

CT perfusie is geïndiceerd als standaard beeldvormend onderzoek bij het acute herseninfarct

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CT perfusie



Wat zien we



Geschiedenis



Waarom CTP



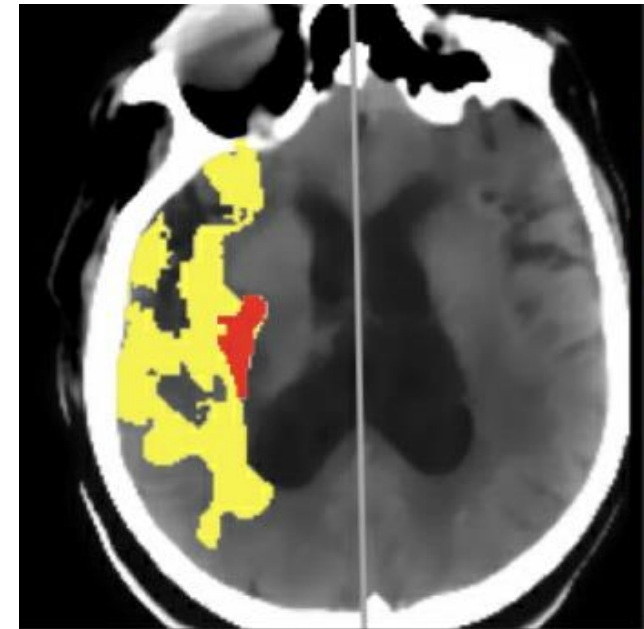
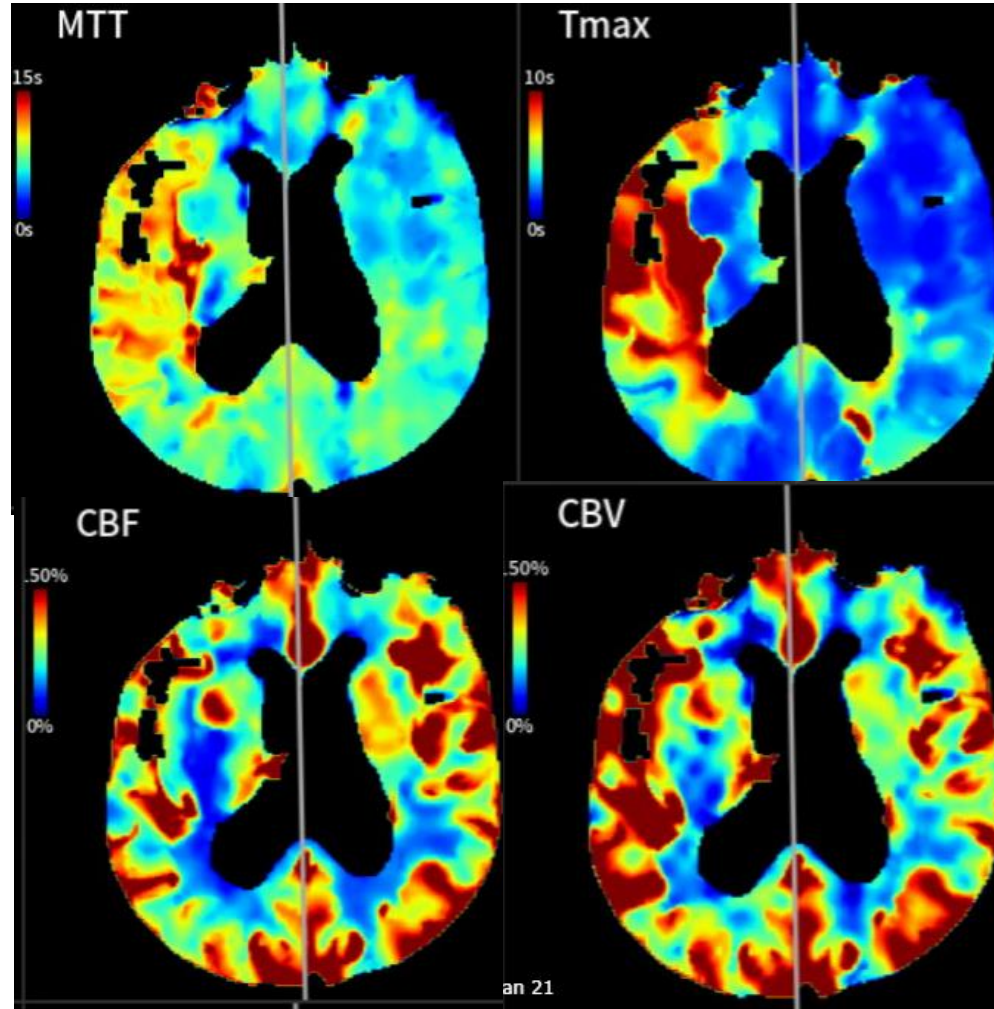
Valkuilen



