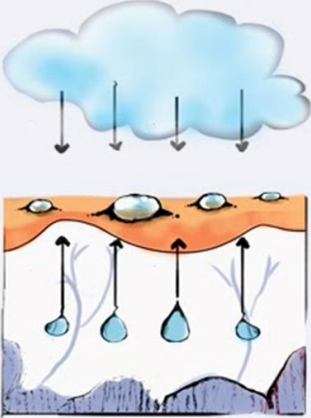
In littekenzorg:

- Controleren van inflammatie, droge huid, jeuk, ECM remodellering



Littekenhydratatie - Ingrediënten

Humectants

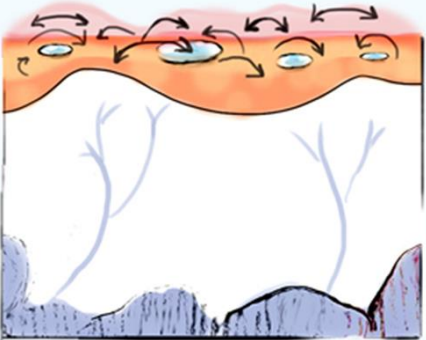


How they work:
Humectants work like magnets, drawing in water from the environment as well as from deep within the skin.

Pros	Cons
<ul style="list-style-type: none"> o Cheap to manufacture o Smooth texture 	<ul style="list-style-type: none"> o Can cause skin to become drier after prolonged use

OCCLUSIVE AGENTS

How they work:
Occlusive agents work as a physical block, preventing water from evaporating from the skin to keep it hydrated.



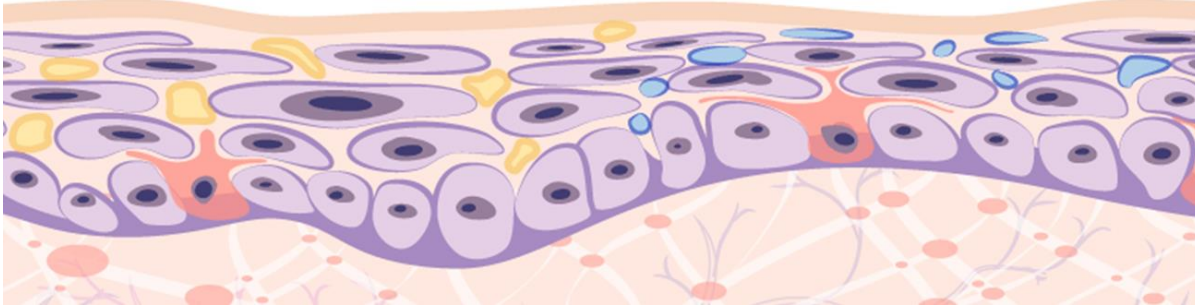
Pros	Cons
<ul style="list-style-type: none"> o Effective 	<ul style="list-style-type: none"> o Tacky/heavy texture

EMOLLIENTS


a type of moisturizer

MIMIC LIPIDS + STIMULATE REPAIR

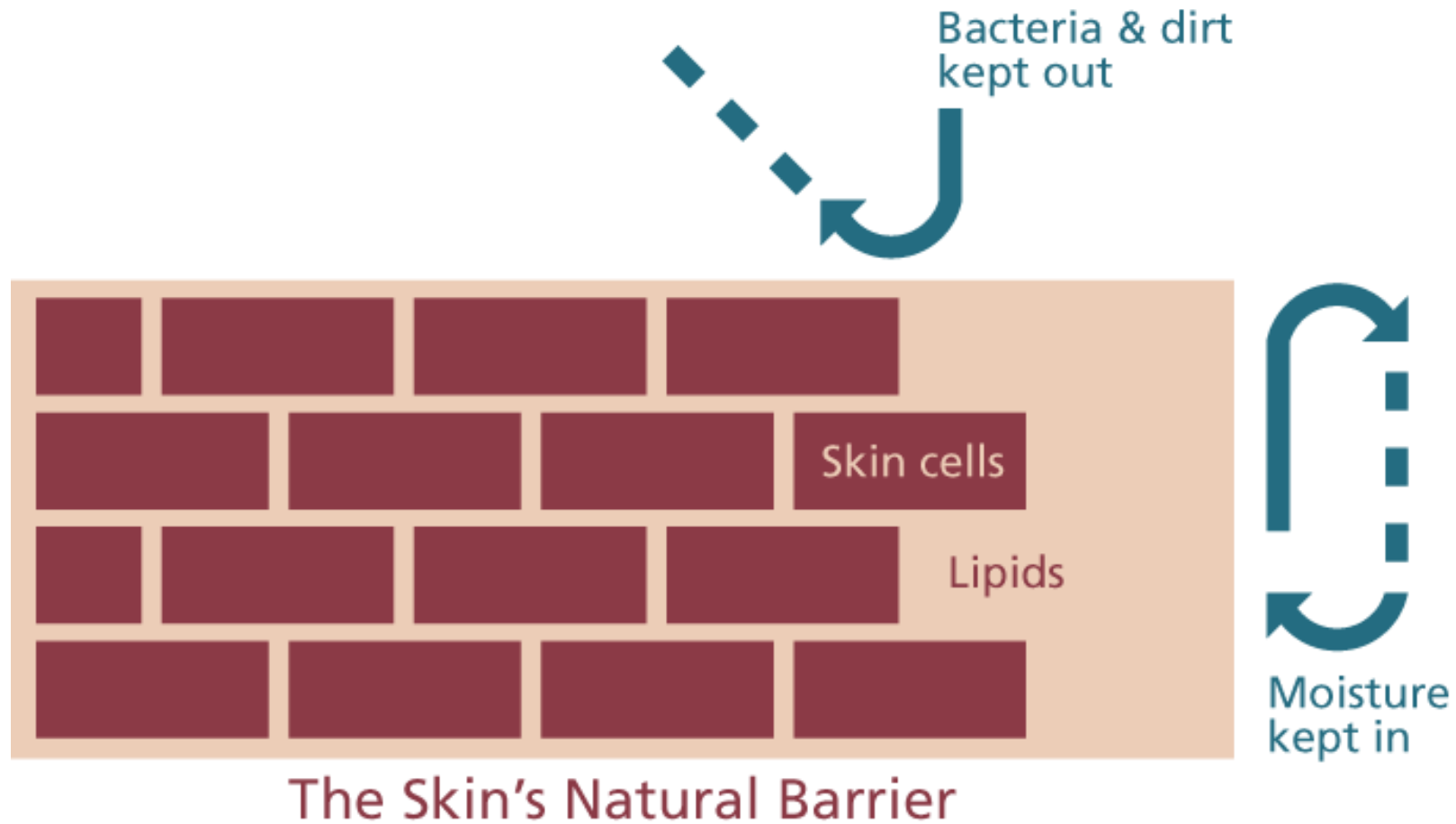
- o EPIDERMAL LIPID
- o EMOLLIENT MOISTURIZER



Free Fatty Acids




Herstel Huidbarrière



Topicale behandeling: Target

Hydratatie

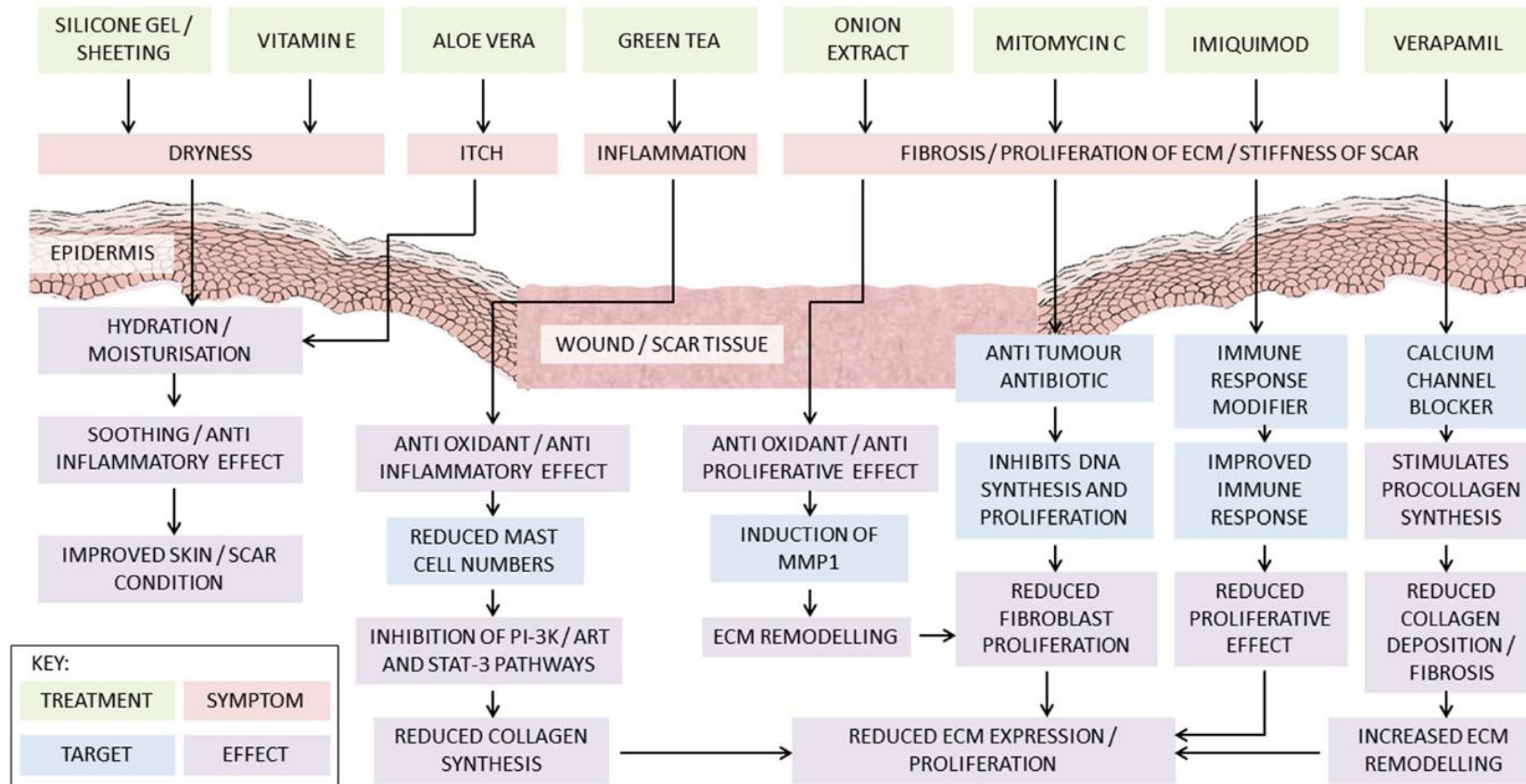
- Stratum Corneum
- Transepidermale route
- Effect afhankelijk van water uptake
- Moisturizer

ECM remodelling

- Dermis
- Transfolliculaire route
- Effect afhankelijk van dikte litteken
- Anti-fibrotische component
- Transepidermal delivery



G.P. Sidgwick et al. Arch Dermatol Res (2015)



DRUKTHERAPIE



DRUKTHERAPIE – WAAROM?

