rTMS behandeling in de GGZ: state of the art & beyond

Iris van Oostrom
klinisch neuropsycholoog, supervisor VGCT, PhD

Disclosure belangen spreker	
Geen (potentiële) belangenverstrengeling	
Voor bijeenkomst mogelijk relevante relaties	**Bedrijfsnamen**
- Sponsoring of onderzoeksgeld - Honorarium of andere (financiële) vergoeding - Aandeelhouder - Andere relatie, namelijk …	- - - In dienst bij GGZ instelling neurocare clinics, gespecialiseerd in rTMS behandeling

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Wat is rTMS?

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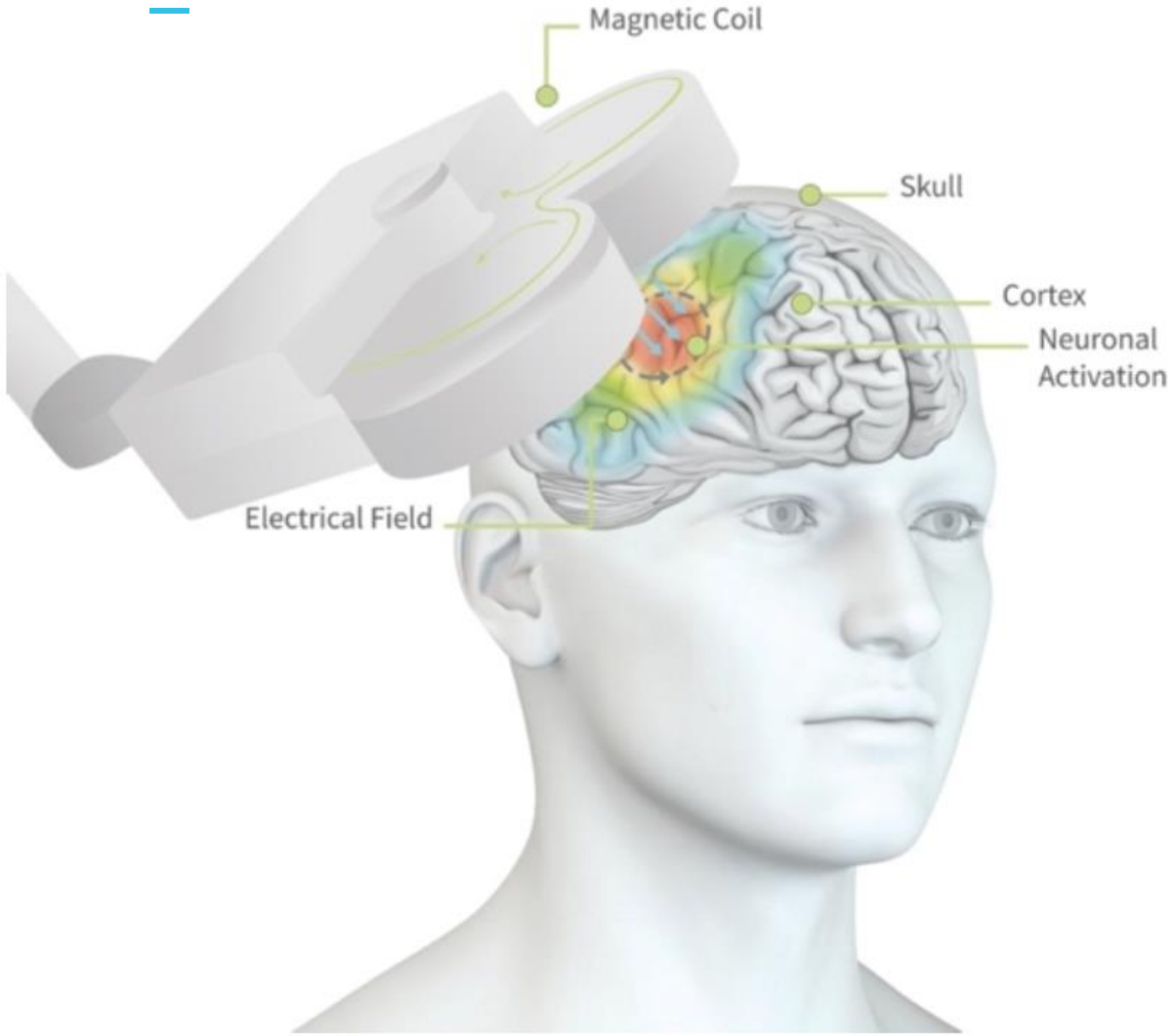
repetitieve Transcraniële Magnetische Stimulatie



een niet-invasieve vorm van hersenstimulatie

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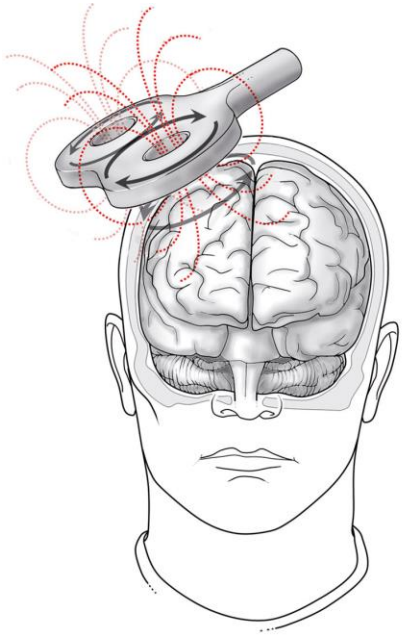
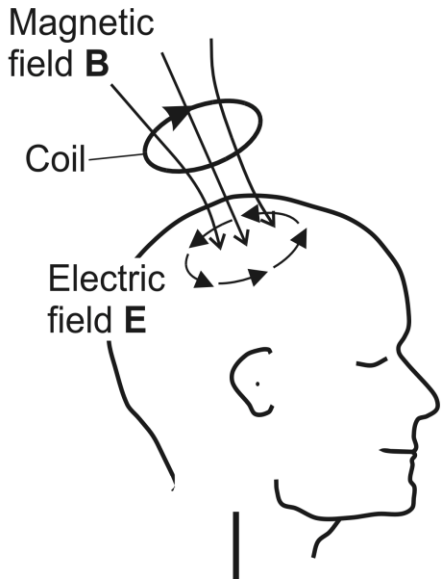
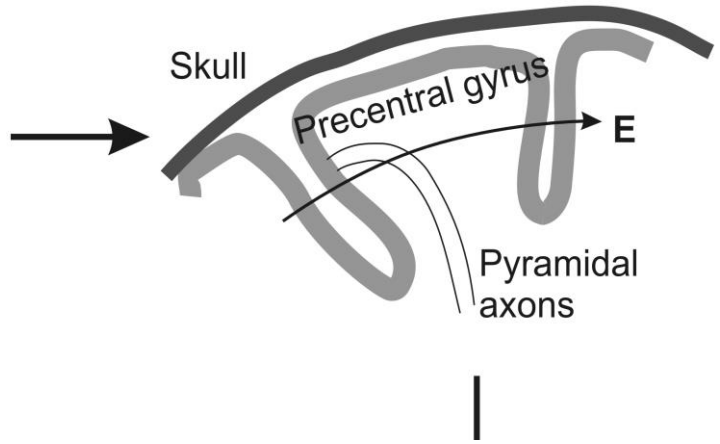
Principe: Electromagnetische inductie







- Kortdurende, sterke stroom door een externe spoel
- Genereert een elektromagnetisch veld: ‘puls’
- Dicht bij de geleidende hersencellen zorgt voor dit voor elektrische activiteit in de cortex

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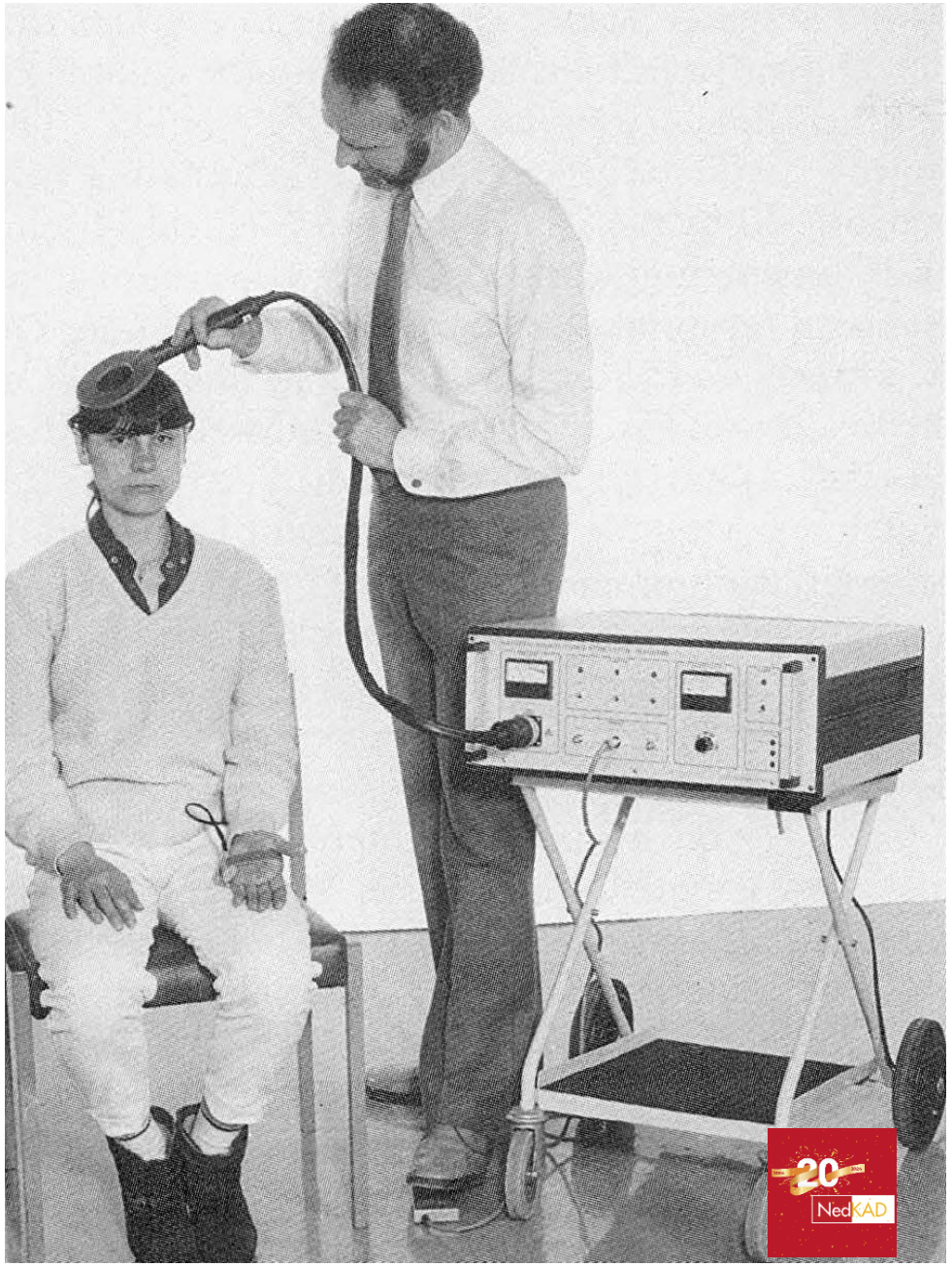
Geschiedenis

Anthony Barker (1985):
➢ Eerste succesvolle magnetische stimulatie *motor* cortex

Magnetische stimulatie werd gebruikt in onderzoek naar oa

- Motoriek
- Taal
- Aandacht
- Geheugen
- Visuele perceptie
- Etc.



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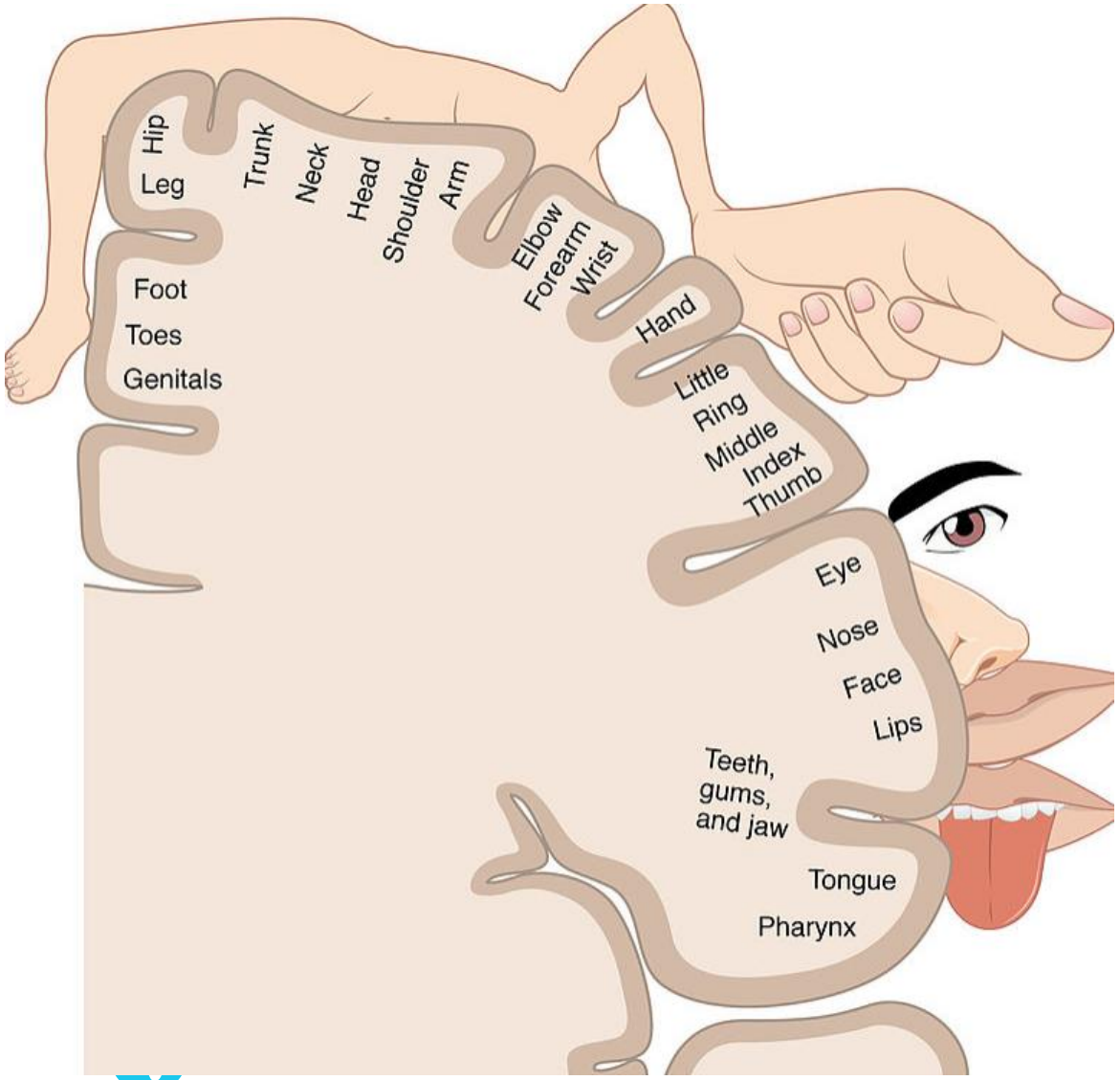
Stimulatie motor cortex in onderzoek

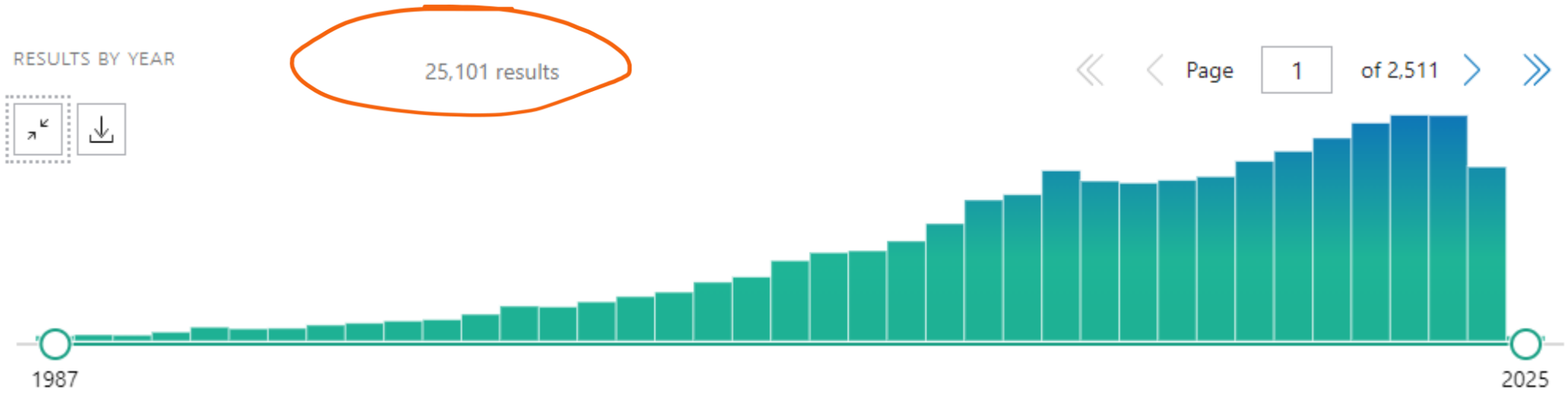


- Stimulatie Motor cortex: (duim) beweging

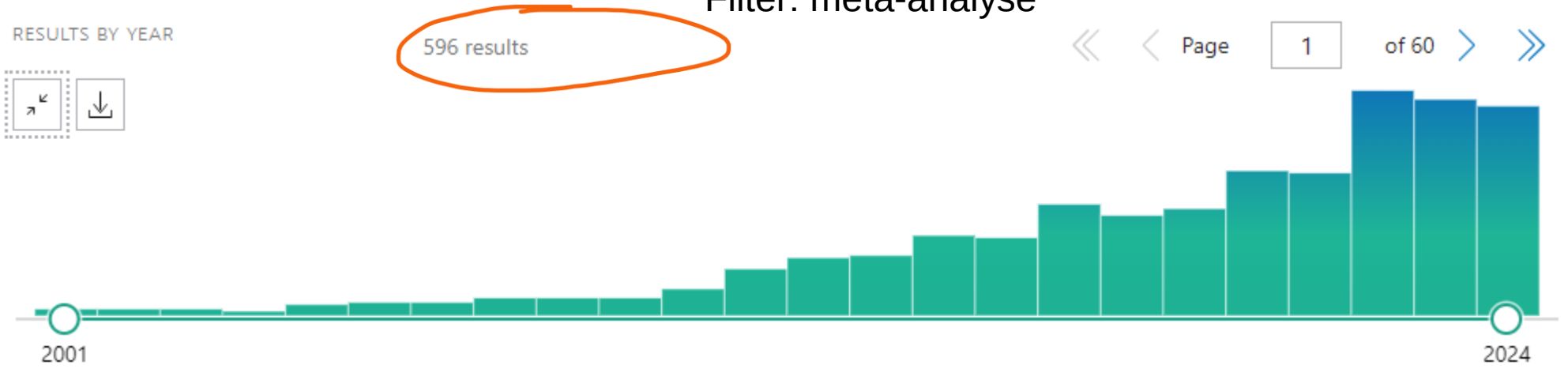
dit wordt in de behandeling gebruikt voor bepalen ‘Motor Threshold’

- Maar proefpersonen rapporteerden tevens psychologische effecten, zoals een verbeterde stemming

Inmiddels veel wetenschappelijk onderzoek



Filter: meta-analyse

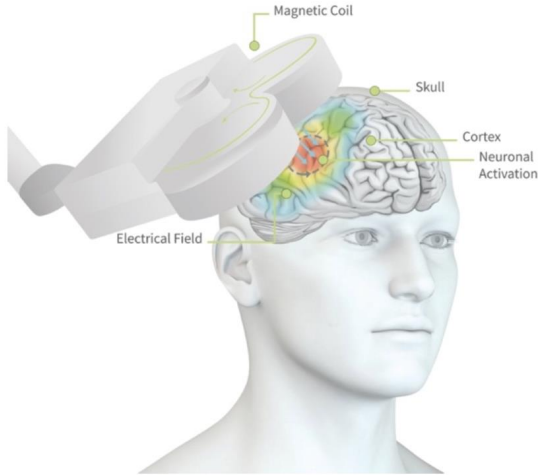


Veilig en goed te verdragen

Regelmatig voorkomende bijwerkingen:

- Lichte, voorbijgaande **hoofdpijn** (10%)
- **Spiertrekkingen**

Met name eerste sessies, herstelt snel



Soms:

