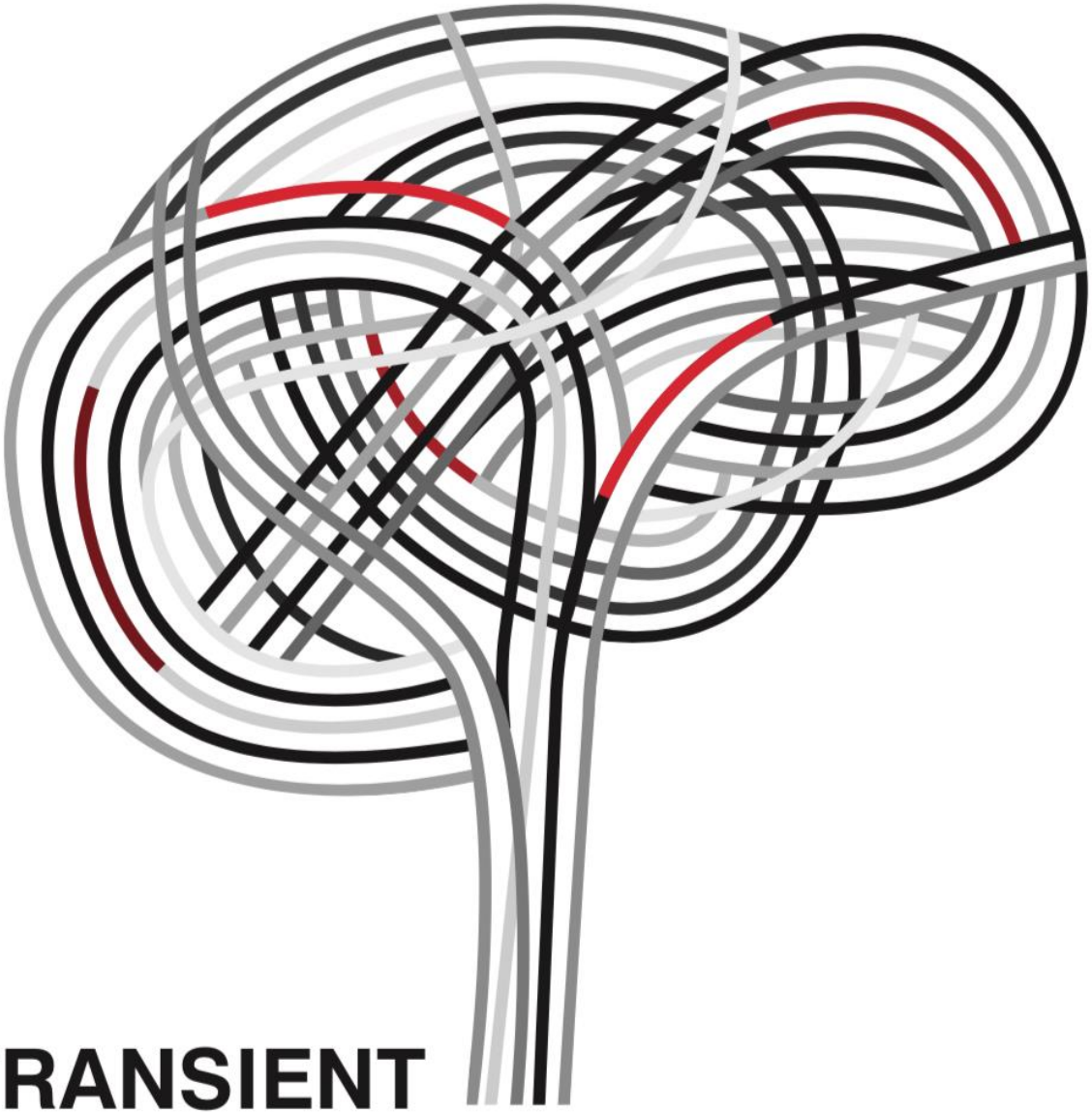
Transient neurological attacks

Schoppen tegen een heilig huisje?