- Druktherapie
 - Op maat gemaakte kledingstukken van elastische stoffen
 - Plastic maskers met een siliconen deklaag
- Sinds 1970: behandeling van brandwonden littekens
- Dit is gebaseerd op toegenomen mate van uitrijping van littekens of gebrek aan verdere ontwikkeling van hypertrofische littekens welke is waargenomen bij gebruik van een bepaalde mate van druk bij individuele patiënten.



Drukkledij: Timing van applicatie

Vroegtijdig starten (< 3 maanden) met druktherapie leidt tot betere resultaten dan laatstijdig toepassen van druktherapie (> 6 maanden)

Te vroeg stoppen met druktherapie leidt tot dikkere en contracterende littekens.

Druktherapie moet volgehouden worden tot de littekens uitgerijpt zijn en de roodheid niet meer verandert.



DRUKTHERAPIE – AANBEVELINGEN

- Wordt beschouwd als gouden standaard bij behandeling van hypertrofische (brandwonden) littekens
- Advies: druktherapie tot 23 uur per dag voor een periode van tenminste 12 maanden
- Kleding die specifiek is gemeten en passend is gemaakt voor de patiënt door een bekwame technicus
- Voor een optimaal resultaat moet drukkledij vervangen worden om de 3 maanden.



Meta-Analyse Ai et al. 2017

SCIENTIFIC REPORTS

OPEN The effectiveness of pressure therapy (15–25 mmHg) for hypertrophic burn scars: A systematic review and meta-analysis

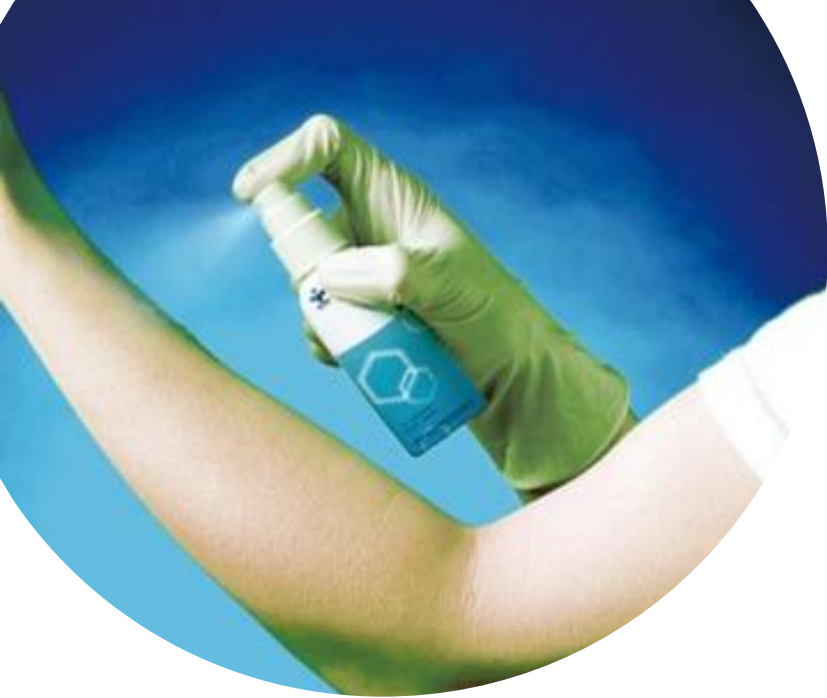
Received: 23 August 2016
Accepted: 02 December 2016
Published: 05 January 2017

Jin-Wei Ai^{1,2,*}, Jiang-tao Liu^{2,*}, Sheng-Duo Pei^{3,*}, Yu Liu², De-Sheng Li², Hong-ming Lin² & Bin Pei^{1,2}

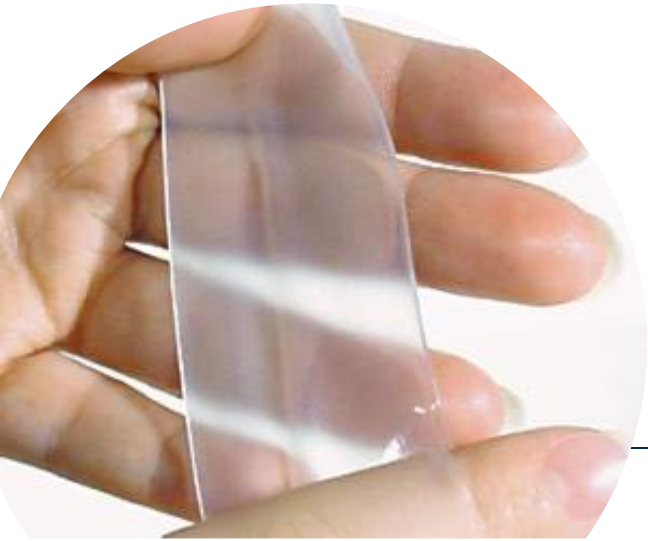
“Our analysis indicated that patients with HS who were managed with PT (15–25 mmHg) showed significant improvements.”



SILICONEN



- Wordt beschouwd als “standard of care” bij alle littekens
- Silicone gel sheets bij brandwondenlittekens
- Silicone gel of spray bij chirurgische littekens



SILICONEN – AANBEVELINGEN

GEL SHEETS

- Littekenhuid reinigen voor applicatie
- Gemiddeld 12 tot 16 uur/dag, progressief opbouwen per 2 (tot 4) uur/dag
- Per 2 tot 3 maanden vervangen
- Extra fixatie met tape of verband/drukkledij
- Reinigen met milde zeep 1x/dag; koken 1x/week
- Let op: huidirritatie of -uitslag
 - Gebruik van siliconen stoppen
 - Advies therapeut/arts
 - Patch test (huidreactie op siliconen)

GEL

- Littekenhuid reinigen voor applicatie
- Tweemaal daags aanbrengen
- Louter een dun laagje gel is nodig
 - Richtlijn: droogtijd < 1 minuut



Cochrane Review O'Brien 2013



**Cochrane
Library**

Cochrane Database of Systematic Reviews

Silicone gel sheeting for preventing and treating hypertrophic and keloid scars (Review)

O'Brien L, Jones DJ

“There is weak evidence of a benefit of silicone gel sheeting as a prevention for abnormal scarring in high-risk individuals. Trials evaluating silicone gel sheeting as a treatment for hypertrophic and keloid scarring showed improvements in scar thickness and scar colour but are of poor quality and highly susceptible to bias.”



Preventie van abnormale littekenvorming

Zes studies toonden aan dat behandeling met silicone gel sheets het risico op abnormale littekenvorming doet dalen.



Cochrane Review O'Brien et al. 2013



Can a cohesive silicone bandage outperform an adhesive silicone gel sheet in the treatment of scars? A randomised comparative trial.

Moortgat, Peter¹; Meirte, Jill, PhD^{1,2}; Maertens, Koen^{1,3}; Lafaire, Cynthia, MD^{1,4}; De Cuyper, Lieve, MD^{1,4}; Anthonissen, Mieke, PhD^{1,5,6}

Plastic and Reconstructive Surgery: December 27, 2018 - Volume PRS Online First - Issue - p
doi: 10.1097/PRS.0000000000005369
Original Article: PDF Only



“An elastic cohesive silicone bandage seems to outperform silicone gel sheets for vertical elasticity when treating hypertrophic burn scars”

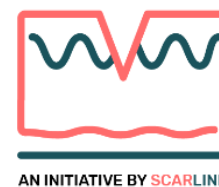
“This was probably due to the unique microstructure of the bandage which ensured a standardised pressure together with uninterrupted contact with the skin.”



Aanbevelingen voor silicone-therapie

- Level of evidence : 1-
- Meestal studies van lage kwaliteit met hoog risico op bias
- Veelal gesponsord door de industrie
- EBM ?





HOW TO TREAT SCARS?

