

# About OMICS Group

OMICS Group International is an amalgamation of Open Access publications and worldwide international science conferences and events. Established in the year 2007 with the sole aim of making the information on Sciences and technology 'Open Access', OMICS Group publishes 400 online open access scholarly journals in all aspects of Science, Engineering, Management and Technology journals. OMICS Group has been instrumental in taking the knowledge on Science & technology to the doorsteps of ordinary men and women. Research Scholars, Students, Libraries, Educational Institutions, Research centers and the industry are main stakeholders that benefitted greatly from this knowledge dissemination. OMICS Group also organizes 300 International conferences annually across the globe, where knowledge transfer takes place through debates, round table discussions, poster presentations, workshops, symposia and exhibitions.

# About OMICS Group Conferences

OMICS Group International is a pioneer and leading science event organizer, which publishes around 400 open access journals and conducts over 300 Medical, Clinical, Engineering, Life Sciences, Pharma scientific conferences all over the globe annually with the support of more than 1000 scientific associations and 30,000 editorial board members and 3.5 million followers to its credit.

OMICS Group has organized 500 conferences, workshops and national symposiums across the major cities including San Francisco, Las Vegas, San Antonio, Omaha, Orlando, Raleigh, Santa Clara, Chicago, Philadelphia, Baltimore, United Kingdom, Valencia, Dubai, Beijing, Hyderabad, Bengaluru and Mumbai.

# Can we protect the brain against thromboembolism during open heart surgery? LAACS project

**Helena Domínguez, MD, PhD, Assoc.Professor**  
Chief consultant – Research Unit of cardiology

**Ph.d. projekt : Jesper Park, MD**

5 sub-projects

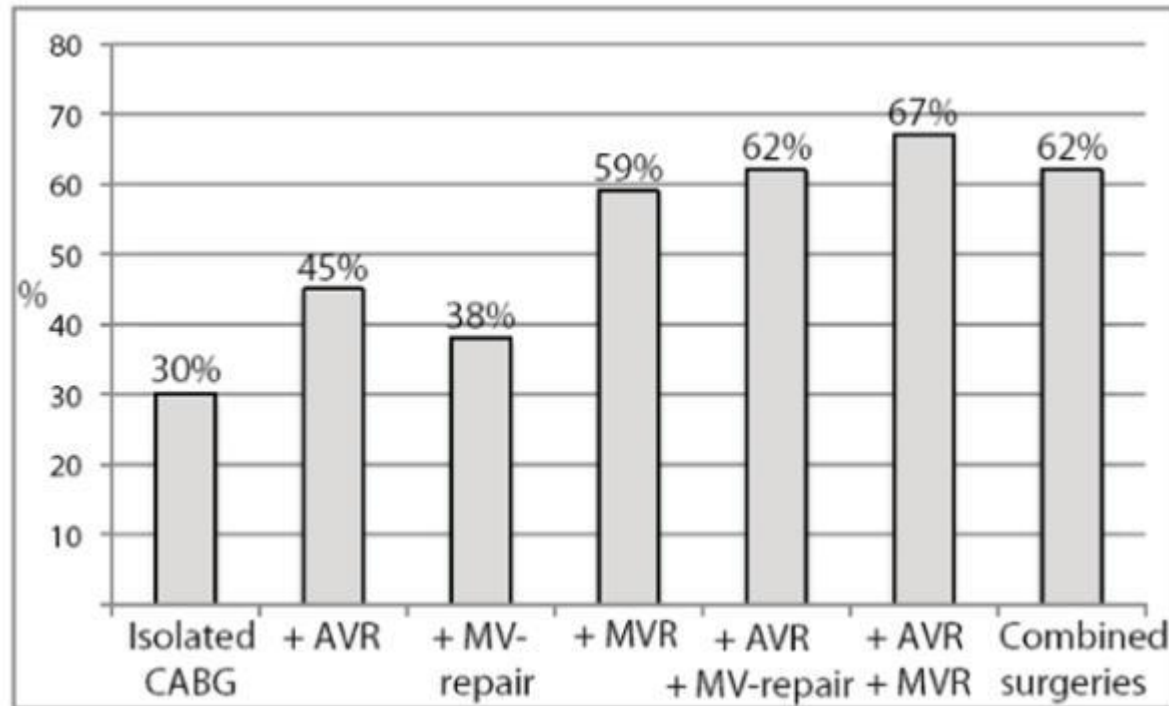
# Background

- Atrial fibrillation (AFIB) causes about 20% of all ischemic strokes... Incidence is increasing

Ball J. Int J Cardiol. 2013 Feb

Observational study  
'Cleveland 1997-2003  
N 10 552

Occurrence of postoperative atrial fibrillation by surgery type



# Background

- Atrial fibrillation (AFIB) causes about 20% of all ischemic strokes... Incidence is increasing
- Atrial fibrillation (AFIB) occurs in 35-60% heart surgery

Rader. Am Heart J. 2010

Lahtinen. Ann Thorac Surg, 2004

Almassi. Ann Surg, 1997

- Stroke occurs in 1-3% of all CABG during the 1<sup>st</sup> year

Crystal Circulation. 2002

- Risk of stroke is at least 4% per year for most heart-operated patients with AFIB (*according to their CHADS-score*)

## ORIGINAL ARTICLE

**Postoperative stroke in patients on oral anticoagulation undergoing coronary artery bypass surgery**

FAUSTO BIANCARI<sup>1</sup>, MIKKO MYLLYLÄ<sup>2</sup>, PEKKA PORELA<sup>2</sup>, TIMO LAITIO<sup>3</sup>,  
KARI KUTTILA<sup>4</sup>, JARI SATTA<sup>1</sup>, MARTTI LEPOJÄRVI<sup>1</sup>, TATU JUVONEN<sup>1</sup> &  
JUHAN K. E. AIRAKSINEN<sup>2</sup>

<sup>1</sup>Department of Surgery, Oulu University Hospital, Oulu, Finland, <sup>2</sup>Division of Cardiology, Department of Medicine, Turku University Hospital, Turku, Finland, <sup>3</sup>Department of Anesthesiology and Intensive Care, Turku University Hospital, Turku, Finland and <sup>4</sup>Department of Surgery, Turku University Hospital, Turku, Finland

**Abstract**

*Objective.* Patients on long-term warfarin treatment have an inherent high risk of stroke and here we aimed to identify the determinants of postoperative stroke after coronary artery bypass grafting (CABG) in these patients. *Methods.* A consecutive series of 270 patients on long-term warfarin treatment who underwent isolated CABG in two university hospitals was assessed by logistic regression as well as classification and regression tree (CART) analysis. *Results.* Postoperative stroke occurred in 10 patients during in-hospital stay (3.7%). Logistic regression showed that CHADS<sub>2</sub> > 2 ( $p = 0.036$ ), recent thrombolysis ( $p < 0.0001$ ) and history of deep vein thrombosis ( $p = 0.025$ ) were independent predictors of postoperative stroke (area under the ROC curve 0.77). CART analysis showed that CHADS<sub>2</sub> > 2, history of stroke/TIA, no preoperative use of aspirin and preoperative use of low molecular weight heparins were associated with an increased risk of stroke (area under the ROC curve of 0.77). *Conclusions.* Both CART and logistic regression analyses showed that the patient characteristics included in CHADS<sub>2</sub> score are important also in the prediction of postoperative stroke risk. Preoperative antiplatelet treatment may be beneficial in the high risk patients and the preoperative bridging with low molecular weight heparins may even be harmful in this respect.

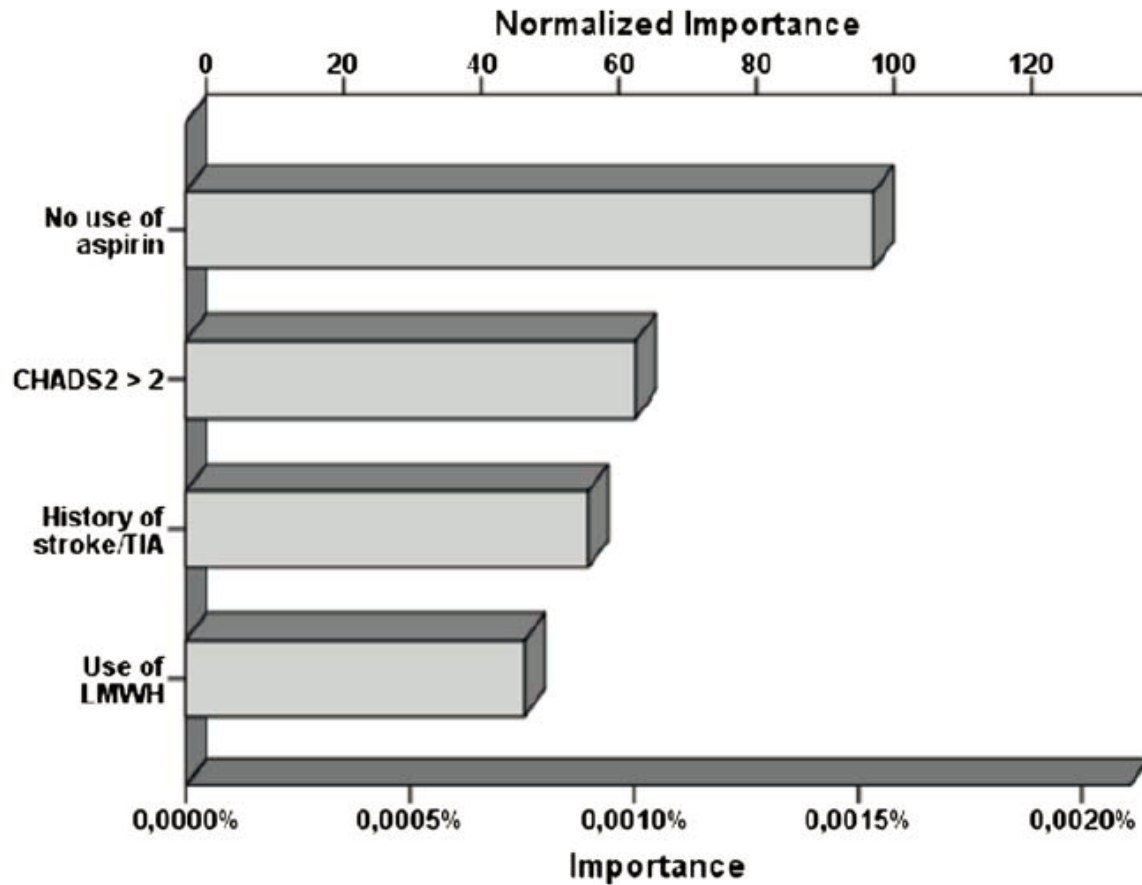


Figure 2. Independent variable importance in predicting in-hospital stroke after coronary artery bypass surgery in patient on oral anticoagulation. LMWH, low molecular weight heparin.

