

Tous les patients post-AVC devraient-ils recevoir un anticoagulant ?

## POSITION CONTRE

- Visiosymposium SSVQ
- Vendredi 22 septembre 2017
- Auditorium de l'ICM
- Montréal, Québec
- Dr Steve Verreault
- Neurologue, MD, frcp(c)
- Hôpital Enfant-Jésus
- CHU de Québec
- Université Laval

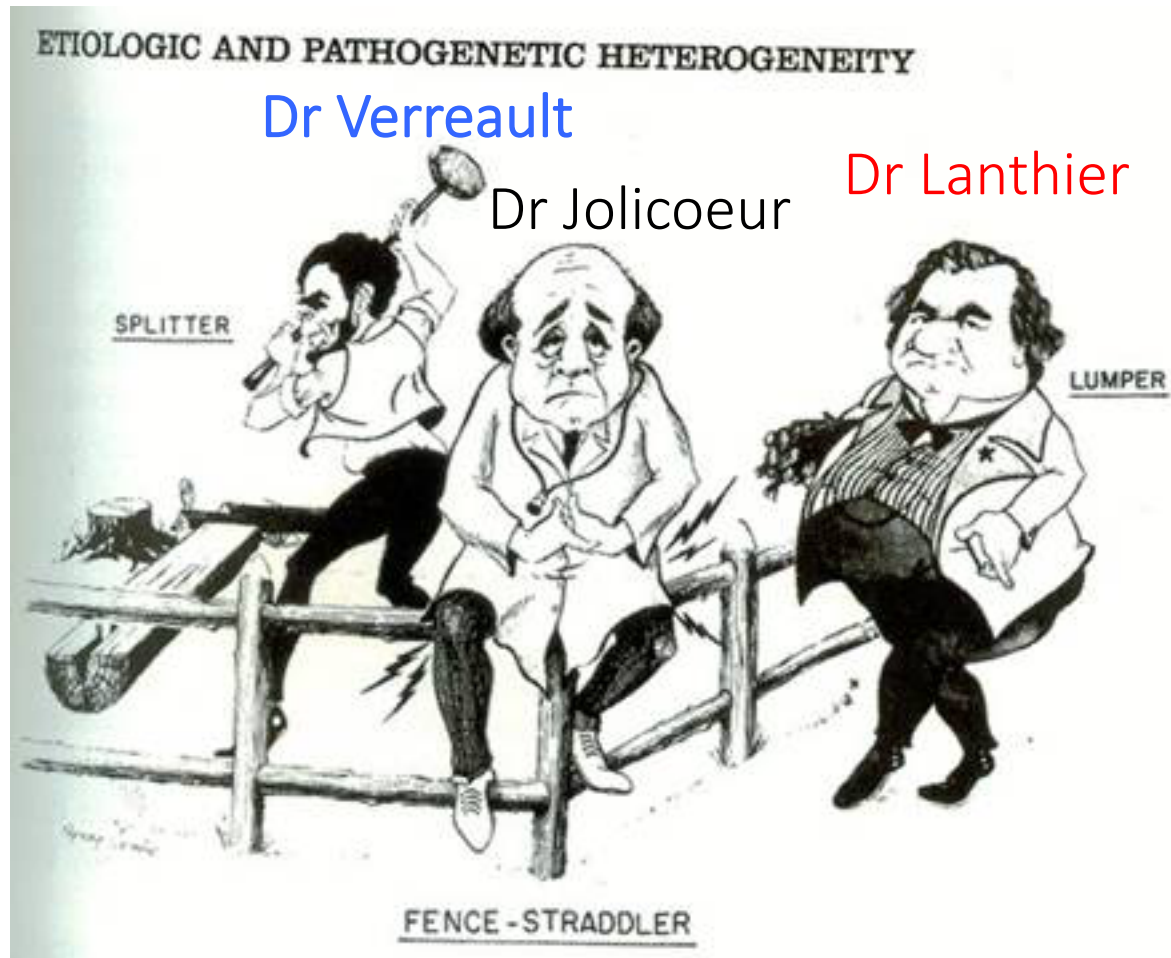
# Divulgation des conflits d'intérêts potentiels

- Subvention/soutien à la recherche
  - Bayer, Boehringer-Ingelheim, Astra-Zeneca, Portola
- Conférenciers/honoraires
  - Bayer, BMS, Boehringer-Ingelheim, Pfizer, Servier

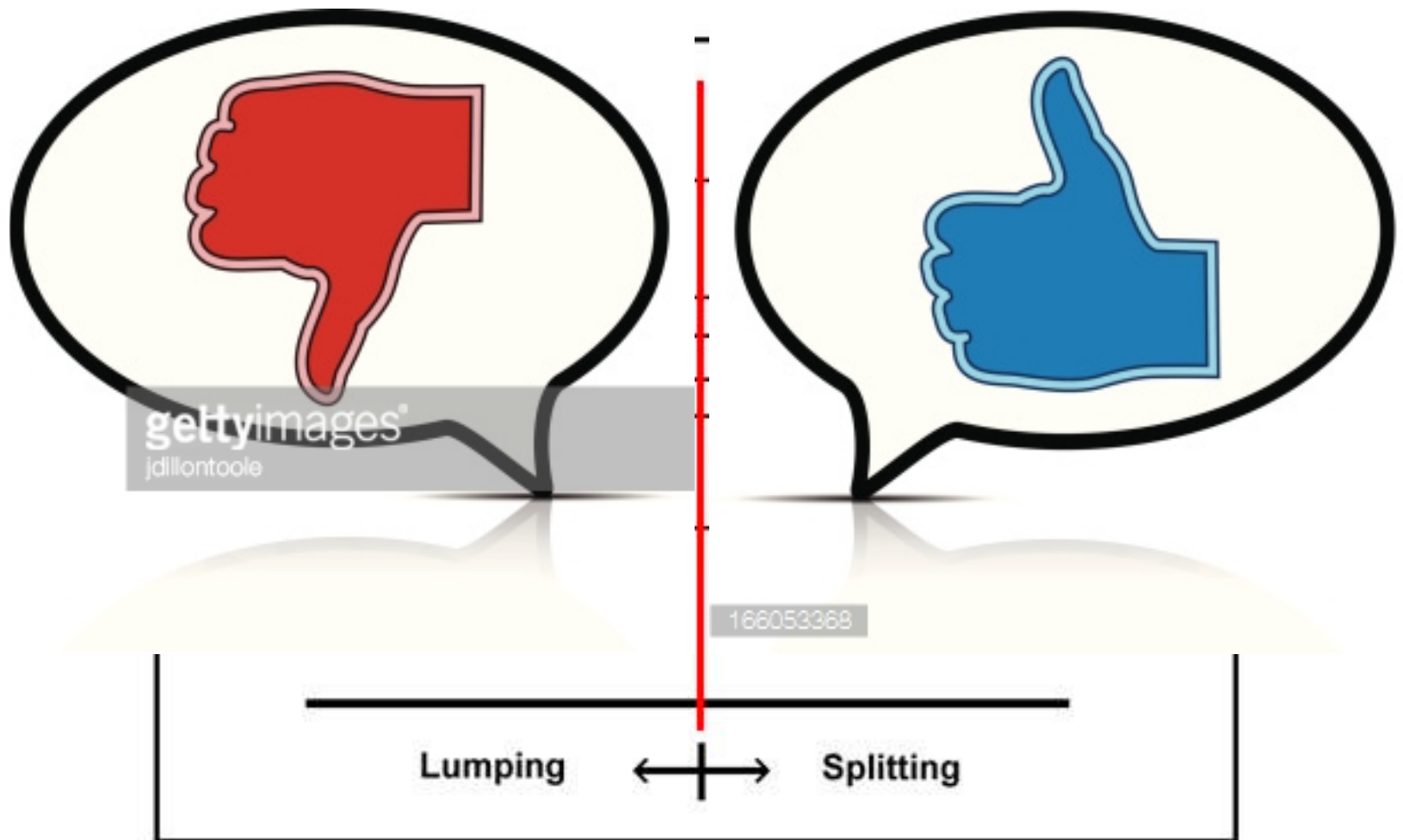
# Objectifs

- Discuter de l'association entre l'AVC ischémique cryptogène et la fibrillation auriculaire, de même que les mesures en place pour dépister cette dernière.
- Mettre en contraste les risques et les bénéfices de l'anticoagulation post-AVC, et ce dans la perspective d'utilisation actuelle des anti-plaquettaires et des dispositifs de fermeture d'appendice auriculaire, entre autres.
- Préciser les rapports risques-bénéfices en fonction des sous-groupes démographiques fréquents et en fonction des types d'AVC associés (cryptogène, embolique, hémorragique).

