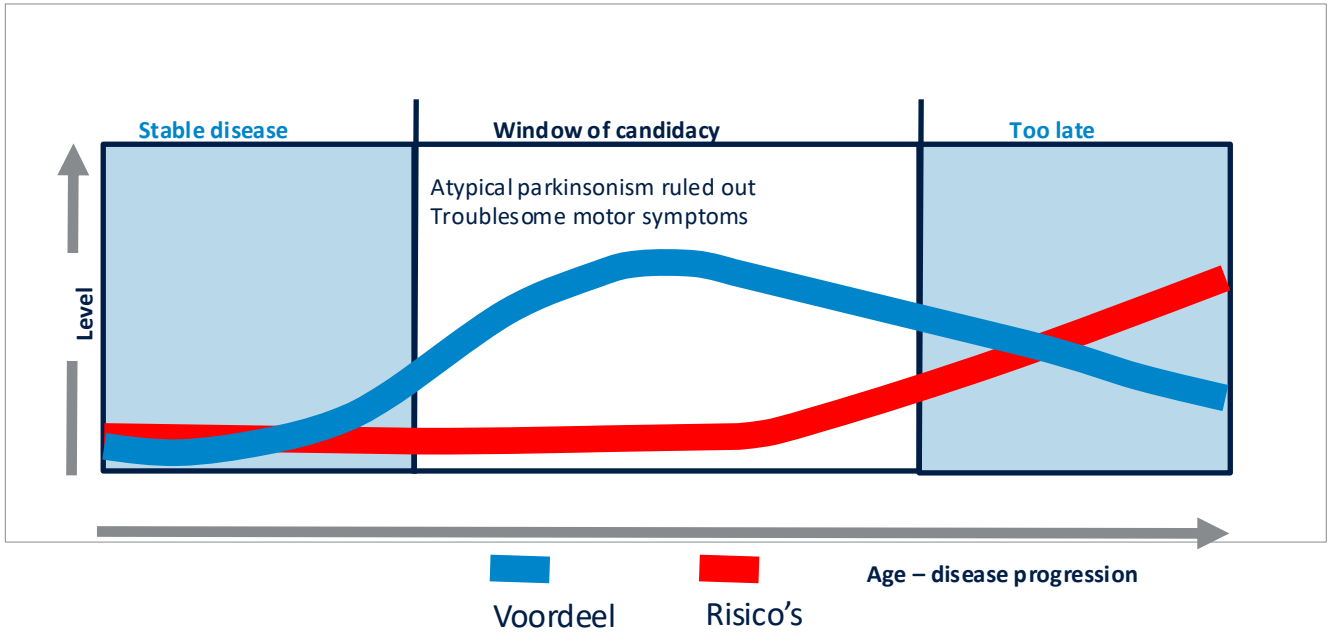
Maastricht UMC+

Geavanceerde behandeling bij de aanpak van Parkinson: Diepe hersenstimulatie

Mark Janssen
neuroloog – klinisch neurofysioloog

Maastricht UMC+

Wanneer DBS?


Stable disease
Window of candidacy
Too late
Atypical parkinsonism ruled out
Troublesome motor symptoms
Level
Age – disease progression
Voordeel
Risico's