CT perfusie - wat zien we

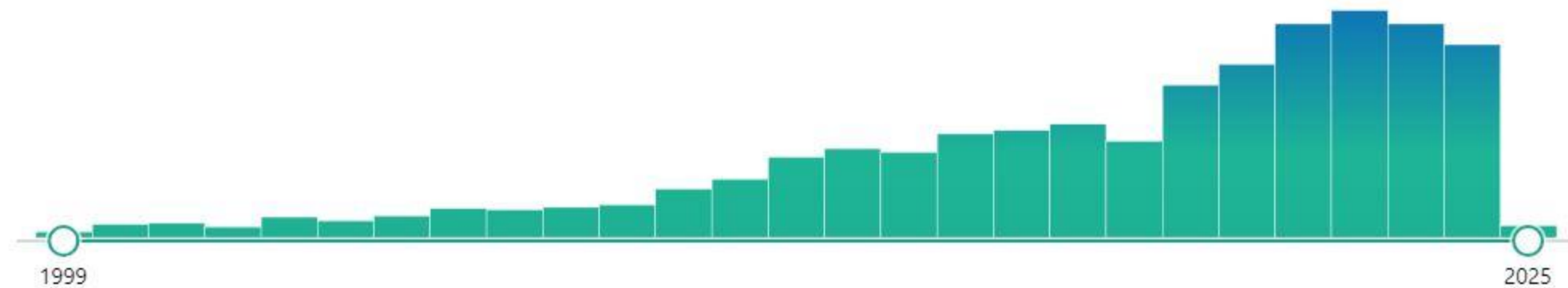
CTP toont perfusiestatus: dynamisch proces - momentopname

		Penumbra	Core
Tmax - Time-to-maximum (sec)	Tijd tot max intensiteit van contrastbolus	↑	↑
MTT - Mean Transit Time (sec)	Passagetijd van contrastbolus	↑	↑
CBF - Cerebral Blood Flow (ml/100g/min)	Volume bloed dat stroomt gedurende bepaalde tijd	↓	↓↓
CBV - Cerebral Blood Volume (ml/100g)	Volume bloed in bepaald gebied	=↑	↓↓



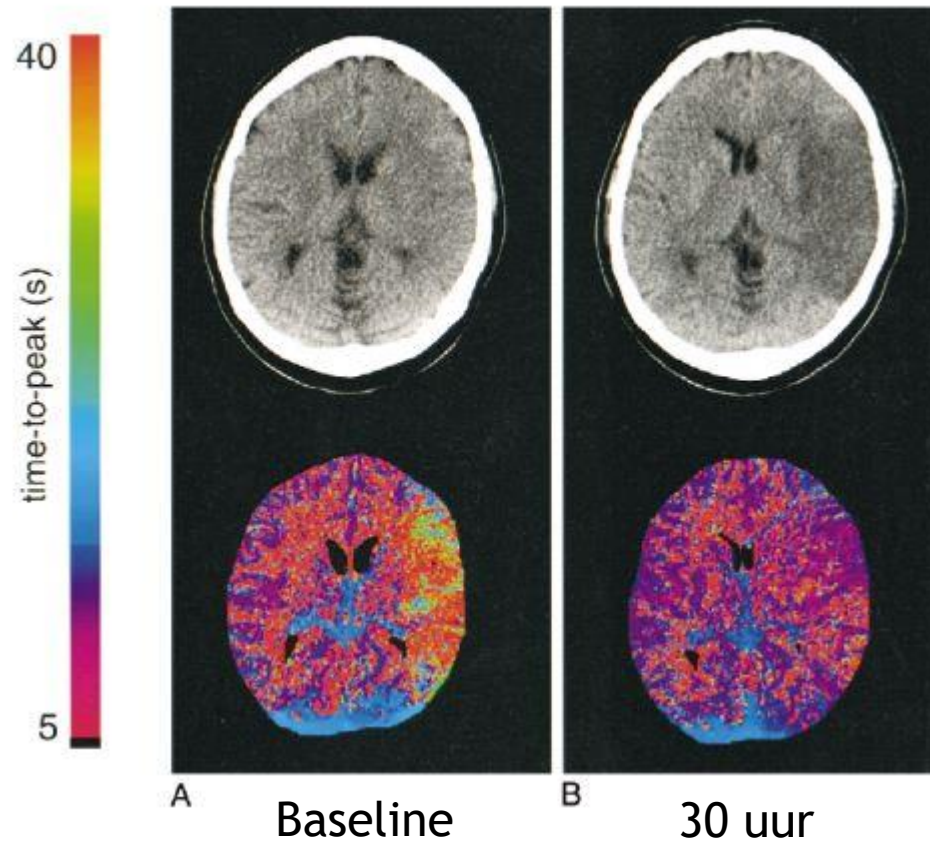


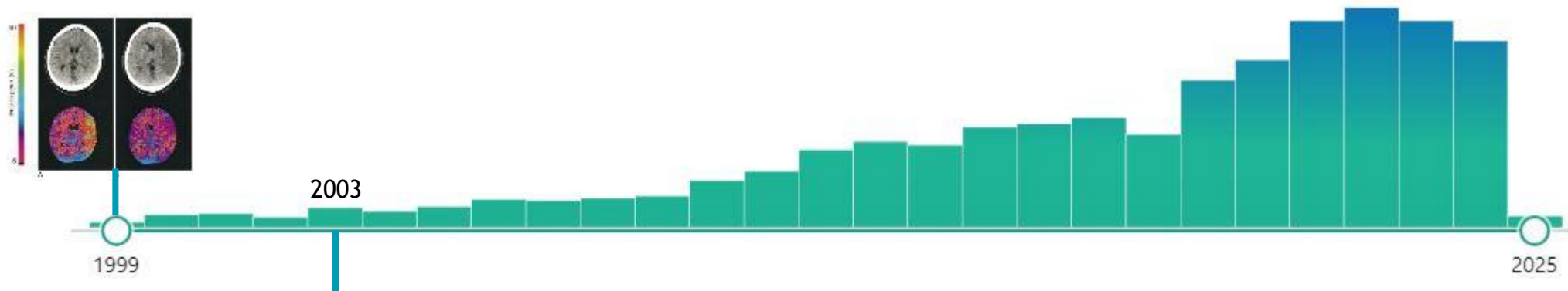
CT perfusie - geschiedenis





1999 - Reichenbach et al., AJNR





Safety and Feasibility of a CT Protocol for Acute Stroke: Combined CT, CT Angiography, and CT Perfusion Imaging in 53 Consecutive Patients

