

“Organisatie acute CVA zorg: nu en in de toekomst”

**Nationaal congres spoedzorg
6 oktober 2017, Utrecht.**

Maarten M.H. Lahr, Ph.D., Afdeling Epidemiologie, UMC Groningen



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Disclosures

- The CONTRAST consortium is supported by Netherlands Cardiovascular Research Initiative, an initiative of the Dutch Heart Foundation, and by the Brain Foundation Netherlands.



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Ons profiel

- Universitair Medisch Centrum
- Traumacentrum met Mobiel Medisch Team (MMT)
- Verzorgingsgebied: 3.5 miljoen inwoners
- Multidisciplinaire onderzoeksgroep: focus op organisatie van acute beroertezorg
 - * Neurologie
 - * Epidemiologie
 - * BedrijfskundeCentre of Expertise Healthwise
- Vraagstukken: ketenoptimalisatie ("time is brain"), centralisatie/decentralisatie van zorg, zorginnovaties



Bouwen aan de toekomst van gezondheid



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Inhoud

- Introductie: personalia, CVA, acute behandeling
- Huidig organisatiemodel acute CVA zorg
 - Status quo en uitdagingen
 - Huidig en toekomstig onderzoek
 - Discussie
- Prehospitale aspecten
 - Status quo en uitdagingen
 - Huidig en toekomstig onderzoek
 - Discussie



Introductie - Personalia

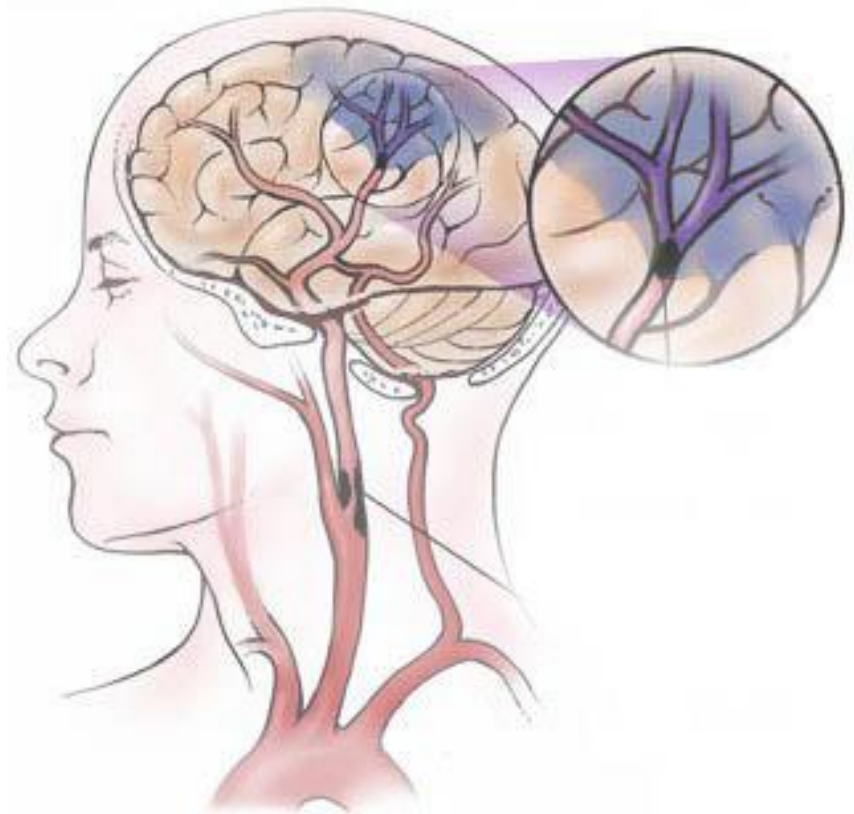
- B.Sc. Fysiotherapie (1999-2003)
- B.Sc. Bewegingswetenschappen (2003-2005)
- M.Sc. Bewegingswetenschappen (2005-2008)
- M.Sc. (Res) Behavioral and Cognitive Neurosciences (2007-2009).
- Ph.D. Medische Faculteit, organisatie acute CVA zorg, UMCG (2009-2013).
- Postdoc Healthy Ageing team, UMCG (2013-2015)
- Managing director SPRINT Center for Excellence, UMCG (2014-2016)
- Postdoc afdeling Epidemiologie, unit Health Technology Assessment, UMCG (juli 2016-Nu).



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Introductie - CVA

- Aandoening van de bloedvaten van de hersenen.
- Paraplu term: ± 85% infarct, ± 15% bloeding.
- Is geen ongeluk!! (cerebro-vascular-~~accident~~ → disease)
- Ongeveer 125 mensen worden per dag getroffen door een beroerte (46.000 per jaar)*
- Nummer 3 oorzaak van mortaliteit, **nummer 1 oorzaak van ernstig invaliditeit op latere leeftijd.**



*Nederlandse Hartstichting 2015



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Introductie - Herseninfarct

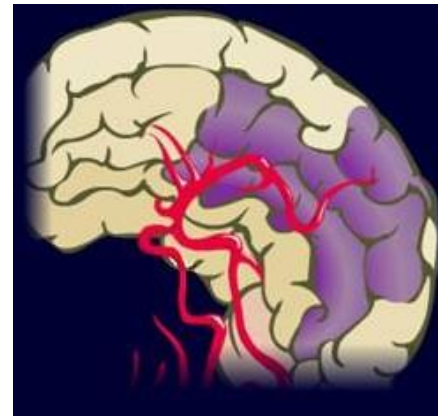
Oorzaak: verstopping bloedvat

Gevolg: geen zuurstof

Geen zuurstof: hersenweefsel sterft af

Hersenweefsel sterft af:
verlies van functie

- (Gedeeltelijk) verlamming arm/been
- Verlies van spraak



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Introductie – “Time is brain”

	Neurons Lost	Synapses Lost	Myelinated Fibers Lost
Per Stroke	1.2 billion	8.3 trillion	7140 km
Per Hour	120 million	830 billion	714 km
Per Minute	1.9 million	14 billion	12 km

Saver J.L. Time is brain: quantified. Stroke 2009.



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Acute behandeling (I)

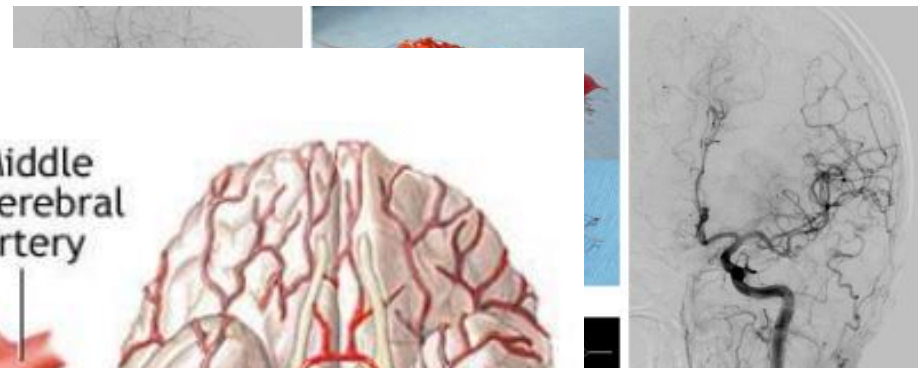
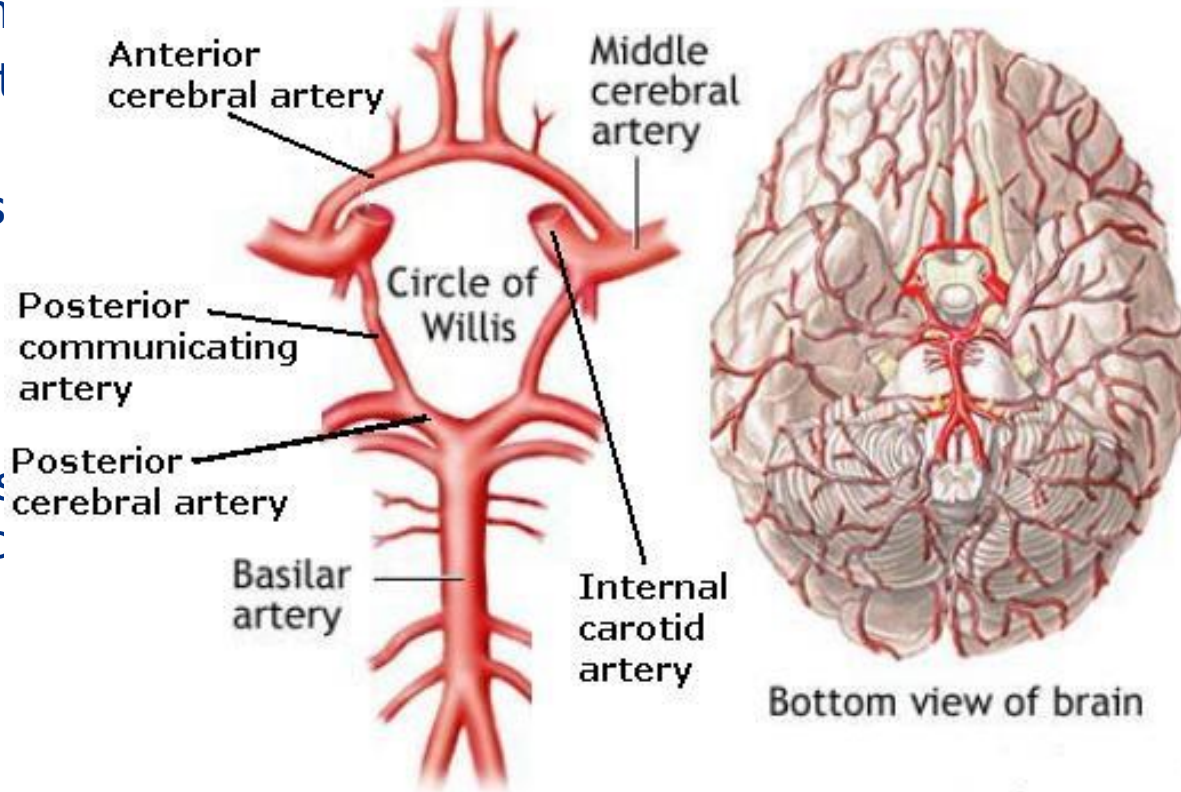
- Intraveneuze trombolysse (IVT)
- **"Clot buster"**
- Start behandeling binnen 4.5 uur.
- Herstellen bloedtoevoer
- Verbetert uitkomst bij 90 dagen (1/3 minder kans op ernstige handicap of sterfte)