AN INITIATIVE BY SCARLINK

Non-Invasive Specialist Treatments



Mobilization



Scar Massage



Shockwave Therapy



Taping



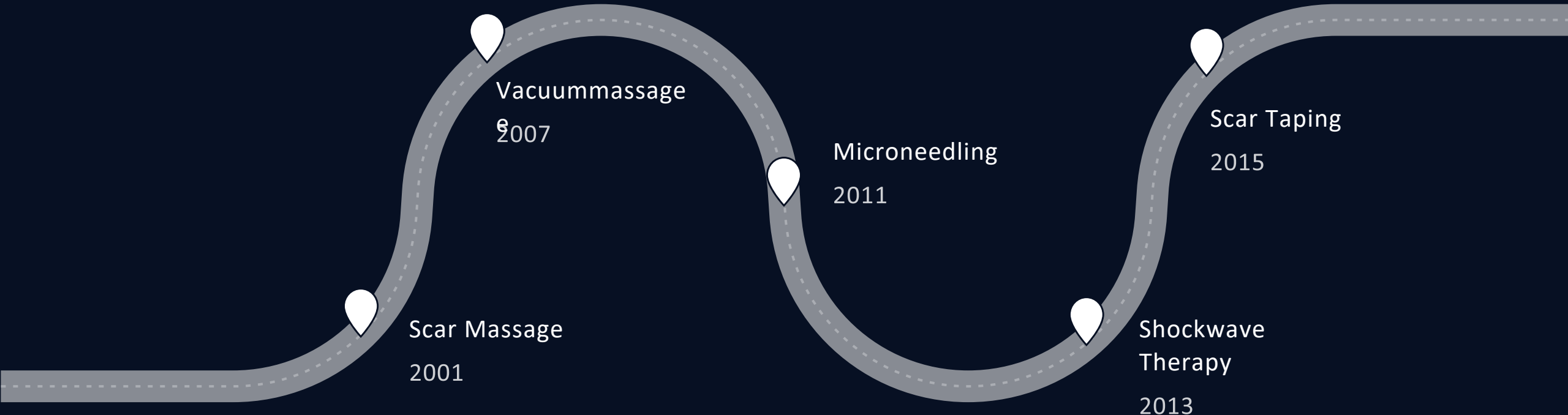
Vacuum Massage





PHYSICAL SCAR MANAGEMENT

INTRODUCING NEW TECHNIQUES AT OSCARE



Littekenmassage en micro- mobilisaties



Gliding Technique



Skin fold technique







Splitting up technique



REVIEW

Effects of scar massage on burn scars: A systematic review and meta-analysis

Tsai Rung Lin MSN, RN, PhD Student^{1,2}  | Fan-Hao Chou PhD, RN, FAAN, Professor^{1,3}  |
Hsiu-Hung Wang PhD, RN, FAAN, Professor^{1,3}  | Ruey-Hsia Wang PhD, RN, FAAN,
Professor^{1,3} 

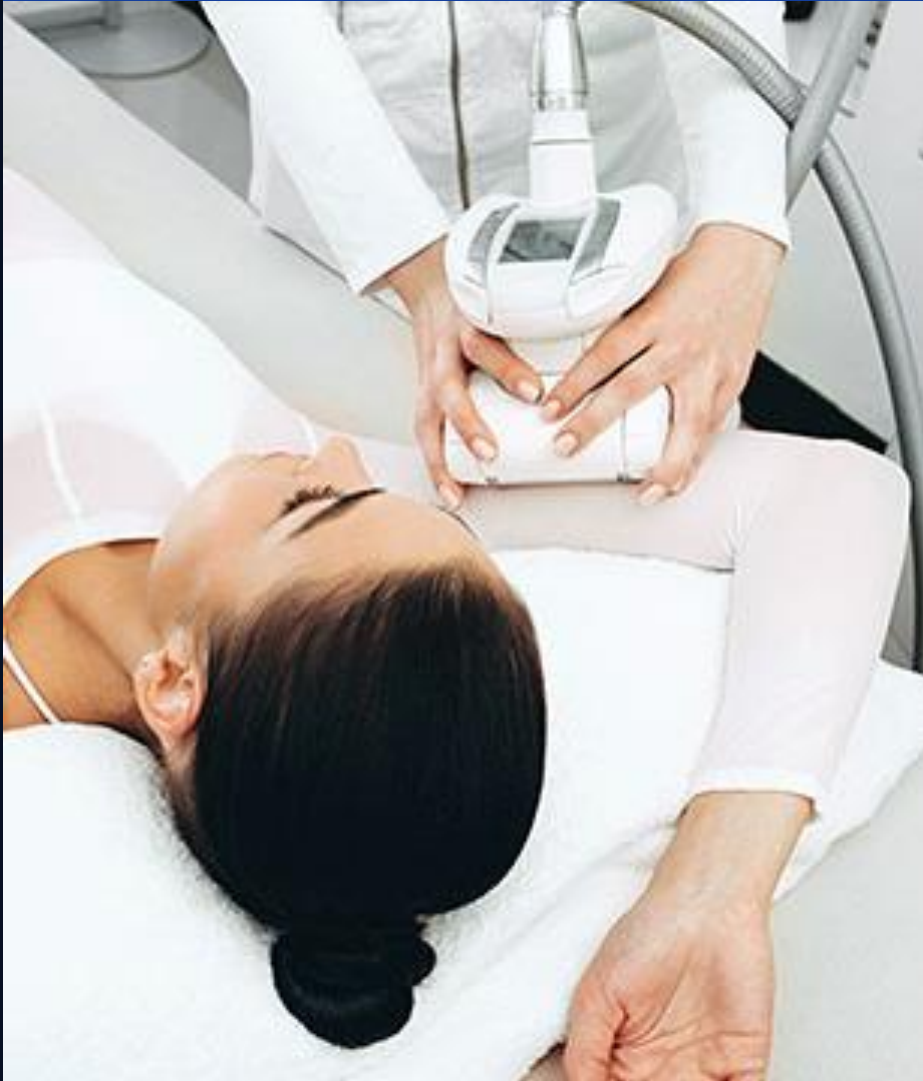
“The meta-effects of scar massage among burn patients are significantly improved scar formation and reduced pruritus and anxiety. Providing scar massage is feasible and effective for burn patients. Future research should evaluate its long-term effects.”



Aanbevelingen voor littekenmassage

- Level of evidence : 2-
- Meestal studies met hoog risico op bias
- Weinig basic research
- Best practice





VACUUMMASSAGE

Endermologie is a type of massage therapy that uses a handheld device with rollers and suction to improve the appearance of scars. The advantages of endermologie for scar treatment include: reducing scar thickness and size, softening scar tissue, improving skin elasticity, and minimizing discoloration. Regular endermologie sessions can help make scars smoother, flatter, and less noticeable over time.

Moortgat, Peter, et al. "The physical and physiological effects of vacuum massage on the different skin layers: a current status of the literature." *Burns & trauma* 4 (2016).

Meirte, Jill, et al. "Short-term effects of vacuum massage on epidermal and dermal thickness and density in burn scars: an experimental study." *Burns & Trauma* 4 (2016).

Anthonissen, Mieke, et al. "Influence on clinical parameters of depressomassage (part I): the effects of depressomassage on color and transepidermal water loss rate in burn scars: a pilot comparative controlled study." *Burns* 44.4 (2018): 877-885.

LITTEKEN EN LITTEKENFIBROSE



TOEPASSINGEN:

- > Recente en oude littekens (bv.: keizersnede)
- > Chirurgische littekens
- > Huidtransplantaties
- > Sclerodermie
- > Brandwonden

HANDELEN:

- > Om littekenvorming te bevorderen of te defibroseren
- > Van de eerste fase met verband (rondom) tot het zeer oude litteken
- > Erop indien schoon, gesloten en niet ontstoken (vitropressietest)

VOORDELEN VOOR DE PATIËNT-BEHANDELAAR:

- > Nauwkeurige weefselopname op moeilijk te bereiken plaatsen
- > Vroegtijdige en pijnloze behandeling
- > Regressie van de fibrose
- > Doeltreffende drainage
- > Beperking van verklevingen
- > Betere beweeglijkheid van de gewrichten
- > Bewezen tijds- en efficiëntiewinst



LITTEKEN EN LITTEKENFIBROSE

Littekenfibrose scheenbeen



Schildklierlitteken



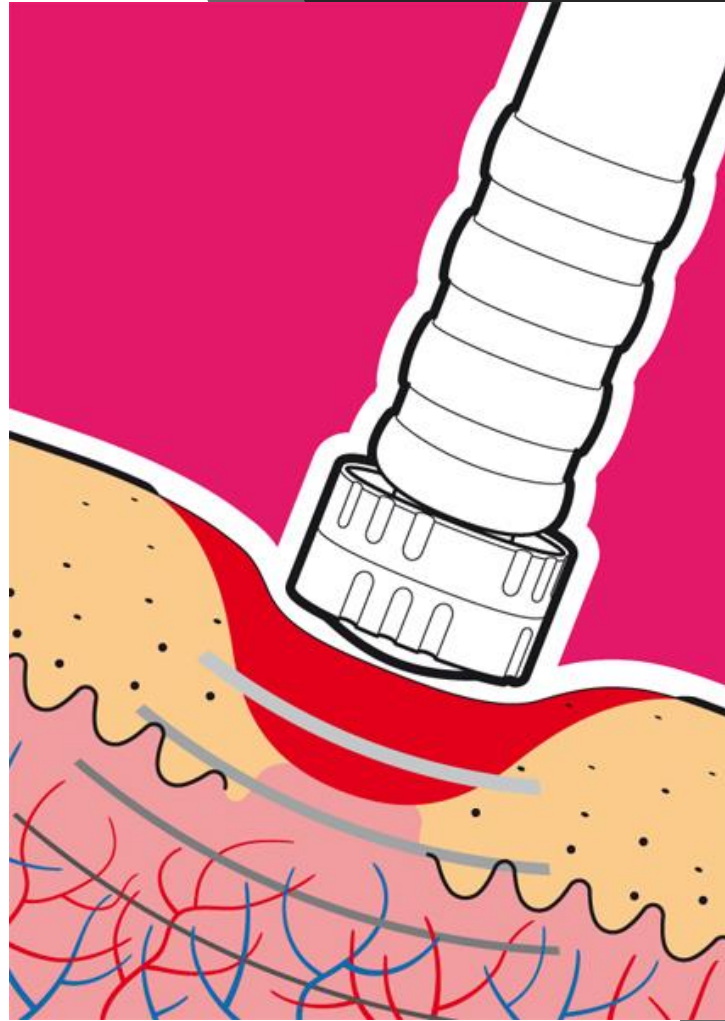


SHOCKWAVE THERAPY FOR BURN SCARS

Shockwave therapy uses pulses of high-pressure acoustic waves to treat burn scars. It accelerates healing by triggering the body's natural healing response and promoting regeneration of healthy tissue. Shockwave therapy shows promise for improving the appearance and flexibility of thick, contracted burn scars.