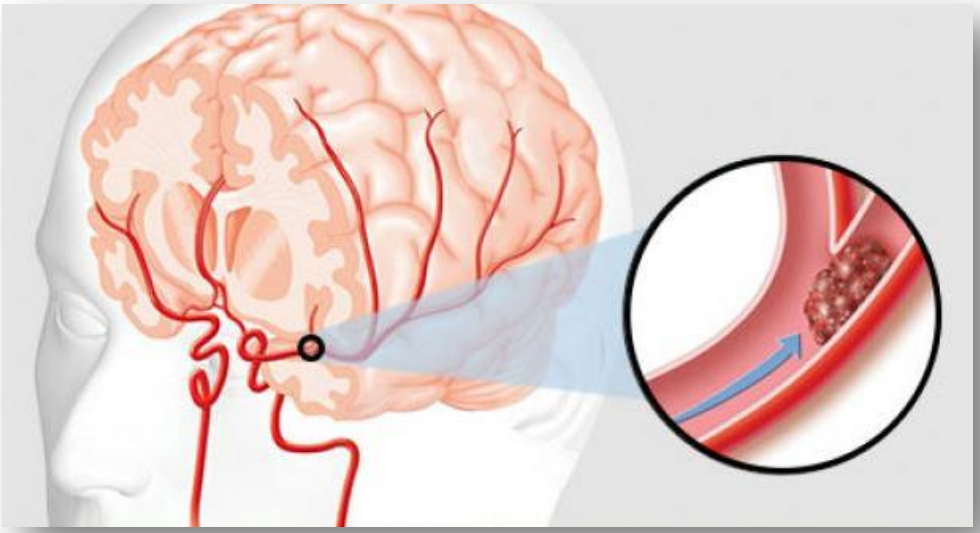
Frank van Rooij
18 april 2019



TRANSIENT NEUROLOGICAL ATTACKS

NEUROIMAGING, ETIOLOGY, AND COGNITIVE CONSEQUENCES

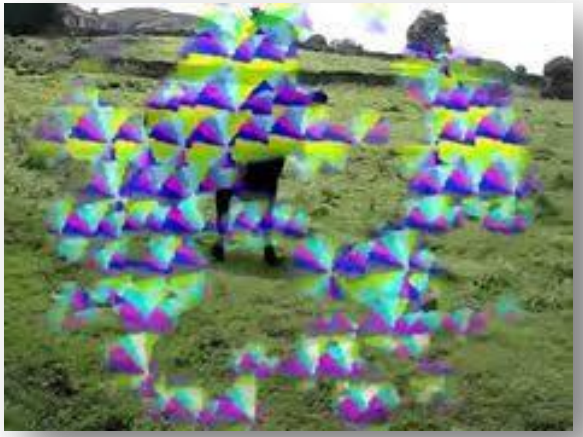
Transient ischemic attack (TIA)



Transient ischemic attack (TIA)

Transient ischemic attack (TIA)

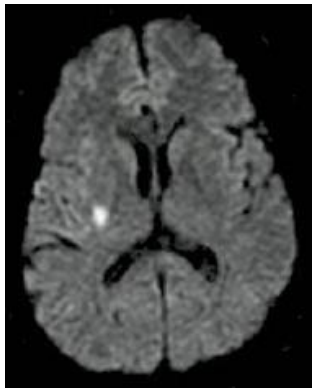
TIA ?



TIA ?

- 45% andere diagnose
- Neurologen vaak oneens

TIA

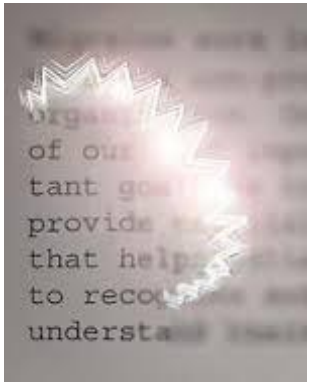


DWI

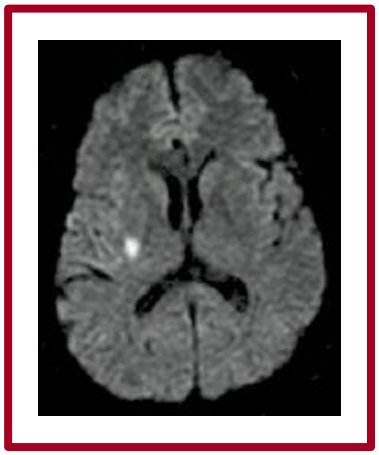
- ⅓ van alle TIA's
- Voorspellers onduidelijk
- Hogere kans op beroerte

Transient neurological attack (TNA)

TNA



Migraine



TIA

Anders

Diffusion-weighted imaging in transient neurological attacks

Doel

- Bepalen prevalentie DWI laesies bij TNA patiënten
- Deze vergelijken met TIA patiënten
- Het klinisch fenotype van TNA in relatie tot DWI beschrijven

Diffusion-weighted imaging in transient neurological attacks

Patiënten

- TIA kliniek
- Acute en kortdurende (<24h) neurologische symptomen
- ≥ 45 jaar, geen eerder herseninfarct of -bloeding
- DWI <7 dagen na start symptomen

Diffusion-weighted imaging in transient neurological attacks

Patiënten

- TIA kliniek
- Acute en kortdurende (<24h) neurologische symptomen
- ≥ 45 jaar, geen eerder herseninfarct of -bloeding
- DWI <7 dagen na start symptomen

- Gedetailleerde beschrijving gebeurtenis
- Gestructureerde beoordeling specifieke symptomen