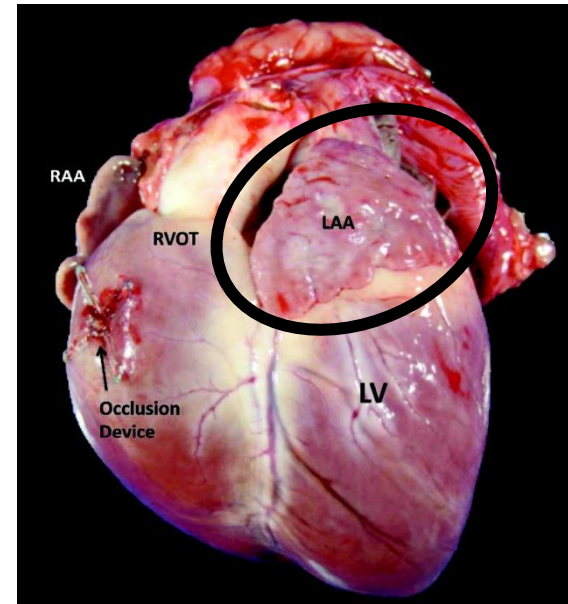
## Background

- 15-20% of patients with AFIB have clots in the left atrium

→ *90% of those are evident in the left atrium appendage*

Manning Ann Intern Med. 1995

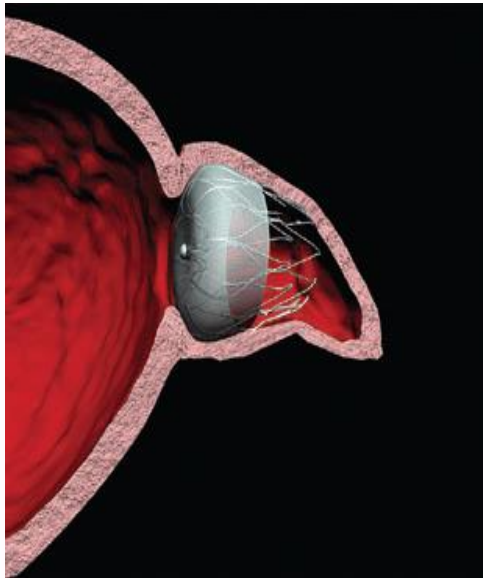
Pearson JACC 1991





## Background

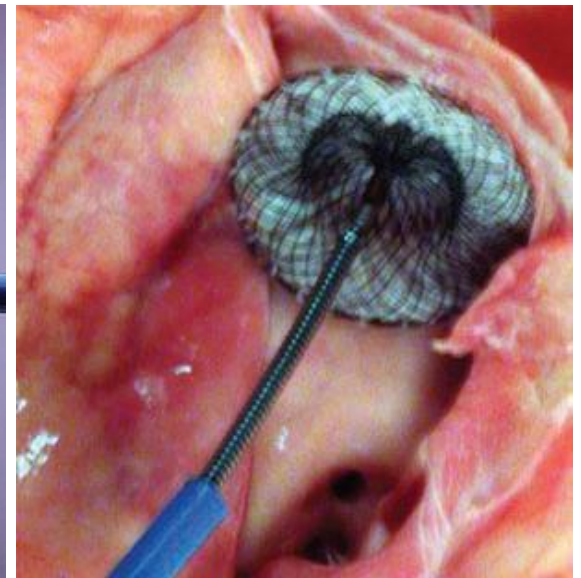
- Percutaneous closure with devices



WATCHMAN device

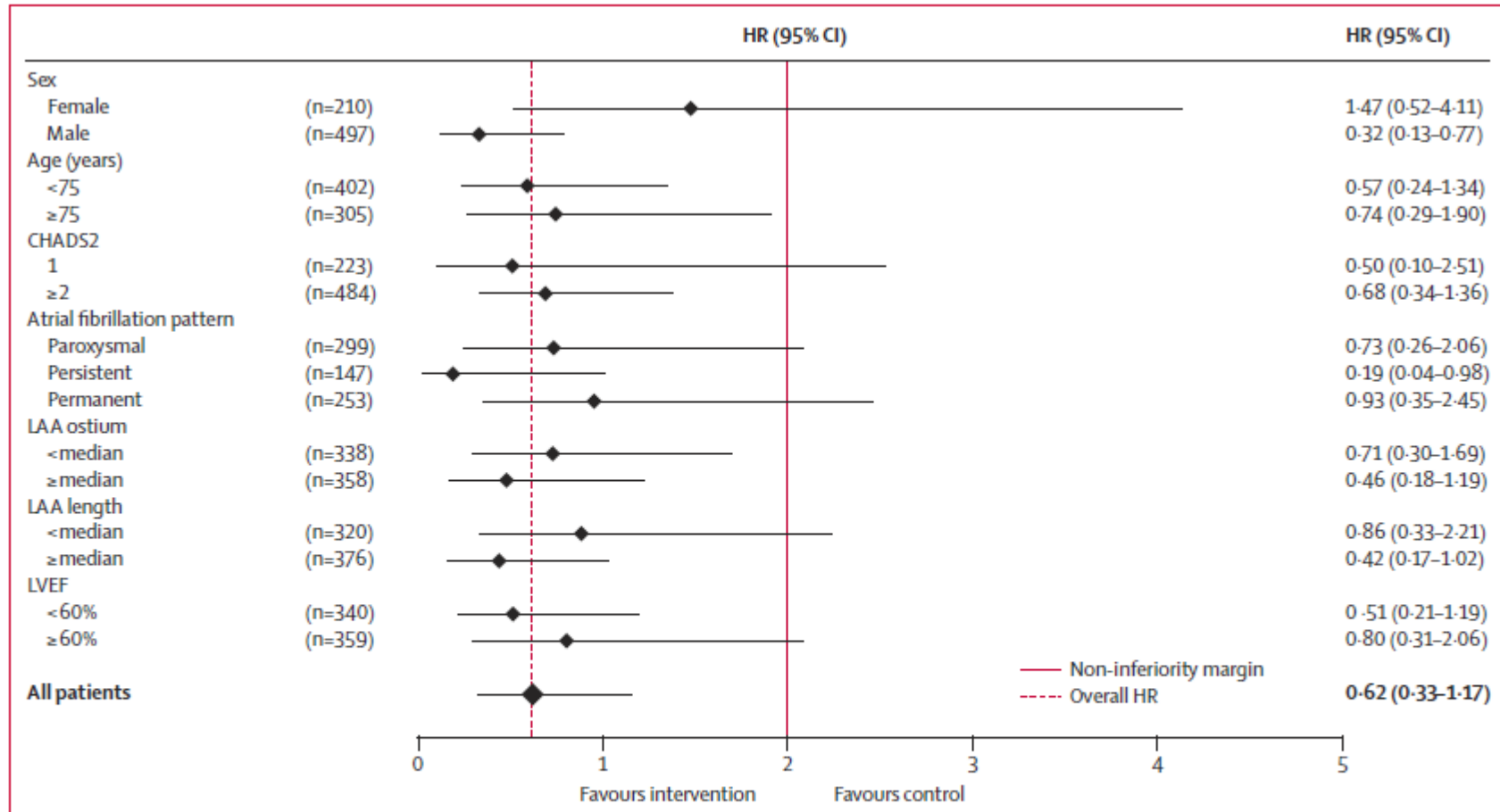


PLAATO device



AMPLATZER device  
(PFO closure-device)

## Non-inferiority Watchmann device vs warfarin



**Figure 3: Primary efficacy results by patient subgroup**

HR=hazard ratio. LAA=left atrial appendage. LVEF=left ventricular ejection fraction. HRs (95% CIs) are shown for the primary efficacy endpoint for all patients and for prespecified patient subgroups. Results are from Cox proportional hazards models, with each subgroup examined in a separate model. The number of randomised patients with data available for the subgroup variable are shown.



## The Journal of Thoracic and Cardiovascular Surgery

Volume 145, Issue 2, February 2013, Pages 582–589



Perioperative management

### **Routine left atrial appendage ligation during cardiac surgery may prevent postoperative atrial fibrillation–related cerebrovascular accident**

Read at the 38th Annual Meeting of The Western Thoracic Surgical Association, Maui, Hawaii, June 27-30, 2012.

Ryan Kim, MD<sup>a</sup>,  , Norbert Baumgartner, MD, FACS<sup>b</sup>, John Clements, MPA<sup>c</sup>

<sup>a</sup> Department of Surgery, Central Michigan University Healthcare, Central Michigan University College of Medicine, Saginaw, Mich

<sup>b</sup> Sparrow Healthcare & Michigan State University College of Human Medicine, Lansing, Mich

<sup>c</sup> Department of Research, Central Michigan University Healthcare, Central Michigan University College of Medicine, Saginaw, Mich

Retrospective

one-surgeon 2001-2010

N= 2067



## The Journal of Thoracic and Cardiovascular Surgery

Volume 145, Issue 2, February 2013, Pages 582–589



### Perioperative management

In the left atrial appendage ligation group with postoperative atrial fibrillation (n = 145):

zero subjects (0%) with a postoperative cardiovascular accident.

In the non-left atrial appendage ligation group with postoperative atrial fibrillation (n = 115):

7 subjects (6.1%) with a postoperative cardiovascular accident

(0.0% vs 6.1%,  $P = .003$ ).