Vasovagale reactie

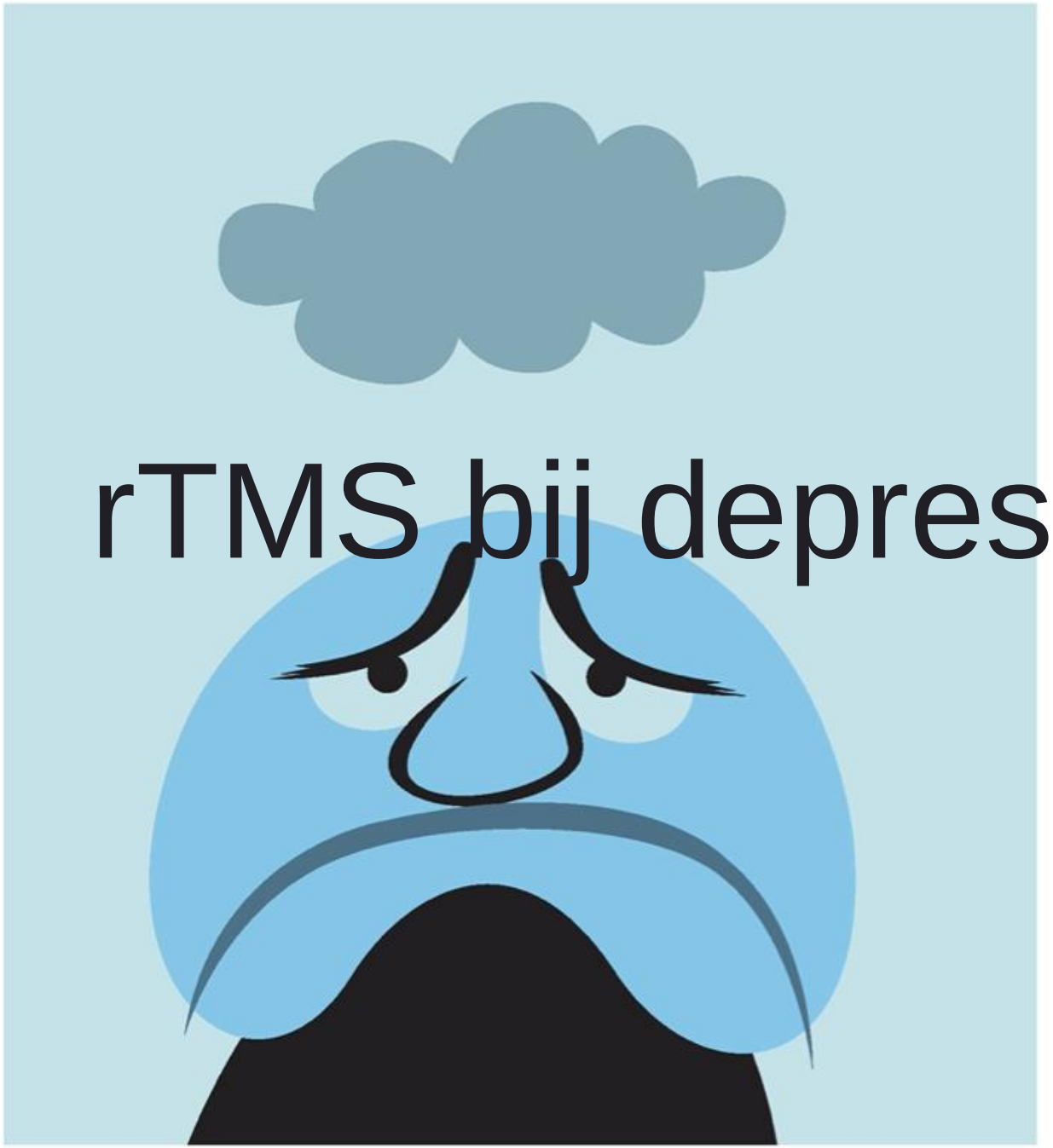
Zeer zeldzame bijwerking:

- **Epileptisch insult** (0,003%);

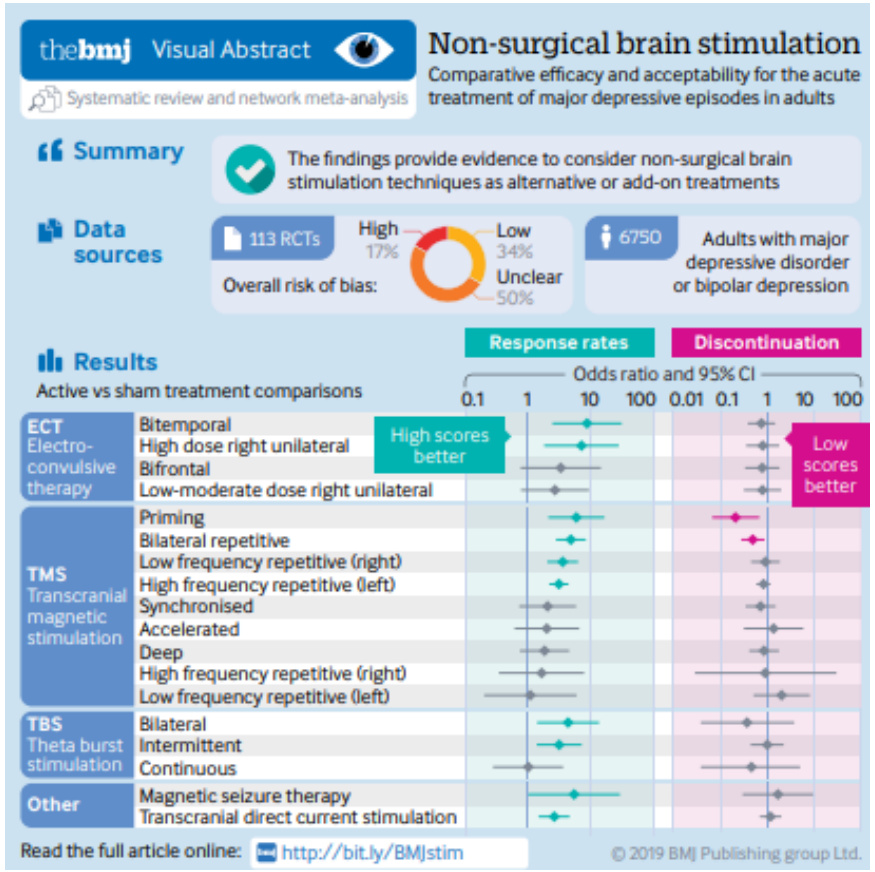
< TCA (0,4-2,0%) en gelijk aan SSRI (0,0 -0,04%)

> Dropout slechts 4,5%

rTMS bij depressie



Netwerk meta-analyse hersenstimulatie (2019)



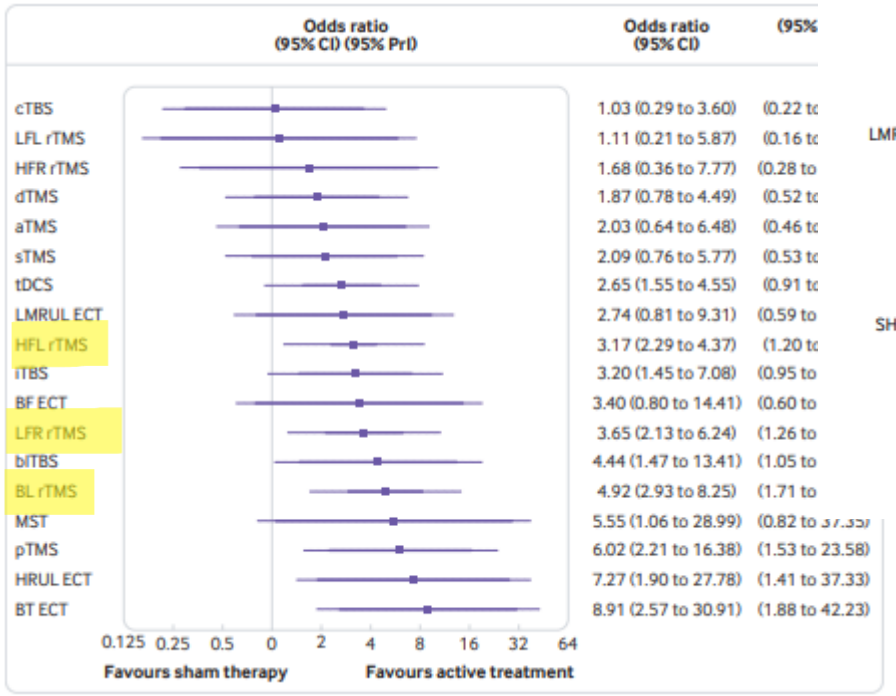
OPEN ACCESS

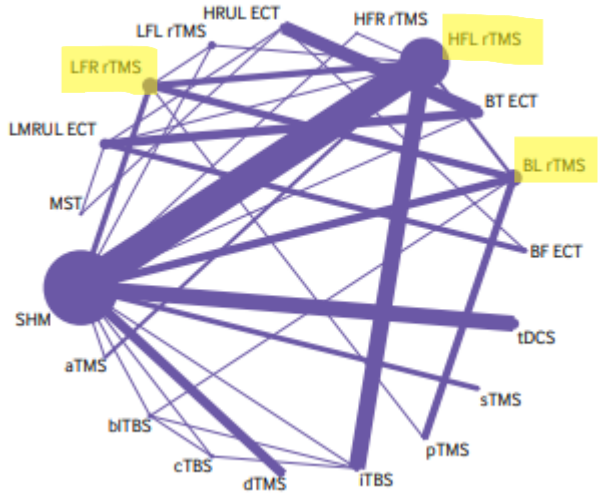
Check for updates

Comparative efficacy and acceptability of non-surgical brain stimulation for the acute treatment of major depressive episodes in adults: systematic review and network meta-analysis

Julian Mutz,[1] Vijeinika Vipulananthan,[2] Ben Carter,[3] René Hurlemann,[4] Cynthia H Y Fu,[5,6] Allan H Young[2,6]

thebmj | BMJ 2019;364:l1079 | doi: 10.1136/bmj.l1079





Robuuste evidentie voor drie vormen van rTMS behandeling

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Meta-analyse (2022)

The association between sample and treatment characteristics and the efficacy of repetitive transcranial magnetic stimulation in depression: A meta-analysis and meta-regression of sham-controlled trials

Iris Dalhuisen [a,b,*], Suzanne van Bronswijk [c,d], Jeanine Bors [a], Filip Smit [e,f], Jan Spijker [g,h], Indira Tendolkar [a,b], Henricus G. Ruhé [a,b], Philip van Eijndhoven [a,b]

65 RCT's

n= 2982

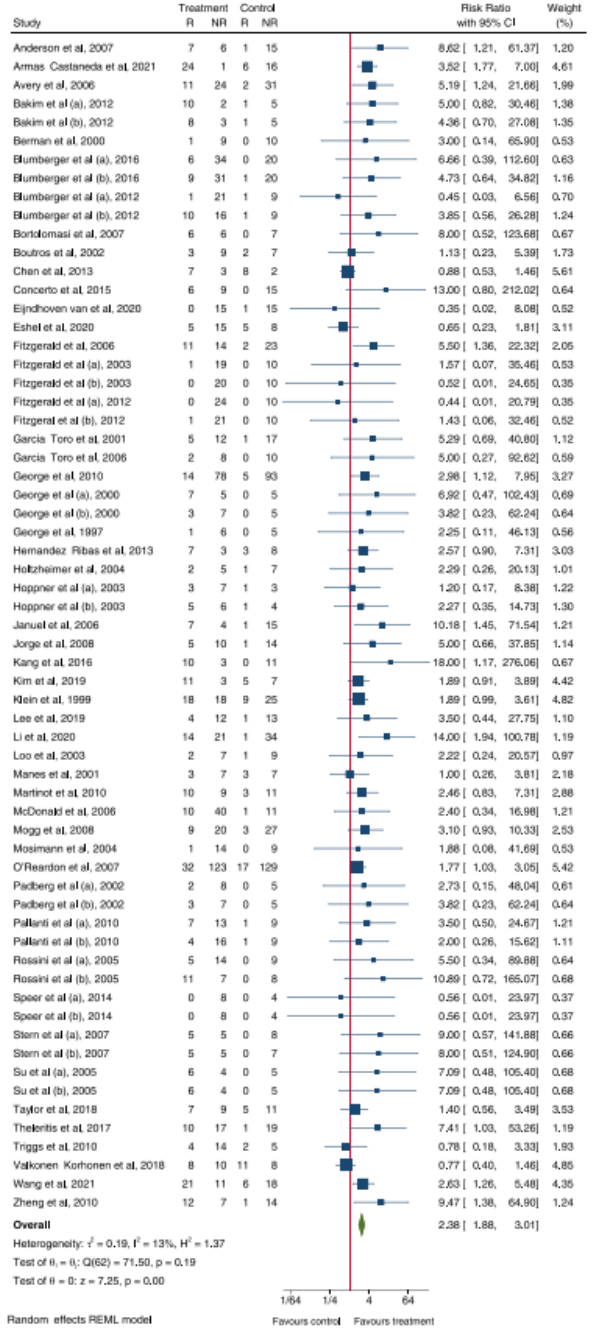
<u>Conclusie:</u>

rTMS is effectief vergeleken met placebo

Significant grotere daling in depressieve klachten (Hedges' g = − 0.8).

Risk ratio voor respons 2.4

Risk ratio voor remissie 2.5



Neuroscience and Biobehavioral Reviews 141 (2022) 104848

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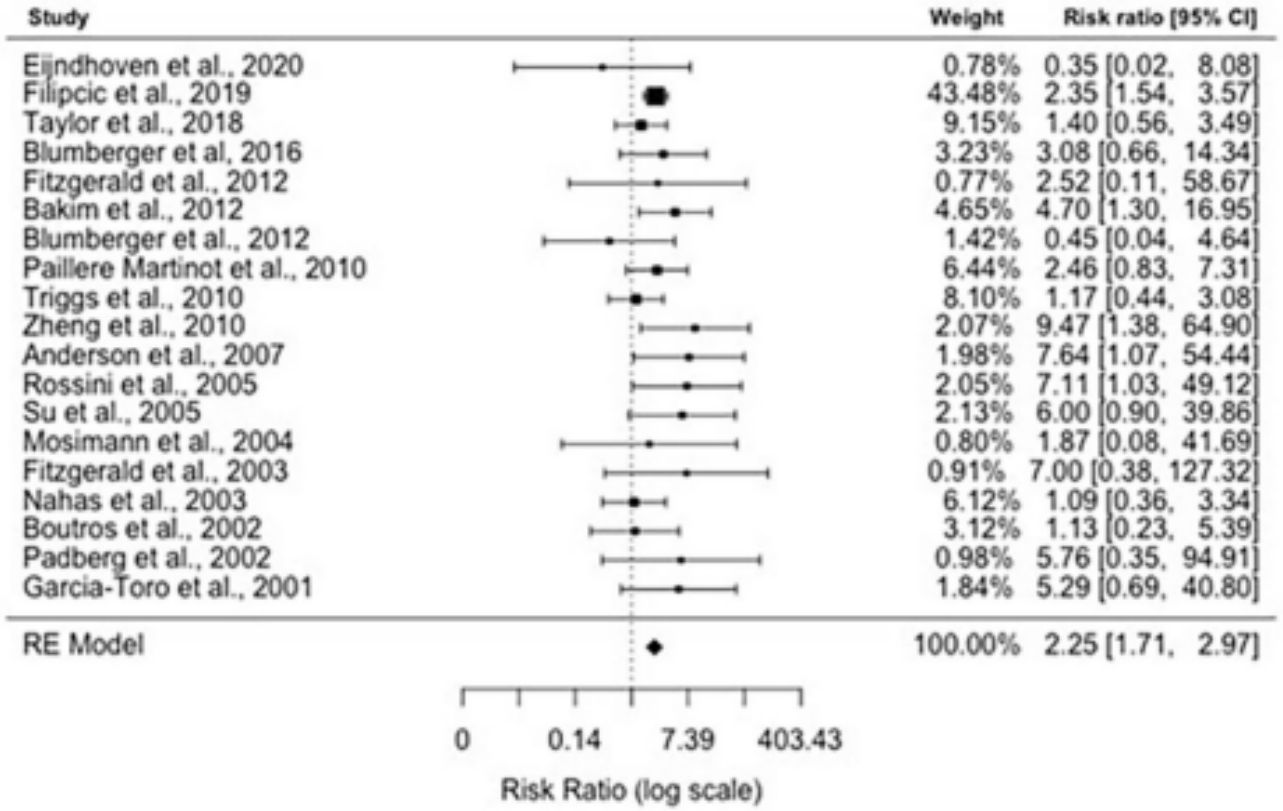
Meta-analyse (2023)

Efficacy of repetitive transcranial magnetic stimulation (rTMS) adjunctive therapy for major depressive disorder (MDD) after two antidepressant treatment failures: meta-analysis of randomized sham-controlled trials

Róbert György Vida[1], Eszter Sághy[2], Richárd Bella[2], Sándor Kovács[2], Dalma Erdősi[2], Judit Józwiak-Hagymásy[2], Antal Zemplényi[2], Tamás Tényi[3], Péter Osváth[3] and Viktor Voros[3*]



Conclusie:

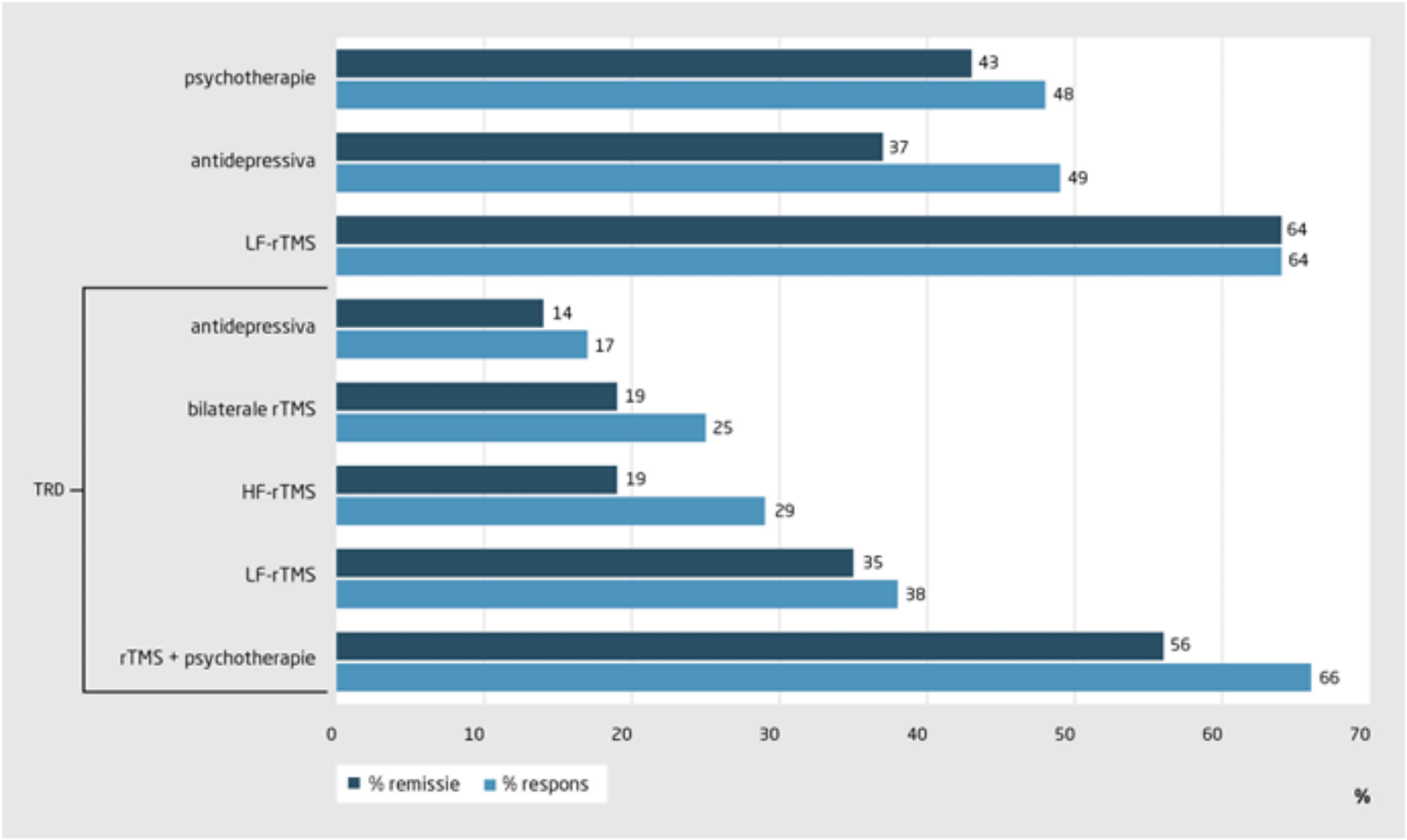
In therapieresistente depressie &

alleen HDRS/MADRS:

- 40% respons (vs 10% in placebogroep)
- 39% remissie (vs 8% in placebogroep)

BMC Psychiatry (2023) 23:545

Vergelijking met andere behandelingen



Dalhuisen ea NTVG 2020

Plaats van rTMS in het behandelalgoritme?

rTMS as a Next Step in Antidepressant Nonresponders: A Randomized Comparison With Current Antidepressant Treatment Approaches

Iris Dalhuisen, Ph.D., Iris van Oostrom, Ph.D., Jan Spijker, M.D., Ph.D., Ben Wijnen, Ph.D., Eric van Exel, M.D., Ph.D., Hans van Mierlo, M.D., Ph.D., Dieuwertje de Waardt, M.D., Ph.D., Martijn Arns, Ph.D., Indira Tendolkar, M.D., Ph.D., Philip van Eijndhoven, M.D., Ph.D.