3-2-1 regel

3 Gebruik van **>3 doses levodopa**

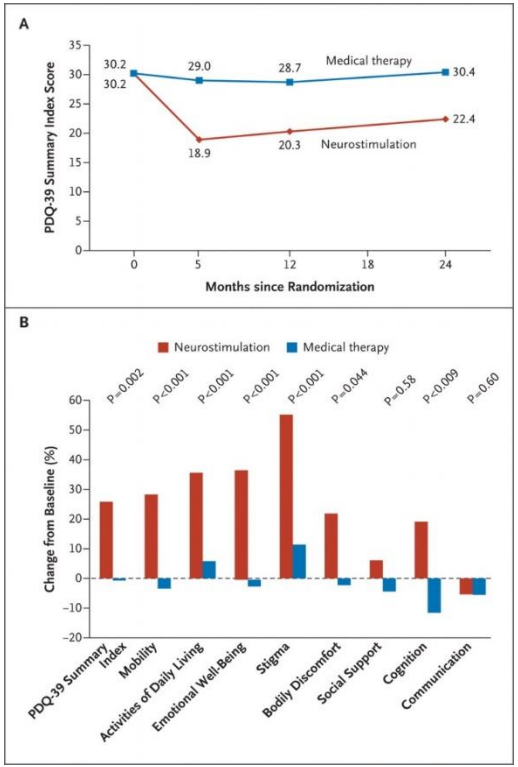
2 **≥ 2 uur OFF-tijd**

ondanks optimale medicatie

1 **≥ 1 uur hinderlijke overbewegelijkheid**

Therapie resistente tremor

EarlyStim Studie: Quality of Life

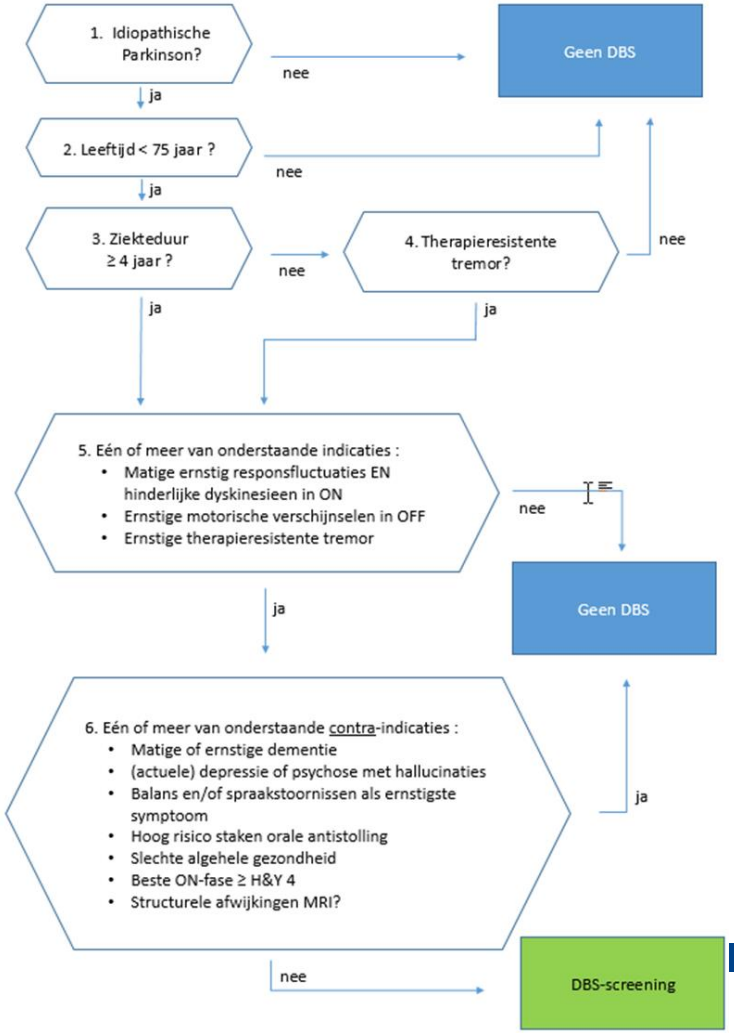


DBS is géén last resort behandeling!

Schuepbach W et al. N Engl J Med 2013


YES
NO

- Responsfluctuaties EN dyskinesien in ON
- Ernstige motorische OFF
- Therapieresistente tremor



Complicaties

Bloeding (<2%)

Infectie (<5%)

Postoperatieve verwardheid

Success van behandeling met DBS afhankelijk van

- Selectie van juiste patienten
- Precisie van electrode plaatsing
- Patient begeleiding
    - Patient verwachtingen
    - Programmeren







Ongewenste neveneffecten/bijwerkingen

Na subthalamische stimulatie:

- Veranderingen in gedrag (zoals euforie) en cognitie
- Spraakmoeilijkheden
- Dubbelzien