## Surgery

**Left Atrial Appendage Occlusion Study (LAAOS):  
Results of a randomized controlled pilot study of left  
atrial appendage occlusion during coronary bypass  
surgery in patients at risk for stroke**

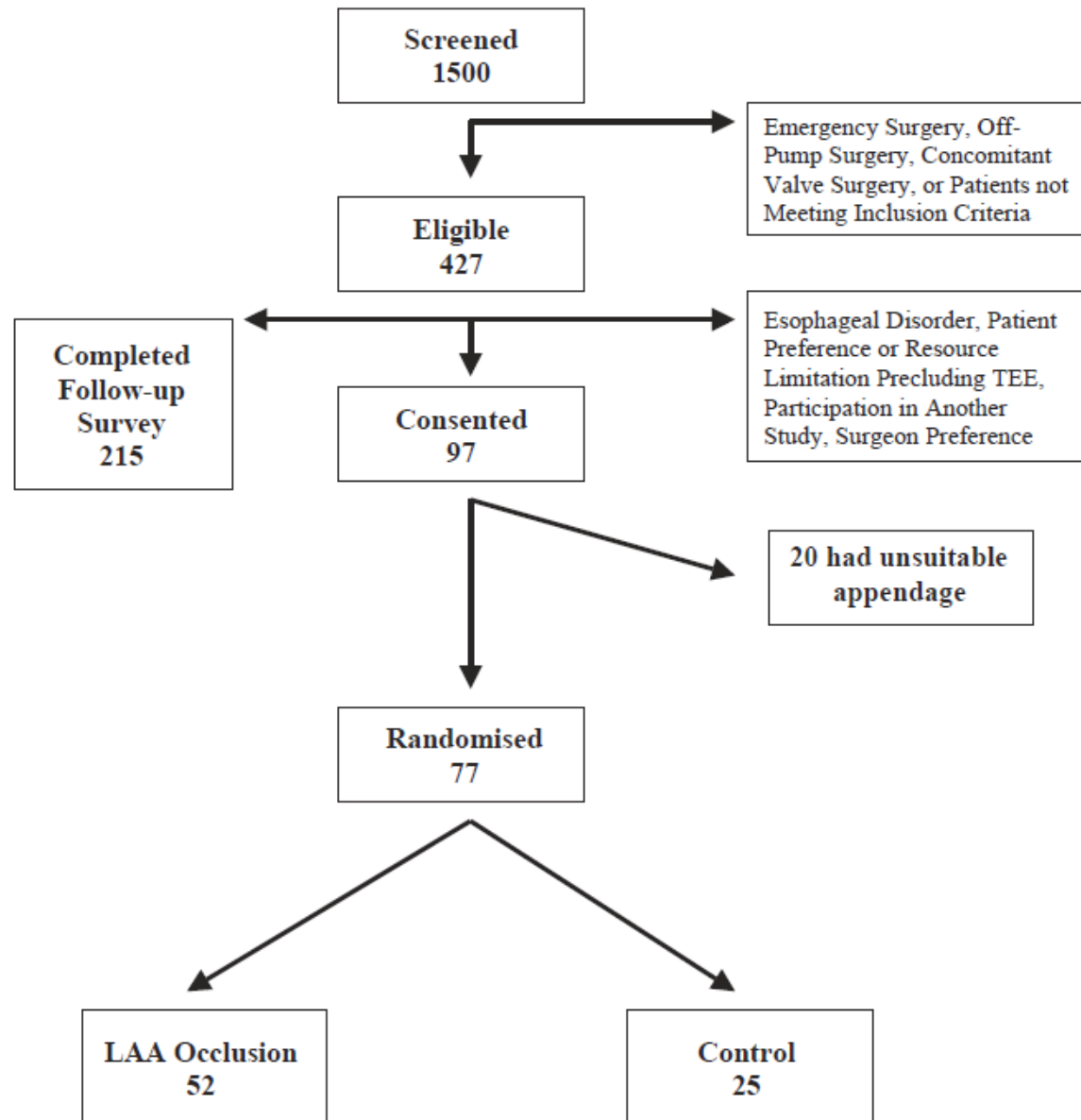
Jeff S. Healey, MD,<sup>a</sup> Eugene Crystal, MD,<sup>b</sup> Andre Lamy, MD,<sup>a</sup> Kevin Teoh, MD,<sup>a</sup> Lloyd Semelhago, MD,<sup>a</sup>  
Stefan H. Hohnloser, MD,<sup>c</sup> Irene Cybulsky, MD,<sup>a</sup> Labib Abouzahr, MD,<sup>a</sup> Corey Sawchuck, MD,<sup>a</sup>  
Sandra Carroll, BSc,<sup>a</sup> Carlos Morillo, MD,<sup>a</sup> Peter Kleine, MD,<sup>c</sup> Victor Chu, MD,<sup>a</sup> Eva Lonn, MD,<sup>a</sup>  
and Stuart J. Connolly, MD<sup>a</sup> *Toronto and Hamilton, Ontario, Canada, and Frankfurt, Germany*

[Am Heart J 2005;150:288-93.]

Protocol published 2003: Power N=2500 - 3000

Single-center

Sutures were changed to stapling during the study



Patient flow in pilot study.

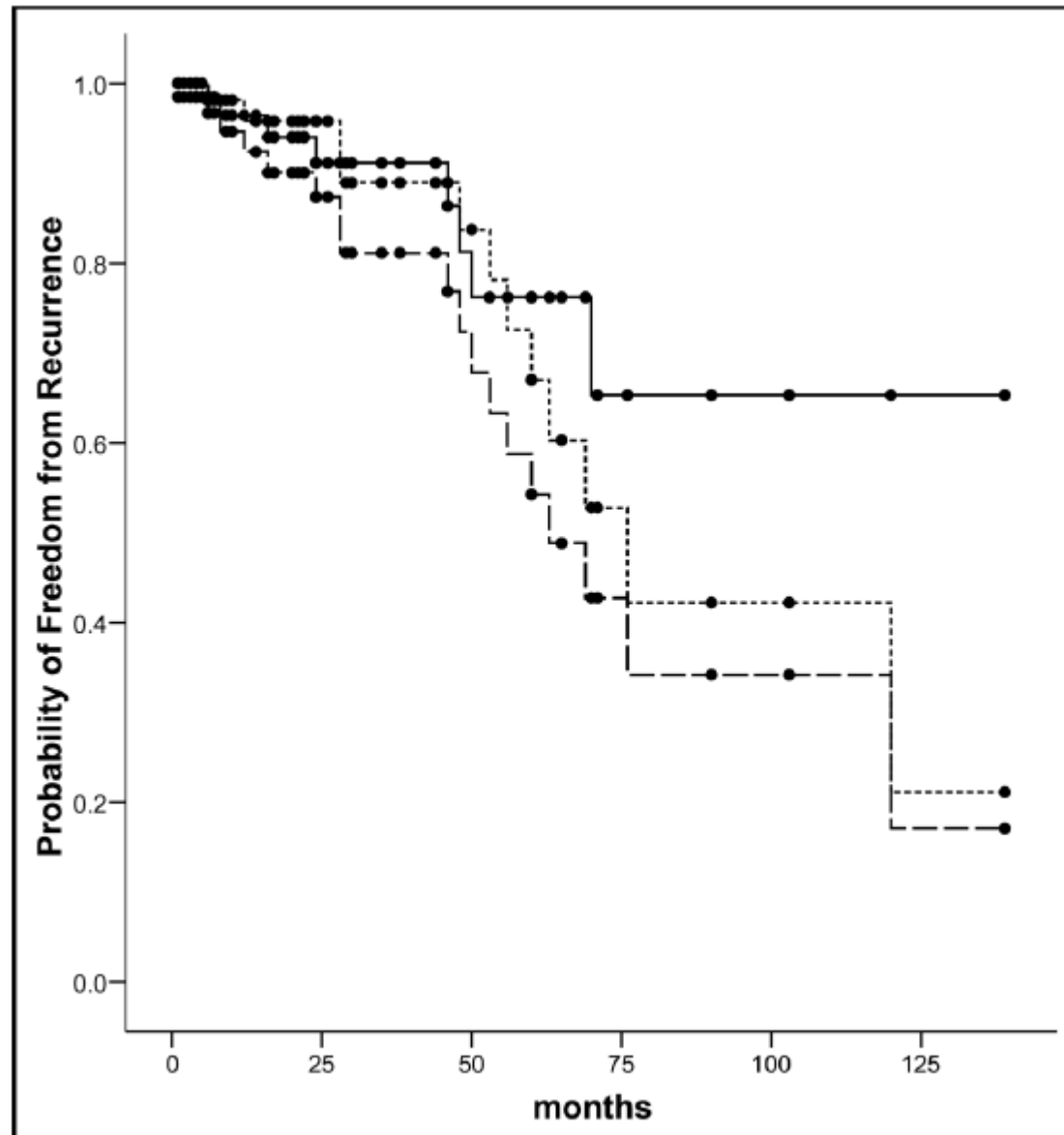


Figure 1. Unadjusted Kaplan-Meier plot before transcatheter device closure of the recurrence rate of symptomatic events (stroke or transient ischemic attack) (*solid line*), silent events (new cerebral MRI lesions) (*dashed line*), and symptomatic plus silent events (*broken line*). Time 0 is the index event time.