# Patients post-AVC: **Pour** ou **Contre** les AOD ?



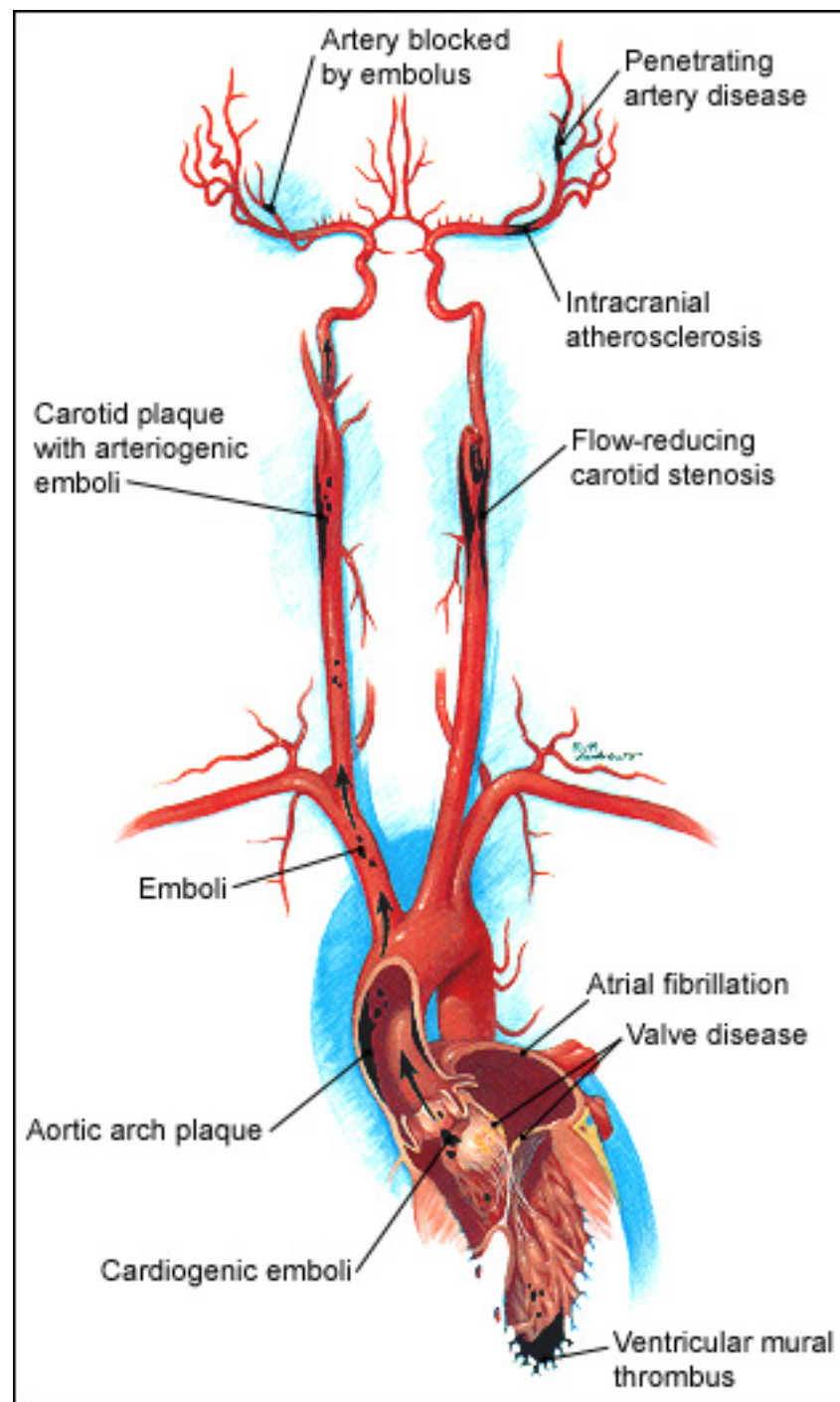
# Patients post-AVC: **Pour** ou **Contre** les AOD ?