Diffusion-weighted imaging in transient neurological attacks

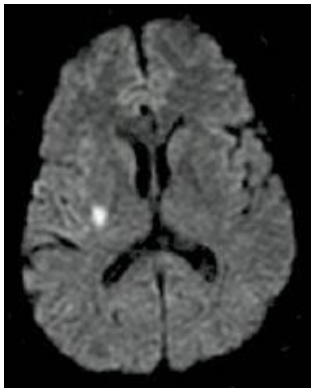
Focal	Nonfocal
Hemiparesis	Decreased consciousness or unconsciousness
Hemihypesthesia	Confusion
Dysphasia	Amnesia
Dysarthria	Unsteadiness
Hemianopia	Nonrotatory dizziness
Transient monocular blindness	Positive visual phenomena
Hemiataxia	Paresthesias
Diplopia	Bilateral weakness of arms or legs
Vertigo	Unwell feelings

Diffusion-weighted imaging in transient neurological attacks

TIA

TNA

- 3 vasculair neurologen
- ~~MRI~~



- 2 ervaren neurologen
- ~~Kliniek~~

Diffusion-weighted imaging in transient neurological attacks

Patiënten (n = 143)

	TIA (n=87)	TNA (n=56)	P
Vrouw, %	51	27	0.01
Leeftijd, jaren (SD)	65 (11)	64 (8)	

Diffusion-weighted imaging in transient neurological attacks

Patiënten (n = 143)

	TIA (n=87)	TNA (n=56)	P
Vrouw, %	51	27	0.01
Leeftijd, jaren (SD)	65 (11)	64 (8)	
Hypertensie, %	78	86	
Hypercholesterolemie, %	71	63	
Diabetes, %	13	4	
Roken, %	31	23	
Atriumfibrilleren, %	14	13	

Diffusion-weighted imaging in transient neurological attacks

Patiënten (n = 143)

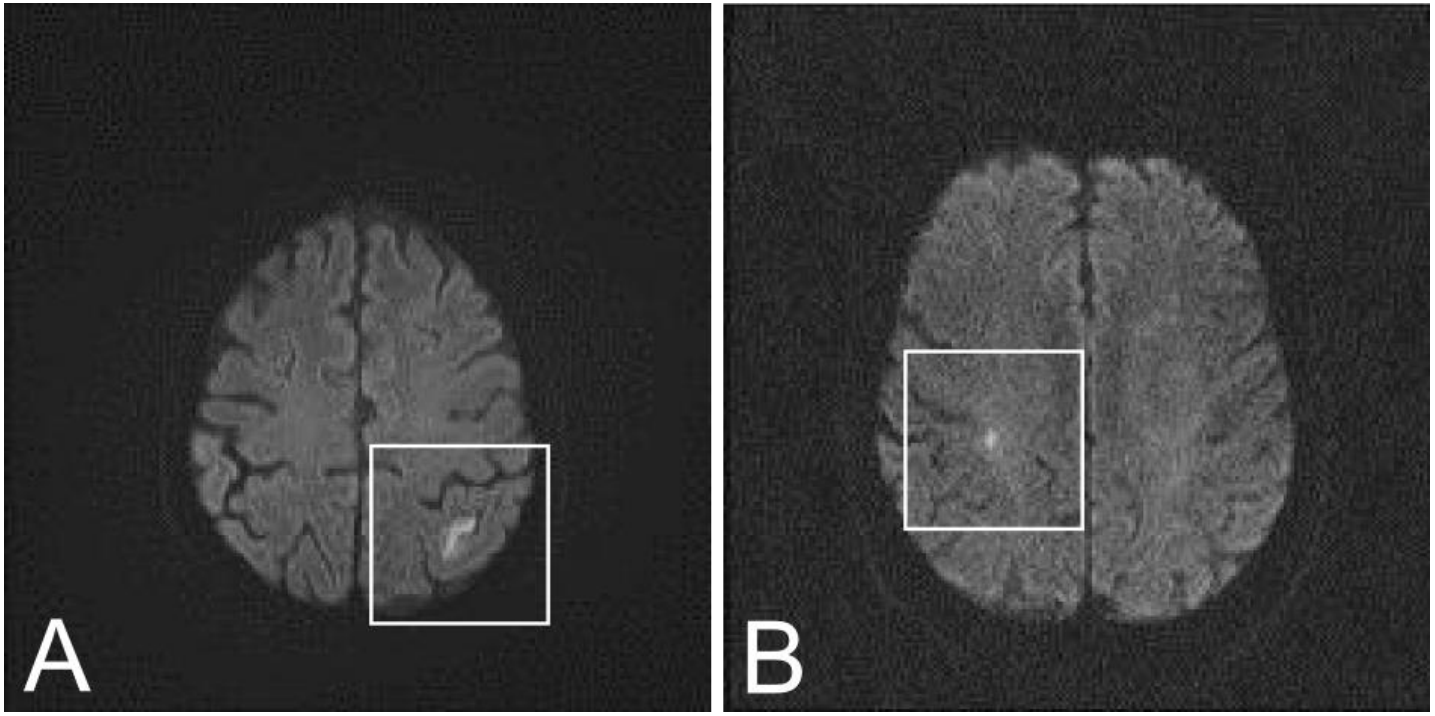
	TIA (n=87)	TNA (n=56)	P
DWI +, n (%)	27 (31)	13 (23)	0.41