<u>Inclusie:</u>

Depressie en twee eerdere behandelingen met onvoldoende resultaat (n=89)

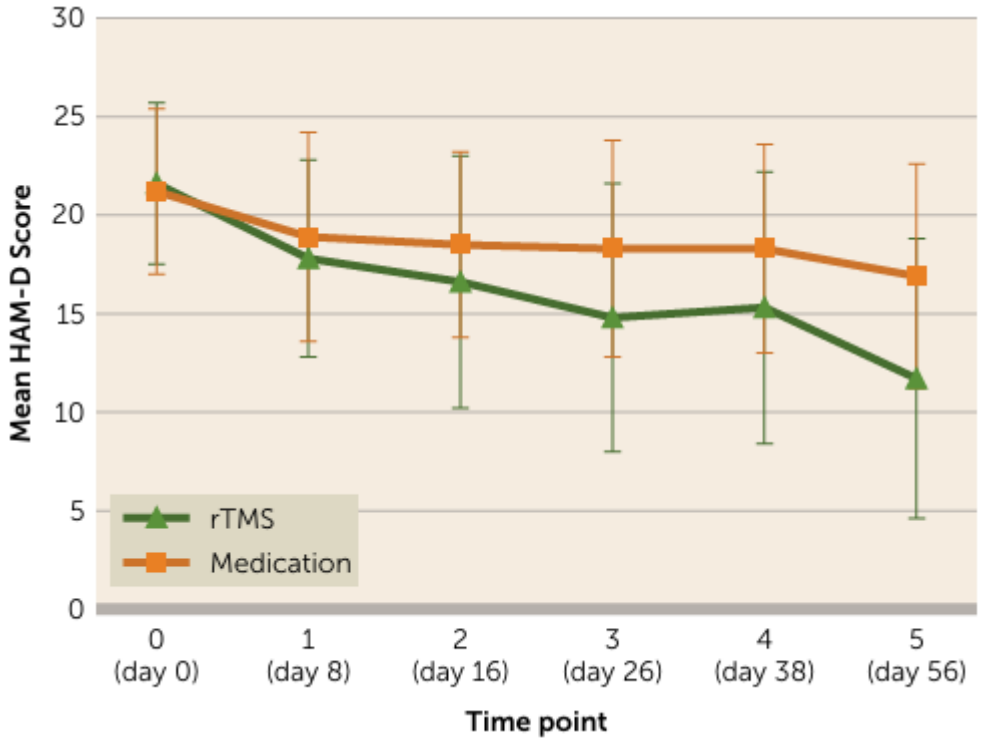
<u>Randomisatie:</u>

rTMS of switch AD conform richtlijn

<u>Resultaten:</u>

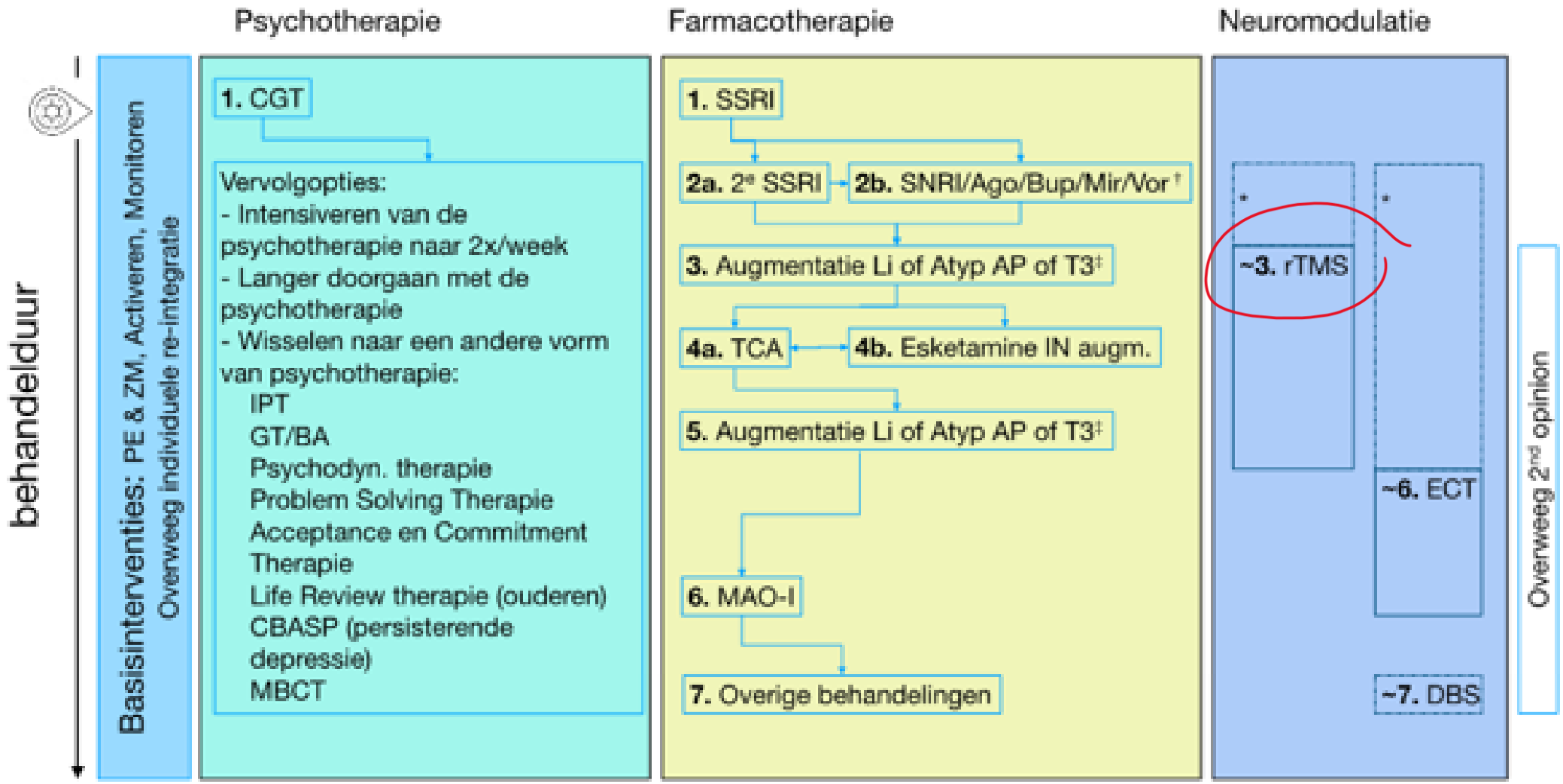
Grotere daling in depressieve symptomen in rTMS groep

Meer respons en remissie in rTMS groep



Am J Psychiatry 2024 Sep 1;181(9):806-814.

Richtlijn depressie (2024)



Richtlijn depressie 2024

Aanbeveling

- We bevelen een rTMS behandeling met hoogfrequente rTMS links of alternatief laagfrequente rTMS rechts aan bij patiënten met een depressie zonder psychotische kenmerken, die niet gereageerd hebben op twee eerdere antidepressieve behandelingen.
- We bevelen een rTMS behandeling voor ouderen met een depressieve stoornis aan, die niet gereageerd hebben op twee eerdere antidepressieve behandelingen.
- Overweeg een rTMS behandeling eerder dan na twee niet succesvolle antidepressieve behandelingen bij patiënten met een depressie die veel last hebben van de bijwerkingen van medicatie of waarbij psychotherapie niet mogelijk blijkt.
- We bevelen een rTMS aan zowel als monotherapie of als additie bij behandeling met antidepressiva. We adviseren voor patiënten met een matig en ernstige depressie een rTMS behandeling in combinatie met psychotherapie, conform de aanbevelingen bij antidepressiva.

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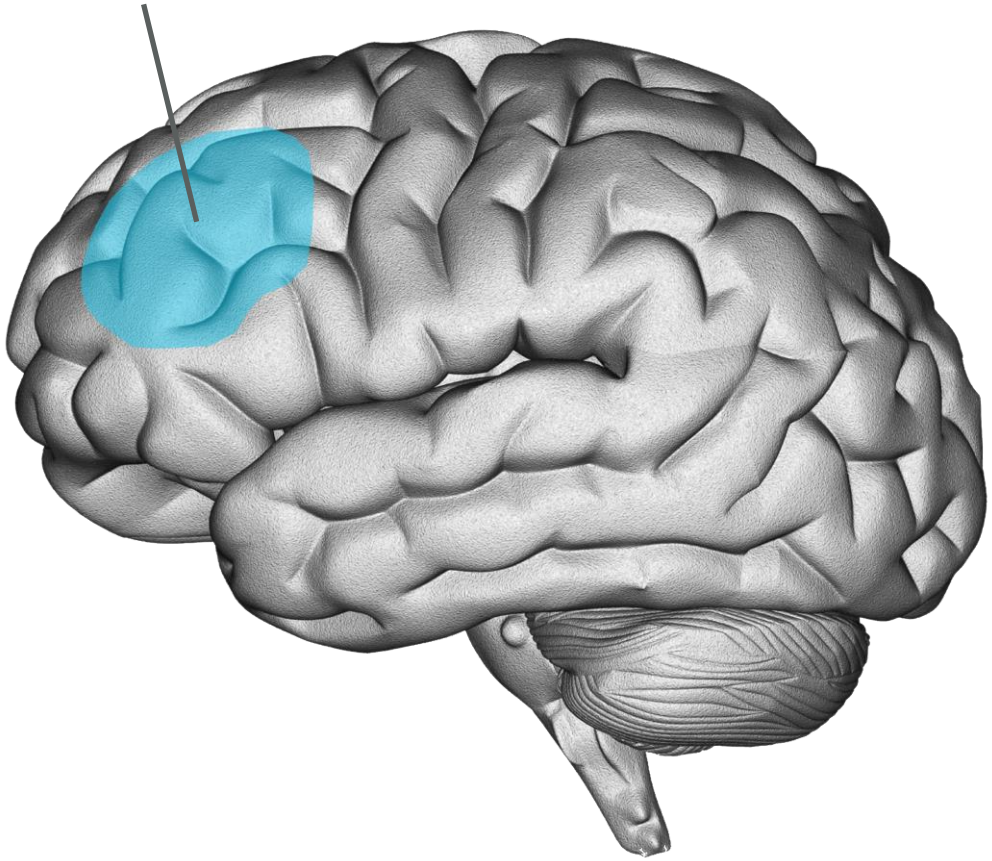
rTMS protocollen bij depressie

Locatie stimulatie

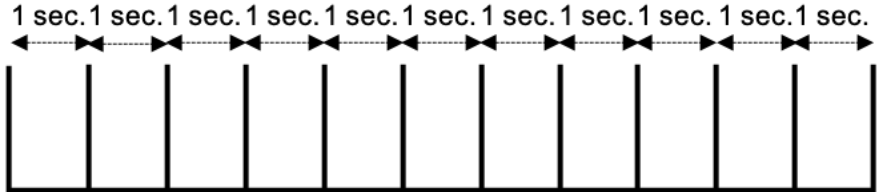
Dorsolateral Prefrontal Cortex (DLPFC)



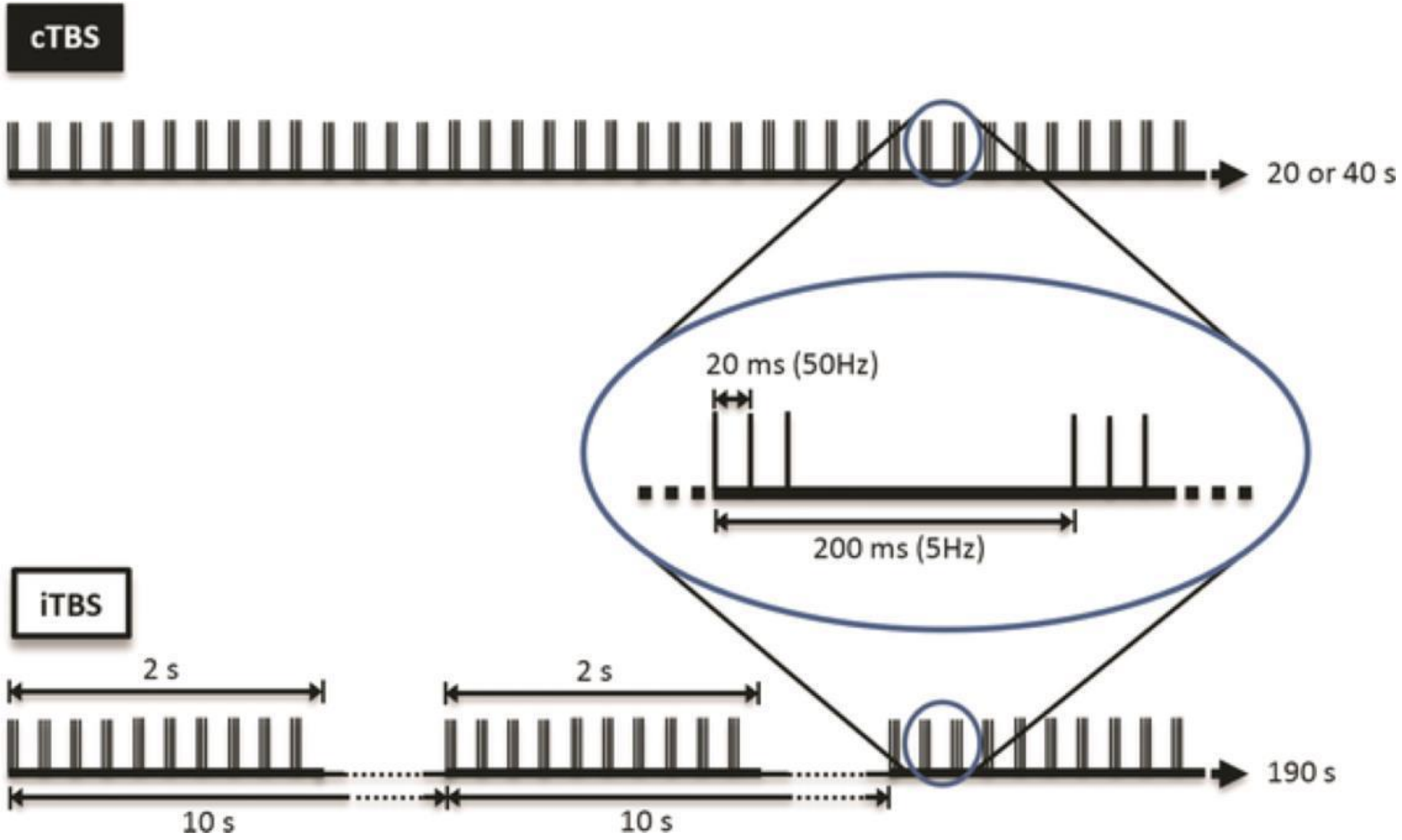
Locatie stimulatie: DLPFC

- 10 Hz (hoogfrequent, HF) links

- 1 Hz (laagfrequent, LF) rechts



Theta burst stimulation



Patroon:

3 pulsen van 50Hz

5x per seconde

(interburstinterval 200ms)

Stimulatie vd orbitofrontale cortex (OFC)

European Neuropsychopharmacology (2018) **28**, 109-117

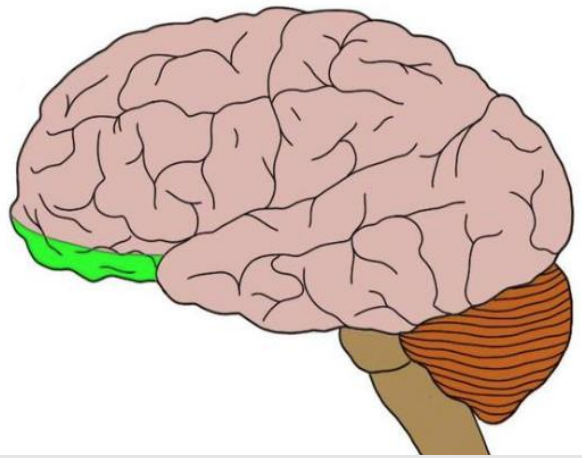
ELSEVIER

www.elsevier.com/locate/euroneuro

1 Hz rTMS of the right orbitofrontal cortex for major depression: Safety, tolerability and clinical outcomes

CrossMark

Kfir Feffer[a,b,c,1], Peter Fettes[d,1], Peter Giacobbe[a,b], Zafiris J. Daskalakis[b,d,e], Daniel M. Blumberger[b,d,e], Jonathan Downar[a,b,d,f,*]



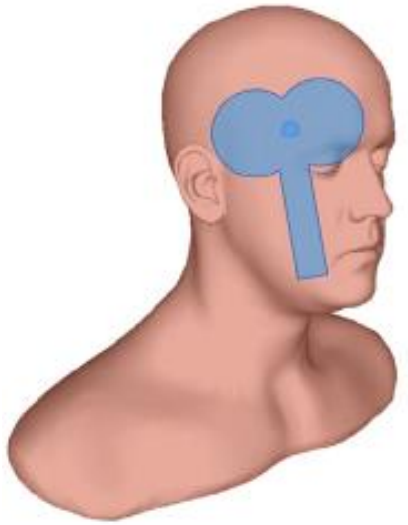


Table 3 Treatment outcomes for MDD patients undergoing 1 Hz right OFC-rTMS.

	Overall	rTMS previous non-responder	rTMS naive
BDI-II			
Response	15/42 (35.7%)	9/30 (30.0%)	6/12 (50.0%)
Remission	10/42 (23.8%)	7/30 (23.3%)	3/12 (25.0%)
% improvement	36.5±26.5%	32.9±25.6%	45.6±27.6%

Response is defined as a >50% decrease in symptoms; remission defined as a final BDI-II score of ≤12. % improvement is calculated from baseline to final score. BDI-II, Beck Depression Inventory-II.

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rTMS orbitofrontale cortex beloftevol

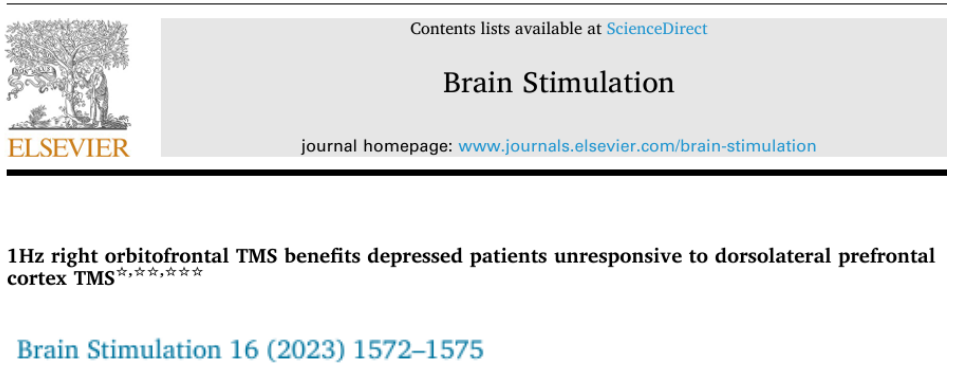
4 open label studies

wisselende methodologie en protocollen

<u>Studie Prentice ea 2023:</u>

NL(n=25): switch naar OFC, Fp2, 1Hz, 900p, double cone coil na gemiddeld 42 sessies

US (n=16): augmentatie met OFC, Af8, 1Hz, 1200p, figure 8 coil na gemiddeld 20 sessies



In DLPFC non-responders:

Remissie: 23% CA

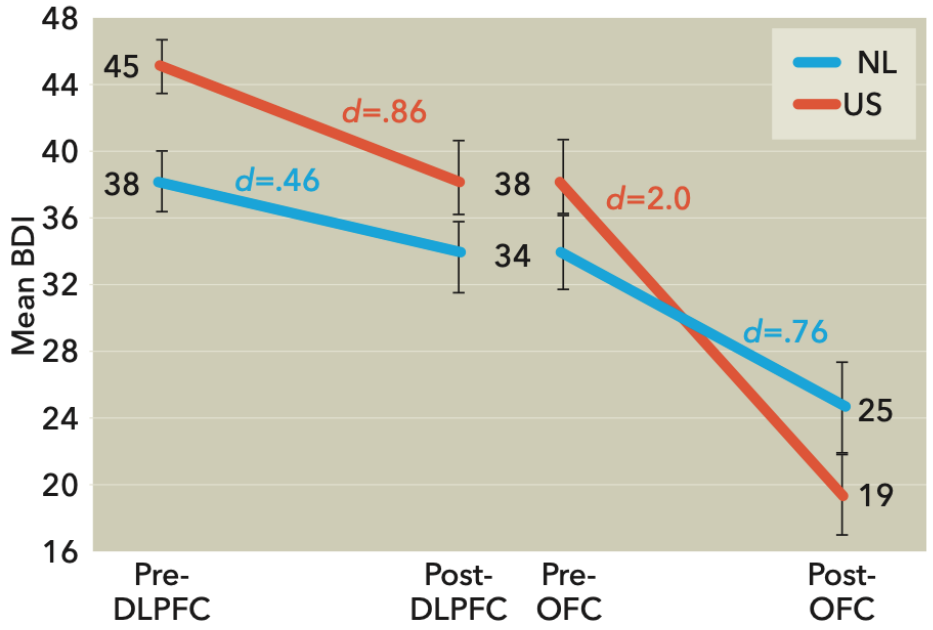
24% NL

31% US

Respons: 36% CA

24% NL

50% US



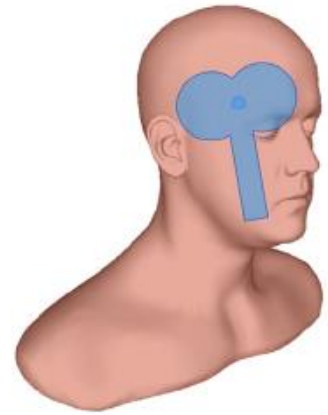


Fig. 1 (A) For the NL-sample, Deymed DuoMag XT-100 with 90BFVT-LQC coil over the right OFC at the Fp2 location in the 10-20 system. (B) Decrease in mean BDI score between pre- and post-TMS treatment (DLPFC and OFC) for the NL and US-samples. Error bars represent SEM, and effect sizes are reported with Cohen's d. BDI=Beck Depression Inventory; DLPFC=dorsolateral prefrontal cortex; NL=Dutch sample; OFC=orbitofrontal cortex; TMS=transcranial magnetic stimulation; US=American sample