Moortgat, Peter, et al. "The effects of shock wave therapy applied on hypertrophic burn scars: a randomised controlled trial." *Scars, Burns & Healing* 6 (2020): 2059513120975624.

Effecten van SWT op wondheling




- Inhibitie van cel apoptose
- Genregulatie van genen betrokken in verkleefing
- Toename van VEGF en NO
- Toename van cel proliferatie
- caveolin-1 and β 1-integrin zijn betrokken bij de SW-induced activatie van angiogenese
- Meta-analyse toonde aan dat SWT beter werkte bij acute en chronische weke delen letsels dan CWT

Effects of SWT on scars

- Downregulation of alpha-SMA, myofibroblast activity, TGF- β 1 expression and fibronectin
- Upregulation dermal fibroblast like phenotype
- Synergistic alterations in pro- and anti-fibrotic proteins
- Amelioration of function
- Decrease of pain
- Improved elasticity



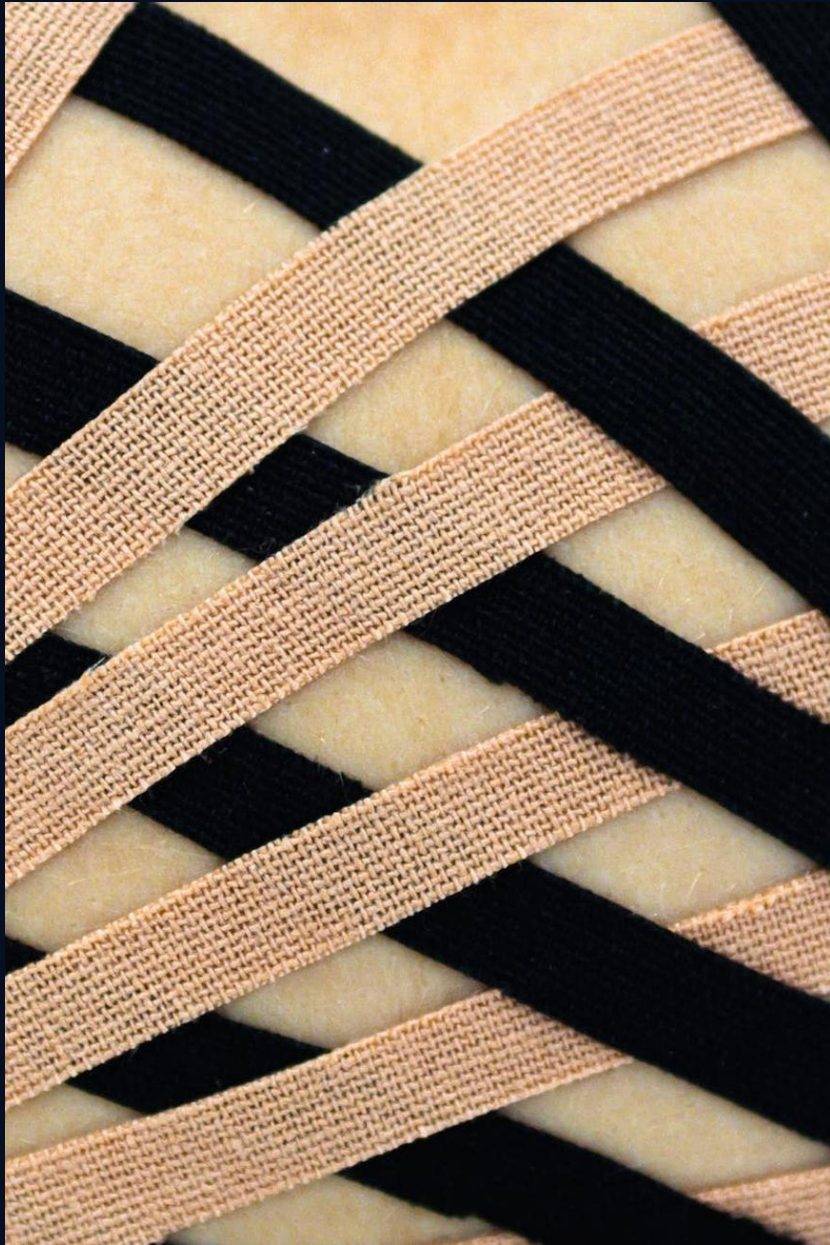
The effects of shock wave therapy applied on hypertrophic burn scars: a randomised controlled trial

Scars, Burns & Healing
Volume 6: 1–10
DOI: 10.1177/2059513120975624
Article reuse guidelines:
sagepub.com/journals-permissions
© The Author(s) 2020
journals.sagepub.com/home/sbh


Peter Moortgat¹ , Mieke Anthonissen^{1,2}, Ulrike Van Daele^{1,3},
Tine Vanhullebusch^{1,3}, Koen Maertens^{1,4}, Lieve De Cuyper^{1,5},
Cynthia Lafaire^{1,5} and Jill Meirte^{1,6}

“ESWT can give added value to the non-invasive treatment of hypertrophic scars more specifically to improve elasticity already in the first three months after wound closure.”

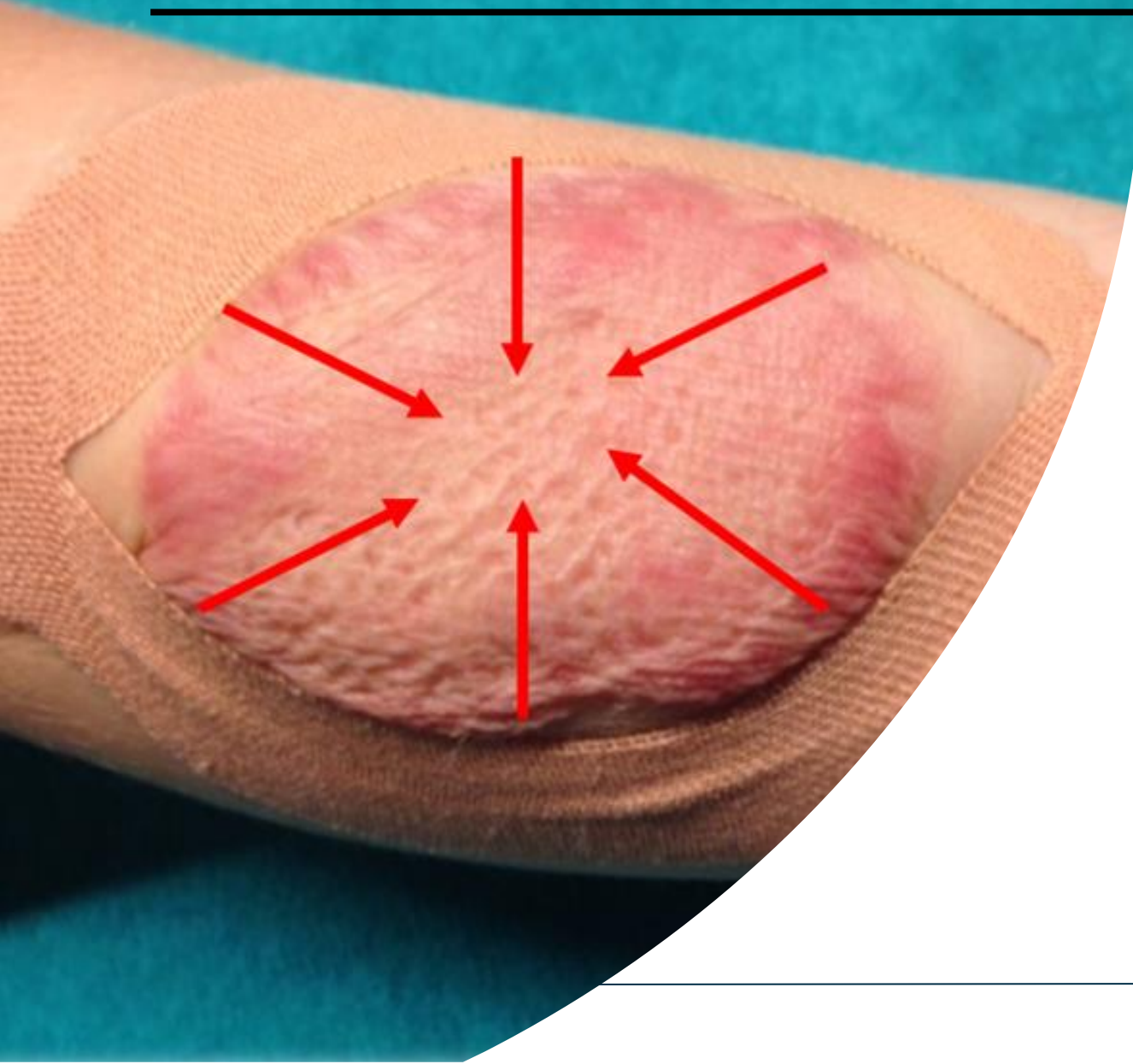




KINESIO TAPE

Kinesio tape is an elastic cotton strip with an acrylic adhesive that is used for the treatment of sports injuries and a variety of other disorders. The stretchy tape can be applied in order to facilitate movement, provide support, and support, and relieve pain. When applied correctly, kinesio tape gently lifts the skin, the skin, which is believed to improve blood and lymph flow to the area. This can reduce inflammation and swelling.