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Acute behandelning (II)

- Intra
- trom
- Start
- uur.
- Hers
- NNT
- <https://www.watc>



A Multicenter Randomized CLinical trial of Endovascular treatment for Acute ischemic stroke in the Netherlands



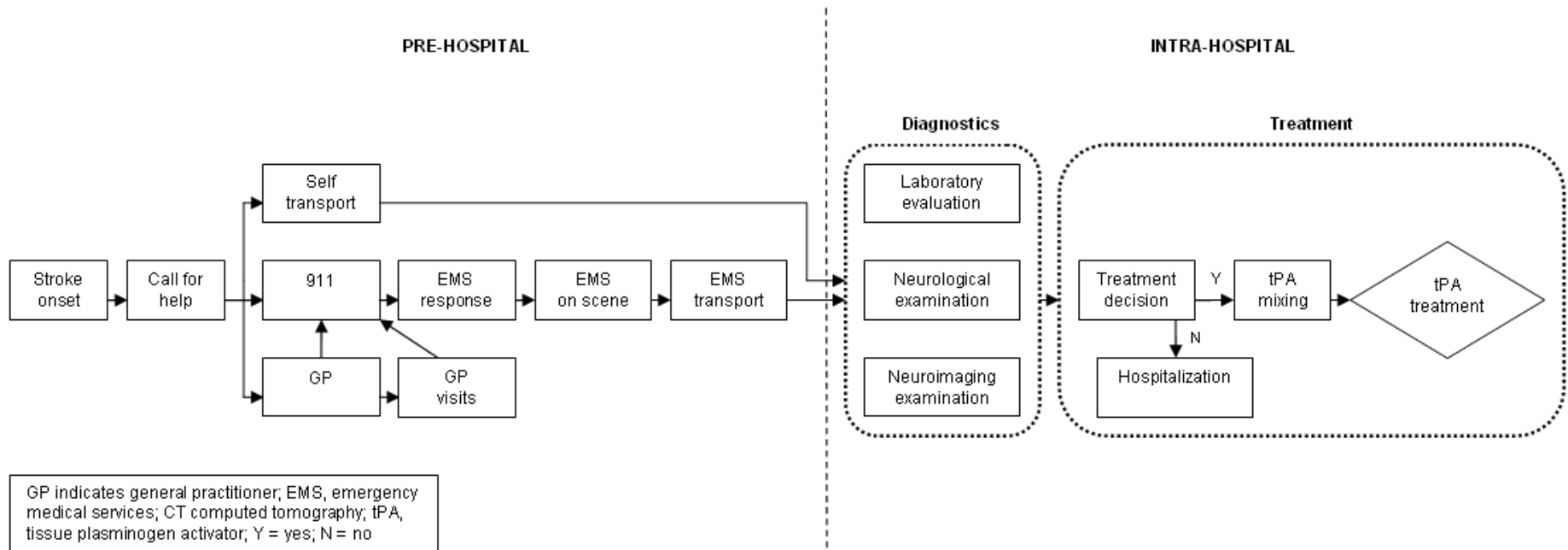
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Organisatie van acute CVA zorg

- Organisatiemodel:
 - Beschrijving (complexiteit)
 - Hele keten benadering
 - Huidige model
 - Nieuwe/innovatieve organisatiemodellen
 - Uitdagingen/ te beantwoorden vraagstukken
 - Stellingen/Discussie



De acute zorgketen - IVT

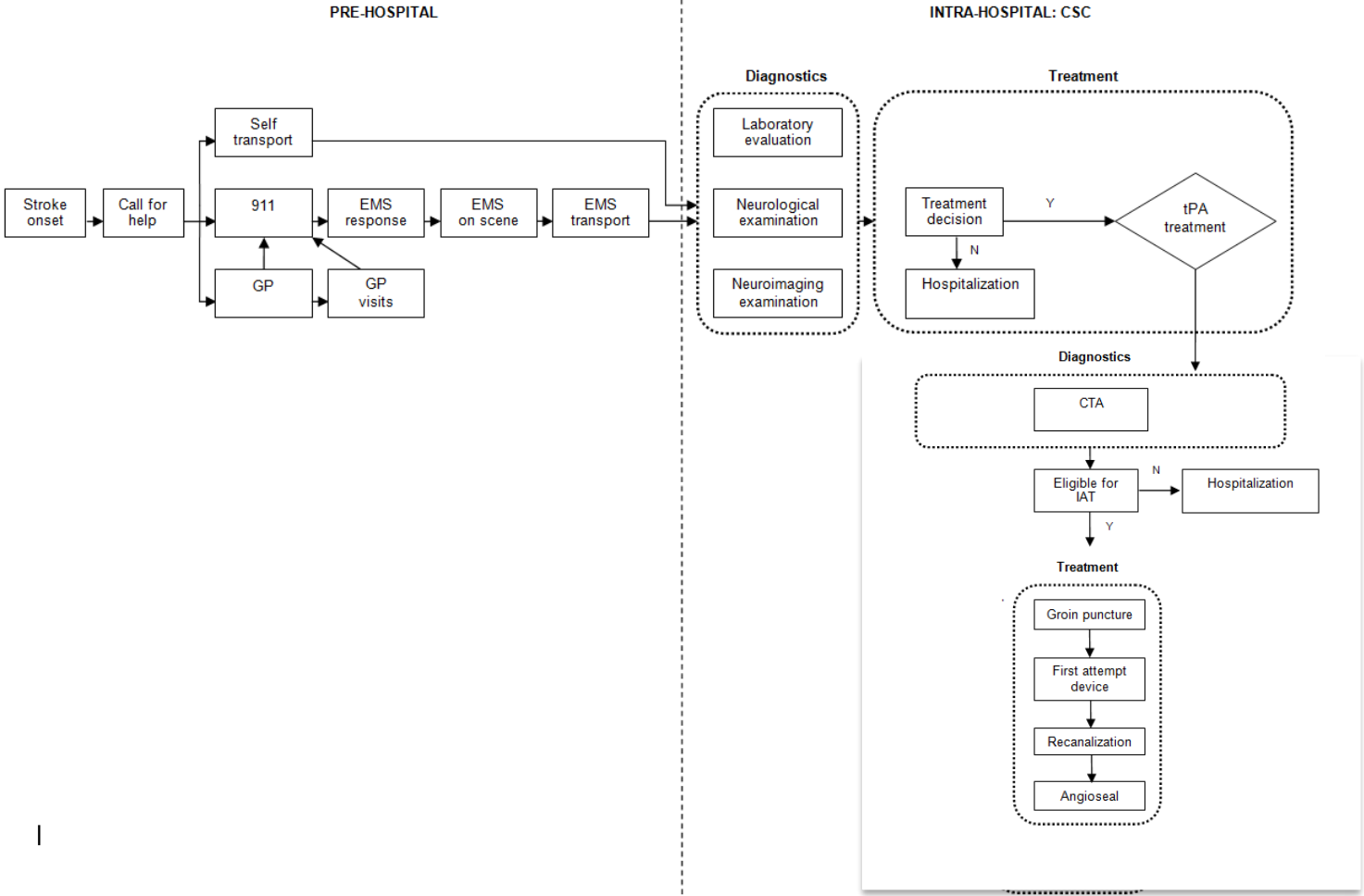


Complex?