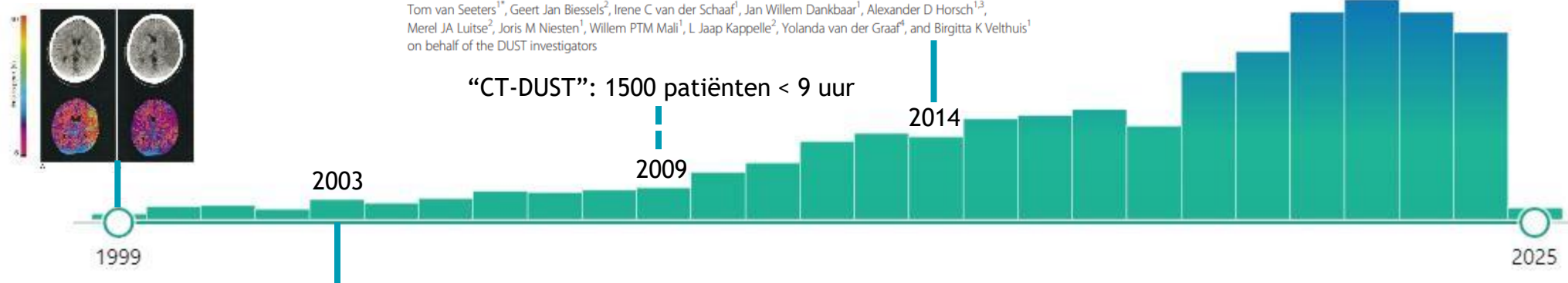
Wade S. Smith, Heidi C. Roberts, Nathaniel A. Chuang, Kenneth C. Ong, Theodore J. Lee, S. Claiborne Johnston, and William P. Dillon

Mediane duur beeldvorming: 27 minuten (range 9-67 minuten)



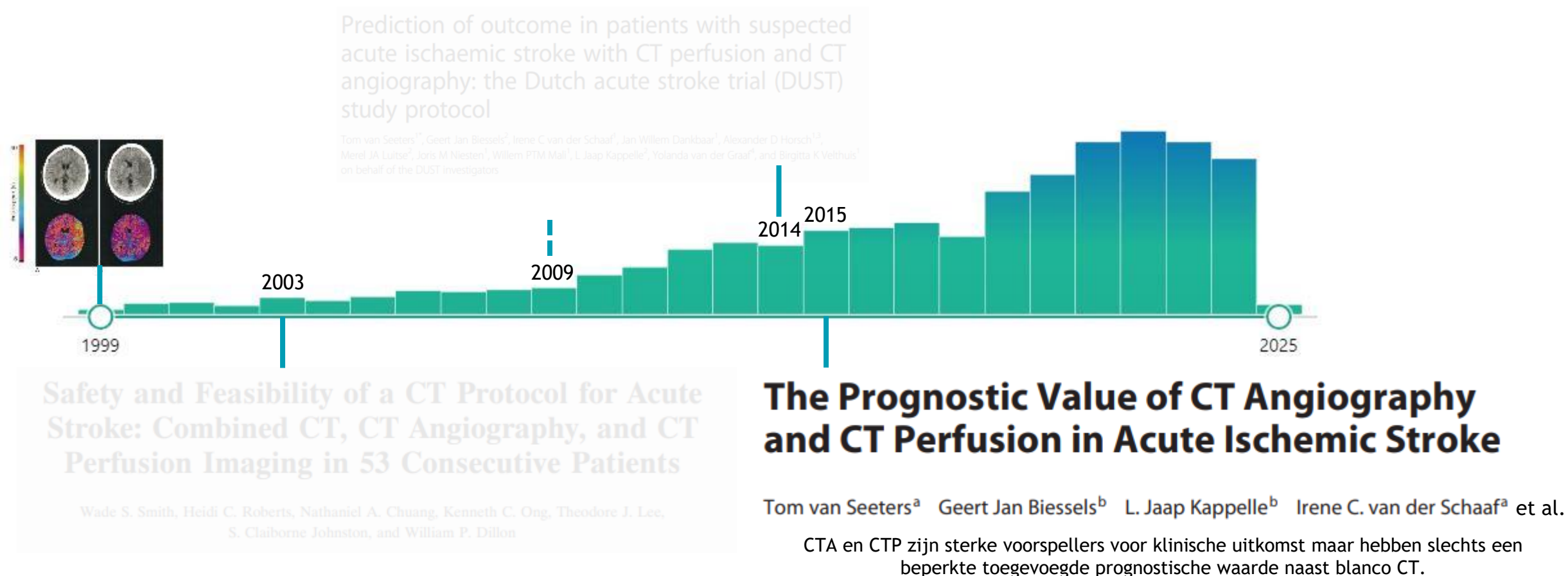
Prediction of outcome in patients with suspected acute ischaemic stroke with CT perfusion and CT angiography: the Dutch acute stroke trial (DUST) study protocol

