

PREHOSPITAL CARE OF STROKE

Klaus Fassbender

Chairman of Department of Neurology,
Saarland University Medical Center
Homburg, Germany

DISCLOSURE STATEMENT OF FINANCIAL INTEREST

Within the past 12 months, I have had a financial interest/arrangement or affiliation with the organization(s) listed below

AFFILIATION/FINANCIAL RELATIONSHIP

- Ownership/Founder
- Intellectual Property Rights

COMPANY

- Intelligent ambulance solutions /
INTAS GmbH

Thrombectomy: too late and too rare

- LVO: 5-15 %
 - Zaidat, Neurology 2012; Cohen, BMJ 2015
- treatment rates < 2 %
 - USA, Menon, Campbell et al. 2015
- „door-to-groin puncture“ times: 91 - 150 min
 - Metha et al., 2014 JAHA 2014
 - Sun, Chung Huan et al., JAHA 2014

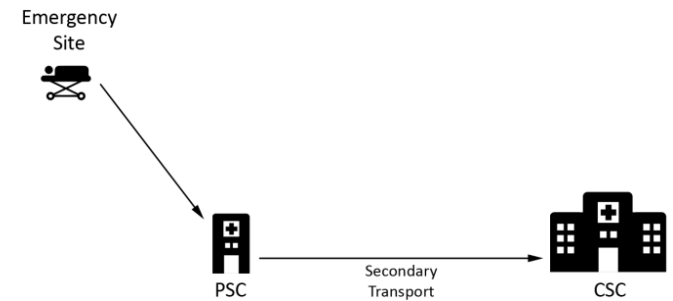


Advanced stroke treatment in a network

- „Drip and ship“
- „Mothership“
- „Drive the interventionalist
(„*Trip and treat*“, „*Drip and drive*“, „*Flying interventionalist*“
- Triage based on use of clinical scales
- „Mobile Stroke Unit“

„Drip and ship“

- Recommended by guidelines (AHA)
- Secondary transports in case of LVO



Detrimental secondary transfers

- delay treatment (> 96-111 min)
 - Sun CH et al., 2013, Fröhler MT et al., 2018)
- impair treatment
 - Prabhakaran S et al., 2011
- deteriorate outcome
 - Sun CH et al., 2014
 - Khatri P et al., 2014
 - Goyal M et al., 2016
 - Fröhler MT et al., 2018
- expensive
 - Sonig A, et al., 2016



„Mothership“ concept

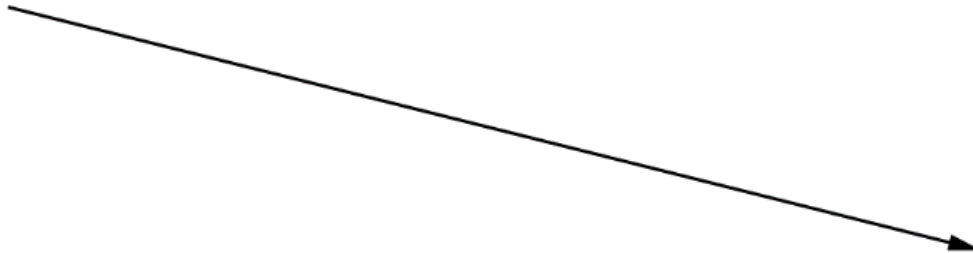
Emergency
Site



PSC



CSC



„Mothership“ concept

pros:

- all patients treatable (incl. LVO)
- faster thrombectomy
- no secondary transfers
- peri-interventional infrastructure

cons:

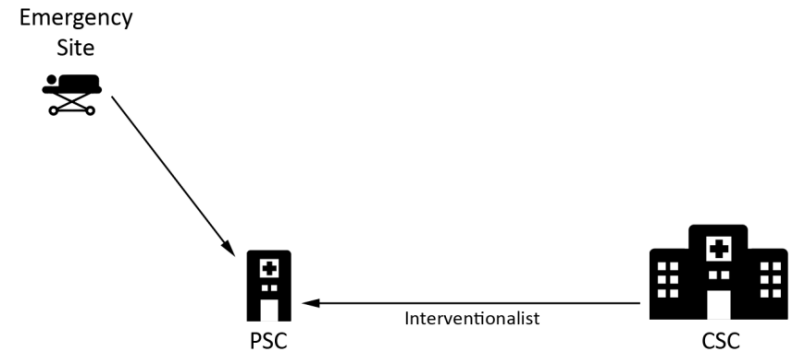
- potential delays before thrombolysis
- pressure on A&E of CSCs
- problems for bypassed hospitals