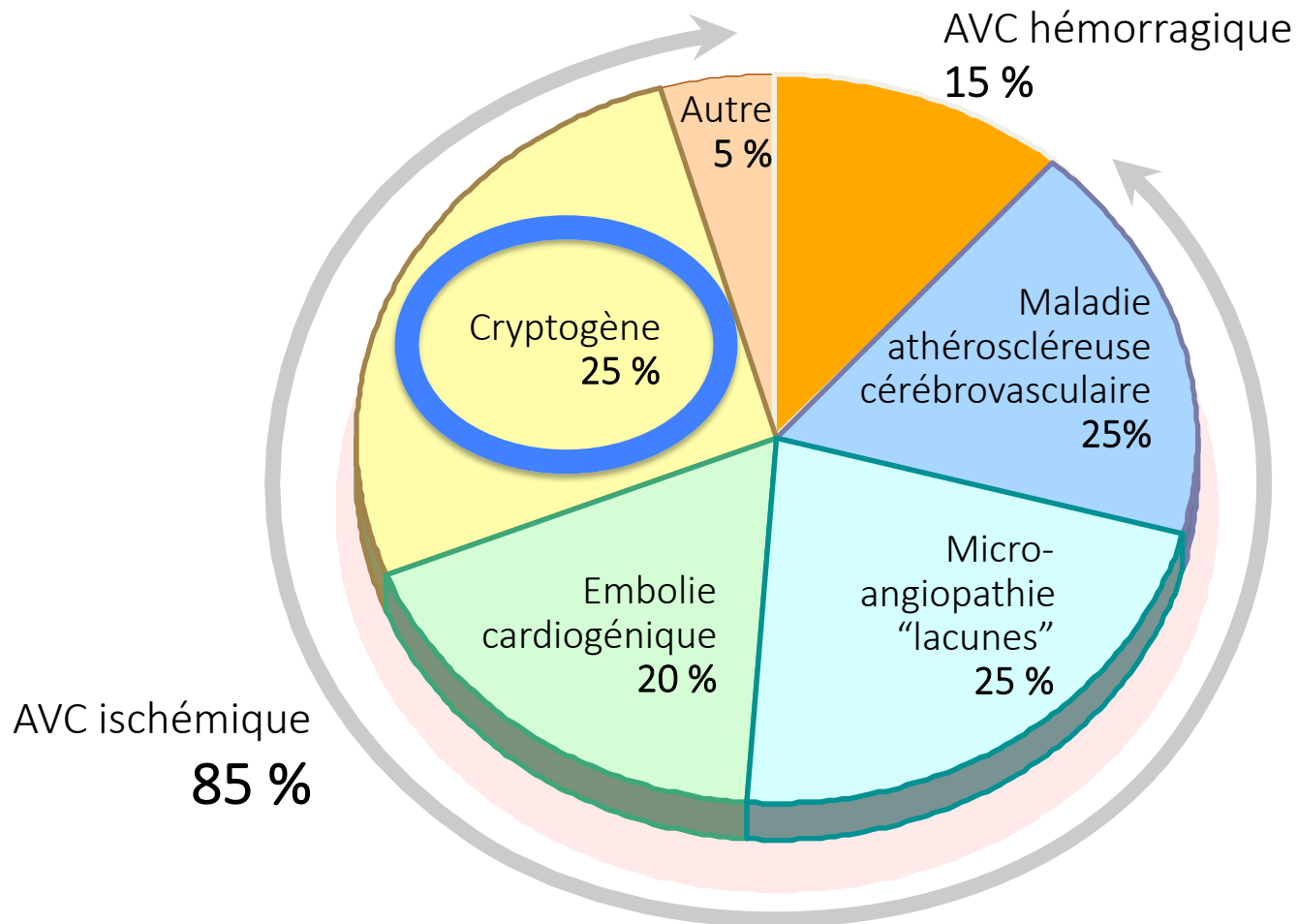
Position du Dr Lanthier:  
Pour les AOD

Position du Dr Verreault:  
Contre les AOD

L'AVC  
ischémique  
est une  
condition  
hétérogène



# L'AVC ischémique est une condition hétérogène



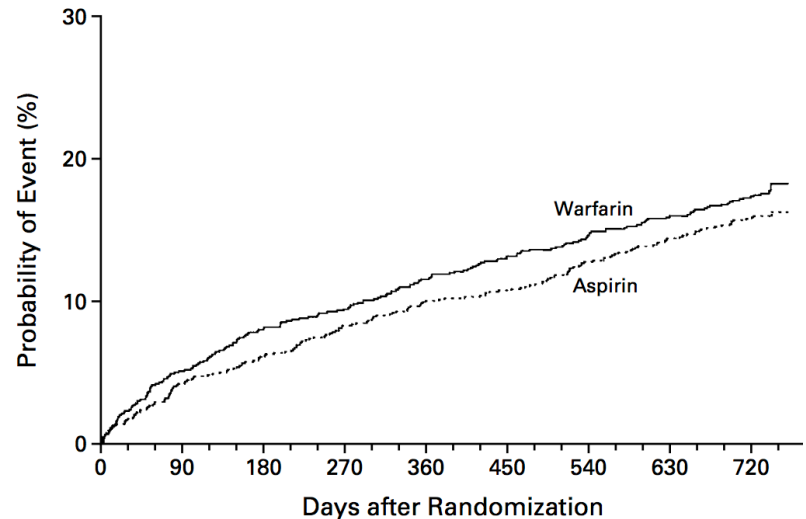
Albers G et al. Chest. 2004; 126 (suppl): 484S.

## A COMPARISON OF WARFARIN AND ASPIRIN FOR THE PREVENTION OF RECURRENT ISCHEMIC STROKE

J.P. MOHR, M.D., J.L.P. THOMPSON, PH.D., R.M. LAZAR, PH.D., B. LEVIN, M.D., R.L. SACCO, M.D., K.L. FURIE, M.D., J.P. KISTLER, M.D., G.W. ALBERS, M.D., L.C. PETTIGREW, M.D., H.P. ADAMS, JR., M.D., C.M. JACKSON, M.D., AND P. PULLICINO, M.D., FOR THE WARFARIN-ASPIRIN RECURRENT STROKE STUDY GROUP\*

**Conclusions** Over a two-year period, we found no difference between aspirin and warfarin in the prevention of recurrent ischemic stroke or death or in the rate of major hemorrhage. Consequently, we regard both warfarin and aspirin as reasonable therapeutic alternatives. (N Engl J Med 2001;345:1444-51.)

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No. AT RISK

Warfarin	1103	1047	1013	998	972	956	939	924	885
Aspirin	1103	1057	1032	1004	984	974	951	932	900





Puisque l'AVC ischémique est une condition très hétérogène, répondre à la question du débat est plutôt facile:

Tous les patients post-AVC devraient-ils recevoir un anticoagulant ?

**NON**

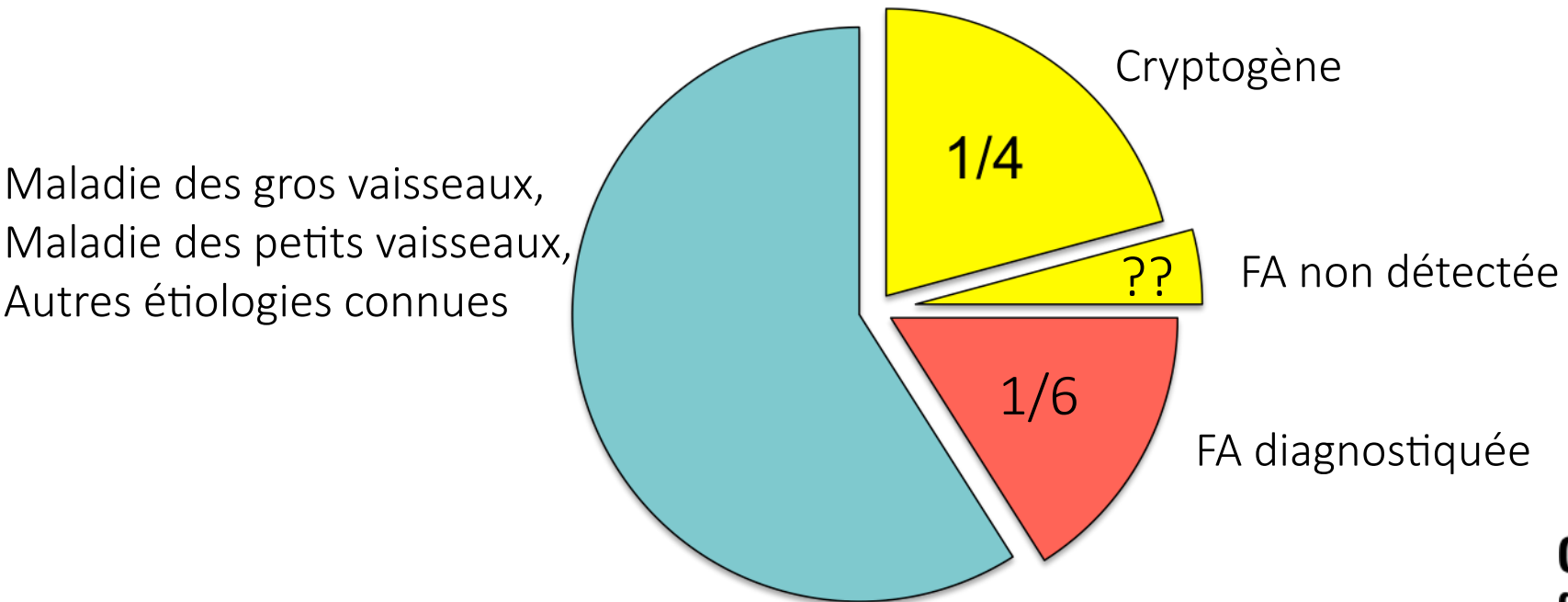
Merci de votre attention

Questions ?

# Concept ESUS:

## AVC embolique de source indéterminée

- 1 AVC ischémique sur 4 est de cause indéterminée (cryptogène)
- Certains AVC cryptogènes pourraient être causés par de la FA non détectée



# Concept ESUS: AVC embolique de source indéterminée

## Panel 2: Criteria for diagnosis of embolic stroke of undetermined source\*

- Stroke detected by CT or MRI that is not lacunar†
- Absence of extracranial or intracranial atherosclerosis causing  $\geq 50\%$  luminal stenosis in arteries supplying the area of ischaemia
- No major-risk cardioembolic source of embolism‡
- No other specific cause of stroke identified (eg, arteritis, dissection, migraine/vasospasm, drug misuse)

\*Requires minimum diagnostic assessment (panel 3). †Lacunar defined as a subcortical infarct smaller than or equal to 1.5 cm ( $\leq 2.0$  cm on MRI diffusion images) in largest dimension, including on MRI diffusion-weighted images, and in the distribution of the small, penetrating cerebral arteries; visualisation by CT usually needs delayed imaging greater than 24–48 h after stroke onset. ‡Permanent or paroxysmal atrial fibrillation, sustained atrial flutter, intracardiac thrombus, prosthetic cardiac valve, atrial myxoma or other cardiac tumours, mitral stenosis, recent (<4 weeks) myocardial infarction, left ventricular ejection fraction less than 30%, valvular vegetations, or infective endocarditis.

# Concept ESUS: AVC embolique de source indéterminée

## Panel 3: Proposed diagnostic assessment for embolic stroke of undetermined source\*

- Brain CT or MRI
- 12-lead ECG
- Precordial echocardiography
- Cardiac monitoring for  $\geq 24$  h with automated rhythm detection†
- Imaging of both the extracranial and intracranial arteries supplying the area of brain ischaemia (catheter, MR, or CT angiography, or cervical duplex plus transcranial doppler ultrasonography)

\*Imaging of the proximal aortic arch is not needed; special blood tests for prothrombotic states only if the patient has a personal or family history of unusual thrombosis or associated systematic signs or disorder. †Cardiac telemetry is not sufficient.