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De acute zorgketen – IAT (direct)

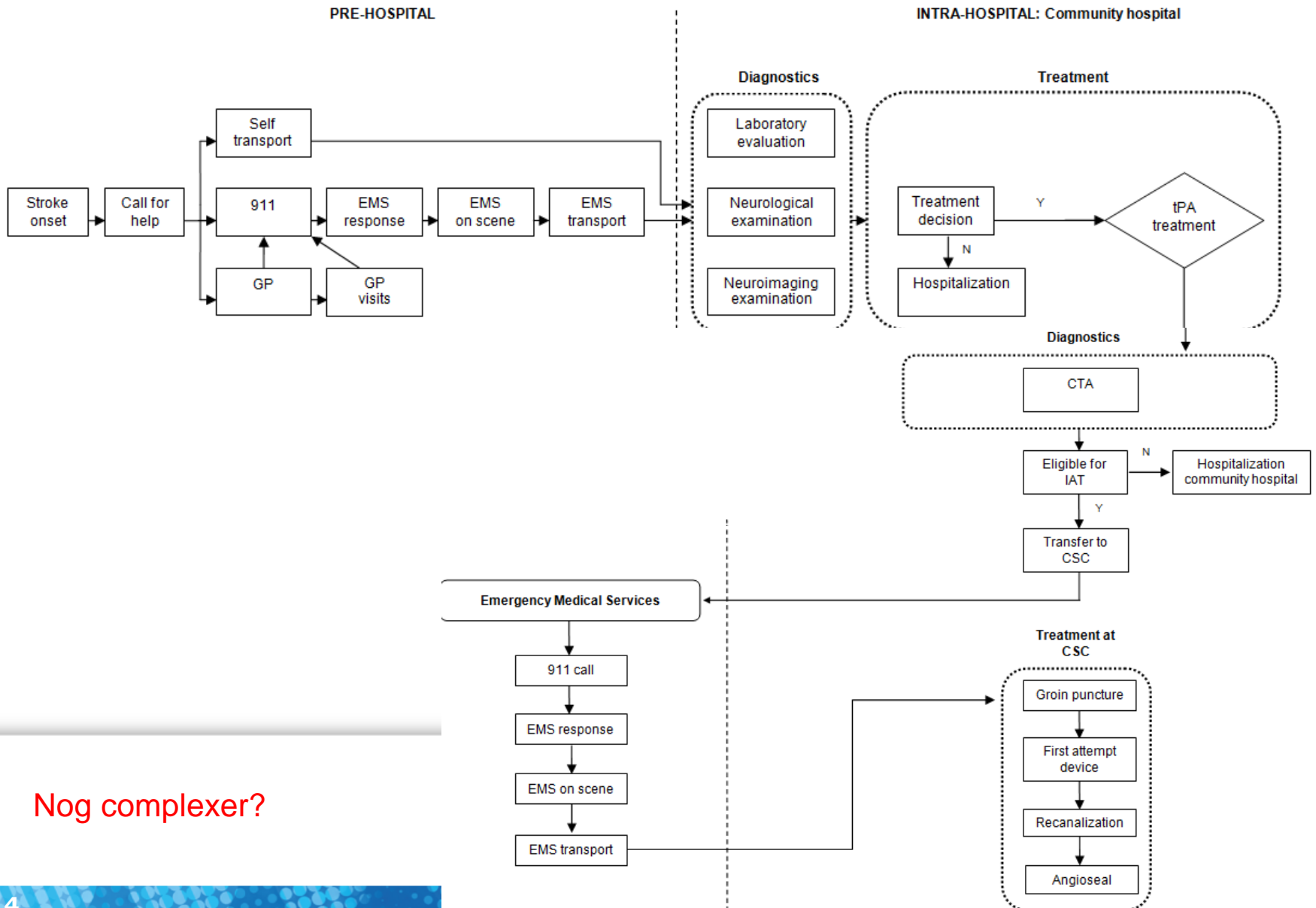


Complexer?



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De acute zorgketen – IAT (indirect)



Nog complexer?



Organisatiemodel: IVT and IAT

Transfer to High-Volume Centers Associated With Reduced Mortality After Endovascular Treatment of Acute Stroke

Lorenzo Rinaldo, MD, PhD; Waleed Brinjikji, MD; Alejandro A. Rabinstein, MD

Background and Purpose—Some have argued that it may be beneficial to expand the availability of endovascular revascularization services to lower-volume hospitals to minimize the morbidity associated with transfer to larger endovascular centers. We compared the outcomes after revascularization of patients directly admitted to a low-volume center and those transferred to a high-volume center.

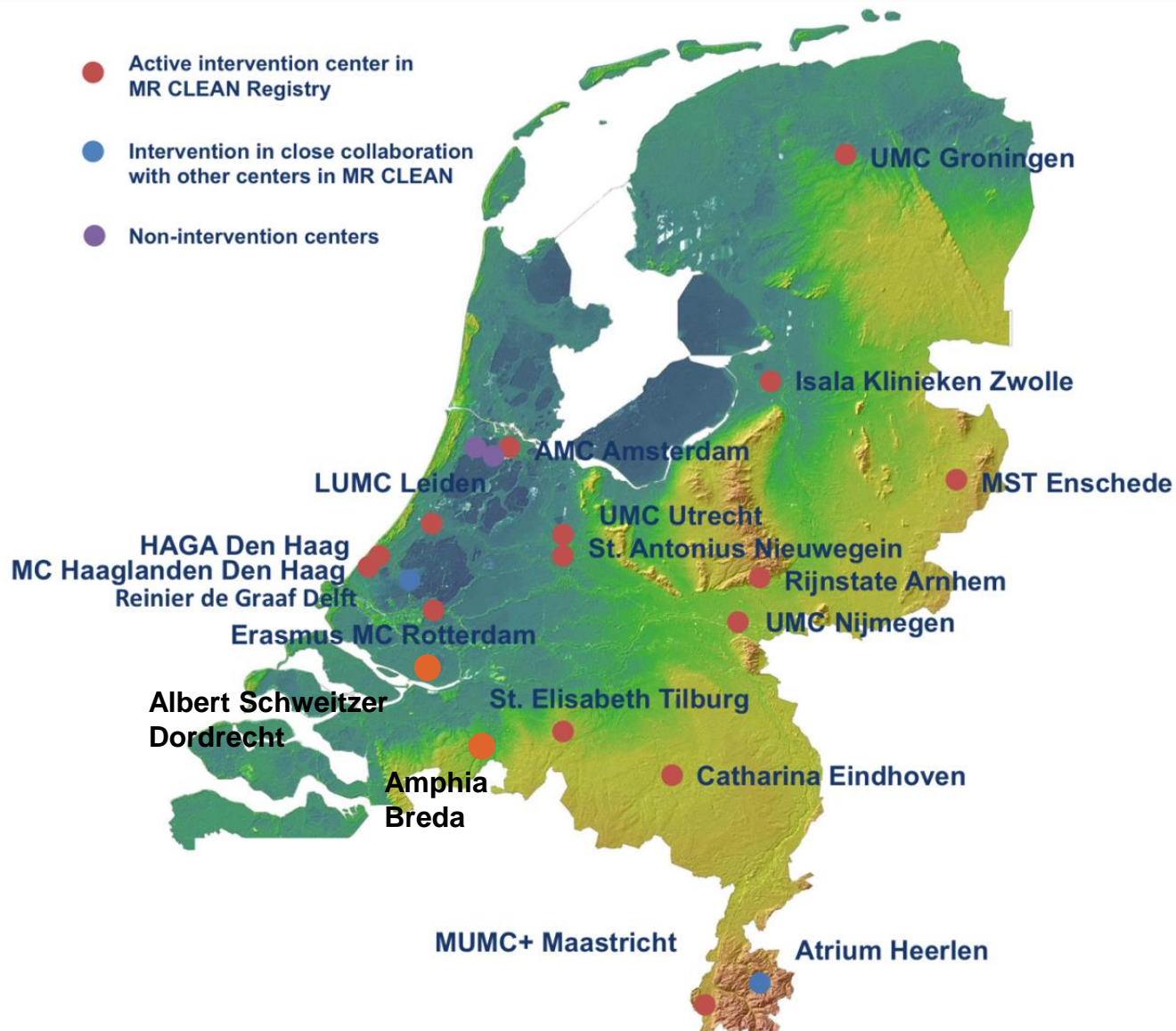
Methods—We searched a national database of hospital-reported outcomes for patients who underwent endovascular revascularization for acute ischemic stroke. Hospitals were categorized as low, medium, or high procedural volume hospitals. Outcomes of inpatient admissions were collected and compared on the basis of admission source and hospital procedural volume.

Results—A total of 118 institutions with 8533 patients were included. Mortality rate (14.9% versus 18.6%; $P=0.049$) and mortality index (1.1 versus 1.6; $P=0.048$) were significantly lower among directly admitted relative to transferred patients. For all patients, there were significant differences in institutional mortality rate (low: 19.7%, medium: 14.9%, high: 9.8%; $P=0.003$) and mortality index (low: 1.5, medium: 1.1, high: 0.8; $P=0.004$) between low-, medium-, and high-volume hospitals. For transferred patients to high-volume centers, both mortality rate (high: 10.0% versus low: 20.4%; $P=0.005$) and mortality index (high: 0.8 versus low: 1.5; $P=0.034$) were significantly lower than that observed for directly admitted patients to low-volume hospitals.

Conclusions—We report a beneficial effect of treatment at high-volume hospitals in spite of the detrimental effects of transfer. These findings argue for the centralization of care. (*Stroke*. 2017;48:1316-1321. DOI: 10.1161/STROKEAHA.116.016360.)



Interventie centra MR CLEAN (n=19)



“Nieuwe en innovatieve organisatiemodellen” (I): Prehospitaal behandelen

- “Mobile Stroke Unit”
- Ervaringen Duitsland, VS, Australië:
 - Verkorten tijd tot aan behandeling
 - Effect op gezondheid? Kosten?
 - NL setting?
- <https://www.youtube.com/watch?v=3ZW5AWeinEM>



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“Nieuwe en innovatieve organisatiemodellen” (II): Telegeneeskunde

- Telemedicine
- Rol IVT? IAT?
- <https://www.youtube.com/watch?v=zCeInd8yd28>



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“Nieuwe en innovatieve organisatiemodellen” (III): Apps/wearables.

- Acute fase?
- <https://www.youtube.com/watch?v=O83ApsLvRjs>

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Status quo



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Uitdagingen

“De juiste patiënt, op de juist plaats, op het juiste moment”





Zorginstituut Nederland

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2017019400

Datum 2 juni 2017
Betreft Advies implementatie intra-arteriële trombectomie bij het acute
herseninfarct

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R. Dupree
T +31 (0)20 797 8100

Onze referentie

2017019400

Geachte mevrouw Schippers,



Intervention centers non MR CLEAN (n=19)



IAT in Nederland



verantwoordelijkheid, patiënt veiligheid, processtrategie en draagvlak zijn opgenomen...