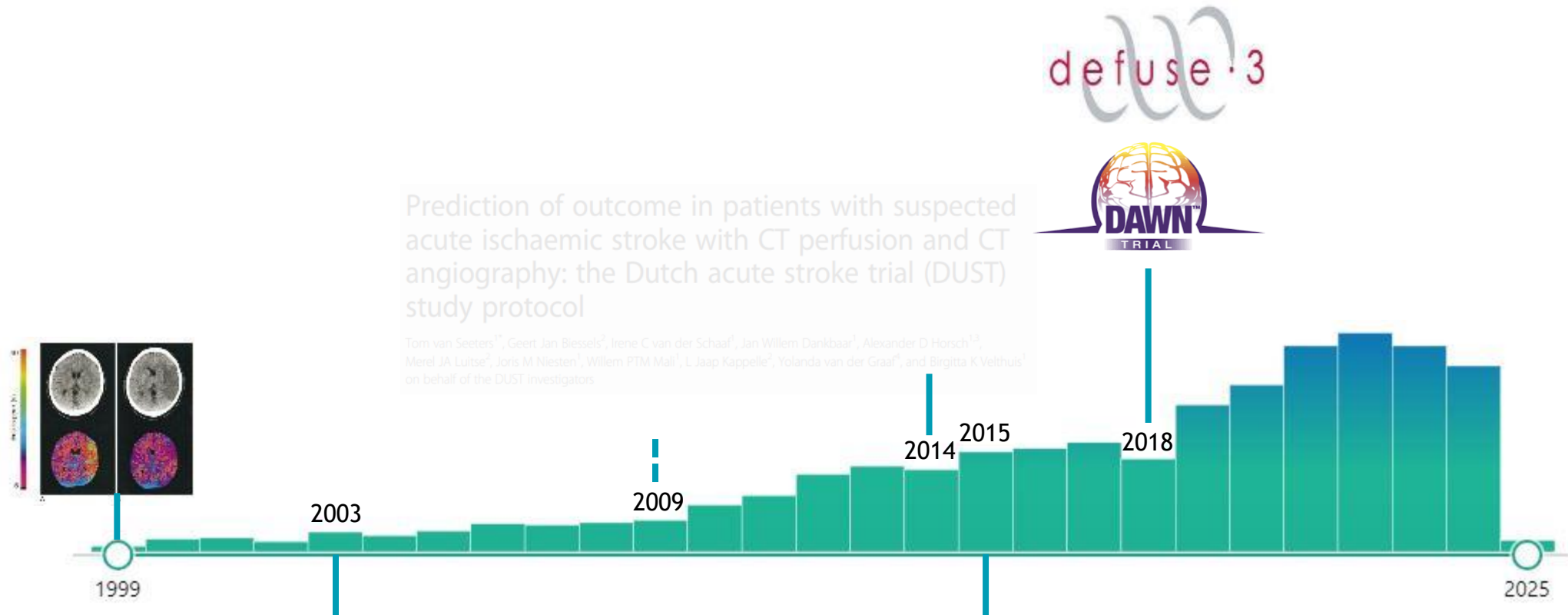
Tom van Seeters^{1*}, Geert Jan Biessels², Irene C van der Schaaf¹, Jan Willem Dankbaar¹, Alexander D Horsch^{1,3}, Merel JA Luitse², Joris M Niesten¹, Willem PTM Mali¹, L Jaap Kappelle², Yolanda van der Graaf⁴, and Birgitta K Velthuis¹ on behalf of the DUST investigators



Safety and Feasibility of a CT Protocol for Acute Stroke: Combined CT, CT Angiography, and CT Perfusion Imaging in 53 Consecutive Patients

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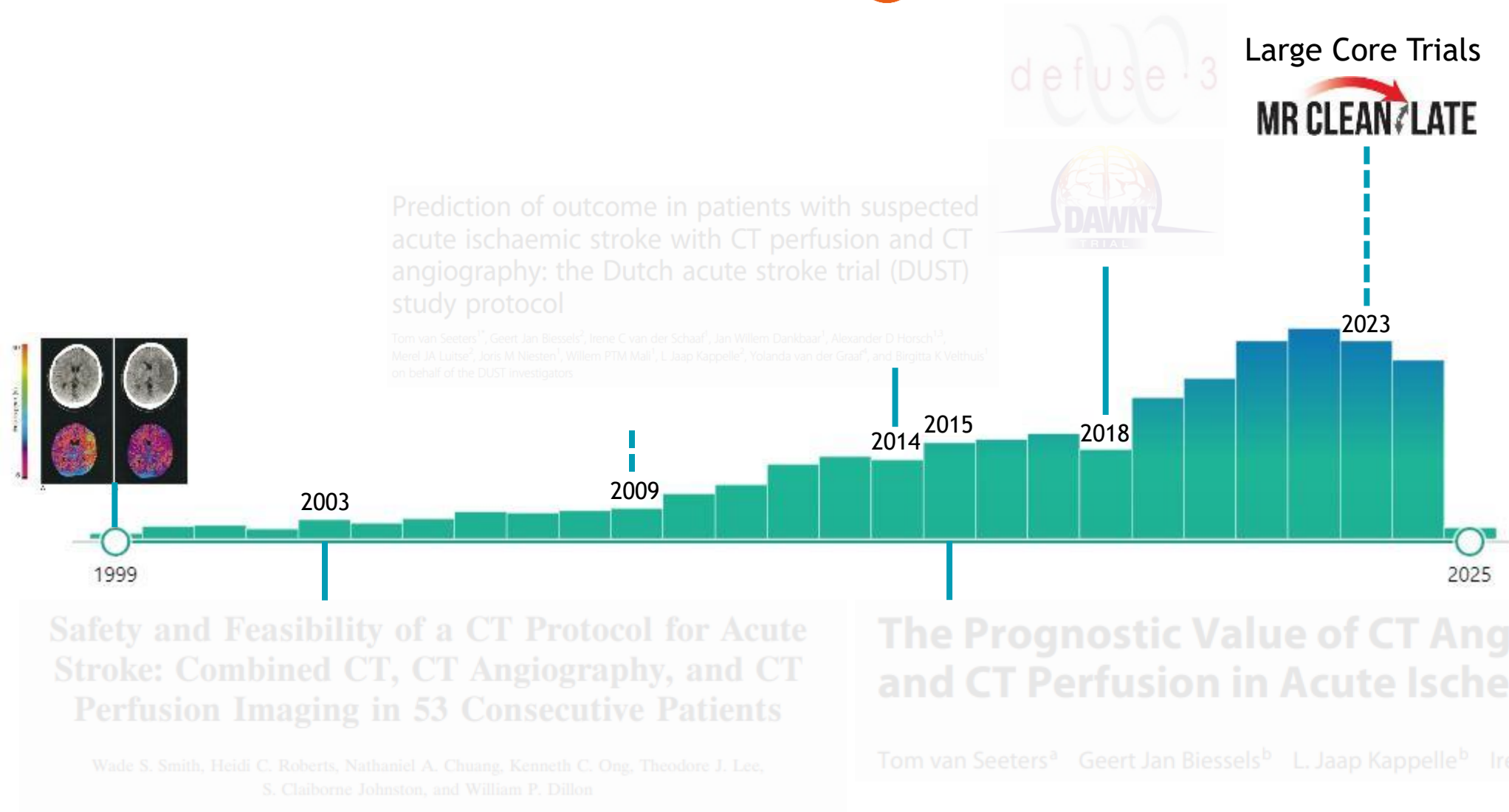