„Drive the interventionalist“

(„trip and treat“, „drip and drive“, „flying interventionalist“)

- Interventionalist comes to the regional hospital
- „Sharing“ of human resources
- Similar to earlier models for delivery of IV thrombolysis

Grotta JC, Arch Neurol 2001



Triage based on use of clinical scales

(e.g., Los Angeles motor scale)

LAMS (Los Angeles motor scale¹⁰⁶ for assessment of stroke severity with high likelihood of large-vessel occlusion)

- Facial droop: one side of the face does not move as well as the other
 - Absent 0
 - Present 1
- Arm drift
 - Absent 0
 - Drifts down 1
 - Falls rapidly 2
- Grip strength
 - Normal 0
 - Weak grip 1
 - No grip 2

2000: Mobile Stroke Unit:

„the hospital comes to the patient“

Emergency
Site



Triage Based
on Diagnosis



PSC



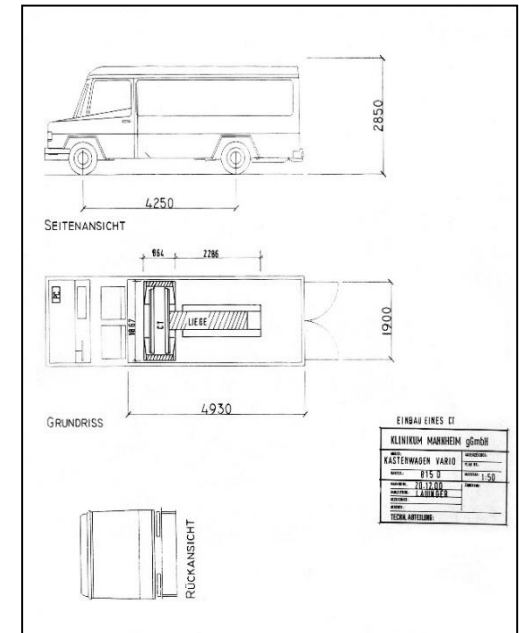
CSC

Stroke



"Mobile Stroke Unit" for Hyperacute Stroke Treatment
Klaus Fassbender, Silke Walter, Yang Liu, Frank Mochlhauser, Andreas Radoschke, Sandra Kiechl and Ovell Mielke

Stroke. 2003;34:e44. originally published online May 15, 2003;
doi: 10.1161/01.STR.0000075573.22885.3B
Stroke is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 2003 American Heart Association, Inc. All rights reserved.
Print ISSN: 0039-2499. Online ISSN: 1524-4628



Homburg, Germany 2008: First prehospital stroke treatment



Walter S et al., PlosOne 2010

Walter et al., Lancet Neurology 2012

2012

“Second generation” Mobile Stroke Unit

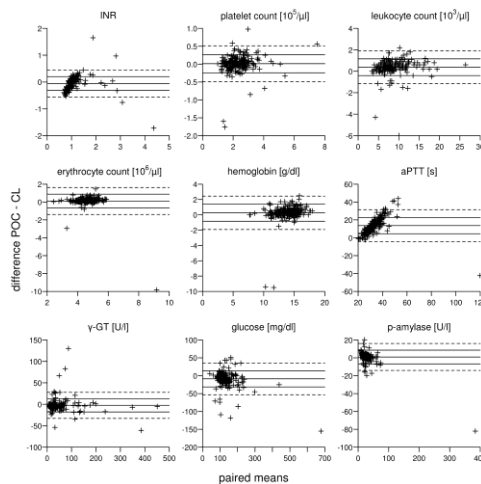


“Point of Care” laboratory



- γ GT
- glucose
- P-amylase
- creatinine...