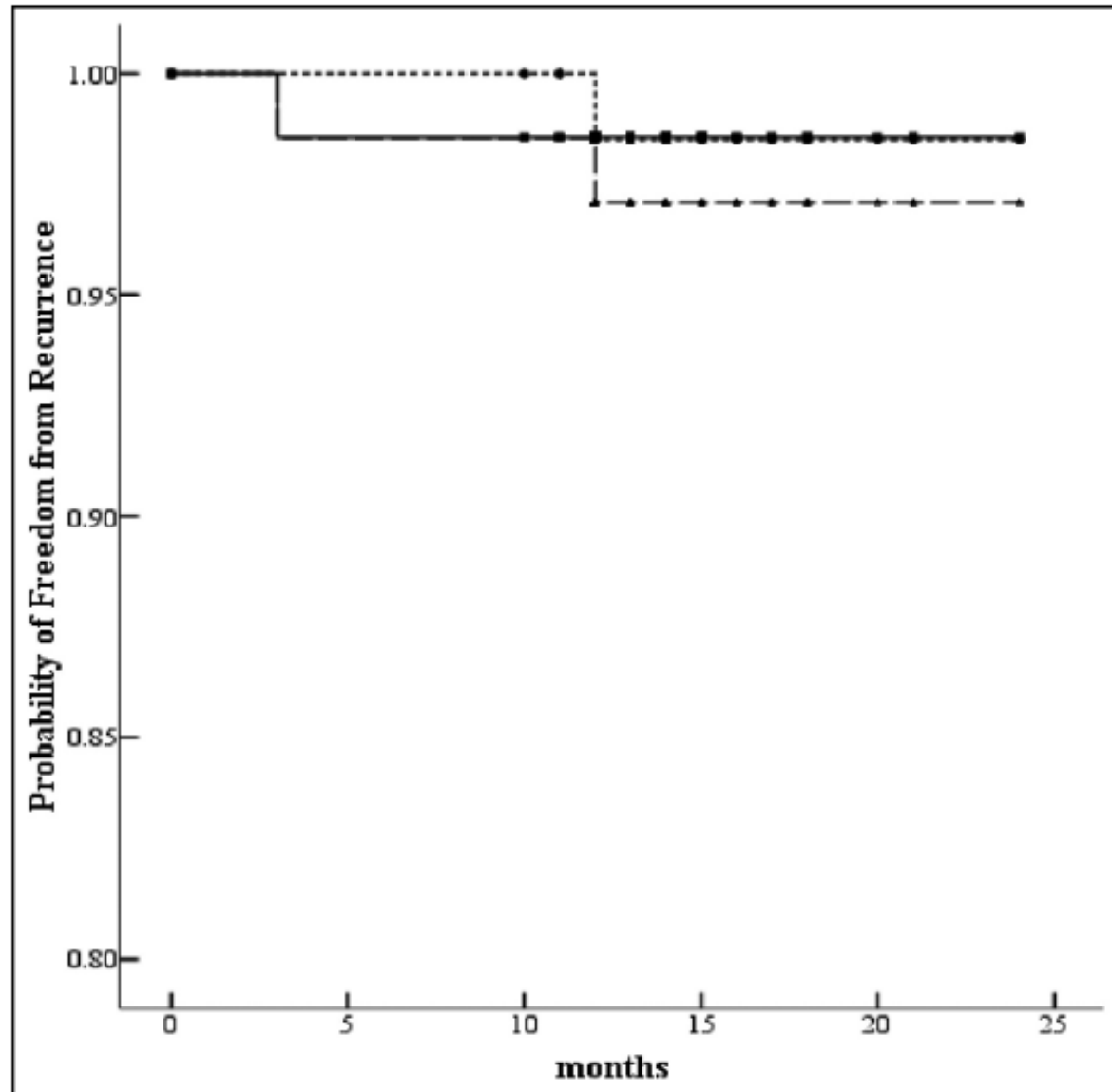


Figure 2. Unadjusted Kaplan-Meier plot after transcatheter device closure of the recurrence rate of symptomatic events (stroke or transient ischemic attack) (*solid line*), silent events (new cerebral MRI lesions) (*dashed line*), and symptomatic plus silent events (*broken line*). Time 0 is the procedure time.



*Am J Cardiovasc Drugs*. 2012 Oct 1;12(5):345-8. doi: 10.2165/11632560-000000000-00000.

## High prevalence of silent brain infarction in patients presenting with mechanical heart valve thrombosis.

Barwad P, Raheja A, Venkat R, Kothari SS, Bahl V, Karthikeyan G.

Department of Cardiology, All India Institute of Medical Sciences, New Delhi, India.

### Abstract

**BACKGROUND:** Symptomatic thromboembolic events including stroke occur frequently in patients with mechanical heart valves, particularly among those who are poorly anticoagulated.

**OBJECTIVE:** This study set out to determine the prevalence of silent brain infarction (SBI) in this population.

**METHODS:** This was a post hoc analysis of data from a randomized controlled trial carried out in a tertiary-care academic medical center. The trial included participants from a randomized controlled trial of fibrinolytic therapy (FT) in patients with left-sided prosthetic valve thrombosis (PVT), who had undergone pre-treatment computed tomography (CT) scans of the brain. The prevalence of SBI in this population was investigated.

**MAIN OUTCOME MEASURE:** Prevalence of silent brain infarction.

**RESULTS:** Silent brain infarction was present in 27 of 72 patients (37.5%; 95% confidence interval [CI] 27.2, 49.1).

Atrial fibrillation (AF) was strongly associated with the presence of SBI (odds ratio [OR] 5.60; 95% CI 1.32, 23.87).

**CONCLUSION:** The high prevalence of SBI among this cohort of young patients with mechanical heart valves is alarming and calls for urgent efforts to improve the quality of anticoagulation.

**CLINICAL TRIAL REGISTRATION:** Registered in the US National Institutes of Health registry at <http://clinicaltrials.gov> as NCT00232622.

### Comment in

Silent brain infarction in patients presenting with mechanical heart valve thrombosis. [*Am J Cardiovasc Drugs*. 2012]

PMID: 22779430 [PubMed - indexed for MEDLINE]

# Technology Insight: brain MRI and cardiac surgery—detection of postoperative brain ischemia

Megan C Leary and Louis R Caplan\*

## Aim

- To demonstrate whether surgical closure of left atrium appendage reduces stroke or asymptomatic brain injury after open heart surgery

## Methods

- Open randomized study in a single surgery center (Rigshospitalet)

- Power calculation:

Incidence of stroke after CABG 1-3% after one year, most occurring 3 months post-surgery

Crystal Circulation. 2002

Incidence of silent MRI-detectable brain infarctions 1 month after CABG 20-30%

N=16

N=38

Friday Heart Surg Forum 2005

Vanninen Arch Neurol. 1998

# Methods

## Primary endpoint

- Incidence of lacunar infarctions assessed by MR-scanning, verified infarctions with CTC/MRI or clinical stroke 6-12 months after heart surgery compared to discharge

# Methods

## Inclusion criteria

- Planned valve surgery
- CABG

## Exclusion criteria

- Age < 18 år
- Endocarditis
- PM
- Metal implants

## Purse-string suture + single stitches

Minimal bleeding

5-8 min

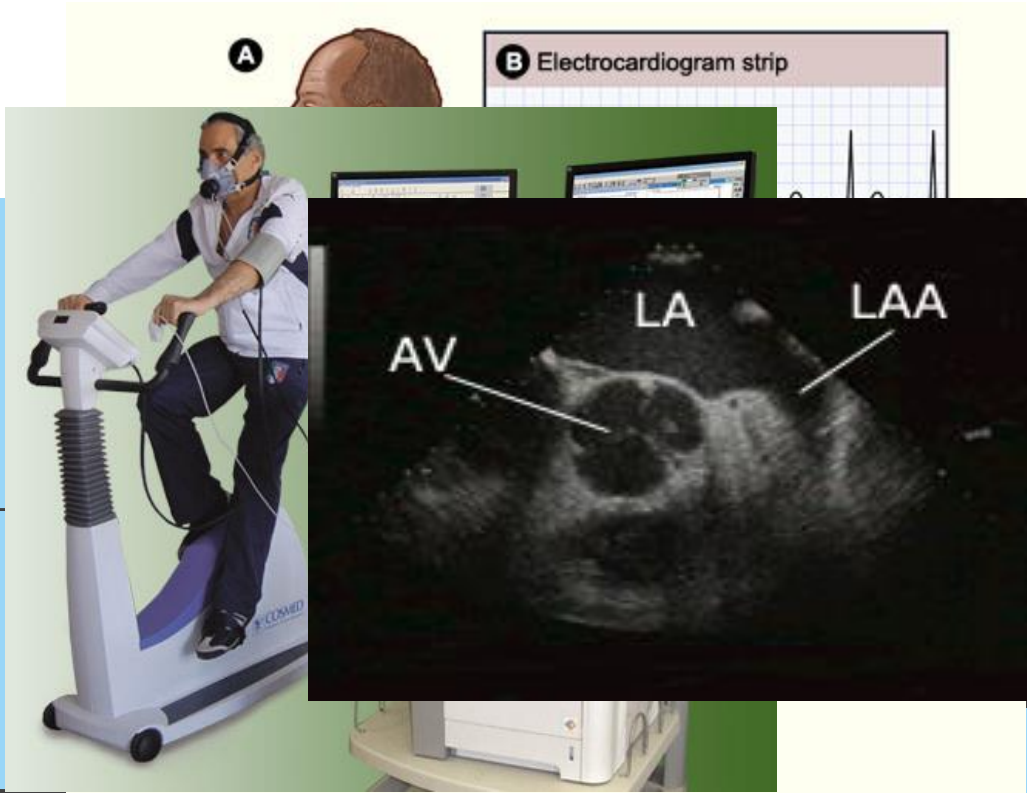
Potential ischemic "ablation"