Safety and Feasibility of a CT Protocol for Acute Stroke: Combined CT, CT Angiography, and CT Perfusion Imaging in 53 Consecutive Patients

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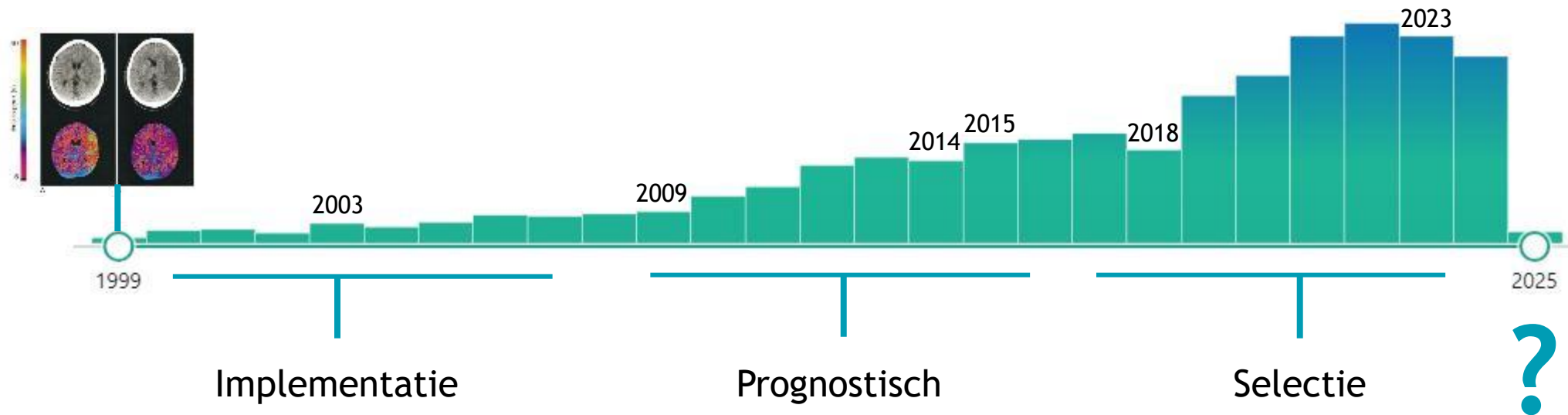
The Prognostic Value of CT Angiography and CT Perfusion in Acute Ischemic Stroke

Tom van Seeters^a Geert Jan Biessels^b L. Jaap Kappelle^b Irene C. van der Schaaf^a





CT perfusie - geschiedenis





CT perfusie - waarom CTP

Detectie!

- Vaststellen van (distale) occlusies
- Snellere selectie = tijdswinst
- Weergave van grootte van bedreigd weefsel - extra informatie over klinische impact en mogelijke opbrengst interventie

Systematic CT perfusion acquisition in acute stroke increases vascular occlusion detection and thrombectomy rates

M. Olive-Gadea et al. J. NeuroIntervent Surg 2022



338 patiënten met verdenking herseninfarct en blanco CT/CTA/CTP

→ 1 groep beoordelaars met alle informatie

→ 1 groep beoordelaars met alleen blanco CT en CTA

Systematic CT perfusion acquisition in acute stroke increases vascular occlusion detection and thrombectomy rates