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Accelerated rTMS

ARTICLE

Accelerated repetitive transcranial magnetic stimulation in the treatment of depression

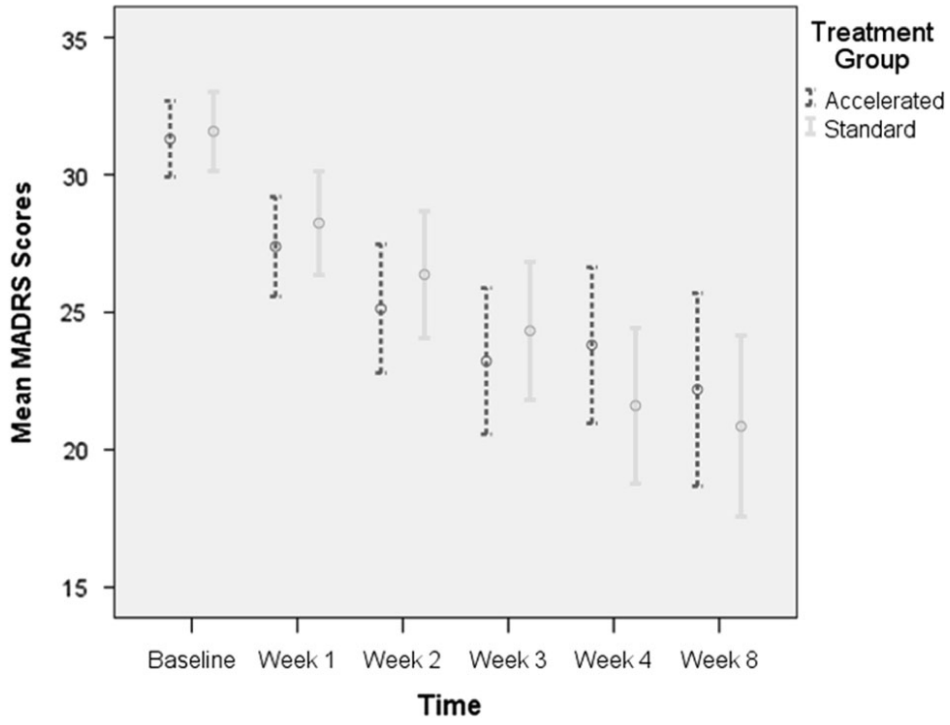
Paul B. Fitzgerald[1,2], Kate E. Hoy[2], David Elliot[2], R. N. Susan McQueen[2], Lenore E. Wambeek[2] and Zafiris J. Daskalakis[3]

Accelerated: 3 sessies per dag (10500 pulsen/dag), tot 20 sessies in 3 weken

Standaard: 1 sessie per dag (3150 pulsen/dag), tot 20 sessies in 4 weken

N = 119

-> Geen significante verschillen in respons en remissie en afname depressieve klachten



2018 neuropsychopharmacoloy

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Accelerated rTMS

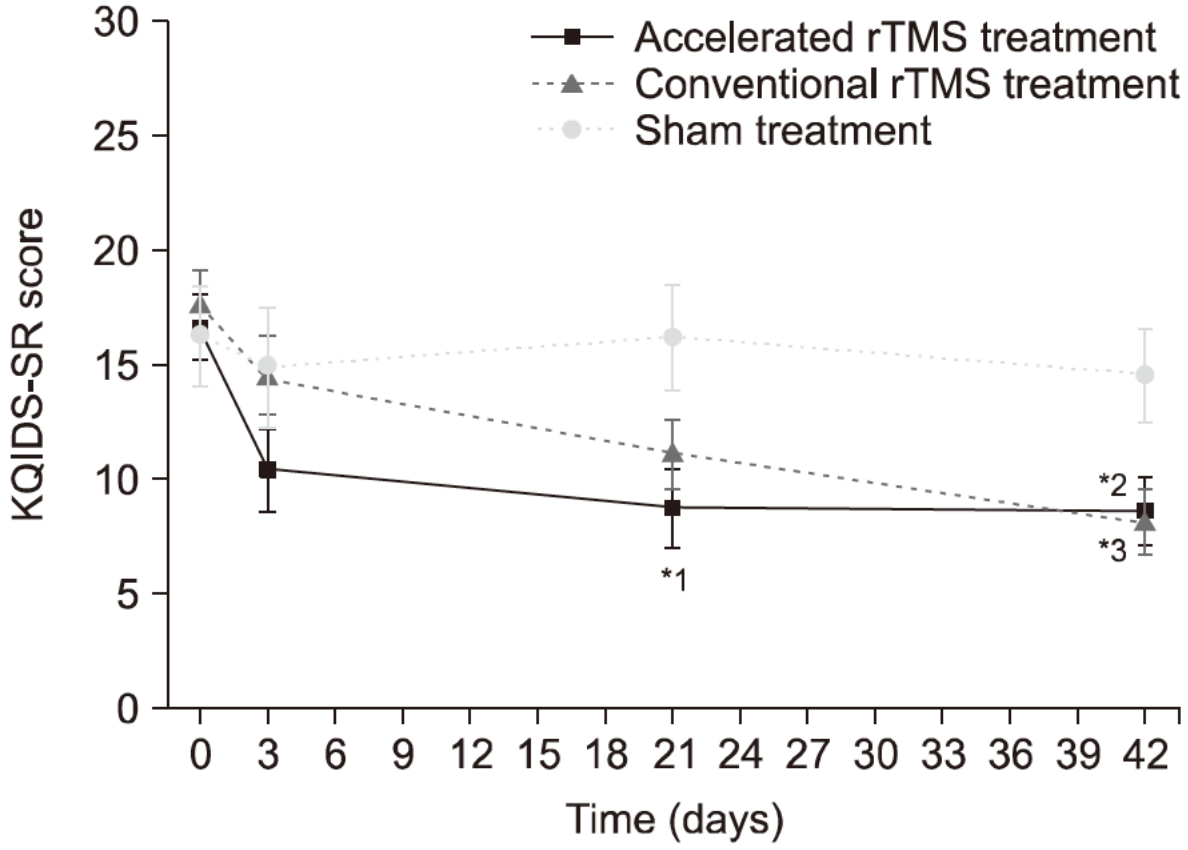
Rapid Symptom Improvement in Major Depressive Disorder Using Accelerated Repetitive Transcranial Magnetic Stimulation

Soo-Jeong Kim[1,2], Sang Joon Son[3], Mi Jang[4], Byung-Hoon Kim[1,2], Seok Joo Hong[3], Lina Seo[3], Sun-Woo Choi[2], Jeong-Ho Seok[1,2], Jai Sung Noh[3]

Accelerated: 15 sessies in 3 dagen

Conventional: 15 sessies in 3 weken

Accelerated groep liet een snellere verbetering zien in depressieve klachten



Clin Psychopharmacol Neurosci. 2021

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Stanford Accelerated Intelligent Neuromodulation Therapy for Treatment-Resistant Depression

Eleanor J. Cole, Ph.D., Katy H. Stimpson, B.S., Brandon S. Bentzley, M.D., Ph.D., Merve Gulser, B.S., Kirsten Cherian, Ph.D
Claudia Tischler, B.S., Romina Nejad, M.S., Heather Pankow, B.S., Elizabeth Choi, B.S., Haley Aaron, B.S., Flint M. Espil, Ph.D
Jaspreet Pannu, B.S., Xiaoqian Xiao, Ph.D., Dalton Duvio, B.S., Hugh B. Solvason, M.D., Jessica Hawkins, B.A.,
Austin Guerra, B.A., Booil Jo, Ph.D., Kristin S. Raj, M.D., Angela L. Phillips, Ph.D., Fahim Barmak, M.D., James H. Bishop, Ph.D
John P. Coetzee, Ph.D., Charles DeBattista, M.D., Jennifer Keller, Ph.D., Alan F. Schatzberg, M.D., Keith D. Sudheimer, Ph.D
Nolan R. Williams, M.D.

10 sessies iTBS per dag

1800 pulsen per sessie

18000 pulsen/dag

5 dagen lang

Day 1	Day 2	Day 3	Day 4	Day 5
iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800
50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI
iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800
50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI
iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800
50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI
iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800
50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI	50 minute ISI
iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800	iTBS 1800
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Am J Psychiatry 2022

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Geindividualiseerde targeting (anticorrelation DLPFC-sgACC)

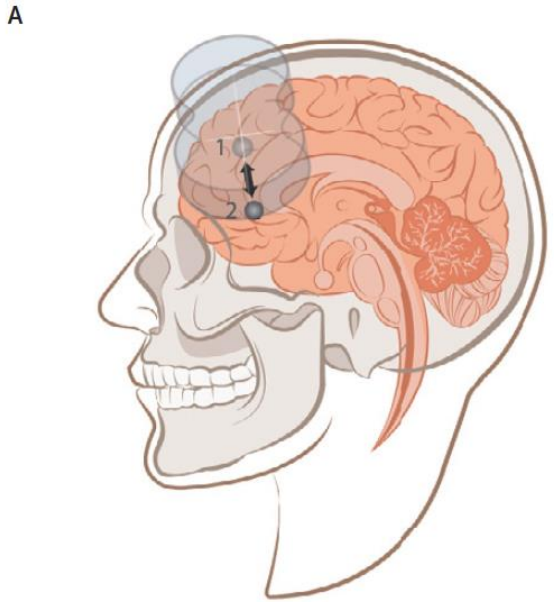
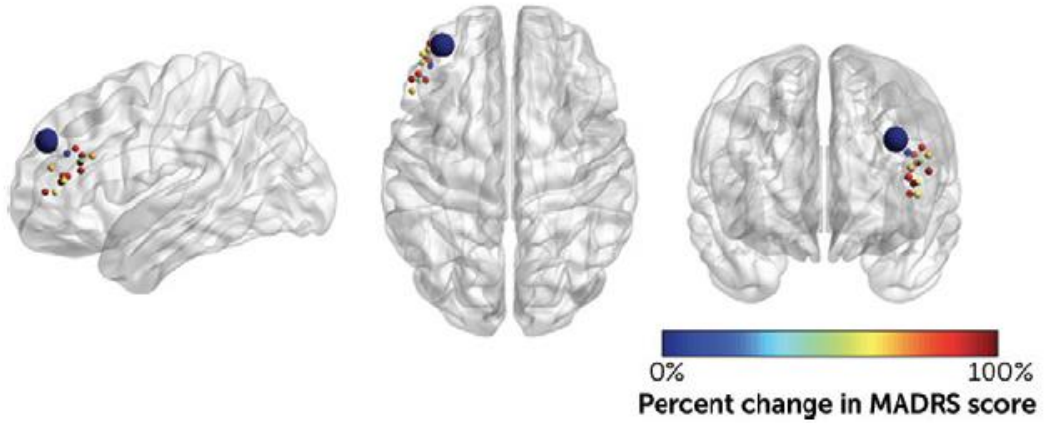


FIGURE 1. Individualized functional connectivity MRI–guided target locations for Stanford neuromodulation therapy in relation to an average F3 coordinate[a]



[a] The location of the F3 coordinate (shown in dark blue) is based on the work of Okamoto et al. (59). The colors of the targets represent the maximum percentage change from baseline in Montgomery-Åsberg Depression Rating Scale (MADRS) score.

Am J Psychiatry 2022

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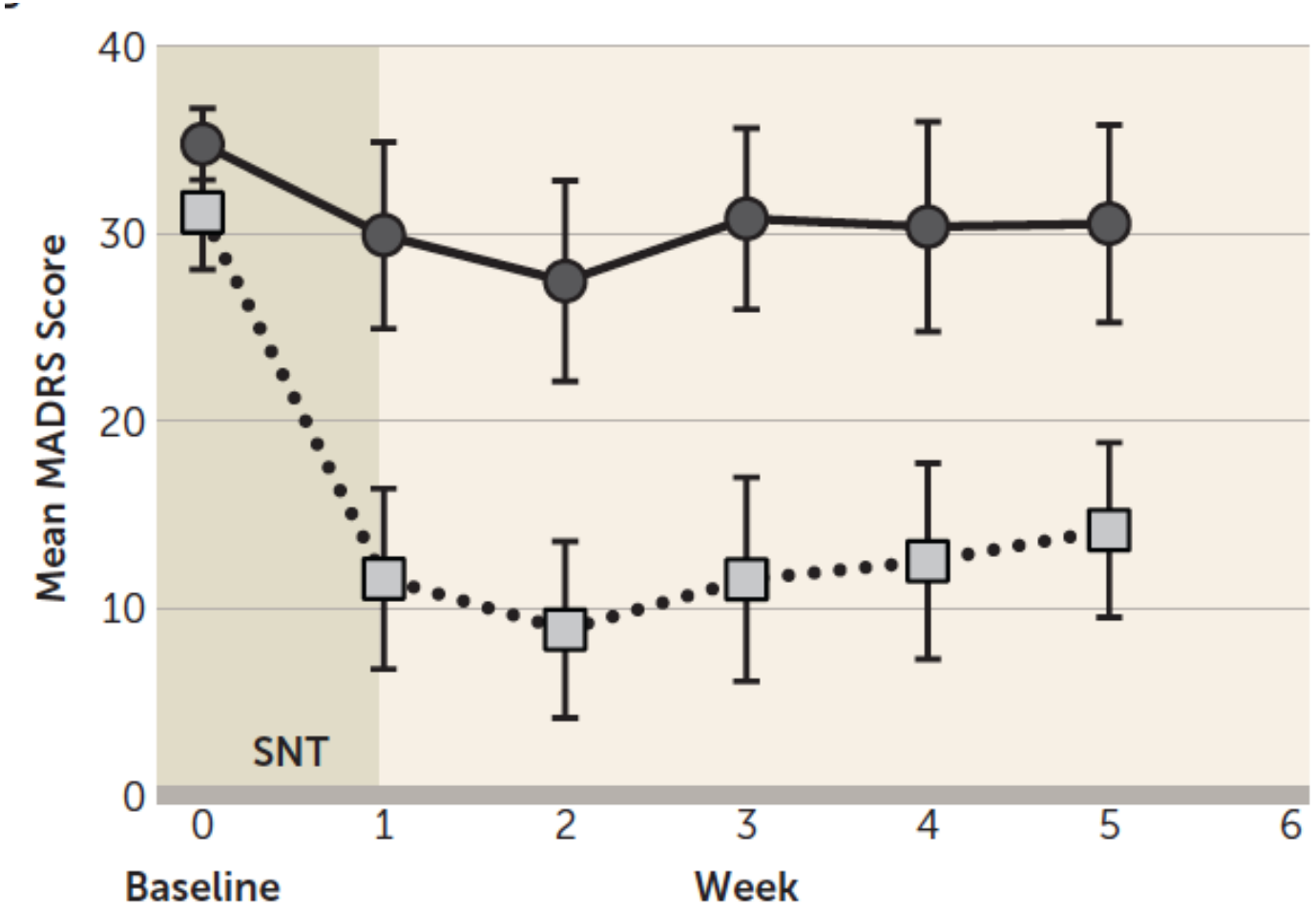
Stanford Neuromodulation Therapy (SNT): A Double-Blind Randomized Controlled Trial

on

Eleanor J. Cole, Ph.D., Angela L. Phillips, Ph.D., Brandon S. Bentzley, M.D., Ph.D., Katy H. Stimpson, B.S., Romina Nejad, M.S., Fahim Barmak, M.D., Clive Veerapal, B.S., Naushaba Khan, B.S., Kirsten Cherian, Ph.D., Emily Felber, M.S., Randi Brown, M.S., Elizabeth Choi, M.S., Sinead King, Ph.D., Heather Pankow, B.S., James H. Bishop, Ph.D., Azeezat Azeez, Ph.D., John Coetzee, Ph.D., Rachel Rapier, B.S., Nicole Odenwald, M.A., David Carreon, M.D., Jessica Hawkins, B.A., Maureen Chang, B.S., Jennifer Keller, Ph.D., Kristin Raj, M.D., Charles DeBattista, M.D., Booil Jo, Ph.D., Flint M. Espil, Ph.D., Alan F. Schatzberg, M.D., Keith D. Sudheimer, Ph.D., Nolan R. Williams, M.D.



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- N=29

TABLE S5. Response and remission rates at each time point

	Immediate-post	1 week	2 weeks	3 weeks	4 weeks	Any week of follow-up
Active group						
Response rate	71.4%	71.4%	78.6%	64.3%	64.3%	85.7%
Remission rate	57.1%	64.3%	50.0%	57.1%	42.9%	78.6%
Sham group						
Response rate	13.3%	13.3%	6.7%	6.7%	6.7%	26.7%
Remission rate	0%	6.7%	6.7%	6.7%	0%	13.3%

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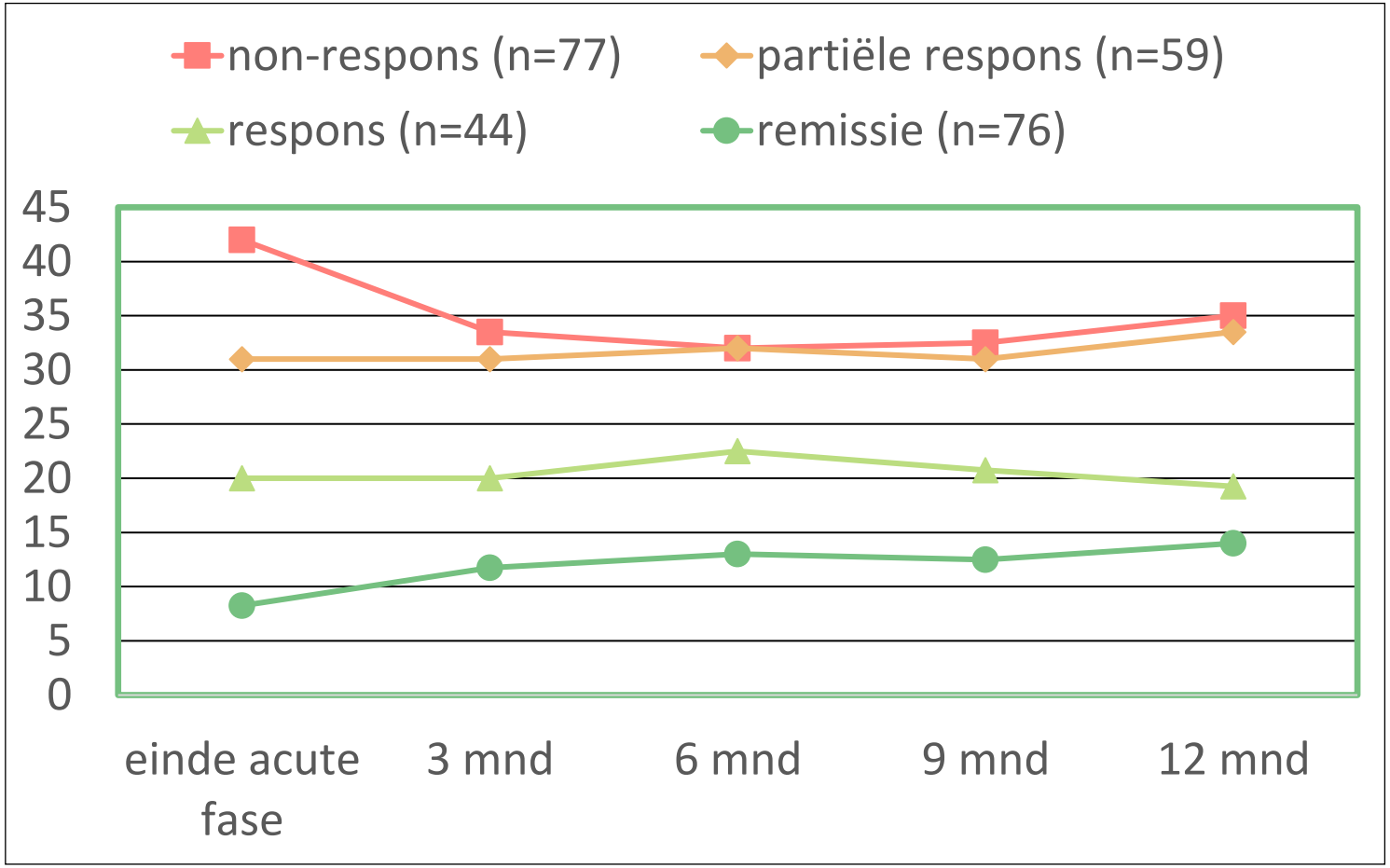
Terugval na rTMS behandeling: wat na de acute kuur?