# Flow-chart

*CABG / Valve op.*

1-2 weeks

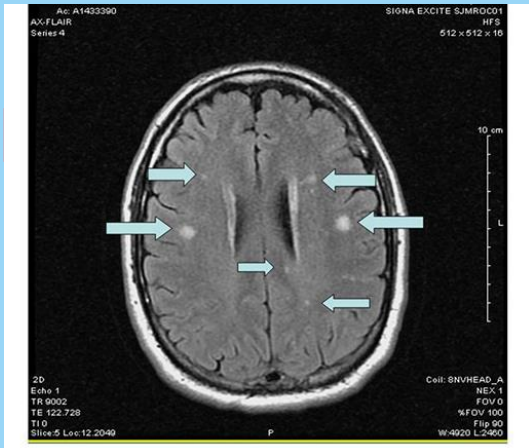
2 - 4 weeks after



with

- Medicine
- Med. history
- ECG

Screening



est

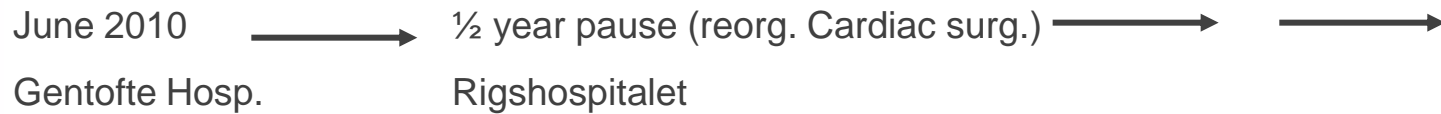
- Medicine
- Med. history
- ECG

• Blood sampling

• Tissue sampling

Telephone:  
• Medicine  
• Med. history

# Status



**About 1800 patients referred for operation**

**370 invited to participate**

**92 accepted**

**5 pacemaker**

**6 death**

**17 withdrawn consent**

**(5 claustrofobia)**

**56 have completed 1-year follow-up**





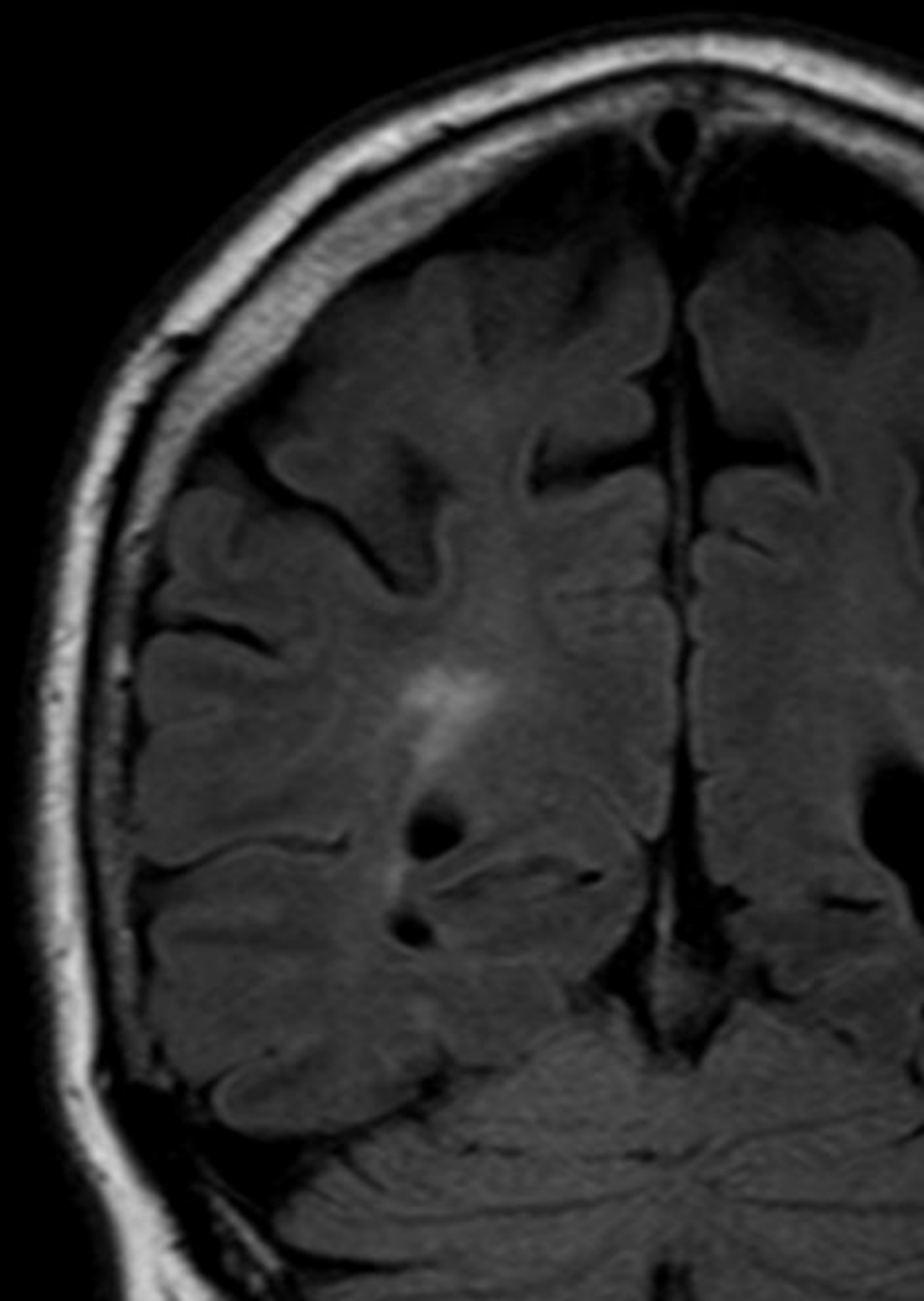
**Herlev  
Hospital**

# **PRELIMINARY RESULTS**

MR1

S

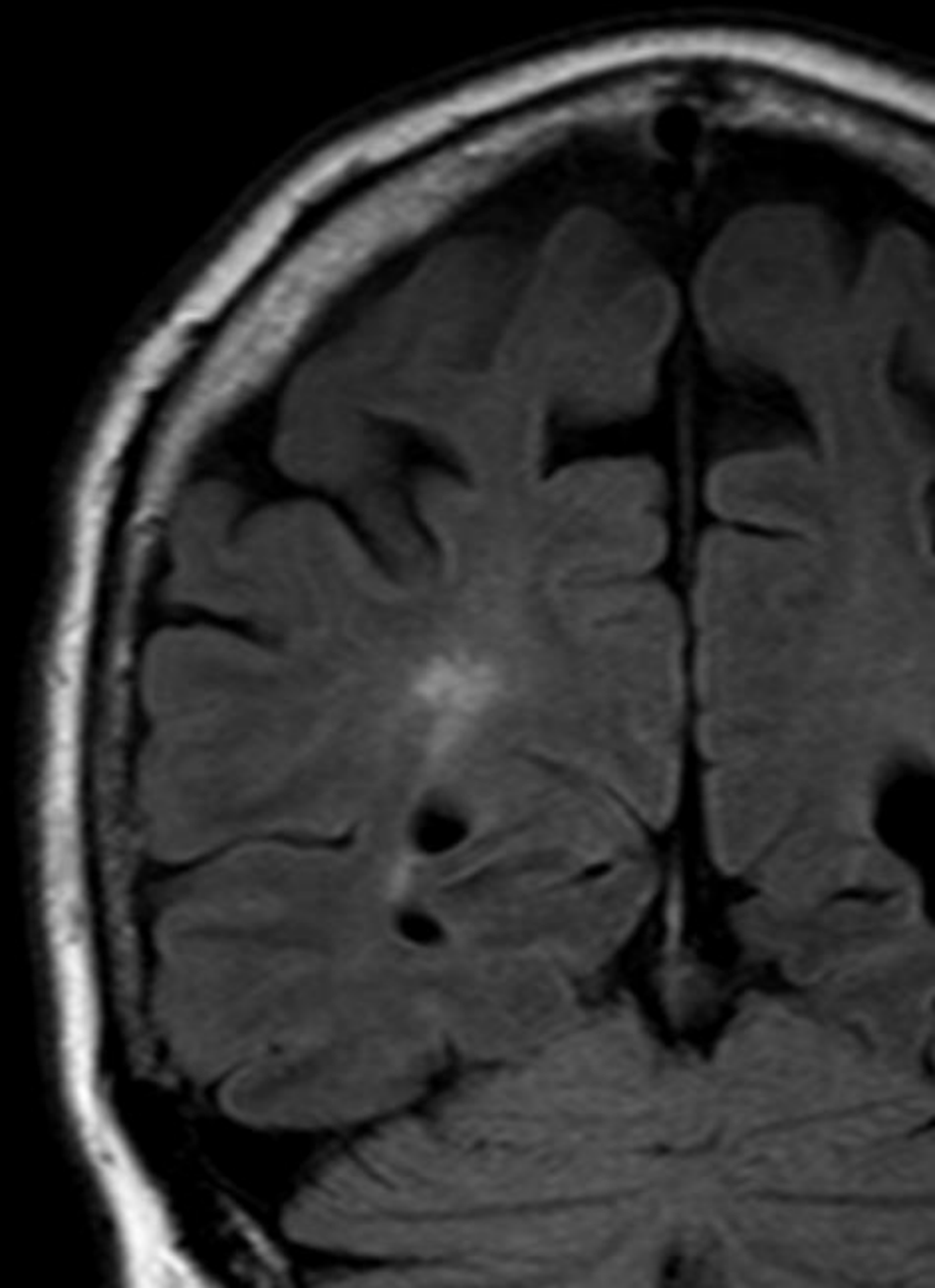
R



MR2

S

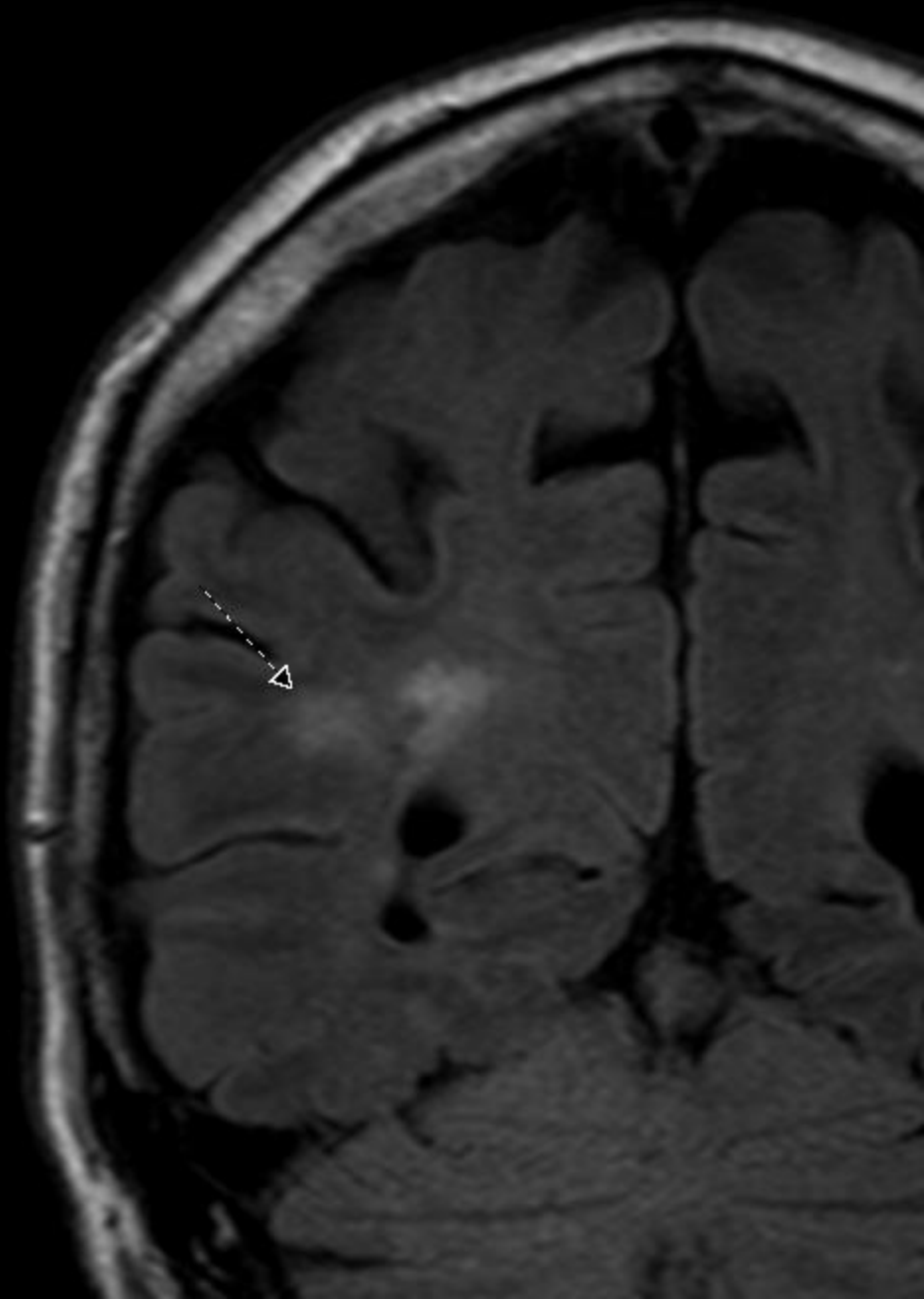
R



MR3

R

S

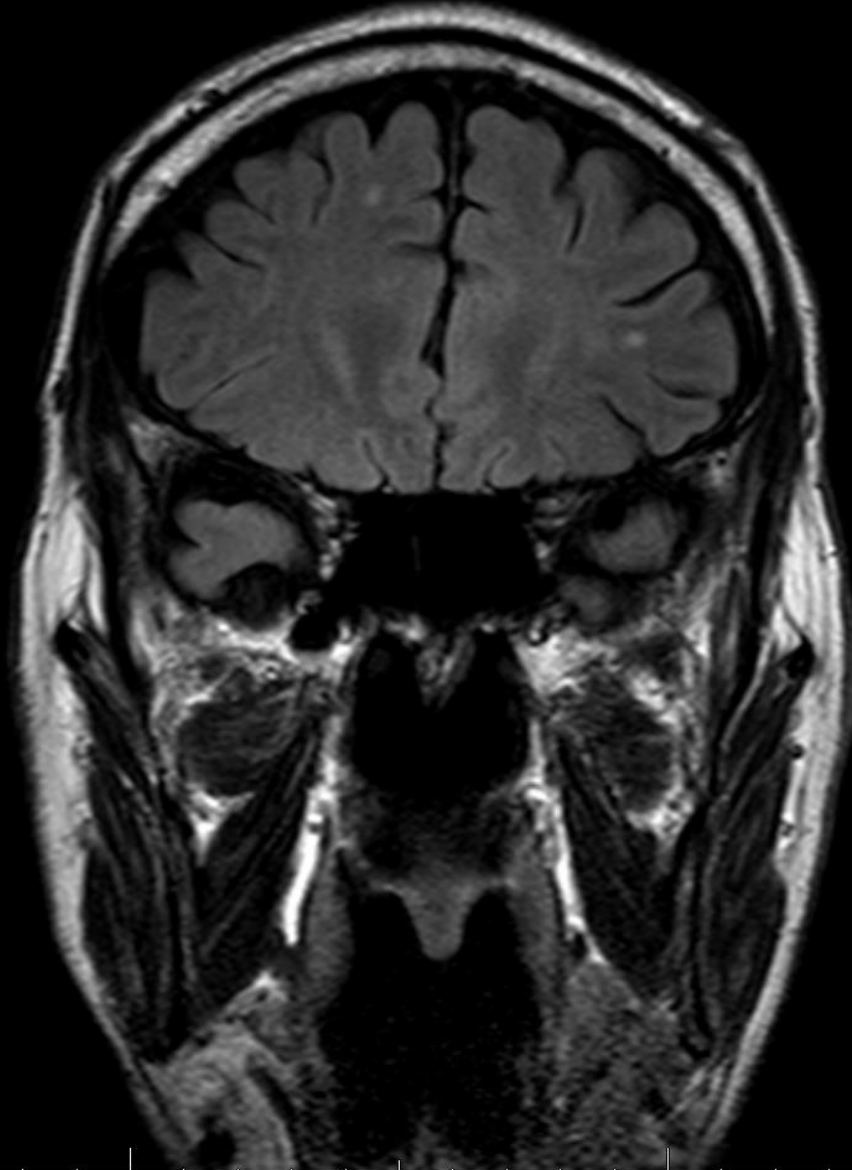


MR2

07-09-2010 10:24:11

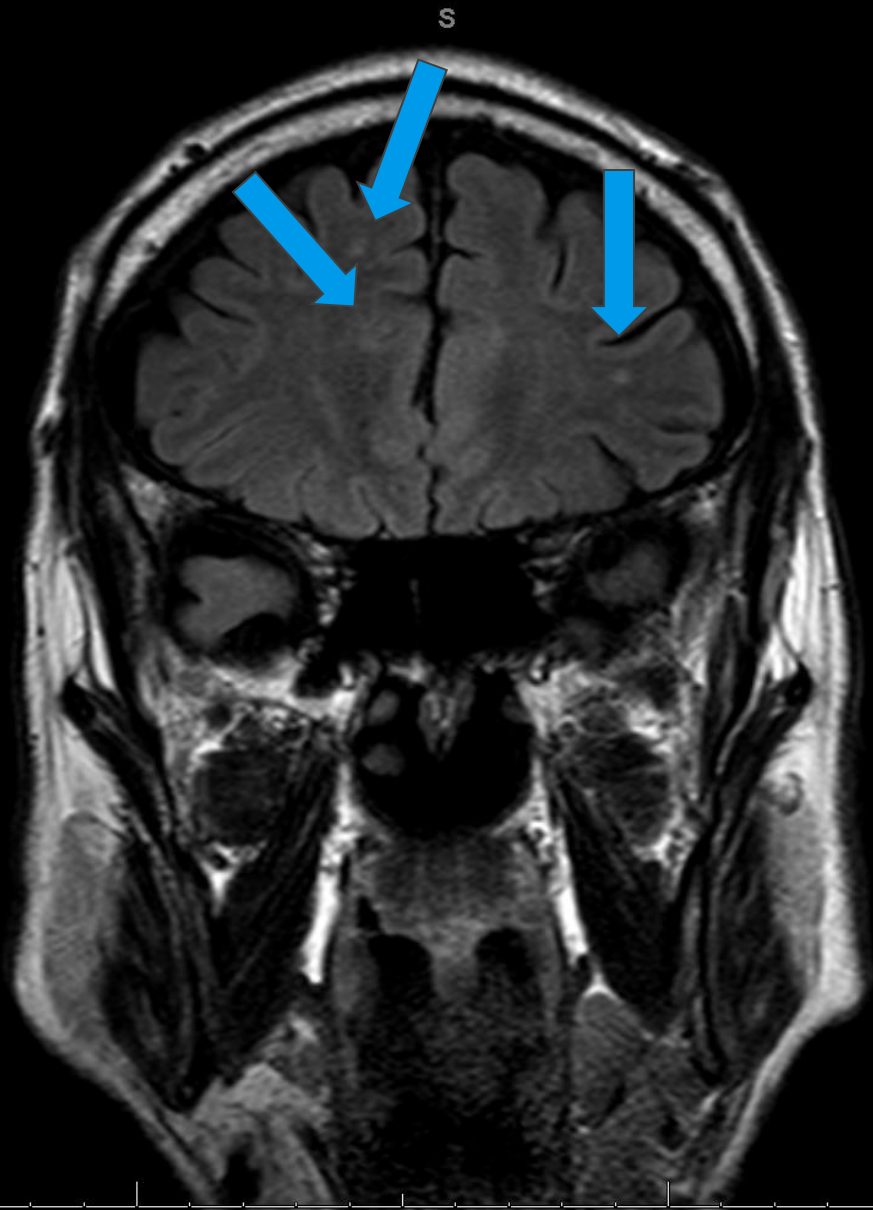
S

R



# MR3

31-03-2011 15:11:39



	MR1 (pre-op)	MR1 (discharge)	MR1 (post-op)		