# Concept ESUS: AVC embolique de source indéterminée

## Panel 1: Causes of embolic strokes of undetermined source

### Minor-risk potential cardioembolic sources\*

#### Mitral valve

- Myxomatous valvulopathy with prolapse
- Mitral annular calcification

#### Aortic valve

- Aortic valve stenosis
- Calcific aortic valve

#### Non-atrial fibrillation atrial dysrhythmias and stasis

- Atrial asystole and sick-sinus syndrome
- Atrial high-rate episodes
- Atrial appendage stasis with reduced flow velocities or spontaneous echodensities

#### Atrial structural abnormalities

- Atrial septal aneurysm
- Chiari network

#### Left ventricle

- Moderate systolic or diastolic dysfunction (global or regional)
- Ventricular non-compaction
- Endomyocardial fibrosis

**Covert paroxysmal atrial fibrillation**

### Cancer-associated

- Covert non-bacterial thrombotic endocarditis
- Tumour emboli from occult cancer

### Arteriogenic emboli

- Aortic arch atherosclerotic plaques
- Cerebral artery non-stenotic plaques with ulceration

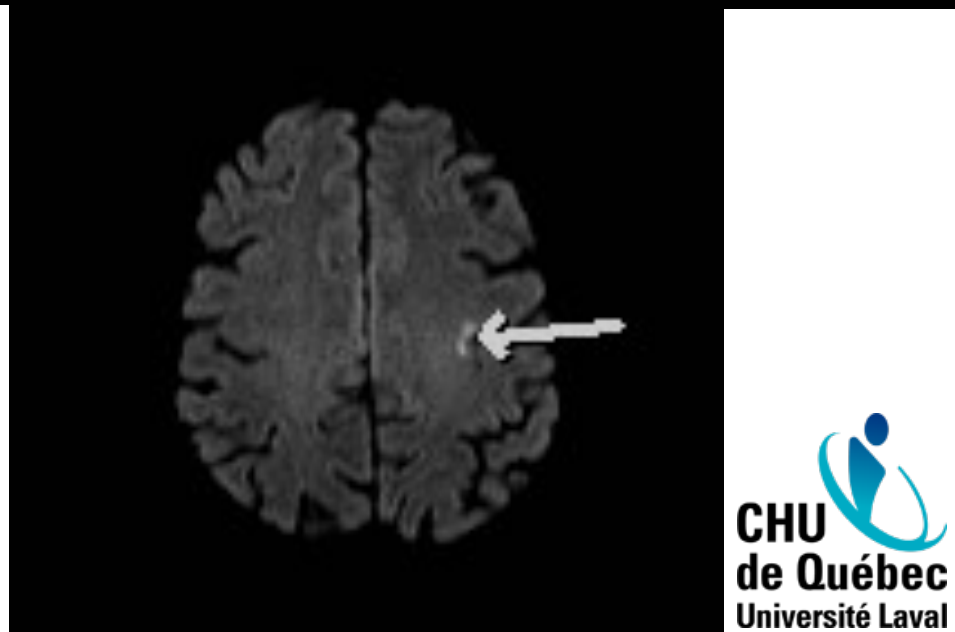
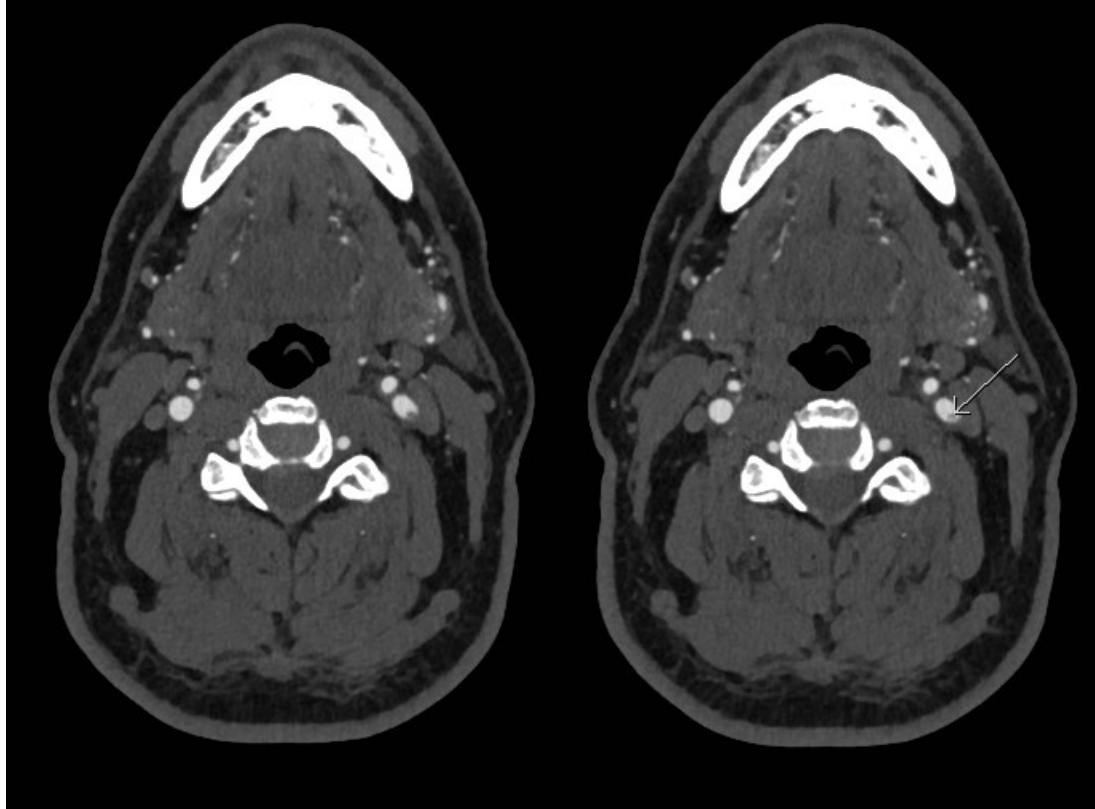
### Paradoxical embolism

- Patent foramen ovale
- Atrial septal defect
- Pulmonary arteriovenous fistula

\*Minor-risk sources are more often incidentally present than is the stroke cause when identified in an individual stroke patient, are associated with a low or uncertain rate of initial stroke, and consequently cause-effect relation and management implications are usually unclear.

Hypothèse des Lumpers  
Comme Dr Lanthier

- Homme, 68 ans
- S'est présenté avec un discret déficit moteur brachio-facial droit
- L'IRM cérébrale démontre un foyer d'ischémie aigu cortical frontal gauche
- Après une bilan d'investigation neurovasculaire adéquat, l'AVC mineur de ce patient répond à la définition d'un AVC embolique de source indéterminée (ESUS)
- Par contre, l'angio-TDM tête et cou révèle une plaque d'athérosclérose ulcérée avec thrombus endoluminal





# Incidence, outcome, risk factors, and long-term prognosis of cryptogenic transient ischaemic attack and ischaemic stroke: a population-based study



Linxin Li, Gabriel S Yiin, Olivia C Geraghty, Ursula G Schulz, Wilhelm Kuker, Ziyah Mehta, Peter M Rothwell, on behalf of the Oxford Vascular Study



- Dans leur cohorte de 2555 patients avec un premier événement ischémique cérébral (1607 infarctus et 948 AIT), la classification selon la cause est la suivante:
  - **Cryptogène 32%**
    - Cardioembolique 26%
    - Maladie petites artères 12%
    - Maladie grosses artères 11%
    - Investigation incomplète 13%
    - Avec > 1 cause 4%
    - Autres causes 2%
- Parmi les patients âgés < 55 ans (n=226):
  - **Cryptogène 48%**

# Incidence, outcome, risk factors, and long-term prognosis of cryptogenic transient ischaemic attack and ischaemic stroke: a population-based study