- INR
- PTT

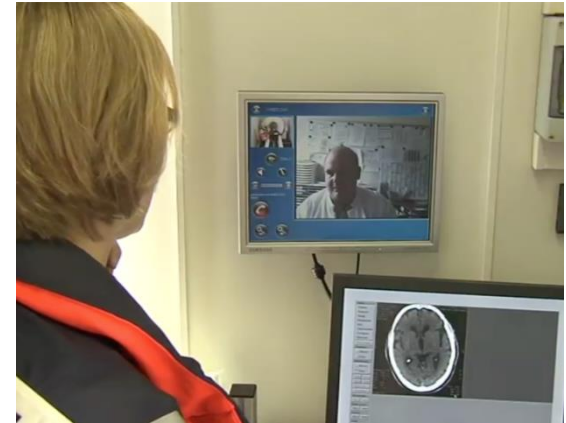


- diff. blood count



Telemedical connection to hospital

- Bidirectional video-conferencing
- Transmission of information (videos of patients examination and CT scans) to hospital PACS system



Fassbender K et al., Stroke 2003

Walter S et al., PLoSOne 2010

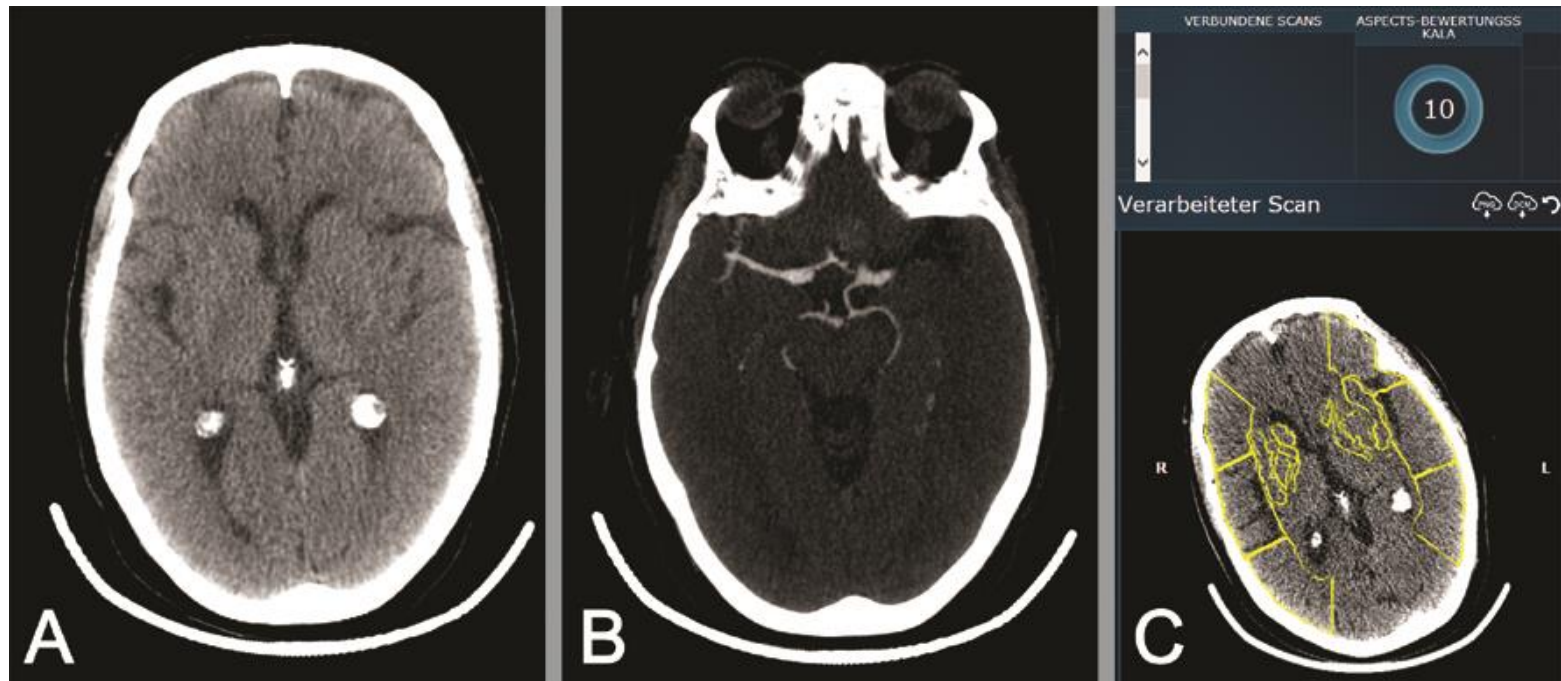
Treatments

(incl. rt-PA, idaruzizumab®)