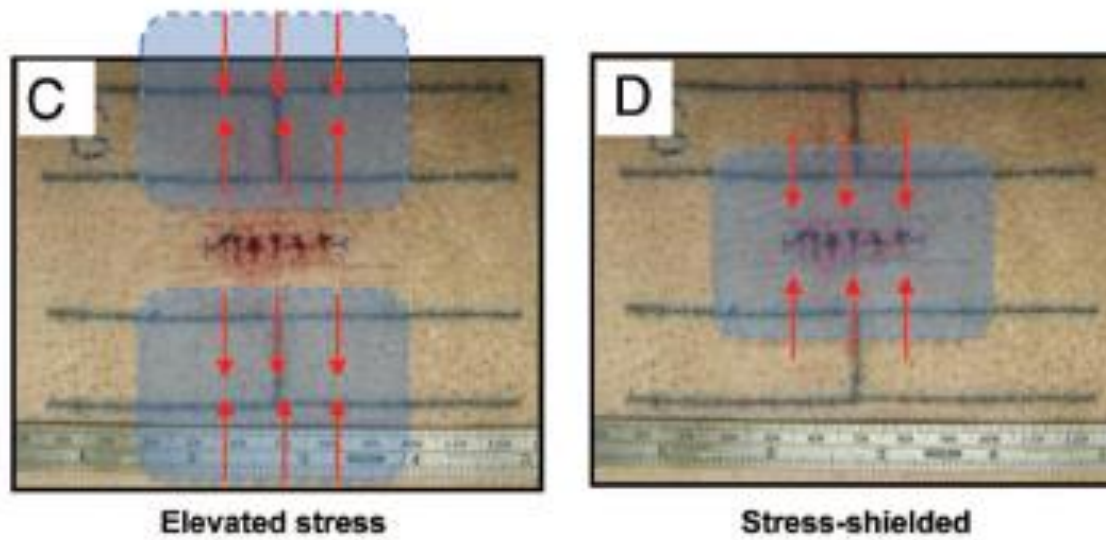
TAPING – SPANNINGSVERLAGENDE THERAPIE



Mechanical offloading of incisional wounds is associated with transcriptional downregulation of inflammatory pathways in a large animal model

Michael Januszky[†], Victor W Wong[†], Kirit A Bhatt, Ivan N Vial, Josemaria Paterno, Michael T Longaker, and Geoffrey C Gurtner*

Department of Surgery; Division of Plastic and Reconstructive Surgery; Stanford University School of Medicine; Stanford, CA USA



TAPING

- Mechanotransductie
- Spanning wegnemen op wonden en littekens doet de kans op hypertrofie dalen (Huang 2011, Gurtner 2011)
- Kinesio-tape (Moortgat 2015)
- Embrace (Longaker 2014)
- Zipline (Tanaka 2016)





Semi-Invasive Specialist Treatments



HOW TO TREAT SCARS?



PDL laser



Corticosteroid Injections



Intense Pulsed Light



Injectables



Non-ablative Fractional Laser



Microneedling



Ablative Fractional Laser





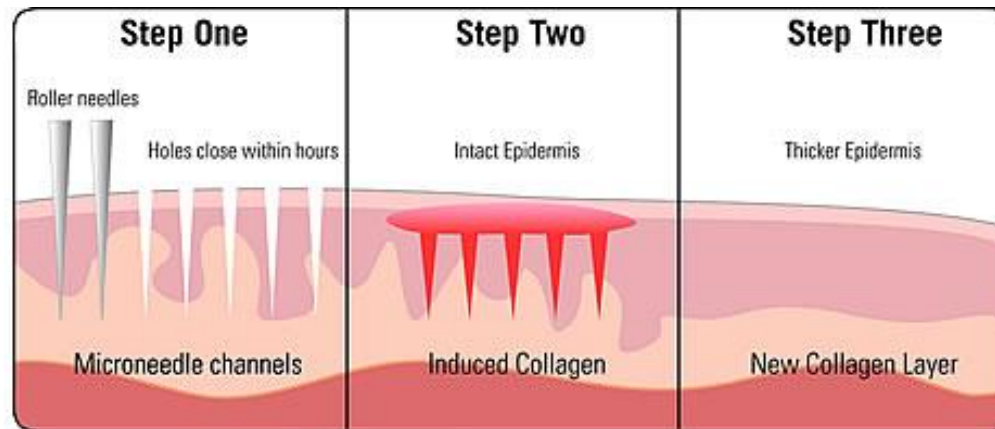
MICRONEEDLING

Microneedling has emerged as a promising therapeutic modality for the amelioration of burn scars. Through the controlled application of micro-penetrative needles, this procedure stimulates collagen production and enhances dermal remodeling. The resultant structural improvements lead to enhanced scar texture, reduced erythema, reduced thickness, and increased pliability. Furthermore, microneedling allows for precise targeting of scar tissue, rendering it a valuable adjunct or standalone intervention in the multifaceted approach to burn scar management.

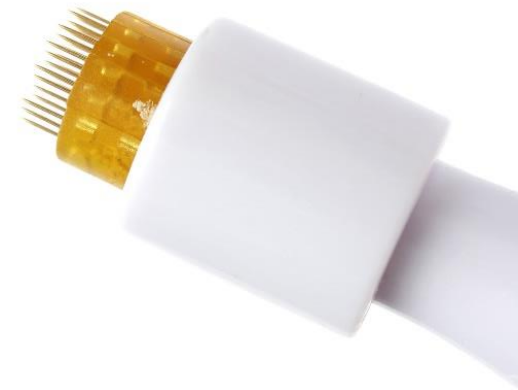
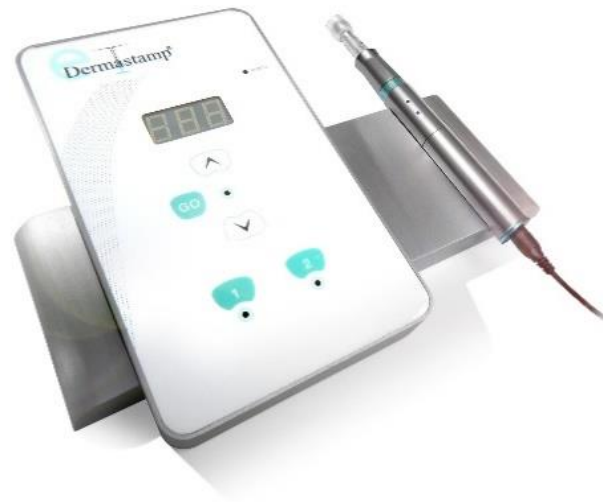
Moortgat, Peter, et al. "The beneficial effects of repetitive medical needling treatments on dermal thickness of burn scars." *Wound Repair and Regeneration* 26.2 (2016).

MICRONEEDLING

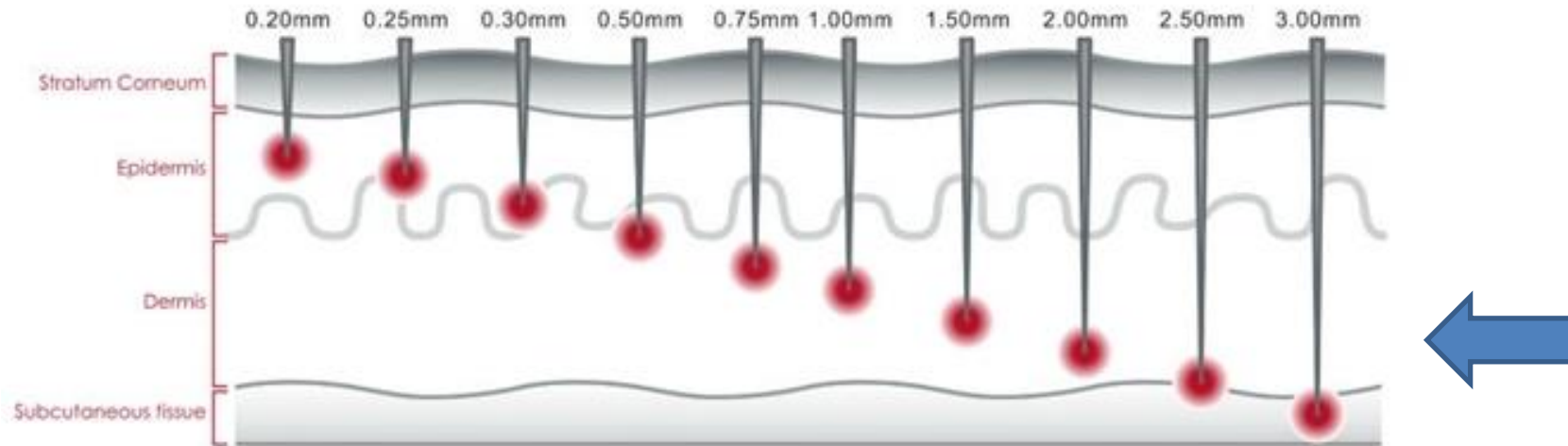
De huid wordt gepuncteerd d.m.v. een toestel met zeer fijne naaldjes, wat leidt tot ECM remodellering.



MICRONEEDLING - APPARATEN



MICRONEEDLING - NAAALDLENGTE

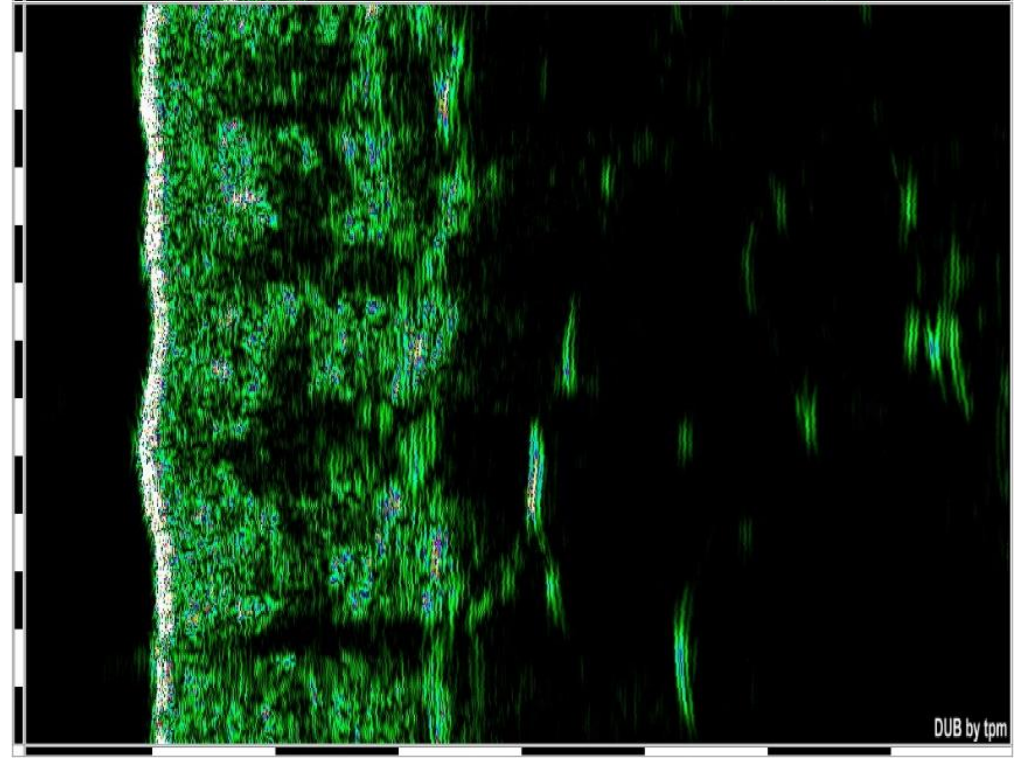


- De keuze van naaldlengte is afhankelijk van de diepte van de laesie.