Diffusion-weighted imaging in transient neurological attacks

Patiënten (n = 143)

	TIA (n=87)	TNA (n=56)	P
DWI +, n (%)	**27 (31)**	**13 (23)**	**0.41**
Duur event >1u, %	33	43	
Tijd event-DWI, dagen (SD)	3.8 (2.9)	3.5 (2.7)	

Diffusion-weighted imaging in transient neurological attacks



A 6 uur verwardheid, DWI 30 min na herstel

B 30 min paresthesie dorsum linkerhand, DWI 48 uur na herstel

Diffusion-weighted imaging in transient neurological attacks

- DWI-laesies >20% TNA-patiënten
- Niet verschillend van TIA-patiënten
- Klinische diagnose TIA schiet tekort in het identificeren van patiënten met cerebrale ischemie
- Vroege DWI heeft toegevoegde waarde

Consequenties: cognitie

Prevalentie cognitieve stoornis na TIA (%)

Cognitief functioneren na TIA

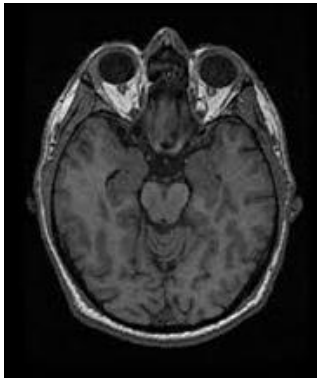


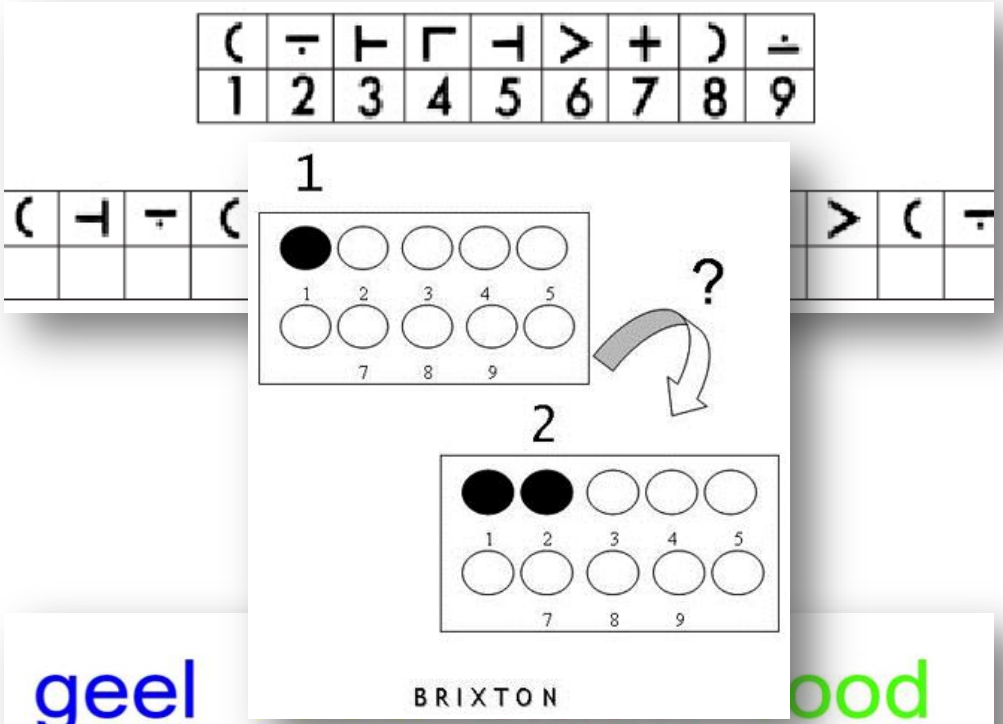
Table 3. Odds Ratios for Cognitive Impairment Within 3 Months After TIA Compared With Controls Without TIA (n=81)