- Een IAT-centrum beschikt over neurologen met vasculaire expertise waarvan altijd één 24/7 telefonisch bereikbaar moet zijn voor overleg.
- Er dienen ten minste 3 IAT-interventionalisten verbonden te zijn aan een IAT-centrum.
- Een IAT-centrum verricht per jaar ten minste 50 IAT-procedures.
- Een IAT-interventionalist verricht per jaar ten minste 20 IAT-procedures (waarbij een procedure die wordt uitgevoerd als 2^e IAT-interventionalist mee kan tellen).



Collaboration for New Treatments of Acute Stroke (CONTRAST)

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Collaboration for New Treatments of Acute Stroke

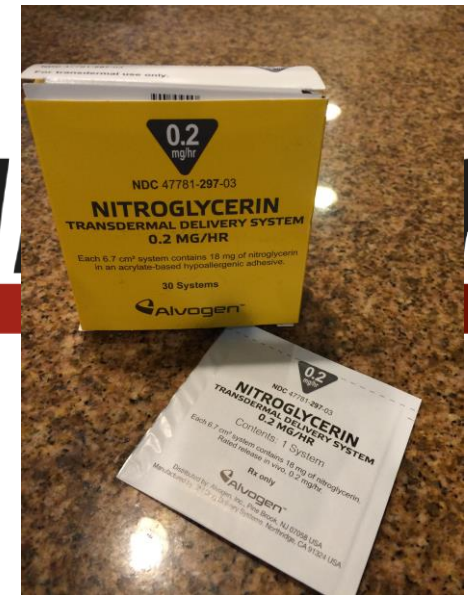
- **Start:** 1 mei 2017
- **Duur:** 60 mnd
- **Coordinator:** Erasmus MC Rotterdam
- **Partners:** UMCs, STZ ziekenhuizen en industrie.
- **UMCG:** WP8 logistiek en epidemiologie.
- **Samenwerking WP8:**
 - Dr. G.J. Luijckx, neuroloog
 - Dr. M. Uyttenboogaart, neuroloog
 - Prof.dr. E.Buskens, hoogleraar HTA
 - Dr. D.J. van der Zee, UHD Bedrijfskunde RuG



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MR CLEAN ASAP

- Nitroglycerine pleister.
- Verbeteren 'collateralen'.
- Toedienen in ambulance.
- Kosten? Tijd?



Effect of Hyperacute Administration (Within 6 Hours) of Transdermal Glyceryl Trinitrate, a Nitric Oxide Donor, on Outcome After Stroke

Subgroup Analysis of the Efficacy of Nitric Oxide in Stroke (ENOS) Trial

Lisa Woodhouse, MSc; Polly Scutt, MSc; Kailash Krishnan, MRCP(UK); Eivind Berge, MD, PhD; John Gommans, MD; George Ntaios, MD, PhD; Joanna Wardlaw, FMedSci, FRSE; Nikola Sprigg, MD, MRCP(UK); Philip M. Bath, FRCP, DSc; on behalf of the ENOS Investigators



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Acknowledgements

- WP Leaders:
 - Paul Nederkoorn (AMC, Amsterdam)
 - Bart van der Worp (UMCU, Utrecht).
- WP Members:
 - Peter van den Berg, (Isala Kliniek, Zwolle)
 - Klaartje Caminada (Ambulancedienst, Zwolle)
 - Jeannette Hofmeijer (Rijnstate Ziekenhuis, Arnhem)
 - Henk Kerkhoff (A Schweitzer Ziekenhuis, Dordrecht)
 - Frank-Erik de Leeuw (UMC Radboud, Nijmegen)
 - Nyika Kruijt (LUMC, Leiden)



CONTRAST – MR CLEAN LATE

- IAT tot tussen 6-12 uur.
- "IAT verbetert functionele uitkomst bij patiënten met een acuut herseninfarct, waarbij de symptomen aanwezig zijn tussen **6 and 24** uur na 'onset' of 'last seen well' en tenminste enige collaterale flow op CTA te zien is"
- Uitbreiding indicatie.
- Gevolgen ambulancediensten?
 - Tijd?
 - Kosten?



Results:
N = 206
mRS 0-2 at 90 days 48.6% versus 13.1%



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- WP Leaders:
 - Robert van Oostenbrugge (MUMC, Maastricht)
 - Wim van Zwam (MUMC, Maastricht)
- WP Members:
 - W. Schonewille (Antonius Ziekenhuis, Nieuwegein)
 - Lycklama à Nijeholt (Medisch Centrum Haaglanden, Den Haag)
 - Marianne van Walderveen (LUMC, Leiden)
 - Maarten Uyttenboogaart (UMCG, Groningen)



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CONTRAST – MR CLEAN NO IV

Outcomes After Direct Thrombectomy or Combined Intravenous and Endovascular Treatment Are Not Different

Sònia Abilleira, MD, PhD; Aida Ribera, BSc, PhD; Pedro Cardona, MD; Marta Rubiera, MD, PhD; Elena López-Cancio, MD, PhD; Sergi Amaro, MD, PhD; Ana Rodríguez-Campello, MD; Pol Camps-Renom, MD; David Cánovas, MD, PhD; Maria Angels de Miquel, MD, PhD; Alejandro Tomasello, MD; Sebastian Remollo, MD; Antonio López-Rueda, MD; Elio Vivas, MD; Joan Perendreu, MD, PhD; Miquel Gallofré, MD, PhD; for the Catalan Stroke Code and Reperfusion Consortium*



Background and Purpose—Whether intravenous thrombolysis adds a further benefit when given before endovascular thrombectomy (EVT) is unknown. Furthermore, intravenous thrombolysis delays time to groin puncture, mainly among drip and ship patients.

Methods—Using region-wide registry data, we selected cases that received direct EVT or combined intravenous thrombolysis+EVT for anterior circulation strokes between January 2011 and October 2015. Treatment effect was estimated by stratification on a propensity score. The average odds ratios for the association of treatment with good outcome and death at 3 months and symptomatic bleedings at 24 hours were calculated with the Mantel–Haenszel test statistic.

Results—We included 599 direct EVT patients and 567 patients with combined treatment. Stratification through propensity score achieved balance of baseline characteristics across treatment groups. There was no association between treatment modality and good outcome (odds ratio, 0.97; 95% confidence interval, 0.74–1.27), death (odds ratio, 1.07; 95% confidence interval, 0.74–1.54), or symptomatic bleedings (odds ratio, 0.56; 95% confidence interval, 0.25–1.27).

Conclusions—This observational study suggests that outcomes after direct EVT or combined intravenous thrombolysis+EVT are not different. If confirmed by a randomized controlled trial, it may have a significant impact on organization of stroke systems of care. (*Stroke*. 2017;48:375-378. DOI: 10.1161/STROKEAHA.116.015857.)

Implicaties organisatiemodel en routing?

AMC and Erasmus MC received additional unrestricted funding on behalf of CONTRAST, for the execution of MR CLEAN NO-IV from Stryker European Operations BV.



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Acknowledgements

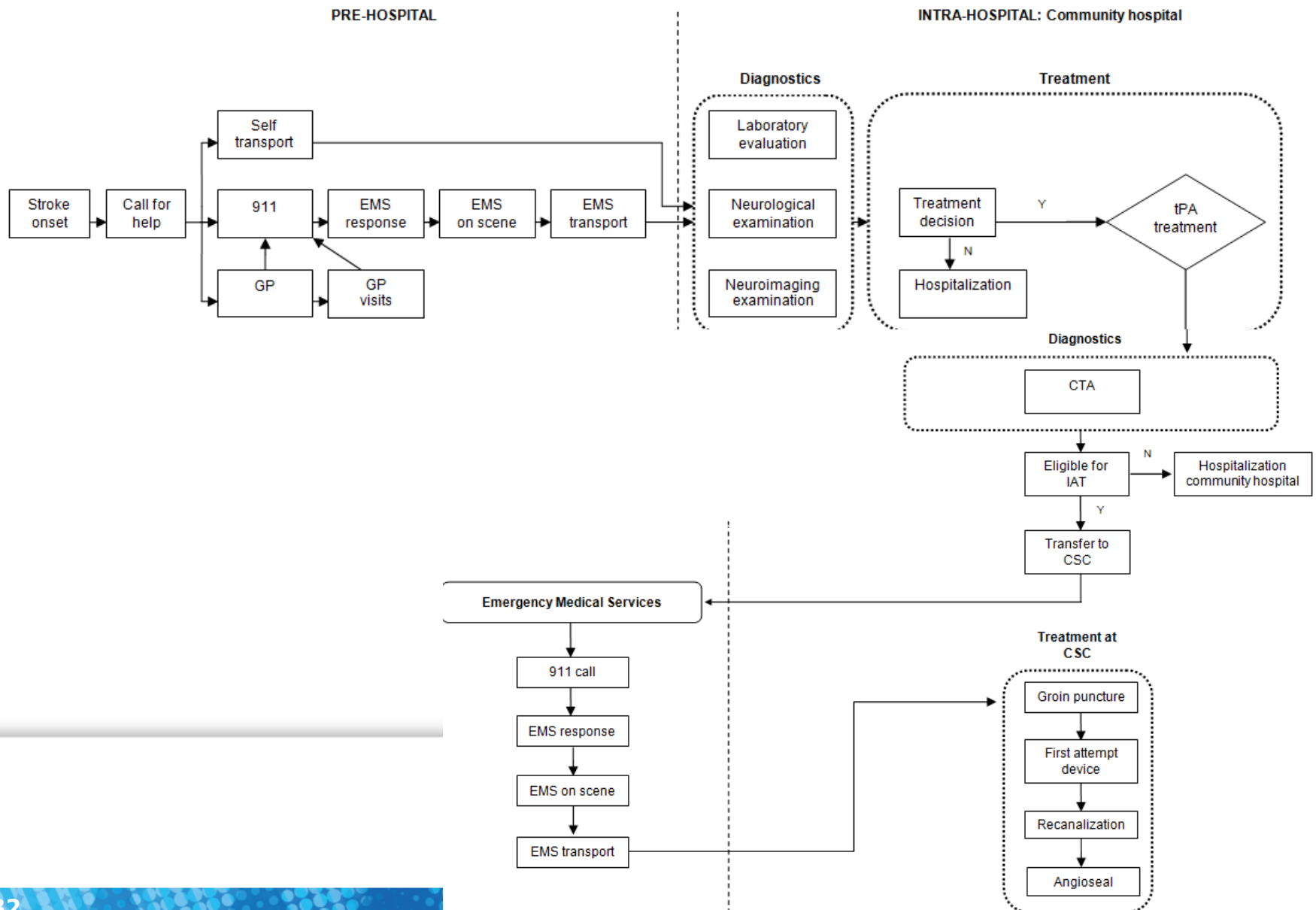
- WP Leaders:
 - Yvo.B.W.E.M. Roos (AMC, Amsterdam)
 - Charles Majoie (AMC, Amsterdam)
- WP Members:
 - Bart Emmer (Erasmus MC, Rotterdam)
 - Wim van Zwam (MUMC, Maastricht)
 - Jelis Boiten (MCH, The Hague)
 - Koos Keizer (Catharina, Eindhoven)