PATIENT 2: F – 57Y - HALS



PATIENT 3: ENKEL-VOET



baseline



behandeling 1



behandeling 3



behandeling 5



PATIENT 3: ENKEL-VOET



baseline



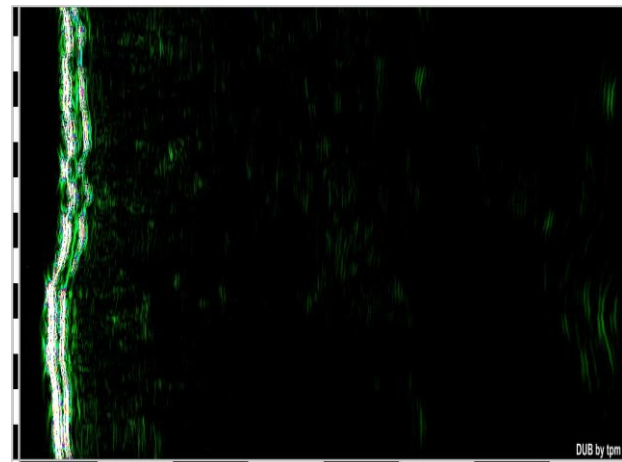
behandeling 1



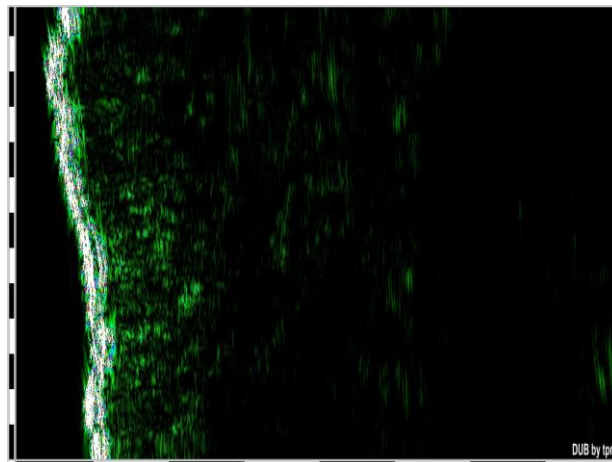
behandeling 5



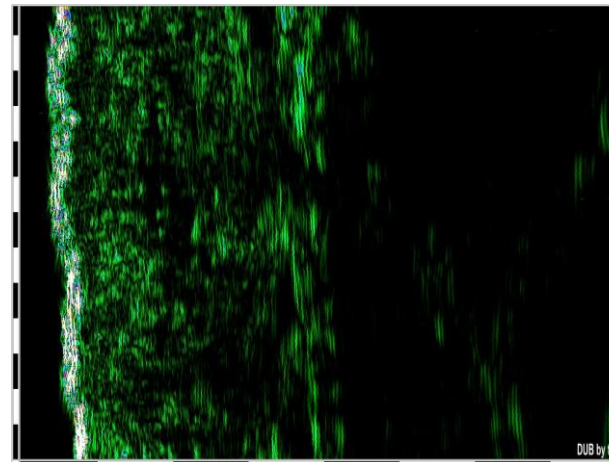
ULTRASOUND SCAN - HUIDDIKTE



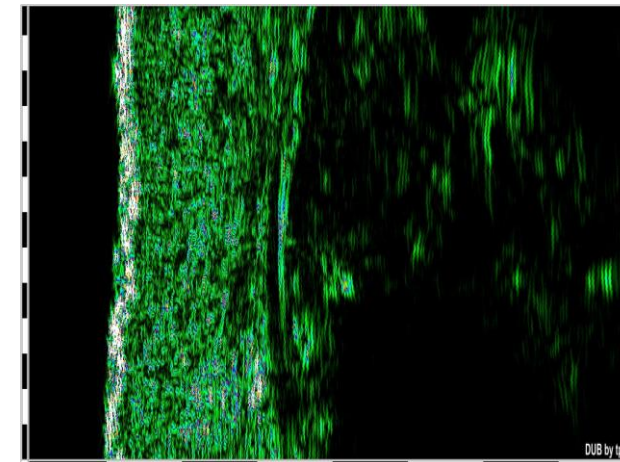
baseline



behandeling 1



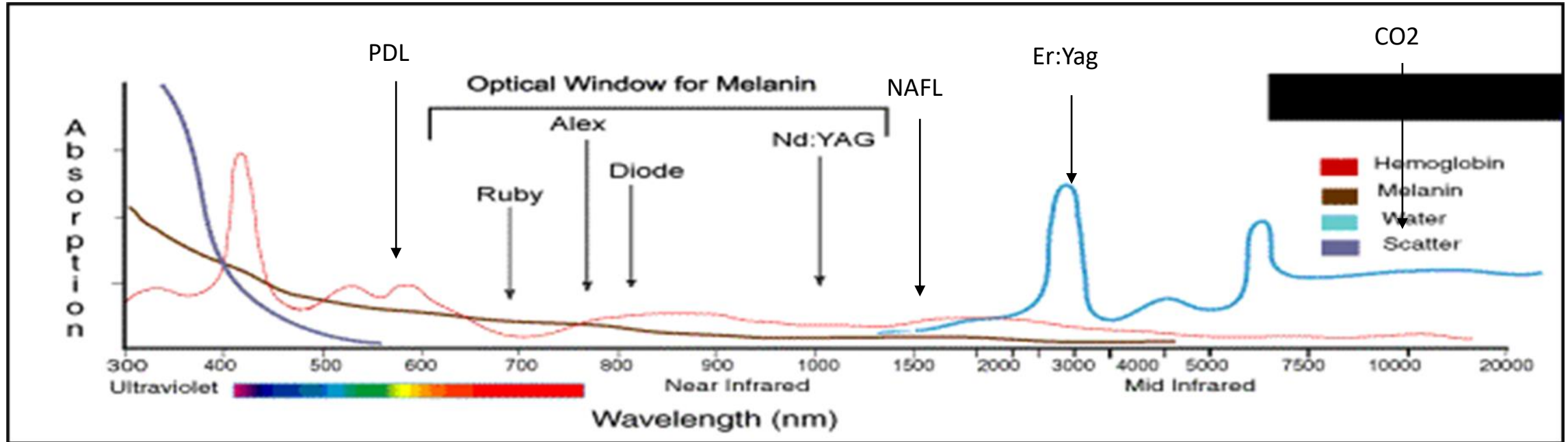
behandeling 3



behandeling 5



Light Amplification by Stimulated Emission of Radiation



Selective Photothermolysis

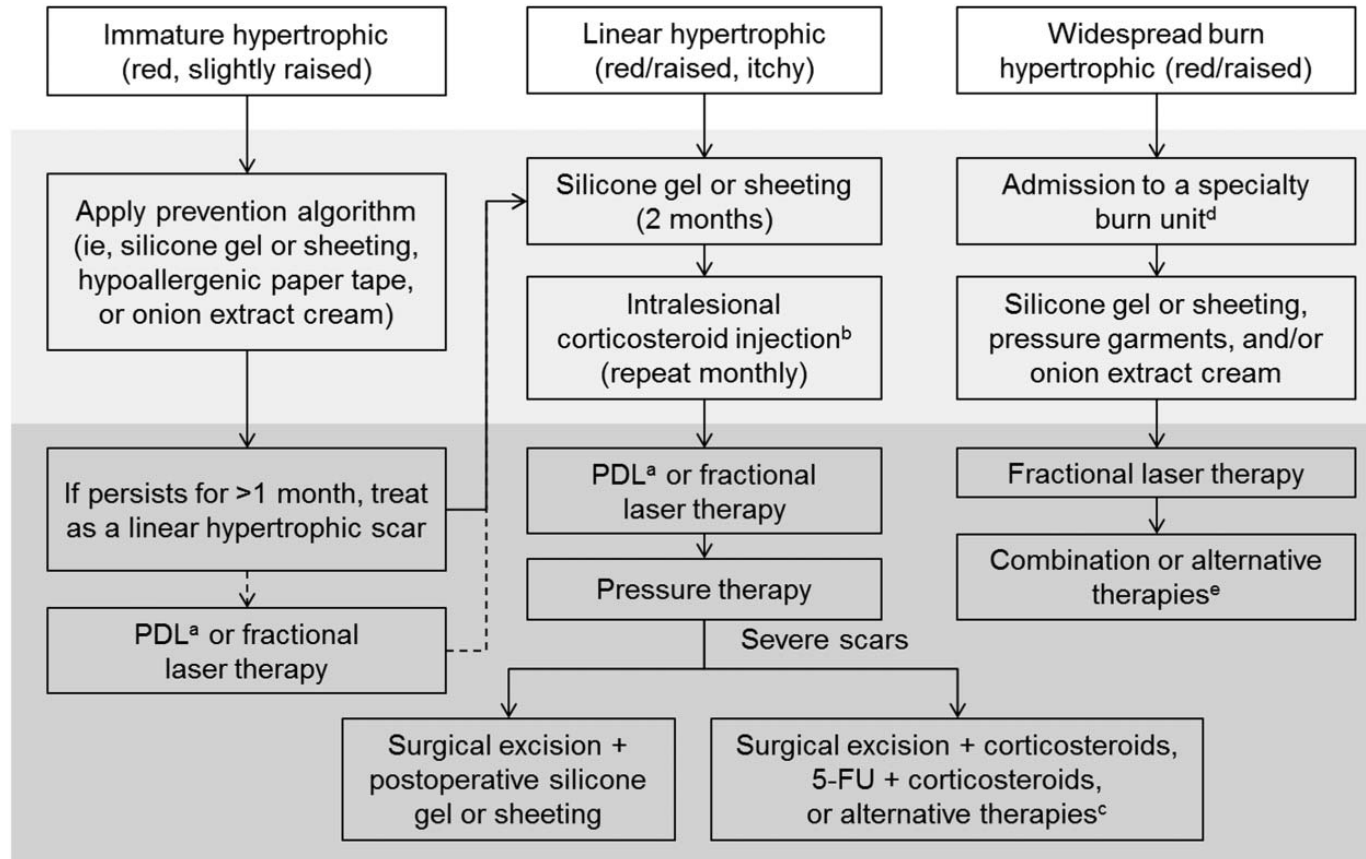


University
of Antwerp

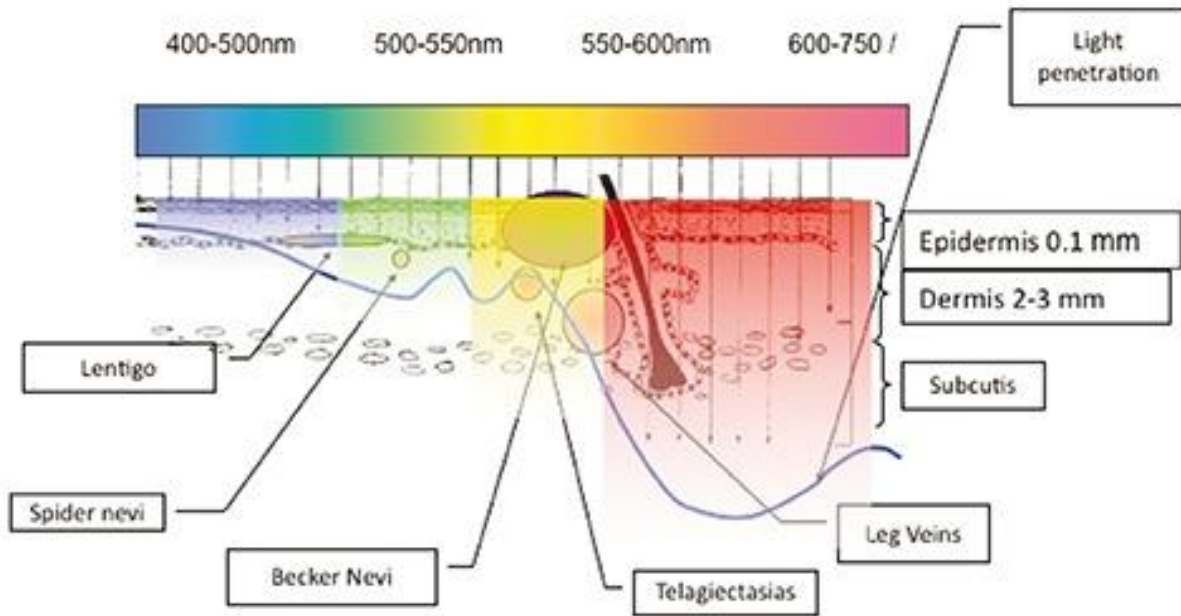