1	0	0	0		
2	8	0	0		
3	0	0	0		
4	0	1	0		
5	0	0	0		
6	0	0	0		
7	5	0	1		
8	0	0	0		
9	0	1	0		
10	0	0	0		
11	0	2	0		
12	0	0	0		
13	0	0	0		
14	0	0	0		
15	3	0	0		
<b>TOTAL</b>	3 patients with changes before operation				
		3 patients with new lesions at discharge			
			1 patient with changes at follow-up		

# Collaborators



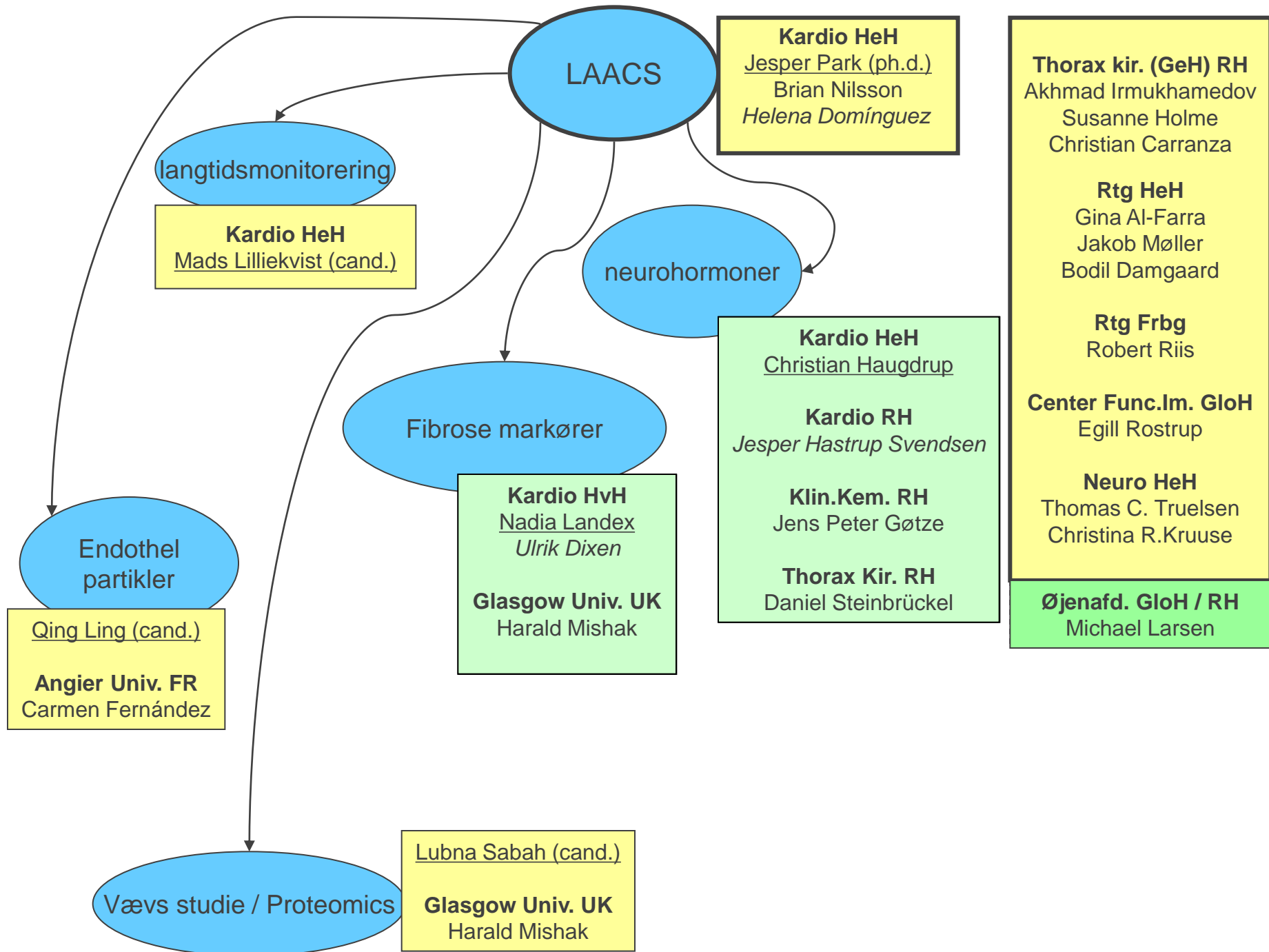
J. Park-Hansen (MD, PhD-student)  
S. Holme (MD, surgeon)  
C. Carranza (MD, surgeon)  
A. Irmukhamedov (MD, surgeon)  
J. Møller (Msci, radiographer)  
C. Rorstrup-Kruuse (MD, neurologist)  
E Rørstrup (MD, Functional Imaging)  
T. Truelsen (Msci, neurologist)  
G. Al-Farra (MD, radiologist)  
B. Damgaard (MD, radiologist)  
R. Riis (MD, PhD-student)  
D. Steinbruckel (Prof., surgeon)  
C. Hagdrup (MD, resident)  
U. Dixen (PhD, cardiologist)  
J. Hastrup Svendsen (Prof., cardiologist)  
N. Landex (Post-doc, cardiologist)  
P. Gøtze (MSci, Biochemist)