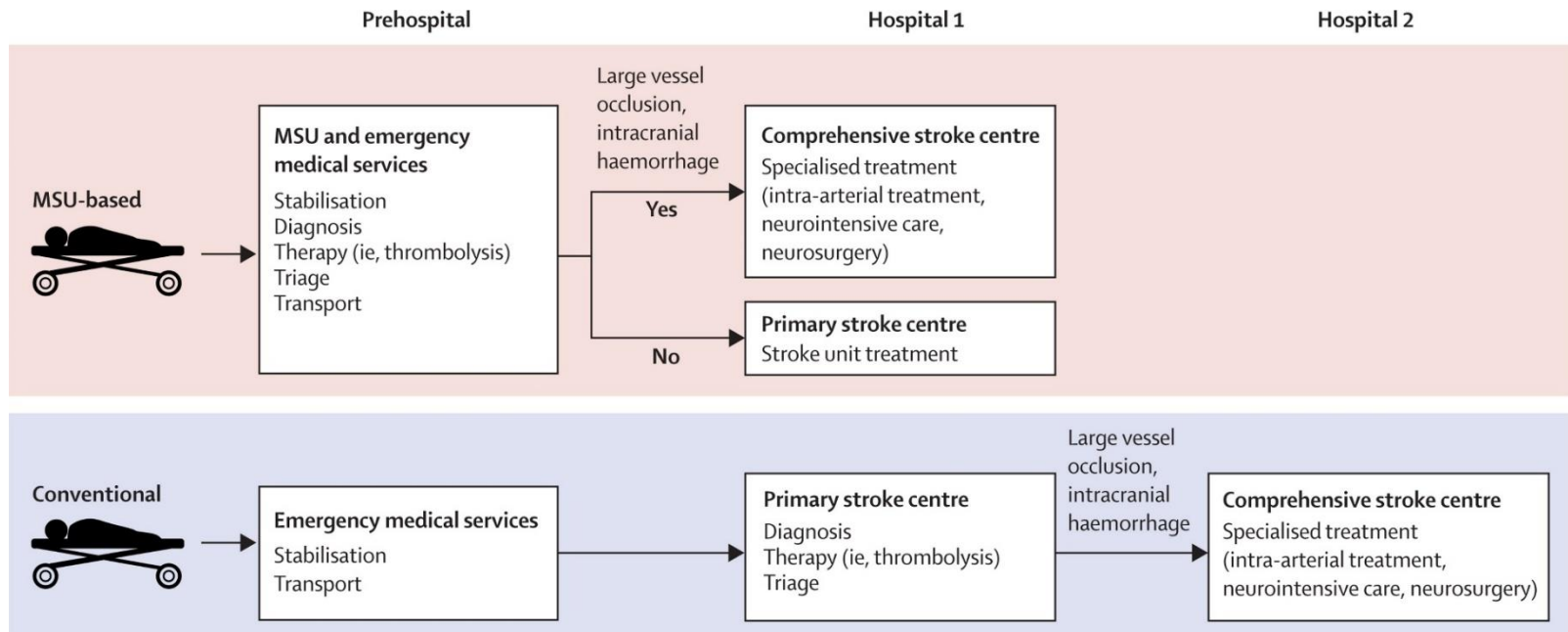
Vascular imaging in the ambulance

→ identification of LVO

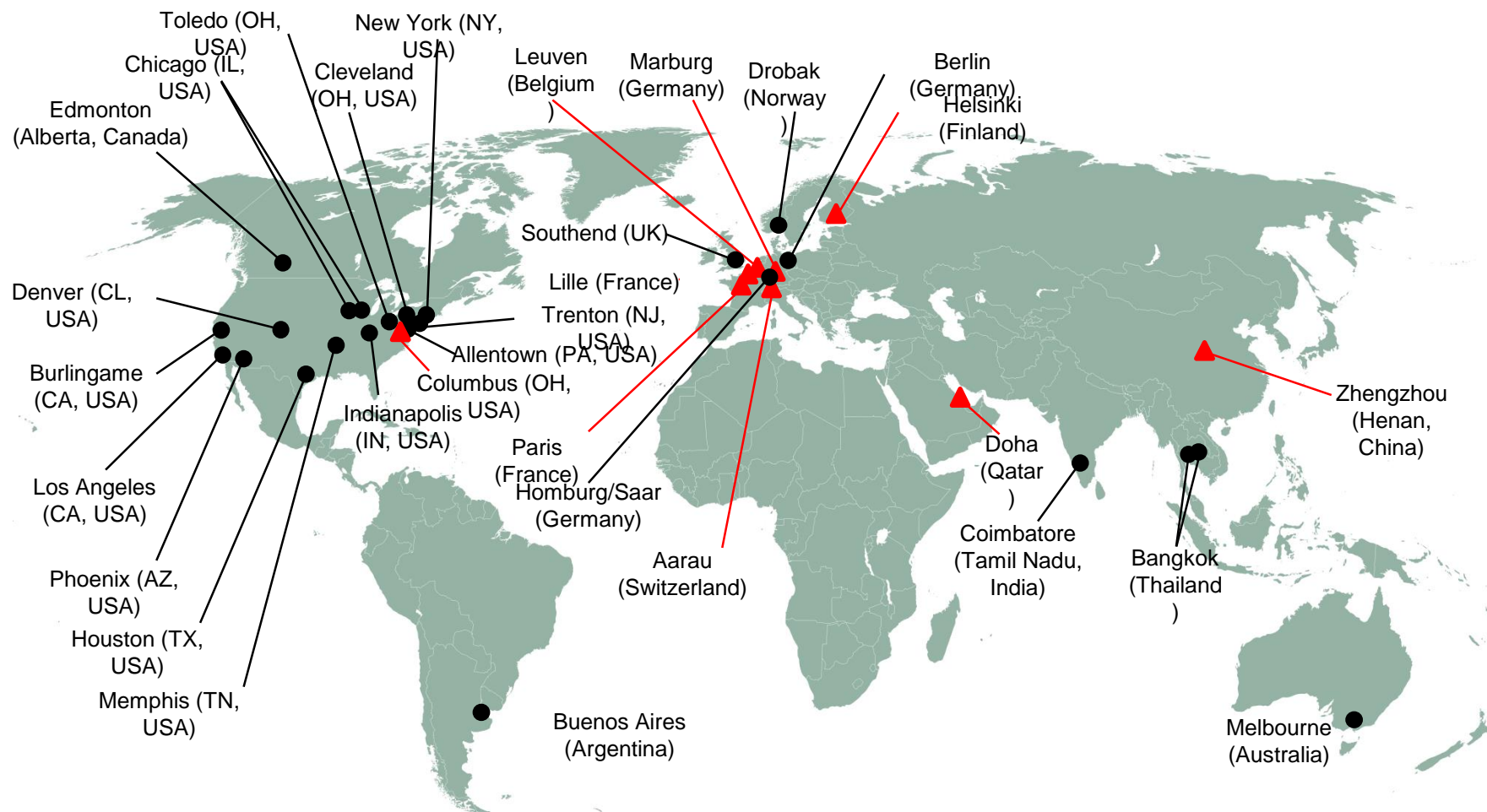


Vascular imaging in the ambulance

→ Triage to appropriate hospital



Mobile Stroke Units: world map



- sites with active mobile stroke units
- ▲ sites with projects in implementation

Kovai Medical Center / Hospital Coimbatore, India

- **Lead:** Dr Matthew Cherian
- **Active Since:** March 2018
- **Team:**
 - Doctor
 - Nurse
 - Paramedic
 - Emergency personnel
 - CT technologist
- **Special Interest:** Emergency call in a radius of 100 km, experience in Indian health care setting

India's First Mobile Stroke Unit Launched by Kovai Medical Center, Coimbatore

BNT News Desk - March 7, 2017 525 1 minute read



(From Left to Right) Dr. Matthew Cherian, Chief of Radiology Services & Dr. Nalla G. Palaniswami, Chairman, KMCH.



Thank you !