PD & DBS

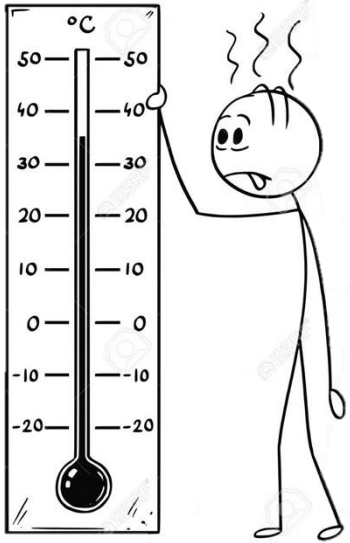






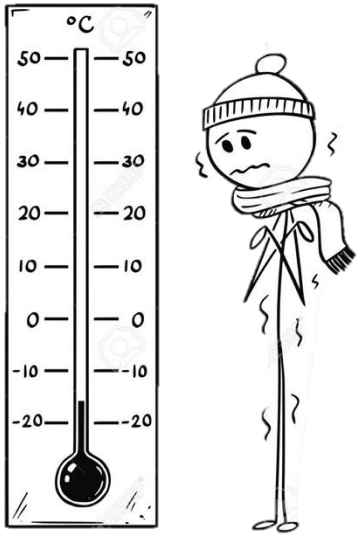
Input

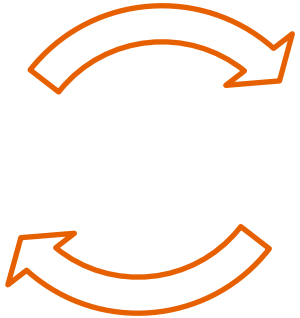
Output





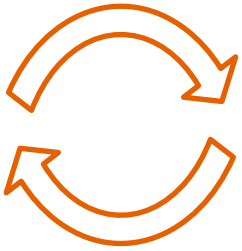


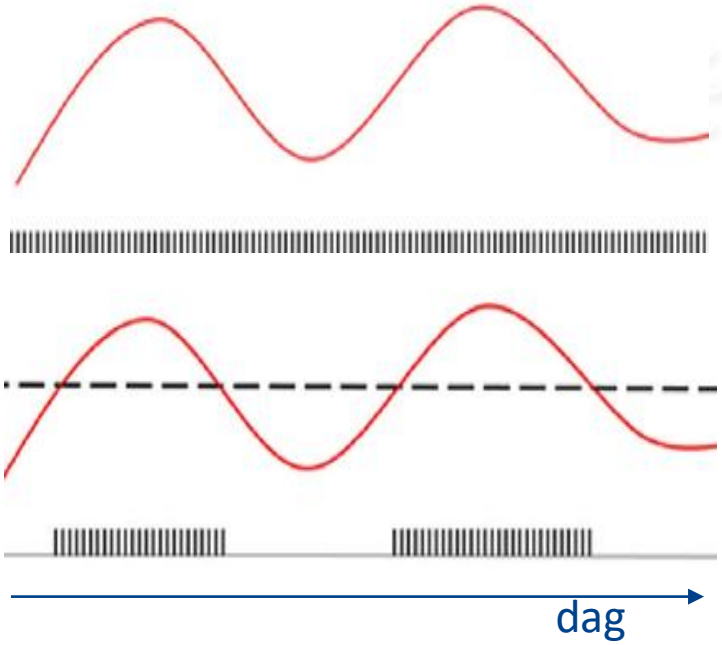

°C
50
40
30
20
10
0
-10
-20



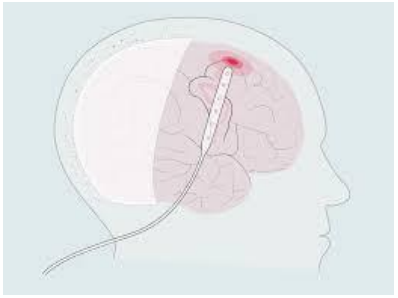


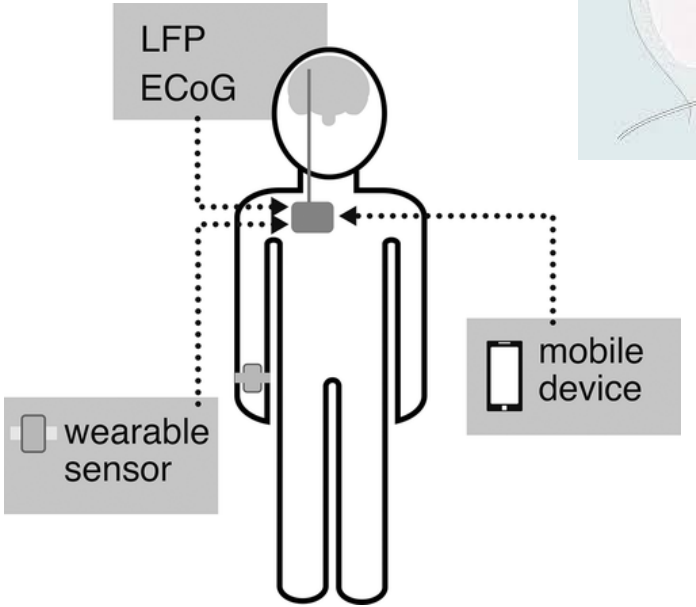





dag

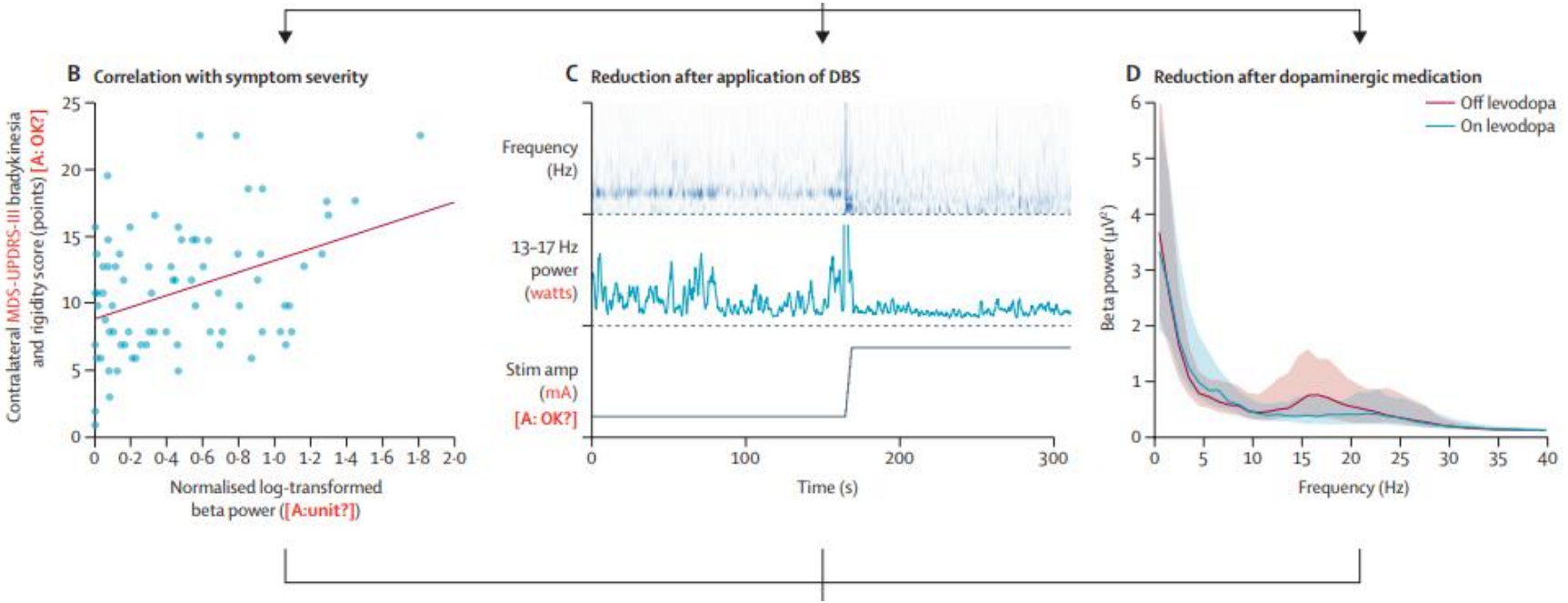


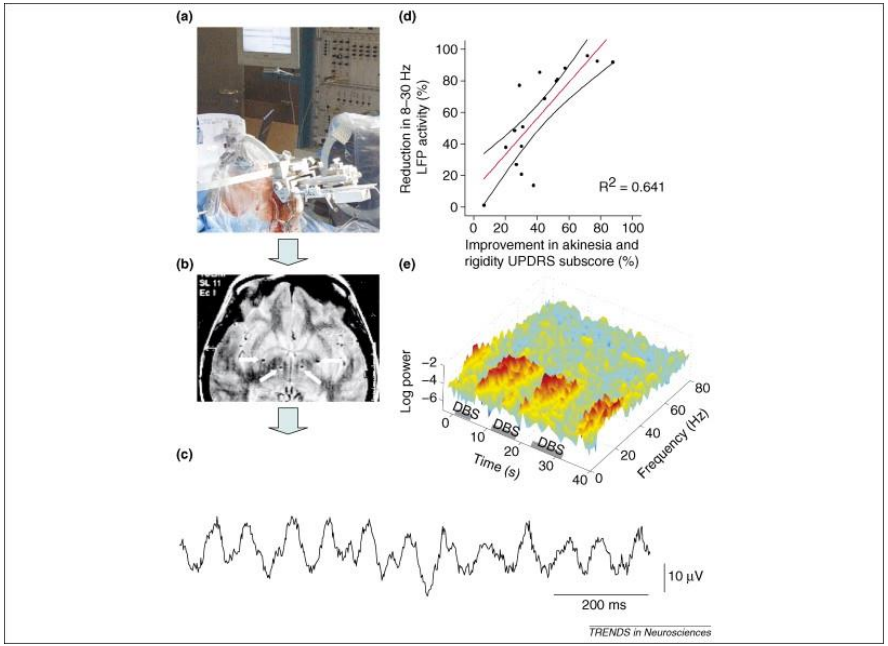






Movement Disorders, Volume: 33, Issue: 12, Pages: 1834-1843, First published: 24 October 2018, DOI: (10.1002/mds.115)


B Correlation with symptom severity