Updated International Clinical Recommendations on Scar Management: Part 2—Algorithms for Scar Prevention and Treatment

MICHAEL H. GOLD, MD,* MICHAEL MCGUIRE, MD,^{†‡} THOMAS A. MUSTOE, MD,[§]
 ANDREA PUSIC, MD,^{||} MUKTA SACHDEV, MD,[¶] JILL WAIBEL, MD,[#]
 AND CRYSTAL MURCIA, PhD^{**}



IPL



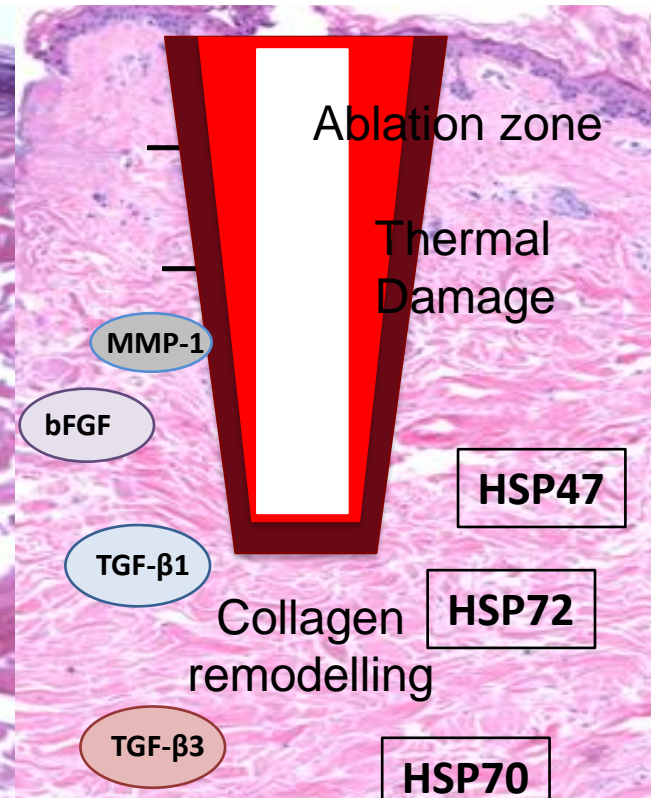
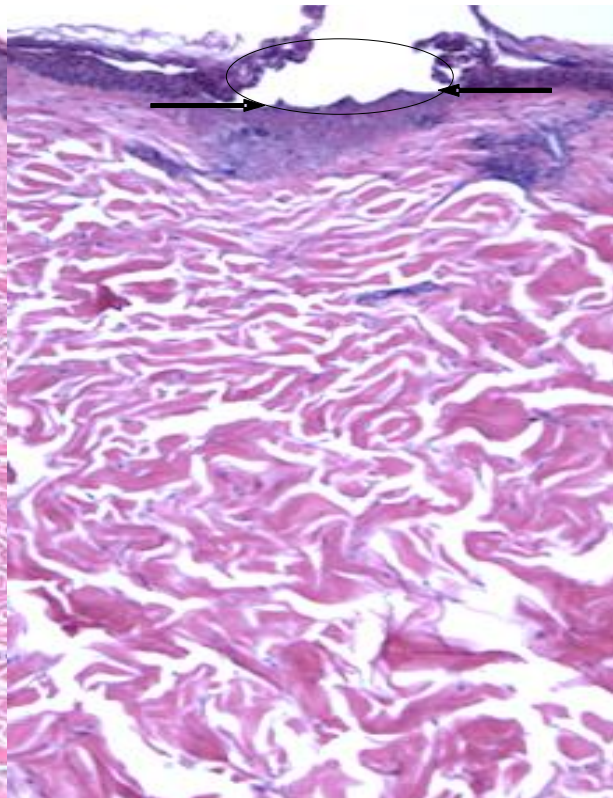
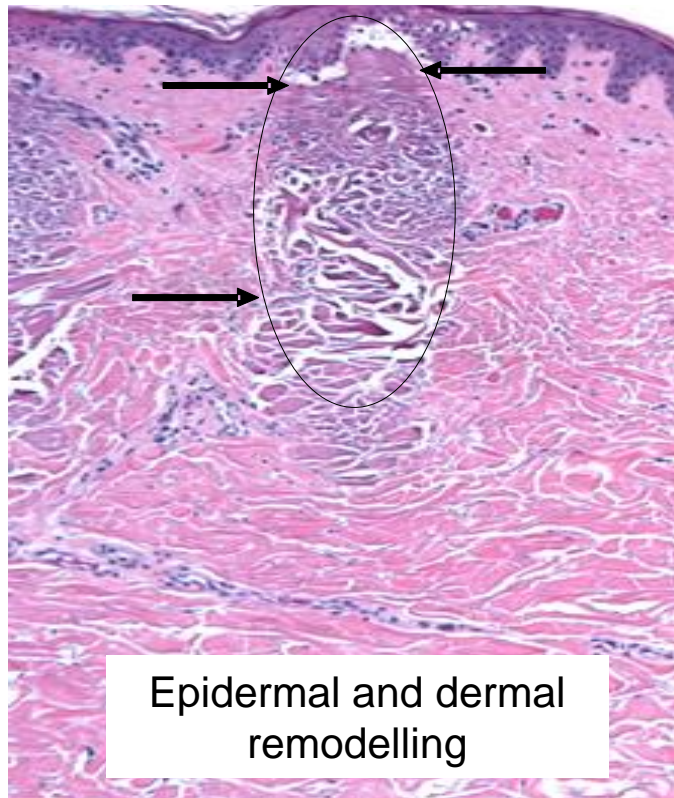
- Verbeteren van dyschromie (Hultman 2015)
- Microneedling is efficiënter voor collageen synthese (Kim 2011)
- Vooral efficiënt in combinatietherapie (Shamsi Meymandi 2014)
- HPPL en IFL (Martella 2017)

FRACTIONAL LASER

Non-ablative
(z.B. 1540, 1550, 1565 nm)

Er:YAG
(2940 nm)

(Deep) CO₂
(10,600 nm)