AMC and Erasmus MC received additional unrestricted funding on behalf of CONTRAST, for the execution of MR CLEAN NO-IV from Stryker European Operations BV.



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CONTRAST – Logistiek en epidemiologie (I)



Simulatiemodel

STROKE PATHWAY



Statical Distributions
 Decision Logic

.Models.PathWay.EventController

Time: 0:00:00.0000

Controls Settings

Start Stop Step

List Init Reset

Faster Slower

Real time x 10

OK Cancel Apply

EVENT CONTROL



MODEL SETTINGS

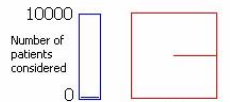
Parameter Settings
 Nr_Patients=10000
 Max_Onset_Needle_Time=270

Experimental Settings
 PointOfCare=0
ScoopAndRun=0

Cost Parameters
 EMS_transport_costs=953 Alteplase_costs=994.96
 EMS_transport_costs_km=5 GP_costs=36.68
 Personnel_costs_ER=115.9 GP_visit_costs=56.33
 Personnel_costs_OC=75.75 Lab_costs=27.1
 CT_scan_costs=190

ScreenCast-O-Matic.com

PERFORMANCE



Perc_Treatment=0
 Nr_Treated=0
 Nr_NTreated=0



Output data (individual patients)

Overall delays Delay patients treated Delay patients not treated Patient input data

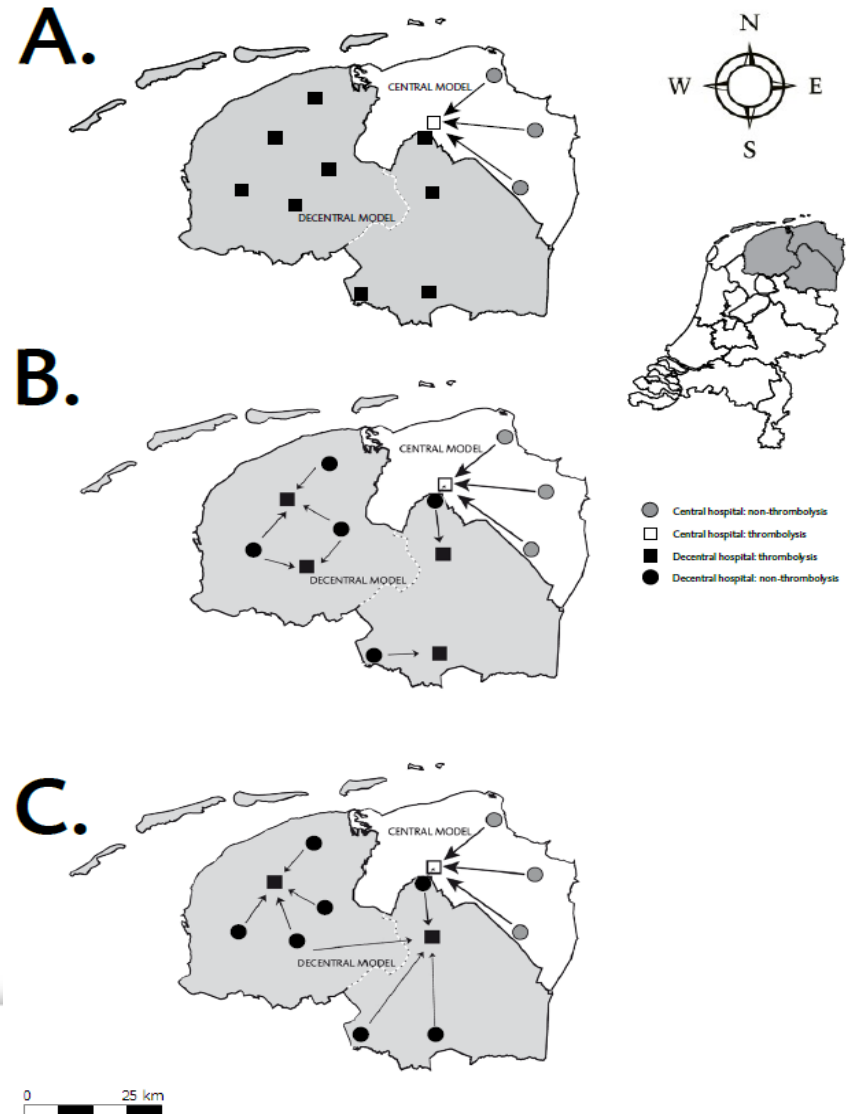
Output data (patient categories, cumulative data)

Patient_Delays Delay patients treated Delay patients not treated



CONTRAST – Logistiek en epidemiologie (II)

- Organisatiemodel
 - Toevoegen/weglaten behandelcentra
 - Tijd tot behandeling
 - % Terecht ingestuurd
 - Doelmatigheid

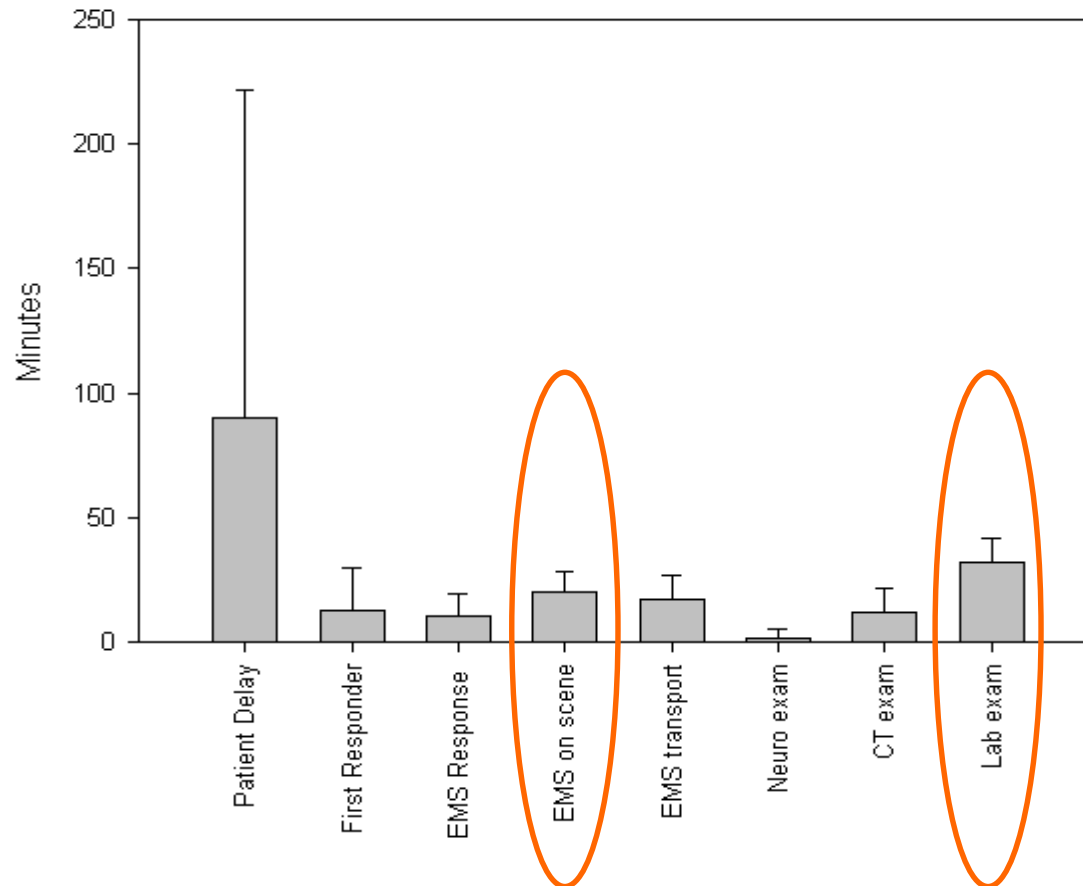


Lahr et al, BMC Med Res Meth 2017.