Naturalistische studie van Dunner ea 2014

62% bleef het effect behouden na 12 maanden

49% kreeg een of meer sessies rTMS in het jaar na afronding



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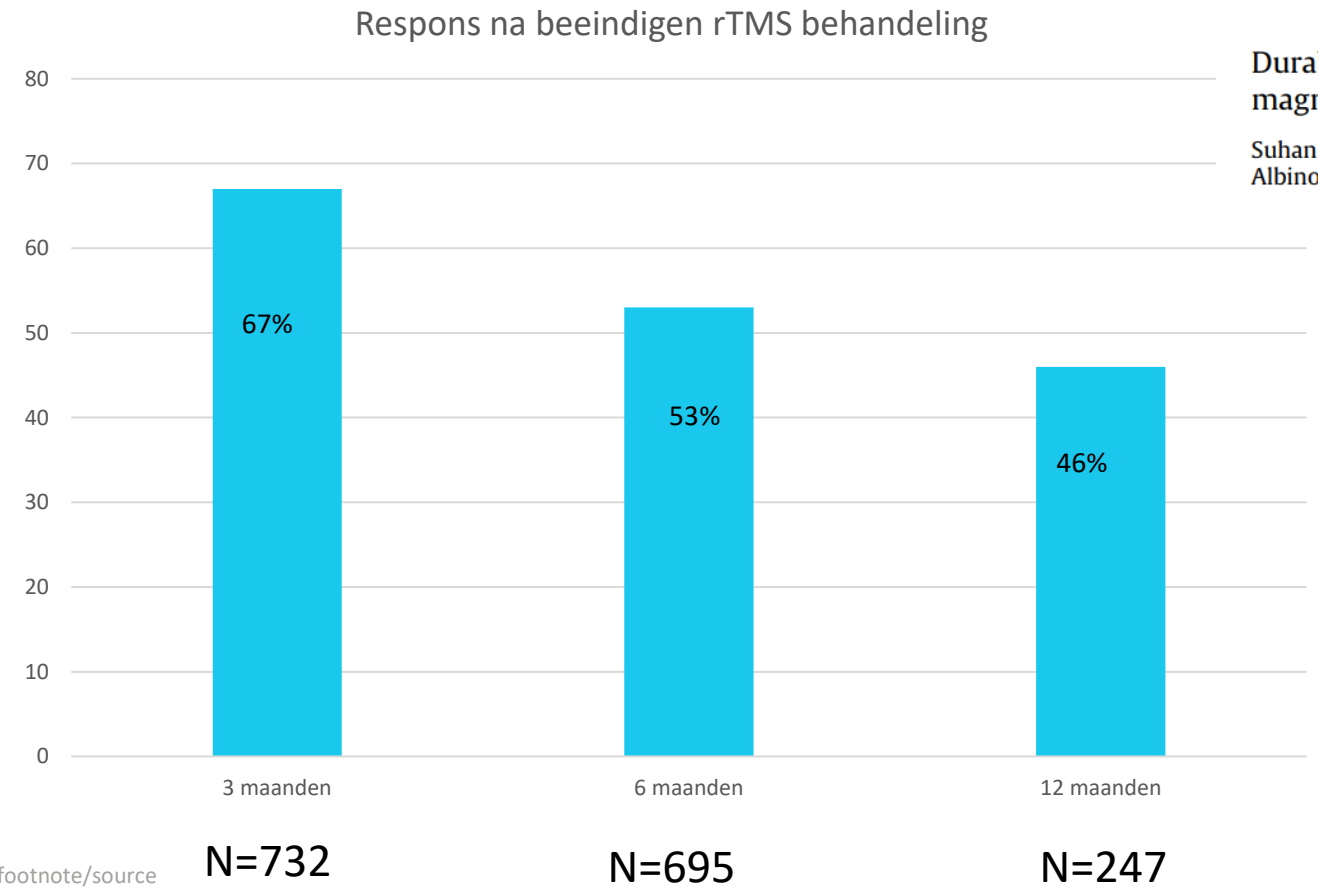
Meta-analyse duurzaamheid



N=732 N=695 N=247

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Brain Stimulation 12 (2019) 119–128

Contents lists available at ScienceDirect

Brain Stimulation

journal homepage: http://www.journals.elsevier.com/brain-stimulation

Durability of antidepressant response to repetitive transcranial magnetic stimulation: Systematic review and meta-analysis

Suhan Senova [a, b, c, 1], Gonçalo Cotovio [a, d, e, h, 1], Alvaro Pascual-Leone [f, g], Albino J. Oliveira-Maia [a, d, e, h, *]

19 studies

Vergelijking

ECT 40-86% terugval na 6 maanden

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Journal of Affective Disorders 296 (2022) 79–88

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Review article

Systematic review of preservation TMS that includes continuation, maintenance, relapse-prevention, and rescue TMS

Saydra Wilson [a], Paul E. Croarkin [b], Scott T. Aaronson [c], Linda L. Carpenter [d], Michelle Cochran [e], Debra J. Stultz [f], F. Andrew Kozel [g,*]

Definitie preservation TMS

“TMS used to sustain a clinical response after a successful acute course of treatment”

30 studies

Placeholder for a footnote/source

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Samenvatting bevindingen

- Voornamelijk open label studies en weinig RCT’s
- Onderhoudsbehandeling is veilig
- Veel verschillende manieren om onderhouds TMS in te zetten
  - Vast schema vs opstarten TMS bij opvlammen symptomen
  - 1 sessie per maand vs 5-10 sessies in enkele dagen per maand
  - Stoppen van de behandeling na vast aantal sessies vs na behalen bepaald effect
- Sommige clienten knapten pas op tijdens onderhoudsbehandeling

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Op basis van deze review zijn aanbevelingen opgesteld door de Clinical TMS Society

If the patient relapses after < 1 year of a successful course of TMS for MDD (i.e., ≥ 50% improvement by rating scale):

1. repeat an acute course of TMS to the best wellness, then
2. consider implementing preservation TMS (see below)

If the patient relapses after > 1 year of a successful course of TMS for MDD (i.e., ≥ 50% improvement by rating scale):

1. repeat an acute course of TMS to best wellness, then
2. continue to monitor without preservation TMS

In NL wordt nu gewerkt aan een consensuspaper hierover

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rTMS bij angst, dwang en traumagerelateerde stoornissen

Overzicht van onderzoek naar indicaties

Contents lists available at ScienceDirect

Clinical Neurophysiology

journal homepage: www.elsevier.com/locate/clinph

Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS): An update (2014–2018)

Jean-Pascal Lefaucheur [a,b,*], André Aleman [c], Chris Baeken [d,e,f], David H. Benninger [g], Jérôme Brunelin [h], Vincenzo Di Lazzaro [i], Saša R. Filipović [j], Christian Grefkes [k,l], Alkomiet Hasan [m], Friedhelm C. Hummel [n,o,p], Satu K. Jääskeläinen [q], Berthold Langguth [r], Letizia Leocani [s], Alain Londero [t], Raffaele Nardone [u,v,w], Jean-Paul Nguyen [x,y], Thomas Nyffeler [z,aa,ab], Albino J. Oliveira-Maia [ac,ad,ae], Antonio Oliviero [af], Frank Padberg [m], Ulrich Palm [m,ag], Walter Paulus [ah], Emmanuel Poulet [h,ai], Angelo Quartarone [aj], Fady Rachid [ak], Irena Rektorová [al,am], Simone Rossi [an], Hanna Sahlsten [ao], Martin Schecklmann [r], David Szekely [ap], Ulf Ziemann [aq]

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[ab] Neurocenter, Luzerner Kantonsspital, Lucerne, Switzerland

Table 20
Summary of recommendations on rTMS efficacy according to clinical indication.

Neuropathic pain	Definite analgesic efficacy of HF-rTMS of M1 contralateral to pain side (Level A), while LF-rTMS is probably ineffective (Level B)
CRPS type I	Possible analgesic efficacy of HF-rTMS of M1 contralateral to pain side (Level C)
Fibromyalgia	**Probable efficacy of HF-rTMS of the left M1 in improving quality of life of patients with fibromyalgia (Level B)**
Fibromyalgia	**Probable analgesic efficacy of HF-rTMS of the left DLPFC in patients with fibromyalgia (Level B)**
Parkinson's disease	**Probable efficacy of HF-rTMS of bilateral M1 regions in motor symptoms of PD patients (Level B)**
Parkinson's disease	Probable antidepressant efficacy of HF-rTMS of the left DLPFC in PD patients (Level B)
Motor stroke	**Definite efficacy of LF-rTMS of contralesional M1 in hand motor recovery at the postacute stage (Level A)**
Motor stroke	**Probable efficacy of HF-rTMS of ipsilesional M1 in hand motor recovery at the postacute stage (Level B)**
Motor stroke	**Possible efficacy of LF-rTMS of contralesional M1 in hand motor recovery at the chronic stage (Level C)**
Post-stroke aphasia	**Probable efficacy of LF-rTMS of right IFG in nonfluent aphasia recovery at the chronic stage (Level B)**
Hemispatial neglect	Possible efficacy of cTBS of the contralesional left parietal in visuospatial hemineglect recovery at the post-acute stage of stroke (Level C)
Multiple sclerosis	**Probable efficacy of iTBS of the leg area of M1 contralateral to the most affected limb (or both M1) in lower limb spasticity (Level B)**
Epilepsy	Possible antiepileptic efficacy of LF-rTMS of the epileptic focus (Level C)
Alzheimer's disease	**Possible efficacy of multisite rTMS-COG to improve cognitive function, memory and language level of AD patients, especially at a mild/early stage of the disease (Level C)**
Tinnitus	Possible efficacy of LF rTMS of the auditory cortex of the left hemisphere (or contralateral to the affected ear) in chronic tinnitus (Level C)
Depression	Definite antidepressant efficacy of HF-rTMS of the left DLPFC in major depression using a figure-of-8 coil or a H1-coil (Level A)
Depression	**Definite antidepressant efficacy of deep HF-rTMS over the left DLPFC in major depression (Level A)**
Depression	Probable antidepressant efficacy of LF-rTMS of the right DLPFC in major depression (Level B)
Depression	**Probable antidepressant efficacy of bilateral right-sided LF-rTMS and left-sided HF-rTMS of the DLPFC in major depression (Level B)**
Depression	**Probable antidepressant efficacy of bilateral right-sided cTBS and left-sided iTBS of the DLPFC in major unipolar depression (Level B), while unilateral right-sided cTBS is possibly ineffective (Level C)**
Depression	**Possibly no differential antidepressant efficacy between: right LF-rTMS vs. left HF-rTMS, bilateral vs. unilateral rTMS of the DLPFC, and rTMS performed alone vs. combined with antidepressants (Level C)**
Post-traumatic stress disorder	**Probable efficacy of HF-rTMS of the right DLPFC in PTSD (Level B)**
Obsessive compulsive disorder	**Possible efficacy of LF-rTMS of the right DLPFC in OCD (Level C)**
Schizophrenia:auditory hallucinations	Possible efficacy of LF-rTMS of the left TPC in auditory hallucinations in schizophrenia (Level C)
Schizophrenia: negative symptoms	**Possible efficacy of HF-rTMS of the left DLPFC on negative symptoms of schizophrenia (Level C)**
Addiction and craving	Possible efficacy of HF-rTMS of the left DLPFC on cigarette craving and consumption (Level C)

In all other conditions, there is "no recommendation", which means the absence of sufficient data to make a recommendation, but not the evidence for an absence of effect.
Recommendations that change from our previous work (Lefaucheur et al., 2014) are shown in bold.

rTMS bij dwang

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Meta-analyse 2023

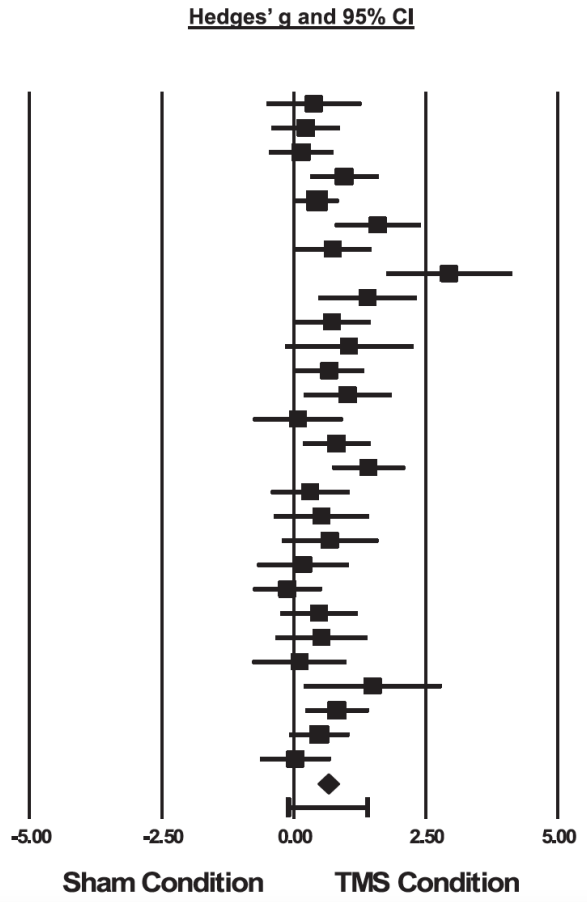
A Meta-analysis of Transcranial Magnetic Stimulation in Obsessive-Compulsive Disorder

Elizabeth R. Steuber and Joseph F. McGuire

Medium effect size

3x maal verhoogde kans op respons

						/alue	p-Value
						0.839	0.402
						0.704	0.481
						0.464	0.643
Badawy 2010b (adjunctive) (72)	0.958	0.328	0.108	0.316	1.601	2.923	0.003
Carmi 2019 (57)	0.445	0.207	0.043	0.039	0.851	2.147	0.032
Elbeh 2015a (1hz) (62)	1.593	0.411	0.169	0.789	2.398	3.881	0.000
Elbeh 2015b (10hz) (62)	0.745	0.368	0.135	0.024	1.466	2.024	0.043
Gomes 2012 (63)	2.944	0.606	0.367	1.757	4.131	4.862	0.000
Haghighi 2015 (73)	1.403	0.472	0.223	0.478	2.328	2.973	0.003
Jahanbakhsh 2023 (74)	0.728	0.367	0.135	0.008	1.448	1.980	0.048
Jahangard 2016 (69)	1.049	0.618	0.381	-0.161	2.259	1.699	0.089
Ji 2021 (75)	0.677	0.332	0.110	0.026	1.328	2.037	0.042
Joshi 2022 (76)	1.024	0.422	0.178	0.196	1.851	2.424	0.015
Kang 2009 (60)	0.082	0.429	0.184	-0.758	0.922	0.191	0.848
Khedr 2022 (dlPFC) (64)	0.816	0.323	0.104	0.183	1.449	2.525	0.012
Khedr 2022 (OFC) (64)	1.422	0.348	0.121	0.739	2.104	4.081	0.000
Mansur 2011 (67)	0.312	0.376	0.141	-0.425	1.049	0.830	0.407
Mantovani 2010 (65)	0.529	0.458	0.209	-0.368	1.426	1.156	0.248
Mantovani 2013 (77)	0.687	0.463	0.215	-0.221	1.595	1.483	0.138
Nauczyciel 2014 (58)	0.181	0.440	0.193	-0.682	1.043	0.410	0.681
Pelissolo 2016 (78)	-0.116	0.328	0.108	-0.759	0.527	-0.353	0.724
Prasko 2006 (61)	0.481	0.368	0.135	-0.240	1.202	1.307	0.191
Ruffini 2009 (66)	0.525	0.444	0.197	-0.344	1.395	1.185	0.236
Sachdev 2007 (59)	0.112	0.452	0.204	-0.774	0.998	0.248	0.804
Shayganfard 2016 (79)	1.498	0.662	0.439	0.200	2.796	2.263	0.024
Xiaoyan 2014 (68)	0.819	0.303	0.092	0.225	1.413	2.701	0.007
Zhang 2019 (80)	0.487	0.285	0.081	-0.073	1.046	1.705	0.088
Ziblak 2021 (81)	0.034	0.337	0.114	-0.627	0.695	0.100	0.920
Pooled	0.650	0.099	0.010	0.456	0.843	6.583	0.000
Prediction Interval	0.650			-0.099	1.399		



2023, Biological Psychiatry

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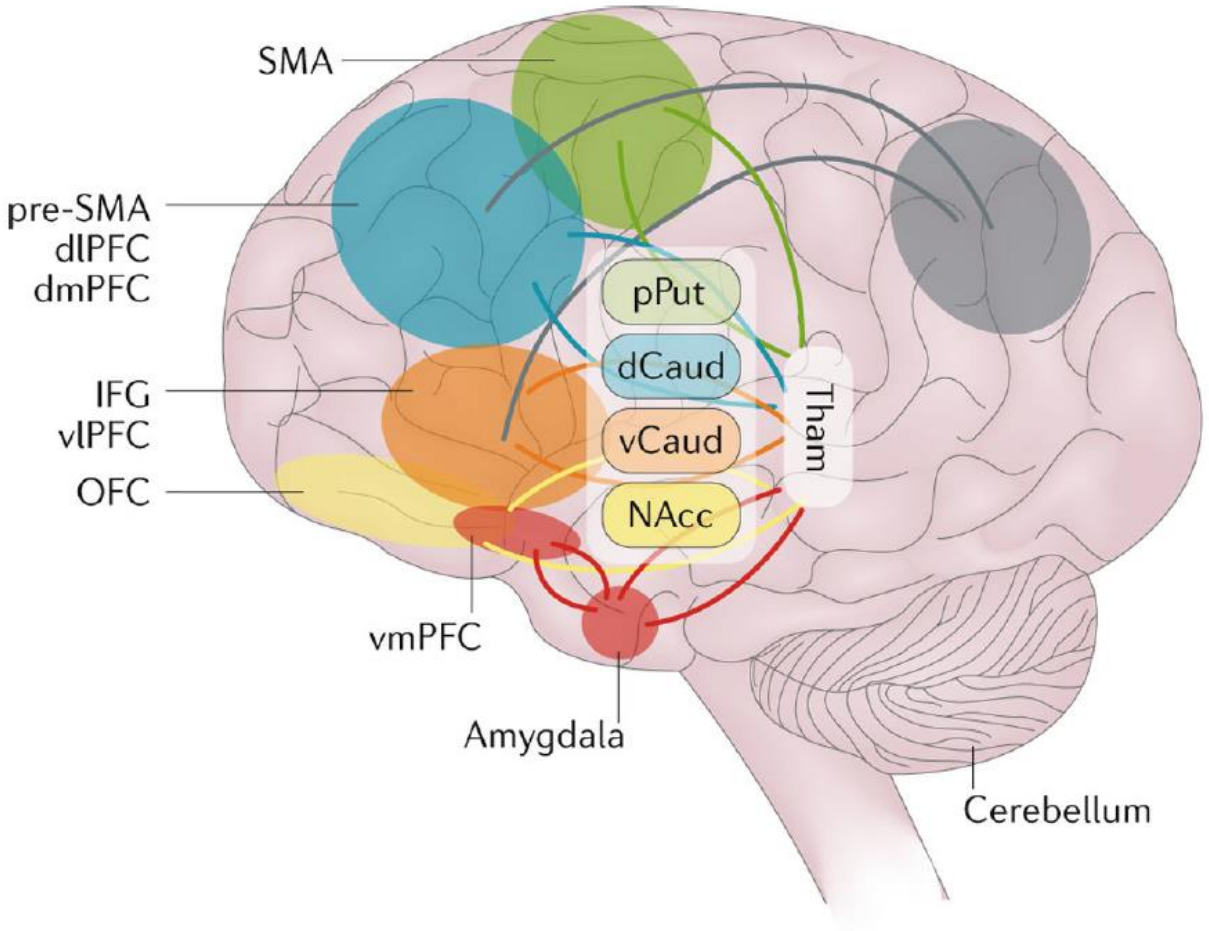
Cortico-striato-thalamo-corticale (CSTC) circuits



- 'Sensorimotor' CSTC circuit
  - Stimulus–response-based habitual behavior
- 'Dorsal cognitive' CSTC circuit
  - Working memory, planning and emotion regulation
- Frontoparietal network
  - Coordination of cognitive control
- 'Ventral cognitive' CSTC circuit
  - Response inhibition
- 'Ventral motivational' CSTC circuit
  - Stimulus-outcome-based motivational behaviour
- 'Frontolimbic' circuit
  - Fear extinction

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Archival Report

Biological Psychiatry: CNNI

Repetitive Transcranial Magnetic Stimulation for Obsessive-Compulsive Disorder: A Meta-analysis of Randomized, Sham-Controlled Trials

M. Prabhavi N. Perera, Sudaraka Mallawaarachchi, Aleksandra Miljevic, Neil W. Bailey, Sally E. Herring, and Paul B. Fitzgerald

ABSTRACT

BACKGROUND: Obsessive-compulsive disorder (OCD) is a chronic, disabling mental health condition with limited treatment options available to date. Numerous randomized controlled trials have explored the efficacy of repetitive transcranial magnetic stimulation (rTMS) in OCD. This meta-analysis synthesized data from selected randomized controlled trials and examined the impact of different treatment parameters to generate hypotheses that would direct future randomized controlled trials.

METHODS: A database search was performed to identify studies published in English up to October 2020. Randomized, sham-controlled studies that used rTMS to treat OCD were included. Effect sizes were calculated using Hedges' *g* for pre- to post-treatment Yale-Brown Obsessive Compulsive Scale scores. Subgroup analyses were conducted to assess the effects of variations in rTMS treatment parameters.

RESULTS: A total of 26 studies with 781 participants were included. Overall, rTMS demonstrated a modest effect on reduction of Yale-Brown Obsessive Compulsive Scale scores (Hedges' $g = 0.64$, 95% confidence interval = 0.39–0.89; $p < .0001$). The largest significant effect size was obtained by targeting the bilateral dorsolateral prefrontal cortex. High- and low-frequency rTMS showed comparable effects. Studies with follow-up data suggested that the effects of active rTMS remain significantly superior to those of sham 4 weeks after treatment.