Medicin students:

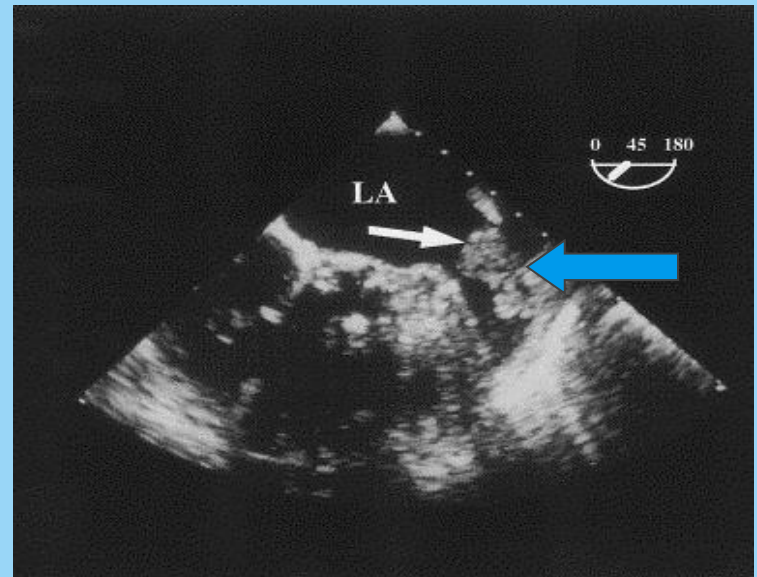
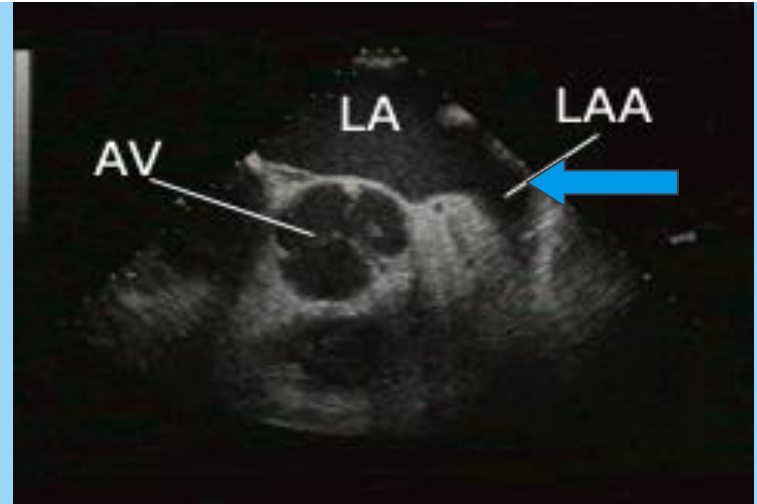
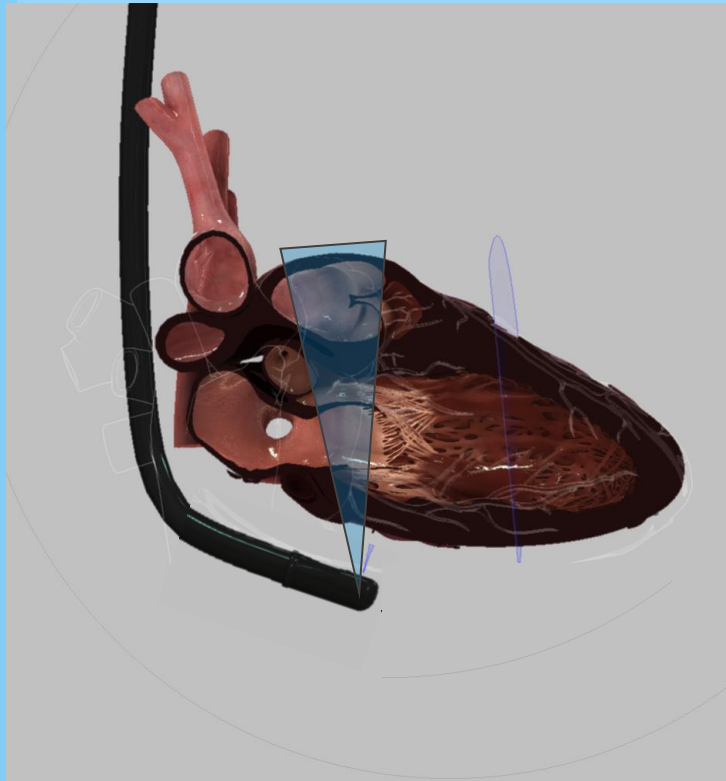
L. Sabah, Q. Ling, M. Liljekvist, J. Azaqoun