CONTRAST – Logistiek en epidemiologie (III)

- Procesverbeteringen

Time delays acute stroke pathway



Acknowledgements

- WP Leaders:
 - Gert-Jan Luijckx (UMCG, Groningen)
 - Erik Buskens (UMCG, Groningen)
- WP Members:
 - Maarten Lahr (UMCG, Groningen)
 - Maarten Uyttenboogaart (UMCG, Groningen)
 - J.M.C. van Dijk (UMCG, Groningen)
 - Durk-Jouke van der Zee (RUG, Groningen)
 - Yvo Roos (AMC, Amsterdam)
 - P.J. Nederkoorn (AMC, Amsterdam)
 - Diederik Dippel (Erasmus MC, Rotterdam)
 - Hester Lingma (Erasmus MC, Rotterdam)
 - Karin Klijn (Radboud UMC, Nijmegen)
 - Ewoud van Dijk (Radboud UMC, Nijmegen)
 - Mervyn Vergouwen (UMCU, Utrecht)



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Optimalisatie



Cutting the Prehospital On-Scene Time of Stroke Thrombolysis in Helsinki A Prospective Interventional Study

Tuukka Puolakka, MD; Markku Kuisma, MD, PhD, EMDM; Sami Länkimäki, MD;
Jyrki Puolakka, MD; Juhana Hallikainen, MD; Kirsi Rantanen, MD;
Perttu J. Lindsberg, MD, PhD, FESO

Background and Purpose—Significant portion of the prehospital delay consists of minutes spent on the scene with the patient. We implemented a training program for the emergency medical services personnel with the aim to optimize the on-scene time (OST) and to study the impact of different elements of prehospital practice to the OST duration.

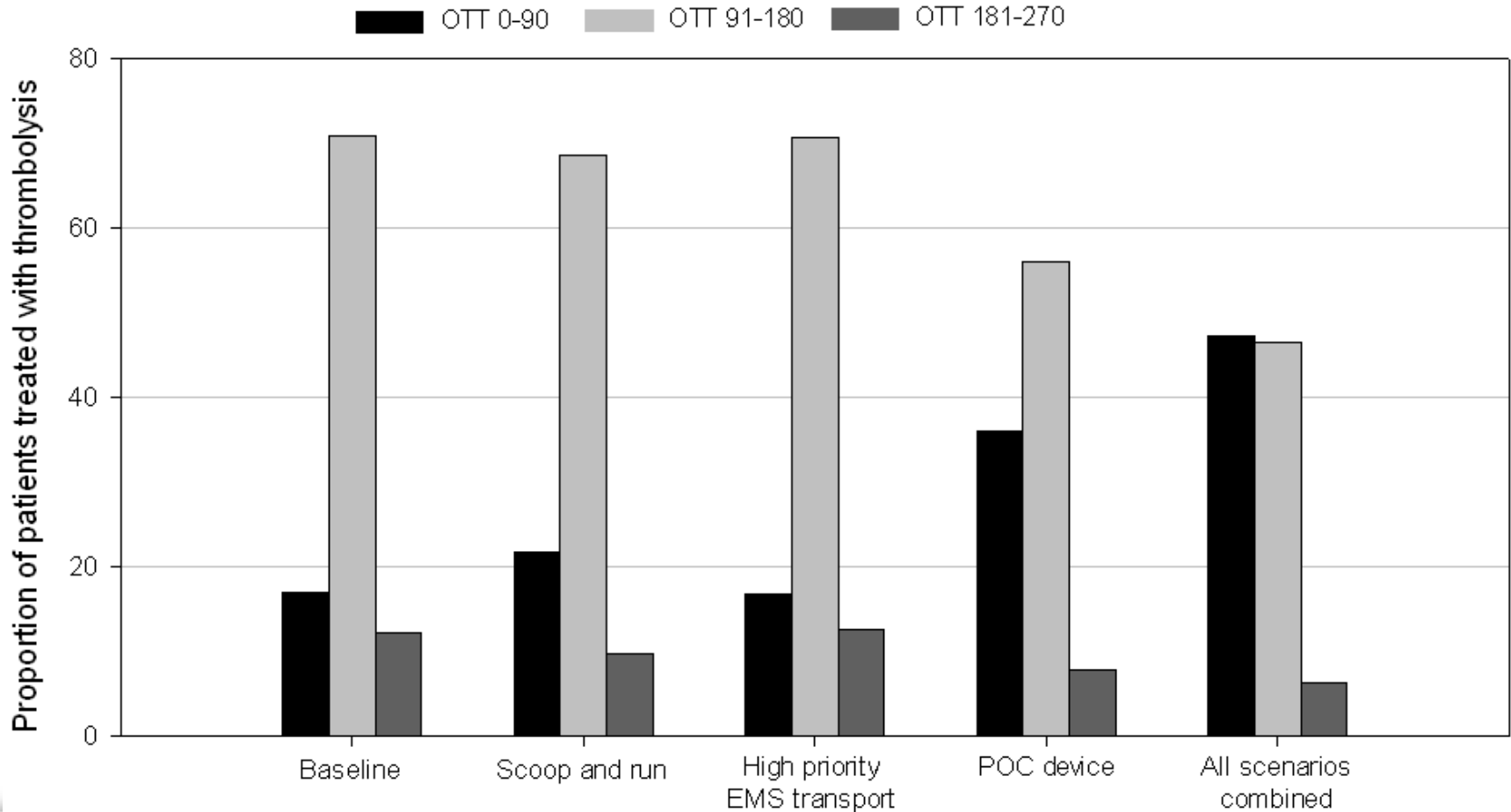
Methods—In this prospective interventional study, key operational emergency medical service performance variables were analyzed from all thrombolysis candidates transported to the Helsinki University Hospital emergency department. The catchment period was 4 months before and 4 months after the implementation.

Results—One hundred and forty-one patients were managed as thrombolysis candidates before and 148 patients after the training program implementation. The OST duration for the groups was 25 (20.5–31) and 22.5 (18–28.5) minutes, respectively ($P < 0.001$). Physician consultations via telephone were associated with a longer (odds ratio 0.546 [0.333–0.893]) and advanced life support training with a shorter OST (odds ratio 1.760 [1.070–2.895]).



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Samenvatting resultaten



Vragen/discussie (I)

- Wat zijn volgens u de uitdagingen binnen de acute beroertezorg?
- Waar loopt u tegen aan?
- Welke innovatieve organisatiemodellen zijn er?
- Waar liggen kansen, wat zijn de risico's?