Contralateral MDS-UPDRS-III bradykinesia and rigidity score (points) [A: OK?]
25
20
15
10
5
0
0 0·2 0·4 0·6 0·8 1·0 1·2 1·4 1·6 1·8 2·0
Normalised log-transformed beta power ([A:unit?])
C Reduction after application of DBS
Frequency (Hz)
13–17 Hz power (watts)
Stim amp (mA) [A: OK?]
0
100
200
300
Time (s)
D Reduction after dopaminergic medication
Off levodopa
On levodopa
Beta power (μV²)
6
5
4
3
2
1
0
0 5 10 15 20 25 30 35 40
Frequency (Hz)



Trends Neurosci. 2007. Hammond C[1], Bergman H, Brown P.

Adaptieve DBS

- Beschikbaar in Nederland

- Niet voor iedereen

CE marked closed-loop DBS devices



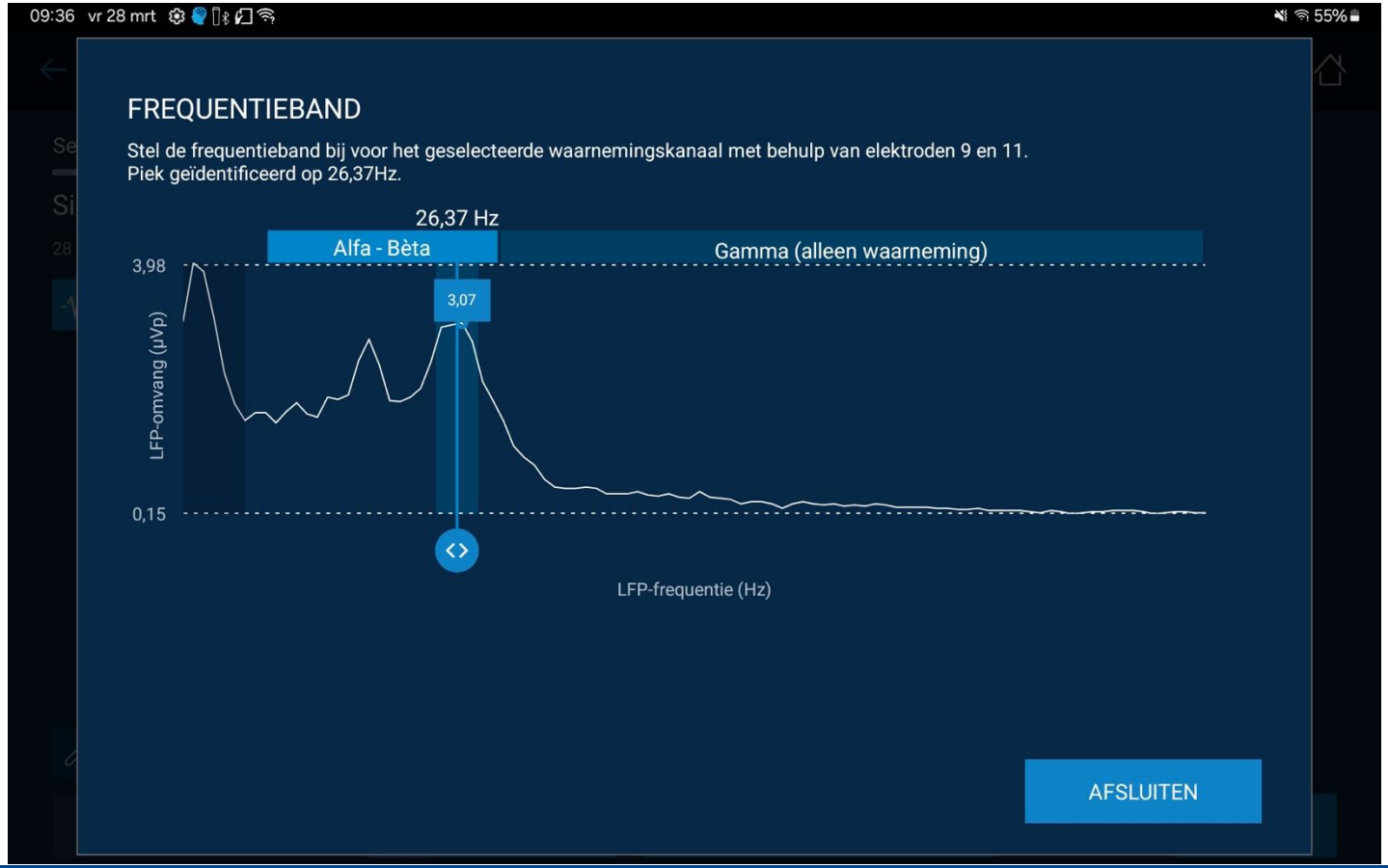
(c)