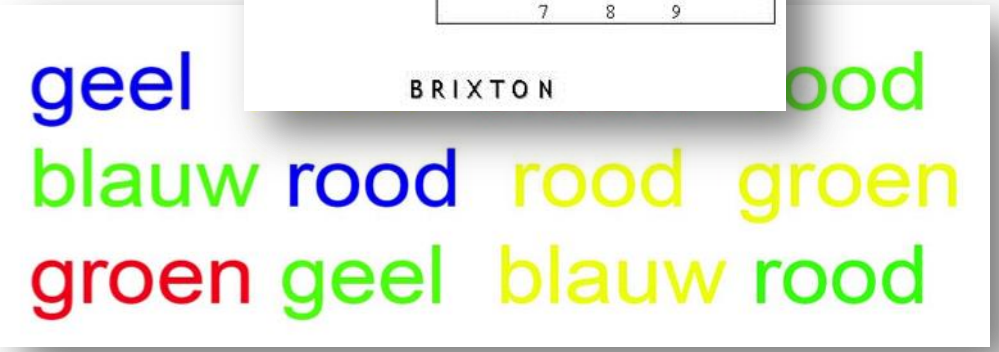
	Cognitive Impairment, OR (95% CI)*	
Cognitive Domain	All Patients With TIA (n=107)	Patients With TIA Without SBI Only (n=89)
Executive function	3.5 (0.7–16.7)	1.5 (0.3–8.7)
Information processing speed	7.1 (1.5–32.5)	4.8 (1.0–23.4)
Working memory	22.5 (2.9–174.3)†	16.2 (2.0–128.7)†
Attention	6.8 (1.9–24.3)†	5.7 (1.5–20.9)†
≥1 cognitive domain	5.9 (2.4–14.5)‡	5.4 (2.1–13.3)‡

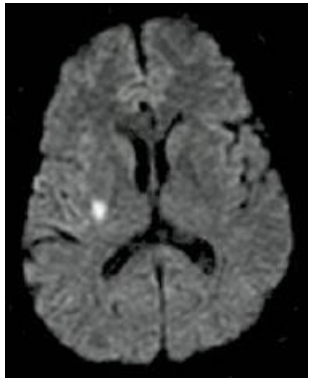
Cognitive impairment defined as domain z score <−1.65. CI indicates confidence interval; OR, odds ratio; SBI, silent brain infarct; and TIA, transient ischemic attack.

*Age- and sex-adjusted logistic regression; †P<0.01; ‡P<0.001.

Cognitief functioneren na TIA en TNA







Cognitief functioneren na TIA en TNA

Table 4. Cognitive Domain Compound Scores <7 Days After Transient Ischemic Attack or Transient Neurological Attack, Stratified by DWI Result

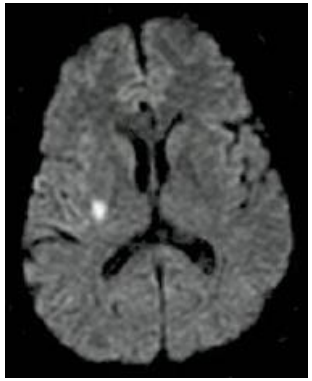
Cognitive Domain	DWI+ (n=32)	DWI– (n=89)	*P* Value*
Executive function	–0.26 (–0.51 to –0.01)	0.08 (–0.07 to 0.23)	0.048
Attention	–0.23 (–0.53 to 0.08)	0.08 (–0.14 to 0.30)	0.23
Info processing speed	–0.08 (–0.33 to 0.19)	0.01 (–0.19 to 0.21)	0.80
Episodic memory	–0.02 (–0.22 to 0.19)	0.01 (–0.14 to 0.17)	0.69

Cognitief functioneren na TIA en TNA

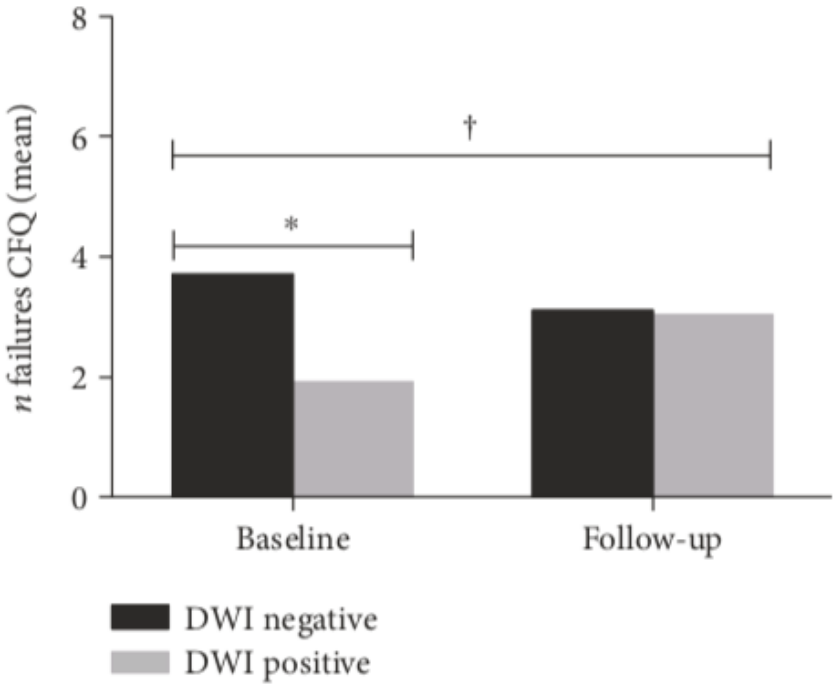
Table 5. Mean Change in Cognitive Domain Compound Scores 6 Months After Transient Ischemic Attack or Transient Neurological Attack, Specified by DWI Result