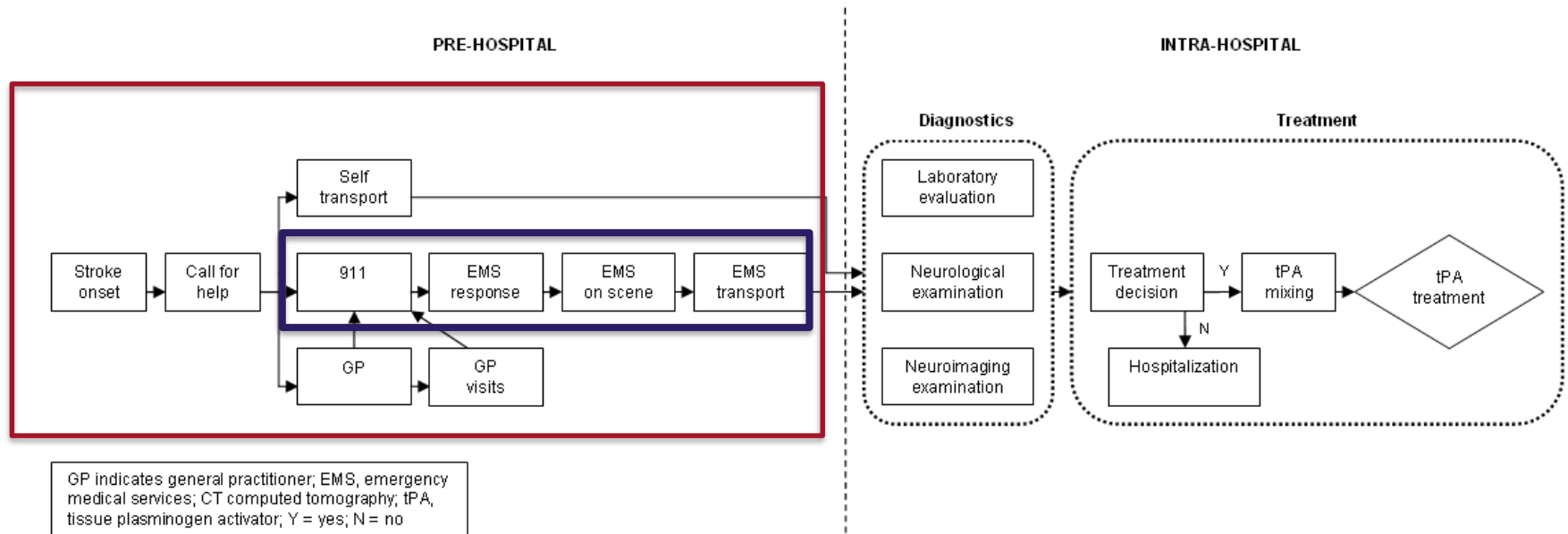


Prehospitale triage van acute CVA zorg

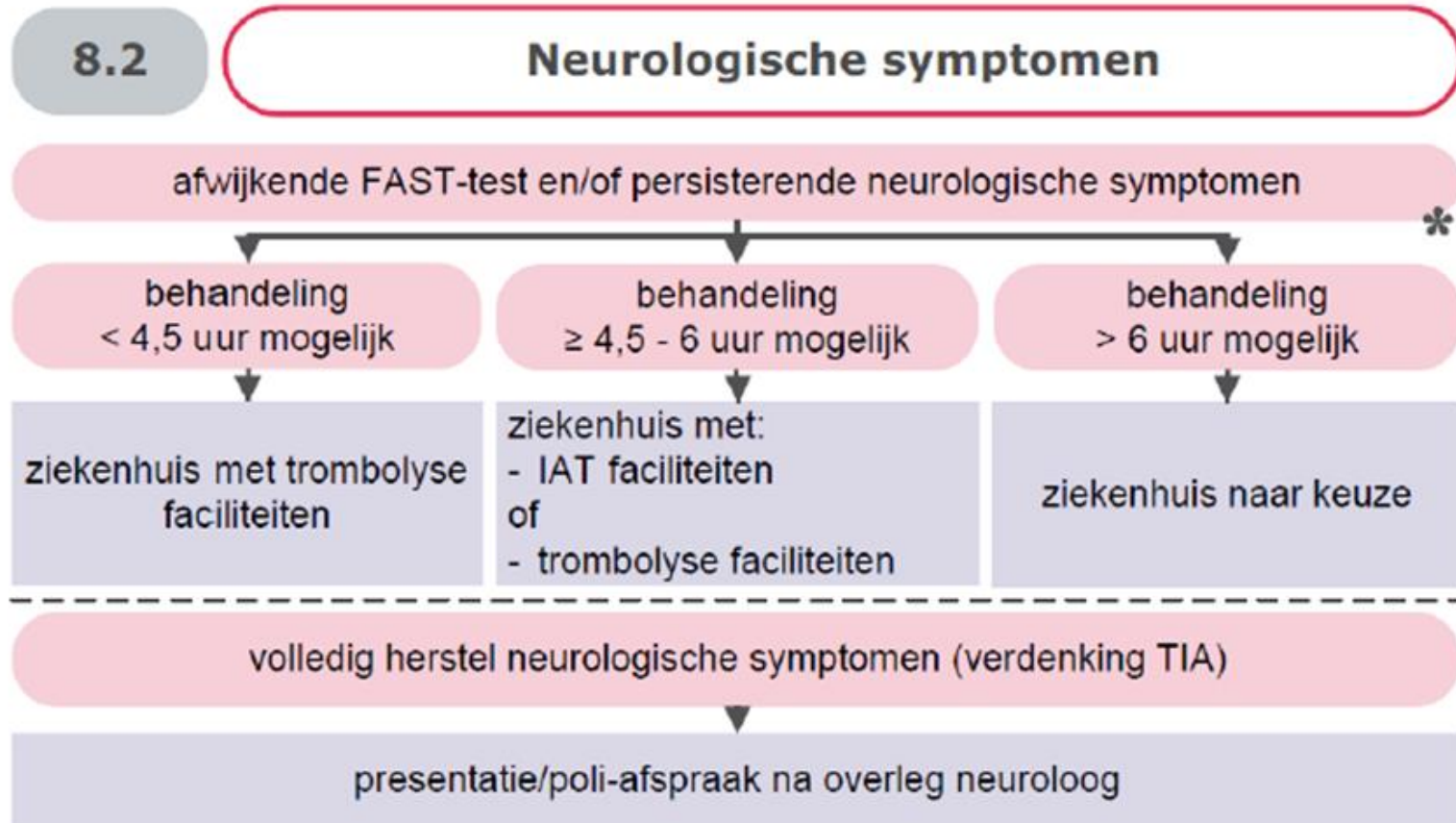
- Prehospitale triage:
 - Beschrijving
 - Schalen/tools
 - Communicatie
 - Routing
 - Innovaties
 - Uitdagingen/te beantwoorden vraagstukken
 - Stellingen/Discussie



Prehospital phase



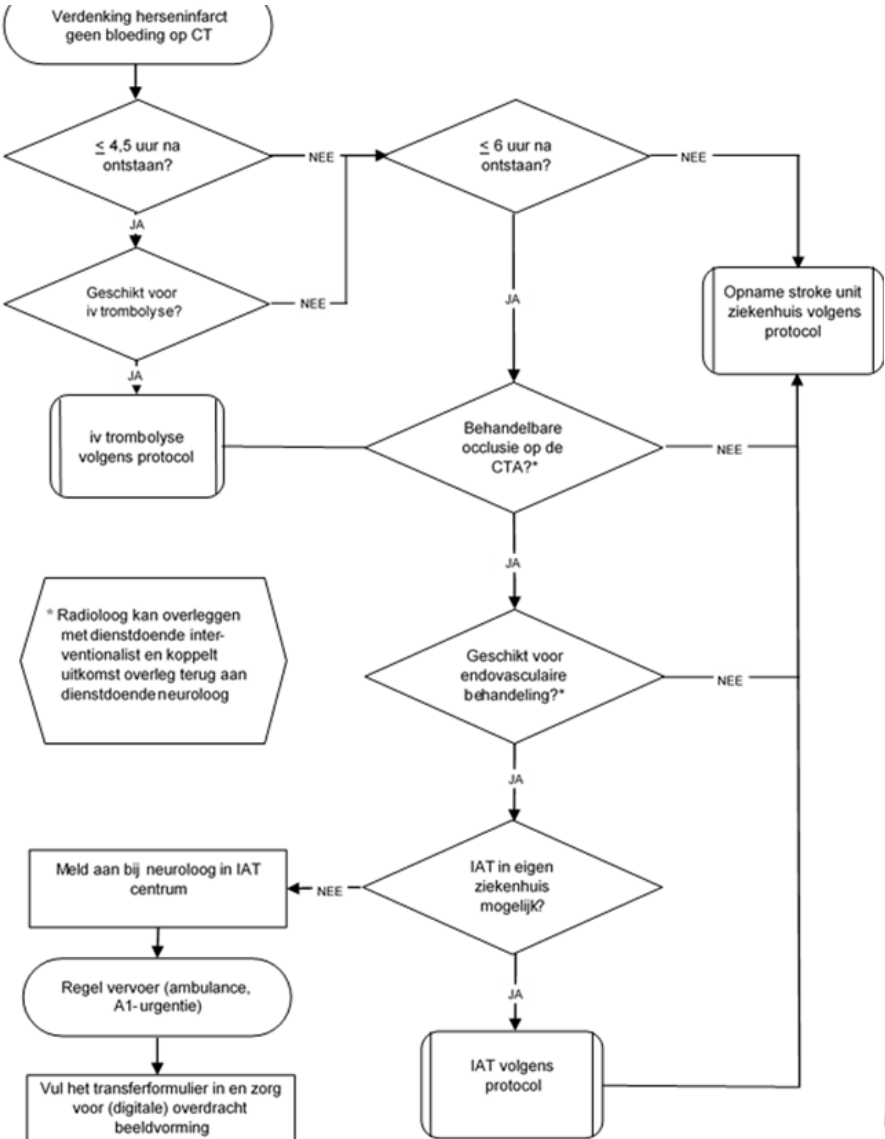
Inleiding



Figuur 1. Landelijk ambulance protocol betreffende patiënten met de verdenking op een beroerte



Kwaliteitsstandaard



* Radioloog kan overleggen met dienstdoende interventionalist en koppelt uitkomst overleg terug aan dienstdoende neuroloog



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Stroke "mimics"

VIEWS & REVIEWS

Prehospital stroke scales in urban environments

A systematic review

Ethan S. Brandler, MD,
MPH
Mohit Sharma, MBBS
Richard H. Sinert, DO
Steven R. Levine, MD

ABSTRACT

Objective: To identify and compare the operating characteristics of existing prehospital stroke scales to predict true strokes in the hospital.

Methods: We searched MEDLINE, EMBASE, and CINAHL databases for articles that evaluated the performance of prehospital stroke scales. Quality of the included studies was assessed using the

Tot 30% van de beroertes worden gemist



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Communicatie

Stroke Chain of Survival

- Detect
 - Dispat
- Prehospital Notification by Emergency Medical Services Reduces Delays in Stroke Evaluation : Findings From the North Carolina Stroke Care Collaborative

Emergency Medical Service Hospital Prenotification Is Associated With Improved Evaluation and Treatment of Acute Ischemic Stroke

Cheryl B. Lin, BS; Eric D. Peterson, MD, MPH; Eric E. Smith, MD, MPH; Jeffrey L. Saver, MD; Li Liang, PhD; Ying Xian, MD, PhD; DaiWai M. Olson, PhD, RN; Bimal R. Shah, MD; Adrian F. Hernandez, MD, MHS; Lee H. Schwamm, MD; Gregg C. Fonarow, MD

- **Disposition** – admit to stroke unit or transfer

Guidelines for Early Management of Patients With Acute Ischemic Stroke. Stroke, 2013



American Heart Association | American Stroke Association

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Routing

- Regionale afspraken?
- Op ervaring, “in

Routing Ambulances to Designated Centers Increases Access to Stroke Center Care and Enrollment in Prehospital Research

Nerses Sanossian, MD; David S. Liebeskind, MD; Marc Eckstein, MD; Sidney Starkman, MD;
Samuel Stratton, MD, MPH; Franklin D. Pratt, MD; William Koenig, MD;
Scott Hamilton, PhD; May Kim-Tenser, MD; Robin Conwit, MD; Jeffrey L. Saver, MD;
FAST-MAG Investigators and Coordinators

Background and Purpose—Emergency medical services routing of patients with acute stroke to designated centers may increase the proportion of patients receiving care at facilities meeting national standards and augment recruitment for prehospital stroke research.