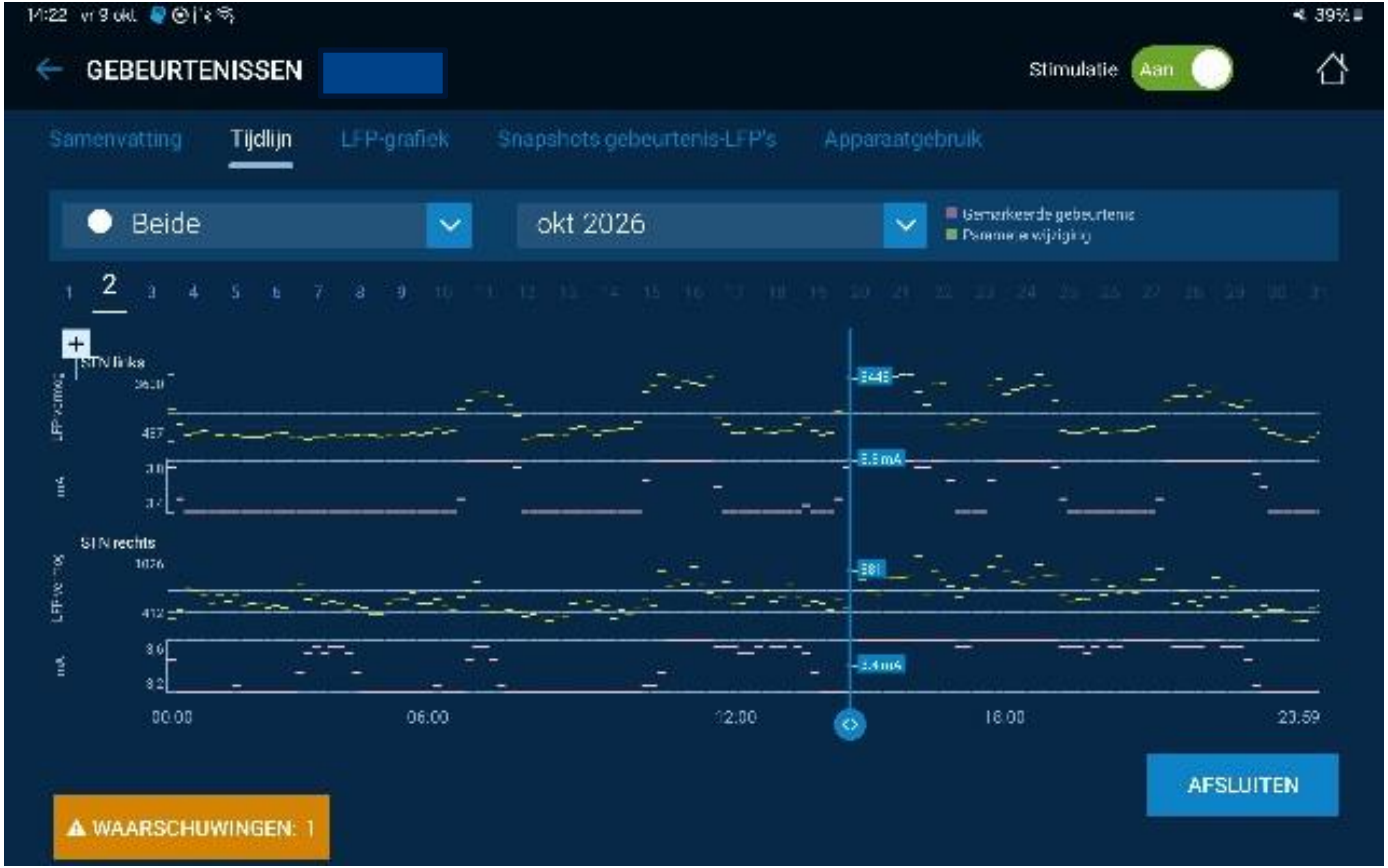


(d)