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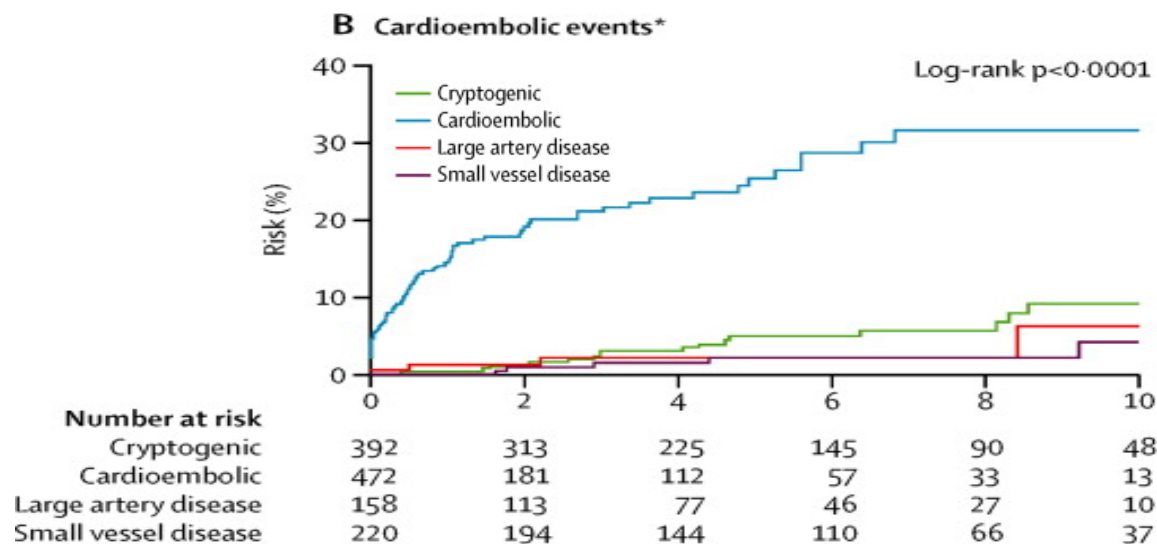
- Dans la cohorte d'Oxford:
  - Le risque récidive d'AVC après un premier AVC ischémique cryptogène est de **32%** à 10 ans
  - Le risque de décès/dépendance à 6 mois après un premier AVC ischémique cryptogène est de **23%**

Aucune différence significative en comparaison avec le groupe des grosses et des petites artères

# Incidence, outcome, risk factors, and long-term prognosis of cryptogenic transient ischaemic attack and ischaemic stroke: a population-based study



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En comparaison avec le groupe des petites et grosses artères, les AVC ischémiques cryptogènes ne sont pas associés à un excès d'évènements cardioemboliques au suivi

# Incidence, outcome, risk factors, and long-term prognosis of cryptogenic transient ischaemic attack and ischaemic stroke: a population-based study



Linxin Li, Gabriel S Yiin, Olivia C Geraghty, Ursula G Schulz, Wilhelm Kuker, Ziyah Mehta, Peter M Rothwell, on behalf of the Oxford Vascular Study



- Dans la cohorte d'Oxford, en comparaison avec le groupe des petites et grosses artères, les AVC ischémiques cryptogènes ne sont pas associés à un excès:
  - de FAP au baseline (6% vs 10%;  $p=0.17$ )
  - de FAP de novo au suivi (HR ajusté 1.23, 0.78-1.95;  $p=0.37$ )
  - d'anomalies échocardiographiques potentielles sources mineures cardioemboliques (37% vs 45%;  $p=0.18$ )

Dans ce contexte, est-il raisonnable d'espérer que la détection de FAP et l'utilisation des AOD dans l'AVC ischémique cryptogène permettront de réduire le risque de récurrence d'AVC ? NON

L'AVC ischémique cryptogène  
n'est pas nécessairement un  
ESUS

# Embolic Stroke of Undetermined Source

## A Systematic Review and Clinical Update

Robert G. Hart, MD; Luciana Catanese, MD; Kanjana S. Perera, MBBS;  
George Ntaios, MD, PhD; Stuart J. Connolly, MD

**Background and Purpose**—Embolic stroke of undetermined source (ESUS) designates patients with nonlacunar cryptogenic ischemic strokes in whom embolism is the likely stroke mechanism. It has been hypothesized that anticoagulation is more efficacious than antiplatelet therapy for secondary stroke prevention in ESUS patients. We review available information about ESUS.

**Methods**—Systematic literature review to assess the frequency of ESUS, patient features, and prognosis using PubMed from 2014 to present, unrestricted by language.

**Results**—On the basis of 9 studies, the reported frequency of ESUS ranged from 9% to 25% of ischemic strokes, averaging 17%. From 8 studies involving 2045 ESUS patients, the mean age was 65 years and 42% were women; the mean NIH stroke score was 5 at stroke onset (4 studies, 1772 ESUS patients). Most (86%) ESUS patients were treated with antiplatelet therapy during follow-up, with the annualized recurrent stroke rate averaging 4.5% per year during a mean follow-up of 2.7 years (5 studies, 1605 ESUS patients).

**Conclusions**—ESUS comprises about 1 ischemic stroke in 6. Patients with ischemic stroke meeting criteria for ESUS were relatively young compared with other ischemic stroke subtypes and had, on average, minor strokes, consistent with small emboli. Retrospective methods of available studies limit confidence in stroke recurrence rates but support a substantial (>4% per year) rate of stroke recurrence during (mostly) antiplatelet therapy. There is an important need to define better antithrombotic prophylaxis for this frequently occurring subtype of ischemic stroke. (*Stroke*. 2017;48:867-872. DOI: 10.1161/STROKEAHA.116.016414.)



# Embolic strokes of undetermined source: the case for a new clinical construct

*Robert G Hart, Hans-Christoph Diener, Shelagh B Coutts, J Donald Easton, Christopher B Granger, Martin J O'Donnell, Ralph L Sacco, Stuart J Connolly, for the Cryptogenic Stroke/ESUS International Working Group*

Cryptogenic (of unknown cause) ischaemic strokes are now thought to comprise about 25% of all ischaemic strokes. Advances in imaging techniques and improved understanding of stroke pathophysiology have prompted a reassessment of cryptogenic stroke. There is persuasive evidence that most cryptogenic strokes are thromboembolic. The thrombus is thought to originate from any of several well established potential embolic sources, including minor-risk or covert cardiac sources, veins via paradoxical embolism, and non-occlusive atherosclerotic plaques in the aortic arch, cervical, or cerebral arteries. Accordingly, we propose that embolic strokes of undetermined source are a therapeutically relevant entity, which are defined as a non-lacunar brain infarct without proximal arterial stenosis or cardioembolic sources, with a clear indication for anticoagulation. Because emboli consist mainly of thrombus, anticoagulants are likely to reduce recurrent brain ischaemia more effectively than are antiplatelet drugs. Randomised trials testing direct-acting oral anticoagulants for secondary prevention of embolic strokes of undetermined source are warranted.