CONCLUSIONS: The therapeutic effects of rTMS are superior to those of sham in the treatment of OCD. Targeting the bilateral dorsolateral prefrontal cortex was the most favorable approach in administering rTMS. Further research is required to determine the optimal frequency, total pulses per session, and duration of treatment with rTMS for OCD.

https://doi.org/10.1016/j.bpsc.2021.03.010

26 RCT's (781 deelnemers)

2021

The therapeutic effects of rTMS are superior to those of sham in the treatment of OCD

Targeting the bilateral dorsolateral prefrontal cortex was the most favorable approach in administering rTMS

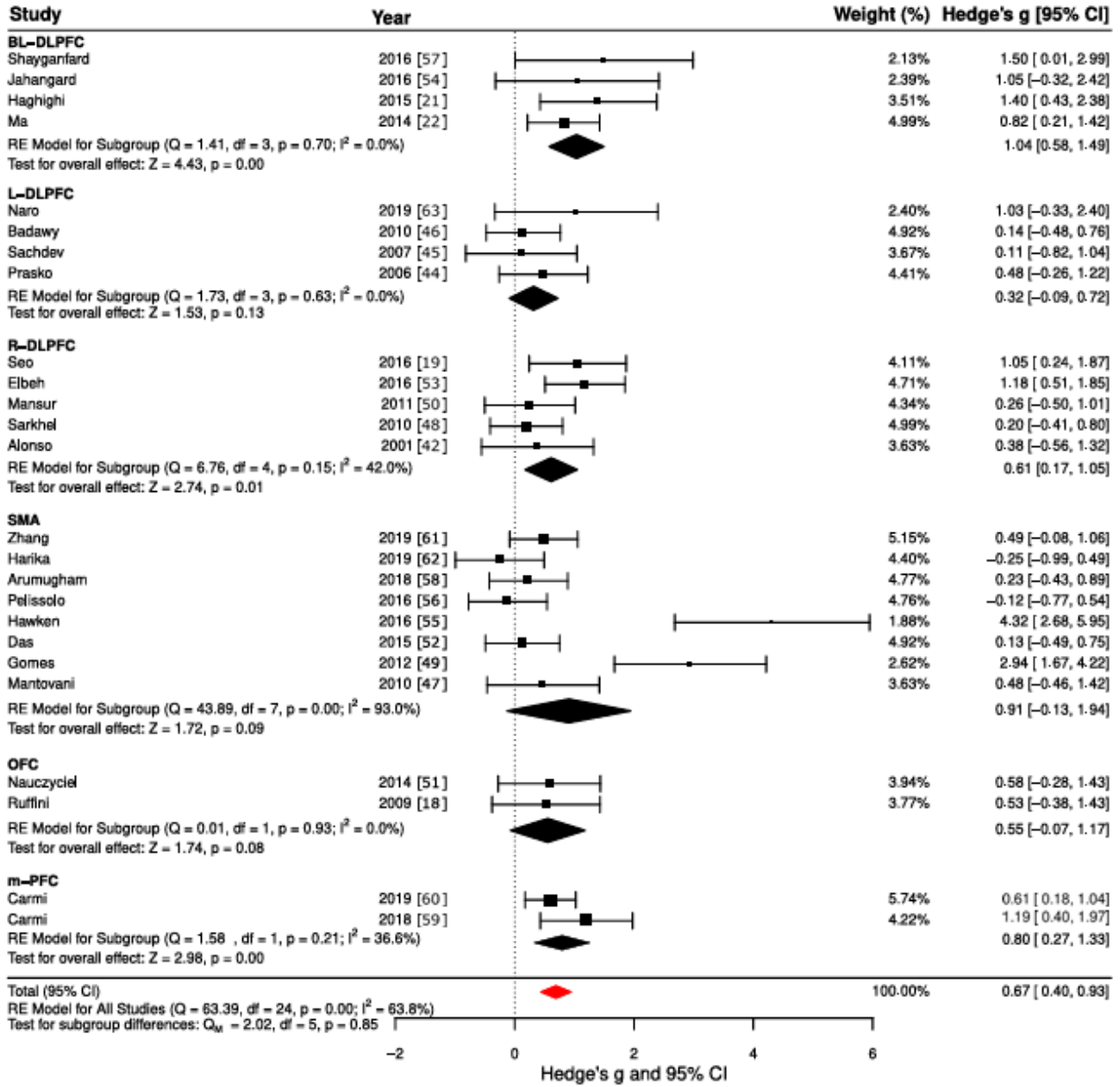

Figure 5. Subgroup analysis by cortical target. Forest plot demonstrating the effect sizes based on cortical target used to treat with repetitive transcranial magnetic stimulation in each included study. BL, bilateral; CI, confidence interval; DLPFC, dorsolateral prefrontal cortex; L, left; m-PFC, medial PFC; OFC, orbitofrontal cortex; Q_M, between-subgroup heterogeneity; R, right; RE, random effects; SMA, supplementary motor area.

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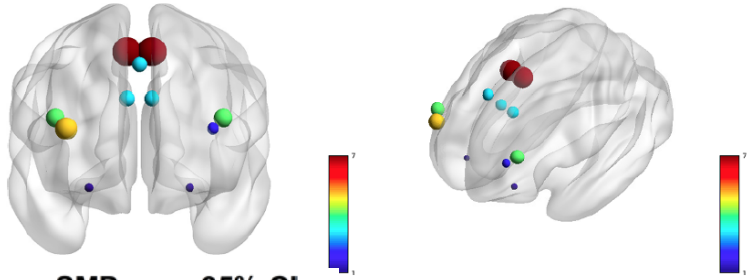
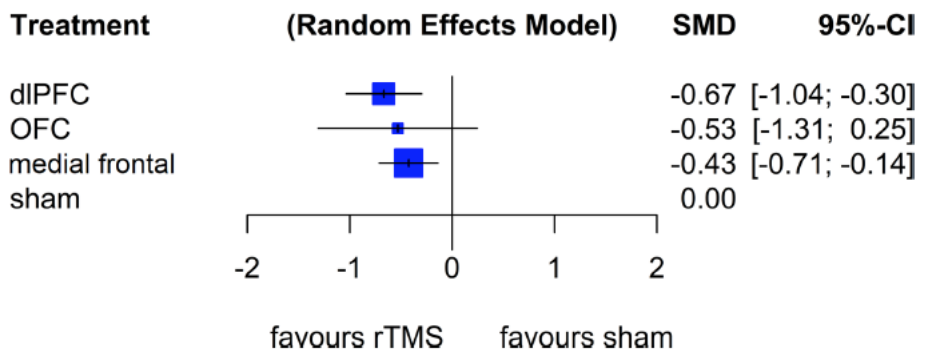
Repetitive transcranial magnetic stimulation for obsessive-compulsive disorder: A systematic review and pairwise/network meta-analysis

Sophie M.D.D. Fitzsimmons [a,b,*], Ysbrand D. van der Werf [b], A. Dilene van Campen [a,b], Martijn Arns [c,d,e], Alexander T. Sack [f,g], Adriaan W. Hoogendoorn [h,i], other members of the TETRO Consortium[j], Odile A. van den Heuvel [a,b]

Journal of affective disorders
2022

	Active	Sham
Total participants in this review	368	294
Sample size per study (mean± SD)	15.33 ± 8.70	14.00 ± 9.17
Age (mean ± SD)	33.52 ± 5.74	35.37 ± 5.46
Total treatment sessions per study (mode, range)	10, 10–30	
Weeks of treatment per study (mode, range)	2, 1–6	
Studies including only treatment resistant patients	18 (86%) of 21 studies	
Baseline YBOCS of all participants (mean, SD)	29.55 ± 3.07	
Baseline CGI of all participants (mean, SD)	5.27 ± 0.43	
Number of studies per stimulation protocol, clustered by anatomical region (location, frequency)		





	r dlPFC and preSMA, LF	1
dlPFC cluster	bilateral dlPFC, HF	4
	R dlPFC, HF	2
	R dlPFC, LF	2
	L dlPFC, HF	2
Medial frontal cluster	bilateral preSMA, cTBS	1
	bilateral preSMA, LF	6
	mPFC and ACC (dTMS), LF	1
	mPFC and ACC (dTMS), HF	2
OFC cluster	R OFC, LF	1
	L OFC, LF	1

Repetitive transcranial magnetic stimulation for obsessive-compulsive disorder: A systematic review and pairwise/network meta-analysis

Sophie M.D.D. Fitzsimmons [a,b,*], Ysbrand D. van der Werf [b], A. Dilene van Campen [a,b], Martijn Arns [c,d,e], Alexander T. Sack [f,g], Adriaan W. Hoogendoorn [h,i], other members of the TETRO Consortium [j], Odile A. van den Heuvel [a,b]

Journal of affective disorders
2022

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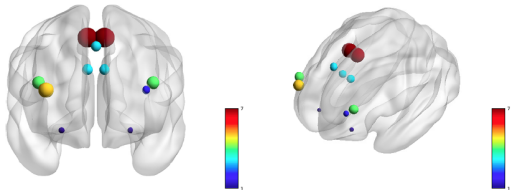

	r dlPFC and preSMA, LF
dlPFC cluster	bilateral dlPFC, HF
	R dlPFC, HF
	R dlPFC, LF
	L dlPFC, HF
Medial frontal cluster	bilateral preSMA, cTBS
	bilateral preSMA, LF
	mPFC and ACC (dTMS), LF
	mPFC and ACC (dTMS), HF
OFC cluster	R OFC, LF
	L OFC, LF

Conclusies:

- rTMS voor OCD was effectief vergeleken met sham

- LF R-DLPFC, HF bilateral DLPFC and LF preSMA stimulatie zijn allen effectief en geven allen significante en vergelijkbare verbeteringen

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Richtlijnendatabase

RICHTLIJNEN | ZOEK | NIEUWS | INSTRUCTIES | WERKWIJZE | OVER | CONTACT | APP | LOG IN | COVID-19

← Terug naar zoekresultaten

Angst- en Dwangstoornissen

+ VOLGEN

Initiatief: NVvP **Aantal modules:** 41

Bijlagen | Download richtlijn

Angst- en Dwangstoornissen

Zoeken binnen deze richtlijn

Alles openklappen

1. **Startpagina - Angst- en Dwangstoornissen**
2. Diagnostiek en Classificatie
3. Psychotherapie
4. EMDR bij Angst- en Dwangstoornissen
5. Vorm van aanbieden psychotherapie bij angst-en dwangstoornissen
6. Farmacotherapie
7. Combinatiebehandeling
8. Neuromodulatie
9. Ondersteunende interventies ter bevordering van maatschappelijke participatie
10. Onderhoudsbehandeling
11. Comorbiditeit Angst- en Dwangstoornissen en Depressie
12. Samenvatting: Behandelalgortimes

Bijlagen

Startpagina - Angst- en Dwangstoornissen

Beoordeeld: 04-03-2024

THUISARTS.NL
Angst- en piekerstoornis

Wat is nieuw?	Publicatiedatum
Diagnostiek en Classificatie	04-09-2024
Signalering van angst- en dwangstoornissen	04-09-2024
Startpagina - Angst- en Dwangstoornissen	04-09-2024
Classificatie en diagnostiek van angst- en dwangstoornissen 2023	04-09-2024
Psychotherapie	04-09-2024

bekijk meer

Deze revisie van de Multidisciplinaire Richtlijnen Angst- en Dwangstoornissen uit 2023 omvat evidence-based diagnostiek en behandeling van de meest belangrijke stoornissen uit de DSM-5-TR hoofdstukken 'Angststoornissen' en 'Obsessieve-compulsieve en verwante stoornissen'. In deze richtlijn zullen we de termen 'dwangstoornis', 'obsessieve-compulsieve stoornis'en de afkorting OCS naast elkaar gebruiken.

Het initiatief voor de revisie van deze richtlijn is genomen door de Nederlandse Vereniging voor Psychiatrie (NVvP). De richtlijn is opgesteld door een multidisciplinaire commissie met vertegenwoordigers van psychiaters, psychotherapeuten, psychologen, huisartsen, verpleegkundigen en patiënten.

Deze richtlijn is bestemd voor alle zorgverleners uit eerste, tweede en derde lijn die betrokken zijn bij de zorg voor patiënten met angst- en dwangstoornissen. Binnen de huisartsenpraktijk is de NHG-Standaard Angst de leidende richtlijn. Er zijn patiëntversies beschikbaar op sites van het Nederlands Kenniscentrum Angst en Depressie (www.nedkad.nl) en de patiëntenvereniging, de Angst, Dwang en Fobie Stichting (www.adfstichting.nl en www.ocdnet.nl). Verder is betrouwbare informatie over deze groep aandoeningen beschikbaar op www.thuisarts.nl/angststoornis en www.nvvp.net/website/patienteninformatie.

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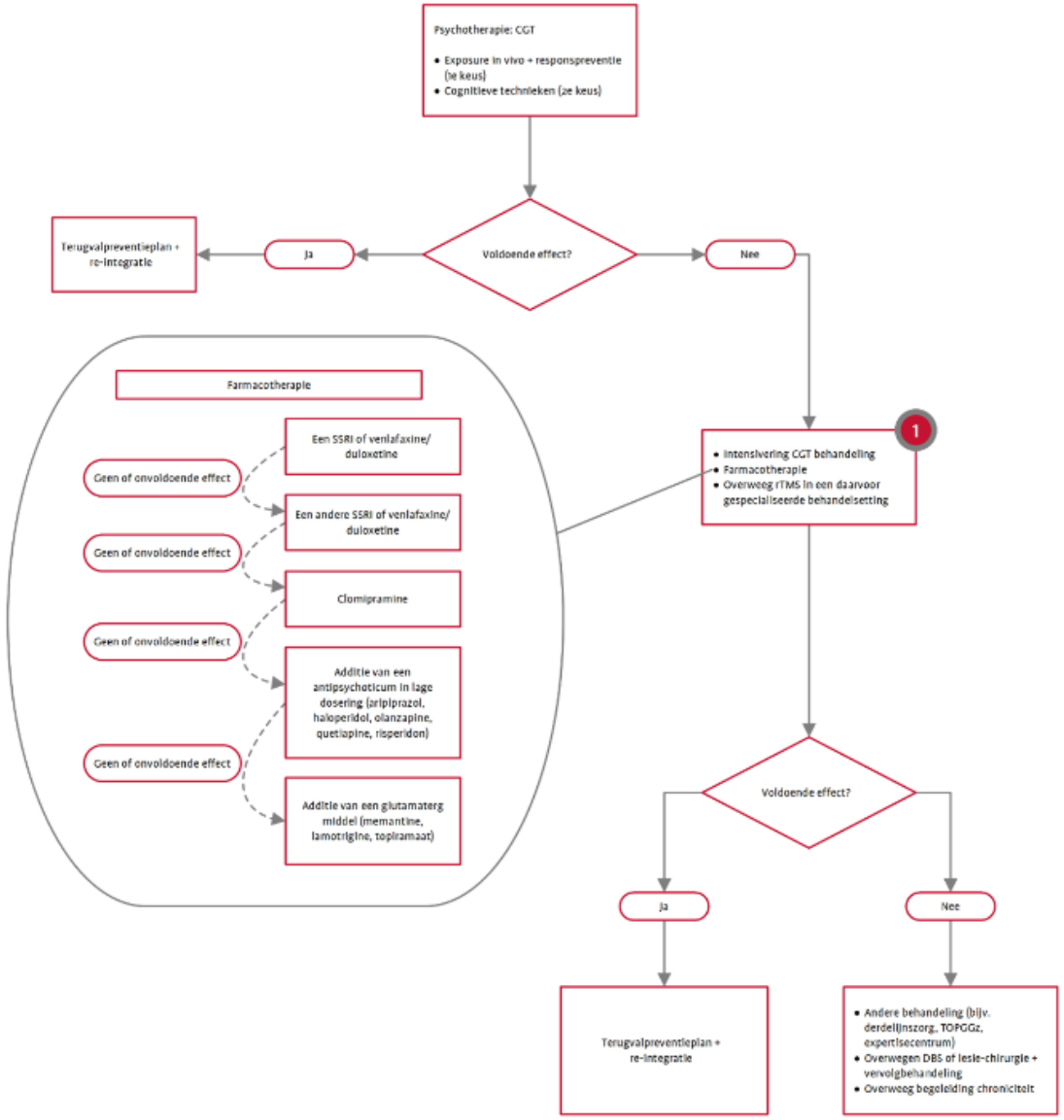
Aanbeveling

rTMS is te overwegen voor bij patiënten met OCS bij wie behandeling met cognitieve gedragstherapie en/of medicatie heeft gefaald (N.B. precieze plaats in het behandelalgoritme is nog te bepalen).

Uitvoering van rTMS vindt bij voorkeur plaats in een in rTMS bij OCS gespecialiseerde behandelsetting, waar ook verder onderzoek gedaan wordt.

Behandelalgoritme Obsessieve-compulsieve stoornis



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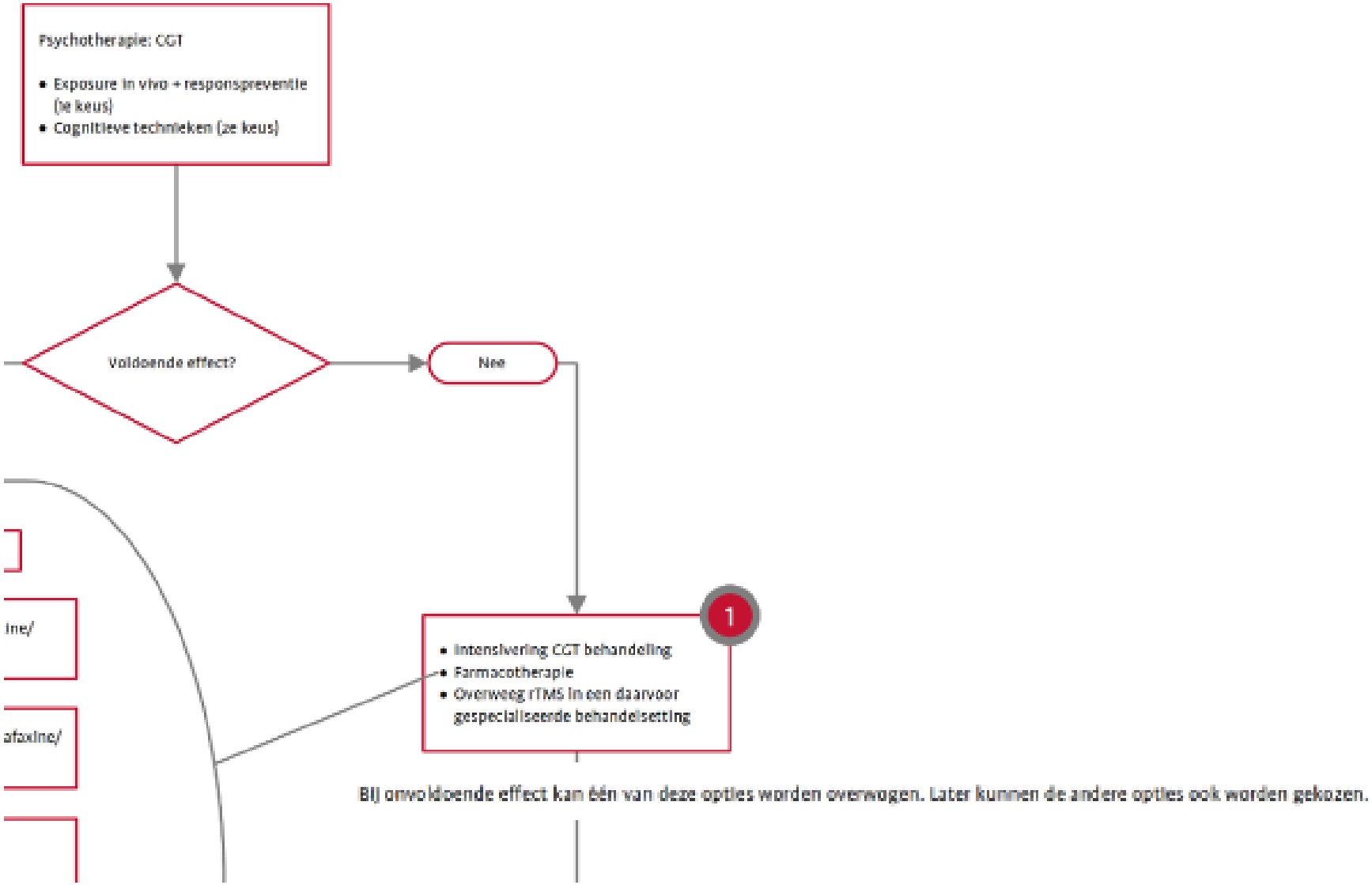
Psychotherapie: CGT
• Exposure in vivo + responspreventie (je keus)
• Cognitieve technieken (ze keus)
Voldoende effect?
Nee
ine/
afaxine/
1
• Intensivering CGT behandeling
• Farmacotherapie
• Overweeg rTMS in een daarvoor gespecialiseerde behandelsetting
Bij onvoldoende effect kan één van deze opties worden overwogen. Later kunnen de andere opties ook worden gekozen.