- Clinically available for Parkinson's disease
  - Not proven to be superior to cDBS

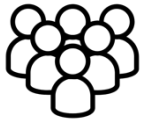
Zhu et al. 2021


09:36 vr 28 mrt
55%
FREQUENTIEBAND
Stel de frequentieband bij voor het geselecteerde waarnemingskanaal met behulp van elektroden 9 en 11.
Piek geïdentificeerd op 26,37Hz.
26,37 Hz
Alfa - Bèta
Gamma (alleen waarneming)
3,98
3,07
LFP-omvang (µVp)
0,15
LFP-frequentie (Hz)
AFSLUITEN


GEBEURTENISSEN
Stimulatie
Aan
Samenvatting
Tijdlijn
LFP-grafiek
Snapshots gebeurtenis-LFP's
Apparaatgebruik
Beide
okt 2026
STN links
STN rechts
00.00
06.00
12.00
18.00
23.59
AFSLUITEN
WAARSCHUWINGEN: 1



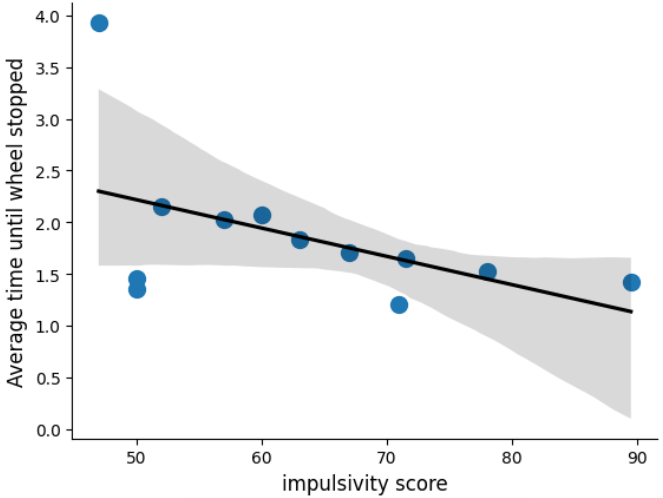

EEG
DBS




Druk op de <spatiebalk> om het rad van fortuin te stoppen.