M. Olive-Gadea et al. J. NeuroIntervent Surg 2022

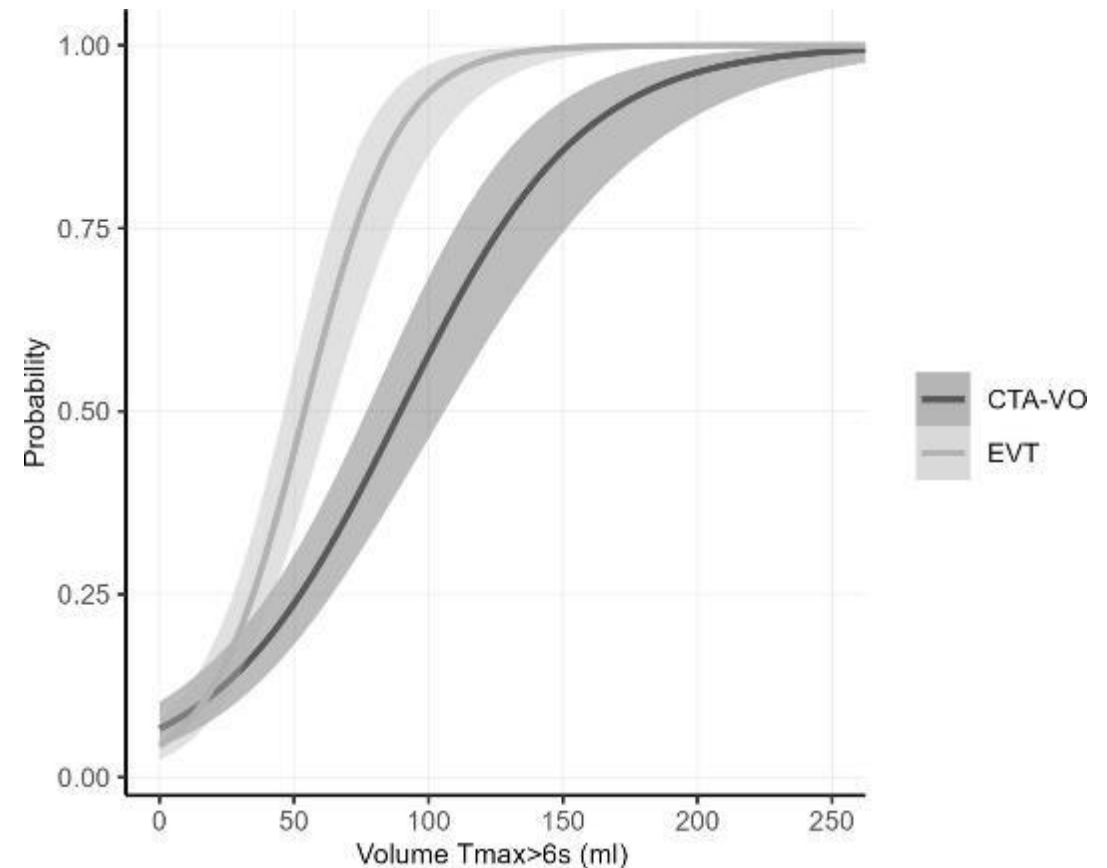


CTP-VO: 157/338 patiënten (46.5%)

CTA-VO: 83/338 patiënten (24.5%)

EVT: 104/338 patiënten (30.5%)

Bij 31 patiënten niet ontdekt op CTA





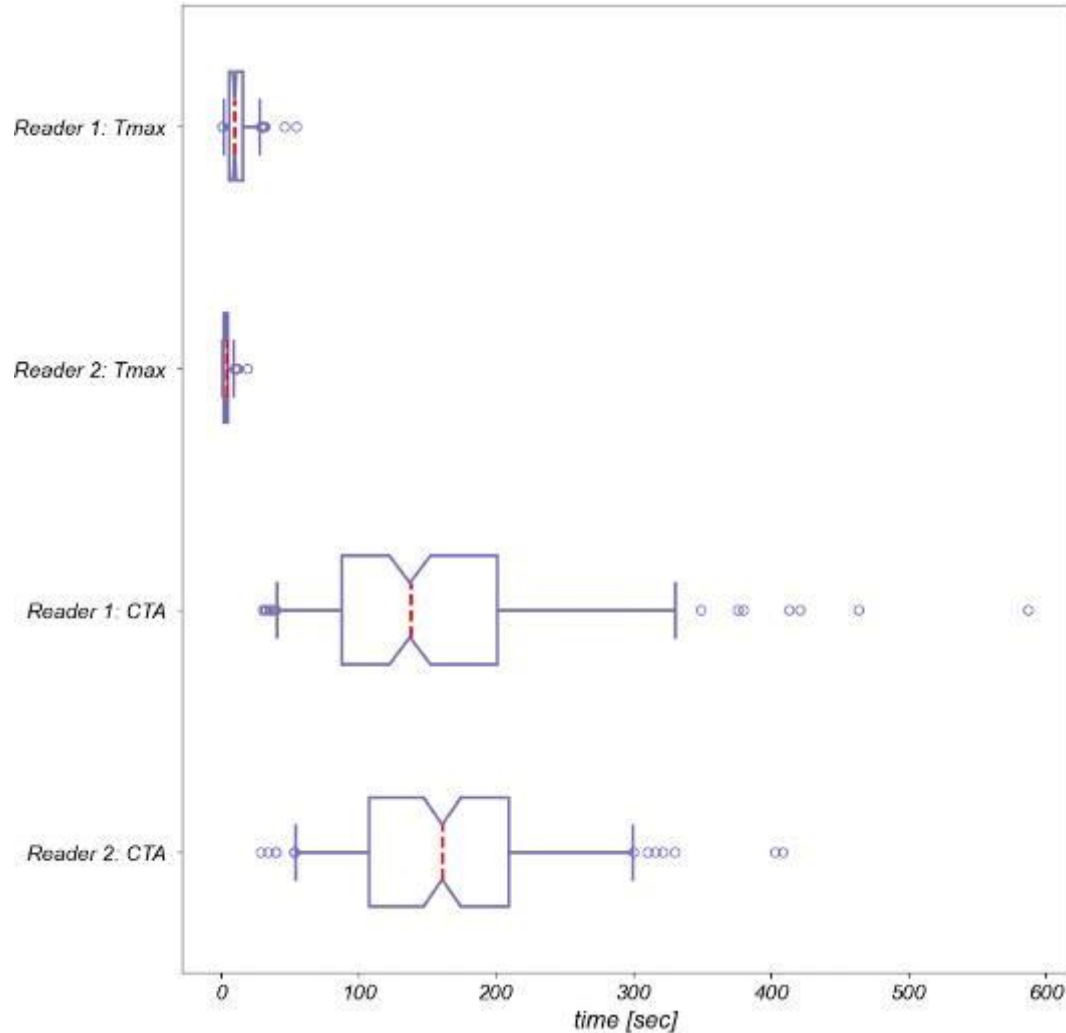
Mediane interpretatietijd:

10 seconden (IQR 6-16)

4 seconden (IQR 2-5)

138 seconden (IQR 130-150)

161 seconden (IQR 140-174)

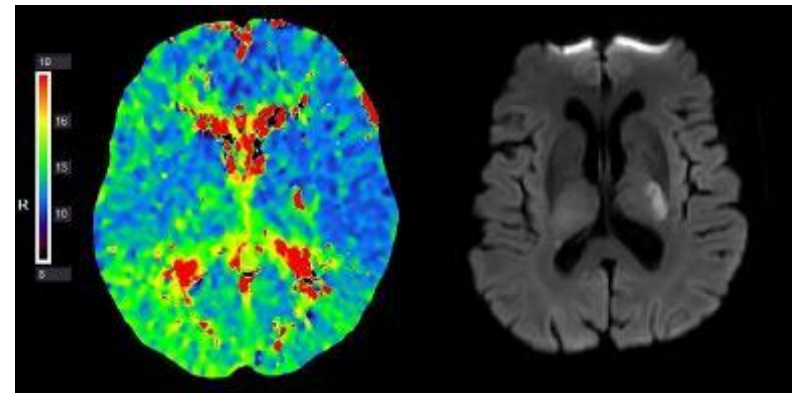
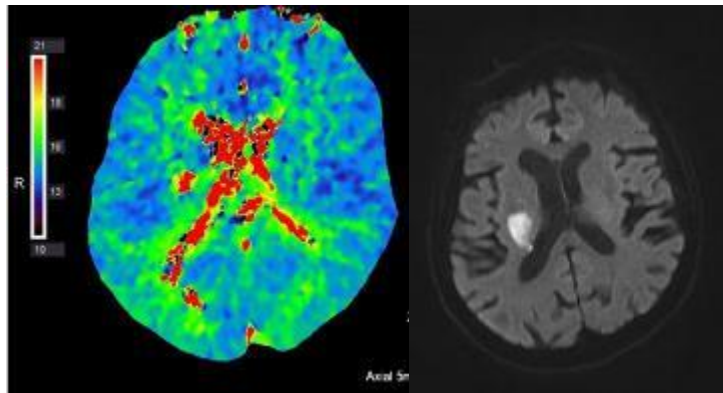


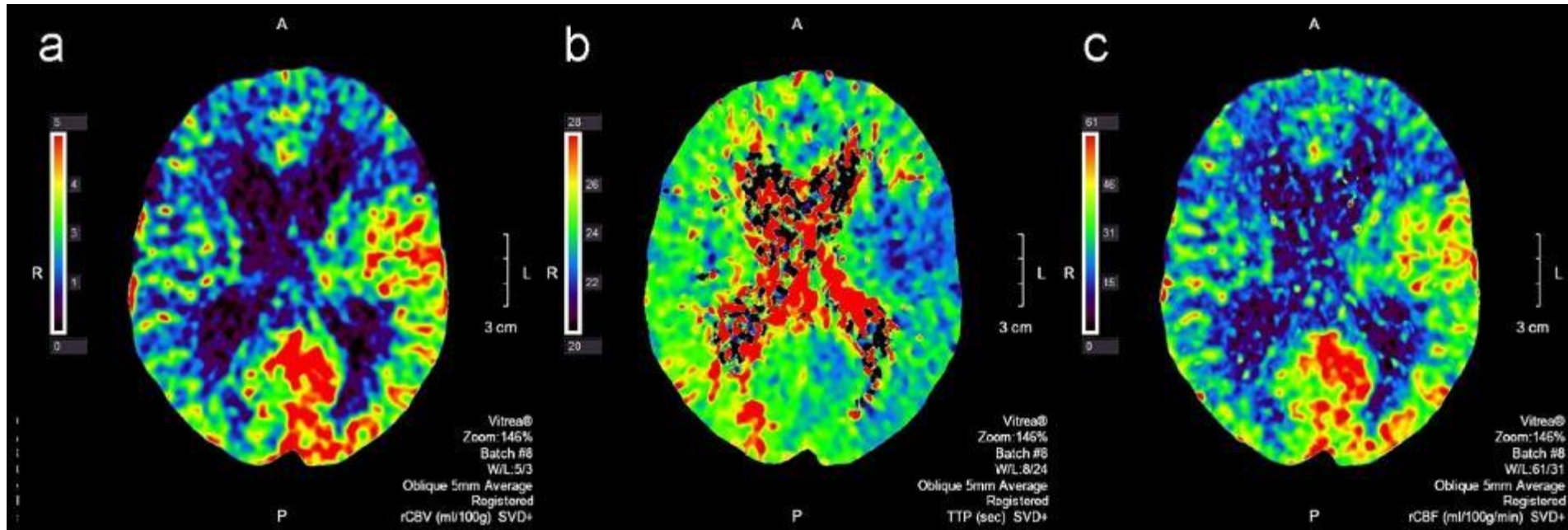


CT perfusie - waarom CTP?