Cognitive Domain	All Patients	*P* Value*	DWI+ (n=32)	DWI– (n=89)
Executive function	–0.23 (–0.33 to –0.13)	0.01	–0.20 (–0.39 to –0.02)	–0.23 (–0.35 to –0.10)
Attention	0.11 (0.02 to 0.20)	0.02	0.21 (0.02 to 0.40)	0.07 (–0.03 to 0.18)
Info processing speed	0.15 (0.02 to 0.28)	0.08	0.07 (–0.12 to 0.27)	0.16 (0.08 to 0.24)
Episodic memory	0.27 (0.17 to 0.38)	0.20	0.35 (0.16 to 0.55)	0.24 (0.11 to 0.37)

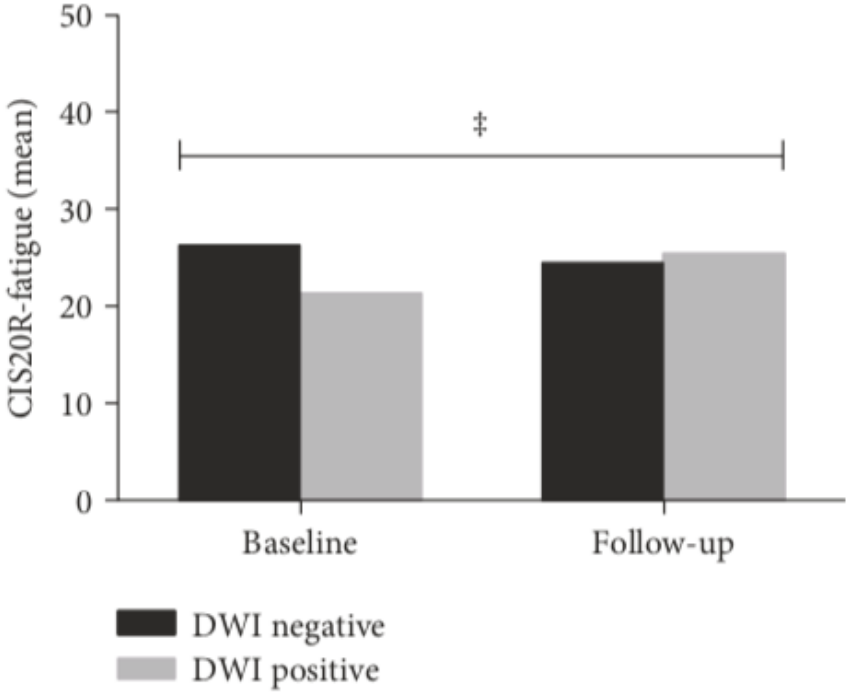
Subjectieve klachten na TIA en TNA



Subjectieve klachten na TIA en TNA



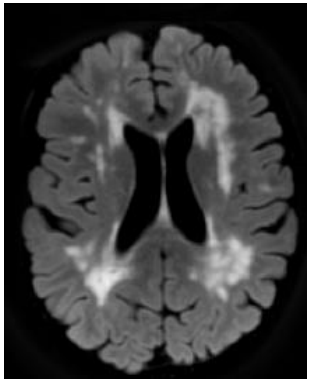
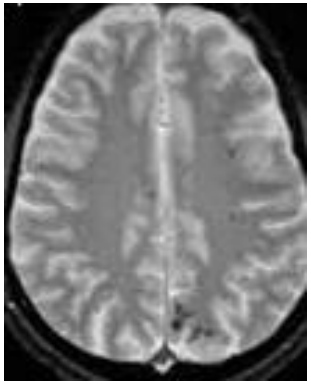
(a) Subjective cognitive failures