The time to stop the spinning wheel correlates with the impulsivity score

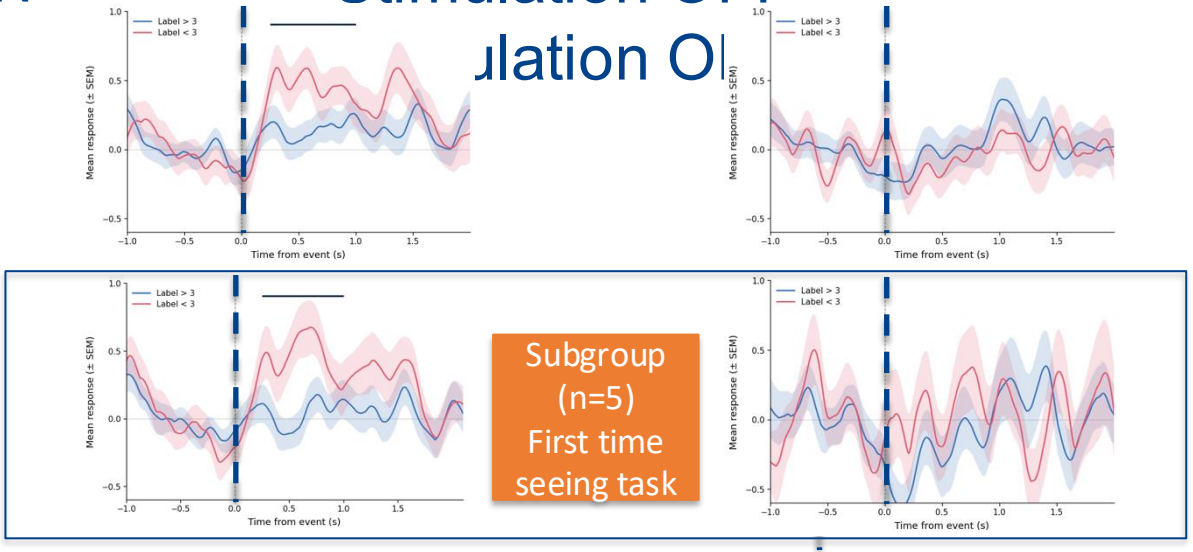




r=0.493, p=0.10

Preliminary results - Stimulation OFF vs. Stimulation ON

Stimulation OFF



Maastricht UMC+

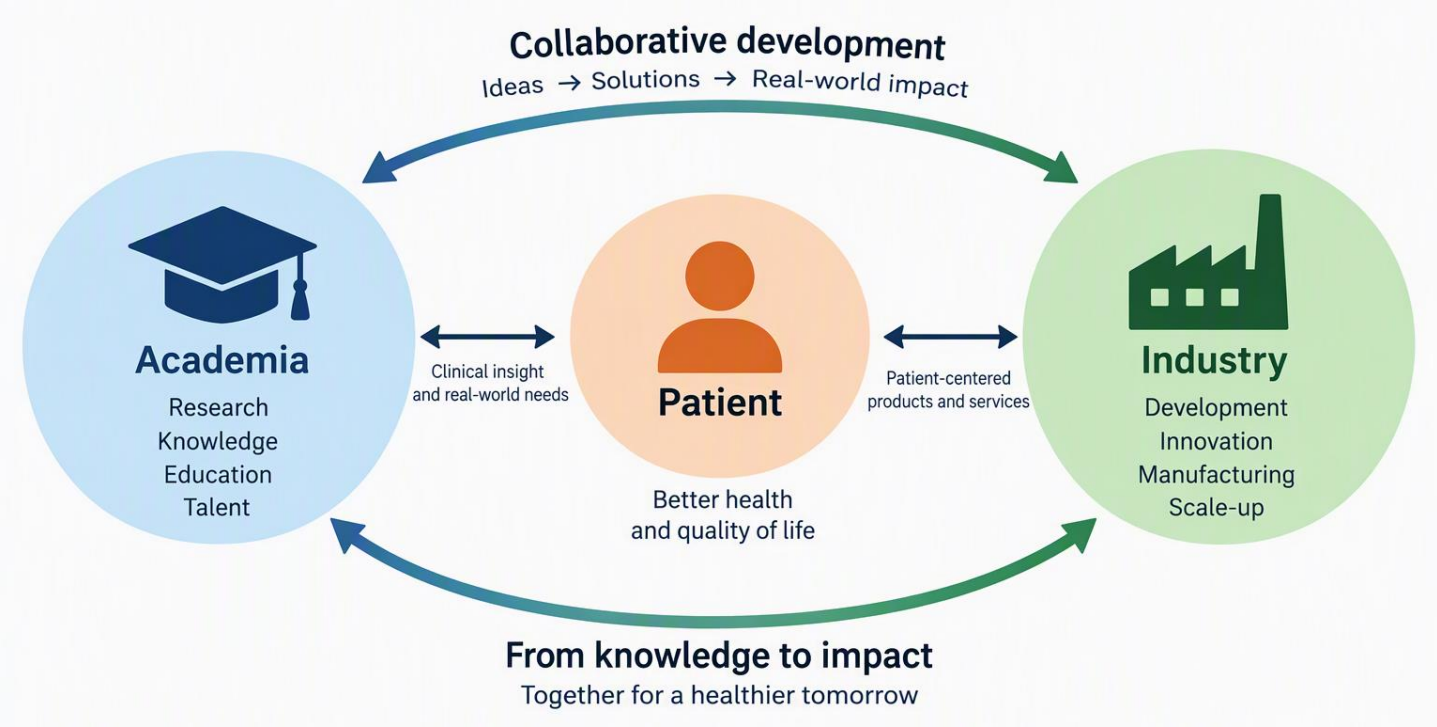
CLOSE-PD



CTRL-PD

- aDBS voor patienten met onvoldoende verbetering met reguliere DBS

- Maastricht UMC+ – HaGa/LUMC – Amsterdam UMC



Created by copilot

INCLUSION CRITERIA

> 18 yo, PD diagnosis, able to provide IC, masters Dutch language
implantation percept PC / RC
reliable beta peak in at least one STN
optimal contact point compatible with aDBS in at least one STN

EXCLUSION CRITERIA

legally incompetent
participation in other studies
pregnancy
inability to recognise the difference between ON and OFF
MCI / dementia (screening)

Focused ultrasound (FUS)

Symptomatische behandeling

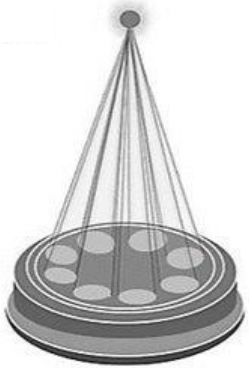
Parkinson en Bewegingsstoornissen
Amsterdam UMC

MRI Guided High Intensity Focused Ultrasound

MRI-gestuurde hoog-energetische gebundelde geluidsgolven



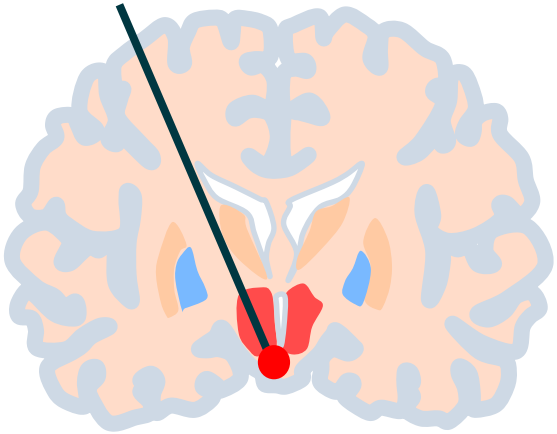
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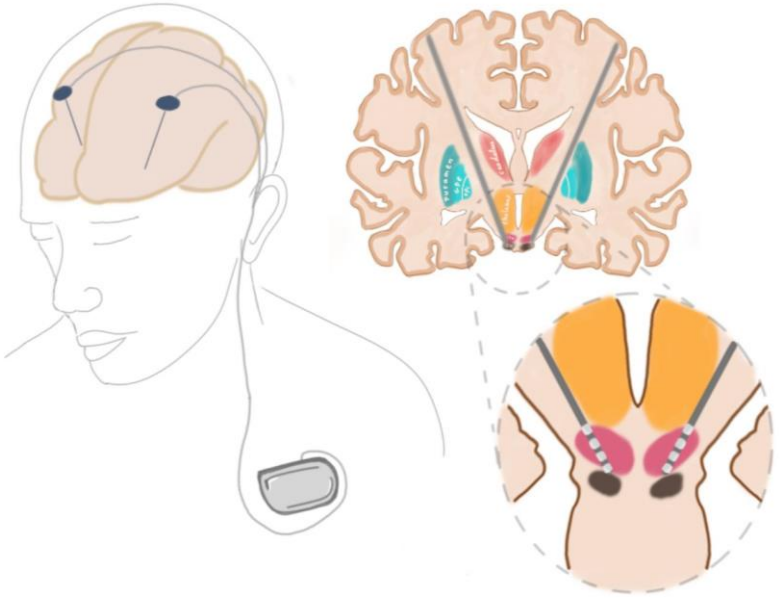