Diagnose!

- Vaststellen van infarct los van therapeutische consequenties
- Stroke mimics - voorkomen van onnodige behandeling





CBV

TTP

CBF

Man, 86 jaar: afasie, hemiparese rechts, inattentie

The importance of multimodal CT
examination in stroke mimics
diagnosis: design of prospective
observational multicentre study

Dvornikova et al. Frontiers in Neurology, 2024

Inclusie 3000 patiënten
Sensitiviteit en specificiteit diagnose stroke mimic

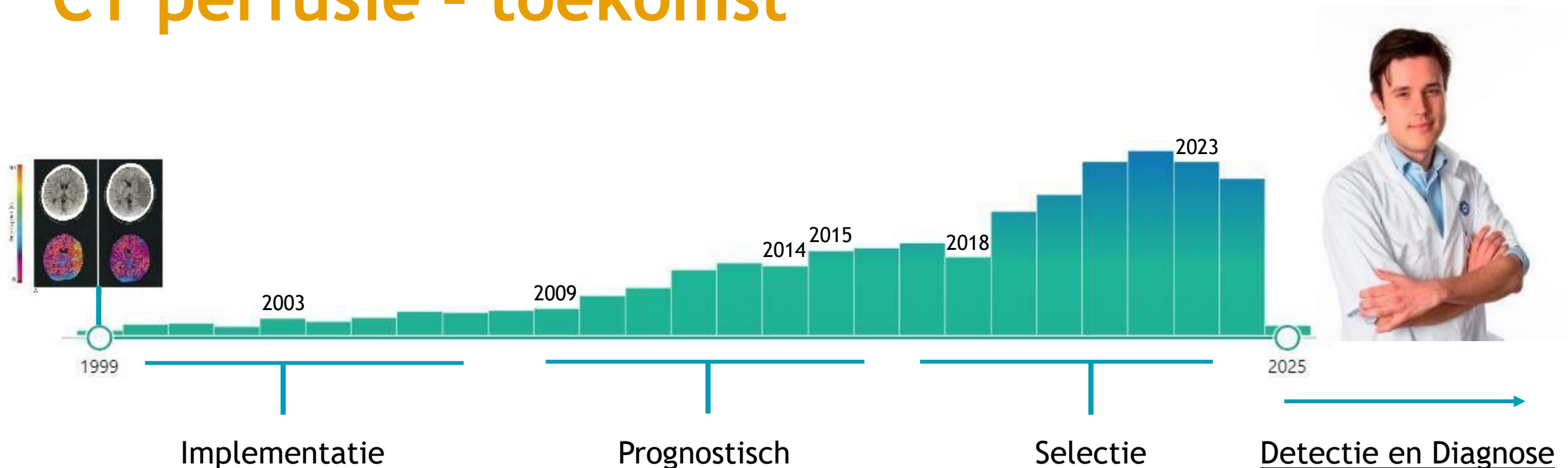


CT perfusie - valkuilen

- Technisch (beweging patiënt, contrast bolus, straling = gelijk aan blanco CT)
 - ➔ timing van CTA middels CTP
- Klinisch
 - Verkeerde inschatting core - bekijk ook blanco CT!
 - Overschatting penumbra - fossa posterior, carotisstenose, hartfalen
 - Posterieure circulatie en lacunaire infarcten



CT perfusie - toekomst



Cost-Effectiveness Study of Initial Imaging Selection in Acute Ischemic Stroke Care

Gabriela Martinez, PhD^{a,b,c}, Jeffrey M. Katz, MD^{d,e,f}, Ankur Pandya, PhD^g, Jason J. Wang, PhD^{c,f}, Artem Boltyenkov, PhD^{a,b,c}, Ajay Malhotra, MBBS, MD^h, Alvin I. Mushlin, MD, ScMⁱ, Pina C. Sanelli, MD, MPH^{b,c,h,i,j}

J Am Coll Radiol 2021

Cost-effectiveness of CT perfusion for the detection of large vessel occlusion acute ischemic stroke followed by endovascular treatment: a model-based health economic evaluation study

Henk van Voorst^{1,2} · Jan W. Hoving¹ · Miou S. Koopman¹ · Jasper D. Daems^{3,4} · Daan Peerlings^{2,5} · Erik Buskens⁶ · Hester F. Lingsma³ · Ludo F. M. Beenen¹ · Hugo W. A. M. de Jong⁵ · Olvert A. Berkhemer^{1,6,7} · Wim H. van Zwam⁸ · Yvo B. W. E. M. Roos⁹ · Marianne A. A. van Walderveen¹⁰ · Ido van den Wijngaard¹¹ · Diederik W. J. Dippel⁴ · Albert J. Yoo¹² · Bruce C. V. Campbell¹³ · Wolfgang G. Kunz¹⁴ · Bart J. Emmer¹ · Charles B. L. M. Majoie¹ · for the CLEOPATRA investigators · for the CONTRAST consortium · for the MR CLEAN Registry Investigators

European Radiology 2024