Methods—We analyzed consecutive patients enrolled within 2 hours of symptom onset in a prehospital stroke trial, before and after regional Los Angeles County Emergency Medical Services implementation of preferentially routing patients



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Status quo



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Uitdagingen

“Prehospitale detectie Large Vessel Occlusion (LVO)”



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Detectie LVO (I)

redict

ID, PhD;

emergent large vessel
d scales for prediction

l status (angiography)
tems with the highest
combination meeting
ormance of Prehospital

gaze palsy/deviation,
(area under the curve)
sitivity=0.66 (95% CI,
n 1/3 of the test cohort
had a median NIHSS
quartile range=5). The
redicting ELVO.
in the field.

Prehospital Acute Stroke Severity scale		
	Yes	No
Incorrect month and/or age?*	<input type="checkbox"/>	<input type="checkbox"/>
Gaze palsy and/or deviation?†	<input type="checkbox"/>	<input type="checkbox"/>
Arm weakness?‡	<input type="checkbox"/>	<input type="checkbox"/>
*NIHSS LEVEL OF CONSCIOUSNESS (age/month) >0		
†NIHSS GAZE >0		
‡NIHSS MOTOR ARM >0		

Figure 2. Prehospital Acute Stroke Severity Scale's individual items and corresponding National Institutes of Health Stroke Scale (NIHSS) scores.

Detectie LVO (II)

Table 1. The FAST-ED Scale and Its Correspondence to the NIHSS

Item	FAST-ED Score	NIHSS Score Source
Facial palsy		
Normal or minor paralysis	0	0-1
Partial or complete paralysis	1	2-3
Arm weakness		
No drift	0	0
Drift or some effort against gravity	1	1-2
No effort against gravity or no movement	2	3-4
Speech changes		
Absent	0	0
Mild to moderate	1	1
Severe, global aphasia, or mute	2	2-3
Eye deviation		
Absent	0	0
Partial	1	1
Forced deviation	2	2
Denial/Neglect		
Absent	0	0
Extinction to bilateral simultaneous stimulation in only 1 sensory modality	1	1
Does not recognize own hand or orients only to one side of the body	2	2

FAST-ED indicates Field Assessment Stroke Triage for Emergency Destination; and NIHSS, National Institutes of Health Stroke Scale.

A Simple and

Fabricio O. Lim
 Karen L. Furie, MD
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Background and Purpose—Patients with acute ischemic stroke who are not treated at endovascular capable centers avoid the benefits of accurate stroke field triage remains unclear.

Methods—The Field Assessment Stroke Triage for Emergency Destination (FAST-ED) National Institutes of Health Stroke Scale (NIHSS) Technology and Outcomes Project is a multicenter, prospective, observational study of angiography within the first 24 hours of stroke onset. The study included internal carotid artery, middle cerebral artery, and anterior+posterior circulation stroke, bihemispheric, and anterior+posterior circulation stroke. Sensitivity, specificity, positive predictive value, and negative predictive value of NIHSS, Rapid Arterial Occlusion Evaluation (RACE), and FAST-ED were compared.

Results—LVO was detected in 240 of 1,000 patients. FAST-ED had higher accuracy than NIHSS and RACE (FAST-ED=0.81 as reference; NIHSS=0.75; RACE=0.70). FAST-ED had sensitivity of 0.60, specificity of 0.87, positive predictive value of 0.55, and negative predictive value of 0.68, and 0.70.

Conclusions—FAST-ED is a simple score that can be used by non-vascular professionals to identify LVOS in the field.

Destination

Large

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1 by direct transfer to endovascular capable centers. However, the impact of LVOs.

based on items of the FAST-ED score included in the Screening for Large Vessel Occlusion (SLVO) computed tomographic perfusion (CTP) algorithm. The study included patients with partial, anterior, middle, and posterior circulation stroke, characteristic curve, and compared with the RACE (CPSS) scale.

The accuracy of predicting LVOs with FAST-ED was higher than that of RACE (characteristic curve: 0.81 vs 0.70) (P<0.002). FAST-ED ≥4 had a positive predictive value of 0.82 versus

0.70 (P=0.002). FAST-ED ≥4 had a positive predictive value of 0.82 versus



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Detectie LVO (III)

Design and Validation of a Prehospital Scale to Predict Stroke Severity

Cincinnati Prehospital Stroke Severity Scale

Brian S. Katz, MD; Jason T. McMullan, MD; Heidi Sucharew, PhD;
Opeolu Adeoye, MD, MS; Joseph P. Broderick, MD

Background and Purpose—We derived and validated the Cincinnati Prehospital Stroke Severity Scale (CPSSS) to identify patients with severe strokes and large vessel occlusion (LVO).

Methods—CPSSS was developed with regression tree analysis, objectivity, anticipated ease in administration by emergency medical services personnel and the presence of cortical signs. We derived and validated the tool using the 2 National Institute of Neurological Disorders and Stroke (NINDS) tissue-type plasminogen activator Stroke Study trials and Interventional Management of Stroke III (IMS III) Trial cohorts, respectively, to predict severe stroke (National Institutes of Health Stroke Scale [NIHSS] ≥ 15) and LVO. Standard test characteristics were determined and receiver operator curves were generated and summarized by the area under the curve.

Results—CPSSS score ranges from 0 to 4; composed and scored by individual NIHSS items: 2 points for presence of conjugate gaze (NIHSS ≥ 1); 1 point for presence of arm weakness (NIHSS ≥ 2); and 1 point for presence abnormal level of consciousness, commands and questions (NIHSS level of consciousness ≥ 1 each). In the derivation set, CPSSS had an area under the curve of 0.89; score ≥ 2 was 89% sensitive and 73% specific in identifying NIHSS ≥ 15 . Validation results were similar with an area under the curve of 0.83; score ≥ 2 was 92% sensitive, 51% specific, a positive likelihood ratio of 3.3, and a negative likelihood ratio of 0.15 in predicting severe stroke. For 222 of 303 IMS III subjects with LVO, CPSSS had an area under the curve of 0.67; a score ≥ 2 was 83% sensitive, 40% specific, a positive likelihood ratio of 1.4, and negative likelihood ratio of 0.4 in predicting LVO.

Conclusions—CPSSS can identify stroke patients with NIHSS ≥ 15 and LVO. Prospective prehospital validation is warranted. (*Stroke*. 2015;46:1508-1512. DOI: 10.1161/STROKEAHA.115.008804.)

Editorials

Prehospital Scales for Large Vessel Occlusion

Closing in on a Moving Target

Patrik Michel, MD

- Externe validatie van schalen in de prehospital setting van ongeselecteerde populaties verdenking acuut herseninfarct
- / A Simulation-based Approach for Improving Utilization of Thrombolysis in Acute Brain Infarction

Maarten M.H. Lahr, MSc (Res), Durk-Jouke van der Zee, PhD,† Gert-Jan Luijckx, MD, PhD,*
Patrick C.A.J. Vroomen, MD, PhD,* and Erik Buskens, MD, PhD,‡*

- ~~Effectiveness and cost-effectiveness of a simulation-based prehospital LVO score.~~



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Take home message

- <https://www.hartstichting.nl/beroerte/mond-spraak-arm-pakket>

Herken een beroerte *be* FAST

Met een eenvoudige test kunt u een beroerte herkennen: de **Face-Arm-Speech-Time test**. Als de persoon één of meer opdrachten niet kan uitvoeren, heeft hij/zij waarschijnlijk een beroerte. Let op de tijd en ... handel direct!



Face Vraag de persoon om te lachen of de tanden te laten zien. Let op de mond scheef staan en een mondhoek naar beneden hangt.



Arm Vraag de persoon om beide armen tegelijkertijd horizontaal naar voren te strekken en de binnenzijde van de handen naar boven te draaien. Let op of een arm wegzakt of rondzwakt.



Speech Vraag aan de persoon of aan de familieleden of er veranderingen zijn in het spreken (onduidelijk spreken of niet meer uit de woorden kunnen komen).



Time Stel vast hoe laat de klachten bij de persoon zijn begonnen. Dit is van belang voor de behandeling. Bel direct huisarts of 112.

HANDEL DIRECT want TIJDVERLIES = HERSENVERLIES
Bel huisarts of 112

Nederlandse  Hartstichting
Redt levens

Bestel het gratis Beroerte-alarpakket

Met de geheugensteuntes uit het gratis Beroerte-alarpakket onthoudt u voortaan de signalen van een beroerte en slaat u direct alarm.

Weet u wat u moet doen bij een beroerte? Snel handelen kan hersenbeschadiging of zelfs overlijden voorkomen. Zorg daarom dat u de signalen van een beroerte onthoudt en bestel het pakket.

BESTEL GRATIS ALARMPAKKET

Wat zit er in het pakket?

Het alarpakket bestaat uit:

- Koelkastmagneet
- Sticker
- Herkenkaartje en brochure
- Ansichtkaarten



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Vragen/discussie (II)

- Waar loopt u tegenaan bij de triage en vervoer CVA patiënten.
- Wat kan er volgens u worden verbeterd aan de triage van CVA patiënten.
- Is het mogelijk om in de ambulance adequaat de ernst van een mogelijke CVA in te schatten?





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