De toepassing van rTMS bij dwangstoornissen in Nederland en België: consensusverklaring

O.A. van den Heuvel, H.L.N. Tandt, K. Scheepstra, I. van Oostrom, C. Bervoets, E. Dijkstra, K. Schruers, I. Tendolkar, N.M. Batelaan, G-J. Hendriks, A.T. Sack, N. Vulink, I.M. van Vliet, P. van Eijndhoven, S.M.D.D. Fitzsimmons, T.S. Postma, Y.D. van der Werf, M. Arns, C. Baeken

Achtergrond In toenemende mate gebruikt men niet-invasieve neuromodulatie, zoals repetitieve transcraniële magnetische stimulatie (rTMS), in de behandeling van neurologische en psychiatrische aandoeningen. Waar rTMS voor behandeling van depressie toenemend terrein wint, is er binnen Nederland/België nog geen consensus over de toepassing ervan bij de obsessieve-compulsieve stoornis (OCS). Er bestaat echter een grote behoefte aan behandelalternatieven wanneer mensen met OCS onvoldoende verbeteren op exposuretherapie en serotonerg werkende antidepressiva.

Doel Consensusverklaring over de toepassing van rTMS in de behandeling van OCS.

Methode Kritische beschouwing van de evidentie van de huidige literatuur naar de effectiviteit van rTMS voor OCS, met name op basis van de vele recente meta-analyses, door een brede groep van experts op het gebied van rTMS, OCS en behandelrichtlijnen.

Resultaten rTMS is een potentieel werkzame behandeling voor OCS met een medium effectgrootte (g ≈ 0,5). Hierbij blijft het op basis van de huidige literatuur onduidelijk welk stimulatieprotocol het effectiefst is.

Conclusie Gezien de huidige evidentie voor de effectiviteit van rTMS voor OCS en het niet-invasieve karakter van deze behandeling, is het te overwegen om rTMS uit te voeren bij moeilijk te behandelen patiënten alvorens over te gaan tot meer invasieve vormen van behandeling, zoals diepe hersenstimulatie of zogenaamde laesiechirurgie.

Consensusbepaling

Het is te overwegen om rTMS uit te voeren bij moeilijk te behandelen patiënten alvorens over te gaan tot invasievere vormen van behandeling zoals DBS of laesiechirurgie

Gecombineerde rTMS met gedragstherapie (met name ERP) lijkt raadzaam

rTMS op de DLPFC, dACC of (pre-)SMA heeft bewezen meerwaarde

Advies dit te doen in een daarin gespecialiseerde setting, waarbij de informatie over de behandeleffecten wordt gebruikt voor verdere onderbouwing van de wetenschappelijke evidentie

(Kosten)effectiviteitsstudie OCD

TETRO
TMS for Exposure Therapy-Resistant OCD

Multicenter RCT TETRO

www.tetro-ocd.nl

Onderzoekt de werkzaamheid van rTMS + ERP bij mensen met OCD

Inclusie: mensen met OCD die onvoldoende baat hebben gehad bij ERP

5-7 weken lang 4x per week rTMS of sham (30 minuten) + ERP (90 minuten)

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TETRO
Locaties

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rTMS bij PTSS

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Hoogste nieuwe binnenkomer op Lefaucheurs hitlijst

Post-traumatic stress disorder	**Probable efficacy of HF-rTMS of the right DLPFC in PTSD (Level B)**
Obsessive compulsive disorder	**Possible efficacy of LF-rTMS of the right DLPFC in OCD (Level C)**
Schizophrenia:auditory	Possible efficacy of LF-rTMS of the left TPC in auditory hallucinations in schizophrenia

Lefaucheur et al, 2020

Gegeneraliseerde angst

PTSS

Paniekstoornis

Sociale angststoornis

ORIGINAL RESEARCH

Brain and Behavior Open Access WILEY

2019

Transcranial magnetic stimulation in anxiety and trauma-related disorders: A systematic review and meta-analysis

Patricia Cirillo[1,2,3] | Alexandra K. Gold[4,5] | Antonio E. Nardi[3] | Ana C. Ornelas[3] | Andrew A. Nierenberg[1,5,6] | Joan Camprodon[1,2,5] | Gustavo Kinrys[1,5,6]

[1]Department of Psychiatry, Massachusetts General Hospital, Boston, Massachusetts

[2]Division of Neuropsychiatry, Department of Psychiatry, Massachusetts General Hospital, Charlestown, Massachusetts

[3]Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

[4]Department of Psychological and Brain Sciences, Boston University, Boston, Massachusetts

[5]Dauten Family Center for Bipolar Treatment Innovation, Massachusetts General Hospital, Boston, Massachusetts

[6]Harvard Medical School, Boston, Massachusetts

Correspondence
Gustavo Kinrys, Dauten Family Center for Bipolar Treatment Innovation, Massachusetts General Hospital, Boston, Massachusetts.
Email: gkinrys@mgh.harvard.edu

Abstract

Background: Transcranial magnetic stimulation (TMS) has been evaluated as an effective treatment option for patients with major depressive disorder. However, there are limited studies that have evaluated the efficacy of TMS for other neuropsychiatric disorders such as anxiety and trauma-related disorders. We reviewed the literature that has evaluated TMS as a treatment for anxiety and trauma-related disorders.

Methods: We searched for articles published up to December 2017 in Embase, Medline, and ISI Web of Science databases, following the Preferred Items for Reporting of Systematic Reviews and Meta-Analyses (PRISMA) statement. Articles (n = 520) evaluating TMS in anxiety and trauma-related disorders were screened and a small subset of these that met the eligibility criteria (n = 17) were included in the systematic review, of which nine evaluated TMS in posttraumatic stress disorder (PTSD), four in generalized anxiety disorder (GAD), two in specific phobia (SP), and two in panic disorder (PD). The meta-analysis was performed with PTSD and GAD since PD and SP had an insufficient number of studies and sample sizes.

Results: Among anxiety and trauma-related disorders, TMS has been most widely studied as a treatment for PTSD. TMS demonstrated large overall treatment effect for both PTSD (ES = −0.88, 95% CI: −1.42, −0.34) and GAD (ES = −2.06, 95% CI: −2.64, −1.48), including applying high frequency over the right dorsolateral prefrontal cortex. Since few studies have evaluated TMS for SP and PD, few conclusions can be drawn.

Conclusions: Our meta-analysis suggests that TMS may be an effective treatment for GAD and PTSD.

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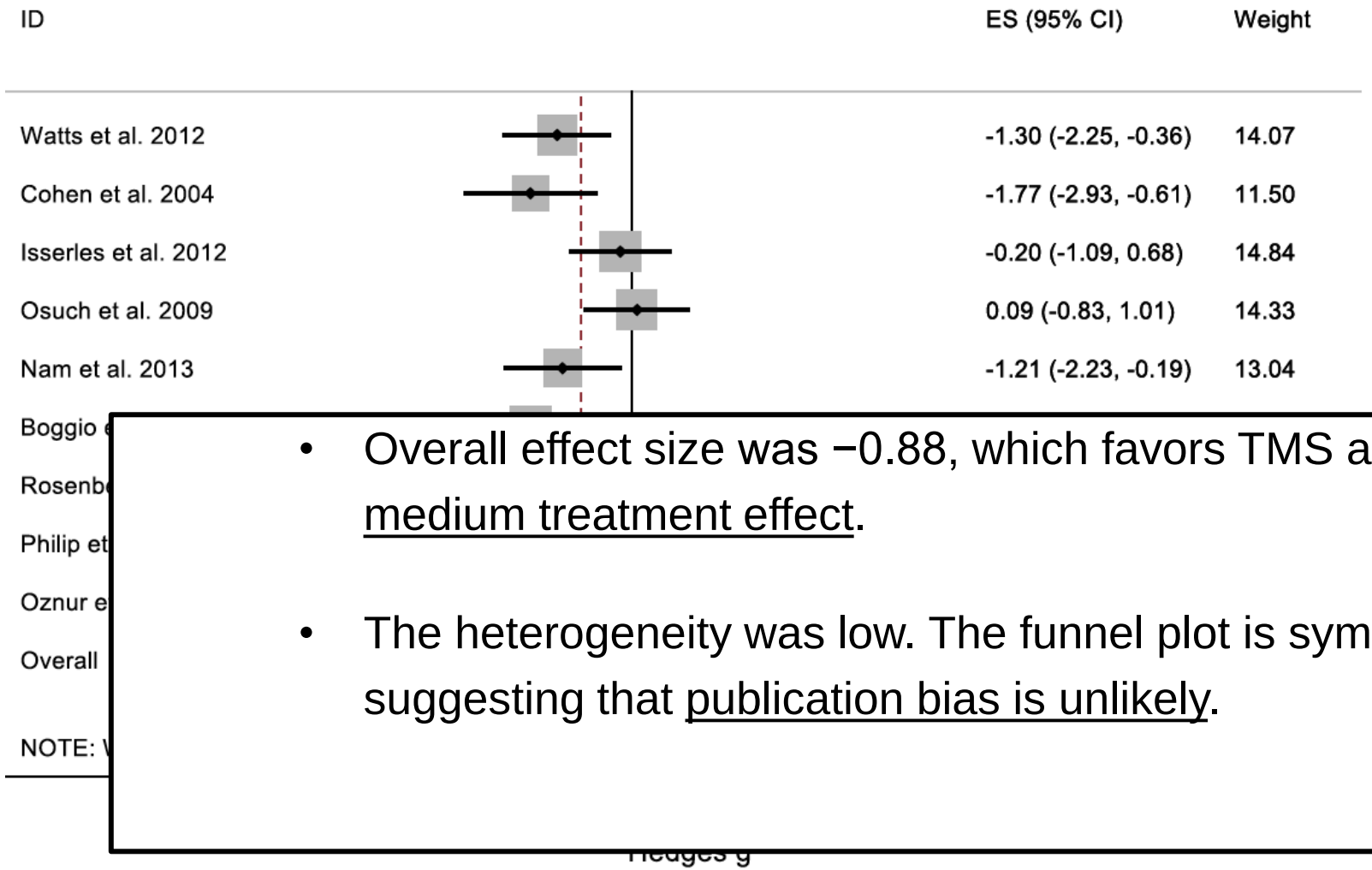
PTSS meta-analyse



- Overall effect size was −0.88, which favors TMS and suggests a medium treatment effect.
- The heterogeneity was low. The funnel plot is symmetric suggesting that publication bias is unlikely.

FIGURE 4 Forest plot of all nine PTSD and TMS studies

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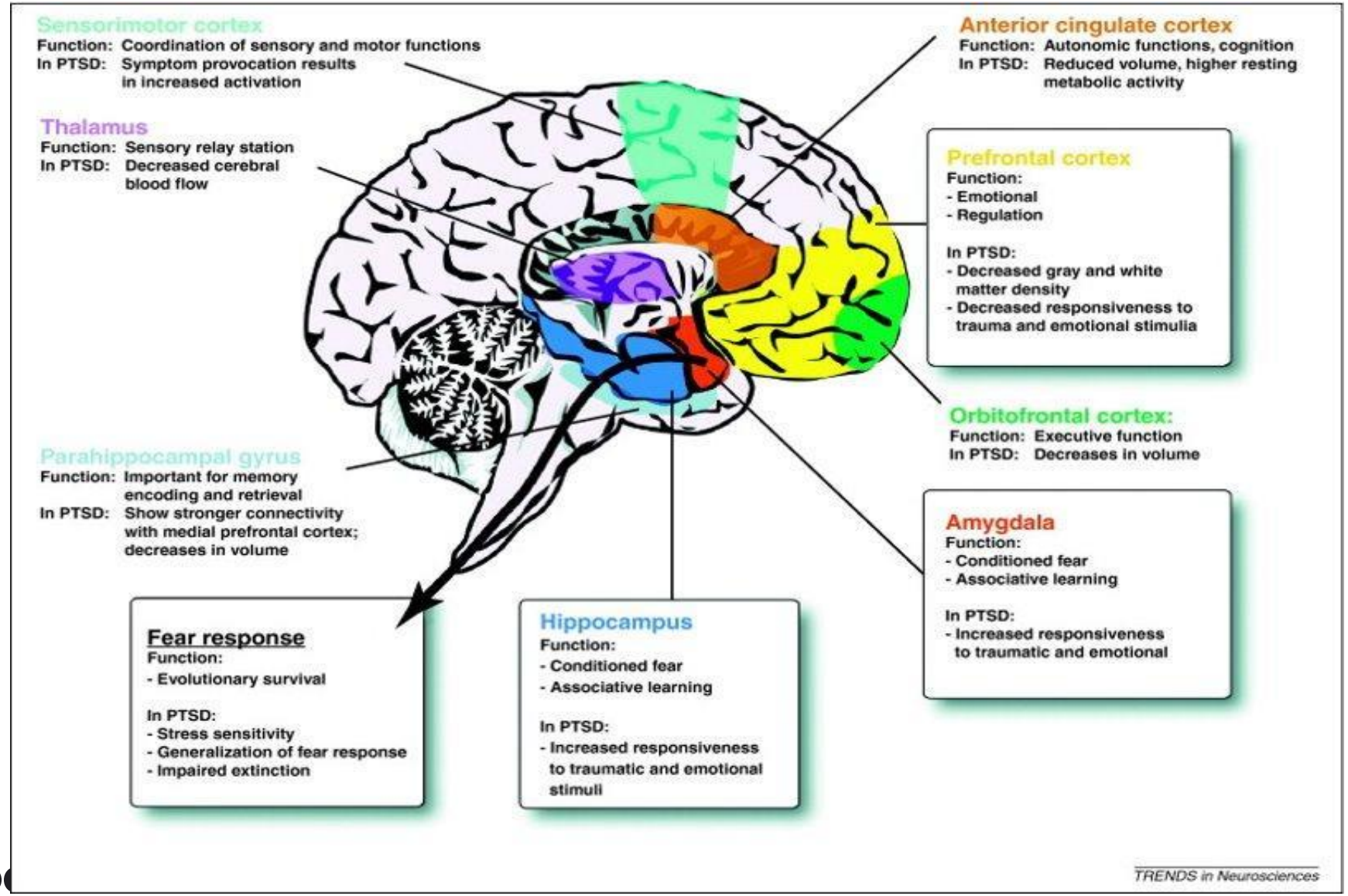
Waar stimuleren?



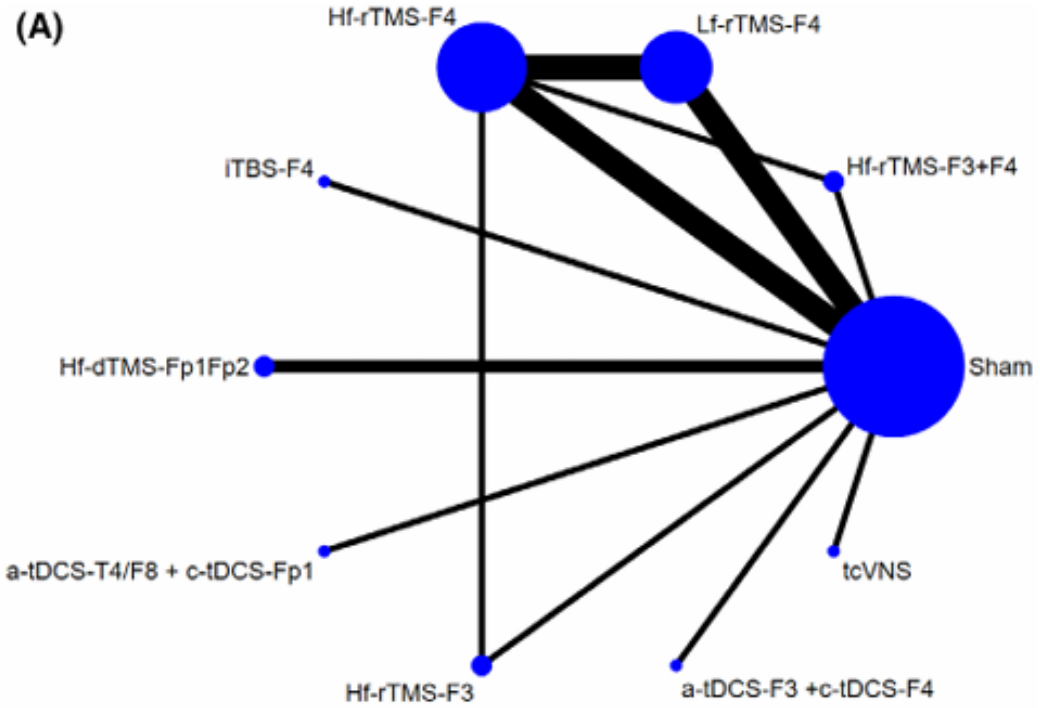
Acta Psychiatrica Scandinavica

META-ANALYSIS

Efficacy and acceptability of noninvasive brain stimulation for treating posttraumatic stress disorder symptoms: A network meta-analysis of randomized controlled trials

Ping-Tao Tseng, Bing-Yan Zeng, Hung-Yu Wang, Bing-Syuan Zeng, Chih-Sung Liang, Yang-Chieh Brian Chen, Brendon Stubbs, Andre F. Carvalho, Andre R. Brunoni **... See all authors**

Acta Psychiatr Scand. 2024;150:5–21.



- 14 RCTs met 686 deelnemers

Conclusie:

- HF stimulation op de R-DLPFC met/zonder HF stimulatie op de L-DLPFC was geassocieerd met een significante afname in PTSS klachten, namelijk depressieve en angstklachten en ernst van de PTSS

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Journal of Affective Disorders 229 (2018) 506–514

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

Repetitive TMS to augment cognitive processing therapy in combat veterans of recent conflicts with PTSD: A randomized clinical trial

F. Andrew Kozel[a,b,*,1], Michael A. Motes[c,1], Nyaz Didehbani[c,1], Bambi DeLaRosa[c,1], Christina Bass[c,1], Caitlin D. Schraufnagel[c,1], Penelope Jones[c,1], Cassie Rae Morgan[c,1], Jeffrey S. Spence[c,1], Michael A. Kraut[d,1], John Hart Jr.[c,e,1]

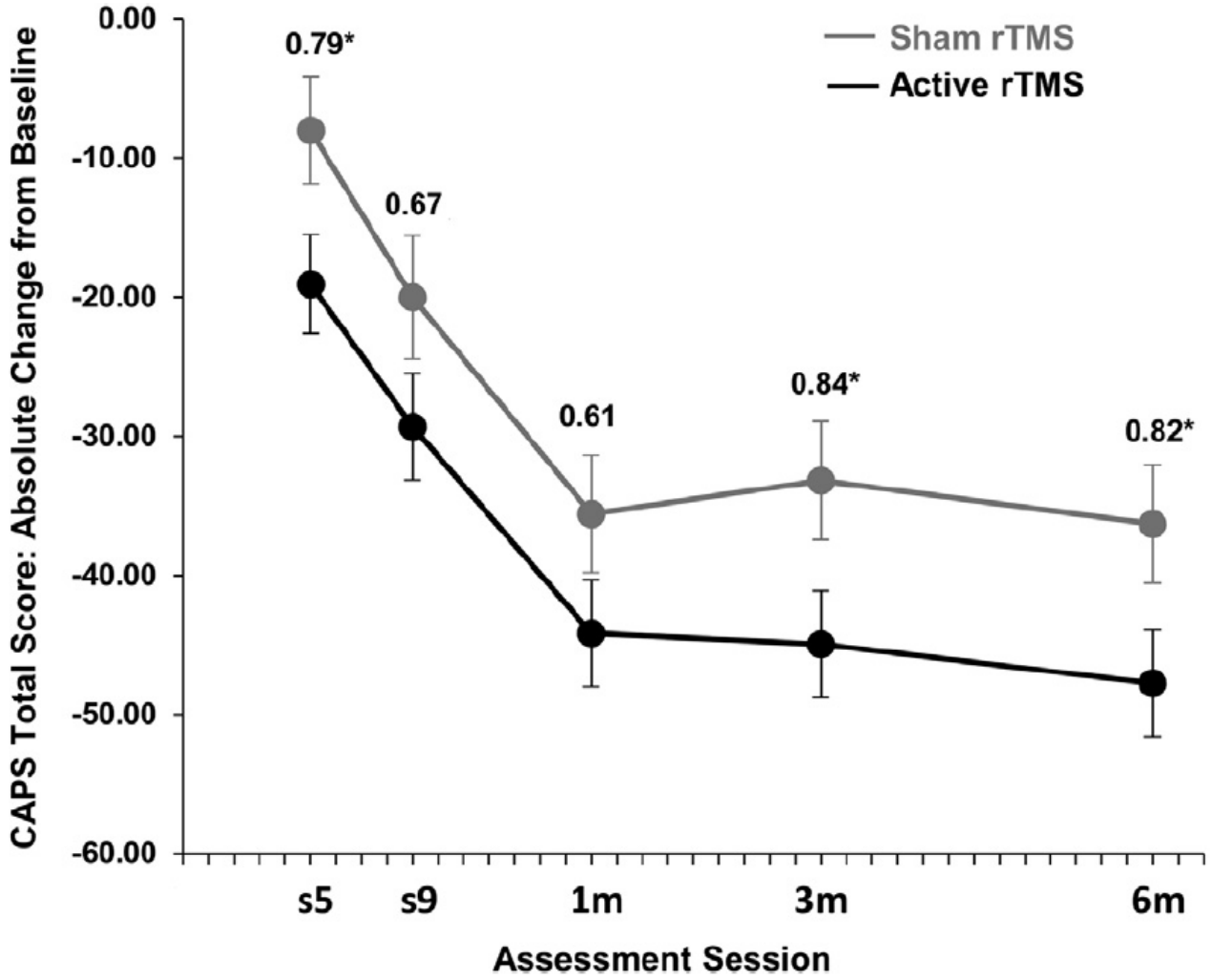
RCT

rTMS+CPT vs sham+CPT

Veteranen met PTSS (N=103)

1 Hz R-DLPFC, een keer per week, 12 sessies

Meteen na de rTMS behandeling een sessie CPT van ongeveer 60 minuten per sessie



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Meer symptoomreductie in de rTMS+CPT groep dan in de sham+CPT groep *(CAPS en PCL)*

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rTMS bij angststoornissen

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ANNALS OF CLINICAL PSYCHIATRY 2022;34(3):152-166,e10-e17 doi: 10.12788/acp.0067

RESEARCH ARTICLE

Repetitive transcranial magnetic stimulation for generalized anxiety and panic disorders: A systematic review and meta-analysis

Jessika Cox, MS
Bhaskar Thakur, PhD
Luis Alvarado, MS
Navkiran Shokar, MD
Peter M. Thompson, MD
Alok Kumar Dwivedi, PhD

BACKGROUND: Repetitive transcranial magnetic stimulation (rTMS) is an FDA-approved, noninvasive modality for treating major depressive disorder and obsessive-compulsive disorder. Earlier studies evaluating therapeutic effects of rTMS on symptom scores of patients with generalized anxiety disorder (GAD) and panic disorder (PD) have yielded inconsistent findings.