*Lancet Neurol* 2014; 13: 429–38

See [Comment](#) page 344

McMaster University and Population Health Research Institute, Hamilton, ON, Canada (Prof R G Hart MD); University Duisburg-Essen, Essen, Germany (Prof H-C Diener MD); University of Calgary, Calgary, AB, Canada (S B Coutts MD); Department of Neurology, University of California

# Comparaison AVC ischémique ESUS VS FA

## ESUS

- Patients plus jeunes
- AVC mineurs (petites embolies)

## FA

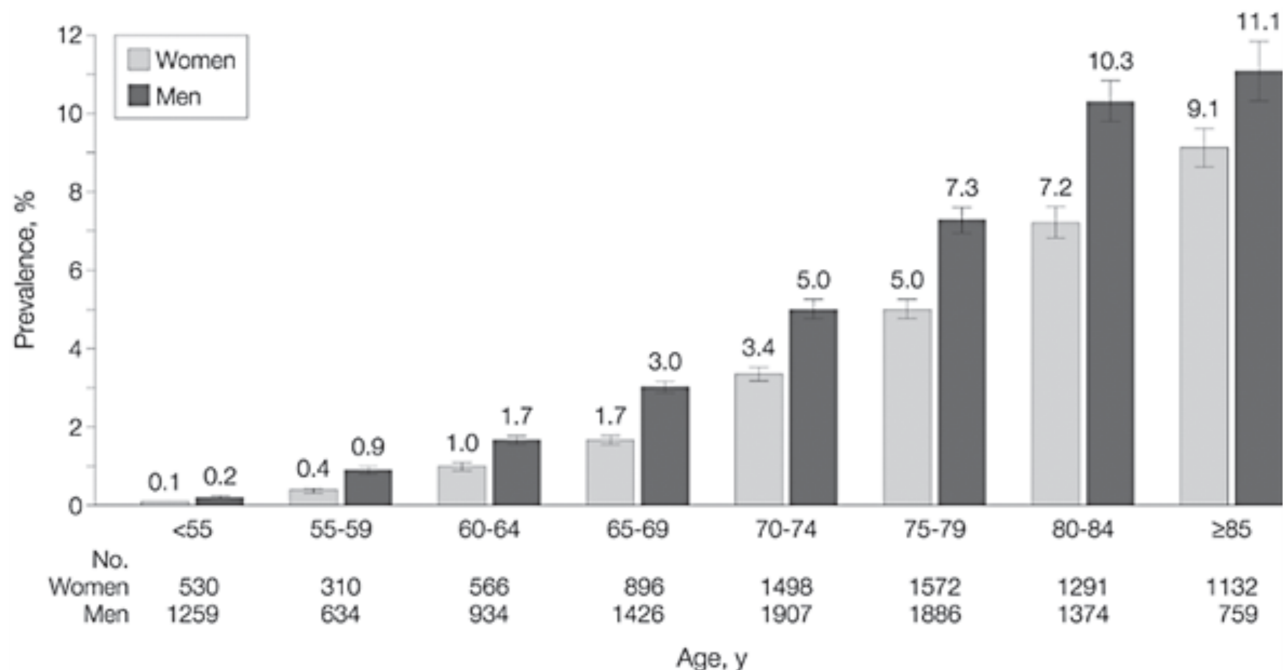
- Patients plus âgés
- AVC plus gros et souvent dévastateurs (grosses embolies)





From: **Prevalence of Diagnosed Atrial Fibrillation in Adults: National Implications for Rhythm Management and Stroke Prevention: the AnTicoagulation and Risk Factors In Atrial Fibrillation (ATRIA) Study**

JAMA. 2001;285(18):2370-2375. doi:10.1001/jama.285.18.2370



**Figure Legend:**

Errors bars represent 95% confidence intervals. Numbers represent the number of men and women with atrial fibrillation in each age category.

# Atrial fibrillation as a predictive factor for severe stroke and early death in 15 831 patients with acute ischaemic stroke

K Kimura, K Minematsu, T Yamaguchi, for the Japan Multicenter Stroke Investigators' Collaboration (J-MUSIC)

*J Neurol Neurosurg Psychiatry* 2005;76:679-683. doi: 10.1136/jnnp.2004.048827

See end of article for authors' affiliations

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Received 29 June 2004  
Revised version received  
8 September 2004  
Accepted  
8 September 2004

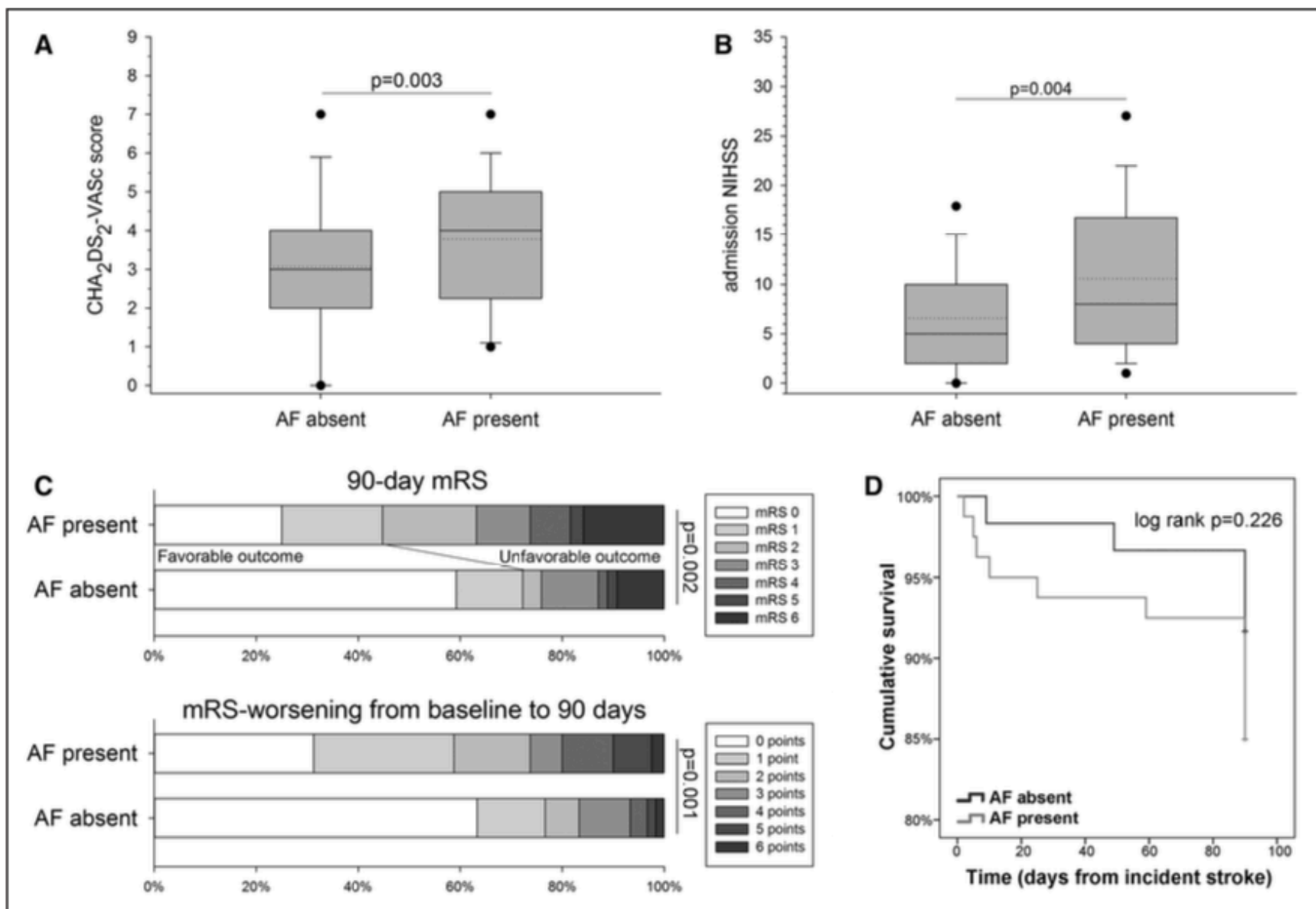
**Background:** Atrial fibrillation (AF) is a common arrhythmia and a major risk factor for stroke.

**Aims:** To assess whether AF in patients with acute ischaemic stroke is associated with severe stroke and early death.

**Materials/methods:** Patients with acute ischaemic stroke (15 831) who were registered in the Japan Multicenter Stroke Investigators' Collaboration registry were analysed. The AF group comprised 3335 (21.1%) patients (median age, 75 years) and the non-AF group comprised 12 496 (78.9%) patients (median age, 70 years). The association between AF and severe stroke and early death was investigated by means of multivariate logistic regression analysis.

**Results:** The admission National Institutes of Health Stroke Scale (NIHSS) score of the AF group was higher than that of the non-AF group (median, 12 v 5;  $p < 0.0001$ ). Multivariate logistic regression analyses found that female sex, advanced age, AF, and a history of stroke were independent factors associated with severe stroke (NIHSS score,  $\geq 11$ ). The mortality rate within 28 days after admission was 11.3% in the AF group and 3.4% in the non-AF group ( $p < 0.0001$ ). Multivariate logistic regression analyses identified older age, AF, and NIHSS score at admission as independent factors associated with early death.