# Samarbejdspartnere i LAACS

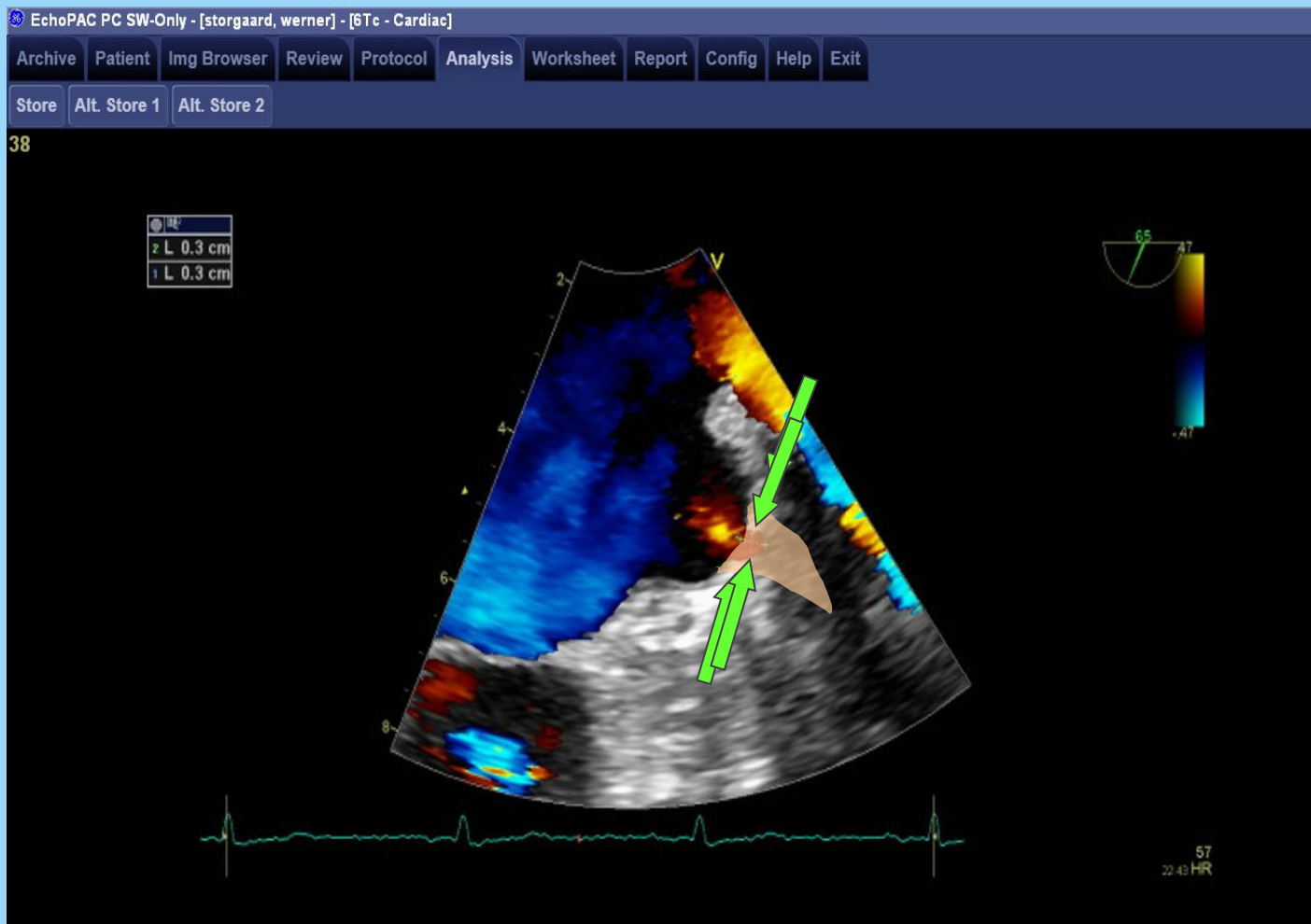


# Konsekvens af ATRIEFLIMREN

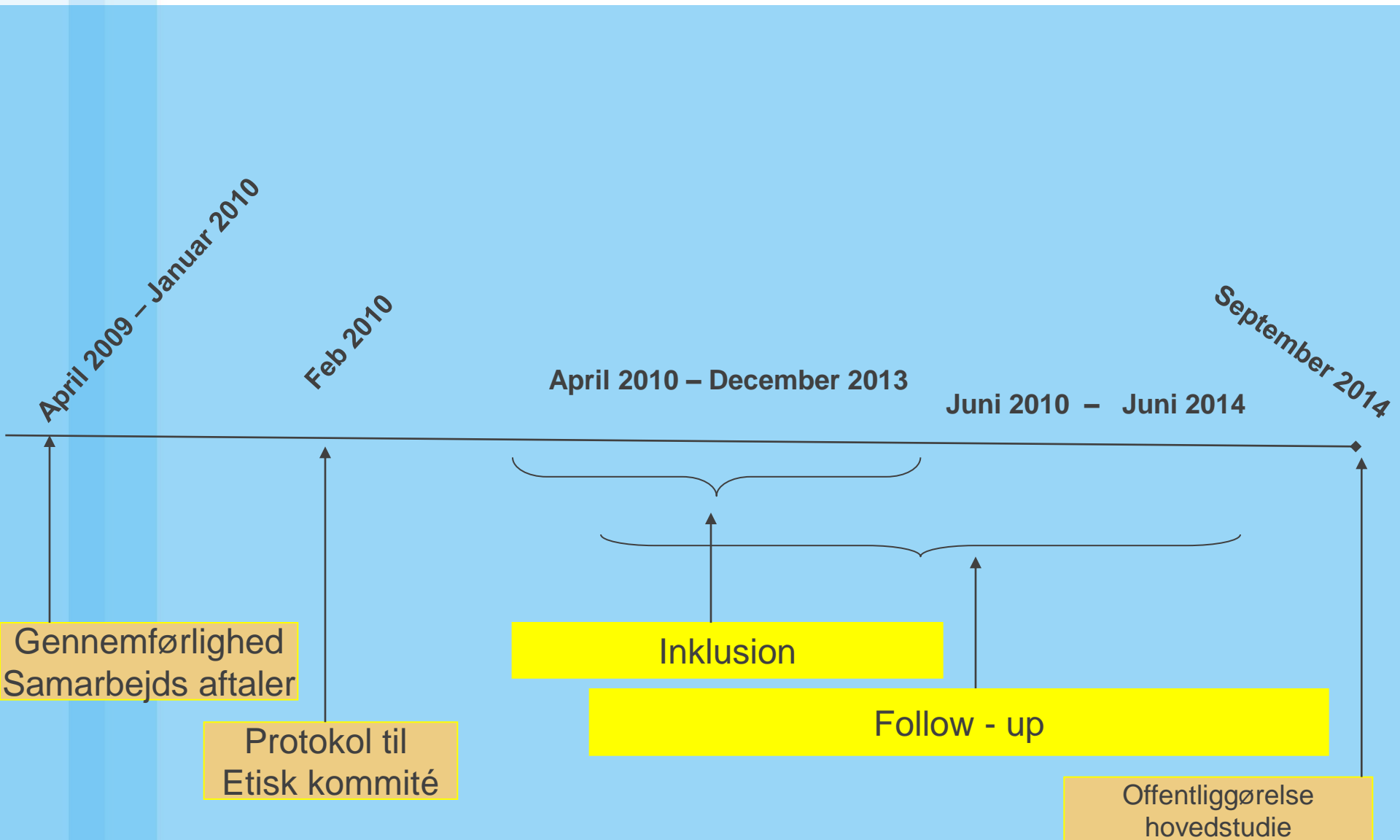


- TEE (echocardiografi)

# Lukket aurikel



# TIDSPLAN



April 2009 – Januar 2010

Feb 2010

April 2010 – December 2013

Juni 2010 – Juni 2014

September 2014

Gennemførlighed  
Samarbejds aftaler

Protokol til  
Etisk kommité

Inklusion

Follow - up

Offentliggørelse  
hovedstudie

## **Titel**

**"LAACS – Left Atrial Appendix Closure**

**with Surgery –**

**A randomized study to prevent**

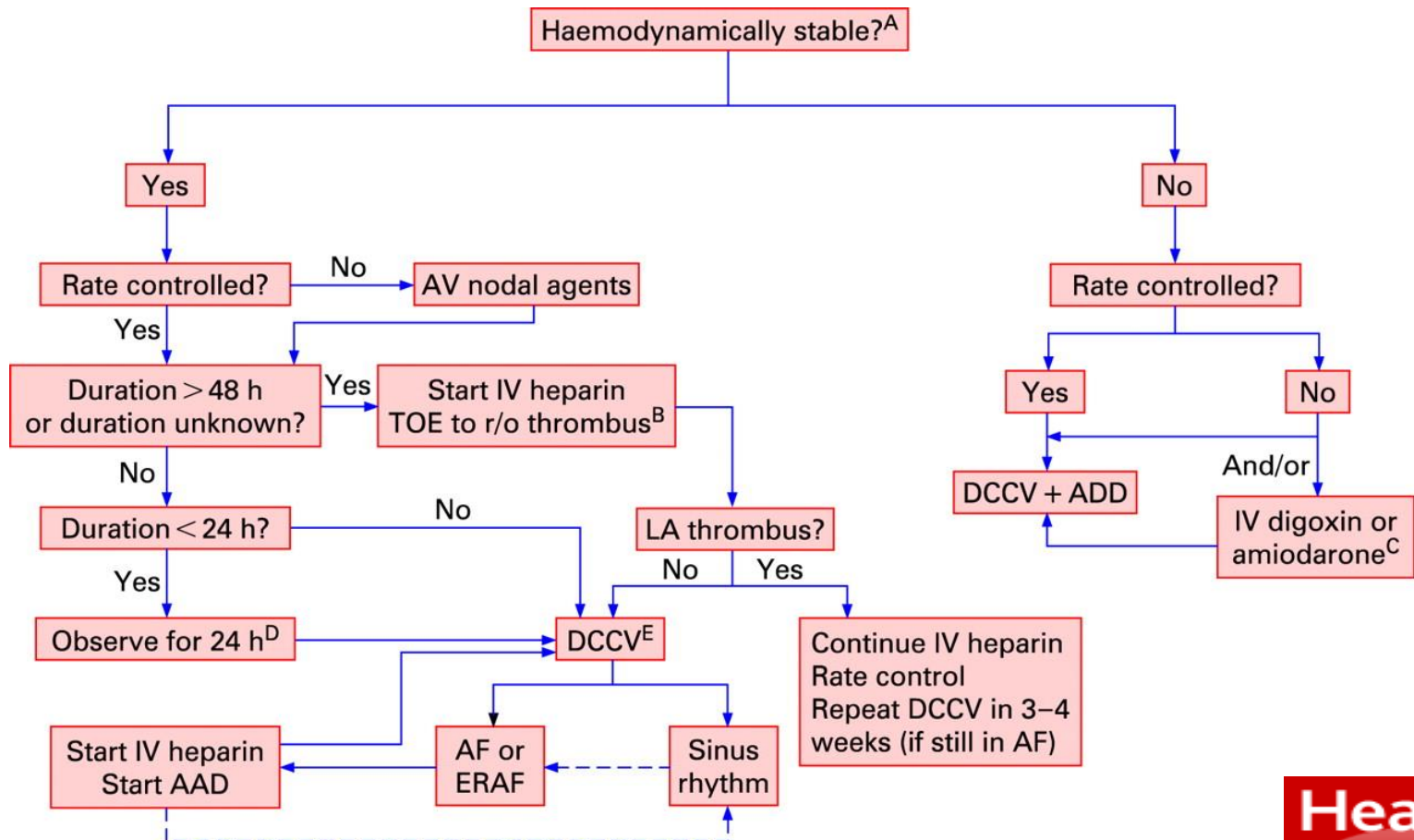
**thromboembolisms after**

**cardiothoracic surgery"**

# Referencer

- Rho RW. *Heart* 2009;95:422-429
- McGarvey JR et al. *Ann Thorac Surg.* 2008 Oct;86(4):1375-7
- Pagé P, Skanes AC. *Can J Cardiol.* 2005 Sep;21 Suppl B:35B-9B
- Johnson WD et al. *European Journal of Cardio-thoracic Surgery* 17. 2000 718-2
- Syed TM, Halpery JL. *Nat Clin Pract Cardiovasc Med.* 2007 Aug;4(8):428-35. Review
- Bonnow R.O. et al. *Circulation* 2008;118:e523-e661
- Crystal E.G. et al. *Am Heart J* 2003;145:174-8.

Figure 3 (A) Haemodynamically unstable is defined as hypotension, ischaemia, congestive heart failure, and mental status change attributed to low cardiac output. (B) Patients who have been in atrial fibrillation (AF) >48 h are at risk of stroke and should be anticoagulated. In this setting or if the duration of AF is unknown, a transoesophageal echocardiogram (TOE) should be performed to rule out left atrial (LA) thrombus before proceeding with elective cardioversion. Anticoagulation with heparin is usually initiated between 36-48 h. The patient should be therapeutically anticoagulated (international normalised ratio (INR) for protime 2-3 or prothrombin time (PTT) 60-80 s) <48 h of onset of AF. (C) Intravenous (IV) amiodarone may be used as a rate control agent in certain patients who are hypotensive, cannot be rate controlled by conventional means, and cannot be electrically cardioverted.<sup>4</sup> (D) The majority of patients who have a single episode of postoperative AF will spontaneously convert within 24 h. If the patient is tolerating the rhythm and is adequately rate controlled it is prudent to observe for 24 h before intervention. (E) Direct current synchronised cardioversion (DCCV) is usually performed in the time period from 24 h to no longer than 48 h after the onset of AF to avoid the need for anticoagulation. AAD, antiarrhythmic drugs; BB, {beta}-blockers; ERAF, early reinitiation of atrial fibrillation; r/o, rule out.





# METODER

## Primær endepunkt

- Lakunære cerebrale infarkter ved MR-scanning eller apopleksi

## Preliminær power-beregning

”Overall” incidens af apopleksi er 3-7% per år efter CABG, afhænger af risikofaktorer: RR hypertension 2,9; RR alder >65år 5,8; RR tidligere cerebr. insult 19,2.

For at reducere forekomst af apopleksi med 90% styrke i en gruppe med incidens af apopleksi 20% over 5 års opfølgning: n=2500. – Crystal et al. Am

Heart J 2003;145:174-8

Efter M-klap og CABG operation er forekomst af MR forandringer på 30-40% efter M-klapoperation og efter 4 mdr. er ca 50-70%. For at kunne finde 20% forskel mellem LAAC og kontrol er der formentligt brug for n=50-100.

*Vi kan ikke beregne styrke meningsfuld da der ikke foreligger studier der belyser variabilitet i denne gruppe → PUBLICÉRBARHED af pilot studie præ/post+ 6 mdr MR er GARANTERET!!*

# Thanks' for your kind attention!!!!!!



# Let Us Meet Again

We welcome you all to our future conferences of OMICS  
Group International

Please Visit:

[www.omicsgroup.com](http://www.omicsgroup.com)

[www.conferenceseries.com](http://www.conferenceseries.com)

<http://cardiology.conferenceseries.com/>