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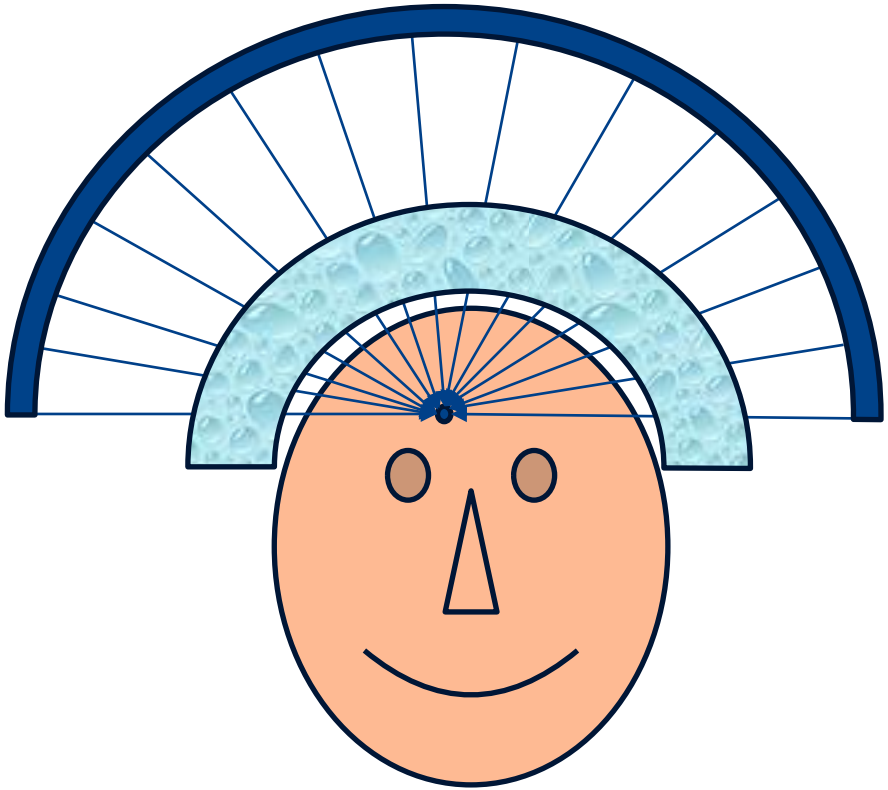


Gaatje branden en Diepe hersenstimulatie





Geluidsgolven



Geluidsgolven





Vergelijking

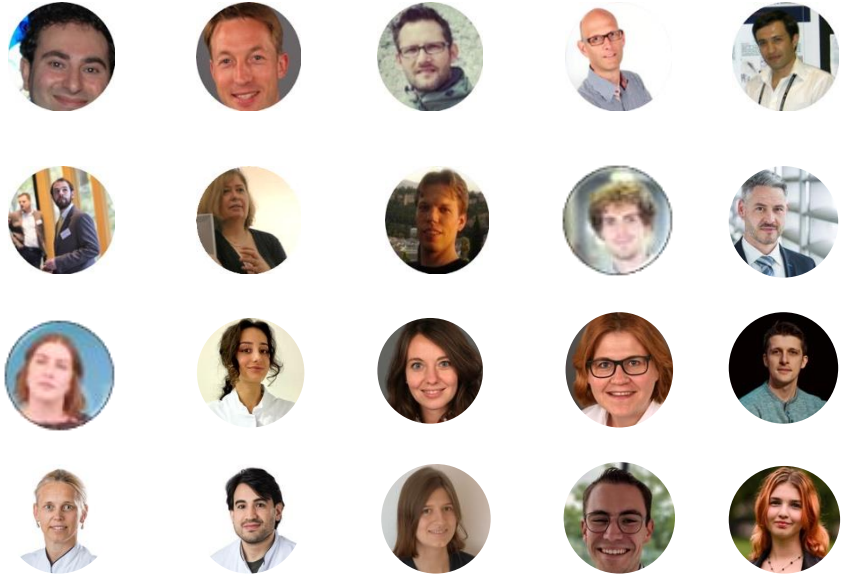
Geluidsgolven

- Hoofd blijft gesloten
- 1 lichaamshelft
- 1 sessie
- Onomkeerbaar
- Wakkere procedure
- Hoofdscheren

Diepe hersenstimulatie

- Boorgaten in hoofd
- Beide lichaamshelften
- Veel afspraken, batterij vervanging
- Deels omkeerbaar
- Kan ook onder narcose
- Geen hoofdscheren

MH&NS school for mental health and neuroscience



Health Holland

Hersen Stichting

Maastricht UMC+