(d) Fatigue

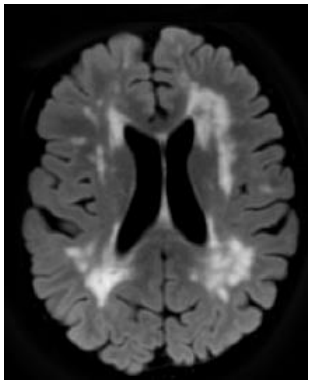
Cognitie en cerebrovasculaire ziekte

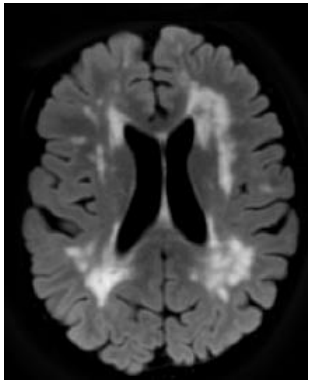
COGNITIEVE ACHTERUITGANG

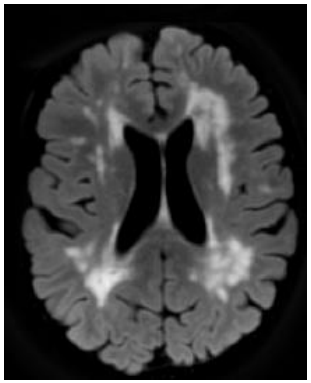
CEREBROVASCULAIRE ZIEKTE

Cognitie en cerebrovasculaire ziekte





Cognitie en cerebrovasculaire ziekte



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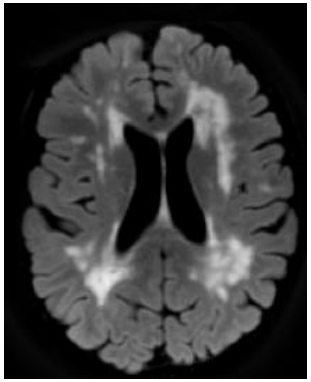
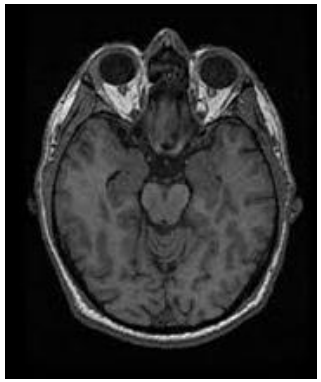
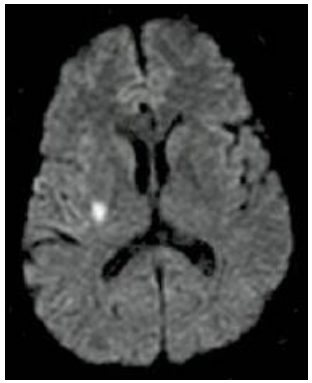
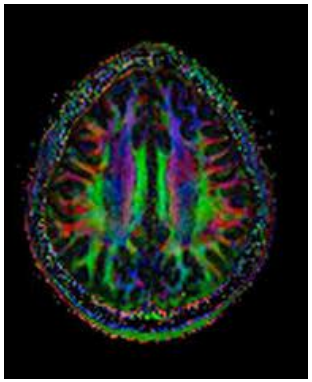


Microstructuur hersenen na TIA en TNA

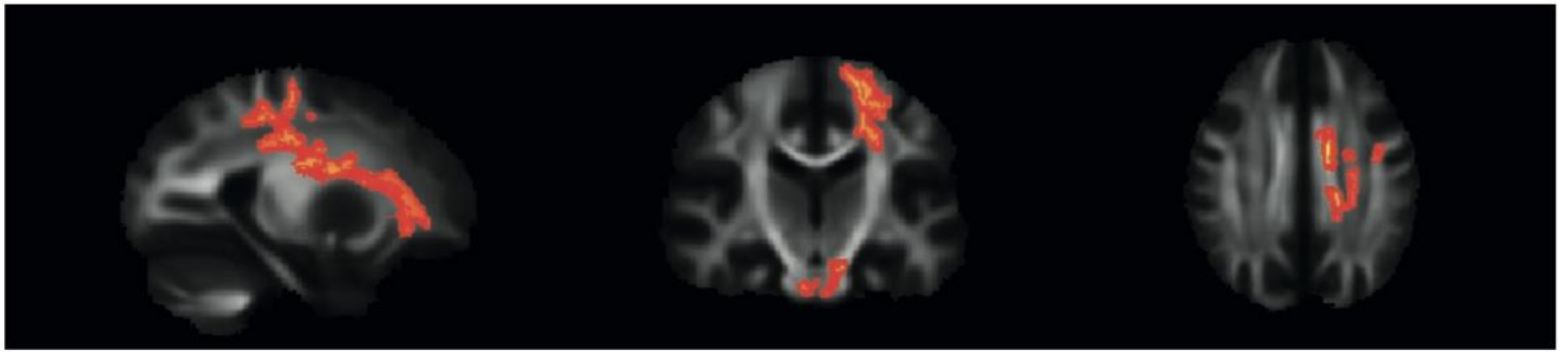






Microstructuur hersenen na TIA en TNA

A:



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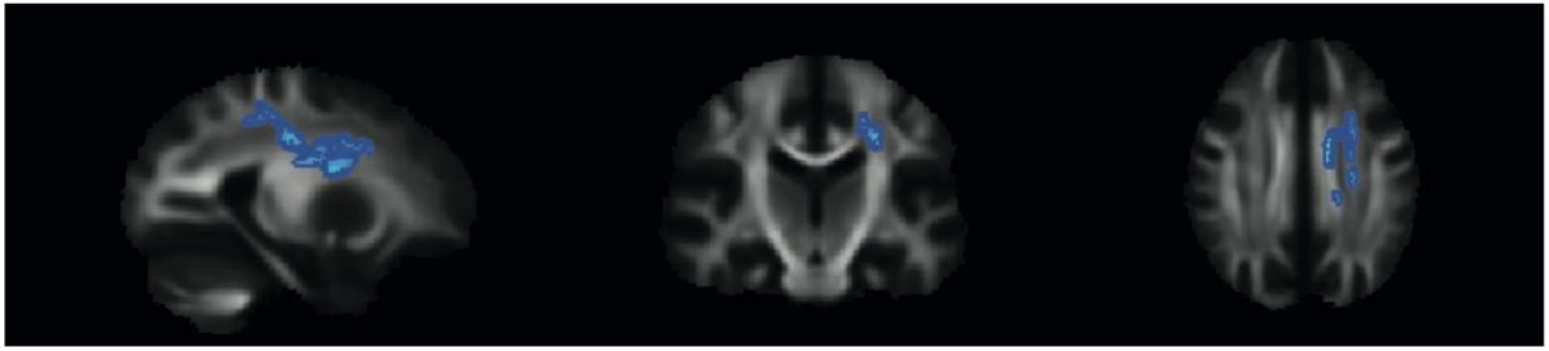
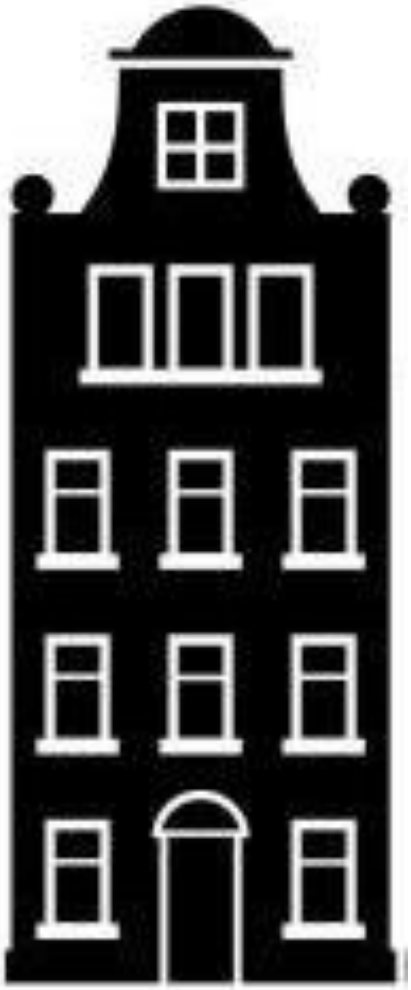


Figure 1. Differences in fractional anisotropy (panel a; $p < 0.05$) and radial diffusivity (panel b; $p < 0.07$) between DWI-positive and DWI-negative TIA and TNA patients. Results of voxel-wise analysis with permutation-based statistical interference tool for non-parametric approach, with the number of permutation tests set to 5000. X=115, Y=106, Z=103.

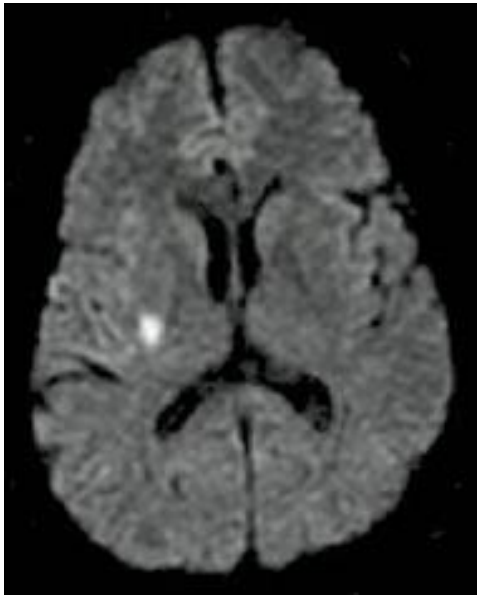
Samenvatting

- Klinische diagnose TIA niet gevoelig voor atypische klachten
- Vroege DWI van meerwaarde
- Cognitieve klachten na TIA en TNA
- Progressief over eerste zes maanden nadien
- DWI laesie geassocieerd met slechter cognitief functioneren
- Microstructurele schade hersenen mogelijk oorzaak hiervoor

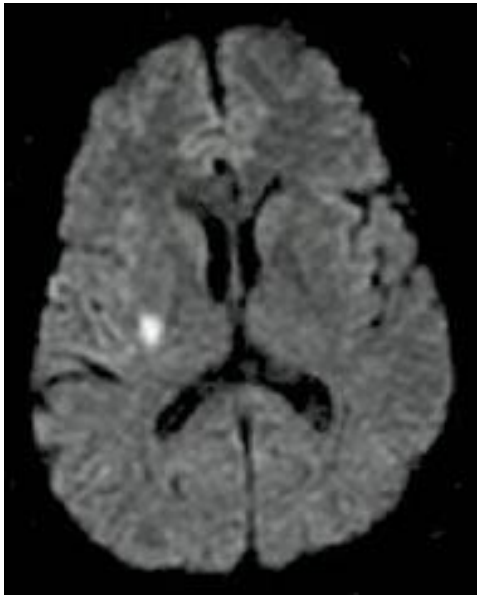


Transient ischemic attack?

Transient ischemic attack?



Transient?



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