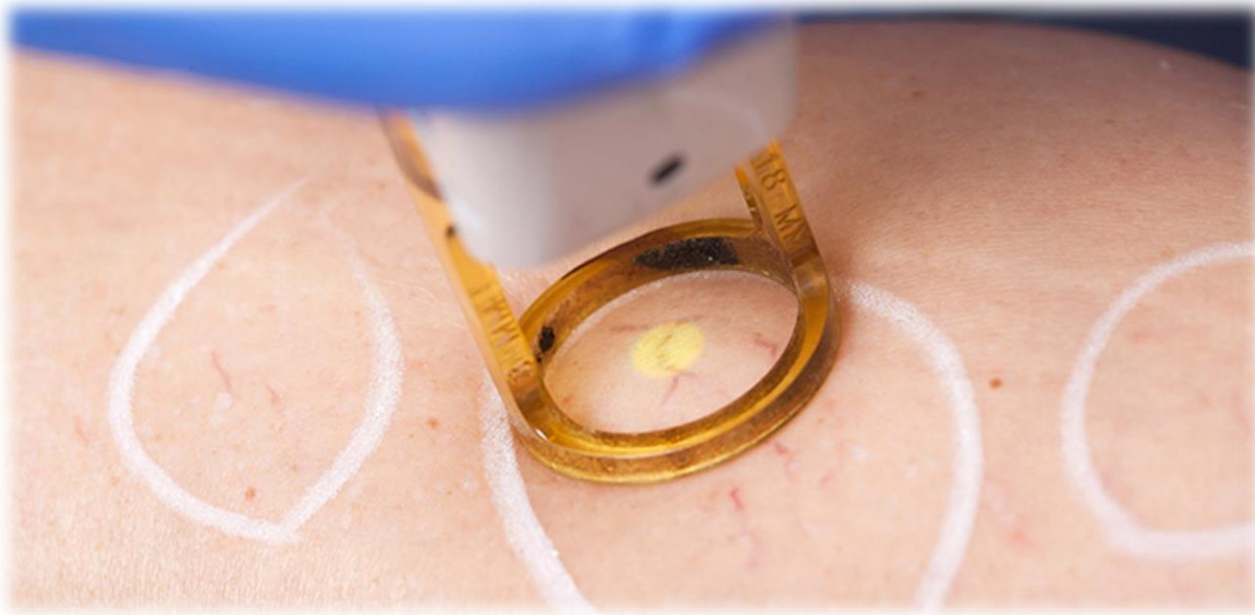
Overzicht van de Lasers

PDL	IPL	Nd:Yag	Ruby	Alexandriet	Diode	Er:Glass Fr	Er:Yag Fr	CO2 Fr
<ul style="list-style-type: none">•Roodheid•Pijn•Jeuk•Evidence ++	<ul style="list-style-type: none">•Roodheid•Evidence +/-	<ul style="list-style-type: none">•Rood (532)•Geel (532)•Oranje (532)•Bruin (1064)•Zwart (1064)•Evidence +	<ul style="list-style-type: none">•Blauw•Groen•Evidence +/-	<ul style="list-style-type: none">•Blauw•Groen•Zwart•Evidence +	<ul style="list-style-type: none">•Roodheid•Pijn•Jeuk•Evidence +/-	<ul style="list-style-type: none">•NAFL•Dikte•Soepelheid•Textuur•Fitzpatrick IV, V en VI•Evidence +/-	<ul style="list-style-type: none">•AFL•Dikte•Soepelheid•Textuur•Fitzpatrick IV en V•Evidence +	<ul style="list-style-type: none">•AFL•Dikte•Soepelheid•Textuur•Contracturen•Verklevingen•Fitzpatrick I, II en III•Evidence ++



Roodheid

Pulsed Dye Laser



University
of Antwerp



Roodheid

Pulsed Dye Laser

- Meerdere behandelingen nodig
- Zwelling en purpurae zijn mogelijke neveneffecten
- Korstvorming en littekenvorming komen zeer zelden voor.
- Langere pulsduur zorgt voor coagulatie zonder beschadiging van omliggende structuren.



Dikte, soepelheid en textuur

Ablative Fractional Laser (AFL)

- Er:Yag laser 2940nm & CO2 laser 10600nm
- Penetratie diepte tot 4 mm
- Toename van HSP 72, HSP 42, TGF- β 3, MMP-1
- Collageen III inductie
- Langere downtime (10-14 dagen)
- Meer kans op PIH – Fitzpatrick I, II, III



CO2 Fractional Laser



MODALITY

Scaar FX

Active FX

Active FX

SETTING



90 - 130 mJ/cm², 250 Hz, 1%

40 – 90 mJ/cm², 300 Hz, 9,
small spot size

125 mJ/cm², 125 Hz, 3, large
spot size



Laser Treatment of Traumatic Scars and Contractures: 2020 International Consensus Recommendations

Meghan Seago, MD ^{1,2} Peter R. Shumaker, MD,^{1*} Leah K. Spring, DO,³ Murad Alam, MD,⁴ Firas Al-Niaimi, MSc, MRCP, EBDV,⁵ R. Rox Anderson, MD,⁶ Ofir Artzi, MD,⁷ Ardeshir Bayat, BSc (Hons), MBBS, PhD,⁸ Daniel Cassuto, MD,⁹ Henry HL Chan, MD, PhD,¹⁰ Christine Dierickx, MD,¹¹ Matthias Donelan, MD,¹² Gerd G. Gauglitz, MD,¹³ Boncheol Leo Goo, MD,¹⁴ Greg J. Goodman, MD,¹⁵ Geoffrey Gurtner, MD,¹⁶ Merete Haedersdal, MD, PhD,¹⁷ Andrew C. Krakowski, MD,¹⁸ Woraphong Manuskiatti, MD,¹⁹ William B. Norbury, MD,²⁰ Rei Ogawa, MD, PhD,²¹ David M. Ozog, MD,²² Uwe Paasch, MD,²³ E. Victor Ross, MD,²⁴ Matteo Tretti Clementoni, MD,²⁵ and Jill Waibel, MD ²⁶

¹Department of Dermatology, Naval Medical Center, San Diego, California, 92134

²Fellow, Micrographic Surgery and Surgical Oncology, Scripps Clinic, La Jolla, California, 92037

³Fellow, Micrographic Surgery and Surgical Oncology, SkinCare Physicians, Chestnut Hill, Massachusetts, 02467

⁴Department of Dermatology, Northwestern University Feinberg School of Medicine, Chicago, Illinois, 60611

⁵Private Practice, London, United Kingdom

⁶Department of Dermatology, Harvard Medical School, and Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, Massachusetts, 02114

⁷Department of Dermatology, Tel Aviv Sourasky Medical Center, Tel Aviv, Israel

⁸Division of Dermatology, Groote Schuur Hospital, University of Cape Town, Cape Town, South Africa

⁹Private Practice, Milan, Italy

¹⁰Private Practice and Department of Medicine (Dermatology), University of Hong Kong, People's Republic of China

¹¹Skinperium Clinic, Luxembourg, Luxembourg

¹²Department of Surgery, Massachusetts General Hospital, Shriners Hospitals for Children—Boston, Harvard Medical School, Boston, Massachusetts, 02114

¹³Department of Dermatology and Allergy, Ludwig Maximilian University, Munich, Germany

¹⁴Naeum Dermatology and Aesthetic Clinic/Skin Rehabilitation Center, Seoul, Korea

¹⁵Department of General Practice, Monash University, Clayton, Victoria, Australia

¹⁶Department of Surgery, Stanford University School of Medicine, Stanford, California, 94305

¹⁷Department of Dermatology, Bispebjerg Hospital, University of Copenhagen, Copenhagen, Denmark

¹⁸Division of Dermatology, St. Luke's University Health Network, Bethlehem, Pennsylvania, 18015

¹⁹Department of Dermatology, Siriraj Hospital, Bangkok, Thailand

²⁰Department of Surgery, University of Texas Medical Branch, Shriners Hospital for Children—Galveston, Galveston, Texas, 77550

²¹Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

²²Department of Dermatology, Henry Ford Hospital, Detroit, Michigan, 48202

²³Department of Dermatology, Venereology, and Allergy, University of Leipzig, Leipzig, Germany

²⁴Scripps Clinic, San Diego, California, 92130

²⁵Laserplast, Milan, Italy

²⁶Miami Dermatology and Laser Institute, Miami, Florida, 33173



Aanbevelingen voor IPL & CO2 Fractional Laser

- Level of evidence IPL : 2-
- Level of evidence CO2 Fractional Laser : 2+
- Te weinig RCT's per indicatie
- Zwaar gepromoot door industrie
- IPL: Option
- CO2 Fractional Laser : EBM?







op school



Fire Safety Truck



bij de jeugdbeweging



bij senioren



Fire Escape Room



Safety Days



Het rookmelderhuis



Rapport bommetjes 2022



Bommetjes op de speelplaats



Veilig op vakantie



Veilig op avontuur





TENTOONSTELLING
HERSCHREVEN
Over leven met littekens



**DIT IS GEEN KUNST, MAAR
 HEDENDAAGSE REALITEIT.**

BEZOEK ONZE ONLINE
 TENTOONSTELLING



**DIT IS GEEN KUNST, MAAR
 HEDENDAAGSE REALITEIT**



**STOP MET STAREN
 EN TEKEN HET MANIFEST.**



BESLUIT – TAKE HOME MESSAGES



Inzicht in ontstaan en oorzaken van (pathologische) littekens



Check de status van de littekens



Informeer de patiënt – howtotreatscars.com



BESLUIT – TAKE HOME MESSAGES



Inzicht in ontstaan en oorzaken van (pathologische) littekens



Check de status van de littekens

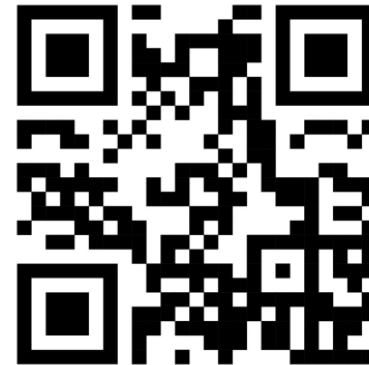


Informeer de patiënt – howtotreatscars.com



Aandacht voor doelgerichte zorg

- **Patiënt centraal**
- In overleg met (andere) zorgverleners ...



ACKNOWLEDGEMENTS



THE ROAD TO

Scarless Healing

peter.moortgat@oscare.be
scaracademy.be