**Conclusion:** AF was a predictive factor for severe stroke and early death in acute ischaemic stroke. Careful cardiac evaluation and appropriate treatment are needed to improve outcome in patients with acute stroke and AF.



# Embolic Stroke of Undetermined Source

## A Systematic Review and Clinical Update

Robert G. Hart, MD; Luciana Catanese, MD; Kanjana S. Perera, MBBS;  
George Ntaios, MD, PhD; Stuart J. Connolly, MD

The mean age of ESUS patients (averaging 65 years) may reflect incomplete diagnostic investigation of older patients with stroke that permit the diagnosis of ESUS.<sup>41</sup> With this caveat, the picture of ESUS patients that emerged is of relatively young (compared with atrial fibrillation-associated stroke) patients with mild strokes and with lower frequencies of conventional vascular risk factors compared with non-ESUS patients with ischemic stroke. We speculate that ESUS is usually caused by relatively smaller emboli from valvular and arterial sources rather than larger emboli originating in the cardiac chambers, notably left atrial appendage thrombi in patients with atrial fibrillation that embolize to cause large, devastating strokes.<sup>42</sup> Most minor risk emboli sources hypothesized to underlie most ESUS typically produce small emboli.<sup>1</sup>

La population de patients avec ESU ~~ne~~  
correspond pas à celle de patients avec  
AVC ischémique causé par la FA

# Concept ESUS: AVC embolique de source indéterminée

## Panel 1: Causes of embolic strokes of undetermined source

### Minor-risk potential cardioembolic sources\*

#### Mitral valve

- Myxomatous valvulopathy with prolapse
- Mitral annular calcification

#### Aortic valve

- Aortic valve stenosis
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### Paradoxical embolism

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\*Minor-risk sources are more often incidentally present than is the stroke cause when identified in an individual stroke patient, are associated with a low or uncertain rate of initial stroke, and consequently cause-effect relation and management implications are usually unclear.

Hypothèse des Lumpers  
Comme Dr Lanthier

# Global Survey of the Frequency of Atrial Fibrillation–Associated Stroke

## Embolic Stroke of Undetermined Source Global Registry

Kanjana S. Perera, MBBS; Thomas Vanassche, MD; Jackie Bosch, PhD;  
Balakumar Swaminathan, MSc; Hardi Mundl, MD; Mohana Giruparajah, BSc;  
Miguel A. Barboza, MD; Martin J. O'Donnell, MBBS; Maia Gomez-Schneider, MD;  
Graeme J. Hankey, MD; Byung-Woo Yoon, MD; Artemio Roxas, Jr, MD; Philippa Lavallee, MD;  
Joao Sargento-Freitas, MD; Nikolay Shamalov, MD; Raf Brouns, MD; Rubens J. Gagliardi, MD;  
Scott E. Kasner, MD; Alessio Pieroni, MD; Philipp Vermehren, MD; Kazuo Kitagawa, MD;  
Yongjun Wang, MD; Keith Muir, MD; Jonathan M. Coutinho, MD, PhD;  
Stuart J. Connolly, MD; Robert G. Hart, MD; on behalf of the ESUS Global Registry Investigators\*

**Background and Purpose**—Atrial fibrillation (AF) is increasingly recognized as the single most important cause of disabling ischemic stroke in the elderly. We undertook an international survey to characterize the frequency of AF-associated stroke, methods of AF detection, and patient features.

**Methods**—Consecutive patients hospitalized for ischemic stroke in 2013 to 2014 were surveyed from 19 stroke research centers in 19 different countries. Data were analyzed by global regions and World Bank income levels.

**Results**—Of 2144 patients with ischemic stroke, 590 (28%; 95% confidence interval, 25.6–29.5) had AF-associated stroke, with highest frequencies in North America (35%) and Europe (33%) and lowest in Latin America (17%). Most had a history of AF before stroke (15%) or newly detected AF on electrocardiography (10%); only 2% of patients with ischemic stroke had unsuspected AF detected by poststroke cardiac rhythm monitoring. The mean age and 30-day mortality rate of patients with AF-associated stroke (75 years; SD, 11.5 years; 10%; 95% confidence interval, 7.6–12.6, respectively) were substantially higher than those of patients without AF (64 years; SD, 15.58 years; 4%; 95% confidence interval, 3.3–5.4;  $P<0.001$  for both comparisons). There was a strong positive correlation between the mean age and the frequency of AF ( $r=0.76$ ;  $P=0.0002$ ).

**Conclusions**—This cross-sectional global sample of patients with recent ischemic stroke shows a substantial frequency of AF-associated stroke throughout the world in proportion to the mean age of the stroke population. Most AF is identified by history or electrocardiography; the yield of conventional short-duration cardiac rhythm monitoring is relatively low. Patients with AF-associated stroke were typically elderly (>75 years old) and more often women. (*Stroke*. 2016;47:2197-2202. DOI: 10.1161/STROKEAHA.116.013378.)

Le taux de détection de FA chez les patients avec ESUS est bas, 2% à 4% environ





ESUS, est-ce une entité clinique  
homogène ou non ?

# Age- and sex-specific analysis of patients with embolic stroke of undetermined source

## ABSTRACT

**Objective:** To investigate whether the correlation of age and sex with the risk of recurrence and death seen in patients with previous ischemic stroke is also evident in patients with embolic stroke of undetermined source (ESUS).

**Methods:** We pooled datasets of 11 stroke registries from Europe and America. ESUS was defined according to the Cryptogenic Stroke/ESUS International Working Group. We performed Cox regression and Kaplan-Meier product limit analyses to investigate whether age (<60, 60–80, >80 years) and sex were independently associated with the risk for ischemic stroke/TIA recurrence or death.

**Results:** Ischemic stroke/TIA recurrences and deaths per 100 patient-years were 2.46 and 1.01 in patients <60 years old, 5.76 and 5.23 in patients 60 to 80 years old, 7.88 and 11.58 in those >80 years old, 3.53 and 3.48 in women, and 4.49 and 3.98 in men, respectively. Female sex was not associated with increased risk for recurrent ischemic stroke/TIA (hazard ratio [HR] 1.15, 95% confidence interval [CI] 0.84–1.58) or death (HR 1.35, 95% CI 0.97–1.86). Compared with the group <60 years old, the 60- to 80- and >80-year groups had higher 10-year cumulative probability of recurrent ischemic stroke/TIA (14.0%, 47.9%, and 37.0%, respectively,  $p < 0.001$ ) and death (6.4%, 40.6%, and 100%, respectively,  $p < 0.001$ ) and higher risk for recurrent ischemic stroke/TIA (HR 1.90, 95% CI 1.21–2.98 and HR 2.71, 95% CI 1.57–4.70, respectively) and death (HR 4.43, 95% CI 2.32–8.44 and HR 8.01, 95% CI 3.98–16.10, respectively).

**Conclusions:** Age, but not sex, is a strong predictor of stroke recurrence and death in ESUS. The risk is  $\approx$ 3- and 8-fold higher in patients >80 years compared with those <60 years of age, respectively. The age distribution in the ongoing ESUS trials may potentially influence their power to detect a significant treatment association. [Neurology® 2017;89:532-539](#)

# Age and the fuzzy edges of embolic stroke of undetermined source

## Implications for trials

From a clinical standpoint, ESUS remains an entity with fuzzy edges and likely represents a disease spectrum with different natural history and future stroke risk. The study by Ntaios et al. demonstrates how this heterogeneity may differ across age groups and has potential implications for clinical management of patients with ESUS and ongoing trials. The results of 3 ongoing trials

ESUS est une entité hétérogène,  
notamment selon les groupes d'âges



Que faire avec les données en provenance des études concernant la composition histologique du thrombus retiré par thrombectomie mécanique ?