Gegeneraliseerde angststoornis

- Significante verbeteringen in angst en depressiescores:

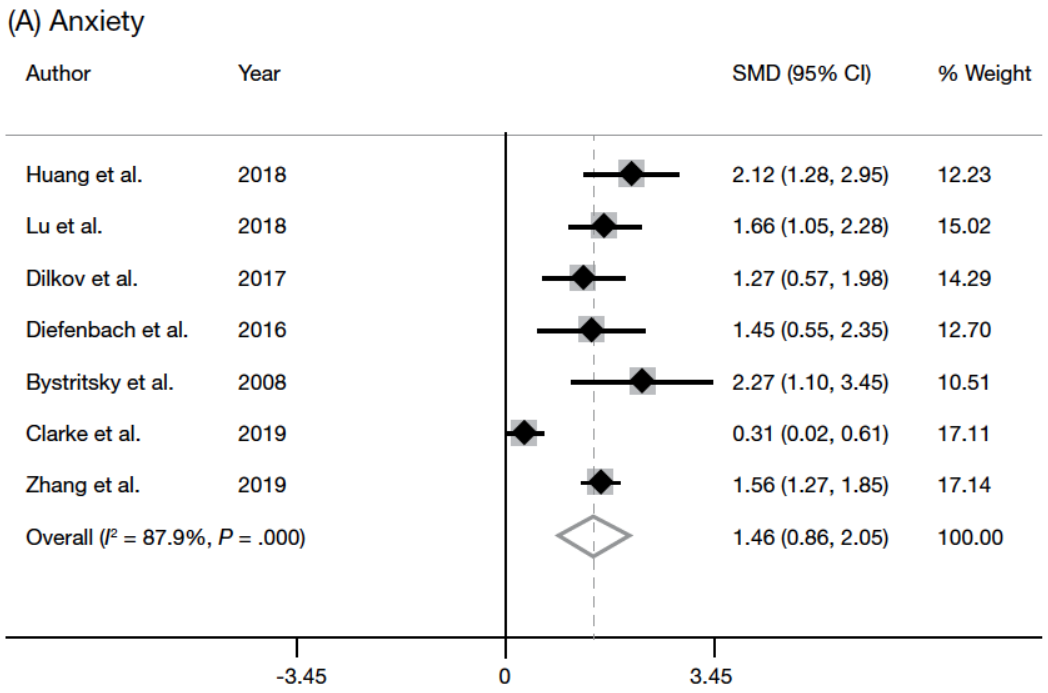
- onafhankelijk van de rTMS parameters

- onafhankelijk van aanwezigheid van comorbiditeit

- Effectiviteit werd bevestigd in een analyse van alleen RCTs

- Meeste effect bij:

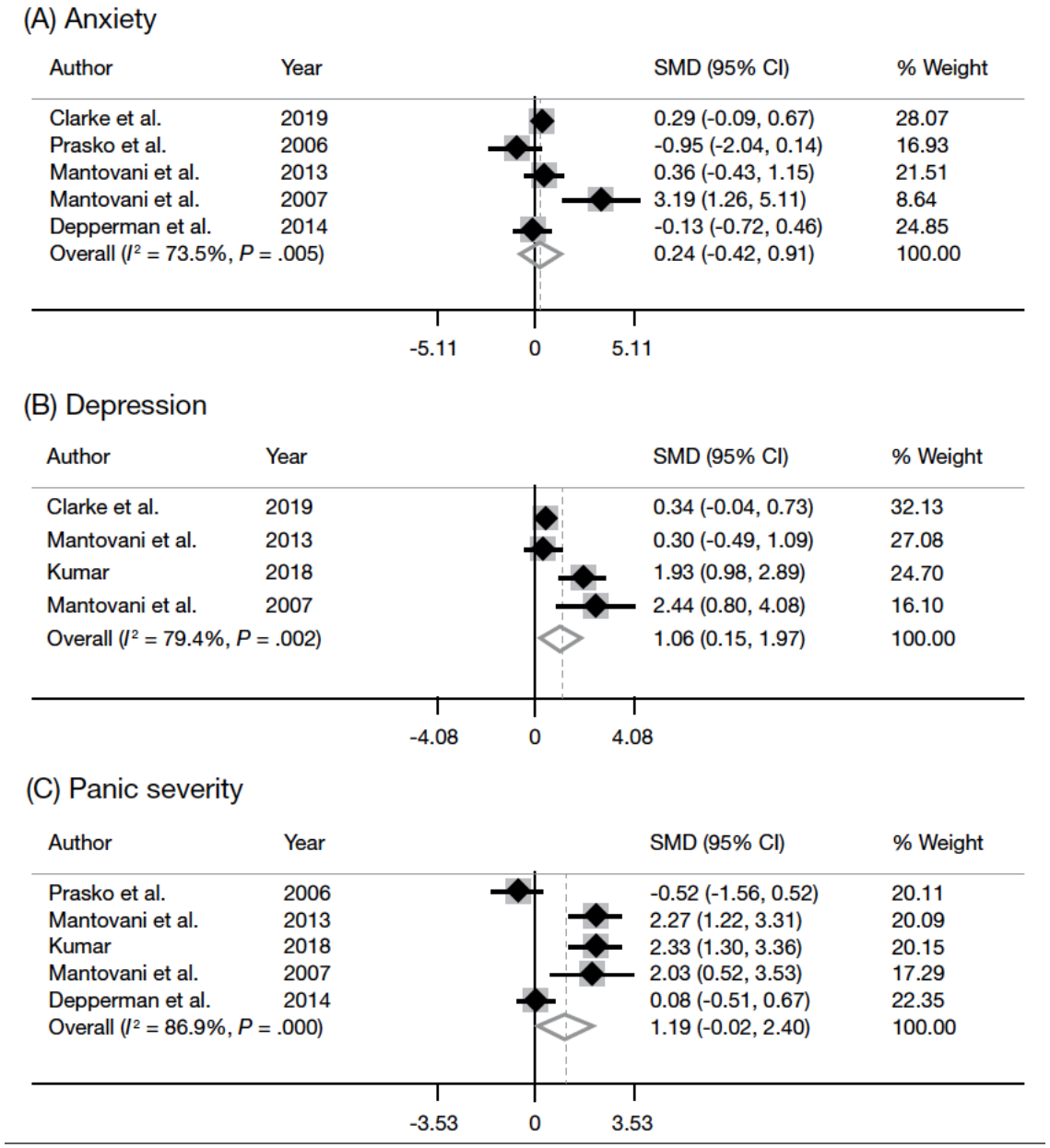
- R-DLPFC, 1Hz of 20Hz



Paniekstoornis

Geen significante verbetering in de ernst van angst en paniekklachten

rTMS had een positief effect bij patienten met paniekstoornis en depressie en niet bij alle patienten met een paniekstoornis



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Combinatiebehandeling

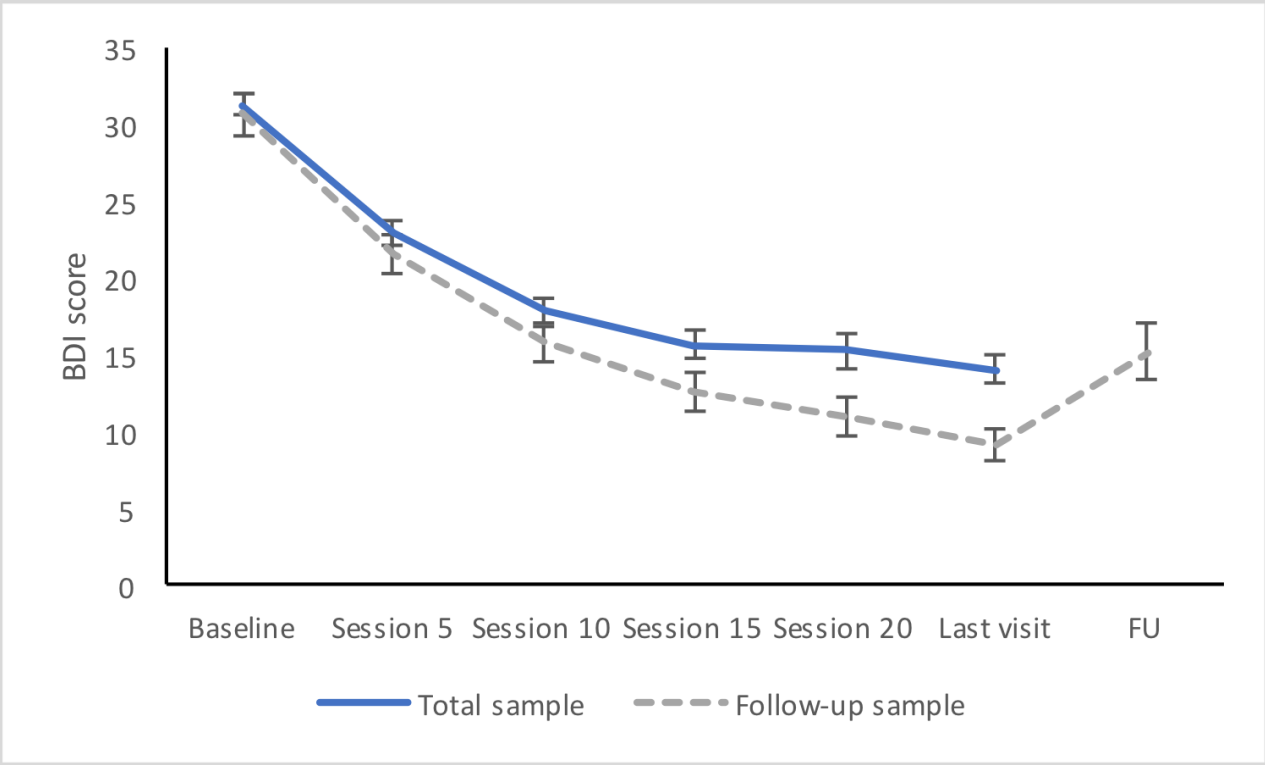
Contents lists available at ScienceDirect

Brain Stimulation

journal homepage: http://www.journals.elsevier.com/brain-stimulation

Simultaneous rTMS and psychotherapy in major depressive disorder: Clinical outcomes and predictors from a large naturalistic study

Lana Donse [a, b], Frank Padberg [c], Alexander T. Sack [a, d], A. John Rush [e], Martijn Arns [b, f, g, *]



L. Donse et al. / Brain Stimulation 11 (2018) 337–345

N = 196

rTMS + CGT bij depressie:

66% respons; 56% remissie

Andere studies rTMS only:

- Blumberger ea (N=385; 48% response; 30% remissie)
- Carpenter ea (N=307: 58% response; 37% remissie)
- Fitzgerald ea (N=1132: 44% response; 31% remissie)

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Contents lists available at ScienceDirect

International Journal of Clinical and Health Psychology

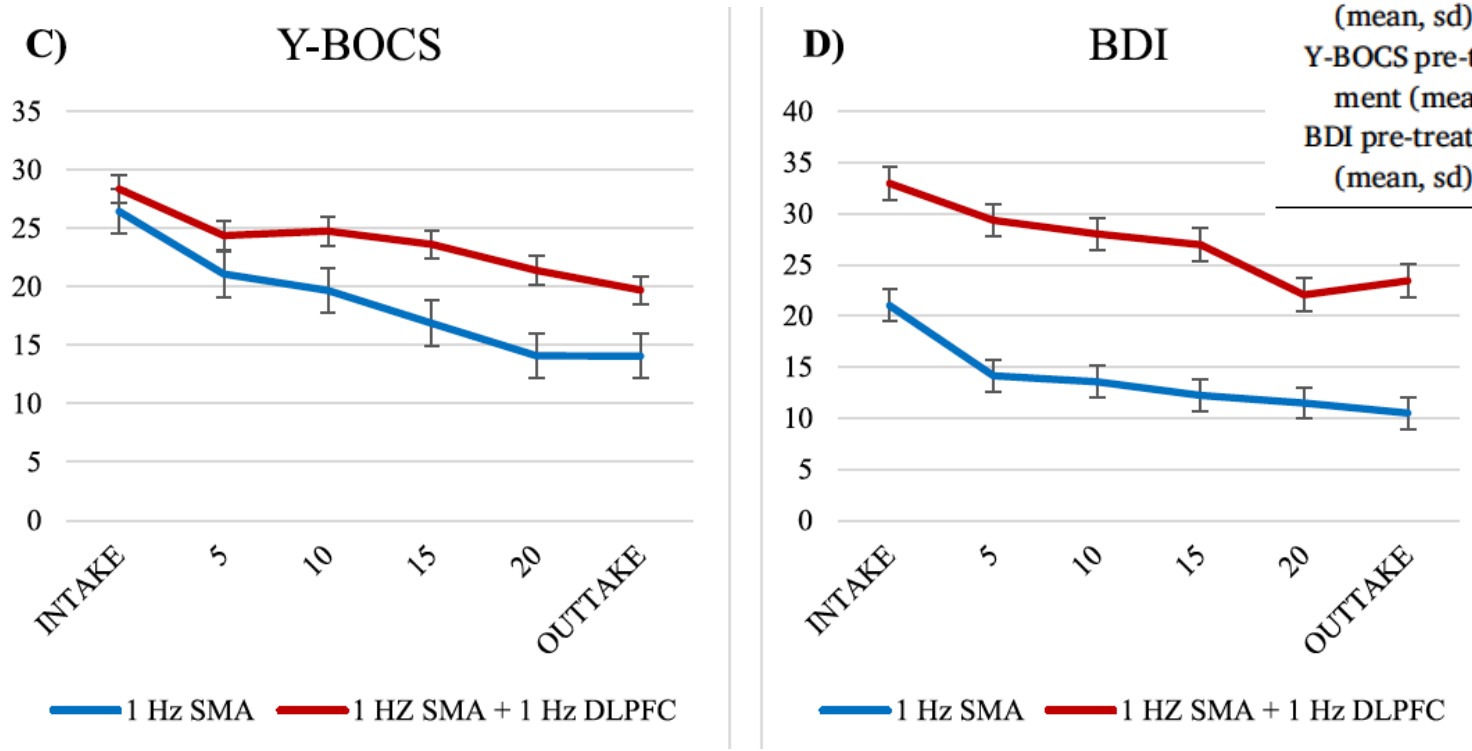
journal homepage: www.elsevier.es/ijchp

Original article

Sleep predicts the response to rTMS and CBT in patients with OCD: an open label effectiveness study

Priya T. Gajadien [a,b], Tjardo S. Postma [c], Iris van Oostrom [g], Karel W.F. Scheepstra [e,f], Hanneke van Dijk [b,d], Alexander T. Sack [d], Odile A. van den Heuvel [c,1], Martijn Arns [b,d,1,*]

	All (n = 61)	1-Hz SMA (n = 35)	1-Hz SMA + 1-Hz DLPFC (n = 26)
Age (y)	37.76 (13.29)	38.32 (13.27)	37.00 (13.55)
Males (n (%))	34 (55.7)	17 (48.6)	17 (65.4)
Medicated (n (%))	42 (68.9)	25 (71.4)	17 (65.4)
Responders (n (%))	32 (52.5)	21 (60.0)	11 (42.3)
Remission (n (%))	18 (29.5)	13 (37.1)	4 (15.4)
Number sessions (mean, sd)	27.8 (10.0)	28.5 (9.8)	26.7 (10.5)
Y-BOCS pre-treatment (mean, sd)	27.25 (6.21)	26.43 (6.40)	28.35 (5.90)
BDI pre-treatment (mean, sd)*	25.12 (10.9)	20.94 (10.2)	30.64 (9.3)



Tenminste 10 sessies TMS & ERP

- Respons 60% OCD
- Respons 42% OCD en depressie

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Neuroscience and Biobehavioral Reviews 142 (2022) 104867

Contents lists available at Scien

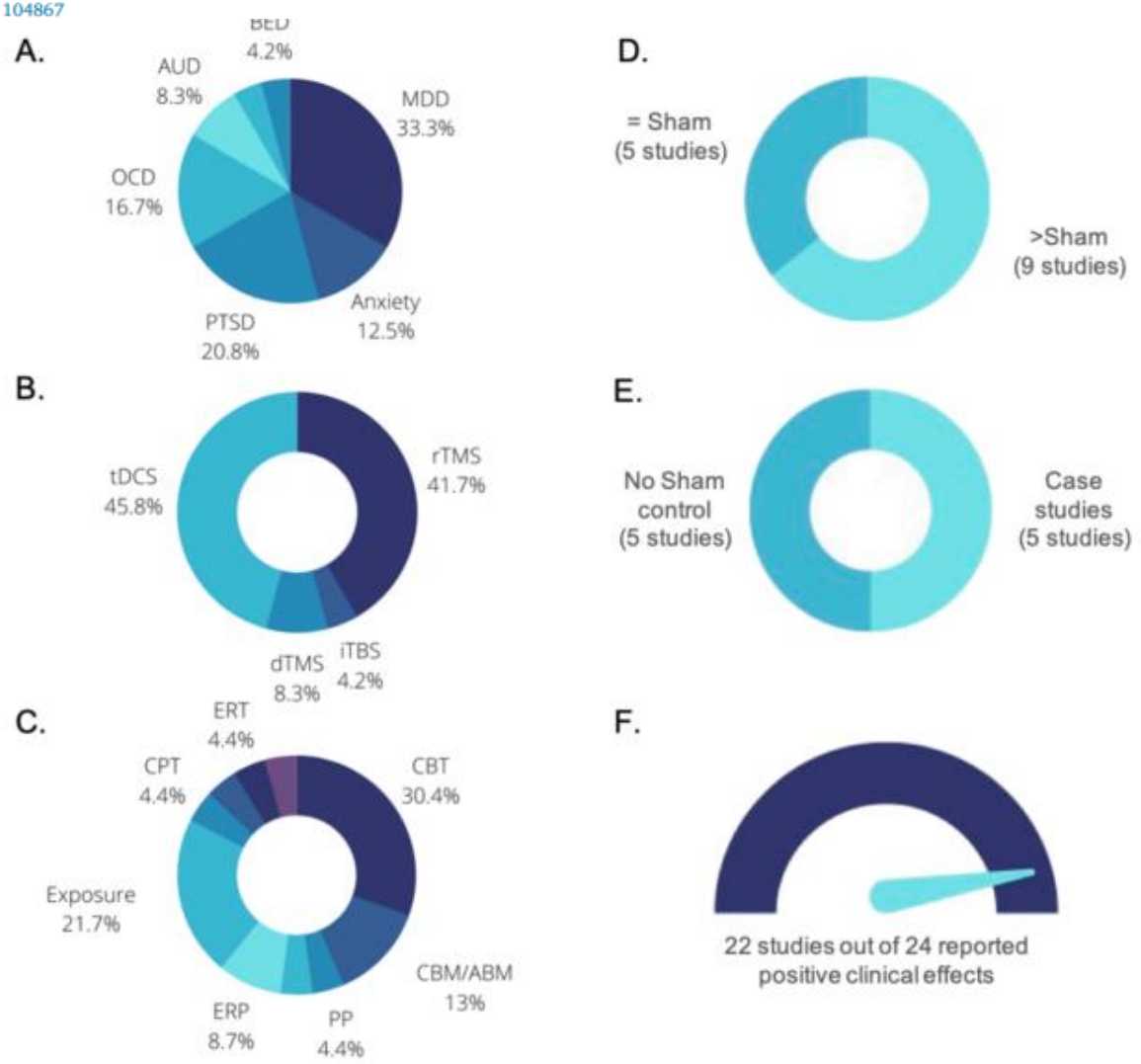
Neuroscience and Biobehav

journal homepage: www.elsevier.com/

Review article

Boosting psychological change: Combining non-inv with psychotherapy

Elisa Tatti [a,*], Angela L. Phillips [b], Rachel Paciorek [c], Sara M. Ro
Giorgio Di Lorenzo [e,f,g], Giulio Ruffini [f,g], Simone Rossi [h], Emilia



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Review Tatti ea 2022

De meerderheid van de studies die tot nu toe zijn gedaan naar de effecten van een gecombineerde behandeling laten inderdaad zien dat de klinische uitkomsten beter zijn wanneer NIHS en psychotherapie worden gecombineerd

In deze studies ging het meestal om een combinatie van NIHS met een vorm van cognitieve gedragstherapie

De meerwaarde van dergelijke combinatiebehandelingen wordt met name gezien bij aan middelen gerelateerde stoornissen, depressie, PTSS en OCS

Dank voor jullie aandacht!!