# Ischemic Stroke

## What Does the Histological Composition Tell Us About the Origin of the Thrombus?

Peter B. Sporns, MD\*; Uta Hanning, MD\*; Wolfram Schwindt, MD; Aglaé Velasco, MD;  
Jens Minnerup, MD; Tarek Zoubi, MD; Walter Heindel, MD; Astrid Jeibmann, MD\*;  
Thomas Ulrich Niederstadt, MD\*

**Background and Purpose**—The introduction of stent retrievers allows for a complete extraction and histological analysis of human thrombi. Ischemic stroke is a major health issue, and differentiation of underlying causes is highly relevant to prevent recurrent stroke. Therefore, histopathologic analysis of the embolic clots after removal may provide valuable information about underlying pathologies. This study analyzes histological clot composition and aims to identify specific patterns that might help to distinguish causes of ischemic stroke.

**Methods**—Patients with occlusion of the carotid-T or middle cerebral artery who underwent thrombectomy at our university medical center between December 2013 and February 2016 were included. Samples were histologically analyzed (hematoxylin and eosin, Elastica van Gieson, and Prussian blue), additionally immunohistochemistry for CD3, CD20, and CD68/KiM1P was performed. These data, along with additional clinical and interventional parameters, were compared for different stroke subtypes, as defined by the TOAST (Trial of ORG 10172 in Acute Stroke Treatment) classification.

**Results**—One hundred eighty-seven patients were included, of these, in 77 patients, cardioembolic; in 46 patients, noncardioembolic; and in 64 patients, cryptogenic pathogenesis was determined. Cardioembolic thrombi had higher proportions of fibrin/platelets ( $P=0.027$ ), less erythrocytes ( $P=0.005$ ), and more leucocytes ( $P=0.026$ ) than noncardioembolic thrombi. We observed a strong overlap of cryptogenic strokes and cardioembolic strokes concerning thrombus histology. The immunohistochemical parameters CD3, CD20, and CD68/KiM1P showed no statistically noticeable differences between stroke subtypes.

**Conclusions**—Histological thrombus features vary significantly according to the underlying cause and may help to differentiate between cardioembolic and noncardioembolic stroke. In addition, our study supports the hypothesis that most cryptogenic strokes have a cardioembolic cause. (*Stroke*. 2017;48:2206-2210. DOI: 10.1161/STROKEAHA.117.016590.)

# AHA/ASA Guideline

## 2015 American Heart Association/American Stroke Association Focused Update of the 2013 Guidelines for the Early Management of Patients With Acute Ischemic Stroke Regarding Endovascular Treatment

### A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

2. Patients should receive endovascular therapy with a stent retriever if they meet all the following criteria (*Class I; Level of Evidence A*). (New recommendation):
  - a. Prestroke mRS score 0 to 1,
  - b. Acute ischemic stroke receiving intravenous r-tPA within 4.5 hours of onset according to guidelines from professional medical societies,
  - c. Causative occlusion of the ICA or proximal MCA (M1),
  - d. Age  $\geq 18$  years,
  - e. NIHSS score of  $\geq 6$ ,
  - f. ASPECTS of  $\geq 6$ , and
  - g. Treatment can be initiated (groin puncture) within 6 hours of symptom onset



La population de patients avec AVC  
ischémique aigu traités par  
thrombectomie mécanique ne  
correspond pas à celle de patients avec  
ESUS



# Patients post-AVC: **Pour** ou **Contre** les AOD ?

- AVC ischémique cryptogène:
  - Hautement hétérogène
- ESUS:
  - Patients jeunes
  - AVC mineurs
  - Taux de détection de FA très bas
  - Demeure hétérogène selon l'âge

# Patients post-AVC: **Pour** ou **Contre** les AOD ?

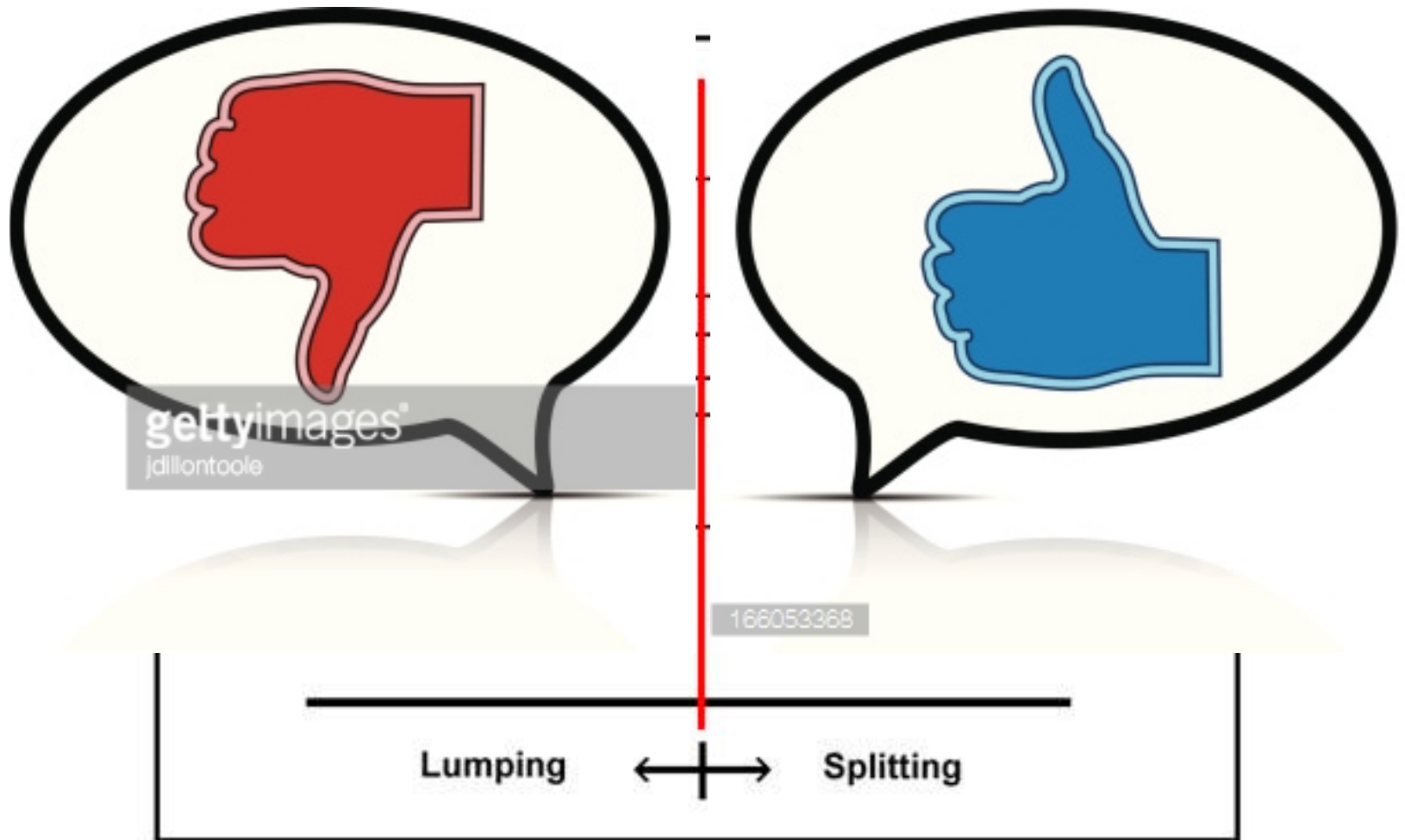
- ESUS est un concept théorique surtout utile à la réalisation d'essais cliniques randomisés impliquant les AOD dans la prévention secondaire de l'AVC ischémique
- Le concept ESUS ne respecte pas vraiment la réelle complexité de l'AVC ischémique cryptogène en terme d'étiologie
- L'hypothèse sur laquelle est basée le concept d'ESUS qui veut que la cause principale soit la FA est fausse

# Patients post-AVC: **Pour** ou **Contre** les AOD ?

- Puisqu'un des principes fondamentaux de la médecine est que le traitement suit le diagnostic:

Il ne faut aucunement s'attendre à ce que la détection de FAP et l'utilisation des AOD va résoudre le mystère de l'AVC cryptogène et éliminer les récurrences d'AVC chez ces patients

# Patients post-AVC: **Pour** ou **Contre** les AOD ?



Position du Dr Lanthier:  
Pour les AOD

Position du Dr Verreault:  
Contre les AOD

Merci de votre attention

Questions ?